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Table of Contents

List of Abbreviations ........................................................................................................5

1 Introduction......................................................................................................................6

2 Project overview ..............................................................................................................8

2.1 Project Extensive Summary .....................................................................................8

2.2 Consortium’s composition and the roles of the partners involved.........................11

3 Project objectives, results and description of work towards their achievement .........15

3.1 WP1: Network communication, Management and consensus mechanism..............15

3.1.1 A1.1 Network Management ..............................................................................15

3.1.2 A1.2 Network communication .........................................................................17

3.1.3 A1.3 Meeting, reporting and consensus mechanism .......................................19

3.1.4 A1.4 Project Quality Assurance scheme and assessment procedures .............20

3.2 WP2: Towards a common PSN classification and assessment criteria .....................22

3.2.1 A2.1 Establishment of a common PSN driving ability classification scheme .......22

3.2.2 A2.2 Establishment of common set of assessment criteria ...............................24

3.3 WP3: Towards a common PSN driving ability assessment methodologies and tools 26

3.3.1 A3.1 Minimum set of common assessment tools .............................................27

3.3.2 A3.2 Towards a common PSN driving ability assessment methodology ...........28

3.4 WP4: Development of IT tools for assessment quality enhancement .....................30

3.4.1 A4.1 Assessment database ..............................................................................30

3.4.2 A4.2 Expert Knowledge Tool ..........................................................................31

3.5 WP5: Dissemination, Creation of public awareness user acceptance enhancement and Network viability schemes .........................................................32

3.5.1 A5.1 Information Dissemination .....................................................................33

3.5.2 A5.2 Public awareness creation and specification of required tools and aids .......41

3.5.3 A5.3 User Acceptance enhancement ...............................................................42

3.5.4 A5.4 Guidelines and recommendations to the authorities and the industry ......43

3.5.5 A5.5 Network viability .....................................................................................47

4 Project results and achievements ..................................................................................53

4.1 Scientific/technological quality and innovation .......................................................53

4.1.1 Network Communication ...............................................................................53

4.1.2 Internet-based CONSENSUS Database .........................................................55

4.1.3 CONSENSUS Expert Knowledge Tool ............................................................59

4.2 Community added value and contribution to EU policies ......................................62

4.3 Impact to the Assessment Procedures Standardisation .............................................64

4.4 Contribution to Community social objectives .........................................................65

4.5 Network establishment, initial synthesis and expansion policies ............................67

4.6 Economic development .............................................................................................68

4.6.1 Dissemination of results ..................................................................................69

4.6.2 Users groups involved .....................................................................................69

4.6.3 Strategic impact of the thematic network in terms of improvement of competitiveness or creation of market opportunities ..............................................70

4.6.4 Exploitation strategies ....................................................................................71

4.6.5 Partners’ benefit .............................................................................................75

5 Deliverables and other outputs ....................................................................................76

November 2004

Page
5.1 Deliverables..........................................................................................................................76
5.2 Other output..........................................................................................................................97
6 Project management and co-ordination aspects.................................................................98
7 Partner Exploitation Plans..................................................................................................103
8 Conclusions.........................................................................................................................105
ANNEX I Thematic Network Members .............................................................................110
ANNEX II Thematic Group Discussions during the First Workshop in Valencia................118
ANNEX III Thematic Group Discussions during the Second Workshop in Ljubljana ..........120
ANNEX IV Ethics in Driver Assessment .............................................................................121
ANNEX V Provisional Terminology for Driver Assessment..............................................123
ANNEX VI Security of CONSENSUS Web services.........................................................126
ANNEX VII Project Dissemination Material ....................................................................128
Annex VIII Submitted CONSENSUS papers ....................................................................130
Annex IX CONSENSUS Newsletters...............................................................................134
Annex X Manual of ADAS and IVIS functions ................................................................135
Annex XI Network Member’s Field of Activity ...............................................................140

List of Tables

Table 1: Consortium composition and the roles of the Partners involved..........................14
Table 2: CONSENSUS workshops participation.................................................................40
Table 3: Categorisation of organisations..........................................................................40
Table 4: Target groups reached by specific dissemination tool..........................................41
Table 5: Perceived usefulness of different systems: in green, more useful systems are indicated, in yellow more useless ones..........................................................45
Table 6: Contributors of Database Input..........................................................................59
Table 7: Contributors of Expert Knowledge Tool Input.....................................................62
Table 8: Maturity classification.........................................................................................64
Table 9: Maturity Model....................................................................................................65
Table 10: Comfort features when driving a private car and when using means of public transport........................65
Table 11: CONSENSUS outcome “exploitation” scheme..................................................72
List of Figures

Figure 1: CONSENSUS Membership scheme .................................................................18
Figure 2: CONSENSUS classification scheme on assessment of PSN .................................23
Figure 3: Codification scheme ...........................................................................................24
Figure 4: Common Assessment Tools per category ...........................................................28
Figure 5: Database welcome page .....................................................................................35
Figure 6: Participants from each category in 1st CONSENSUS workshop ...........................37
Figure 7: Participants from each category in 2nd CONSENSUS workshop ...........................38
Figure 8: Semantic differential scale used in the A5.4 questionnaire .................................44
Figure 9: Respondents’ preferences on network sales policy ...............................................48
Figure 10: Respondents’ opinions on members’ annual subscription fees ............................48
Figure 11: Respondents’ opinions on fee per expert tool request for non-members ..............49
Figure 12: Respondents’ opinions on fee per trainee for non-members ................................49
Figure 13: Respondents’ opinions on homologation cost ....................................................49
Figure 14: The different EC initiatives in the field and their interrelations ............................51
Figure 15: CONSENSUS web site main services ...............................................................54
Figure 16: Screenshot of the start page of the UI for data input ...........................................57
Figure 17: Screenshot of the entry screen of the search/output interface of the CONSENSUS database ........................................................................................................58
Figure 18: Step-by-step guidance ........................................................................................60
Figure 19: Suggested Tools ................................................................................................61
Figure 20: Contact points ....................................................................................................61
Figure 21: Members of different categories of organisations from all countries in the CONSENSUS Thematic Network ..................................................................................................................70
Figure 22: Members of different categories of organisations from all countries in the CONSENSUS User Forum ..........................................................................................................................70
Figure 23: CONSENSUS Network layout ...........................................................................74
Figure 24: Process from fitness to drive assessment to adaptation evaluation according to CONSENSUS project ..........................................................................................................................84
Figure 25: Total person hours per Work Package during CONSENSUS duration ................100
Figure 26: Total person hours per Partner for all Work Packages during CONSENSUS duration .................................................................................................................................100
Figure 27: CONSENSUS Project’s Evaluation Diagram ....................................................102
Figure 28: Network Members Access ..................................................................................126
Figure 29: User Forum Members access .............................................................................127
# List of Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
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<tbody>
<tr>
<td>ADAS</td>
<td><strong>ADVANCED DRIVER ASSISTANCE SYSTEM(S)</strong></td>
</tr>
<tr>
<td>DSN</td>
<td><strong>DRIVERS WITH SPECIAL NEEDS – A SUBGROUP OF PSN WITH A DRIVING LICENSE (DRIVERS WITH DISABILITIES)</strong></td>
</tr>
<tr>
<td>E&amp;D</td>
<td><strong>ELDERLY AND PEOPLE WITH DISABILITIES (SEE PSN)</strong></td>
</tr>
<tr>
<td>ICD</td>
<td><strong>INTERNATIONAL CLASSIFICATION OF DISEASES</strong></td>
</tr>
<tr>
<td>ICD-9-CM</td>
<td><strong>INTERNATIONAL CLASSIFICATION OF DISEASES, VERSION 9, CLINICAL MODIFICATION</strong></td>
</tr>
<tr>
<td>ICIDH-2</td>
<td><strong>INTERNATIONAL CLASSIFICATION OF FUNCTIONING, DISABILITY AND HEALTH, VERSION 2</strong></td>
</tr>
<tr>
<td>ICF</td>
<td><strong>INTERNATIONAL CLASSIFICATION OF FUNCTIONING</strong></td>
</tr>
<tr>
<td>ISO</td>
<td><strong>INTERNATIONAL STANDARDS ORGANISATIONS</strong></td>
</tr>
<tr>
<td>IT</td>
<td><strong>INFORMATION TECHNOLOGIES</strong></td>
</tr>
<tr>
<td>IVICS</td>
<td><strong>IN-VEHICLE INFORMATION AND COMMUNICATION SYSTEMS</strong></td>
</tr>
<tr>
<td>NGO</td>
<td><strong>NON-GOVERNMENTAL ORGANIZATIONS</strong></td>
</tr>
<tr>
<td>PSN</td>
<td><strong>PEOPLE WITH SPECIAL NEEDS – (PEOPLE WITH DISABILITIES) (PSN IS USED AS A GENERAL TERM FOR PEOPLE WITH DISABILITIES – INCLUDING ELDERLY)</strong></td>
</tr>
<tr>
<td>QB</td>
<td><strong>QUALITY BOARD</strong></td>
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<tr>
<td>QP</td>
<td><strong>QUALITY PLAN</strong></td>
</tr>
<tr>
<td>TG</td>
<td><strong>THEMATIC GROUP</strong></td>
</tr>
<tr>
<td>WG</td>
<td><strong>WORKING GROUP</strong></td>
</tr>
<tr>
<td>WHO</td>
<td><strong>WORLD HEALTH ORGANISATION</strong></td>
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1 Introduction

The assessment of the fitness to drive of PSN (People with Special Needs) is a rather complex procedure, that in many cases requires not only the certification of their medical condition, but also the assessment of body dimensions in relation to the potential vehicle, the forces needed to activate controls, perceptual abilities and cognitive resources. Currently, there is a total lack of standardisation methods and tools used for the above procedure.

Previous research has highlighted the relevant differences between the various countries and even regions of EU and beyond. For example, TELAID (V2032) identified 5 distinctive PSN driving assessment models, namely the Central European, the Nordic, the UK, the South-European and the United States models. Still, from 1992 that this survey was conducted [TELAID Del. 1] until today the relevant assessment practices seem to have further diversified instead of converging. Furthermore, the DSN (Drivers with Special Needs) classification scheme proposed by it, has not been adopted by any standardisation body and thus has been only partially used by few National Authorities (i.e. in Italy, Greece).

Knowledge/practices transfer between different Member and Associate States has taken place in national and European research projects, such as the transfer of Benelux driving assessment practices to Greece (HORIZON project DARE, co-funded by DG VII), to Portugal (National project), of Swedish experience to Greece (HORIZON project ODIGO) and to Estonia (National project), multi-national experiences transfer to Slovakia (HORIZON project EAR), etc. Still, this transfer only creates islands of knowledge within Europe and further strengthens the barriers in using good practices from other European regions.

Therefore it is obvious that only the establishment of a Thematic Network Group on a pan-European scale would be able to offer the necessary width of expertise and the critical mass to overcome local assessment practices and procedures and to converge to commonly accepted practices and tools with pan-European applicability. Such a tool needs the use of state of the art telematics to be in close contact (e.g. teleconferencing, shared databases of knowledge, etc.) and may greatly benefit from modern IT tools for driving ability assessment, such as Virtual Reality (VR) simulators, employment of Advanced Driver Assistance Systems (ADAS), etc.

A proposal to establish such a network has been submitted on 05.06.2000 to EU, resulting to the attribute of a feasibility study on the use and viability of such a network, called CONSENSUS (IST-2000-26456). CONSENSUS feasibility study results have proven that:

- In spite of the big differences in current assessment procedures, there seems to be the possibility for reaching consensus on a minimum number of tools and tests used for the assessment. A first draft of what such a minimum assessment methodology is included in D2.2 of CONSENSUS feasibility study. As basic common denominators the (International Classification Diseases (ICD-9-CM) and the International Classification of Functioning, Disability and Health (ICF) their correlation to the driving task as described in the GDE (Goals for Driver Education) framework from the GADGET project.
• There is a great interest Europe-wide on reaching consensus and agreeing on a common PSN driving fitness assessment methodology.

• IT tools seem to be a cornerstone to the development and sustainability of a cost-effective and viable network in this area. There is a great need for a common Internet-based database on assessment tools and practises, on-line consultation and support services (through Internet and teleconferencing) and even shared use of assessment tools in the network. Statistical analysis of assessment results and an expert knowledge tool, to support the evaluation, would also be welcomed. The development of such tools has been voted as of high priority during the CONSENSUS pan-European workshop, conducted on 12.2.02 in Brussels, with the participation of 45 experts from 17 countries.

Based on the above preliminary findings and work of CONSENSUS feasibility study, the follow-up project was addressed which was the actual building of the CONSENSUS Thematic Network. The aims, objectives, work results and achievements of the CONSENSUS Thematic Network are described in the current document.
2 Project overview

2.1 Project Extensive Summary

The main characteristics of current driving assessment practices of PSN within Europe today is their great heterogeneity: no standard exists, procedures vary greatly, assessment tools are different (see e.g. for a review Christie, 1996; Ranney, 1994), as well the professional background of driving assessors. Providing assessors with information on assessment procedures, on existing tools, on particular cases, etc. and proposing guidelines to help them in their everyday practice are the first necessary steps towards driving assessment standardization and hence quality improvement. These first steps have been performed within CONSENSUS project.

The work started, within WP1, with the expansion of the initial CONSENSUS Network (16 Partners from 14 countries and including 5 Assessment Centres) and its support mechanism. Three interrelated sub-groups, a Thematic Groups scheme and three connected service bodies were organised.

The Steering Committee was composed of 10 Members (BIVV/CARA, VTI, CERTH/HIT, UPV, DFT, DDA, IFADO, CRF, IAT and TREDIT), with the aim to supervise all technical and financial activities of the group, to create and approve the relevant Deliverables and to undertake communications with EU and other official bodies.

The Thematic Network includes finally 16 partners and 34 external members (50 in total), of which 17 were entered as funded members. Furthermore, a single Member the UK Forum, represents 10 Assessment centres in the UK and another one EMG group, represents 30 adaptation companies in 11 European countries. Thus, it can be considered that the project objective to reach 50 members has been overpassed. This Network consists from 29 Assessment Centres /PSN Licensing Authorities/Driving schools specialised in PSN issues, 32 Manufactures, 9 Relevant Technology Providers, 12 PSN’ Users Representatives, 4 Funding Organisation/Authorities, 2 Vehicle Inspection. The Thematic Network Members were able to acquire all information (official and internal Deliverables) generated by the Network and to provide data for and feedback on them. In addition, they participated to two meetings of the Network annually and had full rights to info access and one vote each for the approval of formal resolutions and decisions taken by the group. All CONSENSUS feasibility project Network Members were automatically accepted as initial CONSENSUS Thematic Network Members (upon their agreement), as well as any new project participant.

A number of key actors from all over Europe participated to the project’s User’s Forum, that was established by the beginning of the project as a continuation of the CONSENSUS feasibility study one. The User Forum Network consists from 12 Assessment Centres /PSN Licensing Authorities/Driving schools specialised in DSN issues, 2 Manufactures, 2 Relevant Technology Providers, 9 PSN Users Representatives, 3 Funding Organisation/Authorities, 2 Vehicle Inspection. User Forum Members had been informed about new project info at the project’s WWW site and were able to download project results from it and send back their opinion.
Five Thematic Groups were established within the Network, on classification schemes, user problems and views, assessment methodologies and tools, IST support tools, recommendations and standardisation respectively. The Thematic Group meetings were organized in parallel, one day before or after the Steering Committee Meetings and constituted the main project body for technical information dissemination, discussion, debate.

In addition, three connected services were created, namely the Network Secretariat (in CARA), which produced and disseminated project Deliverables and dissemination material and managed the project’s WWW site, the Quality Control Group (in CERTH/HIT), where the quality of project’s deliverables were evaluated by the Peer Reviewers, and the Ethical Committee (in COAT) settled by three permanent, external and independent from the Consortium members, appointed by COAT (as president), BIVV/CARA and HIT. The actual work of the Network started with the establishment of a description of PSN problems and residual abilities classification in relation to the driving task, within WP2, as well as a uniform set of criteria, for PSN driving ability assessment for pan-European adoption.

Analytically, one of the main objectives, within this activity, was the establishment of a standardised way to classify both medical and functional data for the assessment process of drivers with disabilities, taking into account the important difference between ‘fitness-to-drive’ and ‘driving abilities’. The differences can be described as follows. **Fitness to drive** is a medical term referring to the status of a driver with possible functional impairments. To be fit to drive, a driver needs to have the perceptual, cognitive and motor abilities to drive a car; has to have a low probability of loosing control suddenly and unpredictably during driving, and has to possess the needed social responsibility (attitudes) and social judgment during driving. While, **driving ability** refers to the complex interaction between physical, cognitive, perceptual and psychological abilities needed to carry out the driving task safely, i.e. relating the abilities to the actual driving task demands. Thus, **fitness-to-drive assessment** is a term used to describe the medical and functional assessment aimed to determine if a person with disabilities has a potential to become a licensed driver and **driving ability assessment** refers to the functional assessment of a person’s ability to drive safely. The CONSENSUS selected target group includes drivers suffering from the following illnesses or disabilities: spinal cord disabilities, peripheral nervous system sensory and locomotor disorders, muscle diseases and other locomotor diseases. The classification scheme was based on the: ICD-9-CM (International Classification of Diseases, version 9, Clinical Modification) and ICIDH-2 (International Classification of Functioning, Disability and Health) classifications. This classification scheme has been finally detailed, having as examples four use cases (Traumatic Spinal Cord Injury, Post – Poliomyelitis, Duchene Muscular Dystrophy, and Amputation), as they represent some of the most frequent cases in driving ability assessment and constitute an example of pan-European applications of the new assessment system.

Furthermore, the way for the standardisation of assessment procedures at a European level has been defined, agreed and prioritised, to be undertaken by the Network in the future, by reviewing the current situation with regard to commonalities and differences in the assessment procedure, and by introducing structured lists including the functional measurements and assessment criteria for selected medical conditions. The main target group was the personnel responsible for the actual assessment procedure:
medical doctors, general practitioners, occupational therapists, specialised physicians, etc. The four use cases, mentioned above, were explained in detail as a concrete illustration of the recommended assessment procedure.

A common minimum set of evaluation tools and a uniform assessment methodology were specified, within WP3, based upon background info from CONSENSUS feasibility study. The methodology has been detailed and standardised in the four specific use cases. These would serve as guidance and best practice cases for applying the agreed assessment tools and methods to other types of disabilities.

Two specific IST tools were developed within WP4 and presented in the Network website, namely an Internet-based assessment tools/practices database and an expert knowledge tool, in order to support the PSN driving ability assessment procedure. The database contains 20 assessment criteria, 42 assessment tools, 6 assessment procedures, 43 literatures and 52 use cases. The expert knowledge tool provides guidance to the assessment personnel for the PSN driving ability assessment process according to each disability case which is described from the assessment personnel, by following the codification methodology developed within CONSENSUS. It consists of 48 tools for physical evaluation, 68 contact points within 21 countries and 52 use cases supported from the database.

Last but not least, a concise dissemination, public awareness and user (i.e. PSN) acceptance scheme was formulated within WP5 and followed throughout the project in order to promote the use of the project’s proposed common evaluation framework by all PSN driving Assessment Centres in EU and beyond, the acceptance of this framework by PSN people and their relatives and the awareness of the society as a whole towards the needs of DSN. This strategy employed project leaflets, posters, an interactive website (http://www.consensus-eu.org), allowing the shared and concurrent use of the assessment tools by Network members, a code of Good Practice on PSN driving ability assessment, 13 published papers in scientific and non-scientific Magazines and presented in Conferences and two workshops. The first workshop, that took place in Valencia, Spain in Month 13 of the project, on September 2003, had 87 participants of which 68 were external to the consortium. The second workshop, that took place one in Ljubljana, in Month 22 of the project on June 2004, had 52 persons attended the workshop, of which 34 were external to the consortium.

The developed Code of Good Practice encompasses recommendations for best practice when assessing the fitness-to-drive of people with special needs and further recommendations. These recommendations define the mission and the guiding principle of every assessment. Specific recommendations on organisational, standardisation and legislative issues have been drawn and submitted to the Driving license Committee of DG TREN, as well as several national Authorities. Recommendations on required ADAS have been formulated for the industry, prioritising 33 existing or developed ADAS. User acceptance and awareness has been captured and promoted by the use of two questionnaires. The first one filled by professional experts and the second one by drivers who use car adaptations to successfully compensate for existing disabilities. The different questionnaire modules included items, such as asking if the respondents agree to certain statements corresponding to stereotypes about drivers with disabilities, as well as questions about practices with regard to the technical inspection of adapted vehicles, questions about instruments and tools used during the assessment process and questions about car adaptations that
are not yet available on the market. The respondents were furthermore asked for suggestions to improve the co-operation between the driving assessors and their clients with disabilities.

Eventually, a Network viability study was performed, to propose strategies and solutions, so that the Thematic Network will remain alive after the project’s end. A questionnaire survey was performed among network members, so as to collect their opinion on network organisation and expected income, which showed among others that the majority of respondents would prefer a charging per request only for non-members, and for members, they would accept an annual subscription fee of 2000-3000 €. Then, a strategy has been devised regarding the establishment of this Network, in the legal form of a non-profit NGO, established in an EU country of one of the founding members, most probably Greece. This will be governed by a Supervisory Board of 5 members, chaired by a Chairman, a General Secretary and an Assembly of Members. Rules have been defined for decision taking and acceptance of new members. A first estimation of annual income and expenses has been devised, based on the questionnaire survey results and on partners and members interest to join this network. The network income is expected from the annual subscription fees of members, the use of the developed within CONSENSUS project database and expert tool, the organisation of 4 training courses per year and the homologation of tools and methods for assessing driving ability of people with disabilities. Comparing income with expenses, one can conclude that the Network will be economically viable. Finally, a proposal is made regarding the cooperation of the Thematic Network with other running research projects, namely AGILE and IDEA projects, so as to strengthen the Networks expertise towards also the driving assessment of elderly and the vocational training of the driving assessors of PSN.

More detailed achievements and results of the project can be found in the following chapters and a summarised description of these in the conclusion section of this document.

2.2 Consortium's composition and the roles of the partners involved

The final Consortium composition and the roles of the Partners involved are briefly described in the following table.

<table>
<thead>
<tr>
<th>Part. Role</th>
<th>Part. no.</th>
<th>Participant name</th>
<th>Participant short name</th>
<th>Coun try</th>
<th>Main area of activity/specialisation</th>
<th>Partner’s main Role in the project</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>1</td>
<td>Swedish Road and Transport Research Institute</td>
<td>VTI</td>
<td>S</td>
<td>VTI is a research centre, working in the transportation sector, in the fields of infrastructure, traffic and transport research.</td>
<td>VTI as coordinator of the project was responsible for its management and consensus mechanism. VTI has coordinated on the establishment of minimum set of common assessment tools and has contributed on the development of a common PSN driving ability assessment methodology.</td>
</tr>
<tr>
<td>P</td>
<td>2</td>
<td>Centre for Research and Technology Hellas/ Hellenic Institute of</td>
<td>CERTH/HIT</td>
<td>EL</td>
<td>HIT focuses on applied research in all fields of Transport, with the aim to provide inputs for, among other fields, policy formulation, documentation of</td>
<td>HIT was responsible for the project quality scheme and assessment procedures. It also participated in the Network management, as</td>
</tr>
</tbody>
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November 2004

Page 11
<table>
<thead>
<tr>
<th>Part. Role</th>
<th>Part. no.</th>
<th>Participant name</th>
<th>Participant short name</th>
<th>Country</th>
<th>Main area of activity/ specialisation</th>
<th>Partner’s main Role in the project</th>
</tr>
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<tbody>
<tr>
<td>P</td>
<td>3</td>
<td>Belgian Road Safety Institute</td>
<td>BIVV-CARA</td>
<td>B</td>
<td>Determines the driving fitness of people with functional disorders. If necessary, the required adaptations are determined in addition to the driving fitness decision.</td>
<td>a member of the steering committee and Quality manager. Finally, HIT developed the CONSENSUS expert knowledge tool.</td>
</tr>
<tr>
<td>P</td>
<td>4</td>
<td>Mobility Advice and Vehicle Information Service</td>
<td>DFT - MAVIS</td>
<td>UK</td>
<td>DFT-MAVIS role is to provide advice, information and assessment services to DSN, in order to help them make informed choices about their own motoring needs.</td>
<td>DFT-MAVIS has contributed on the establishment of a common PSN driving ability classification scheme and assessment methodology.</td>
</tr>
<tr>
<td>P</td>
<td>5</td>
<td>Polytechnic University of Valencia</td>
<td>UPV</td>
<td>E</td>
<td>Among UPV’s main activity fields are included homologations and certifications, research, development, education and training.</td>
<td>UPV has set up the ITS network and was responsible for the Network communication. It has reported on the establishment of a common PSN driving ability classification scheme.</td>
</tr>
<tr>
<td>P</td>
<td>6</td>
<td>Disabled Drivers Association</td>
<td>DDA</td>
<td>IRL</td>
<td>DDA provides an Information and Support Service to PSN and operates a Driving School providing tuition on specially adapted vehicles for persons with physical disabilities, the Association’s principal concerns being independency and mobility.</td>
<td>DDA represents the PSN users point of view in the CONSENSUS Consortium. DDA has significantly contributed in the users’ awareness enhancement by distributing the relevant questionnaire to its members and by contributing to its analysis. It has also contributed in the Network viability schemes.</td>
</tr>
<tr>
<td>P</td>
<td>7</td>
<td>Institut National de Recherche sur les Transports et leur Sécurité</td>
<td>INRETS</td>
<td>F</td>
<td>The role of INRETS is to develop relationships between needs and expectations of potential users of transport and industrial products and/or services supplied by transport operators.</td>
<td>INRETS was mainly responsible for the specification of the existing assessment system and the promotion of CONSENSUS scheme and tools in France.</td>
</tr>
<tr>
<td>P</td>
<td>8</td>
<td>Fiat Research Centre</td>
<td>CRF</td>
<td>I</td>
<td>CRF is a leading European organisation in industrial research and technological development sector. It is the research centre of an automotive manufacturer (FIAT).</td>
<td>CRF represents the car manufacturers’ point of view in the Consortium. CRF has led on the recommendations to the authorities and the industry.</td>
</tr>
<tr>
<td>P</td>
<td>9</td>
<td>Institut für Arbeitsphysiologie</td>
<td>IfADo</td>
<td>D</td>
<td>IfADo’s central topics are the preservation and improvement</td>
<td>IfADo was responsible for the establishment of a</td>
</tr>
<tr>
<td>Part. Role</td>
<td>Part. no.</td>
<td>Participant name</td>
<td>Participant short name</td>
<td>Country</td>
<td>Main area of activity/ specialisation</td>
<td>Partner’s main Role in the project</td>
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<tr>
<td>P</td>
<td>10</td>
<td>TransEuropean Consultants for Transport, Development and Information Technology S.A.</td>
<td>TREDIT</td>
<td>EL</td>
<td>TREDIT provides international multidisciplinary consultancy to public and private sector organisations, with regard to services in Regional Development, Urban and Regional Planning, Management, Economics and Specialised Services in all fields of Transport (including Transport Telematics).</td>
<td>TREDIT was responsible for the Network viability. It has also significantly contributed to the dissemination and use plan of the project.</td>
</tr>
<tr>
<td>P</td>
<td>11</td>
<td>Institute for Rehabilitation, Republic of Slovenia</td>
<td>IRRS</td>
<td>SL</td>
<td>Rehabilitation hospital for people with physical disabilities. IRRS is running an outpatient Clinic for drivers with disabilities and car adaptations.</td>
<td>IRRS has contributed on the establishment of the minimum set of common assessment tools.</td>
</tr>
<tr>
<td>P</td>
<td>12</td>
<td>Transport Research Centre</td>
<td>CDV</td>
<td>CZ</td>
<td>CDV is a governmental company - research institute of the Ministry of Transport and Communications of the Czech Republic. Main activities cover research and consultancy in all transport modes in national, regional and local level.</td>
<td>CDV has contributed in the public awareness creation and specification of required tools and aids. It has also contributed in the recommendations to the authorities and industry.</td>
</tr>
<tr>
<td>P</td>
<td>13</td>
<td>Institute of Psychology and Rehabilitation</td>
<td>IPR</td>
<td>LT</td>
<td>IPR is a centre for scientific research, pedagogical activity and practical medicine.</td>
<td>IPR has contributed in the establishment of a common PSN driving ability classification scheme and assessment methodology.</td>
</tr>
<tr>
<td>P</td>
<td>14</td>
<td>Centraal Bureau Rijvaardighedenbewijzen</td>
<td>CBR</td>
<td>NL</td>
<td>CBR is an Assessment Centre for the driving skills, as well as the medical fitness to drive of people with disabilities. It also determines the necessary car adaptations.</td>
<td>CBR has contributed on the establishment of a common PSN driving ability classification scheme and assessment methodology.</td>
</tr>
<tr>
<td>P</td>
<td>15</td>
<td>Centre of Applied Technologies in Mental Health</td>
<td>COAT</td>
<td>CH</td>
<td>COAT’s core research team, consisting of psychiatrists, psychologists and neurologists, focuses on diagnosing and treating various neuropsychological disturbances, as well as on investigating anthropocentric factors, leading to more naturalistic human computer interfaces.</td>
<td>COAT, as the president of project’ Ethical committee has reported on the ethical of the assessment procedure issues. It has also contributed in the development of common PSN classifications and assessment criteria.</td>
</tr>
<tr>
<td>P</td>
<td>16</td>
<td>Institute for Human Factors</td>
<td>USTUTT/IAT</td>
<td>D</td>
<td>Fields of research at the IAT are &quot;Multimedia Business</td>
<td>IAT developed the CONSENSUS assessment</td>
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<td>Part. no.</td>
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<td>Participant short name</td>
<td>Country</td>
<td>Main area of activity/specialisation</td>
<td>Partner’s main Role in the project</td>
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The Network has in addition another 34 Members. They are all listed in Annex I, at the end of this document.

Table 1: Consortium composition and the roles of the Partners involved.
3 Project objectives, results and description of work towards their achievement

3.1 WP1: Network communication, Management and consensus mechanism

Results

Effective management of the Network and inter-communication between its members.

3.1.1 A1.1 Network Management

Objectives

- To organise the Network and provide the necessary Management and support mechanisms for its optimal operation.

Approach followed towards achieving the objectives

Three interrelated sub-groups, a Thematic Groups scheme and three connected service bodies were organised. The relevant subgroups were:

- **Steering Committee**

  It was composed of 10 Members (BIVV/CARA, VTI, CERTH/HIT, UPV, DFT, DDA, IFADO, CRF, IAT and TREDIT), with the aim to oversee all technical and financial activities of the group, to create and approve the relevant Deliverables and to undertake communications with EU and other official bodies. The Network Administrative and Financial Manager was VTI, representing the Consortium towards EU. The Network Technical Manager was VTI and Quality Manager was HIT.

- **Network Members**

  The rest participants were appointed the status of a Thematic Network Group Member and thus were able to acquire all information (official and internal Deliverables) generated by the Network and to provide data for and feedback on them. The Network Members participated to two meetings of the Network annually and had full rights to info access and one vote each for the approval of formal resolutions and decisions taken by the group. All CONSENSUS feasibility project Network Members were automatically accepted as initial CONSENSUS Thematic Network Members (upon their agreement), as well as any new project participant. For the admission to the Network a form was required (available also at project’s WWW site) and the satisfaction of a number of minimum requirements criteria. Finally, the relevant decision of admission was taken at the next Plenary or Steering Committee Forum with a simple majority rule.

The Network includes finally 16 partners and 34 external members (50 in total), of which 17 were entered as funded members. Furthermore, a single Member the UK Forum, represents 10 Assessment centres in
the UK and another one EMG group, represents 30 adaptation companies in 11 European countries. Thus, it can be considered that the project objective to reach 50 members has been overpassed. In Annex I the table of the Thematic Network Members is included, containing detailed information about each member.

The Thematic Network consists from 29 Assessment Centres /PSN Licensing Authorities/Driving schools specialised in PSN issues, 32 Manufactures, 9 Relevant Technology Providers, 12 PSN’ Users Representatives, 4 Funding Organisation/Authorities, 2 Vehicle Inspection.

- **User Forum Members**

A number of key actors from all over Europe participated to the project’s User’s Forum, which was established by the beginning of the project as a continuation of the CONSENSUS feasibility study one. The User Forum Network consists from 12 Assessment Centres /PSN Licensing Authorities/Driving schools specialised in PSN issues, 2 Manufactures, 2 Relevant Technology Providers, 9 PSN’ Users Representatives, 3 Funding Organisation/Authorities, 2 Vehicle Inspection.

User Forum Members had been informed about new project info at the project’s WWW site (see A1.2) and were able to download project results from it, if they so wish, and send back their opinion. They participated in Network Meetings, on their own expenses and without vote.

- **Thematic Groups**

Five Thematic Groups were established within the Network:

- Thematic Group on PSN classification related to the motor, cognitive, perceptual and sensibility functionalities and the driving task.
- Thematic Group on PSN driving ability assessment methodologies and tools.
- Thematic Group on PSN driving problems and opinions.
- Thematic Group on new developments (with emphasis on IST technologies).
- Thematic Group on recommendations and proposals for standards.

The Thematic Group meetings were organized in parallel, one day before or after the Steering Committee Meetings and constituted the main project body for technical information dissemination, discussion, debate.

Within the first Workshop in Valencia, Spain (Month 13) parallel discussions of these five Thematic Groups were organised. The workshop participants were free to choose the TG of their interest. For all the five TGs, some pre-defined questions/issues were used, in order to initiate the discussions. The Annex II includes the main issues that were discussed.
A similar procedure was followed in the second Workshop in Ljubljana (Month 22). The discussions based on predefined discussion points for each group. Many interesting opinions were recorded; the main issues, that were discussed, are presented in Annex III.

In addition, within this work package, three connected services were created:

- **Network Secretariat** (in CARA)
  
  It produced and disseminated project Deliverables and dissemination material and managed the project’s WWW site.

- **Quality Control Group** (in CERTH/HIT)
  
  HIT appointed an external expert to act as Peer Reviewer of project’s Deliverables. All Steering Committee members were appointed one internal Quality expert each, all together formulating the project’s Quality Control Board, chaired by a HIT representative, Dr E. Bekiaris, who monitored the quality of project’s and participants’ work at all levels. More details about its work can be found in the section of A1.4 that follows.

- **Ethical Committee** (in COAT)
  
  A Project Ethical Committee is settled by three permanent, external and independent from the Consortium members, appointed by COAT (as president), BIVV/CARA and HIT. An Ethical report was established, containing basic privacy and confidentiality issues concerning the types of information gathered within CONSENSUS, which are sensitive and private for many people, although attitudes and expectations vary widely. This report provides specific guidelines for the confidentiality of the information included in the CONSENSUS database and the anonymisation and coding of any data gathered within project. These guidelines were followed in all project activities and especially in the developed tools, the CONSENSUS database and the Expert knowledge tool. A summary on the ethical policies of CONSENSUS can be found in the Annex IV.

Finally, within this work package an internal report had been composed. The aim of this internal report is to provide the CONSENSUS consortium with an initial proposal on terminology, to be used by the project Thematic Groups (see Annex V).

### 3.1.2 A1.2 Network communication

**Objectives**

- To develop an efficient and cost-effective communication link between the Network Members, viable also after the end of the project and easily extendable to other entities.
Approach followed towards achieving the objectives

Within this activity the official web page (http://www.consensus-eu.org) of the project was established, following the definition of the level of access for each one of the user groups which CONSENSUS consists of. The groups of the project were defined, as well as the services the web page offers.

The CONSENSUS consortium was initially formulated by 16 members, representing driving assessment authorities, relevant technology providers and user representatives of the People with Special Needs. The CONSENSUS groups can be clustered as follows:

- Consensus Consortium Partners.
- Network Members.
- User Forum Members.
- Others.

This scheme is shown in the figure that follows:

![Figure 1: CONSENSUS Membership scheme](image)

The web page is the basis for the Network communication of CONSENSUS and its members, extended to any User Forum Member that wished to join it.
Furthermore, the necessary security of communication between the Network members was provided (by an appropriate encryption mechanism), to allow for safe transfer of medical and personal data from one authority to another for comparison and methodological reasons.

The functionalities of this communication link could be grouped according to the way they are incorporated and functioning into the Web Page:

- Public Web Page and services.
- Private Web server, which includes:
  - User forum;
  - Electronic Newsletter;
  - Project results;
  - Updates will be notified by e-mail;
  - Expert Consulting;
  - Shared Databases;
  - Remote Assessment Facilities;
  - Data Storage Service.
- FTP server, including:
  - Deliverables and discussion documents;
  - Different directories for each Work plan;
  - Programs / Applications;
  - Forum FTP folder;
  - Directories with information from other interesting EU Projects.

The CONSENSUS Web offered public services, such as interactive demos or formation request (feedback form), and gives access to other private services as well, such as the Network’s Web server and FTP.

The authentication takes place via login and password. There is a level of access for each group, as is defined in Annex VI.

3.1.3 A1.3 Meeting, reporting and consensus mechanism

Objectives

- To set-up the meeting and quality control mechanism of the project.

Approach followed towards achieving the objectives

Nine Plenary and Steering Committee meetings took place during the project. Two of these meeting were organised in NAS countries (Lithuania, Slovenia). Full Minutes of each meeting were devised and sent to EC. A crucial voting took place in a Steering Committee meeting (in Dublin, June 2003, Month 10), which led to the decision of the change of the project coordinator, from BIVV/CARA (due to BIVV/CARA’s internal reorganisation) to VTI.

Two Project Workshops were organised within CONSENSUS project. The first one took place in Valencia, Spain on Month 13 of the project (September 2003), to review project results and diffuse CONSENSUS concept. The second one took place in Ljubljana, on Month 22 of the project, (June 2004), in order to present the final project results.
In addition, eight Quarterly Management Reports were constructed and sent to EC, as well as three Periodic Reports, covering the periods: 01.09.2002-31.05.2003 first Periodic Report, 01.06.2003-31.05.2004 second Periodic Report and 01.06.2004-31.10.2004 third Periodic Report.

In Month 9, the Consortium Agreement was finalised and signed.

3.1.4 A1.4 Project Quality Assurance scheme and assessment procedures

Objectives

- To set-up an appropriate self-assessment scheme for effective monitoring of the project.

Approach followed towards achieving the objectives

Within this activity, the Quality plan has been described as an integral part of management planning. As a pre-requisite to its preparation, the Quality Assurance Manager has reviewed all requirements, in order to determine the necessary activities that need to be planned. It has been prepared early in the project, in order to demonstrate and provide the Consortium with the assurance that:

1) the contract requirements and conditions have been reviewed,
2) effective quality planning has taken place,
3) the quality system is appropriate.

To ensure relevance of the Quality plan, quality reviews were conducted, throughout the duration of the contract, and when contractual changes occurred. The quality plan and amendments to it were submitted to the Project Co-ordinator for approval.

The Quality Assurance Manager ensured that the quality plan is available to all concerned and that its requirements were met.

A list of the activities that were implemented, including their sequence, in order to ensure that the project and its deliverables conform to its requirements is given below:

- Management responsibilities,
- Quality Plan Review,
- Quality system,
- Document and data control,
- Purchasing,
- Product identification and traceability,
- Inspection and testing,
- Control of non conforming prototype / deliverable,
- Corrective and preventative action,
- Internal quality audits,
- Training.

Furthermore, within A1.4 a set of quantifiable and objective criteria and an associated methodology were established to evaluate internally the progress of the project, as well as weighting factors and thresholds that aim to, as accurately as possible, reflect project status. These are based upon the EU-defined Horizontal proposals evaluation criteria, weighting factors and thresholds, as they are used within 5th FW program of EU.
The criteria used in the assessment process are briefly described below.

- Technical Quality Criterion (TQC).
- Community added value criterion (CAV).
- Community Social Objectives criterion (CSO).
- Economic Development criterion (EDC).
- Resources, partnership and management criterion (RPM).
- Overall Evaluation Function (OEF).

These assessment criteria have been evaluated four times during the CONSENSUS project life span and their relevant evolution has been monitored by the Projects Evolution Diagram. More details about this methodology and the relevant diagram can be found in section 6 of this document.

All criteria were above the respective thresholds in all four times of evaluation. The Overall Evaluation Function increased during the whole project duration and since month 20 has been higher than the initial evaluation rating of the CONSENSUS proposal. Thus, the project progress has been good and according to its objectives.

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3.2 WP2: Towards a common PSN classification and assessment criteria

Results

The establishment of a common, comprehensive classification of PSN in relation to the driving task and a minimum common set of PSN driving ability assessment criteria, to be used Europe-wide.

3.2.1 A2.1 Establishment of a common PSN driving ability classification scheme

Objectives

• To agree on a common classification scheme, leading from medical problem to driving ability, still allowing for individual differences and abilities to be considered.

Approach followed towards achieving the objectives

The process originally devised to be used for the development of a coding scheme had to be revised several times. It turned out that practically no Assessment Centre used a fixed and “standard” coding
scheme to organise the assessment results. Thus, the coding scheme had to be developed basically from scratch. However, the few coding systems used were considered and provided input to the development of the present proposal. Starting from the driving task description, it provided a rather small input to the presently proposed coding scheme. However, in the end an analysis and proper description of the actual task had to be considered in order to further develop the assessment procedure towards an assessment that can be harmonised and also validated with respect to traffic safety.

In accordance with the CONSENSUS scheduled program, the 1st CONSENSUS Workshop was held in Valencia (Spain) on 11th September 2003. During the workshop the main issues related with the project aims and objectives were discussed by network members in thematic groups. Participants in the Thematic Group nº 1 “PSN Classification Motor, Cognitive, Perceptual and Sensibility Functionalities” were 16 driving assessment experts and researchers in the field of driving assessment from 6 European countries (Croatia, France, Portugal, Slovenia, Spain and United Kingdom). The next step in the development of the CONSENSUS PSN Driving Classification scheme took into account the conclusions of this Workshop.

**Presentation of the new CONSENSUS Classification / Codification Scheme**

The correlation for defining a procedure towards a pan-European PSN driving assessment scheme including the new CONSENSUS codification scheme is shown below.

![CONSENSUS classification scheme on assessment of PSN](image)

The establishment of the coding system includes two important parts. The first part of the codification scheme, contains the code for the functional problem (ICF based) with an additional code or extension, which can be used to specify furthermore the functional deficit. The second part contains the code for the
medical problem (ICD based); if necessary the code can be very detailed. The following figure explains the idea on how the code can be put together. By putting the codes next to each other, the classification can be formed, using only 4 levels.

![Figure 3: Codification scheme](image)

In that way the code achieved by combining the 4 levels, gives the assessor a basic idea of the status of the PSN’s residual activities at the start of the assessment procedure. When attributing to a PSN a certain code, it is easier to predefine a certain procedure to follow, so the complete evaluation can be standardised in a certain way.

While using the 4 levels coding, it is assured that comparison can be made between several cases with the same outcome, even coming from different Assessment Centres and/or countries.

The above comprehensive and theoretically classification scheme has been finally detailed, having as examples the following use cases:

- **Traumatic Spinal Cord Injury.**
- **Post – Poliomyelitis.**
- **Duchene Muscular Dystrophy.**
- **Amputation (lower left leg).**

These cases are very important as they represent some of the most frequent cases in driving ability assessment and constitute complete expendable of pan-European applications of the new assessment system.

### 3.2.2 A2.2 Establishment of common set of assessment criteria

**Objectives**
• To agree on a minimum set of common criteria for assessing PSN driving ability.

**Approach followed towards achieving the objectives**

The objective of this activity was to pave the way for the standardisation of assessment procedures at a European level, by reviewing the current situation with regard to commonalities and differences in the assessment procedure, and by introducing structured lists, including the functional measurements and assessment criteria for selected medical conditions. Hence, the main target group was the personnel responsible for the actual assessment procedure: medical doctors, general practitioners, occupational therapists, specialised physicians, etc.

One of the central stages of the assessment procedure is determining the type of information that is required to decide about the fitness-to-drive of a client with a specific condition. Two different types of information have been required:

- Medical information about the medical condition of the client.
- Functional information about the actual functional abilities of the client.

With respect to fitness-to-drive assessment, medical and functional perspectives are complimentary. Medical information is required in the beginning of the process for three reasons: to ensure that the client is able to remain conscious and in order to specify which functional abilities might be affected. The actual performance capabilities of a client are then evaluated with a functional assessment.

Medical information about the condition(s) of a person should be provided by specialised physicians or general practitioners via ICD or ICF codes, to guarantee correct interpretations of the diagnosis by actors without specialised medical training. Medical information specifies the nature of a disability or disease, e.g. if it is progressive, congenital or if the fitness of a person is changing over time, as it is for example often the case for people who have ageing-related diseases.

Medical information in itself is in most cases not sufficient to decide about a client’s fitness-to-drive, because the actual effect of a condition on a client’s fitness-to-drive depends on the degree of functional impairments. Functional abilities have thus to be tested practically to evaluate also the capabilities of the client to cope with the consequences of the condition with respect to driving a car.

**Four use cases** (Traumatic Spinal Cord Injury, Post – Poliomyelitis, Duchene Muscular Dystrophy, Amputation) were examined (during the 1st CONSENSUS workshop, held in Valencia in September 2003), in order to initiate the development of recommendations for the functional measurements and criteria that should be applied when assessing fitness-to-drive in clients having one of the four medical conditions in question, so that the subjective and heterogenous situation in Europe could be overcame. The assessment process was elaborated in detail for each condition and the functional measurements (criteria) to be used were specified and summarised in a structured list. Furthermore, the use case of traumatic SCI was described in more detail, to provide an idea of the level of detail that would be required to standardise the assessment procedure.
The assessment procedure and the criteria were determined by an internal project task force, consisting basically of occupational therapists, very experienced in carrying out the assessment procedure, and traffic psychologists with a deep understanding of the driving task (see Ellison et al., 2004 for details). The assessment procedures for the use case examples were based on a consensual agreement between all members of the task force.

The objective of the suggested lists of methods and criteria was to initiate the standardisation of the assessment procedure for the medical conditions in question. The lists have been disseminated to the members of the project’s network across Europe. The recommendations were revised according to received feedback, so that they serve as fitness-to-drive assessment recommendations, guiding the procedure when assessing fitness-to-drive in clients with such medical conditions.

The assessment criteria do not specify clear thresholds to distinguish between sufficient and poor performance in a functional measurement. This would require empirical research, which is beyond the scope of this project. It is suggested to concentrate future research on the definition of such thresholds in order to further objectify the assessment process. Once objective thresholds are established, IST tools could be implemented into the assessment procedure, for example for remote assessment of people with disabilities living in rural regions, far away from the next available assessment centre.

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3.3 WP3: Towards a common PSN driving ability assessment methodologies and tools

*Results*
Common minimum set of assessment tools and assessment methodology for driving ability evaluation of PSN.

3.3.1 A3.1 Minimum set of common assessment tools

Objectives
- To agree on a common minimum set of tools for assessing PSN driving ability.

Approach followed towards achieving the objectives
The selection of the appropriate tools has been a very important step in the assessment process, as it requires from assessors certain knowledge with regard to the tool availability, their usability, and the interpretation of the scores given. In this activity, the kinds of tools that can be used in an assessment process were decided and concrete examples of how to use them in the framework of the evaluation of ability to drive of the four selected diagnoses were provided.

The decision was based on the differentiation of the assessment tools by their type, depending on the technology used:

- Paper and Pencil (PP), e.g. Trail Making Test.
- General Instruments (GI), e.g. callipers, tapes, goniometers, x-ray.
- Computer Software (SP), e.g. RT tests, vigilance tests.
- Computer based Tools (CT) with dedicated hardware and software.
- Test Rigs (TR) (e.g. anthropometers).
- Driving Simulators (DS).
- Test Vehicles (TV) (with adaptation) for on-the-road tests.

However, the final selection of the set of tools was based on scientific and effectiveness analysis of those tools. Therefore, a distinction was made between the three following functional domains: the psychomotor, perceptual, and cognitive domains.

This distinction leads to the following classification of assessment tools:

- Tools for Physical assessment.
- Tools for Psychomotor assessment.
- Tools for Neurological (Cognitive) assessment.

The graph below represents the percentage of common agreed assessment tools according to the classification, described above.
3.3.2 A3.2 Towards a common PSN driving ability assessment methodology

**Objectives**

- The development of a common assessment methodology for driving ability evaluation of PSN.

**Approach followed towards achieving the objectives**

According to the CONSENSUS Technical Annex “Description of the Work”, the types of disabilities to be considered in the project were:

- **Locomotor diseases** (e.g. limb amputations, rheumatoid diseases, arthrodesis, etc.).
- **Muscle diseases** (e.g. muscular dystrophy, etc.).
- **Peripheral nervous system** (e.g. paralysis of upper, lower or upper and lower limbs).
- **Spinal cord disabilities** (e.g. paraplegia, tetraplegia as well as degenerative diseases, such as multiple sclerosis and some types of muscular dystrophy).

During the 1st CONSENSUS workshop held in Valencia in September 2003, it was decided that these four types should be exemplified by the following four more specific cases (“the four selected diagnoses”):

- **Traumatic Spinal Cord Injury**.
- **Post – Poliomyelitis**.
- **Duchene Muscular Dystrophy**.
- **Amputation (lower left leg)**.

These example diagnoses were chosen because they were considered to be relatively simple to assess and they do most often not include cognitive impairments, which are considered as more complicated to assess, compared to motor and perceptual disabilities. Starting with the relatively simple diagnoses and eventually moving towards the more complex ones, was considered the only feasible line of action. The four selected diagnoses were also used for the four selected cases that were used during the workshop on
assessment practices that was held at CBR (Rijswijk, The Netherlands), on 27 of January 2004 (see Deliverable 2.2).

For these four selected diagnoses, a similar procedure was recommended, that includes: welcoming the client, assessing the client’s physical functional abilities using off road tests, and assessing the client’s functional abilities in context by means of a standardized on-the-road test, to see the extent to which the technical adaptations can compensate for a physical disability. Also, suggestions of use of specific tests to obtain objective data and standardized protocol sheets to record the assessment data, are provided.

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3.4  WP4: Development of IT tools for assessment quality enhancement

Results

The result of this workpackage was the establishment of two tools in the Network website, a database and an expert knowledge tool, in order to support the PSN driving ability assessment procedure. The database contains 20 assessment criteria, 42 assessment tools, 6 assessment procedures, 43 literatures and 52 use cases. The expert knowledge tool provides guidance to the assessment personnel for the PSN driving ability assessment process according to each disability case which is described from the assessment personnel by following the codification methodology developed within CONSENSUS. It consist of 48 tools for physical evaluation, 68 contact points within 21 countries and 52 use cases supported from the database.

3.4.1  A4.1 Assessment database

Objectives

- To specify and use an Internet-based, assessment tools and practices database as a knowledge repository for PSN driving ability assessment personnel.

Approach followed towards achieving the objectives

Within this task, an expert’s database was developed in order to support the assessment of drivers with special needs by correlating the specific characteristics of the driver with special needs with the appropriate assessment criteria, guidelines and tools to be used for the assessment. Thus, the aim was to provide both information relevant for the evaluation of drivers with special needs and a set of use cases to be used as a pan-European reference. To achieve this goal, a web based solution was decided, as this one guarantees easy access throughout Europe without the need for special software for the end user and enables data input and update in the same way.

A server was installed at USTUTT-IAT (University of Stuttgart, Germany). Furthermore, the MySQL-database system and php-script language were installed on this server. Two different user interfaces were developed, one for the input of data by the CONSENSUS-partners and one for the end user. The latter one of these two interfaces allows to search for specific information and to show the content of the database. Both interfaces were kept in the design of the CONSENSUS web page, in order to form one seamless tool together with the CONSENSUS-web page. Data can be added and edited through the world wide web. The data stored in the database can be retrieved world wide through the web as well. In this way, the database is easily accessible and does not require installing specific software on the computer of the user, which increases both the accessibility and the usability significantly.

Before its finalisation, a short study on the usability of the CONSENSUS database was conducted in order to guarantee the ease of use of the database and, hence, wide dissemination of the database and the results of the CONSENSUS project. The data input and data search/output interfaces were tested with the cooperation of the members both of the project and the network. In order to do so, a database trial run has
been defined and launched at the CONSENSUS-workshop in Cordoba. Following the respective results, it can be concluded that overall, the functionality and the design of the database has been done in a decent way. The database features a clear and easy to understand layout and is easy to use. Structural optimizations were introduced to the database as a result of the comments of the experts.

3.4.2 A4.2 Expert Knowledge Tool

Objectives

- To specify and use an expert knowledge tool, to support and guide the PSN driving ability assessment process.

Approach followed towards achieving the objectives

An Expert Knowledge Tool was developed, in order to provide guidance/assistance to the inexperienced assessment personnel for the appropriate evaluation procedure to be followed, giving instructions/suggestions on the assessment steps, assessment tools, sequence to be followed and driving support mechanisms for the client to be assessed. The reason for the use of an expert tool, especially in the area of driving assessment for PSN, is that it can help assessors and can compose the knowledge and experience of more than one expert, thus offering better assessment objectivity. Furthermore, such a system can provide an explanation for its decision, hence offering to the user insight in the decision process and may resolve possible misunderstandings in this way.

The input for the tool rules and algorithm is strongly dependent on the driving assessment methodology of D3.1: “Towards a common set of assessment tools and a common PSN driving assessment methodology” (i.e. assessment steps and rules), of D2.1: “PSN Driving ability classification and codification scheme”, the assessment criteria of D2.2: “Towards common PSN driving ability assessment criteria”, and the CONSENSUS database use cases of Task 4.1. In fact it is a tool that guides the assessor on how to implement the integrated assessment procedure that is described in the D3.1. The CONSENSUS Codification Methodology and the CONSENSUS Physical Evaluation Form are the mains parts of the Deliverables D2.1 and D2.2 that are used in the Expert Knowledge Tool. In the CONSENSUS Codification Methodology, the assessor is asked to select the codes that describe best the situation of the person with disabilities that he/she is going to evaluate. According to these selections, the assessor has to perform the relevant part of the CONSENSUS Physical Evaluation Form in cooperation with the client, so that a more detailed status of the assessed person’s residual activities and potential problems might be formulated.

After the usability tests, that were intended to be a check of the quality of the interface of the tool, the software has been constructed accordingly. The usability and reliability tests of the Expert Knowledge Tool software took place in 5 countries: Belgium, Greece, Sweden, Spain and UK, from 11 experts, including:

- three rehabilitation doctors;
- three driving instructors;
- three driving assessment persons;
- one transport education manager;
• one automotive and transport engineer.

These tests were intended to check the usability, reliability and functionality of the interface of the tool. Following the tests results/comments, structural optimizations were introduced, so that the functionality and the design of the tool have been optimized. The Expert Knowledge Tool can be found in the Network’s website, characterised by a simple and modular user interface, adequate for non-expert PC users.

<table>
<thead>
<tr>
<th>Submitted documents</th>
</tr>
</thead>
<tbody>
<tr>
<td>ID</td>
</tr>
<tr>
<td>---------------------</td>
</tr>
<tr>
<td>Internal Reports</td>
</tr>
<tr>
<td>Internal Report IAT4_1_1</td>
</tr>
<tr>
<td>COAT_4_1</td>
</tr>
<tr>
<td>HIT_4_2_1</td>
</tr>
<tr>
<td>VTI 4_1.doc</td>
</tr>
<tr>
<td>Deliverables</td>
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<tr>
<td>D4.1</td>
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<tr>
<td>D4.2</td>
</tr>
</tbody>
</table>

3.5 WP5: Dissemination, Creation of public awareness user acceptance enhancement and Network viability schemes

Results

The result of this workpackage is a wide dissemination and acceptance of project results from all interested groups (specialised medical practitioners, state authorities, PSN and their organisations, relevant industry, etc.), by the production of the dissemination material (i.e. logo, leaflets, posters), the publications in scientific journals, newspapers and magazines, the participation in exhibitions, conferences and major fairs focusing on issues relative to CONSENSUS, the development of an interactive, the electronic newsletters and the organisation of two workshops with the participation of external experts (87 persons attended the 1st workshop, of which 68 were external to the consortium and 52 persons attended the 2nd workshop, of which 34 were external to the consortium), to further attract other organisations to join the network and to promote the project results and guidelines.

The services to be provided by the Network after the end of the project are the information on newest development in the field, the dissemination of any other relevant information to the members, the expert consultation on assessment methodologies and tools, the use of the database and the expert knowledge tool, the consultation on required car adaptations, the establishment of agreements between interested
actors and individual members, the dissemination of code of good practice and design guidelines to any interested body and the promotion of standardisation activities.

3.5.1 A5.1 Information Dissemination

Objectives

- To develop a concise information dissemination and awareness creation strategy for the pan-European diffusion and adoption of CONSENSUS results.

Approach followed towards achieving the objectives

The following actions were undertaken for disseminating the project’s results and for attracting new members:

- Production of dissemination material for the project (logo, 8,000 leaflets, 600 posters).
- Publications in (4) scientific journals, newspapers and magazines.
- Participation in (16) exhibitions, conferences and major fairs focusing on issues relative to CONSENSUS.
- Development of an interactive web site to present project achievements and to ensure effective members communication.
- Issue of an electronic newsletter every six months for wide diffusion of project accomplishments.
- Organisation of two workshops with the participation of 102 external experts (68 in 1st workshop, 34 in 2nd workshop), to further attract other organisations to join the network and to promote the project results and guidelines.

Specifically, the logo for CONSENSUS has been conceived to be unique, distinctive and memorable. The picture has been conceived to communicate the idea of the assessment of driving ability of people with disabilities (see Annex VII).

In addition, the Leaflet as a ‘first contact means’ had as main goal to effectively communicate the project message and contents, whilst at the same time providing cues to the other sources (e.g. web site), that contain more detailed information. The graphical design deeply overlaps with the web site one, with all the elements on which the CONSENSUS image is recognised (logo, IST logo, colours, acronym). The content adopts a language that translates a huge and scientific issue matter in an attractive and easy-to-read way. Outside part of the CONSENSUS leaflet (see Annex VII) useful information concerning Consortium partners, co-ordinator contact information and website address, as well as an urge to join the network is provided. Inside the CONSENSUS leaflet the project objectives are presented in detail. The operation and functionalities of the CONSENSUS are also presented, together with the expected CONSENSUS unified methodology on assessing driving ability of people with disabilities.
Posters (see Annex VII) were primarily displayed at events (e.g. Workshops; exhibitions, etc.) and at project partners’ sites/laboratories. The content is similar to the leaflet and the layout with respect to the colours and schemes used is strongly correlated with the CONSENSUS leaflet.

13 papers were published in scientific and non-scientific Magazines and presented in Conferences such as:

- III Assessment Centres Catalanian Congress. Vilafranca del Penedes (Barcelona), Spain.
- HCI 2003, Crete, Greece.
- National Conference on “TRAUMA in Lithuania”.
- Valakupiai Rehabilitation Centre, Vilnius.
- VIII ASECEMP Spanish Assessment Centres organisation congress. Córdoba (Spain).
- UAMK national conference.
- 10th International Conference on Mobility and Transport for Elderly and Disabled People, Hamamatsu – Japan.
- IMMORTAL Project Workshop. Valladolid (Spain).

The list of papers that were published in scientific and non-scientific Magazines and presented in Conferences is included in Annex VIII, as well as the two workshops organised within the project.

A newsletter was distributed every six months to all CONSENSUS members. The objective of the newsletter is to inform all network and user forum members about the project results, in a concise and brief way, as many of them may not have time to thoroughly read all project deliverables, but also to attract new organisations to become members. Four newsletters were distributed and are included in Annex IX.

A website of the project was developed for disseminating project results and providing information related to the project and the partners. It is available in nine languages (English, Greek, Lithuanian, German, Italian, Czech, Spanish, Swedish, and Slovenian). The website’s address is: http://www.consensus-eu.org. The main screen is presented below.
The Public Web Server has the following areas:

- Project description and objectives.
- Project achievements.
- Partner information and contact data.
- Feedback form.
- Visitor counter / Access statistics.
- Related Links.

The Private Web Server is used only by User Forum members and includes the following areas:

- User forum.
- Electronic Newsletter.
- Project results (updates are notified by e-mail).
- Expert Consulting.
• Shared Databases.
• Remote Assessment Facilities.
• Data Storage Service.
• Consensus Private FTP Server.
• Deliverables and discussion documents.
• Different directories for each workplan.
• Programs / Applications (assessment tools of WP4).

The Private FTP server is used by Thematic Network Members and Consortium Partners only. It includes the following:

• Deliverables and discussion documents.
• Different directories for each workpackage.
• Programs / Applications (assessment tools of WP4).

Two Project Workshops were organised within CONSENSUS project:

• The first one took place in Valencia, Spain in Month 13 of the project, on September 2003, to review project results and diffuse CONSENSUS concept.
• The second one took place in Ljubljana, in Month 22 of the project on June 2004, in order to present the final project results.

First Workshop in Valencia

In total, 87 persons attended the workshop, of which 68 were external to the consortium. Attendees represented 18 countries including newly associated ones as well as a multidisciplinary area of expertise and knowledge, from 10 Universities, 19 Assessment Centres, 25 PSN Organisations, 7 Car adaptation companies, 11 Psychomotor tests developers and 8 Ministries of Transport.
The following presentations took place:

- the project concept and main targets;
- the classification scheme proposed within CONSENSUS;
- the assessment procedures to be developed;
- the IST tools for the mobility of the people with disabilities used within the CONSENSUS Network for communication between the Members and support of the assessors.

The major workshop findings can be summarised as follows:

- There is a need to interrelate the assessment results to the car adaptations to be used (if any). That should not be limited to the theoretical “ideal” adaptations, but include best practice on their proper design and use.

**Action:** For this reason the expert tool makes reference to the aids and the use cases of the several databases (including the CONSENSUS database).

- The importance of proper assessment personal training, in order to use CONSENSUS tools and methodologies was highlighted.

**Action:** The assessment personal training which results from the CONSENSUS tools and methodologies was established in a way that it can be adapted from other projects such as IDEA.
- It was agreed that the developed support tools (database, expert tool) should be consultory, not all inclusive. It should be clearly stated that they do not include all possible solutions. They should also be dynamic, to allow users and manufacturers to constantly supply new input.

**Action:** The development of the tools was in accordance to this comment, by resulting a dynamic database and a modular expert tool. In addition, relevant text has been added in order to clarify that these tools do not include all possible solutions, but provide guidance and suggestions to assessment personnel.

- A priority should be to perform national statistics, on adapted car accidents (to prove that drivers with disabilities do not pose a risk to traffic safety).

Parallel discussions of these five Thematic Groups were organised. The workshop participants were free to choose the TG of their interest. For all the five TGs, some pre-defined questions/issues were used, in order to initiate the discussions.

**Second Workshop in Ljubljana**

In total, 52 persons attended the workshop, of which 34 were external to the consortium. Attendees represented 18 countries, including newly associated ones, as well as a multidisciplinary area of expertise and knowledge, from 7 Universities, 11 Assessment Centres, 12 PSN Organisations, 5 Car adaptation companies, 6 Psychomotor tests developers and 5 Ministries of Transport.

![Participants in 2nd CONSENSUS workshop]

The project concept and main targets were presented, followed by the presentations of:

- the classification scheme proposed within CONSENSUS, as well as the assessment procedures to be developed;
• the CONSENSUS codification scheme proposed, explaining the steps for towards the final result. Relevant examples were used to explain the methodology;

• the process for establishing the common assessment methodologies;

• the expert knowledge tool, developed within CONSENSUS, its operational architecture, as well as some screenshots of the tool;

• the assessment database, also developed within CONSENSUS.

After the presentation it was discussed that the car adaptations should be checked by a national scheme in order to be recognised and result in reduced insurance. It was also pointed out that many drivers transfer an adaptation from one car to another. This is not proper, as not all adaptations fit all car types.

In addition, the user’s opinion of 38 PSN persons was presented, based on a questionnaire. The main results of this questionnaire involved the use of adaptations in the car, the usefulness of technology for drivers with disabilities, the appropriate person for carrying out an assessment, etc.

Parallel discussions of these five Thematic Groups were organised. The workshop participants were free to choose the TG of their interest. For all the five TGs, some pre-defined questions/issues were used, in order to initiate the discussions.

Finally, the ethical issues were presented, involving the following sectors:

• Well being of the clients.
• Respecting the clients rights.
• High standard of competence.
• Complying with laws.
• Accurate information.
• Treating colleagues with fairness.
• Communication with other partners.
• Privacy, confidentiality and anonymisation of data.

The table below presents the participation in CONSENSUS workshops of the Member States per type of organisation as specified in the table Categorisation of organisations.
### Table 2: CONSENSUS workshops participation.

<table>
<thead>
<tr>
<th>Type of organisation</th>
<th>AD</th>
<th>MAN</th>
<th>VI</th>
<th>FA</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSN Driving Assessment Authorities</td>
<td>✓</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>PSN Licensing Authorities</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PSN Users’ Representatives</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relevant Technology Providers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PSN Driving Aids Manufacturers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PSN Other Aids Manufacturers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vehicle Inspection</td>
<td></td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Funding Organisations / Authorities</td>
<td></td>
<td></td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

### Table 3: Categorisation of organisations.

<table>
<thead>
<tr>
<th>Categories</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSN Driving Assessment Authorities</td>
<td>A</td>
</tr>
<tr>
<td>Assessment - Medical / Paramedical – Centres</td>
<td></td>
</tr>
<tr>
<td>PSN Licensing Authorities</td>
<td></td>
</tr>
<tr>
<td>PSN Users’ Representatives</td>
<td>U</td>
</tr>
<tr>
<td>Relevant Technology Providers</td>
<td>T</td>
</tr>
<tr>
<td>PSN Driving Aids Manufacturers</td>
<td>AD</td>
</tr>
<tr>
<td>PSN Other Aids Manufacturers</td>
<td>MAN</td>
</tr>
<tr>
<td>Vehicle Inspection</td>
<td>VI</td>
</tr>
<tr>
<td>Funding Organisations / Authorities</td>
<td>FA</td>
</tr>
</tbody>
</table>

The table below presents the impact of each dissemination tool to particular group.

<table>
<thead>
<tr>
<th>Dissemination Strategy</th>
<th>Impact Level</th>
<th>Relation to particular Actor Groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dissemination material (leaflets, posters)</td>
<td>High</td>
<td>Were successful in drawing the initial attention of many Members. Afterwards, a more specific tool (i.e. website, Thematic Groups) is needed.</td>
</tr>
<tr>
<td>Web site</td>
<td>Medium</td>
<td>Nearly, all Members visiting the website before deciding to apply for Membership sent their Membership electronically (on-line), through the web site.</td>
</tr>
<tr>
<td>Publications</td>
<td>Low</td>
<td>Important for the scientific world, the Assessment Centres or the PSN,</td>
</tr>
</tbody>
</table>
Table 4: Target groups reached by specific dissemination tool.

<table>
<thead>
<tr>
<th>Dissemination Strategy</th>
<th>Impact Level</th>
<th>Relation to particular Actor Groups</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>High</td>
<td>Medium</td>
</tr>
<tr>
<td>Newsletters</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Workshops</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Thematic Groups</td>
<td></td>
<td>✓</td>
</tr>
</tbody>
</table>

3.5.2 A5.2 Public awareness creation and specification of required tools and aids

Objectives

- To establish a code of Good Practice on PSN driving ability assessment

Approach followed towards achieving the objectives

The main objective of this task was the development of a Code of Good Practice for the assessment of the driving ability of people with special needs. For this purpose two questionnaire surveys were carried out. The first surveyed professional experts and the second surveyed drivers who use car adaptations to successfully compensate for existing disabilities. The different questionnaire modules included items, such as asking if the respondents agree to certain statements corresponding to stereotypes about drivers with disabilities, as well as questions about practices with regard to the technical inspection of adapted vehicles, questions about instruments and tools used during the assessment process and questions about car adaptations that are not yet available on the market. The respondents were furthermore asked for suggestions to improve the co-operation between the driving assessors and their clients with disabilities.

The conclusions of the surveys constituted the basis for recommendations for the improvement of the assessment process. These recommendations represent the Code of Good Practice which adopts a key principle of the European Driving Licence Directive: "The goal of every fitness-to-drive assessment should be to make it easier for people with disabilities to drive vehicles, while considering the necessary conditions for safe driving at all times during the assessment process". Hence, the recommendations for best practice include mainly guidelines for the enhancement of the assessment process itself, the way to treat the client during the assessment process and the way to convey the assessment result.

Specifically, the main parts of the Code of Good Practice are describing below:
• Mission of every assessment: Support the client’s (auto-)mobility and make it easier for a person with disabilities to drive a car. During the procedure and the decision making process, take into account the conditions prescribed by the driving licence directive at all times.

• Guiding principle of every assessment: Apply as many functional measurements as necessary, but at the same time as few as possible. The approach should be client-centred, i.e. the assessment should be tailored to the disability of the client. A truly “client-centred” process must aspire to working in equal partnership.

• Create a positive and friendly atmosphere during the assessment.

• Treat the client with disabilities like any other person without a disability.

• A third person should be available during the procedure in order to assist the client whenever the client asks for assistance.

• Every client has the right for an objective assessment. Make an objective assessment with functional measurements even in the case of a strong subjective impression that a client is not fit to drive.

• Explain the assessment procedure in detail and the reason for each functional measurement.

• Paint a realistic, and not an over-optimistic picture of the capabilities of available car adaptations.

• Avoid medical and technological jargon.

• Explain the assessment result in detail in a personal interview.

• Ask the client if his/her family or friends should participate in the interview. Explain the reason why it may be helpful that the client’s social system is included in the discussion.

• Information about alternative transport schemes and other material should be given in writing (e.g. via brochures) after the assessment. The information in the brochures should be explained verbally.

3.5.3 A5.3 User Acceptance enhancement

Objectives

• To promote and secure the users’ (PSN) acceptance of the project results.

Approach followed towards achieving the objectives

The proposed tools within CONSENSUS project and the main concepts of the project were widely disseminated to the PSN organizations (Network members and further) through four Newsletters, in order to receive feedback and accordingly adapt the project’s methodology. Their comments were the basis for the development of CONSENSUS tools and methodologies.
Specifically, the following percentages illustrate the main opinions of the PSN population (38 respondents):

- 79% reported they were given vital information from these Newsletters;
- 68% felt Technology could always overcome a disability when driving;
- 55% have car adaptation aids fitted that were recommended during their assessment;
- 58% felt car adaptation aids can always compensate for a disability;
- 84% reported that Range of Movement and Strength should be checked during an assessment.

3.5.4 A5.4 Guidelines and recommendations to the authorities and the industry

Objectives

- To derive to guidelines and recommendations for the authorities and the industry.

Approach followed towards achieving the objectives

Recommendation for the industry:

The first step of the activity has been to carry out a collection of available ADAS (Advanced Driver Assistance Systems) and IVICS (In-Vehicle Information and Communication Systems). Each system has been described in order to highlight its particular aid to driving and its particular context of use.

The output of this part of the activity has been the Manual of ADAS and IVICS functions (see Annex X). Main target users of the glossary should be disability experts working in Assessment Centres and experts people working in Disabled Organizations. In order to be a useful tool for them to better understand new technology systems, particular attention has been devoted to terms definition and language use. Technical words have been barely used in terms’ definition and description. For an easier access, the glossary has been organized in alphabetical order.

In a second phase of the activity, disability experts were asked to judge the perceived usefulness of different systems for different PSN people. According to collected data, each system has been related to particular DSN problems, in order to understand whether some systems might be more useful for some drivers than for others. In order to do that, an ad hoc questionnaire has been created. The aim of the questionnaire was to collect information about the perceived usefulness of different systems and functions. Assessment Centres and Disabled Organizations had to fill it in on the basis of their experience, useful to understand systems features and potential usefulness for different drivers.

The questionnaire was structured in three parts:

1. Instructions.
2. Systems and functions evaluation.

The questionnaire was composed by different items, each related to a different system or function collected in the Manual.

For each item, participants were requested to judge its perceived usefulness on a 7-points semantic differential scale, like in the figure below.

![Semantic differential scale used in the A5.4 questionnaire.](image)

Moreover, for each item, participants were asked to think about particular disabilities which could be helped by the presence of different systems/functions.

The questionnaire has been sent to all Consensus Network Members. In particular, Assessment Centres and PSN organizations were requested to fill it in and 15 responses have been collected. The collected data indicate that all systems are perceived as **useful**. The majority of scores are located on the positive end of the scale (semantic differential scale from 1 – very useless, to 7 – very useful); concluding that the analysis performed has provided data about different systems usefulness for drivers. In particular, it has been pointed out that telematic and technological systems may be useful for all drivers, despite their age or their health condition. Nevertheless, some of the proposed systems may be particularly suitable for different drivers and may support them in maintaining an adequate level of attention. The table below presents the scores of each systems derived from the opinion of the respondents.

<table>
<thead>
<tr>
<th>SYSTEM/FUNCTION</th>
<th>SCORE</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACC (Adaptive Cruise Control)</td>
<td>5,9</td>
</tr>
<tr>
<td>Emergency-related services</td>
<td>5,9</td>
</tr>
<tr>
<td>Pre-Crash systems</td>
<td>5,9</td>
</tr>
<tr>
<td>Parking support system</td>
<td>5,9</td>
</tr>
<tr>
<td>Blind Spot Monitor</td>
<td>5,8</td>
</tr>
<tr>
<td>Driver monitoring</td>
<td>5,5</td>
</tr>
<tr>
<td>Cruise Control</td>
<td>5,4</td>
</tr>
<tr>
<td>Collision Warning</td>
<td>5,3</td>
</tr>
<tr>
<td>Collision Avoidance</td>
<td>5,3</td>
</tr>
<tr>
<td>Stop-and-Go</td>
<td>5,2</td>
</tr>
<tr>
<td>ATIS (Advanced Traveller Information Systems)</td>
<td>5,1</td>
</tr>
<tr>
<td>Junction management</td>
<td>5,1</td>
</tr>
<tr>
<td>Smart cards</td>
<td>5,1</td>
</tr>
<tr>
<td>Lane Departure Warning System</td>
<td>5,1</td>
</tr>
<tr>
<td>ISA (Intelligent Speed Adaptation)</td>
<td>5,0</td>
</tr>
<tr>
<td>Lane keeping system</td>
<td>5,0</td>
</tr>
<tr>
<td>Lateral collision avoidance</td>
<td>5,0</td>
</tr>
<tr>
<td>SYSTEM/FUNCTION</td>
<td>SCORE</td>
</tr>
<tr>
<td>-----------------------------------------------------</td>
<td>-------</td>
</tr>
<tr>
<td>Vision Enhancement</td>
<td>5.0</td>
</tr>
<tr>
<td>Route Guidance System</td>
<td>4.8</td>
</tr>
<tr>
<td>Vehicle-infrastructure communication</td>
<td>4.8</td>
</tr>
<tr>
<td>IVICS (In-Vehicle Information and Communication Systems)</td>
<td>4.7</td>
</tr>
<tr>
<td>TMC (Traffic Message Channel)</td>
<td>4.7</td>
</tr>
<tr>
<td>Decision aid at junction</td>
<td>4.7</td>
</tr>
<tr>
<td>Navigation functions</td>
<td>4.7</td>
</tr>
<tr>
<td>Route Navigation System</td>
<td>4.6</td>
</tr>
<tr>
<td>Global Positioning System (GPS)</td>
<td>4.6</td>
</tr>
<tr>
<td>Time to collision</td>
<td>4.6</td>
</tr>
<tr>
<td>Travel and Traffic Information</td>
<td>4.6</td>
</tr>
<tr>
<td>Vehicle-vehicle communication</td>
<td>4.4</td>
</tr>
<tr>
<td>GSM (Global System for Mobile Communications)</td>
<td>4.3</td>
</tr>
<tr>
<td>PDA (Personal Digital Assistant)</td>
<td>3.5</td>
</tr>
<tr>
<td>Traffic Network Equalization</td>
<td>3.4</td>
</tr>
<tr>
<td>Traffic Management in Transport and Logistics</td>
<td>3.3</td>
</tr>
</tbody>
</table>

Table 5: Perceived usefulness of different systems: in green, more useful systems are indicated, in yellow more useless ones.

According to the data collected, the usefulness of ADAS/IVICS is the following in usefulness descending order:

**Very useful:**
- ACC (Adaptive Cruise Control)
- Emergency-related services
- Pre-Crash systems
- Parking support system
- Blind Spot Monitor
- Driver monitoring
- Cruise Control
- Collision Warning
- Collision Avoidance
- Stop-and-Go

**Neither useful nor useless:**
- Traffic Management
- Traffic Network Equalization
- PDA (Personal Digital Assistant)
- GSM (Global System Mobile Communications)
- Vehicle-vehicle communication
- Traffic Network Equalization
- Travel and Traffic Information
- Global Positioning System (GPS)
- Route Navigation System
- Navigation functions
- Decision aid at junction
All these points are included in an internal report providing more detailed information regarding the usefulness of the ADAS/IVICS systems according to the PSN and experts opinions, in order to derive recommendations to the authorities and the industry.

In addition, an excel file has been constructed, providing useful information about the following eleven most useful ADAS functions:

- Forward Collision Warning (FCW);
- Side Obstacle Detection (SOD);
- CC (Cruise Control);
- Adaptive Cruise Control (ACC);
- Night Vision (NV);
- Lane Departure Warning (LDW);
- Lane Keeping Assistance;
- Parking Aid;
- Blind Spot (BS);
- Pre-crash system;
- Stop&Go system (S&G);

such as the functional description, the type of the system (safety or comfort function), the level of development (on market/prototype), the DSN problem, the relevant HMI issues and the HMI guidelines.

**Recommendations for authorities:**

One of the main objectives of CONSENSUS is the development of a Code of Good Practice for the assessment of the driving ability of people with special needs. For this purpose two questionnaire surveys were carried out. The first surveyed professional experts and the second surveyed drivers who use car adaptations to successfully compensate for existing disabilities. The information collected from these questionnaires concludes to the recommendations for the improvement of the assessment process. A basic result concerns the necessity of involving also the vehicle/and manufacturers in an effective and accomplished assessment procedure.

Some of the recommendations resulted from the questionnaires relate to the consistency knowledge of the manufacturer and assessor, namely:

- Assessors should get regular further training and education about current trends in road safety related to drivers with disabilities and car adaptation technologies.
• Public authorities should further improve the road infrastructure to adapt it to the needs of drivers with disabilities. The knowledge and experience of professional assessors would be most useful for the infrastructure improvement.

• Future research and development in the car adaptations sector should focus on voice-controlled systems and systems providing assistance during ingress.

• Future research and development should concentrate on systems to compensate cognitive deficits (e.g. further development of route guidance systems for drivers with memory deficits).

• Future research and development in the diagnostic instruments sector should focus on driving simulators and computer-based assessment tools.

• Future research and development is particularly required with regard to diagnostic instruments for the assessment of cognitive driving skills.

• Adapted cars should be approved with an official certificate.

• Before driving a car with new adaptations, the users of the adaptation should receive a special training to familiarise themselves with the adaptation.

In addition the following proposals have been formulated towards the EC:

• CONSENSUS-AGILE-IDEA follow up proposed to DG TREN, for further details and recommendations.

• Invited presentation of CONSENSUS in the joint meeting on “Fitness to Drive” of Driving License Committee of DG TREN, on 27-28/04/05, on a standardised assessment methodology for drivers with disabilities.

3.5.5 A5.5 Network viability

Objective

• To propose strategies to guarantee the Networks viability.

Approach followed towards achieving the objectives

CONSENSUS constitutes a pan-European Network of Excellence, so as to systematically exchange information on driving ability assessment of people with disabilities, promote relevant technology transfer within EU and access to expertise and resources of highly specialised Centres to other less specialised country authorities, using state of the art Telematics tools and procedures and experimenting new IT support tools (database and expert knowledge tool). Beyond the project execution, the continuation of this Network in terms of an Association is supported by 15 consortium partners and 34 other Members of its Forum.
Thus, a study has been performed, to propose strategies and solutions, so that the Thematic Network will remain alive after the project’s end.

A questionnaire survey was performed among Network Members, so as to collect their opinion on network organisation and expected income. A total of 15 completed questionnaires have been collected, which showed among others that the majority of the respondents would prefer a charging per request only for non-Members, and for Members, they will accept an annual subscription fee of 2000-3000 €. The figures below outline these conclusions.

Regarding the sales policy of the Network, most of the respondents prefer that the charge is per request and that the services are free for the Network Members, as shown below.

![Service / sales policy](image1.png)

**Figure 9: Respondents’ preferences on network sales policy.**

![Members annual subscription fees](image2.png)

**Figure 10: Respondents’ opinions on members’ annual subscription fees.**

According to 5 out of 15 respondents would accept an annual subscription fee in the range 2,000-3,000 €.

![Fee per expert tool request for non-members](image3.png)

**Figure 11: Respondents’ opinions on fee per expert tool request for non-members.**

Most of the respondents (6 out of 15) suggest a fee in the area 30-50 € per expert tool request for non-Members.
Most of the respondents (9 out of 15) suggest a fee in the area 500-1000 € per trainee and training course for non-Members.

5 out of 15 respondents suggest that the tool producer should pay 50-100% over the exact testing cost for reasons of homologating the tool by the Network.

Then, a strategy has been devised regarding the establishment of this Network, in the legal form of a non-profit NGO (NON-GOVERNMENTAL ORGANIZATION), established in an EU country of one of the founding members, most probably Greece. This will be governed by a Supervisory Board of 5 members, chaired by a Chairman, a General Secretary and an Assembly of Members. Rules have been defined for decision taking and acceptance of new Members.

Analytically, a legal person will be established among the interested partners and members of the CONSENSUS project, located in the country of one of these partners, who will be the Network Founding Members. The country has still to be decided, but most probably this will be in Greece or Belgium. The legal form of the Network has also been investigated. The exact form will depend on the final country of establishment, but it will rather have the form of an Association, namely a non-profit NGO.

Next, a first estimation of annual income and expenses has been devised, based on the questionnaire survey results and on partners and members interest to join this network. The legal person will be constituted without initial capital. It will be financed by:

- annual subscription made by the Members;
- drawing on revenues obtained as payment for the work performed on behalf of third parties;
- admission fees charged to new Members;
- the financial contributions for contracts, grants or subsidies;
- sales of services and products developed by the members (training courses, database, expert tool, homologation activities);
- other payments.
The network income is expected from the annual subscription fees of members, the use of the developed within CONSENSUS project database and expert tool, the organisation of 4 training courses per year and the homologation of tools and methods for assessing drivers with disabilities. Comparing income with expenses, one can conclude that the Network will be economically viable.

According to internal discussions, it is expected that 14 of the CONSENSUS project partners and Members will become founding members of the new legal person, while the rest 20 organisations are also willing participate as members after being proposed and accepted by the founding members. They can be distinguished in:

- Assessment centres / Authorities / State institutes: 22
- Commercial companies: 5
- PSN organizations: 7

A ‘3-tier’ membership is planned to be created:

- Voluntary groups or charities involved in assessment / advice, with an annual subscription fee of 500 €.
- State sponsored/funded groups or government bodies, with an annual subscription fee of 2,000 €.
- Commercial companies, e.g. adaptation firms, motor manufacturers, with an annual subscription fee of 3,000 €.

Finally, a proposal is made regarding the cooperation of the Thematic Network with other running research projects, namely AGILE and IDEA projects, so as to strengthen the Network’s expertise towards also the driving assessment of elderly and the vocational training of the driving assessors of PSN. The figure below shows the current knowledge derived from the combination of these three projects and the basic need for the future.
The results of these projects provide valid empirical data and scientific tools, covering the whole problem of PSN assessment. Both the tools and the results of their evaluation are of major importance for the 3rd Driving License Directive and beyond, because they pave the way towards a driving assessment procedure for drivers with disabilities, and a re-assessment procedure for elderly drivers (new Annex 3), as well as the formulation of requirements for assessors and driving instructors (new Annex 4 or 5).

What remains to be done is the integration of all the isolated results and performing tests at a larger scale, involving sufficient numbers of DSN across Europe, in order to have reliable data and optimise and thoroughly validate the tools (technically, organisational and from a cost effectiveness point of view). In doing so, it can be expected that driving assessment procedures will achieve the required consensus and maturity for pan-European adoption.

<table>
<thead>
<tr>
<th>ID</th>
<th>Title</th>
<th>Type</th>
<th>Involved Partners</th>
<th>Date of publication</th>
</tr>
</thead>
<tbody>
<tr>
<td>5-4 Report on ADAS/IVICS questionnaire CRF.doc</td>
<td>Results of Questionnaire on ADAS and IVICS for PSN organisation</td>
<td>Public</td>
<td>CRF</td>
<td>September 2004</td>
</tr>
<tr>
<td>CRF T5_4 Manual on functions.doc</td>
<td>Glossary on ADAS and IVICS for PSN organisations</td>
<td>Public</td>
<td>CRF</td>
<td>October 2003</td>
</tr>
<tr>
<td>IFA5_2_6.doc</td>
<td>Questionnaire – Disabled People Organisations</td>
<td>Public</td>
<td>IfADo</td>
<td>August 2003</td>
</tr>
</tbody>
</table>

Figure 14: The different EC initiatives in the field and their interrelations.
<table>
<thead>
<tr>
<th>ID</th>
<th>Title</th>
<th>Type</th>
<th>Involved Partners</th>
<th>Date of publication</th>
</tr>
</thead>
<tbody>
<tr>
<td>IFA5_2_5.doc</td>
<td>Questionnaire - Assessment Centres</td>
<td>Public</td>
<td>IfADo</td>
<td>July 2003</td>
</tr>
<tr>
<td>IFA5_2_4.doc</td>
<td>Concept and Questionnaire</td>
<td>Public</td>
<td>IfADo</td>
<td>March 2003</td>
</tr>
<tr>
<td>TRUTh_5_1_1</td>
<td>Dissemination and use plan</td>
<td>Public</td>
<td>TREDIT</td>
<td>December 2002</td>
</tr>
<tr>
<td>D5_3_draft_ww</td>
<td>Project interactive multimedia www site</td>
<td>Public</td>
<td>UPV</td>
<td>June 2004</td>
</tr>
</tbody>
</table>

### Deliverables

| D5.1 | Dissemination and use plan | Public | TREDIT | February 2003 |
| D5.2 | Project Leaflets and Posters. First project web site                | Public | BIVV-CARA | April 2003 |
| D5.3 | Project interactive multimedia www site                             | Public | UPV    | July 2004    |
| D5.4 | Code of Good Practice on PSN driving ability assessment, relevant guidelines and specification of assessment tools and adaptations needed. | Public | IfADo | October 2004 |
| D5.5 | Network viability schemes                                          | Public | TREDIT | October 2004 |
4 Project results and achievements

4.1 Scientific/technological quality and innovation

As CONSENSUS is Network, it has not performed pure scientific work and thus can’t claim technical innovation. Still, several technical issues were accomplished, that innovated the way such services are given today in Europe. Still the common classification and assessment procedure, developed within CONSENSUS, is innovative.

4.1.1 Network Communication

The web page is the basis for the Network communication of CONSENSUS and its members, extended to any User Forum Member that wishes to join it. This is Public and provides, among others, the following functionalities:

- Automatic information dissemination to all Network Members.
- Automatic notification of User Forum Members that new information is available.
- FTP site, where all project Deliverables and discussion documents are classified in different directories. This is built on a distributed network environment, facilitating also the common use of programs/applications (assessment tools) available by a member by other members of the Network (only for demo and evaluation purposes).
- Access to dissemination interactive demos.
- Visitors counter and identification form.
- Feedback Form for the visitors.
- Shared and concurrent access and use of a selected number of assessment tools and the Network developed tools by all Network members.

The CONSENSUS Web gives some public services, as interactive demos or feedback form, and gives access to other private services as well. They are the Private Web server and the Private FTP server as can be seen as follows:
There is a level of access for each group and the authentication is via login and password.

There is a level of access for each group as described below.

**Consortium Partners access**

This group had full access to all the information and services the Web and the FTP provide. They were in charge of looking after the good state of the information and services offered.

**Network Members access**

The Network Members had full rights to info access in the Web page, but not in the FTP server. This thematic group has an identifier and password once the contracts were signed.

**User Forum Members access**

This group had no access to the FTP server. If any of them wants to use the CONSENSUS private Web server in the future, it would have to pay a fee. The access to the other private services is restrained.

**Others access**

This group can access only to the public services, it is to say:

- Public Web Page and services.
- CONSENSUS Forum Web.

In Annex VI there are diagrams explaining the access of each category.
A multipoint videoconference was proposed to be established among the members of the CONSENSUS Network. It is a very useful tool, but it has some drawbacks as well. Several alternatives were proposed and studied as can be seen in detailed in the Deliverable 5.3.

The first proposed solution, Microsoft NetMeeting only works for the first and the second participant of the conference/connection. In addition, Microsoft has stopped developing this program and is making efforts now to improve the Messenger communication tools, and then this program was discarded.

Second, Click-To-Meet gives a very good service, but it is too expensive for the network, then it was discarded too.

The third solution was the videoconference. According to the questionnaire made by UPV regarding the hardware and connections available from each partner, it had a difficult implantation in CONSENSUS, and then it could not be used.

Last solution, Messenger has low requirements, low price (free) and a satisfactory service and performance. Only two people can make a videoconference, but in the future, it is supposed to give the possibility to make multi-point videoconferences. Then, due to the price, service and performance, this was the most suitable solution.

4.1.2 Internet-based CONSENSUS Database

The aim of the CONSENSUS-database is to support the assessors in correlating the specific characteristics of the driver with special needs and the appropriate assessment criteria, literature, methodologies and tools to be used for the assessment. All main parameters that have been recognized affecting the driving ability of the PSN are included in this database, together with the relevant criteria and indicative figures. In addition, specific examples, namely ‘Use cases’ are provided to assist them on the way to proceed to the assessment of a candidate, by means of already performed assessments from different EU countries (i.e. application examples), providing them with data on the parameters measured and their final result.

Data can be added and edited through the World Wide Web, using an easy to use interface. The data stored in the database can be retrieved world wide through the web as well. In this way, the database is easily accessible and does not require installing specific software on the computer of the user, which increases both the accessibility and the usability significantly. Moreover, the database is included in the structure of the CONSENSUS web page and, thus stays in the common use context which also enhances the usability of the database.

The basic structure of the database was characterized by five main sections:

- Assessment criteria (20);

  The criteria that have been identified to be of significant importance to the evaluation of drivers with special needs are included in this section.
• Assessment tools (42):
  Information about tools relevant for the evaluation of drivers with special needs is included in this section.

• Assessment methodology (6):
  Information about assessment methodologies such as the description, steps followed, relevant problems, contact info, limitations, etc.

• Assessment literature (43):
  Literature information is provided in this section such as relevant journal/book/proc, the title, author, category, year of publication, type of publication, etc.

• Use cases (52):
  Application examples by means of already performed assessments from different EU countries are described in detail.

**User Interface:**

Using PHP and HTML code, two different user interfaces (UIs) were implemented. One for the input of data and one for the search and output of data. These two interfaces are described below.

**Data Input:**


In the navigation bar on the left (Figure 16), two different categories of lists to be entered can be accessed. Using the links in the upper section, the following pre-defined lists that represent input to the four main sections can be edited:

- Countries
- Languages
- Driving subtask
- Driving subtask EC
- Adaptations used
- Functional problems
- Referral
- Disability
- Assessor Type / Qualification
- Literature Category
- Type of publication
- Target profession
- Consensus Codes
Figure 16: Screenshot of the start page of the UI for data input.

Using the links in the lower section, information for the main sections of the database can be entered and edited. A help function is also available.

Data search and output

The CONSENSUS-database is accessible through a link on the CONSENSUS web page at http://www.consensus-eu.org, featuring a special log-in page that controls access to the data. The design of the whole search and output interface follows the design of the CONSENSUS web page in order to increase its usability, as was outlined in the introduction.
To search for one of the items above, the user has to click on the related name on the navigation bar, i.e. Use Cases, Tools, Methodologies, Criteria (see Figure 17). In the opening search window, he/she may specify the search criteria for each case:

- **For the Assessment Criteria**, the search criteria are relevant driving subtasks, disability.

- **For the Assessment Tools**, the search criteria are the assessment type, driving subtasks, disability, relevant criteria.

- **For the Assessment Methodologies**, the search criteria are the driving subtasks, relevant criteria.

- **For the Assessment Literature**, the search criteria are the type of publication, driving subtasks, relevant criteria.

- **For the Use Cases**, the search criteria are the gender, age, driving subtasks, disability, and outcome of evaluation.

There are the options in all categories above to enter a free search criterion in the ‘free search’ field or to display all entries included in the database in this category.
The database followed a relational concept, i.e. all of the five sections are interrelated. For example, in a use case, both the criteria and the tools used in the specific assessment can be specified in terms of the criteria and tools included in the relevant sections of the database.

The table below presents the contributors of CONSENSUS database input, per type of organisation as specified in the table “Categorisation of organisations”.

<table>
<thead>
<tr>
<th>Database Input</th>
<th>Member States</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type of organisation</strong></td>
<td><strong>Member States</strong></td>
</tr>
<tr>
<td>A</td>
<td>UK</td>
</tr>
<tr>
<td>U</td>
<td>✓</td>
</tr>
<tr>
<td>T</td>
<td>✓</td>
</tr>
<tr>
<td>AD</td>
<td>✓</td>
</tr>
<tr>
<td>MAN</td>
<td>✓</td>
</tr>
<tr>
<td>VI</td>
<td>✓</td>
</tr>
<tr>
<td>FA</td>
<td>✓</td>
</tr>
</tbody>
</table>

Table 6: Contributors of Database Input.

<table>
<thead>
<tr>
<th>Categories</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSN Driving Assessment Authorities</td>
<td>A</td>
</tr>
<tr>
<td>Assessment - Medical / Paramedical – Centres</td>
<td></td>
</tr>
<tr>
<td>PSN Licensing Authorities</td>
<td></td>
</tr>
<tr>
<td>PSN Users’ Representatives</td>
<td>U</td>
</tr>
<tr>
<td>Relevant Technology Providers</td>
<td>T</td>
</tr>
<tr>
<td>PSN Driving Aids Manufacturers</td>
<td>AD</td>
</tr>
<tr>
<td>PSN Other Aids Manufacturers</td>
<td>MAN</td>
</tr>
<tr>
<td>Vehicle Inspection</td>
<td>VI</td>
</tr>
<tr>
<td>Funding Organisations / Authorities</td>
<td>FA</td>
</tr>
</tbody>
</table>

4.1.3 CONSENSUS Expert Knowledge Tool

The Expert Knowledge Tool was developed in order to provide guidance/assistance to the inexperienced assessment personnel for the appropriate evaluation procedure to be followed, giving instructions/
suggestions on the assessment steps, assessment tools, sequence to be followed and driving support mechanisms for the client to be assessed. It consist of 48 tools for physical evaluation, 68 contact points within 21 countries and 52 use cases supported from the database.

The innovation of this expert tool, in the area of driving assessment, is that it can help assessors and can compose the knowledge and experience of more than one expert, thus offering better assessment objectivity. Furthermore, such a system can provide an explanation for its decision, hence offering to the user insight in the decision process and may resolve possible misunderstandings in this way.

The functionality of the tool is as follows:

- Step-by-step guidance of evaluation procedure (based on A3.2).
- Suggestion of tools to be used in each case.

![Figure 18: Step-by-step guidance](image)

When the evaluation procedure ends the tool offers the following possibilities:

- Suggestion of possible solutions (such as car adaptation aids from the CONSENSUS Database).
- Suggestion for further expert help (contact points per country).
- Relevant use cases (from the CONSENSUS Database).
The Expert Knowledge Tool follows a modular architecture, so as to be able for the user to be consulted on-line, from the Networks www, characterised by a simple and user friendly interface, adequate for non-expert PC users.
The table below presents the contributors of CONSENSUS Expert Knowledge Tool’ input, per type of organisation as specified in the table “Categorisation of organisations”.

<table>
<thead>
<tr>
<th>Expert System Input</th>
<th>Member States</th>
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<tbody>
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<td>U</td>
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</tr>
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<td>T</td>
<td>✔️</td>
</tr>
<tr>
<td>AD</td>
<td></td>
</tr>
<tr>
<td>MAN</td>
<td></td>
</tr>
<tr>
<td>VI</td>
<td></td>
</tr>
<tr>
<td>FA</td>
<td></td>
</tr>
</tbody>
</table>

Table 7: Contributors of Expert Knowledge Tool Input.

<table>
<thead>
<tr>
<th>Categories</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSN Driving Assessment Authorities</td>
<td>A</td>
</tr>
<tr>
<td>Assessment - Medical / Paramedical – Centres</td>
<td></td>
</tr>
<tr>
<td>PSN Licensing Authorities</td>
<td></td>
</tr>
<tr>
<td>PSN Users’ Representatives</td>
<td>U</td>
</tr>
<tr>
<td>Relevant Technology Providers</td>
<td>T</td>
</tr>
<tr>
<td>PSN Driving Aids Manufacturers</td>
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<tr>
<td>PSN Other Aids Manufacturers</td>
<td>MAN</td>
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<tr>
<td>Vehicle Inspection</td>
<td>VI</td>
</tr>
<tr>
<td>Funding Organisations / Authorities</td>
<td>FA</td>
</tr>
</tbody>
</table>

Categorisation of organisations

4.2 Community added value and contribution to EU policies.

The direction of free mobility for all in Europe, the relevant process of PSN driving assessment needs to be standardized, so that:

- PSN do not move around Europe, trying to identify Centres that offer better prospects for them;
- PSN get a fair, cost-effective and ethical assessment anywhere in Europe, anytime;
• PSN driving ability assessors can receive proper training and a universally recognized qualification, enabling them to work anywhere in Europe;

• an optimum balance between road safety and mobility is reached at affordable cost.

By establishing a Thematic Network on PSN driving ability assessment, EU has actively contributed in this socially sensitive area, where common practices today differ a lot from country to country and, in some cases, even from region to region. CONSENSUS Network includes Assessment Centres, thus guaranteeing the de facto adoption of project results to the majority of European states, including Associated countries.

The successful performance of CONSENSUS project has supported the following EC policies:

• A critical mass of industrial, academic and business (i.e. Assessment Centres) research groups coordinates its research activities on PSN driving ability assessment, towards a common, high quality and objectivity assessment procedure. This modular assessment procedure was applicable also to outlying regions of EU and Associated states, whereas a core of members will start experimenting with more advanced, IT-based assessment tools.

• Within CONSENSUS a systematic exchange of information and experiences (in the form of the Internet based database, an interactive www site and an expert knowledge tools) was developed, thus forging actual working links between the European PSN driving assessment Centres.

• The Network facilitated IT tools (i.e. interactive web site, teleconferencing, and database, expert tool) to maximise and accelerate the standardisation and interoperability of PSN driving assessment procedures within Europe.

• ISO TC173/SC1/WG6 is working on accessibility issues of motor vehicles for persons with disabilities, which lacks a common PSN classification scheme and terminology in relation to driving. CONSENSUS established a common PSN driving ability classification and codification scheme.

• ISO TC22/WG4 is working on “Accessibility in Public Transport vehicles”, which also lacks a relevant classification scheme and common terminology, as well as its new extension, ISO TC22/SC26/WG3 on “Driving Controls for People with Disabilities”. Although CONSENSUS prime concern rests with private car driving, the relevant common classification schemes and tools might later be adapted to suit also better this type of activities.

• CONSENSUS results can be directly used by ISO 173 (Technical Aids for Disabled People), ISO 22 (Road vehicle standards) and relevant RESNA Committees.

• CONSENSUS stimulated and promoted the dissemination and uptake of previous findings within past IST projects, such as TELAID (V2032), TELSCAN (TR1108), TURTLE (T1194), TRANSWHEEL (DE3013) and CONSENSUS feasibility study (IST-200-26456).
• CONSENSUS supports DG TREN work on Directives CEC 91/439 and 2000/56 revision (driving license acquisition), expanding also the work of the DG TREN co-funded project INCA (B3-B96-B2-7020-SIN-25 82) and contributing towards a standardised and objective driving ability evaluation scheme for people with disabilities. Invited presentation of CONSENSUS in the joint meeting on “Fitness To Drive” of Driving License Committee of DG TREN, on 27-28/04/05.

• Furthermore, the tools and the results of the evaluation of the CONSENSUS IDEA and AGILE projects, covering the whole problem of PSN assessment are of major importance for the 3rd Driving License Directive and beyond, because they pave the way towards a driving assessment procedure for drivers with disabilities, and a re-assessment procedure for elderly drivers (new Annex 3), as well as the formulation of requirements for assessors and driving instructors (new Annex 4 or 5).

4.3 Impact to the Assessment Procedures Standardisation

The following table includes the crude estimation to categorise Assessment Centres per country according to the assessment practices that it are followed in each country, if they are single/dominant or common network centres, related to CONSENSUS scheme or not.

<table>
<thead>
<tr>
<th>Categorisation of Assessment Centres per Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Many small Assessment Centres, no relation between them or with CONSENSUS.</td>
</tr>
<tr>
<td>2 Common Network, harmonised assessment, or Single/ dominant Assessment Centre; not related to CONSENSUS.</td>
</tr>
<tr>
<td>3 Many small Assessment Centres, with at least one trying to make a Network and following CONSENSUS scheme.</td>
</tr>
<tr>
<td>4 Single or dominant Assessment Centre:</td>
</tr>
<tr>
<td>a) agreed to follow CONSENSUS scheme;</td>
</tr>
<tr>
<td>b) under consideration and discussion with CONSENSUS.</td>
</tr>
<tr>
<td>5 Common Network, harmonised assessment:</td>
</tr>
<tr>
<td>a) agreed to follow CONSENSUS scheme;</td>
</tr>
<tr>
<td>b) under consideration and discussion with CONSENSUS.</td>
</tr>
</tbody>
</table>

Table 8: Maturity classification

According to the above categorisation, the following table presents the Maturity Model describing the network perception of the current status of each Member State in CONSENSUS Thematic Network.
Table 9: Maturity Model

4.4 Contribution to Community social objectives

Quality of life

Driving is a modality more user friendly for PSN than public transportation, as many of them are not able to walk the required distance, stand for a long time and have the overall physical endurance to use public transportation means. Indeed, over 25% of PSN Americans are not able to use public transportation means [Walter, 1969]. The comfort features of driving are presented in the following Table.

<table>
<thead>
<tr>
<th>Private car</th>
<th>Public transport</th>
</tr>
</thead>
<tbody>
<tr>
<td>Luggage transportation easy</td>
<td>Luggage transportation difficult</td>
</tr>
<tr>
<td>High psychosocial safety</td>
<td>Low psychosocial safety</td>
</tr>
<tr>
<td>Much privacy</td>
<td>Little privacy</td>
</tr>
<tr>
<td>Seat assured</td>
<td>Seat uncertain</td>
</tr>
<tr>
<td>Parking necessary</td>
<td>No parking problems</td>
</tr>
<tr>
<td>Weather protection good</td>
<td>Cold and windy stations</td>
</tr>
<tr>
<td>Walking distance &lt;400 m</td>
<td>Walking distance &gt;400 m</td>
</tr>
<tr>
<td>Entrance easy</td>
<td>Entrance difficult</td>
</tr>
<tr>
<td>Moderate casualty risk</td>
<td>Low casualty risk</td>
</tr>
</tbody>
</table>

Table 10: Comfort features when driving a private car and when using means of public transport.

(Modes of transportation with an advantage for the PSN over the rest, are found in italics. taking into account the average physical capabilities of people over 65, [Brouwer, 1994])
Several studies suggest that older people (including those of reduced mobility due to ageing) will need to drive more in the future and that, in fact, this trend is already in place. For example, [Hu, 1992] found that drivers over 65 reported driving at least 30% more in 1990 than in 1983. [Burkhardt, 1998] concludes that older drivers will both need and want to drive more in the next 20 years than they did during the previous 20 years. The same is true for high numbers of people with motor impairments, which account for around 70% of people with special needs or around 4% of the overall population [TELAID, 1992].

Thus, the successful social integration of PSN in everyday activities to the greatest possible extent, depends upon their ability to become and remain active as vehicle drivers. This, however, needs to be counterbalanced to the need of safeguarding public safety on the road. **CONSENSUS paved the way towards a pan-European evaluation methodology of PSN driving ability, thus establishing this necessary balance between safety and mobility, under common terms in Europe and beyond.**

**Enhancement of Road Safety**
Although elderly drivers accident rates are a controversial issue [Ecosometrics, 1998], it is predicted that traffic fatalities with elderly will in USA alone increase from 7,500 in 1995 to around 32,000 in 2030, as more and more elderly become and remain drivers. On the other hand, only in 1981 in UK 10 wheelchair users were killed and 528 were injured in road accidents [Kjelmann, 1995]. Even though in many of these cases PSN drivers or travellers might not be at fault, PSN enhanced fragility results in accounting for as high as 90% of the killed and 5% of the severely injured people in traffic accidents [Thulin, 1994], accounting for a relevant annual cost of 3.5 billion Euro to the society. Hence, working towards a concise evaluation framework as proposed by CONSENSUS, it is expected to enhance road safety, without limiting unnecessarily PSN ability to drive.

**Employment and working conditions**
In a relevant survey among 112 PSN, who visited Iniochos Centre in Greece within 1998 to apply for a driving license, it was found that 42% were unemployed for more than 2 years. One year after they acquired their driving license, 75% of those unemployed were working, without having undergone any other special educational course or changing their working profile [ODIGO project, Del. G2.3.2.A.1]. The acquisition of a driving license results in enhancement of PSN employment chances, as it offers them the freedom to move autonomously in the non-adapted city environments. **CONSENSUS is serving PSN occupational status improvement through proposing standardised assessment procedures and tools.**

**Support in autonomous living and reduction in social care costs**
PSN users that are unable to drive and travel are more prompt than others to instistitutionalisation, the mean annual cost of which is around 15 kEuro for each PSN [Waller P., 1988]. The enhancement of transport and travel autonomy of a large part of PSN users will also diminish the required time of carers and relatives by around 20% [WHO, 1995] for assistance and transportation tasks, thus enhancing their productive Manpower. As the relevant amount spent today in Europe for home care of PSN is around 127 billions Euro [WHO, 1995], the relevant economy may be of a magnitude of billions of Euros. **CONSENSUS by promoting the mobility of PSN, supports their independent living and helps reduce relevant social care costs.**
4.5 Network establishment, initial synthesis and expansion policies

Statement of mission and objectives

A legal person will be established among the interested partners and members of the CONSENSUS project, located in the country of one of these partners, who will be the Network Founding Members. The country has still to be decided, but most probably this will be in Greece or Belgium. The legal form of the Network has also been investigated. The exact form will depend on the final country of establishment, but it will rather have the form of an Association, namely a non-profit NGO.

The Network will have a mission to promote and facilitate the mobility of the PSN. The object of the Network will be to:

- provide for the exchange and distribution of information on research projects and standardisation activities conducted in the field of promoting the mobility of PSN as well as on the results of such research projects;

- provide a platform for an assessment and training network by organising [and/or supporting] on a non-profit basis seminars or university-related research projects;

- participate in structuring the European Research Area by supporting mobility of assessment personnel, researchers and trainees in the area of mobility of PSN as well as by supporting the joint planning of programs and joint use of assessment and research infrastructures among its Members as well as non-members;

- promote driving ability assessment activities, driver training and mobility related and promote distribution of research and standardisation results among and beyond its membership, e.g. by advising on joint and integrated research activities, by providing for the publication of research reports / standards documents (either hardcopy, CD or via the internet) and by inviting interested specialists as well as interested entities and persons concerned with the application of such research results / standardisation actions to participate in its seminars;

- explore and inform on opportunities to conduct driving ability assessment of PSN, training- and/or mobility-related research activities and standardisation actions;

- promote the accreditation of methods and tools used for the driving ability assessment and training of PSN, as well as of driving aids for them;

- offer on a non-profit basis services and tools to its members and non-members, to enhance the quality of the driving assessment and training of PSN, facilitate their mobility and/or to promote the effective communication between its members and non-members;

- explore on a non-profit basis services and/or products developed by the Network or its members;

- organise on a non-profit basis training courses on driving ability assessment of PSN, support and/or training;
• provide on a non-profit basis consultation to its members and non-members on optimal ways to assess the driving ability of PSN, develop driving support aids for them, offer driver training courses to them and in general promote their mobility (i.e. by issuing relevant codes of good practice and/or guidelines);

• intensify the cooperation between its Members, and prepare further steps aimed at the continued integration of their activities in the field of mobility of the PSN.

The Network may thus be engaged in research projects that are either self-funded or funded by external sources and grants. The Network will be able to participate in such a research project as a whole, based upon a relevant 2/3 majority decision of its Supervisory Board. Then, the project may be realised in any of the two following ways:

• Project work may be realised by persons directly working for the Network, in which case the received funds will remain in the Network and matching funds (if needed) will stem from its budget (including Member or others’ donations or grants).

• Project work may partly or fully be delegated to specific Network Members, under the control of the Network. In that case, these Members will have to supply the matching funds (if any) corresponding to their shares of activities.

The legal person will be constituted without initial capital. It will be financed by:

• annual subscription made by the Members;

  (note: a subscription is a written contract by which one engages to take and pay for capital stock of corporation or to contribute a sum of money for a designated purpose either gratuitously as in the case of subscribing to a charity or in consideration of an equivalent to be rendered as a subscription to a periodical, a forthcoming book, or a series of entertainments);

• drawing on revenues obtained as payment for the work performed on behalf of third parties;

• admission fees charged to new Members;

• the financial contributions for contracts, grants or subsidies;

• sales of services and products developed by the members (training courses, database, expert tool, homologation activities);

• other payments.

4.6 Economic development
As CONSENSUS is a Network on a social care area, it did not aim to produce directly any economic benefit. Still, its activities are expected to directly or indirectly create wealth for its Members and the society, as explained below.

4.6.1 Dissemination of results

CONSENSUS dissemination strategy was based on an innovative strategy, including:

- Development of the project logo and production of leaflets (8,000) and posters (600).
- Thirteen papers were published in scientific and non-scientific Magazines and presented in Conferences.
- Organisation of two workshops with the participation of 68 external experts in total. The first one took place in Valencia, Spain in Month 13 of the project, on September 2003, to review project results and diffuse CONSENSUS concept. The second one took place in Ljubljana, in Month 22 of the project on June 2004, in order to present the final project results.
- Electronic Newsletter every six months, carrying forward project results to all Network and User Forum Members in a concise and brief way.
- Development of an interactive WWW site that presents all project achievements in a multimedia way, including demos of the assessment tools proposed.

Detailed information about the dissemination of results can be found in section 3 of this document.

4.6.2 Users groups involved

Project user groups include:

<table>
<thead>
<tr>
<th>Categories</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSN Driving Assessment Authorities</td>
<td>A</td>
</tr>
<tr>
<td>Assessment - Medical / Paramedical – Centres</td>
<td></td>
</tr>
<tr>
<td>PSN Licensing Authorities</td>
<td></td>
</tr>
<tr>
<td>PSN Users’ Representatives</td>
<td>U</td>
</tr>
<tr>
<td>Relevant Technology Providers</td>
<td>T</td>
</tr>
<tr>
<td>PSN Driving Aids Manufacturers</td>
<td>AD</td>
</tr>
<tr>
<td>PSN Other Aids Manufacturers</td>
<td>MAN</td>
</tr>
<tr>
<td>Vehicle Inspection</td>
<td>VI</td>
</tr>
<tr>
<td>Funding Organisations / Authorities</td>
<td>FA</td>
</tr>
</tbody>
</table>

The different fields of activities of the CONSENSUS Thematic Network organisations can be grouped according to the categories presented in the table above. A list of CONSENSUS Thematic Network Members is provided in the Annex XI where each organisation/member belongs to one of the categories described above. The different categories of organisations present at the membership of the Thematic Network are schematically presented as follows.
4.6.3 Strategic impact of the thematic network in terms of improvement of competitiveness or creation of market opportunities

The eventual unification of the European assessment tools and methods Market, through the CONSENSUS proposed common PSN driving ability assessment scheme, is expected to create significant new market opportunities for the vendors of such systems. Even more important is however the fact that the creation of a relevant common Market is expected to reduce the cost of such tools (e.g. of driving simulators for assessing PSN driving ability), thus making them available also to many more Assessment Centres throughout the European regions, including a number of Associate States. Finally, the establishment of the proposed tools for the Network communication and the PSN driving assessment is expected to formulate a new area of knowledge competence for the participating...
Assessment Centres that could be requested to offer training services to other Assessment Centres in their or other countries.

### 4.6.4 Exploitation strategies

CONSENSUS became the basis for a relevant Association, to promote the mobility of drivers with disabilities. This Association will use and further develop the tools and concept developed during the course of the project and will provide a platform for their continuation, dissemination and exploitation. Since the proper operation of such an Association requires to achieve consensus within the consortium and Network Members, regarding its operation, cost, etc, a questionnaire was created, intended only for internal use for Network partners and Members, in order to guide the formulation and policy of the relevant Association. Emphasis was given on the sources of income and viability of the Association. A total of 15 completed questionnaires have been collected. Based on the response to the questionnaire survey regarding the organization and functioning of the CONSENSUS Thematic Network after the end of the research project as well as on the interest of project partners and members for participation in such a network, a study has been performed, defining the objectives of this network, its structure and managing bodies as well as the anticipated annual expenses and incomes. Based on this, it can be deduced that the Thematic Network will be viable, even if not considering its future expansion with the addition of other members and income generated by other R&D activities.

In addition, the Deliverables create wealth and competitive skills, so that they formulate a secondary exploitation scheme, according to the following Table:

<table>
<thead>
<tr>
<th>Project outcome</th>
<th>Responsible Partner for exploitation</th>
<th>Timing (after the end of the project)</th>
<th>Target price or societal gain (annually)</th>
<th>Current Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>D2.1, PSN driving ability classification scheme</td>
<td>UPV, CARA, VTI, DFT, IRRS, IPR, CBR</td>
<td>1-2 years</td>
<td>Accepted as de facto or de jure standard in PSN driving licensing procedure Europewide</td>
<td>Their use has been agreed as pilot basis in 6 countries (Belgium, Greece, Italy, Lithuania, Slovenia, and Spain). It is being currently considered in another 7 countries (Czech Republic, Ireland, UK, Netherlands, Portugal, Sweden and Switzerland). In some other countries, they will be used by some Centres and effort will be devoted to extend it to others (Germany and France).</td>
</tr>
<tr>
<td>D2.2, Towards common PSN driving ability assessment criteria</td>
<td>CBR, CARA, VTI, DFT, UPV, INRETS-LESCOT, IFADO, IRRS, CDV, IPR, COAT</td>
<td>Immediately after</td>
<td>Dissemination to all interested parties as part of training services</td>
<td></td>
</tr>
<tr>
<td>D3.1, Towards a common set of assessment tools and driving Assessment methodology</td>
<td>CARA, VTI, DFT, UPV, DDA, INRETS-LESCO, CRF, IFADO, IRRS, CDV, IPR, CBR, COAT</td>
<td>Immediately after</td>
<td>Dissemination to all interested parties as part of training services</td>
<td></td>
</tr>
<tr>
<td>D4.1, Assessment database</td>
<td>TRUTH, HIT, IAT</td>
<td>6-12 months</td>
<td>Renewable database as part of relevant service</td>
<td></td>
</tr>
<tr>
<td>Project outcome</td>
<td>Responsible Partner for exploitation</td>
<td>Timing (after the end of the project)</td>
<td>Target price or societal gain (annually)</td>
<td>Current Status</td>
</tr>
<tr>
<td>-----------------</td>
<td>--------------------------------------</td>
<td>---------------------------------------</td>
<td>----------------------------------------</td>
<td>----------------</td>
</tr>
<tr>
<td>D4.2, Expert knowledge tool</td>
<td>TRUTh, IAT, HIT</td>
<td>1-2 years</td>
<td>offered to all interested parties upon an annual fee (project version offered for free)</td>
<td></td>
</tr>
<tr>
<td>D5.4, Code of Good Practice on PSN driving ability assessment and relevant guidelines</td>
<td>VTI, CARA, CBR, DFT, IRRS, DDA</td>
<td>Immediately after</td>
<td>Used as support tool for the PSN assessment upon an annual fee (project version offered for free). Services on guidance to its use.</td>
<td>Proposed recommendations have been submitted for uptake to DG TREN and several national authorities. Several of them answered positively, such as the UK Forum (UK Network of Assessment Centres), the Ministry of Transport of Greece (legal action is ready and awaits final signature by the General Secretary) and ASECEMP (Spanish Association of Drivers Mental-Psychological Assessment Centres). Design recommendations have been adopted already by CRF (car manufacturer), SIEMENS VDO (automotive system supplier). Over 50 others have received it and feedback is expected.</td>
</tr>
<tr>
<td>Knowledge on PSN critical problems in relation to driving task (part of D5.4)</td>
<td>CRF</td>
<td>1-2 years</td>
<td>Transfer of relevant know-how to better vehicle design for PSN</td>
<td></td>
</tr>
</tbody>
</table>

Table 11: CONSENSUS outcome “exploitation” scheme

Furthermore, ways of cooperation of the Thematic Network with other running research projects are proposed, so as to conclude to a contribution to the new driving license directive.
The overall Network layout and functions are better explained in the following figure, including indicative revenue return points, to support the Network viability. This is a layout for the future CONSENSUS, after the end of the project.
CONSENSUS Network

A. Internal Standardisation on assessment practices and tools (CONSENSUS trademark)

B. SECRETARIAT (in CARA)

1. Database
   - Driving aids
   - Assessment tools

2. Marketing
   - External Relations
   - Relation to Authorities

3. Translation
   - Research
   - Communication

4. DG TREN Unit E3 “Sécurité Routière” Comité sur le Permis de Conduire

5. Driving license and homologation departments of Ministries of Transport

6. Standardisation bodies

C. Consultation body on car adaptation

1. Matching Tables of Adaptations
2. Best Practice Code
3. Info template

D. Training

1. For assessment
2. On driving aids
3. Services / Sales

Figure 23: CONSENSUS Network layout
4.6.5 Partners’ benefit

The Assessment Centres participating in the CONSENSUS project will benefit from the enhanced know-how (especially in relation to the use of IT tools for their everyday activities), while the knowledge and tools’ providers will better understand the relevant needs and requirements of the Assessment Centres. Both will surely lead to further uptake actions (i.e. establishment of collaboration agreements or market products) in a mid-term horizon. For a more detailed description of the Partners’ benefit from CONSENSUS please refer to the relevant section of the present document (section 6).
5 Deliverables and other outputs

5.1 Deliverables

<table>
<thead>
<tr>
<th>Deliverable Code &amp; Name</th>
<th>Planned delivery date</th>
<th>Actual delivery date</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>WP1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D1.1: Project Presentation</td>
<td>Month 3</td>
<td>Month 3</td>
<td>Deliverable in time completed</td>
</tr>
<tr>
<td>D1.2: Project’s Management and Quality plan</td>
<td>Month 4</td>
<td>Month 4</td>
<td>Deliverable in time completed.</td>
</tr>
<tr>
<td>D1.3: Assessment Procedures</td>
<td>Month 6</td>
<td>Month 7</td>
<td>Deliverable completed in month 7. The small delay is due to the Peer review process.</td>
</tr>
<tr>
<td>D1.4: Project Assessment results.</td>
<td>Month 24</td>
<td>Month 26</td>
<td>Deliverable submitted</td>
</tr>
<tr>
<td>D1.5: Final Report</td>
<td>Month 24</td>
<td>Month 26</td>
<td>Deliverable submitted</td>
</tr>
<tr>
<td>WP2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D2.1 PSN driving ability classification and codification scheme</td>
<td>Month 12</td>
<td>Month 21</td>
<td>Submitted. The Deliverable has been delayed as a result from other work in the project that revealed alternative approaches to develop more practically useful coding principles, which should be explored and included in the deliverable. The codification was ready since Month 20, but it was commented by the Network Members at the meeting of 31/03/04.</td>
</tr>
<tr>
<td>D2.2 Towards common PSN driving ability assessment criteria.</td>
<td>Month 20</td>
<td>Month 22</td>
<td>Submitted on M22. Draft existed since Month 18.</td>
</tr>
<tr>
<td>WP3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D3.1 Towards a common set of assessment tools and driving assessment methodology.</td>
<td>Month 22</td>
<td>Month 26</td>
<td>Submitted slightly delayed due to data overload and in order to achieve CONSENSUS.</td>
</tr>
<tr>
<td>WP4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D4.1 Assessment database.</td>
<td>Month 18</td>
<td>Month 22</td>
<td>The database was on line and functioning since Month 18. However, modifications were suggested at the 7th plenary meeting and by the</td>
</tr>
<tr>
<td>Deliverable Code &amp; Name</td>
<td>Planned delivery date</td>
<td>Actual delivery date</td>
<td>Comments</td>
</tr>
<tr>
<td>-------------------------</td>
<td>-----------------------</td>
<td>----------------------</td>
<td>----------</td>
</tr>
<tr>
<td>D4.2 Expert knowledge tool.</td>
<td>Month 22</td>
<td>Month 26</td>
<td>Submitted delayed, in order to incorporate all project use cases. Software draft was ready in Month 20.</td>
</tr>
<tr>
<td>WP5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D5.1 Dissemination and use plan</td>
<td>Month 6</td>
<td>Month 7</td>
<td>Deliverable completed in month 7. The small delay is due to the Peer review process.</td>
</tr>
<tr>
<td>D5.2 Project Leaflets and Posters. First project web site</td>
<td>Month 8</td>
<td>Month 8</td>
<td>Deliverable in time completed. Deliverable submitted</td>
</tr>
<tr>
<td>D5.3 Project interactive multimedia www site.</td>
<td>Month 22</td>
<td>Month 23</td>
<td>Slightly delayed in order to include all data.</td>
</tr>
<tr>
<td>D5.4 Code of Good Practice on PSN driving ability assessment, relevant guidelines and specification of assessment tools and adaptations needed.</td>
<td>Month 24</td>
<td>Month 26</td>
<td>Deliverable submitted</td>
</tr>
<tr>
<td>D5.5 Network viability schemes.</td>
<td>Month 24</td>
<td>Month 26</td>
<td>Deliverable submitted</td>
</tr>
</tbody>
</table>
WP1: Network communication, Management and consensus mechanism

Deliverables

D1.1: Project presentation

Abstract
In the deliverable D1.1 the project presentation is introduced, by specifying the main goals of the project, the technical approach that will be followed within the project, the structure of the CONSENSUS Thematic Network. In addition, the expected results and impacts are pointed out, regarding the quality of life, the enhancement of Road Safety, the employment and working conditions and the support in autonomous living and reduction in social care costs.

D1.2: Project’s Management and Quality plan

Abstract
This deliverable provides the management quality assurance strategy to be followed in the framework of the project as well as the requested forms to be completed, and templates for documents. At the end of the deliverable, a linear distribution of PMs for each partner is given, per WP and tasks.

D1.3: Assessment procedures

Abstract
Within this deliverable, a methodology has been developed in order to specify an evaluation framework to constantly monitor and assess the progress of the work of CONSENSUS project and the level of its associated achievements.

Executive Summary/ Results

A multi-criteria approach for assessing CONSENSUS progress was proposed, defining and analysing 5 main criteria: TQC (Technical Quality Criterion), CAV (Community Added Value criterion), EDC (Economic Development Criterion) and RPM (Resources, Partnership and Management criterion). Each of them is composed by a wide variety of single factors, associated with the quality of each project deliverable, the delay in workpackages execution and/or deliverables submission, the relevant prospects of its outcomes in the market, the project participants level of contributions, etc. All these factors are quantified within a 0-5 scale, using both objective and subjective measurements.

Then, a set of weighting factors and thresholds are calculated for each of the above five criteria and an overall evaluation function for CONSENSUS is defined. These were based upon the EU-defined Horizontal proposals evaluation criteria, weighting factors and thresholds, as they are used within 5th FW program of EU. They had however to be detailed and in some cases adapted, to the particular issues, of CONSENSUS.
Based on the above, an evaluation framework was proposed for CONSENSUS, based upon a six-month period estimation of all the above-mentioned factors and criteria and applied through a Project Evaluation Diagram. The results of this 6-month internal assessment were used by the Project Coordinator and the Quality Assurance Manager to initiate internal and external audits and propose risk mitigation strategies whenever necessary. More detailed information about this methodology and its results can be found in section 6 of this document.

**D1.4: Project Assessment results**

**Abstract**

The methodology, described in the deliverable D1.3, had been applied in various time points during the project execution. The analytical description of these applications is presented in this deliverable D1.4, calculating the 5 main criteria of this methodology. The final evaluation in each time point was plotted on a Project Evaluation Diagram, which provides a visual overview of the project progress.

**Executive Summary/ Results**

The multi-criteria approach for assessing the CONSENSUS project progress that has been proposed in the deliverable D1.3, has been applied in various time points during the project execution, and the final evaluation in each time point is plotted on a Project Evaluation Diagram, providing a visual overview of the project progress. This overview is the content of the deliverable D1.4. The assessment criteria have been evaluated four times during the CONSENSUS project life (Months 6, 12, 20 and 26) span and their relevant evolution has been monitored by the Projects Evolution Diagram. As it is described in the deliverable, all criteria are above the respective thresholds in all four times of evaluation.

The Overall Evaluation Function increases during the whole project duration and since month 20 was higher than the initial evaluation rating of the CONSENSUS proposal. Thus, the project progress has been good and according to its objectives.

**D1.5: Final Report**

**Abstract**

Ref. to the present deliverable.

**WP2: Towards a common PSN classification and assessment criteria**

**Deliverables**

**D2.1: PSN driving ability classification and codification scheme**

**Abstract**

Deliverable D2.1 elaborates a standardised way to classify both medical and functional data for the assessment process of drivers with disabilities, taking into account the important difference between ‘driving abilities’ and ‘fitness-to-drive’. The CONSENSUS target group includes drivers suffering from the following illnesses or disabilities: spinal cord disabilities (paraplegia, tetraplegia, degenerative
diseases, multiple sclerosis and some types of muscular dystrophy), peripheral nervous system (paralysis of upper, lower or upper and lower limbs) sensory and locomotor disorders, muscle diseases (muscular dystrophy, etc.) and locomotor diseases (limb amputations, rheumatoid diseases, arthrodesis, etc.). The classification scheme was based on the: ICD-9-CM (International Classification of Diseases, version 9, Clinical Modification) and ICIDH-2 (International Classification of Functioning, Disability and Health) classifications. Four practical examples of locomotor impairments are explained in detail in accordance with the proposed codification scheme.

**Executive Summary/ Results**

Deliverable D2.1 elaborates a standardised way to classify both medical and functional data for the assessment process of drivers with disabilities, taking into account the important difference between ‘driving abilities’ and ‘fitness-to-drive’. The CONSENSUS target group includes drivers suffering from the following illnesses or disabilities: spinal cord disabilities (paraplegia, tetraplegia, degenerative diseases, multiple sclerosis and some types of muscular dystrophy), peripheral nervous system (paralysis of upper, lower or upper and lower limbs) sensory and locomotor disorders, muscle diseases (muscular dystrophy, etc.) and locomotor diseases (limb amputations, rheumatoid diseases, arthrodesis, etc.).

Along the assessment process, it is important to keep in mind the important difference between ‘driving abilities’ and ‘fitness-to-drive’. The term ‘driving abilities’ refers to the complex interaction between physical, cognitive, perceptual and psychological abilities required to drive safely. The term ‘fitness-to-drive’ refers to a multidisciplinary decision about the extent to which a person is able to participate in a safe way in traffic with a vehicle.

When looking for a classification for PSN, the most prominent link is the 'family' of classifications developed by the World Health Organisation (WHO). Within CONSENSUS it was proposed to use a classification scheme based on the: ICD-9-CM (International Classification of Diseases, version 9, Clinical Modification) and ICIDH-2 (International Classification of Functioning, Disability and Health) classifications.

When medical information (ICD-9-CM), functional info (ICF), and our driving model are linked, we can start thinking about the assessment procedure. The proposal of the CONSENSUS project starts the assessment procedure with the definition of the Medical diagnosis, using the WHO ICD-9-CM classification and coding the Medical PSN diagnosis. The next more complex step concentrates on establishing a relationship between the medical diagnosis and the PSN functional status, based on WHO ICF (ICIDH-2) classification. In this case it is absolutely necessary to define, as accurately as possible, the functional residual capabilities of the PSN, in order to know which problems in sustained executive functions, attention, etc. could be affected by the PSN disability.

Once the physical, cognitive or perceptual functions affected by the disability are defined, we have to take a look at how they influence the driving task, and to identify the concrete driving problems. These problems could be affecting the operational, tactical, strategic and/or motivational level of the driving task. At the next step, the different functional limitations will be matched to the driving aids and driving
licence codes, as specified within EU Directive 91/439 and 2000/56 and detailed by INCA (B3-B96-B2-7020-SIN-25 82) and QUAVADIS (B 2000, E3 2000-4S12.301737) projects.

The above correlation will not be linear and will leave ample space for taking into consideration the particular problems of the individual PSN. Still, it is expected to be a good guide for the homogenous classification of mobility disorders and a valuable consultant for the more complex cases.

The last step is to take a decision about the person’s fitness-to-drive, based on the gathered information. This final decision will give us the different possibilities:

- **fit to drive,**
- **fit to drive with vehicle adaptations,**
- **fit to drive with restrictions in time or space,**
- **fit to drive with conditions (e.g. glasses),**
- **and unfit to drive.**

The final decision will affect the driving school training, the necessary type of vehicle adaptations, the legal process for approving the adapted vehicle, the driving licence codes and limitations, and the driving licence periodic validity and reassessment.

According to the discussions during the CONSENSUS Thematic Network Members meeting held in Cordoba (Spain) 31st of March 2004, and taking into account the conclusions obtained during the 1st Workshop in Valencia (Spain), a new, simplified CONSENSUS codification scheme was presented. It was decided to simplify the medical problems codes presented in the ICF and ICD classifications to limit the relevant list based on the most frequent problems (around 40-50 codes should be enough, covering about 95 % of the cases). The classification of the PSN’s problem can be called a dual coding system, using two important parts. The first part contains the code for the functional problem (ICF based) with an additional code or extension, which can be used to specify furthermore the functional deficit. The second part contains the code for the medical problem (ICD based). If necessary, this code can be very detailed. By putting the codes next to each other, the classification is formed, using only 4 levels. In this way, the code will give the assessor a basic idea of the status of the PSN at the start of the assessment procedure. Due to this coding it will be easier to predefine a certain procedure to follow, so the complete evaluation can be standardised in a certain way. While using the 4 levels coding, the assessors make comparisons between several cases with the same outcome. Further improvements of the coding system were discussed during the 2nd workshop in Ljubljana June 2004. There was a proposal to go though more details concerning the medical classification. This work has been continued by CARA, VTI and one of the members in the Network (John Hunter from the Scottish Driving Assessment Centre).

**D2.2: Towards common PSN driving ability assessment**

**Abstract**
Deliverable D2.2 paves the way for the standardisation of assessment procedures at a European level by reviewing the current situation with regard to commonalities and differences in the assessment procedure, and by introducing structured lists including the functional measurements and assessment criteria for selected medical conditions. Hence, the main target group of this deliverable was the personnel responsible for the actual assessment procedure: medical doctors, general practitioners, occupational therapists, specialised physicians, etc. Four use cases are explained in detail as a concrete illustration of the recommended assessment procedure.

Executive Summary/ Results

Within the context of CONSENSUS project, assessment criteria are operationally defined as those functional measurements and the corresponding normative values that are applied when assessing fitness-to-drive of a person who wants to drive a private car.

Currently there is no consensus regarding the assessment criteria that should be used when assessing fitness-to-drive of people with special needs. Several surveys carried out among assessment facilities across Europe show that there seems to be a complete lack of consistency with regard to the procedures and criteria applied by different actors. The European Directives specify only minimal standards for the assessment procedure, and the individual countries are allowed to apply more severe criteria. As a consequence, assessment of people with similar pathologies can vary considerably across Europe. There is thus a clear need for unifying the procedure in order to avoid problems in the actual application of the relevant European Directives.

The procedures and criteria are also not clearly specified at national level. Two surveys carried out for this deliverable have shown that official national regulations specify only the type of assessment when examining medical aspects of fitness-to-drive of people with special needs (medical, medical-psychological, orthopaedic, neurological, etc.). Even at the level of a specific assessment centre, the criteria are not defined. The assessment centres, where practical aspects of fitness to drive are examined, tend to follow a common procedure. However, the depth and style of assessment differ depending on the knowledge, experience, professional background and preference of the assessor carrying out the assessment. This inconsistent and largely subjective approach limits the validity of fitness-to-drive assessments. The lack of a clear evidence base for assessment criteria to be applied when determining fitness-to-drive post injury or illness is a central gap in current driver licensing status assessment procedures.

This gap has inhibited the development of a level playing field for people with special needs. To initiate a process of peer review, which could pave the way for the standardisation of assessment procedures for different medical conditions four case examples are described. Structured lists providing step by step the functional measurements and criteria to be applied during the assessment procedure were developed by a CONSENSUS II task force consisting of experienced fitness-to-drive assessment experts and traffic researchers. The lists will be distributed to assessment facilities across Europe. If they are accepted they will serve as fitness-to-drive assessment recommendations, guiding the procedure when assessing fitness-to-drive in clients with the medical conditions in question (amputation of the lower left leg, poliomyelitis, Duchenne muscular dystrophy, spinal cord lesion at L2 level).
The assessment criteria do not yet specify clear thresholds to distinguish between sufficient and poor performance in a functional measurement. This would require empirical research, which is both beyond the scope of CONSENSUS in general, and this deliverable in particular. It is suggested to concentrate future research on the definition of such thresholds in order to further objectify the assessment process. Once objective thresholds are established, IST tools could be implemented into the assessment procedure, for example for remote assessment of people with disabilities living in rural regions far away from the next available assessment centre.

WP3: Towards a common PSN driving ability assessment methodologies and tools

Deliverables

**D3.1: Towards a common set of assessment tools and a common PSN driving assessment**

**Abstract**

This deliverable provides a general overview of the integrated fitness to drive assessment procedure, from its initial starting point to the final end up, which goes further than the conclusion in terms of holding a driving licence or not. Specifications of driver-related conditions, driving licence use restrictions and technical car adaptations are taken into consideration in the whole assessment process. In the envisioned procedure, the assessed person is considered as a client, so that his/her needs, intentions, attitudes, decisions, and actions etc. are central in the outcome of the fitness to drive assessment. This overview applies to both deliverables 2.2 and 3.1.

**Executive Summary/ Results**

Assessment of fitness to drive is a multidisciplinary task that requires both medical/paramedical as well as technical and traffic safety expertise. The aim of this deliverable is to provide an integrated view of the whole assessment methodology and of the assessment tools that can help assessors all along the process. As for CONSENSUS D.2.1 and D.2.2, four use cases are explained in detail as a concrete illustration of the recommended assessment procedure. The following figure outlines the fitness to drive assessment process within CONSENSUS project starting with the medical assessment and ending with the final adaptation evaluation.
In the first part of this deliverable, the fitness to drive assessment process is defined and outlined. Both the medical and functional aspects have to be taken into consideration. The aim of the whole procedure is to determine if the medical preconditions are fulfilled according to e.g. annex III in the driving licence directive (EC, 2000/56; EEC, 91/439). The process starts with the medical assessment and ends with the evaluation of the proposed car adaptation.

In addition, it is stressed that conclusions go beyond decisions in terms of holding or not a driving licence. Indeed, specifications of driver-related conditions, driving licence use restrictions and technical car adaptations are parts of the whole assessment process. The preliminary prescriptions should be used to initiate vehicle adaptation, education and training activities. Finally, the adaptation will have to be evaluated, to see to what extent it compensates for the driver’s impairments and whether it meets the driver’s real needs.

In the envisioned procedure, the assessed person is considered as a client, so that his/her needs, intentions, attitudes, decisions, and actions are central in the outcome of the fitness to drive assessment.
Both mobility and safety objectives should be considered during the assessment process, mobility being the primary objective while keeping sufficient safety.

Finally, to be effective, the process should be both sensitive and specific in order to discriminate between those persons with a potential to become licensed drivers and those persons that have not this potential. It is thus highly recommended to validate the assessment methods and tools used, by means of the best criterion depending on the assessment purpose.

In the overall procedure, the diagnosis will help to classify observed problems, determine appropriate treatment, and prognosticate the future for the client. The diagnosis also allows determining what kind of basic functional disabilities can be expected such as motor, perceptual and cognitive disorders. In some cases, the diagnosis will be crucial for discriminating who is capable to drive from a more legal point of view i.e. regulations and directives. Finally, the medical assessment can serve as medical referral.

Although the medical diagnosis is important in the fitness to drive assessment process, it is not sufficient to determine adaptation and training requirements for a potential driver since an equal medical diagnosis can lead to different functional disabilities. Functional abilities can be understood as combinations of fundamental abilities that are more task-oriented but still generic e.g. reaction time, coordination. The problems can be grouped in to five categories: motor, sensory, cognitive, intrapersonal, and interpersonal abilities.

There is a real need for a detailed assessment, for example, to help in prescribing car adaptations. Among the tests recommended is the in car assessment, which is a test of functional abilities in context, assessing the probability that the disabilities can be compensated for by vehicle adaptation(s) and/or training.

Evaluating the adaptation with respect to the driver’s needs is very important in the process to ensure that there is optimal use of the available resources and that the adaptation sufficiently compensates for the driver’s disability. The driver’s opinion together with objective tests like brake and steering performance should also be considered. Finally, subjective aspects like experienced functionality, comfort, and the driver’s trust in the adaptation, as well as workload aspects should be taken into consideration.

Also, this deliverable gives an overview of different driving ability assessment methods used in various European countries. A summary of the CONSENSUS feasibility study results is provided. The way the assessment process is invoked and performed (steps, methods and tools) as a function of the different legal frameworks in the sampled European Countries is presented. This allows us to emphasize the real need for standardization in the field of driving ability/fitness to drive assessment amongst European countries. Differences between European countries are related to the background of professional assessors involved in the assessment process (trained professionals with or without medical background), to the legally regulated assessment requirements (lifelong driving licences vs. limited validity), to the domains assessed (medical, physical, perceptual and/or cognitive), and to the tools used.

Furthermore, the four selected cases of physical impairments are presented, namely Traumatic Spinal Cord Injury, Post-polioymelitis, Duchene Muscular dystrophy, and Amputation. The extent, to which these impairments affect the motor, sensory, and cognitive aspects, is explained.
The general rationale behind the fitness to drive assessment is also provided. Minimal knowledge of medical conditions, of the driving task, and of the vehicle components is needed for any assessor involved in the fitness to drive assessment process. It is emphasised that a technical adaptation of the car should compensate for the drivers’ disability and that it does not make the driving task more complicated. The application of the Reduce, Reinforce, and Replace (RRR) principle is given. Specific rationale behind the four selected diagnoses is then underlined.

Selecting the appropriate tools is a very important step in the assessment process and demand that the assessor has sufficient and specific knowledge with regard to the tool availability, the usability of the tool, and the interpretation of the scores given. The kind of tools that can be used in an assessment process are briefly described before giving concrete examples of how to use them in the framework of the evaluation of ability to drive of the four selected diagnoses. Finally, the two CONSENSUS tools specifically developed in the framework of CONSENSUS, namely, the CONSENSUS database and expert tool, are briefly described. These tools are under development and could in the future, be used by assessors to assist along the fitness to drive assessment process.

In conclusion, the fitness to drive assessment practices varies greatly within Europe, regarding the legal aspects, assessment procedures and tools, or background level of assessors. In order to improve the quality of the assessment, in terms of its validity and reliability, a systematic procedure has to be defined, which is the main goal of CONSENSUS. In this way, the assessment should be experienced as fair from the client’s perspective, whose right for mobility and independence has to be fully considered. The fitness to drive assessment is an integrative and comprehensive process, which aims at determining if a person with impairments will be able to drive a car, and where limitations are detected, determines how these can be compensated.

This deliverable gives detailed recommendation on how fitness to drive assessment of drivers with one of the four selected impairments can be performed in a systematic and proper way. A large part of the population being assessed in specialist assessment centres involves mixed cases, including cases showing cognitive deficits, or torment from degenerative diseases requiring regular re-assessments. These cases are very important in light of fitness to drive and should therefore be considered in the future work.

WP4: Development of IT tools for assessment quality enhancement

Deliverables

D4.1: Assessment database

Abstract

The deliverable D4.1 describes the CONSENSUS database which was developed in order to support the assessors in correlating the specific characteristics of the driver with special needs and the appropriate assessment criteria, literature, methodologies and tools to be used for the assessment. In the first part of the deliverable, both the hardware and software configurations of the CONSENSUS-database are presented. The structure of the content and its implementation in a MySQL-type database are discussed.
Special attention is paid to the specific user interfaces of the database. Namely, these are one interface for the input of data and a second one for the search and output of data, of which the latter one is public and accessible through the CONSENSUS-web page. The layout of these two interfaces as well as their functionality are explained in detail. The second part discusses the feedback gained from a short usability study of the database and identifies further actions that are to be taken.

**Executive Summary/ Results**

The aim of the CONSENSUS-database was to support the assessors in correlating the specific characteristics of the driver with special needs and the appropriate assessment criteria, literature, methodologies and tools to be used for the assessment. All main parameters that have been recognized affecting the driving ability of the PSN are included in this database, together with the relevant criteria and indicative figures. In addition, specific examples, namely ‘Use cases’ are provided to assist them on the way to proceed to the assessment of a candidate, by means of already performed assessments from different EU countries (i.e. application examples), providing them with data on the parameters measured and their final result.

Data was added and edited through the World Wide Web using an easy to use interface. The data stored in the database can be retrieved world wide through the web as well. In this way, the database is easily accessible and does not require installing specific software on the computer of the user, which increases both the accessibility and the usability significantly. Moreover, the database was included in the structure of the CONSENSUS web page and, thus stayed in the common use context which also enhances the usability of the database.

Detailed description of the database, its functionalities and its evaluation can be found in section 4 of this document, where the technological results of the project are reported.

**D4.2: Expert knowledge tool**

**Abstract**

The deliverable D4.2 describes the CONSENSUS Expert Knowledge Tool which was developed in order to provide guidance/assistance to the inexperienced assessment personnel for the appropriate evaluation procedure to be followed, giving instructions/ suggestions on the assessment steps, assessment tools, sequence to be followed and driving support mechanisms for the client to be assessed.

This deliverable presents the technical framework and the main functionalities of the software program by means of which the tool was developed. The tool structure by means of explanatory figures and screenshots are outlined. In addition, the content of the tool determined, the User Interfaces main functionalities are discussed. Finally, the results of the Usability tests and optimisation of the tool are described.

**Executive Summary/ Results**
The Expert Knowledge Tool was developed in order to provide guidance/assistance to the inexperienced assessment personnel for the appropriate evaluation procedure to be followed, giving instructions/suggestions on the assessment steps, assessment tools, sequence to be followed and driving support mechanisms for the client.

The reason for the use of an expert tool, especially in the area of driving assessment, is that it can help assessors and can compose the knowledge and experience of more than one expert, thus offering better assessment objectivity. Furthermore, such a system can provide an explanation for its decision, hence offering to the user insight in the decision process and may resolve possible misunderstandings in this way.

The content of the Tool is a result of the common assessment methodology proposed in A3.2: “Towards a common PSN driving ability assessment methodology”, following the classification scheme in A2.1: “Establishment of a common PSN driving ability classification scheme”.

The Expert Knowledge Tool follows an open architecture, so as to be able to be constantly extended and the user to be consulted on-line, from the Networks www, characterised by a simple and modular user interface, adequate for non-expert PC users.

Detailed description of the expert knowledge tool, its functionalities and the results of the Usability tests can be found in section 4 of this document, where the technological results of the project are reported.

WP5: Dissemination, Creation of public awareness user acceptance enhancement and Network viability schemes

Deliverables

D5.1: Dissemination and use plan

Abstract

This deliverable sets up a concise and clear plan, on how to achieve the objectives of this workpackage, which are:

- To develop a concise information dissemination and awareness creation strategy for the pan-European diffusion and adoption of CONSENSUS results.
- To promote and secure the users’ (PSN) acceptance of the project results.
- To propose strategies to guarantee the Networks viability.
- To derive to guidelines and recommendations for the authorities and the industry.

CONSENSUS is a thematic network, namely it does not develop products for direct marketing, but aims in creating a network for knowledge transfer and consultation in the area of assessing driving ability of people with disabilities. Therefore the use cases presented in this deliverable are concentrated on how to achieve the network full operation, after the project funding ends.

Executive Summary/ Results
The Dissemination and Use Plan deliverable aimed to provide a sound and effective dissemination plan of the CONSENSUS project, following the path towards the accomplishment of the WP5 objectives described in its ‘Description of Work’ document. The objectives of the relevant WP5 tasks were the development of an effective dissemination (with project logo, leaflet, poster, publications, interactive WWW site, two project workshops, six-monthly electronic newsletters) and exploitation scheme, namely how to achieve network viability after the project end.

Initially, the current structure of the Thematic Network was presented, as it developed during the project life. The Thematic Network currently consists of 16 Members that cover 14 countries. The network scope during the project is mainly to achieve a harmonised methodology for assessing driving ability of people with disabilities at a European level. After the project end, the Thematic Network aims to continue the transfer of knowledge on this issue and to widely disseminate relevant knowledge. These objectives are presented in detail together with the expected structure of the network after the project end.

Next the dissemination actions planned by the Consortium, so as to achieve maximum information diffusion and to attract new members to join the network are presented. These start from the design of a project logo and the production of project leaflets and posters, the presentation of work in relevant conferences and journals. An electronic newsletter was also circulated to user forum members every six months. An interactive web site has been also developed, including a public web site server, a private server, which was accessible by the members of the User forum, as well as a private ftp server, accessible only to the member of the Thematic Network and which includes material for access only by the project partners. The project organised two workshops. The first one took place in Valencia, Spain in Month 13 of the project, on September 2003, to review project results and diffuse CONSENSUS concept. The second one took place in Ljubljana, in Month 22 of the project on June 2004, in order to present the final project results. All consortium partners were contacting new organisations, so as to attract them in the network. Specific criteria have been defined, which must be fulfilled by an organisation in order to join the Thematic Network.

In parallel to these, a questionnaire survey was conducted with the aim to identify negative stereotypes regarding drivers with disabilities and to collect best practice examples of assessment procedures. All these will were finally included in a code of good practice of fitness to drive assessment. The Consortium had also undertaken activities, so as to enhance user acceptance of the expected products of the project. For this reason, the project concept was presented through a videoconference with users from various European countries during the Annual meeting of DDA in April 2003.

Finally, the Consortium collected state of the art data on physical and cognitive ergonomics of drivers with disabilities and driving ability criteria, for the development of guidelines and recommendations to authorities and car manufacturers. The collected data, the relevant guidelines and recommendations encompassed in the Deliverable D5.4.
As a conclusion, the project followed a dissemination strategy that can be described as successful, since it has more than doubled the number of members of the Thematic Network while it had created a User Forum with an equal number of organisations.

**D5.2: Project Leaflets and Posters. First project web site**

Abstract

8,000 Leaflets and 600 Posters were printed. The first project web site was established (http://www.consensus-eu.org) in Month 7.

**D5.3: Project interactive multimedia www site**

Abstract

The CONSENSUS WWW (http://www.consensus-eu.org/) site was developed at the seventh month of the project. The main objective of the site was to present and promote project results. It is a living place where the project achievements and outcomes became known and available to a broader audience all around the world. Statistical analysis of site visits shows that numerous users from all around the world have visited the electronic place of CONSENSUS in order to be informed about the latest progress of the project.

In addition to all above, the project site serves as an internal reference place where partners can share their work among them. Through an internal ftp site, which is accessible from the www site, partners could download and review the latest internal documents as well as progress reports.

This deliverable is an annex to the fully operative www site. This site is a very helpful Information Tool for the Thematic Network. It constructs and brings near the net of knowledge and assessment, allowing the CONSENSUS network to reach a pan-European level.

**D5.4: Code of Good Practice on PSN driving ability assessment, relevant guidelines and specification of assessment tools and adaptations needed**

Abstract

The main objective of this deliverable is the development of a Code of Good Practice for the assessment of the driving ability of people with special needs. For this purpose two questionnaire surveys were carried out. The first surveyed professional experts and the second surveyed drivers who use car adaptations to successfully compensate for existing disabilities. The different questionnaire modules included items asking if the respondents agree to certain statements corresponding to stereotypes about drivers with disabilities as well as questions about practices with regard to the technical inspection of adapted vehicles, questions about instruments and tools used during the assessment process and questions about car adaptations that are not yet available on the market. The respondents were furthermore asked for suggestions to improve the co-operation between the driving assessors and their clients with disabilities. The information collected with the survey is analysed and discussed. The conclusions of the
survey are the basis for recommendations for the improvement of the assessment process. These recommendations are presented at the end of this deliverable as a Code of Good Practice.

The Code of Good Practice adopts a key principle of the European Driving Licence Directive: "The goal of every fitness-to-drive assessment should be to make it easier for people with disabilities to drive vehicles, while considering the necessary conditions for safe driving at all times during the assessment process". Hence, the recommendations for best practice include mainly guidelines for the enhancement of the assessment process itself, the way to treat the client during the assessment process and the way to convey the assessment result.

**Executive Summary/ Results**

Assessing people with special needs (PSN) is indeed a sensitive process. The assessors have to balance general road safety requirements and the mobility requirements of their clients. The clients themselves have the right to an objective assessment including optimal support during all stages. The assessment should be carried out in collaboration between the client and the assessor. Differences between both groups participating in the process, i.e. the client and the assessors, with regard to opinions, ideas and expectations about the procedure may cause discrepancies impairing their mutual co-operation during the process.

The goal of this deliverable was to identify commonalities and differences between both groups in order to formulate suggestions and recommendations for an optimal framework for the assessment procedure. For this purpose two questionnaire surveys were carried out. The first questionnaire surveyed professional experts and the second surveyed drivers who use car adaptations to successfully compensate for existing disabilities. The aim was to contribute to a harmonisation of the assessment procedure at two levels: On the one hand, the recommendations shall pave the way towards a level playing field for people with disabilities by improving the objectivity of the assessment procedure. On the other hand, they shall contribute to a harmonisation of the assessment procedures between the member states of the European Union by providing best practice recommendations for important aspects of the assessment process, e.g. the treatment of the clients during the procedure and related topics.

The building block of this task was therefore the collection of information for a so-called Code of Good Practice on PSN assessment of fitness to drive. The aim of this survey was less to produce a large-scale survey with a big group of subjects, but instead to learn more about the opinions of the two main actor groups involved in the assessment process. Hence, an international group of professional fitness-to-drive assessors - i.e. people working as practitioners in this context - and drivers with disabilities were contacted by the partners in the CONSENSUS consortium.

The framework specified in the European Directive (91/439/EEC) defines only minimal standards for the fitness to drive assessment for drivers with disabilities. These standards determine “what” has to be measured. The question how to measure and what criteria should be applied is not fully answered by the directive. However, the directives state explicitly that a person with a disability should be supported as much as possible to improve independent mobility.
The goal to support people with disabilities shows up also in further details of the directive. Special standards can be applied, for example, for adapted cars (91/439/EEC; Art. 3, 6) or in case of medical or technological progress relevant for a particular disability (listed in annex III of the Directive).

Hence, the guiding principle of the directive with regard to drivers with disabilities is to support their personal (auto-)mobility. This deliverable adopts the principle of the directive. Any fitness-to-drive assessment of a person with special needs should have the guiding principle to help the person by finding optimal solutions.

The survey aimed to identify opportunities to improve the assessment process. 27 professionals and 35 drivers with disabilities participated in the survey. The major difference between the two subject groups was a certain bias in the group of people with disabilities: As all subjects in this group successfully gained a driving licence there was positive selection bias in this group. Hence, the drivers with disabilities all had positive experiences with the assessment. The assessors have, on the contrary, experienced assessments where the applicant was evaluated as unfit to drive, because the disability could not be sufficiently compensated for by car adaptations. When interpreting the results of the survey, this difference should be taken into account. As a consequence of the different experience horizons of the two groups - and due to the professional expertise of the assessors -, the experts have probably a stronger focus on road safety, while the drivers with disabilities put more emphasis on the individual mobility of people with disabilities.

The first section of the questionnaire was dedicated to stereotypical statements about drivers with disabilities in order to identify differences between the professional experts and their clients. About a third in both groups agreed with the statement that an objective assessment is sometimes not necessary, although the relevant EU directive prescribes at least a medical assessment. Thus, clients not fulfilling the requirements for license acquisition should be objectively assessed so the rationale behind any result or decision can be clearly explained to the client.

Many drivers with disabilities expressed strong expectations with regard to the opportunities to compensate disabilities with car adaptations. 75% of the drivers with disabilities thought that it is possible to compensate motor disabilities completely with appropriate adaptations while only 34% thought that car adaptations can completely compensate cognitive disabilities and. Professional experts should consider these strong expectations during the assessment process and explain both the compensatory potential of a car adaptation and the limits to compensate disabilities with available technical solutions.

Most respondents thought that the driver/owner of a car should be present during the technical inspection of the car. A formal process for the technical inspection of vehicle adaptations could be imagined as follows:

The adaptation company documents all the adaptations in the car on a standardised form called a "technical data sheet". The driver with disabilities himself/herself presents the car for technical inspection. The technical datasheet is provided to the person responsible for the inspection. In this way personal communication between the person responsible for the inspection and the driver with disability is established along with an indirect communication between the adaptation manufacturer and the inspector, mediated by the technical datasheet. This process would take into account about 2/3 of the
combined responses to the question who should be responsible for the presentation of the vehicle. The interval for the regular re-inspection proposed by most subjects is 2-3 years. If an adapted car is approved, majorities in both responding groups suggested that an official certificate should be issued. If necessary, the driver should also receive a special training to familiarise him/herself with the adaptations. Again, most subjects in both groups agreed to such a familiarisation training. According to the assessors, a major research and development is needed with regard to voice-controlled systems and systems assisting the driver during ingress to the car.

Hence, according to the opinion of most assessors, future research and development is particularly needed for the field of car adaptations compensating cognitive skills. The most important section of EU-Directive 91/439/EEC with regard to the actual assessment practice is article 8.1:

“Driving licenses subject to certain restrictions, if necessary, may be issued to physically handicapped applicants or drivers following the issuing of an opinion by a competent medical authority. This opinion must be based on a medical assessment of the complaint or abnormality in question and, where necessary, on a practical test.”

The Directive puts emphasis on three dimensions: Firstly, the diagnosis (1) should be produced by a “competent medical authority”. The assessment itself must be based on a (2) medical assessment of the complaint or abnormality in question and (3) when necessary include a practical test.

The majority of professional experts thought a “specialist physician” should be responsible for establishing the applicant’s medical diagnosis, whereas 46% PSN preferred a “rehabilitation expert”. These answers reflected the different approach of the two groups to the assessment process. A specialised physician might speak a typical expert language, while the rehabilitation expert takes also the more personal and social consequences of a disability into account. Hence, during the procedure the clients should be informed in a comprehensible language avoiding medical jargon.

A key result of the survey was that the experts were throughout more positive towards the assessment of individual functional driving skills. A significant share in both groups prefers an assessment directly tailored to the client’s disabilities. Therefore, it is suggested to adapt - whenever possible - the assessment procedure to the disability of each individual client.

The skills suggested by most subjects in both groups for the assessment of locomotor skills are muscle strength, mobility / flexibility and movement coordination / movement control. If any other skills are assessed during the assessment of motor skills, the reason for the specific functional measurement should be explained to the clients, because they might not understand why that particular skill is relevant for driving.

With regard to perceptual skills about 50% in both groups indicated that “hearing” should be assessed. However, actually this ability is, according to the relevant EU Directive, the only ability that is not required for a driving license, except for applicants of a “group 2” license. As there are big differences between the results of both groups it is once again suggested to focus on those skills associated with the client’s disability, because many clients would not easily accept any other measurement.
The same assessment strategy should be applied when considering the assessment of cognitive skills. While cognitive skills were considered very important among the assessors, fewer respondents in the group of drivers with disabilities indicated that cognitive skills should be assessed during each assessment. A major share of the drivers with disabilities prefers, once again, an assessment that is tailored to the disability of a client.

People with cognitive problems are mostly assessed with practical driving tests. Tests measuring reaction time, field of view, intelligence etc. are also frequently used. The variability in the responses of the assessors showed the great heterogeneity of the procedures that are applied when assessing people with cognitive disabilities. The professionals saw in particular a need for driving simulator-based and computer-based tests for the assessment of cognitive skills. The responses of both groups showed that the best way to assess practical driving skills is to start the practical assessment with a basic driving skills test to evaluate the most important skills. The second phase of the assessment should focus on practical driving skills related to the driving tasks affected by the client's disability.

The key result of the questionnaire sections about the assessment of the different skill dimensions was that more professional experts than drivers with disabilities suggest assessment of the different functional skills i.e., the professionals indicate generally more often that a particular skill should be assessed. Hence, the professional experts prefer a more general and broad assessment approach, while the drivers with disabilities have a stronger tendency towards a limited approach where only those functional skills are assessed that are associated with the disability of the client. The following hypothetical explanations and a preliminary conclusion could be drawn.

**Different experiences due to the characteristics of the survey sample**: The group of drivers with disabilities consisted exclusively of people with special needs whose assessment procedure was successful. The professional experts, on the contrary, also have experience with assessment procedures where the result was negative. The different experiences may make the professional experts more cautious than the drivers with disabilities.

**Different perspectives of the two subject groups**: The drivers with disabilities may have answered the questionnaire from their own personal subjective perspective, while the experts probably answered the questions from a professional perspective.

**Shortening of the procedure**: The people with special needs probably prefer a short procedure without too many tests. The less exhaustive and focused the procedure, the better for the clients.

**Bias due to terminology in questionnaire**: Some terms used in the questionnaire were quite scientific (e.g. proprioceptive) and may have been completely understood only by the professional experts. Drivers with disabilities may have answered questions based on a different interpretation of the terms.

The difference between the results of the professional experts and the drivers with disabilities was probably a consequence of a complex interaction of the four factors. However, when aiming at a client-centred approach for fitness-to-drive assessment for people with special needs the opinions and wishes of the target group have to be taken into account carefully. Hence, any assessment procedure should be limited to only those functional measurements that are absolutely necessary for the specification of the
client’s functional status. Therefore it may be that consideration should be given to the idea of dividing
the fitness-to-drive assessment of people with special needs into two parts: A first general part assessing
the most relevant functional skills independently from the client’s functional status, and second part
tailored specifically to the client’s disability. In short, an assessment should be as exhaustive as
necessary, but as short as possible.

The final section of the questionnaire presented several open questions with the aim to collect ideas and
suggestions about possible ways to improve the co-operation between the client and assessors during the
assessment procedure. Both drivers with disabilities and the assessors stressed the need for a friendly and
open treatment of the clients in a positive and warm atmosphere. The assessment procedure and the
individual steps should be explained in detail to the client. A main concern within both groups was the
demand for true committeemen from the client when asked for. Drivers with disabilities emphasised in
addition that they want to be autonomous during the assessment, i.e. treated like any other person without
a disability. Help should be provided only if the client asks for assistance.

Both respondent groups preferred personal interviews in which the final assessment decision is explained
in detail. The presence of family members during this interview seems to be important for the assessors,
but less important for the drivers with disabilities. This result was probably a consequence of the selection
bias in the group of drivers with disabilities. They all passed the assessment successfully and, hence, did
not require alternative mobility support. Therefore the clients should nevertheless consider the
participation of relatives in the personal interview, relatives and/or friends become very important in case
of a negative decision.

Not all assessment centres operate under the same conditions of conduct or with the same ethos. The
relationship between the assessment centre and the licensing authority determines the responsibility of
status decision. Usually licensing authorities determine the status of clients. In order to carry out this duty
licensing authorities need information and this comes from assessment centres. This relationship is likely
to be varied across Europe.

If the assessment centre is in practice responsible for the status there is a greater need for equal
partnership between the client and the assessor. In the dynamics of this relationship there will be
predispositions, and it is the case that many people with special needs presenting for assessment feel that
they are in an unequal relationship and are waiting for direction. The assessors should use their expertise
to try to adjust this professional relationship inequity in order to empower the client. Expert knowledge
should be used to liberate, not dominate and direct. A truly “client-centred” process must aspire to
working in equal partnership.

D5.5: Network viability schemes

Abstract

A study was performed within this deliverable, in order to propose strategies and solutions, so that this
Thematic Network will remain alive after the project end. The objective of this Thematic Network will be
to promote the mobility of PSN by exchanging information, offering services and tools to enhance the
quality of assessment (having as a starting point the database and expert tool developed within the

November 2004
CONSENSUS project), organising relevant training courses, promoting the accreditation of methods and tools used for assessment.

Executive Summary/ Results

CONSENSUS project has indeed developed a pan-European Network, so as to systematically exchange information on driving ability assessment of people with disabilities, promote relevant technology transfer within EU and access to expertise and resources of highly specialised Centres to other less specialised country authorities, using state of the art Telematics tools and procedures and experimenting new IT support tools (database and expert knowledge tool).

During the project execution, a Thematic Network has already been established including:

- 16 consortium partners.
- 17 funded members.
- 17 non-funded members.

Special agreements have been signed between the CONSENSUS project coordinator and the members of the Thematic Network.

The purpose of this membership agreement was to enable members to contribute to the implementation of the provisions of the CONSENSUS project contract. The scope of the agreement is presented below:

1. The Network Members become part of the CONSENSUS (IST-2001-37092) Consortium and Network and hold full access rights to its results.

2. The members perform their share of the work pursuant to the membership agreement in compliance with the requirements of CONSENSUS contract. The members cooperate with the coordinator in order to ensure the efficient management of the project. They, in particular, provide the coordinator with the information that the project manager requires in order to carry out his duties.

A questionnaire survey was performed among network members, so as to collect their opinion on network organisation and expected income, which showed among others that the majority of respondents would prefer a charging per request only for non-members, and for members, they would accept an annual subscription fee of 2000-3000 €.

A strategy has been devised regarding the establishment of this Network, in the legal form of a non-profit NGO, established in an EU country of one of the founding members, most probably Greece. This will be governed by a Supervisory Board of 5 members, chaired by a Chairman, a General Secretary and an Assembly of Members. Rules have been defined for decision taking and acceptance of new members. A first estimation of annual income and expenses has been devised, based on the questionnaire survey results and on partners and members interest to join this network. The network income is expected from
the annual subscription fees of members, the use of the developed within CONSENSUS project database and expert tool, the organisation of 4 training courses per year and the homologation of tools and methods for assessing driving ability. Comparing income with expenses, one can conclude that the Network will be economically viable.

Finally, a proposal is made regarding the cooperation of the Thematic Network with other running research projects, namely AGILE and IDEA projects, so as to strengthen the Networks expertise towards also the driving assessment of elderly people and the vocational training of the PSN driving assessors.

5.2 Other output

Apart from the 15 deliverables published and possible to download from the consensus web site, CONSENSUS resulted in:

Web site
A WWW site was established in month 8 (April 2003) at http://www.consensus-eu.org/.

CONSENSUS Leaflet and Poster
8.000 A4 leaflets and 600 A3 posters were produced for dissemination purposes.

Workshop
Two Project Workshops were organised within CONSENSUS project:

- The first one took place in Valencia, Spain in Month 13 of the project, on September 2003, to review project results and diffuse CONSENSUS concept.

- The second one took place in Ljubljana, in Month 22 of the project on June 2004, in order to present the final project results.

Detailed report of both workshops and their results are included in the section 3, where the Activity A5.1 is described.

CONSENSUS IT tools for the enhancement of assessment quality

- Development of the CONSENSUS Database

- Development of the CONSENSUS Expert Knowledge Tool

More information about these IT tools can be found in section 4 of this document, where the technological results of the project are reported.
6 Project management and co-ordination aspects

The project management is based on a quality assurance strategy, described in the Deliverable D1.2: “Project Management and Quality Plan”. In this deliverable a quality system was described which is briefly documented within these lines. The Consortium took as basis the relevant evaluation criteria, weighting factors and thresholds used by the 5th FW programme of EU to evaluate the R&D project proposals; with which also CONSENSUS had been evaluated. These parameters were critically reviewed and adapted to the particular CONSENSUS issues, following a number of principles (principle of correlation, clarity, relevance, interoperability and flexibility). Thus, a multicriteria approach for assessing CONSENSUS project progress was defining and analysing 5 main criteria: TQC (Technical Quality Criterion), CAV (Community Added Value criterion), EDC (Economic Development Criterion) and RPM (Resources, Partnership and Management criterion). Each of them is composed of a wide variety of single factors, associated with the quality of each project deliverable, the delay in workpackages execution and/or Deliverables submission, the relevant prospects of its outcomes in the Market, the project participants level of contributions, etc. All these factors are quantified within a 0-5 scale, using both objective and subjective measurements. Then, a set of weighting factors and thresholds were calculated for each of the above five criteria and an overall evaluation function for CONSENSUS is defined. Based on the above, an evaluation framework is proposed for CONSENSUS, based upon a six-month period estimation of all the above mentioned factors and criteria and applied through a Project Evaluation Diagram. The results of this 6-month internal assessment will be used by the Project Coordinator and the Quality Assurance Manager to initiate internal and external audits and propose risk mitigation strategies whenever necessary.

This quality system of the project was in accordance to the ISO – 9001 standard and for that reason it consist of the following chapters:

- Requirements of the project.
- Organisational structure of the project.
- Co-ordination in between the partners.
- General measures and actions taken.
- Planning and control.
- Control of the documentation.
- Quality control of the project.
- Files and archives.
- List of quality forms to be used.

The Quality Plan (QP) was applicable to all the project’s activities, and strict compliance with it is mandatory for all involved. The QP was documented and authorised by the Quality Board, which after its authorisation was submitted it to the Consortium (PSC Board) for approval. All subsequent changes were approved by the Quality Board and submitted to the PSC Board for approval.

The Quality Board (QB), chaired by HIT, was responsible for the co-ordination and supervision, regarding the implementation of the measures for the quality assurance. Also, it was responsible for the
project’s quality assurance matters. This board consist of three types of members, the project coordinator, the workpackage leaders and the external expert Dr A. Amditis from ICCS, appointed by HIT.

The main Tasks of this board were:
- Overview of the technical reports produced.
- Quality control of all deliverables submitted.
- Guidance (upon request) to the WP Leaders on the expected characteristics and contents of the relevant deliverables.

A standard project document coding system was indicated. The Internal Reports Template for the internal communication between Partners is presented in the Deliverable D1.2. A full list of reviewers of the deliverables and other documents produced within the project is included in this deliverable.

**Review procedure**
Each deliverable was reviewed by the two appointed internal members of the QB, each of them not working in the institutes of the partners involved in preparing the deliverable. In isolated cases, if all main partners were involved in the preparation, a choice was made among members of the QB, as well as the external member of QB. Each of reviewers had to complete a 3-pages form within 2 weeks from the date of the Deliverable submission. The form’s scope is to rate the Deliverable in terms of content, layout, contribution to state of the art and other issues, and include text remarks. These reports were consolidated by the Project Quality Manager and accompanied by the relevant Deliverable. The final version of the 15 Deliverables, the 15 peer review reports and the answers / actions of the responsible partners for the deliverable publication, were submitted to the Commission.

**Problems encountered**
A crucial voting took place in a Steering Committee meeting (in Dublin, June 2003, Month 10), where lead to the decision of the tranfer of the project coordination from BIVV/CARA to VTI, due to BIVV/CARA’s internal reorganisation.

**Overview of total effort spent during the project**
Below are given graphically the total number of person hours spent per Partner and per Work Package respectively, during the whole project duration.
Figure 25: Total person hours per Work Package during CONSENSUS duration.

Figure 26: Total person hours per Partner for all Work Packages during CONSENSUS duration.

**Project Assessment Scheme Evaluation**

This methodology was useful for the progress assessment of the project work and the level of its associated achievements, since it was covering criteria regarding the scientific/technological quality and innovation developed, the community added value and contribution to EU policies and to community social objectives, the economic development prospects, the resources, partnership and management for the whole duration of the project.
The Technical Quality Criterion (TQC) for each Deliverable encompasses the following issues:

- response to user needs;
- clarity of presentation of achievements;
- depth and extent of coverage;
- relevance;
- target status satisfied or not;
- delay of the submission;
- deliverable layout;
- content precision and cohesion;
- correspondence to project, sector and program objectives;
- contribution to state of the art.

Therefore, the calculation and the continued attendance of this criterion were crucial for the progress of the project, providing a detailed view of the status of the deliverables. In that way, the Consortium warned and informed immediately, if there was any “error” or submission delay of each deliverable.

The Community Added Value (CAV) criterion encompasses whether the needs of the majority of PSN, driving assessors and the industry were accomplished, and the project results could be applied to European countries.

The Community Social Objectives criterion comprises the assessment of the enhancement of the number of DSN, their satisfaction/comfort rate, as well as opinion about the driving assessment procedure and the road safety impacts of the project assessment methodology application.

The Economic Development criterion (EDC) includes the issue of the viability of the Network, the calculation of the Membership rate of the Network and the impacts of dissemination, examining the popularity of the project website and the attendance of the experts in both workshops.

The Resources, partnership and management criterion (RPM) concerns with the resources level factor of each participant, resulting from the deviation of the participants actual versus planned resources. In addition, the overall project progress and especially activities which are in its critical path or Deliverables that are preconditions to other project activities, were underlined. Finally, the number of Consortium meetings performed, including Technical workshops with attendance of more than 4 Participants, was consulted within this criterion.

All assessment criteria, described above, result to the creation of a useful diagram, namely the Project’s Evaluation Diagram which is presented below. All criteria are higher than the respective thresholds.

The Overall Evaluation Function which is based upon the assessment criteria and the defined weighting factors, increases during the whole project duration. Since month 20 its value is higher than the initial evaluation rating of the CONSENSUS proposal, thus it is considered to have reached and even surpassed the initial project aim and goals.
The diagram reflects reliably the actual progress of the projects, since all assessment criteria mark a decreasing or constant route until month 6 - 12. This behavior presents the problem encountered in this period, i.e. delays in submission of deliverables (Small delay in the submission of D1.3: “Assessment Procedures”, small delay in the submission of D5.1: “Dissemination and Use Plan”, small delay in the submission of the 2nd QMR,D2.1: “PSN driving ability classification and codification scheme”, small delay in the submission of D2.2: “Towards common PSN driving ability assessment criteria”, small delay in D4.1: “Assessment database”), and the change of the project coordinator (2nd of June 2003). Thus, it can be concluded that this methodology was a useful tool for the Coordinator and the Consortium, underlying the actual progress of all deliverables and achievement during the project, identifying the gaps, the internal actions and the misleading of the project’ targets.
7 Partner Exploitation Plans

Assessment Centres:

All PSN Assessment Centres (BIVV/CARA, CBR, DFT/MAVIS, IRRS,) will gain twofold: by offering better services in less time they will enhance their productivity and reduce their service costs, while they will also gain knowledge and tools to provide relevant training services to third countries or other Centres within their own country. Particularly, DFT-MAVIS will try to implement and disseminate CONSENSUS tools and practices UK-wide, utilising the relevant organisation, of which it is an active member. BIVV-CARA, as a dominant Assessment Centre in Belgium and one of the pioneers that introduced the set of IT tools in the PSN driving ability assessment area, will be also one of the pioneers who will implement them in their everyday activities. In addition, BIVV-CARA, having gained a great experience from structuring the framework for the common PSN driving ability assessment, will proceed in diffusing this experience and knowledge to other national Assessment Centres or Centres in other countries, in the form of training services.

Industrial Research and Technological Organisations:

CRF being part of the Fiat group and the AUTONOMY program is a major actor to promote use of vehicles adapted to drivers with disabilities has acquired, thanks to CONSENSUS, a better understanding of the relevant needs and requirements of the Assessment Centres as well as of the PSN society which is their direct market. CRF intends to proceed in establishing collaboration agreements on available or new market products in a mid-term horizon. CRF will be able to mitigate the knowledge gained on PSN particular problems in relation to the driving task to its vehicle products; ultimately reflecting the gain back to the PSN community through improved products and services for DSN in the context of the relevant Fiat AUTONOMY program.

Research Centres/Institutes/Universities:

VTI, CERTH/HIT, UPV, TREDIT, INRETS, IFADO, CDV, and USTUTT/IAT will gain knowledge and the core tools to offer continuously updated information services on PSN assessment tools and practices in the form of a multimedia database, thus also contributing to the further dissemination of CONSENSUS scheme and tools to National and pan-European level.

Proposed recommendations have been submitted for uptake to DG TREN and several national authorities. Several of them answered positively, such as the UK Forum (UK Network of Assessment Centres), the Ministry of Transport of Greece (legal action is ready and awaits final signature by the General Secretary) and ASECEMP (Spanish Association of Drivers Mental-Psychological Assessment Centres).

VTI as the Coordinator of the project and member of the CONSENSUS Thematic Network will keep on expanding its collaborations through the Network.
CERTH/HIT being the expert knowledge tool’ provider will benefit from the enhanced know-how gained during the CONSENSUS project. CERTH/HIT intends to realise the specified tool and further exploit it in a mid-term horizon. In addition to this, CERTH/HIT having a better understanding of the relevant needs and requirements of the Assessment Centres, can go further with the update and improvement of the tool proposed or even the development of new tools.

USTUTT/IAT being the Internet database’ provider will benefit from the enhanced know-how gained during the CONSENSUS project. Furthermore, USTUTT/IAT having a better understanding of the relevant needs and requirements of the Assessment Centres, can go further with the update and improvement of the tool proposed or even the development of new tools.

UPV being the web site’ provider of the project will benefit from the enhanced know-how gained during the CONSENSUS project. Furthermore, UPV gained expertise knowledge on the PSN driving ability classification and codification scheme.

**Disabled Drivers Associations:**

DDA, as a Disabled Drivers Association, will gain a new service to offer to its Members and will enhance the quality of PSN driving assessment, to the benefit of its Members.

**Centres/Institutes of Technologies in Mental Health:**

COAT and IPR will acquire knowledge on medical criteria and tools for the driving ability assessment, which will be valuable for the rest of their research activities and clinical studies.
8 Conclusions

Reaching consensus means agreeing on a standardised minimum set of assessment tools and practices. PSN related projects have indeed proved fruitful, even after a significant period of time. A period of 9 years was required until the standardisation and coding of driving licence definitions was achieved (within TELAID and INCA projects). Today driving licence codes are applied in the form of EU directive (Directives CEC 91/439). The harmonised codes are applied in most EU member states today and the number is still increasing.

Reaching consensus in assessment practices and tools is obviously a big and ambitious step; which is translated into a lot of time and effort, estimated even to a period of 20 years, but it has to start soon and from somewhere. Setting the right strategy for achieving this goal is the starting point of a bigger issue and CONSENSUS claims to have accomplished it.

The main project objectives and the level, by which they have been met, are summarised below:

- Agreement on a concise pan-European adapted PSN functional classification, with reference to driving ability.

  **Status:** Achieved in D2.1.

  **Comments:** According to the discussions during the CONSENSUS Thematic Network Members meeting held in Cordoba (Spain) 31st of March 2004, and taking into account the conclusions obtained during the 1st Workshop in Valencia (Spain), a CONSENSUS codification scheme was determined. It was decided to simplify the medical problems codes presented in the ICF and ICD classifications to limit the relevant list based on the most frequent problems.

  This classification scheme has been finally detailed, having as examples four use cases (Traumatic Spinal Cord Injury, Post – Poliomyelitis, Duchene Muscular Dystrophy, Amputation), as they represent some of the most frequent cases in driving ability assessment and constitute complete example of pan-European applications of the new assessment system. However, there is a need for further improvement and extension of the coding scheme. A subgroup within the project and member group has voluntarily undertaken this task. The work is also continued after the end of the project within a group from VTI, CARA and an external member.

- Agreement on a common set of PSN driving assessment criteria, assessment tools and procedures.

  **Status:** Achieved in D2.2 and D3.1.

  **Comments:** Common assessment criteria do not exist. Several have been proposed in D2.2 and are accepted by all Partners and Network Members as the minimum common denominations. More importantly, work towards assessment criteria to be developed, has been defined, agreed and prioritised, to be undertaken by the Network in the future.
The commonly agreed assessment tools and methodologies have been collected and listed in D3.1. The methodology has been detailed and standardised in four specific use cases, namely for people suffering from traumatic spinal cord injury, post-polio myelitis, muscular dystrophy, amputation (lower left leg). These would serve as guidance and best practice cases for applying the agreed assessment tools and methods to other types of disabilities. Rather than limiting the choice of the assessment tools to specific ones (not possible, due to unavailability of certain tools in some languages/markets, etc.), it was agreed that any assessment centre should perform each type of assessment, using any of the listed, acknowledge tools within D3.1.

- Specification and use of a benchmarking database on used and proposed PSN driving assessment tools and methodologies, as well as an expert decision tool, to support evaluators and improve and standardise the quality of assessment.

**Status:** Developed and reported in D4.1 and D4.2.

**Comments:** Both tools have been developed and tested with assessment experts. The database contains 20 assessment criteria, 42 assessment tools, 6 assessment procedures, 43 literatures and 52 use cases. The expert knowledge tool provides guidance to the assessment personnel for the PSN driving ability assessment process according to each disability case which is described from the assessment personnel by following the codification methodology developed within CONSENSUS. It consist 48 tools for physical evaluation, 68 contact points within 21 countries and 52 use cases supported from the database. Evaluation results show that 90% of the experts judged the tools as helpful, well designed and easy to use. Some suggestions and comments of the experts were made and implemented in both tools, resulting valuable and comprehensive pan-European tools for the assessment of drivers with special needs.

- Identification of relevant gaps in existing assessment tools as key issues for future research.

**Status:** Achieved in D5.4.

**Comments:** The types of driving aids and adaptations that are necessary to support drivers with disabilities, but which are, nevertheless, not yet available on the market, were identified as major gaps and key issue for future development. These types correspond to the following categories:

- More voice-controlled applications.
- Improved support systems for ingress.
- Better ergonomics.
- Need of electronic aids (ADAS/IVICS).
- Need of horizontal steering wheel
- Joystick applications
• Motorbike adaptations.

In addition, the types of assessment tools which are not yet available on the market and which should be developed in the future, were recognized as really important gaps for the assessment procedures. A need for driving simulator-based and computer-based tests for the assessment of cognitive skills is the main issue that has to be taken under consideration. In particular, the use of new technologies for fitness-to-drive assessment of people with disabilities is needed. Driving simulators are useful tools for the assessment of practical fitness-to-drive in a safe environment. Computer-based tests can be used to assess the clients’ abilities with regard to the assessment of specific skills relevant for driving.

• Establishment of a coherent group of experts and centres of excellence Europe-wide, that facilitates the state of the art in IST networking technologies to stay in close contact and be able to draw from each other’s experience in the field.

**Status:** Achieved within WP1.

**Comments:** The project started with 16 Partners (initial Network Members) from 14 countries and including 5 Assessment Centres. At the end of the project the Network encompasses 50 Members from 21 countries, of which 29 are Assessment Centres. Furthermore, a single Member the UK Forum, represents 10 Assessment centres in the UK and another one EMG group, represents 30 adaptation companies in 11 European countries, resulting to 88 single legal entities. All of them have agreed on the common PSN classification schemes, assessment criteria, tools, procedures and have experienced the use of the developed IT tools.

• Proposal of a code of good practice on PSN driving ability assessment, recommendations to authorities and the industry and achieving relevant users acceptance and public awareness enhancement.

**Status:** Achieved in D5.4 and Internal Report “Questionnaire on ADAS and IVICS for PSN organisations”.

**Comments:** The developed Code of Good Practice encompasses recommendations for best practice when assessing the fitness-to-drive of people with special needs and further recommendations. These recommendations define the mission and the guiding principle of every assessment. Specific recommendations on organisational, standardisation and legislative issues have been drawn and submitted to the Driving license Committee of DG TREN, as well as several national Authorities. Recommendations on required ADAS have been formulated for the industry, prioritising 33 existing or under developmet ADAS. User acceptance and awareness has been captured and promoted by the use of two questionnaires. The first one filled by professional experts and the second one by drivers who use car adaptations to successfully compensate for existing disabilities. The different questionnaire modules included items, such as asking if the respondents agree to certain statements corresponding to stereotypes about drivers with disabilities, as well as questions about practices with regard to the technical inspection of adapted vehicles, questions about instruments and tools used.
during the assessment process and questions about car adaptations that are not yet available on the market. The respondents were furthermore asked for suggestions to improve the co-operation between the driving assessors and their clients with disabilities.

As Quantitative objectives, the following have been defined:

<table>
<thead>
<tr>
<th>Quantitative objectives of the project</th>
<th>Actual status at the end of the project</th>
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<tbody>
<tr>
<td>Use of the agreed classification and common assessment criteria, tools and procedures in at least 6 European countries by the end of the project.</td>
<td>Their use has been agreed, as pilot basis, in 7 countries (Belgium, Greece, Italy, Lithuania, Slovenia, Spain and UK). It is being currently considered for adoption by another 6 countries (Czech Republic, Ireland, Netherlands, Portugal, Sweden and Switzerland). In some other countries, they are being used by some Centres and effort will be devoted to extend it to others (namely in Germany and France).</td>
</tr>
<tr>
<td>Use of the agreed classification and common assessment criteria, tools and procedures in at least 15 European countries, 10 years after the end of the project, if the Network indeed gets self-sustainability.</td>
<td>As the target is 10 years after the end of the project, it can’t be assessed in this report. Nevertheless, the above explanations make it obvious that this objective is indeed expected to be satisfied.</td>
</tr>
<tr>
<td>Uptake of proposed recommendations and reference to them by at least 3 national or international authorities and 3 relevant manufacturers by the end of the project.</td>
<td>Proposed recommendations have been submitted for uptake to DG TREN and several national authorities. Several of them answered positively, such as the UK Forum (UK Network of Assessment Centres), the Ministry of Transport of Greece (legal action is ready and awaits final signature by the General Secretary) and ASECEMP (Spanish Association of Drivers Mental-Psychological Assessment Centres). Design recommendations have been adopted already by CRF (car manufacturer), SIEMENS VDO (automotive system supplier). Over 50 others have received it and feedback is expected.</td>
</tr>
<tr>
<td>Inclusion of at least 50 members in the Network by the end of the project.</td>
<td>At the end of the project the Network has 50 Members (88 single legal entities), as promised. Several Members represent Unions of several legal entities (i.e. 30 car adaptation companies in one Member and 10 Assessment Centres in another).</td>
</tr>
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Furthermore, the assessment personal training which results from the CONSENSUS tools and methodologies was established in a way that it can be adapted from IDEA project. This project focuses on the improvement of skills and knowledge of the driving assessment personnel by helping them to better know and use tools specifically developed for the purpose of fitness to drive assessment, such as ICT-based assessment tools, driving simulation, etc., aiming to the development of a standardised vocational training scheme within Europe. The common PSN driving ability classification scheme and the common assessment methodology/tools for driving ability evaluation of PSN that were derived from
The CONSENSUS project and exits in the CONSENSUS Expert Tool are included in the training scheme for the personnel assessing the driving ability of PSN, developed within IDEA. Finally, the input of the Internet-based CONSENSUS database was estimated as a very useful tool for the training of the assessment personnel. Part of this input, such as the assessment procedures, use cases, assessment criteria, assessment tools, was utilized in the IDEA project, providing an excellent base for the enhancement of the content of the IDEA Multimedia Training Tool.

According to the results presented in the table above, it can be concluded that the CONSENSUS project accomplished its targets, such as the creation of the CONSENSUS Network, which works systematically and efficiently towards the free and safe movement of DSN all over Europe.
## ANNEX I Thematic Network Members

### Thematic Network Members *(green marked = agreement finalised, yellow = agreement not finalised, not marked = no agreement settled)*

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Candidate Member</th>
<th>Country</th>
<th>Contact</th>
<th>Function</th>
<th>Type of organisation</th>
<th>Tel</th>
<th>Fax</th>
<th>Address</th>
<th>website</th>
<th>Signed by</th>
<th>Responsible Partner</th>
</tr>
</thead>
<tbody>
<tr>
<td>MDPC</td>
<td>Moscow Disabled Persons Club</td>
<td>Russia</td>
<td>Ekaterina N. Kim</td>
<td>President</td>
<td>PSN User</td>
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<td>+7 095 475 9336</td>
<td>11 Startovaya Street 129336 Moscow</td>
<td>VTI</td>
<td>DDA</td>
<td></td>
</tr>
<tr>
<td>ICCS</td>
<td>Institute of Communications and Computer Systems</td>
<td>Greece</td>
<td>Angelos Amidis</td>
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<td></td>
<td>+30/2107722 398</td>
<td>+30/210 7723557</td>
<td>Pathision 42, 10642, Athens, Greece</td>
<td>CARA</td>
<td>HIT</td>
<td></td>
</tr>
<tr>
<td>INIOHOS</td>
<td>INIOHOS</td>
<td>Greece</td>
<td>Evangelia Maragoudaki</td>
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<td>PSN Organisation</td>
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<td>+30/210-2386287</td>
<td>9th bus stop, Chassias Ave., 131 22, Ilion</td>
<td>VTI</td>
<td>HIT</td>
<td></td>
</tr>
<tr>
<td>COCEMF E</td>
<td>COCEMFE</td>
<td>Spain</td>
<td>Manuel Lobato</td>
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<td>Rehabilitation Specialist</td>
<td>+34/9412103 07</td>
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### CONSENSUS CONSORTIUM

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ANNEX II Thematic Group Discussions during the First Workshop in Valencia

Within the first Workshop in Valencia, Spain (Month 13) parallel discussions of these five Thematic Groups were organised.

Thematic Group 1: PSN classification (Leader: UPV)

In total 14 persons participated in the discussion of this TG, from 6 countries: Croatia, France, Portugal, Slovenia, Spain, UK. There were 3 pre-defined questions/issues for discussion, addressed to assessment personnel people regarding the need of the development of a common classification/codification scheme within CONSENSUS project, in order to define the diseases/illnesses/disabilities of driver applicants and to provide help in the actual gaps of assessment procedures.

Thematic Group 2: Assessment Methodologies & Tools (Leader: IFADO)

In total, 19 people participated in this TG from 7 countries: Germany, Belgium, Italy, Greece, Great Britain, The Netherlands and Spain. The following disabilities were considered:
- Spinal Cord Disabilities.
- Disorders of the Peripheral Nervous System.
- Muscle Diseases.
- Locomotory Deficits.

The pre-defined issues for discussion were the following:
1. Suggestion of assessment tools for the target illnesses/diseases.
2. The necessity of a practical on-the-road test in order to assess the fitness to drive of people suffering from the above illnesses/diseases.
3. The person responsible for establishing the final decision about an applicant’s fitness to drive.
4. Assessment procedures from other countries that could be examples of good practice.
5. The assessment system in each country regarding the restriction or the support of the mobility of people with disabilities.

Thematic Group 3: People with special needs driving problems and opinions (Leader: DDA)

In total 6 persons participated in the discussion of this TG, from 5 countries: Spain, Belgium, Slovenia, United Kingdom and Ireland.

The following issues were mainly discussed in this TG:
1. The safeguards that should be included in CONSENSUS for equal and fair treatment of PSN.
2. The necessity of the in-car evaluation in the procedure of the assessment.
3. The need of development of a standardised in car assessment, within CONSENSUS or the adaptation of the standard existing assessment.

Thematic Group 4: IST support tools (Leader: HIT)

In total 6 persons participated in the discussion of this TG, from 4 countries: France, Greece, Italy, and Spain.

The following issues were mainly discussed in this TG:
1. For the users: Their need of any assistance/help on specific tasks, e.g. information, warning that can be provided by the use of telematic aids (e.g. on accessible parking, intersections handling, vision enhancement in bad weather conditions, etc.).
2. For the assessment personnel: Their opinion about the usability of an expert tool that will provide guidance and will suggest on further actions (tests, tools to be used, etc.) when the results of a test are provided, but does not decide nor suggest an overall assessment result.

3. For the assessment personnel: Their opinion about the usability of an assessment database that will be easy to use and will consist of the following fields: “assessment tools”, “assessment criteria”, “assessment methodology” and “literature”.

4. For the DSN: Their need on assistance/help on specific driving tasks, e.g. information, warning that can be provided by the use of telematic aids (e.g. on accessible parking, intersections handling, vision enhancement in bad weather conditions, etc.).

5. For DSN: Their interest to have the possibility to have, in addition to ADAS systems, also information devices (e.g.: navigation tools for lacks in orientation ability, possibility to do emergency calls and so on).

*Thematic Group 5: Standardisation actions (Leader: VTI)*

The 8 participants of this TG, represented 6 countries: Sweden, Finland, Spain, Czech Republic, Italy, United Kingdom.

The three pre-defined questions for this TG referred to:

1. The documents (directives, standards and guidelines) that specifically concern drivers with disabilities.
2. The discrimination of the official regulations as expressed in written documents as directives, standards and guidelines for drivers with disabilities.
3. The missing public documents that could promote independent mobility for (potential) drivers with disabilities.
ANNEX III Thematic Group Discussions during the Second Workshop in Ljubljana

Within the second Workshop in Ljubljana (Month 22) parallel discussions of these five Thematic Groups were organised.

Thematic Group 1: PSN classification
- CONSENSUS codification scheme needs to be extensively used and comparatively evaluated (in relation to UK, CBR, etc. ones) Europewide.
- Relevant initiative to be undertaken covering EU 25, Norway, Switzerland and other countries.
- Need for at least 1 Assessment Centre per country as CONSENSUS node, due to language and local legal barriers and specificities.

Thematic Group 2: Assessment Methodologies & Tools
- Medical and practical fitness to drive should be ideally assessed in the future within the same roof, at a common Assessment Centre.
- On-road driving assessment should be standardised.
- Need for common vocabulary and terminology in the area.
- Need for pan-European assessors qualification and accreditation schemes.

Thematic Group 3: People with special needs driving problems and opinions
- Assessment Centres acting as CONSENSUS nodes in each country need to work hand in hand at local PSN organization.
- A pan-European PSN appeal procedure needs to be established.
- CONSENSUS methodology needs to be effective enough so as to enlighten the assessment procedure and not perplex it.

Thematic Group 4: IST support tools
- Not assessment but assessor support tools.
- Tools should be used for mobile assessment, on the spot.
- Keep on working on IST assistive systems, but mainly for the PSN of the future.

Thematic Group 5: Standardisation actions
- Tests to be devised for the combination of equipped car and driver to verify adaptations.
- Input to 3rd driving license Directive possible up to end of 2005.
- Need to extend current DG TREN working groups to other issues such as elderly drivers and cognitive problems.
ANNEX IV Ethics in Driver Assessment

Introduction

In the behavioural sciences, respect for privacy and confidentiality is a central concept in the conduct of ethical research with human participants. Difficulties with privacy issues can lead to difficulties in properly conducting research. If a client perceives that his or her privacy is threatened this can lead to biased sampling, evasive and/or false responses, and many other impediments that can affect the validity of the results.

Privacy and confidentiality

The types of information gathered within CONSENSUS are sensitive and private for many people, although attitudes and expectations vary widely. All people involved in the work with the CONSENSUS database are responsible to protect the privacy of the participants. Privacy means that the client can control the access to personal information; he decides who has access to the collected data in the future. The participant has to be asked for an agreement (informed consent) before private information can be taken.

Participants with legal guardian aides as well as participants who cannot rationalise the test course and goal based on any impairment of their cognitive abilities are excluded from any project study.

It is not allowed to circulate information without anonymisation. This means that only relevant attributes i.e. sex, age etc. will be retained. When confidential information within CONSENSUS was used, it was decided on a case by case basis.

An important question in CONSENSUS is how confidentiality can be maintained, if personal data is stored in databases:

Personal information in the CONSENSUS database

Personal information must be regarded as confidential. Normally custodian of the CONSENSUS database must ensure they have each persons’ explicit consent to obtain, hold and use personal information.

1. The CONSENSUS database, using identifiable personal information, or using anonymised data which is not already in the public domain, must be approved by an Ethics Committee.
2. All personal data must be coded or anonymised as far as is possible and consistent with the needs and as early as possible in the data processing. Only personal identifiers that are essential should be held.
3. Each individual entrusted with patient information is personally responsible for their decisions about disclosing it. Health professionals disclosing information should in particular, ensure they are familiar with the advice of the General Medical council on disclosures for research.
4. Personal medical information is handled only by health professionals or staff with an equivalent duty of confidentiality.
5. Principal investigators must take personal responsibility for ensuring that training, procedures, supervision, and data security arrangements are sufficient to prevent unauthorized breaches of confidentiality (Medical Research Council, 2000).

Anonymisation and Coding

As a minimum anonymised data must not contain any of the following, or codes for the following:

- Name, address, phone/fax. Number, e-mail address, full postcode.
- Any identifying reference numbers
- Photograph or names of relatives.

With both linked and unlinked anonymised data it is sometimes possible to deduce individuals’ identities through combinations of information. The most important identifiers are:
• The age, if a small sample size is taken; in this case has to be compromised between scientifically precision and the protection of the individual privacy.
• Rare disease or treatment, especially if an easily noticed illness is involved;
• Partial post-code, or partial address;
• Place of treatment
• Rare occupation or place of work.
• Combinations of birth date, ethnicity, place of birth, and date of death.

CONSENSUS should always consider before passing information to others, and before publishing information- whether data contains combinations of such information that might lead to identification of individuals or very small groups. How much of this potentially identifying information can be safely included in data that is assumed to be unidentifiable can only be judged on a case by case basis taking into account the sample size, the ways in which results will be published and used.

Informed consent

Respect for persons requires that subjects, to the degree they are capable, be given the opportunity to choose what shall or shall not happen to them. This opportunity is provided, when adequate standards for informed consent are satisfied.

In seeking informed consent, the basic elements of informed consent according to the American Psychological Association (2002) are used (purpose of research, risks, benefits, right to decline, contact information).
ANNEX V Provisional Terminology for Driver Assessment

Proposal on terminology for driver assessment Thematic Group (WP1-related)

An internal report was written with the aim to provide the CONSENSUS consortium with an initial proposal on terminology for driver assessment methodology and tools. The list proposed is not exhaustive and should be completed. Definitions presented here are adapted to fit the fitness to drive assessment context.

Provisional terminology for the use in driver ability and fitness to drive assessment for PSN

Adaptation Evaluation is a term used to designate the appraisal actions carried out to verify if the technical vehicle adaptation actually compensate(s) for the functional impairments of the driver.

Adaptations (technical) refers to the technical modifications supplied to a vehicle in order to compensate for the driver’s impairment(s). Adaptations are translated into specific codes on the driving licence.

ADAS (Advanced Driver Assistance Systems): in-vehicle technologies designed to improve vehicle safety by aiding the driver, such as collision avoidance, curve warning, lane departure warning, etc.

Assist devices are add-on devices used by drivers with disabilities who require some assistance in gripping or operating a primary control. Such devices are used with automotive steering wheels or other primary controls. They may be either permanently attached or quickly disconnectable. Examples of assist devices are spinner knobs, C grip, etc. These devices are.

Automobility is a term used in the context of an adapted vehicle to indicate the car is both a mobility mean and a prosthetic device necessary for mobility.

Conditions: refers to driver-related conditions as a function of the driver’s functional state. Wearing glasses is an example of a limiting condition. Conditions are translated into specific codes and written on the driver’s driving licence.

Criterion is a rule or a test by which anything is tried in forming a correct judgment respecting it.

Display—a device that imparts information to a human being for the purpose of operating a piece of equipment.

Driving ability refers to the complex interaction between physical, cognitive, perceptual and psychological abilities needed to carry out the driving task safely.

Driving ability assessment refers to the functional assessment of a person’s ability to drive safely, i.e. relating the abilities to the actual driving task demands.

Driver performance is the upper limit of a driver’s ability, that is, how good a driver can perform the task at the best.

Driving behaviour refers to what a persons actually ‘does’. The term can be exchanged with the term ‘competence’.

Driving skills refers to what a person is able to do when driving a car. It essentially concerns the operational and tactical aspects of driving.

Egress: Term used referring to the action of exiting from a vehicle by a human being. In the context of fitness to drive assessment, the impaired diver should be able to exit its vehicle independently, without any help.

Fitness to drive is a medical term referring to the status of a driver with possible functional impairments. To be fit to drive, a driver needs to have the perceptual, cognitive and motor abilities to
drive a car; has to have a low probability of loosing control suddenly and unpredictably during driving, and has to possess the needed social responsibility (attitudes) and social judgment during driving.

**Fitness-to-drive assessment** is a term used to describe the medical and functional assessment aimed to determine if a person with disabilities has a potential to become a licensed driver.

**Fitness-to-drive assessment process** is the process aiming at determining if a functionally impaired driver is able to drive safely possibly with restrictions, adaptations, or conditions.

**Functional abilities** can be understood as combinations of fundamental abilities which are more task-oriented but still generic e.g. reaction time, co-ordination.

**In-depth assessment** generally refers to a later assessment stage (after a screening). It is an analytic-type assessment that should be restricted to those few drivers considered as being potentially at risk on the basis of screening results.

**Ingress**: Term used referring to the action of entering or getting into a vehicle. In the context of fitness to drive assessment, the impaired driver should be able to enter its vehicle independently, without any help.

**IVICS** (In-Vehicle Information and Communication Systems): information and communication systems intended for use by the driver while driving. They provide drivers with different information (traffic information, route information). They are not intended to apply to vehicle control systems.

**Mechanical Hand Controls** are those devices that a person with a disability uses to operate the accelerator and service brakes of a vehicle.

**Medical Assessment** is used to describe the actions taken to identify and determine the range of abilities and disabilities of a potential driver with impairments in order to find out if the person has a potential to become a licensed driver.

A **neuropsychological assessment** is an evaluation performed by a (neuro-)psychologist (specializing in conditions of the central nervous system) who assesses the individual’s cognition, behaviour and emotional functioning to determine the degree of damage present. A neuropsychological assessment typically evaluates multiple areas of functioning and is not restricted to measures of intelligence. The following represents a set of cognitive functions that is likely to be assessed:

- Sensory perceptual and motor functions
- Attention
- Memory
- Auditory and visual processing
- Language
- Concept formation and problem solving
- Planning and organization
- Speed of Processing
- Intelligence
- Academic skills
- Behaviour, emotions, and personality

**Norms** allow the interpretation of test results, as they allow relating to a normative scale the raw scores, which would be meaningless without any reference to the results of other subjects.

**Primary controls** are controls for implementing throttle, brake, and steering inputs to the motor vehicle. The functionally impaired driver should be able to operate the car without assistance at the same performance level as a not functionally impaired driver, under all traffic conditions.

**Psychomotor assessment** means assessment related to mental events that have motor consequences or vice versa.

**Reliability** refers to the degree to which test scores are free of errors of measurement.

**Restriction** refers to the conditions imposed on the driving licence use after a fitness to drive
evaluation. Restrictions can be limitations of driving in time (e.g., when a PSN driver is allowed to drive during the daylight conditions only), or in environment (e.g., when a PSN driver is allowed to drive within a limited spatial area around home). The different categories of restrictions are translated into specific codes and written on the driver’s driving licence.

Scores are summary statements about the observed behaviour. Test scores can be expressed in a variety of forms. Scores are generally reported as values of a scale based on the raw scores made by a standardized population.

Screening means the systematic search for persons with a particular characteristic in a defined population. For example in medicine, genetic screening serves as an important adjunct of modern preventive medicine. Such screening has the potential to decrease the devastating impact of genetic disease.

Sensitivity of a test is a term used in the context of assessment to designate the proportion of people with a particular feature (generally a disease) who have a positive test result. The higher the sensitivity, the greater the detection rate and the lower the false negative rate. In the particular context of fitness to drive assessment, high sensitivity implies that the assessment tools will identify all individuals that are able to drive safely. High sensitivity has the advantage that the risk of missing a potentially driver is low but on the other hand will the risk of letting a non-fit driver pass also be high.

Specificity of a test is a term used in the context of assessment to designate the proportion of people without a particular feature (generally a disease) who have a negative test result. The higher the specificity, the lower will be the false positive rate. In the particular context of fitness to drive assessment, High specificity means that we can effectively distinguish those not fit to drive with the risk of increasing the number of missed but fit drivers.

Test ride refers to the standardised course for an on-road test. The use of a standardised test ride enhances its reliability and hence its validity.

Threshold is a concept used when a subject’s level of performance has to be assessed with regard to a desired level of performance. Subjects are classified into two categories: those reaching the desired level and those who fail. Such a reference score is named ‘threshold score.

UFOV: the Useful Field of View refers to the spatial area from which one can extract visual information in a brief glance without head or eye movement.

Validity is the most important consideration in test evaluation and refers to the question ‘do the tests and tools actually measure what we are looking for?’ Validity concerns the inferences that can be made from a particular test. The concept of validity is not unitary and involves different aspects, like the content validity, theoretical validity, for example.

The content validity is defined as the extent to which a measure assesses all the important aspects of a phenomenon that it claims to measure. Judgments of experts are often used to assess the relationship between parts of the test and the defined phenomenon.

The theoretical (also known as conceptual/construct) validity concerns the inferences from test scores to a psychological construct. Because it is concerned with abstract and theoretical construct, construct validity is also known as theoretical construct.

Test validation is the process allowing the accumulation of evidences to support inferences made from the test scores. Several types of evidence should be gathered in an ideal validation process, knowing that validity is nevertheless a unitary concept.

Visual screening refers to a quick visual testing, generally performed using technical equipment. Visual screening generally includes testing visual acuity, depth perception, colour vision, glare vision, glare recovery, field of vision, tracking, neglect, and double vision.
ANNEX VI Security of CONSENSUS Web services

The level of access for each group as is defined below providing explanatory figures.

**Consortium Partners access**
This group has full access to all the information and services the Web and the FTP provide. They are in charge of looking after the good state of the information and services offered.

**Network Members access**
The Network Members have full rights to info access in the Web page, but not in the FTP server. This thematic group will have an identifier and password once the contracts are signed.

Next figure explains this feature:

![Diagram of Network Members Access](image)

Figure 28: Network Members Access

One specific folder is the only permission this group has into the FTP site.

**User Forum Members Access**
This group hasn’t access to the FTP server. If any of them wanted to use the CONSENSUS private Web server, it would have to pay a fee. The access to the other private services is restrained. User Forum Members have this schematic access:
Others Access
This group can access only to the public services, it is to say:

- Public Web Page and services
- CONSENSUS Forum Web

Other services are available for this group, but with the payment of a fee, as the CONSENSUS expert’s service access.
ANNEX VII Project Dissemination Material

Project Logo:

[Image of the Project Logo]

Project Leaflet:

[Image of the Project Leaflet]
Project Poster:

CONSENSUS IST-2001-37092

Aims:

- Network of Excellence for driving ability assessment of disabled persons
- Standardisation of driving ability assessment procedures for disabled people
- Supports access to expertise and resources of specialised centres
- Enhancing mobility and safety

Promoting CONSENSUS in assessing driving ability of PSN through common methodologies and normative tools

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EUROPEAN COMMISSION INFORMATION SOCIETY TECHNOLOGIES

November 2004
## Annex VIII Submitted CONSENSUS papers

CONSENSUS papers submitted and dissemination issues

| Date                | Type and Title/Scope                                                                 | Number of persons attended and other information                                                                                                                                 |
|---------------------|--------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------
<p>| November 2002       | Network WWW and FTP site fully operational                                            | The deliverables from the CONSENSUS Feasibility Study have also been included in the website.                                                                                                     |
| 11 September 2003   | First International CONSENSUS Workshop, Valencia                                      | Thematic Network Members and User Forum Members, Partners and other interested people attended. In addition, exhibition stands form 3 developers for assessment tools and driving aids were present. |
| 13-14 June 2003     | Paper submitted and accepted: “Project CONSENSUS” Juan F. Dols, III Assessment Centres Catalanian Congress. Vilafranca del Penedes (Barcelona), Spain. | 1 person from UPV attended the conference.                                                                                                                                                    |
| 22-27 June 2003     | Paper submitted and accepted: ‘Key issues in automotive HMI for disabled drivers – the CONSENSUS approach’ Guido Baten, Maria Panou, HCI 2003, Crete, Greece. | 1 person from the CONSENSUS consortium attended the conference.                                                                                                                                 |
| 27 November 2003    | “ASSESSMENT OF DRIVING ABILITY OF DISABLED PEOPLE IN LITHUANIA” Dr. A Stankus presentation at National Conference on “TRAUMA in Lithuania” | 1 person from IPR attended the conference.                                                                                                                                                     |
| November 2003       | “EC CONSENSUS PROJECT: OBJECTIVES AND PERSPECTIVES IN LITHUANIA” Dr. A Stankus presentation at local conference on Assessment and training of driving abilities in disabled persons. Valakupiai Rehabilitation Centre, Vilnius. | 1 person from IPR attended the conference                                                                                                                                                      |
| 31 March            | Thematic Network Meeting, Cordoba                                                    | Thematic Network Members and User Forum Members, Partners and other interested people attended. The meeting was held in connection to the VIII ASECEMP conference, Cordoba.                        |
| 1-3 April 2004      | Paper submitted and accepted: “La UPV, su relación con la Seguridad Vial, con CONSENSUS y otros grupos de trabajo” Juan F. Dols. VIII ASECEMP Spanish Assessment Centres organisation congress, Córdoba (Spain). | 1 person from UPV attended the conference.                                                                                                                                                     |
| 1-3 April 2004      | Paper submitted and accepted: “The CONSENSUS Project” Björn Peters VIII               | 1 person from VTI attended the conference.                                                                                                                                                      |</p>
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<td>1 person from VTI attended.</td>
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<td>16 June 2004</td>
<td>New Millennium”, Slovenia</td>
<td>Thematic Network Members and User Forum Members, Partners and other interested people attended. In addition, exhibition stands form 3 developers for assessment tools and driving aids were present. The workshop took place in parallel to the 8th EFRR Conference on rehabilitation Sciences for the new millennium, to benefit from the people being in Ljubljana for the Conference.</td>
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<tr>
<td>21-22 June 2004</td>
<td>The second International CONSENSUS workshop, Ljubljana</td>
<td>1 person from UPV attended.</td>
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<tr>
<td>9 October 2004</td>
<td>Invited speaker at the EMG annual meeting in Gothenburg, “Driving licences and adapted cars for drivers with disabilities” by Bjorn Peters</td>
<td>1 person from VTI attended</td>
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<tr>
<td>6 – 9 August</td>
<td>Paper submitted and accepted: CONSENSUS: building a network of excellence to share knowledge on driver assessment in the European Union by Björn Peters, The ADED (The association for driver rehabilitation specialists) annual conference in Kansas City, Missouri, USA</td>
<td>1 person from VTI will attend</td>
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**Articles Published, Press coverage, development web sites, etc.**

<table>
<thead>
<tr>
<th>Date and Type</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>A new WWW site was established in month 3 (November 2002).</td>
<td>Establishment of, namely <a href="http://www.consensus-eu.net">http://www.consensus-eu.net</a></td>
</tr>
<tr>
<td>February 2003, Electronic Newsletter</td>
<td>First Electronic Newsletter has been designed and distributed. Is also available through website.</td>
</tr>
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<td>Date and Type</td>
<td>Details</td>
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<tr>
<td>September 2003, Electronic Newsletter</td>
<td>Second Electronic Newsletter has been designed and distributed. Is also available through website</td>
</tr>
<tr>
<td>June 2004, Electronic Newsletter</td>
<td>Third Electronic Newsletter has been designed and distributed. Is also available through website</td>
</tr>
<tr>
<td>AAATE Autumn 2003 Newsletter</td>
<td>Association for the Advancement of Assistive Technology in Europe Newsletter. The CONSENSUS Project article published.</td>
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</tbody>
</table>
Annex IX CONSENSUS Newsletters

Some indicative screens of the Newsletters:
Annex X Manual of ADAS and IVIS functions

Manual of ADAS and IVICS functions

One of the aim of CONSENSUS project is to share a classification of different in-vehicle technology systems ADAS and IVICS available nowadays. A classification of such systems may help to identify most suitable ones for DSN. Moreover, it’s a tool by which it is possible to share technological competence towards different backgrounds partners.

This manual has been built in order to provide easy to understand definitions and descriptions of different functions and systems. In the manual, only functions strictly related to driving have been considered. Terms are presented in alphabetical order and they are related to functions or systems. Moreover, for each term synonyms and related terms are indicated.

**ACC (Adaptive Cruise Control):** cruise control system that is able not only to keep a speed selected by drivers, but also to automatically maintain a safe distance from the vehicle ahead, using dedicated sensors (such as long-range Radar, Lidar, etc.) and adapting to speed changes of the obstacles ahead. [see also Stop-and-Go]

**ADAS (Advanced Driver Assistance Systems):** generic term describing in-vehicle technologies designed to improve vehicle safety by aiding the driver, such as collision avoidance, curve warning, lane departure warning, etc. (synonyms: ADA)

**Advanced Traveller Information Systems (ATIS):** include technology that provides a variety of information that assists travellers in reaching a desired destination via private vehicle, public transportation, or a combination of the two. It may include information provided before a trip (pre-trip), such as through a Web page or kiosks, or during travel (en-route), such as through variable message signs and highway advisory radio.

**Blind Spot Monitor:** vehicle-based system that uses sensors to detect the presence of vehicles located in a zone to the side and rear of the host vehicle (corresponding to the driver’s mirror “blind spot”); a warning indicator can be presented to the driver when vehicles are detected in the zone and a higher-level warning presented if the driver initiates a potentially hazardous lane change.

**Collision Avoidance:** system providing information to the driver regarding the level of danger of other objects (mostly other vehicles close to the host-vehicle) and the avoidance tactics to employ. (synonyms: obstacle avoidance) [see also: Collision Warning, Pre-crash systems]
Collision Warning: a function that detects the presence and motion of vehicles and provides warnings to driver in the event that a collision may occur. (synonyms: Global collision warning) [see also: Pre-crash]

Cruise Control: a system that keeps the vehicle speed set by the driver independently on the road profile. [see also: ACC]

Decision aid at junction: a system which will help the drivers to accept or reject a gap when they are doing a left turn at a T junction or a turn across traffic.

Driver monitoring: any system which detects driver’s physiological status, for instance: drowsiness, lacks of attention, eye-movements, heart rate variability.

Emergency-related services: any system that can perform the emergency call to the rescue services, for example after an accident or in case of a driver’s sudden collapsing (and in this case, possibly after that the vehicle pulls up alongside the emergency lane automatically). [see also Driver’s Monitoring]

Front-end Collision Warning: A collision warning system applied to the front of a vehicle to help accident prevention, in particular, rear-end collisions with preceding vehicles. (synonyms: Front Collision Warning; Forward Collision Warning);[see also: Collision Warning; Longitudinal Warning]

Global Positioning System (GPS): US satellite positioning system used to pinpoint geographic locations world-wide. A system consisting of 24 satellites and controlling ground stations, operated by the US Department of Defence, that provides highly synchronised signals to allow receivers (usually but not always ground-based) to pinpoint their location anywhere on the earth to a high degree of accuracy; this, along with map databases and map-matching software, is the key enabling technology for in-vehicle route guidance, automatic collision notification, and other intelligent vehicle applications.

GSM (Global System for Mobile Communications): digital cellular telephony system used in ITS services such as traffic information, emergency call and fleet management

Headway: the time (gap expressed in time-terms) between a leading vehicle and the velocity of the host vehicle

HMI (Human-Machine Interface): previously know as man-machine interface (MMI); means by which a user interacts with a machine and includes simple and advanced functions such as voice recognition, speech synthesis and touch screens
ISA (Intelligent Speed Adaptation): systems designed to alert drivers when they exceed the speed limit or are travelling dangerously slow, with some systems also offering dynamic correction capabilities.

ITS (Intelligent Transport Systems and Services): any system or service that makes the movement of people or goods more efficient and economical, thus more "intelligent".

IVICS (In-Vehicle Information and Communication Systems): information and communication systems intended for use by the driver while driving. They provide drivers with different information (traffic information, route information). They are not intended to apply to vehicle control systems (such as Collision avoidance and Cruise control systems).

Junction management: any system able to warn the drivers (i.e.: in terms of speed recommendations) when they approach a junction, depending on the intended colour of the traffic light when crossing the intersection or turning in intersection, so that there is no risk of collision.

Intersection infrastructure (i.e.: traffic light ) is able to communicate bi-directionally with all vehicles, passing the junction. (synonyms: Intelligent junction)

Lane Departure Warning System: any system that detects the host vehicle’s position inside the lane (namely, measuring the distance from the lane boundaries) and warns the driver when the vehicle trajectory indicates potential hazard of exiting the lane itself. (synonyms: Lane warning systems; Road departure warning systems).

Lane keeping system: any system that maintains the vehicle inside its own lane automatically.

Lateral collision avoidance: any system able to warn the driver in case that a risk of lateral collision occurs. It can work with radars or with cameras.

Navigation Functions: provide drivers with information about how to get from one place to another.

Parking support system: any system that supports and helps the driver in the parking manoeuvre. It can be completed automatic (the vehicle acts the manoeuvre without any driver’s action), semi-automatic (the driver acts only on lateral commands or, alternatively, on longitudinal ones), or it can provide only indications on the parking manoeuvrer (i.e.: optimal trajectory, parking room)
PDA (Personal Digital Assistant): small, hand-held devices offering functions similar to a personal computer (though limited); also now offering access to some ITS services

Pre-Crash systems: any system that can detect when an accident is unavoidable. This information can be used for a “pre-activation” of the on-board vehicle restrain system (i.e.: seat-belts, airbags).

Route Guidance System: a system which enables a driver to select a precise destination, the system then computes the best route to follow based on specific criteria and gives the driver specific instructions in the course of the journey.

Route Navigation System: a system which provides support to a driver through a map indicating position and destination, but the driver is expected to actively make navigation decisions to arrive at that destination.

Smart cards: contactless systems which permit to have easy access to particular places, to memorise specific data concerning the driver (seat and command adjustment, controls, medical information ..).

Stop-and-Go: a variant of Adaptive Cruise Control for the low speed scenarios (queue in motorways, urban environment, etc.); the system is capable of operating continuously at low speed, including the opportunity to stop completely the vehicle behind a leading vehicle and then restarting (automatically or manually) when the lead vehicle moves again. As before mentioned, it is very useful in cases of severe traffic congestion.

Telematics: a term used commonly throughout the world to refer to the integration of computer and communications systems into transportation systems; similar to the US term Intelligent Transportation Systems.

Traffic Management in Transport and Logistics: Any system with the aim to improve transport efficiency in delivery of goods. The idea is to optimise dynamically the utilization of transport routes, delivery vehicles, as well as delivery period, mobile communication and computing resources. In addition, the customer will benefit from new opportunities for monitoring and controlling the transport of his goods. (see also Traffic Network Equalisation)

Traffic Network Equalization: a network system for traffic management, with the objective of improving the performance of the roadway network. The idea is to utilize existing traffic infrastructure more efficiently by combining strategic management of traffic streams with individualized driver information and route guidance.
**Time to collision:** the time (gap expressed in time-terms) between a leading vehicle and the relative velocity of the host vehicle.

**TMC (Traffic Message Channel):** digital channel used to provide silent, coded messages to in-vehicle applications in order to display route and traffic information in a user's native language.

**Travel and Traffic Information:** system providing information to the driver regarding the features of the road network, particularly any potential hazards and congestion information. Could also give public transport information and more particularly the existence of accessible subway or railway station.

**Vehicle-vehicle communication:** any system able to perform the communication between vehicles, in order to get and transmit information (i.e.: fog presence, ice on the roads, etc.). Vehicles act as “probes” on the road network [see also vehicle-infrastructure communication]

**Vehicle-infrastructure communication:** the same type of system, but in this case the communication is between vehicles and infrastructure. The information exchange can concern weather conditions, traffic jam situation, availability of the parking spaces dedicated to the drivers with disability and so on. In this case the communication can be towards a traffic central server (which will then provide to spread the information to all other interested vehicles) or towards a more traditional type of infrastructure (traffic lights in a junction, which get the information about the vehicles flow passing the intersection). [see also: vehicle-vehicle communication; junction management]

**Vision Enhancement:** a function that aims to improve a driver’s perception of the forward driving conditions using specific devices (such as an infra-red camera); in sub-normal visibility conditions (at night or in bad weather) it improves visibility by providing enhanced visual information directly to the driver.

**WAP (Wireless Application Protocol):** standard which brings Internet content to mobile phones.
**Annex XI Network Member’s Field of Activity**

The table below gives an overview of the field of activity of the countries-members organisations of the CONSENSUS Network. The field of activity/category is represented by a coding.

<table>
<thead>
<tr>
<th>Country</th>
<th>Organisation</th>
<th>Category</th>
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<td>Russia</td>
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<td>The Swedish Association of Traffic and Polio Victims</td>
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<td>England</td>
<td>European Mobility Group (includes 30 Members)</td>
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<td>Lithuania</td>
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<td>Country</td>
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<td>PSN Users’ Representatives</td>
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