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Road Safety Data, Collection, Transfer and Analysis

Deliverable 1.1/4.1 Consultation of a panel of experts on the needs for data and technical tools in road safety policy-making

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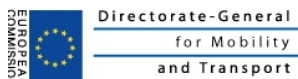
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EXECUTIVE SUMMARY

In a co-production of DaCoTA WP1 and DaCoTA WP4, an Experts Panel was created and a consultation was launched for the preliminary assessment of knowledge, data and analysis needs within road safety management. The objective of the consultation of this Experts Panel was the assessment of current needs for evidence-based road safety decision making in the European countries, to be used also by other DaCoTA activities. In particular, it was intended to identify specific needs for knowledge, data and tools, which will be taken into account for the development of a data warehouse (DaCoTA WP3) and for the creation of useful and relevant road safety decision support tools (DaCoTA WP4). Moreover, this preliminary consultation of the Experts Panel serves as a first step towards the full assessment of current practices and future needs of knowledge-based road safety management, which will be carried out later on by means of a broader consultation of stakeholders (DaCoTA WP1).

The members of the Experts Panel included members of the CARE National Experts group of the European Commission, as well as persons within the national road safety administration or scientific community of each country suggested by the National Experts. The Panel was complemented with additional persons suggested by the DaCoTA partners. The Panel eventually covers 20 EU Member States and 3 other European countries with different histories and experiences of RS management. The Experts have in-depth knowledge of road safety management processes and needs in their country, being either directly involved in decision making, or working closely with decision makers as advisors.

Two parallel consultation methods were implemented; the first concerned semi-directive interviews carried out by members of the DaCoTA WP1 partners with members of the Panel mainly from their own countries, and the second concerned a request for written contributions in case of language or time constraints. Particular emphasis was given to the open nature of the questions, both within the interviews and the written contributions, allowing the experts to describe their own experiences, views and messages and to put emphasis on the issues they consider themselves important, without being "directed" by a detailed questionnaire to specific judgments.

The consultation provided a wealth of information on all aspects of road safety management in the European countries. A synthesis of the results of this open consultation was carried out by means of a predefined matrix. In this matrix, the basic road safety management tasks were decomposed into their particular components, and were then cross-tabulated with distinct categories of needs (knowledge needs, data needs, methodological needs, tools needs etc.), allowing the linking of specific aspects of road safety policy making to specific benefits from using the necessary knowledge, data, methods and tools. The matrix allowed for a classification of the opinions provided by the experts in the written contributions as well as in the interviews.

Overall, the consultation of the Experts Panel provided valuable information about the current practices and future needs and priorities for evidence-based road safety management in Europe. It was stressed that only through the establishment of appropriate structures and procedures can evidence-based road safety management be achieved. Specific recommendations on such structures and procedures include the institutional arrangements for road safety management to be carried out centrally (at national level) by a single dedicated organization, the establishment of links and processes for smooth and efficient interaction between national and local road safety

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policies, and the introduction of compulsory consideration of scientific evidence for each road safety decision.

Several useful remarks and recommendations on the various road safety management tasks, from fact-finding and assessment of problems to the development of road safety strategies and programmes, and from the planning and implementation of these programmes to the monitoring and evaluation of their effectiveness, were also derived from this preliminary consultation.

First of all, the need for setting ambitious yet realistic targets for the improvement of road safety was confirmed. As regards the development of road safety programmes and the selection of measures, a need for methodological advances was identified, including the improvement of cost-benefit and cost-effectiveness analyses, so that they can serve both for setting priorities and for assessing the combined effects of road safety measures. Moreover, the creation of handbooks and databases with accumulated international experience on these questions was proposed, with emphasis on the country-specific conditions necessary to take into account in order to reach the maximum benefit of each measure.

With respect to the planning and implementation of road safety programmes and measures, the need to gather and harmonise the available information from the international experience of measures implementation was frequently expressed. In particular, the information and data on the procedures, the conditions, the time frame and the costs for implementing the measures need to be made available at European level.

Furthermore, the monitoring and evaluation task is considered to be most essential, not only for assessing the effectiveness of road safety measures, but also for identifying needs for further improvement. Several methodological needs were also mentioned, including the need for standardized assessment tools (statistical models, analysis techniques etc.), that will allow for the identification of the reasons and mechanisms leading to the observed safety effect of the measures.

Finally, a number of issues concerning the availability and quality of data for knowledge-based road safety management were outlined. They include the need to address the injury under-reporting problem at European level, the need for improved methods for determining accident locations by means of GIS technologies and tools, the need for improved exposure data, for increasingly reliable behavioural data and the need to promote the collection and use of in-depth accident investigation data. The Experts also stressed the need for road safety databases of different types (accident data, health data, exposure data etc.) to be linked and to be made more accessible.

The synthesis of the results of the consultation may serve as a first overview of experiences with road safety management in the European countries. Furthermore, it may serve as an outline of expert opinions on the needs and priorities for knowledge, data and tools to support road safety management, as well as on the related needs for better processes and structures, allowing the integration of knowledge and decision support tools into policy making.

It is noted that such a consultation was launched for the first time at European level. The main directions and priorities identified for knowledge-based road safety management are presented in detail in the present report. These can be useful not only for the collection (WP3) and analysis (WP4) of data and information intended to support road safety decision making, but they can also be used as a broader guide towards the improvement of road safety management processes and practices both by individual countries and at European Union level (WP1). Finally, the information

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gathered in this consultation is also relevant for further developments of the ERSO, given the many suggestions made concerning the type of information and tools that should be made available at a European level.

1. INTRODUCTION – GOAL OF THE EXPERT PANEL CONSULTATION

1.1. Background on the DaCoTA project

Traffic crashes have a major impact to European society, in 2008 over 38,000 road users died and over 1.2 million were injured. The economic cost is immense and has been estimated at over 160 billion for the EU 15 alone. The European Commission and National Governments place a high priority on reducing casualty numbers and have introduced a series of targets and objectives.

The experience of the best-performing countries is that the most effective policies are based on an evidence-based, scientific approach. Information about the magnitude, nature and context of the crashes is essential while detailed analyses of the role of infrastructure, vehicles and road users enables new policies to be developed.

The EU funded SafetyNet project established the European Road Safety Observatory to bring together data and knowledge to support safety policy-making. The project developed the framework of the Observatory and the protocols for the data and knowledge, the ERSO is now a part of the DG-Move website http://ec.europa.eu/transport/road_safety/specialist/index_en.htm.

The DaCoTA project will add to the strength and wealth of information in the Observatory by enhancing the existing data and adding new road safety information. The main areas of work include

- *Work package 1 - Policy-making and Safety Management Processes*
Developing the link between the evidence base and new road safety policies
- *Work package 2 – In-depth Accident Investigations*
Setting up a Pan-European Accident Investigation Network
- *Work package 3 – Data Warehouse*
Bringing a wide variety of data together for users to manipulate
- *Work package 4 – Decision Support*
Presenting analysis results and data to policy makers
- *Work package 5 – Safety and eSafety*
Intelligent safety system evaluation
- *Work package 6 - Naturalistic driving observations*

The present deliverable is a co-production between two work-packages (WP) of the the DaCoTA project: WP1 (Policy Making and Road Safety) and WP4 (Decision Support).

1.2. General goals of Work Package 1 - Policy

The first work package of DaCoTA, "Policy", focuses on the actions and practices of field actors. As such, it relies, beyond the scientific community, on the contacts set up in each country with decision-makers at the national and local levels, their technical support teams, and the other stakeholders actually involved in policy-making.

The work package is a central activity in DaCoTA as it is meant to anchor the development of the European Road Safety Observatory into policy-making by

feeding information on the needs for data, knowledge and methodologies obtained from decision-makers and stakeholders in European countries to two other work packages, WP4 - Decision Support and WP3 - Data Warehouse. Basic qualitative information describing road safety management organisation and policy-making activities will also be gathered to provide a framework and to prefigure the future area of ERSO on road safety management.

The detailed objectives of the Work-Package are as follows:

- Identifying policy-makers' needs in terms of data, data analysis and methodological tools, and consulting major stakeholders on these issues
- Defining a methodology for the investigation of road safety management and policy-making processes
- Gathering and making available qualitative information on road safety management and policy-making on a sample of countries
- Supporting other DaCoTA work packages by feeding them validated information on policy-makers needs

1.3. General goals of Work Package 4 – Decision Support

The aim of WP4 is to bridge the gap between research and policy to enable knowledge-based road safety management. To support road-safety decision makers, this Work Package will: (1) exploit the data available for analysis by providing forecasts of the road safety situation in the different member states and, possibly, the whole of Europe; and (2) work on the development of ready-to-use instruments. Tools that were well-appreciated in the past will be standardised and complemented by new tools. This will be done in close communication with the end-users themselves. The end-users mainly concern the policy makers, but may in some case also concern power-users from research and the industry.

The expected outcomes of WP 4 are

- National forecasts
To enable target setting and monitoring of the road-safety progress in the different countries, forecasting models will be implemented.
- European forecasts
To identify common trends in different European countries, the accident outcomes will be analysed jointly.
- Web texts
Web texts are already provided on the ERSO website that give compact, impartial information on important road safety issues. These will be updated and web texts on complimenting issues will be added.
- Browser tool for data warehouse
A browser tool will allow easy access to information stored in the Data Warehouse that will be developed in Work Package 3.
- Country overviews
These will give an overview of the road safety situation in each country. Data availability allowing, the overviews will address final road safety outcomes, performance indicators, policy performance and background characteristics.

To ensure that the products of this work package are indeed tailored to the policy makers' needs, the consultation presented here will give a first assessment of these needs. In the following, this panel (or a subgroup) will be consulted for more concrete input and feedback on each of the products named above.

1.4. Specific goals of the consultation of an expert panel

Work package 1, "policy", is based on an extensive information collection exercise to be performed on a large sample of European countries. Working out a detailed methodology for this purpose is a key task and the process of defining, performing and analysing the information on policy-making processes and the needs for knowledge will be carried out during the whole duration of the DaCoTA project.

Work package 4, "decision support" is focused on producing analyses and tools that meet these needs for knowledge. The first step for both work packages is a joint one, to provide information for the collection of data and the construction of tools. To do so, preliminary results had to be produced the consultation of a panel of selected experts in knowledge-based road safety management was thus organised with three purposes:

- Of conducting a preliminary assessment of policy-makers' needs for data and methodological tools based on expert opinion, in order to provide a basis for the development of a data warehouse (WP3) and of relevant decision-support tools (WP4);
- Of serving as a test for the definition of a broader investigation of knowledge needs and policy-making processes to be carried out on a sample of European countries (WP1).
- Of providing a basis to consult non-governmental stakeholders on knowledge-based road safety management issues to be performed so as to get the full picture of needs and practice (WP1).

Given the broad scope of issues provided to experts to comment upon, it is anticipated that some of the results obtained and presented here will also be useful to other DaCoTA work packages.

It is important to mention that this consultation was not aimed to allow for a quantified estimation of the topics that would be brought to the fore by the experts. First: because the time and operational constraints precluded from working with a sample of experts from all countries in the Union. Second, and most importantly, because of the truly exploratory nature of the task: the aim was to have the experts speaking/writing as freely as possible about RS management and the knowledge needs associated to it.

2.METHODOLOGY

2.1. Selection of Experts

The selection procedure for the present study capitalized on the existence of a group of National Experts established by the European commission to obtain information and data concerning accident and road safety, as determined by a council conclusion¹. This group of experts has been set up in the framework of the SafetyNet project, to allow further developing the CARE database² as well as to develop homogeneous country performance indicators across the different member states. The National Experts group includes representatives from all member states as well as from the non-EU “Schengen” countries (Norway, Switzerland, and Iceland). As such the group offers ideal possibilities for liaison with those countries for the purpose of a consultation. The national experts themselves often happen to be involved in decision-making processes in a direct (working as advisors for governments or ministries) or in an indirect way (through the preparation of the evidence that should inform the ultimate decisions). However, the actual professional profile of this group is not very well known. It was consequently necessary to first examine whether the profile of the national experts was adequate for the consultations to be held by the WP1 and WP4 of DaCoTA. Whenever necessary, the National Expert group was extended to obtain the complete panel of experts for this consultation. All experts in this extended group, or panel, received an invitation to take part in the consultation (“Preliminary assessment of needs”), sent by the commission.

In order to check the adequacy of the professional profiles of the experts in this group for the consultations to be conducted, a preliminary questionnaire (“profile questionnaire”) was prepared and circulated to the National Experts. In this questionnaire they were asked to indicate their present position and their experience with road-safety. Table 1 summarises the names and positions of the national experts who completed the “profile questionnaire” for each country. No questionnaire was returned for Lithuania, Luxemburg, Portugal, Romania, Slovenia and UK.

The profile questionnaire also described the planned WP1/WP4 activities. In particular, the “evaluation of needs in terms of knowledge (data, methods, tools) that decision makers use – or would want to use – to guide and orient their decisions” was presented. It was explained that “consultants” would be needed, that is to say, people with good knowledge of what those information needs are in their country, and who are thus either directly involved in decision-making processes, or working as advisors in those processes. The experts were then asked to indicate whether they “felt they could be such a consultant” for DaCoTA. In case they did not consider themselves to be the appropriate person, they were asked to advise one or two

¹ The Transport Ministers adopted the following « Council conclusions » on 5 June 2003 (Council doc. 10753/1/103 REV1 – discussion on the road safety action programme – conclusion # 8): (The Council) urged Member States to co operate fully with the Commission in its efforts to carry out comprehensive analysis on the basis of appropriate data collection with particular attention to accident data, data on research and development, road safety performance indicators, risk exposure variables, investigation of accident causes and trauma data. In this respect, the comparability and harmonisation of data and the wide dissemination of data and knowledge to the decision makers and to the public is a priority, whilst respecting legal requirements in the files of privacy and data protection (...)

² CARE is a Community accident database on road accidents resulting in death or injury (no statistics on damage-only accidents).

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additional names for their country. The names they advised as consultants are given in the right hand column of Table 1 in italics.

The results of the profile questionnaire were examined during the 1st WP1 Technical Meeting (Brussels, February 2010, which was also attended by the relevant WP4 partners). Whenever this appeared necessary, the partners present provided additional names for the countries whose RS management organisation/structure they were familiar with. As one of the partners was from Israel, an expert for this country was also included³. The names that were suggested by DaCoTA partners are underlined in the right hand column of Table 1.

³ Over the last decade researchers from the Transportation Research Institute (Haifa, Israel) were involved in the EU projects such as GADGET, ESCAPE, ROSEBUD, IMPROVER, SAFETYNET, ARTEMIS, CYBERCARS. It is common in such studies to consider expertise from the countries whose representatives are involved in the research team.

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Country	Name	Current Post	Additional names
BE	Y. Casteels	Researcher, IBSR	<u>M. Scheers</u> <u>M. VanSnick</u>
BG	V. Panchev	State expert on Road Safety Ministry of transport, information technologies and communications	<u>I. Kovacheva</u>
	D. Vladinov	Head of Information systems of the Traffic police	
CZ	O. Kastlova	Ministry of Transport Department for Strategy Transport Policy Unit	<u>Z. Ambrosova</u>
DK	S. Hemdorff	Project Coordinator in the Road Directorate	
DE	A. Schepers	Head of Section "Accident Statistics" Accident Analyses" at BAST	<u>G. Kroj</u>
	I. Vorndran	Head of division "Traffic Accidents Statistics" Federal Statistical Office in Germany	
EE	M. Pashkevich	Chief Specialist Estonian Road Administration (ERA) Traffic Safety Department Traffic Safety Programme Division	<u>R. Ude</u> <u>E. Aarniste</u> <u>D. Antov</u>
IE	M. Brosnan	Head of Research Department Road Safety Authority	<u>R. Fuller</u>
EL	G. Yannis	Assistant Professor National Technical University of Athens	<u>A. Tsaglas</u> <u>J. Frantzeskakis</u>
ES	A. Ocampo-Sánchez	Head of Research and Statistics Area National Road Safety Observatory	<u>C. Mederos-Cruz</u>
FR	L. Fernique	General Secreteray National Interdepartmental Road Safety Observatory	<u>C. Machu</u> <u>R. Bergel</u> <u>M. Ledru</u>
IT	S. Bruzzone	Head of the Road Accidents Survey Unit National Statistics Institute	<u>P. Sardi</u> <u>M. Marturano</u>
CY	I. Manoli	Engineer RS Unit Ministry of Transport and work	<u>G. Morfakis</u> <u>D. Dimitriou</u>
LV	A. Lama	Road accident database and road safety expert	<u>J. Smirnov</u>
LT			<u>V. Pumputis</u> <u>M. Ramuné</u>
LU			<u>G. Heintz</u> <u>C. Ginter</u>
HU	E. Csapó	Chief Councillor Hungary Central Statistical Office	<u>P. Lanyi</u> <u>P. Hollo</u>
MT	A. Testaferrata de Noto	Head Transport Research and Development Unit	<u>M. Attard</u>
NL	P.M. Mak	Centre for Transport and Navigation (DVS) Ministry of Transport, Public Works and Watermanagement	<u>P. van Vliet</u> <u>N. Aland</u>
AT	C. Brandstaetter	Senior Researcher, KfV	<u>E. Eichinger</u>
PL	A. Zielinska	Senior researcher, Road Traffic Safety Centre Motor Transport institute	<u>K. Jamroz</u> <u>A. Grzegorzcyk</u> <u>R. Krystek</u>
PT			<u>J. Cardoso</u> <u>A. Lemonde de</u> <u>Macedo</u>
RO			<u>A. Gönczi</u>
SL			<u>B. Zlender</u> <u>T. Pavicic</u>
SK	Š. Machciník	Project manager	<u>B. Bezak</u> <u>K. Meliska</u>
FI	A. Forsberg	Traffic Safety Manager Finnish Transport Agency	<u>R. Kulmala</u> <u>J. Luoma</u>
SE	J. Standroth M. Melkersson	Traffic Safety Analyst / Researcher Statistical Project Manager	<u>T. Lekander</u> <u>C. Tingvall</u>

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UK	Pat Kilbey Anil Bhagat	Head of Road Safety Statistics, Statistician Road Safety Statistics (International and Analysis)	<u>H. Ward</u> <u>R. Allsop</u> <u>D. O'Reilly</u> <u>R. Gifford</u> <u>D. McDonnell</u>
CH	M. Baudenbacher	Project Manager ASTRA (federal agency for roads)	<u>A. Simma</u> <u>S. Siegrist</u>
IS	G. Gunnarsson	Project Manager of Accident Database Director RS Departement at RS directorate	
NO	M. Stoelan Rostoft	Senior Principal Engineer, Traffic Safety Section Norwegian Public Roads Administration	<u>A. Engebretsen,</u> <u>R. Muskaug</u> <u>G. Ranes</u> <u>R. Elvik</u>
Israel			<u>S. Hakkert</u> <u>D. Zaidel</u> <u>D. Link</u> <u>Y. Ronen</u>

Table 1: Answers of the National Experts to the “profile questionnaire” and additional experts suggested.

All the regular members of the National Experts Group set up by the commission, the experts they advised and those added by the WP1 partners subsequently received the “request for written contribution” described in the following section. The experts were given about one month to send their written contribution back. All the interviews were conducted within the same period of time.

2.2. Method of consultation

The preferred method for consulting experts was through semi-directive interviews carried by members of the DaCoTA WP1 team. However, due to language and time constraints, only experts from the countries with representatives in the team and/or those using a language spoken by a team member could be directly questioned. In order to give a chance to experts from all European countries to provide an opinion, a request for written contributions was also sent to all of the panel members.

The contents of written contributions and of interviews were first summarized and analysed separately: using the “Road Safety Management Tasks” matrix as a basis, recurrent themes were identified in each type of material and comments from the experts were classified. The comments classification for the written contribution and for the interviews can be found in Appendices 3 and 4, respectively. This classification, first performed independently by two different WP1 partners for the interviews and for the written contribution has then been checked by two additional researchers in the Work Package, who examined the coherence of the classifications made for the two types of materials. A synthesis of both sets of results was then performed as a final analysis step (see point 3.2).

2.2.1. Request for written contributions

A request for written contributions was prepared by WP1/WP4 team and sent through the EC officer responsible for entertaining the National Experts Group (J.P. Repussard) to all experts selected in our panel (see full text in Appendix 1). In the request, the full scope of the consultation was described. The key tasks identified for policy making and road safety management were:

- Fact finding: diagnosis of the road safety situation at country level, international comparisons between European countries, establishing facts in order to identify target groups for road safety action;

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- Road safety programme development: setting up quantitative targets, selecting appropriate measures or combination of measures addressing the priorities identified in the “fact finding” phase, assessing the expected combined effects of the measures to ensure the quantitative targets can be reached in time;
- Preparing implementation: identifying requirements for the sectoral implementation of measures addressing infrastructure, transport and traffic, vehicles, behaviour, health factors, costing the overall programme and defining funding mechanisms;
- Monitoring and evaluation: following up accident and injury trends, forecasting changes and future trends, assessing the overall effect of road safety policies, evaluating individual measures in the short and the long term.

For each of these tasks, the needs for knowledge to be examined included:

- Data: basic data, composite indicators (definitions, data collection and management, quality issues);
- Technical tools for data treatment: data analysis, modelling, forecasting, costing, etc.
- Other decision-support tools: methodologies, syntheses, aid to access the relevant information or tools, etc.
- Training tools: methods to assess the needs for training, training programmes, other training systems (simulation, games, expert systems, etc.)

Tasks and needs for knowledge were cross-tabulated as a two-dimensional matrix to provide guidance to experts who were requested to comment on as many cells of the matrix they felt entitled or able to. Experts were also free to add tasks or tools which, in their view, were missing in the matrix.

To further guide their contributions, three questions were asked, applying to all cells of the matrix:

- To identify the most important tasks, both in the practice of each country and in the opinion of the expert;
- To elaborating on the needs for knowledge for each of the most important tasks;
- To identify the needs which are already satisfied through the current offer of data, information and knowledge at the European level and the needs towards the satisfaction of which further efforts or research are needed.

The format of written contributions was left free, so that experts did not feel constrained and could easily express themselves. In practice, some experts followed the list of tasks, some used the cells of the matrix, some used the three questions to structure their contributions and a few experts provided ideas outside the framework provided. Text analysis was used to examine the information collected.

2.2.2. Guidelines for interviews

To ensure comparability of interview material, guidelines for the interviewers were prepared by WP1 team members and were used in interviews with the experts. The full document can be found in Appendix 2.

During interviews, the initiative was first to be given to the expert with guidance from the interviewer who was invited to listen rather than question. The guidelines

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provided advice on the duration of the interview and on the way to introduce the exercise to the expert, on how to avoid suggestions and leave the expert free to elaborate on issues of interest, on how to identify key issues on which the expert obviously had more in-depth knowledge and getting this knowledge from him.

Some broad and open questions were formulated to ask the experts in order to get them on the right track for the purpose of the consultation; these were similar to the three questions raised in the request for written contributions, using the matrix as a basis: what are the most important tasks, how to perform them, what is currently done well and what is not done and why? Experts were left to re-formulate the demand in their own way, so that the focus was on what they considered to be the most important issues.

Finally, based on the objectives and preoccupations of WP1 and WP4, precise questions were also provided to get some relevant information on key problem areas: these questions, which formed the framework for the directive part of the interview, were to be asked only if experts had not covered the ground through their spontaneous contributions.

For each interview, detailed notes were drafted by the team member responsible and forwarded to the expert for comments, complements or corrections. The final notes were used for analysis and the synthesis.

3.RESULTS

3.1. Sample description

An invitation for a contribution was distributed by the Commission to the National Experts and the persons suggested by the experts and work package partners. This mailing list therefore contained names of national experts who had evaluated that they were not the most appropriate persons for this consultation. In the whole mailing list, 79 names could be considered as “targets” for this consultation. Of all the persons who received the invitation from the Commission, 38 in total contributed to the consultation. 20 of these contributions were interviews and 18 written contributions. Three persons who were interviewed sent written contributions as well. Two written contributions were produced by two persons jointly and one interview was conducted with two persons jointly.

Country	Type of contribution		
	Written Contribution	Interview	Both
Belgium	1	2	
Bulgaria			
Czech Republic	1		
Denmark	2		
Germany	1		
Estonia	1		
Ireland		1	
Greece		2	
Spain			
France		1	1
Italy	1		1
Cyprus			
Latvia	1		
Lithuania			
Luxembourg			
Hungary	1		
Malta	1		
Netherlands		2	
Austria		1	
Poland	1	2	
Portugal	1		
Romania			
Slovenia			
Slovakia	1		
Finland		1	
Sweden			
United Kingdom		2	1
Switzerland		1	
Iceland			
Norway	2		
Israel		2	
Total	15	17	3

Table 2: Number of written contributions and interviews from the various member states – NB: Interviews or written contributions produced jointly by two persons are counted once; light-greyed countries are those that accessed the EU in 2004 or after.

Overall, the number of contributions obtained can be considered satisfying, given the time constraints: The experts were given less than a month for providing written contributions, and the interviews were supposed to be scheduled, carried out and processed in a month. One can reasonably assume that many experts were unable

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to provide a contribution in such a short period of time, especially those from countries for which the language barrier could not be overcome;

Tables 2 and 3 describe the profile of the contributing group which is shown with respect to two characteristics of the responders: their country (Table 2) and their professional role (Table 3).

As Table 2 shows, the respondents are spread widely across the Union and other European countries. It must be noted however, that, although the member states that more recently accessed the EU did contribute to the consultation, they tended to do so to a lesser extent than the other member states. Less of these countries provided a contribution whatsoever, and most of them provided one written contribution each (while several contributions, written and interviews, were obtained from the “older” member states). This relative under representation of newer member states consequently seems to result both from a difference in response rates and from the composition of the Work Package 1, which influenced the choice of persons that were interviewed.

Position	Type of contribution		
	Written Contribution	Interview	Written contribution and Interview
RS decision maker	2	2	
Head of RS research group	5	5	
Advisor on RS programs		6	2
In-house expert/statistician	3	3	1
RS Researcher	4		
Unknown	1		
Total	15	17	3

Table 3: Number of written contributions and interviews depending of the respondent's function

In Table 3 it can be seen that few contributions were received from decision makers who are not involved in research activities. The majority of the contributions came from people leading a road safety research group, or from scientists who have an advisory function in the government (present or former). There are also a number of researchers working directly in the institution that is responsible for decision making (in-house expert/statistician). A small number of the written responses were sent by researchers who work for institutes conducting road safety research.

To summarise, it can be said that the majority of the contributions on which the present results are based come from people working at the interface between road safety science and road safety decision making. The respondents are used to present research results to policy makers and are thus familiar with the requirements of decision makers with respect to content, and presentation of research output.

3.2. Synthesis of the Written Contributions and Interviews

The general synthesis is based on all the contributions provided by road safety experts: 18 written contributions and 20 interviews. The contributions and interviews cover the following countries: Belgium, the Czech Republic, Denmark, Germany,

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Estonia, Ireland, Greece, France, Italy, Latvia, Hungary, Malta, the Netherlands, Austria, Poland, Portugal, Slovakia, Finland, the United Kingdom, Switzerland, Norway and Israel. The summaries of written contributions and the interviews are given in Appendix 3 and 4 respectively..

Before further discussing the results of the consultations, it is important to remind that the main purpose was to provide an initial in-depth insight into the road safety management needs, not to limit the considerations in advance by any pre-defined boundaries. The experts were free in selecting topics for providing written contributions and were only slightly directed during the personal interviews, where they could focus the discussion on any process or components of RS management of their choice, having no obligation to cover them all. As a consequence, the experts' opinions collected in this process are useful mostly for identification of urgent needs and for providing better definition of the domain in general. Since the framework of the expert consultations was not strictly defined, a quantitative analysis of the information provided in such a process might have been misleading and was therefore not applied.

Moreover, although the total of 38 contributions (of various depth and scope) received can be considered satisfying for exploratory purposes, it cannot be considered as a sufficient statistical sample for numerical analyses. Thus, the results of expert consultations were summed up in a qualitative manner, with the aim of highlighting the needs which were deemed essential for the processes of RS management by the experts. The methodological problems encountered in the current survey, including the need for a more systematic survey, based on a more strictly defined framework (which will be applied on the next stage of the project), are further discussed in Sec.3.3.

The analysis of experts' opinions focused on the identification of data and tools which are essential for the processes of road safety (RS) management. The processes considered are: fact finding and diagnosis of RS problems; RS programme development; programme implementation; monitoring and evaluation. The data, tools and other components indicated by the experts are mostly those which are required for the RS processes but needs for improvements, development of methodologies and of common definitions and methods, etc were also frequently expressed. The findings presented below reflect the opinions expressed by the experts. To assure a correct selection of items from the opinions provided a cross-check was made at each step of the analysis.

Not surprisingly, the findings from the written contributions and the interviews had much in common, i.e. many issues raised by the experts are identifiable in both sources of information. Table 4 (at the end of Section 3.2) provides a formal comparison of the items learnt from both forms of the contributions. The following section provides a summary of the main findings, which are presented in accordance with the four RS management processes.

3.2.1. Fact finding and diagnosis issues

A number of experts feel it necessary to underline that road safety policy-making should be based on knowledge, a point which may not be as obvious to some of the decision-makers in their respective countries (Italy, Portugal, for example). In the interviews, some experts focused the discussion on the need for promotion of evidence-based decision-making. In general, to promote the use of the available information and knowledge in the RS policy-making processes an increase of awareness of the RS decision-makers is required, which is done through a systematic dissemination of findings, communication and training. A possible

incentive for moving to evidence-based policy making could be through adopting formal procedures which would oblige a consideration of the expected safety efficiency of a certain measure or intervention as a necessary condition for its approval (for budget expenses, introducing new regulation, etc). This implies of course that it is possible to actually assess the effects of a measure or intervention under consideration and that if the expected effects cannot be assessed the measure should be abandoned.

Experts do insist on the extent and complexity of the knowledge needed and on the efforts to be made to provide easier access to it. Better understanding of crash mechanisms and causation processes is found essential. The knowledge available to be able to integrate road safety and other policies is an emerging issue.

The following analysis illustrates these points in detail and highlights the implications for the development of new tools and data systems.

3.2.1.1. Assessment, improvement and treatment of existing data

At the national level, the basic data for road safety management is crash and injury data from police sources. Underreporting remains a problem, especially with regards to vulnerable road users (cyclists, pedestrians) and motorcyclists. Severe injuries and serious crashes are not well enough defined and there is a need to come to a better common definition for European countries, especially to perform international comparisons. Crash localisation is not accurate enough, which makes it difficult to link crashes and infrastructure characteristics and to assess geographical disparities.

To develop a better assessment of road casualties, it appears essential to link health or hospital data to crash data from police sources. The definition of reportable serious injuries should find a practical solution in this context. The linking should also provide information on the consequences of the road injuries (time spent in hospital, rehabilitation, etc.) and further facilitate integrating RS in a public health perspective. Other sources to link with have also been mentioned such as statistical files on work related accidents and on the causes of deaths. Another source for checking the reported numbers can be periodical national surveys. Standardized methods for checking data, in particular for assessing the level of underreporting, and for linking police and health databases or Registers are needed.

To improve the reliability of police crash data and reduce underreporting, it has been suggested that the basic data collection at the crash site should be computerized, based on experience (in Italy, for example). This also makes crash information more quickly available for use. A number of technologies, including GIS (Geographical Information System) based ones are available to improve crash location data, but there is a need for creating a common system applicable in Europe with special attention to the secondary road networks.

Some experts emphasize the need for flexible access to crash and injury data so that it is suitable for all purposes from comparisons based on aggregated data to detailed analyses based on individual crash cases: the structure of data introduced in the databases must therefore allow for this flexibility. Among other things, information on the risk ratios of specific types of infrastructure, specific road user groups, etc should be available. Possibilities for disaggregated data analysis of crash, exposure and other databases should be provided for a better examination of specific problems.

For international comparisons, the EC crash databases and ERSO site are acknowledged as useful tools, with some restrictions bearing on the lack of common definitions of the severity of injuries and of serious crashes, on insufficient availability and use of exposure data, and on the need for additional indicators on crash

circumstances and on behaviour (see Section 3.2.1.2). In addition, periodically updated basic fact-sheets on crashes and injuries in the European Union would be welcome as they are faster to work with than a crash database when standard information is needed. In general, the international comparisons are seen as important: for identification of major safety problems of the country; for benchmarking; for evaluating safety effects of various measures/interventions (see Section 3.2.2).

Seminar and other training tools would be useful for facilitating fact-finding, interpreting crash, exposure and other data, getting familiar with the results of good practice, meta-analyses and so on. Further development of targeted databases and information sources for searching relevant facts is required.

3.2.1.2. Insufficient or missing data and needs for new tools

Beyond crash and injury data, experts stress that road safety policy-making must rely on a much broader range of data and that crash and injury databases should be linked to databases on vehicles (characteristics of the vehicle fleet, of newly registered vehicles, pass/failure results of the periodical vehicle tests), on roads (design characteristics, surfacing, signing and marking, safety devices, lighting, state of maintenance), on drivers (driver licensing, traffic violations), on traffic (traffic flows, traffic mix). Further integration of different sources of data (e.g. from the insurance companies) would be useful as well. In most countries, such linkages are still missing and some of the data required, for example on roads and on drivers, has not been fully developed. Standardized methodologies for data collection on vehicles, roads, drivers, traffic should be worked out as well as software for linking the relevant databases.

To further explore the background of road safety, it has been suggested that the crash database should also be linked to the Register of work related accidents, of which in average more than half occur in traffic, or the opposite – to identify crashes occurring on the way to or from work, in the road crash database.

Experts also emphasize the need to collect behavioural data in a systematic way through periodical surveys, especially on the behavioural items known to be related to crash processes (speed, alcohol-impaired driving, use of safety belts, etc.). However, it would be useful to make a distinction between "must-have" and "nice-to-have" road safety performance indicators. The development of common methodologies to collect such data (the process started by the SafetyNet) should be continued. Training tools for survey methodologies to measure such indicators should continue to be produced and best practice results to be disseminated. Establishing an institution for a systematic data collection on behavioural indicators is required. Information should also be collected on road users' attitudes.

Multiple linkages of data bases as well as systematic surveys of road user behaviour should facilitate the identification of relevant exposure data which is indispensable to risk studies and international comparisons. In general, more efforts should be devoted to the definition of exposure indicators for the purposes of international comparisons and priority setting. Quite apart from exposure, the need is also stressed for common behavioural indicators related to crashes. These could be particularly useful for international comparisons. Some experts indicated a need for a more realistic benchmarking and country comparisons, which would account for the legal, cultural and other contexts of specific countries.

Other data to be collected serve to identify external or confounding factors, which influence the crashes and fatality trends without being related to road safety measures or policies. It is important to collect the data on and to evaluate the impact

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of external factors such as weather, demography, economy. Efforts seem to be particularly needed on the systematic collection of disaggregated exposure data for specific road user categories (pedestrians, cyclists, motorized two-wheelers), specific age groups (young/older drivers) and at different locations (geographical level, type of road network).

There is no lack of methods to assess the risk levels of various categories of traffic participants and to identify risk factors. However, as stated by one expert, “the current approach to identify hazardous locations remains primitive in most countries”, so that there is a need to develop a common accepted method based on empirical risk estimates to identify high-risk crash locations, especially with concentrations of severe crashes. There is also a lack of common ground on the level of risk considered acceptable. This is a subject worth being discussed to examine the necessity and feasibility of designing a quantitative risk acceptance method.

More generally, better tools are needed to establish priorities for action, based on crash and related data, such as descriptive analysis methodologies to identify patterns and methods for ranking problems combining descriptive and risk analyses methods. It is suggested that a common accepted methodology for priority setting would help base policy-making on knowledge and would reduce the part of subjective assessment in the decision-making process.

Finally, assessment of the cost of crashes is considered a useful tool to mobilize policy-makers and funding sources. However, there is a lack of useful information on the subject. There is a need both for comparative fact-sheets on costs of crashes in EU countries and for designing a common methodology to assess costs, including the data necessary and the means for collecting it. Assessing the potential benefits from road safety policies requires more tools (see “Programme development issues”, Section 3.2.2).

3.2.1.3. Needs for a better understanding of road safety

The need to reach a better understanding of crash causation at a clinical level is strongly expressed by the experts who point out the need for in-depth crash investigations and analyses. The priority is to analyse fatal crashes and crashes with severe injuries in order to identify the contributing factors. This may mean the preparation of guidelines for crash investigations and analyses as well as the preparation of fact-sheets on typical crash scenarios and the relevant causation factors in European countries. It is stressed that in-depth knowledge of crash causation should open new opportunities for remedial measures.

One expert stated that another entry into knowledge of crash causation may be to collect enquiries (and possibly verdicts) from Courts in charge of crash cases.

Surveys of road user behaviour, already found useful to provide standard indicators for a diagnosis of crashes at the aggregated level, can also be extended to refine our knowledge and understanding of human factors related to different categories of traffic participants and their involvement in typical crash scenarios. Methodological tools have to be developed.

Naturalistic driving studies and driving simulator studies may provide important information on road user behaviour and interaction with road environment, where this information could not be obtained from other existing sources.

3.2.1.4. Integration of road safety with other sectoral policies

Experts are aware that other sectoral policies may rank higher on the political agenda than road safety. In particular, the need to create a synergy between road safety and

the environment agenda is stressed. Moreover, it is underlined that economic trends are going to make it more and more difficult to mobilize funding specifically for road safety (see also in “Programme development issues”, Section 3.2.2). Such considerations do broaden the scope of fact finding although more work is needed to define the needs for data and common methodologies.

Several experts indicated that it is important to consider all the effects together (i.e. health, safety and environment) as such a combination increases the probability of intervention success. On the other hand, frequently the interventions provide positive effects for all the three aspects. In general, a road safety problem has a better chance for increasing social awareness when being promoted in combination with health and environment problems.

3.2.2. Programme development issues

The complexity of policy-making based on broad knowledge is underlined. Experts feel that tools are missing or could be improved for almost every task. In the interviews, the experts detailed more the data needs and underlined the needs for standardized tools and procedures for carrying out the evaluations of safety effects. Some worrying examples of road safety management processes were evoked, such as disjunctions between fact-finding, priority setting, measure selection, and expected results, although this was not the central question in the panel survey. Several experts also highlighted the necessity to improve the circulation of knowledge between and at all levels: European, national, regional or local.

3.2.2.1. Tools for target setting and the selection and combination of safety measures

In the experts' opinion, a quantified target is essential to the success of road safety programmes, provided the period of time allowed for achieving it is strictly defined. Moreover, the definition of intermediate or partial targets should help monitor the progress made during the period of implementation of the programme and thus facilitate the introduction of changes or additional measures if it can be seen that the target is not being reached. The quantified target set up by the European Union has been a great help to calibrate individual countries' own targets. However, it is felt that a more scientific approach is needed at the national level. To this purpose, better tools to determine ambitious but realistic targets are needed.

To reach the agreed target, the right combination of road safety measures should be introduced in a multi-annual programme. Here again, common methodologies are missing. It is stressed, on one hand, that selection and design of the safety measures to implement should take into account the specific country background (culture, habits, current legislation, organisation, stakeholders) and the level of acceptability expected, and, on the other hand, that “ideally”, measures should be selected according to cost-effectiveness. It is commonly feared that subjective or political views will prevail on the knowledge-based approach and the involvement of scientists in programme development and the coordination of implementation is strongly recommended. “As much expertise as possible should be involved from the beginning”

Cost-benefit or cost-efficiency assessments differ according to whether the measures implemented are likely to produce short term effects (infrastructure measures, for example) or longer term ones (education, for example). Moreover, in order to integrate expected road safety effects and other expected impacts on the social environment, a more sophisticated approach to cost-benefit is now required, based on multiple indicators (lives saved, improvement of the quality of life, improvement of

overall health, changes in mobility and decrease of environmental nuisances). There is a need to develop new methodologies to integrate these implications. A more sophisticated approach to cost-benefit evaluations becomes particularly important when casualties are falling and may have reached a level below which they cannot easily go.

The selection and design of appropriate measures generally relies on the cost-benefit or cost-efficiency assessment available at the European level through meta-research studies (see Section 3.2.2.2.). However, it should also benefit from the feedback of past road safety action in the country itself: evaluation of the measures implemented and partial results obtained on the intermediate targets set up for the current action programme provide some valuable indications for the selection of the next measures to implement. Thus, the evaluation task is essential to the long-term process of policy-making (see also below “Monitoring and evaluation”, Section 3.2.4).

To check whether the measures selected are expected together to reach the target of fatality and injury reduction, a holistic approach has to be adopted, which involves analysing, not only the expected effect of each measure and its cost, but also the relationships between the measures and between the crash and injury problems they address. “Models for estimating the combined effects of measures are currently primitive and more research is needed in this area”. The models to be used should ensure, in particular, that fatalities which may be spared through several of the measures of the programme are counted only once (a practical example can be found, for example, in Denmark). Studies on combined effects of measures should be carried out EU-wide and the results communicated. A standard methodology for carrying out such evaluations across the EU would be helpful.

The expected combined effects of the measures integrated in the action programme have to be applied to the fatality and severe injury trends forecast over the implementation period. However, “forecasting a baseline scenario when developing a road safety programme is difficult and more research is needed in this area”. In general, statistical models: time series analyses and forecasting - are required for target setting.

3.2.2.2. Improvement of data and knowledge on the effects of road safety measures

To develop effective road safety programme, it is necessary to have the support of a broad survey of potentially effective road safety measures as well as of “good” (effective and efficient) practices to implement them. It is to be noted that existing meta-analyses of the cost-benefit or cost efficiency ratios of measures probably have to be updated as the information we get from them goes back to a time when the number of fatalities in European countries was much higher than now: therefore the expected reduction in fatalities may not apply any longer.

During the interviews, the experts strengthened the needs for information and data concerning the application and effectiveness of safety measures and interventions in local (country) conditions as well as for qualitative summaries of values from the international experience. More specifically, summary information would be needed on enforcement activities and the impact thereof; on the comparative efficiency of certain policies (e.g. enforcement vs. education) or their combined effect (e.g. measures affecting behaviour and communication); about safety benefits and distraction associated with in-car technologies, etc, in order to better target the resource allocation and to identify which measures and technologies the policy should support. In addition, there is a need for information about the effectiveness of behavioural measures. Many experts suggested that there should be databases with

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accumulated international experience on safety effects of various safety measures and interventions.

In parallel, a need for standardized methods and procedures for carrying out the safety efficiency evaluations was emphasized by many experts. To make the summaries on the efficiency of various countermeasures more accessible, it would be useful to provide tools enabling quick search of recent findings/summaries of studies on specific issues.

Some experts fear that funding allocated to road safety programmes may become constrained, so that “we have to do better with less”. This view, combined with the reducing benefits to be generally expected from safety measures, increases the need for valid information and requires new methodologies to use the knowledge (an example of this can be found in the Total Place approach implemented in Great Britain). Information is also needed on the cost of safety measures in European countries. The costs should reflect all the components in terms of labour, machinery and other resources, which are necessary for the measure's implementation. For example, considering the introduction of tests on alcohol concentration (e.g. saliva tests in Belgium), when selecting the measure, the costs associated with the training of the police officers should be accounted for.

Finally, the expected effect of measures is highly dependent upon implementation conditions and quality. Thus more attention should be given in surveys of safety measures to implementation processes and to the necessary conditions to reach optimal cost-benefit performances. Comparisons of the frameworks in which measures are implemented (the political, cultural, economic, social and legal environment in the different European countries) are important to understand why and how measures are selected and applied and what are the limitations on their implementation. The aforementioned needs are especially relevant as to the introduction of safety rules and regulations. Several experts noted that one of the tools that was most lacking on the international level is a database with traffic laws and regulations, from the European countries, and matching the definitions applied by traffic laws and regulations in the road safety field.

Some experts would also like to see thematic reports on good practices in Europe to reduce key problems such as safety of young drivers, of motorcycles, of heavy goods vehicles, etc., as well as summaries of good practice for specific fields of intervention (e.g. enforcement). It was suggested by one expert that the ERSO site should provide more examples of “best practices” and evaluations of effectiveness.

3.2.2.3. Developing knowledge on public acceptance

Many experts in the interviews were concerned with the problem of public acceptance of road safety measures. The level of public acceptance influences the decision-making processes in road safety, where it is frequently judged not on the basis of objective data about public acceptance, but on the basis of reactions in the media. In an ideal case, a regulation comes following the public acceptance of the measure. However, many road safety measures are not popular with the public in the initial phase that means that the efforts should be undertaken in order to change the situation. (As one expert mentioned: "get public on board but not driven by public")

To improve the situation, it was suggested to collect more systematic and factual information about values, attitudes, etc. of public as to specific safety measures in the country. Comparative legal and enforcement data and information as well as information on the experiences of other countries with respect to the acceptance/resistance of road users in relation to specific measures, would be helpful as well.

3.2.2.4. Integration of road safety with other sectoral policies

Because of current priorities on political agendas as well as the problems anticipated in getting funding for measures which are likely to become less cost-effective, ways have to be found to integrate road safety and other policies, of which the most important ones address the environment (Global Warming related issues). Although experts have not further expanded this opinion in their written contributions, we can see that this involves the development of new methodologies: for example, issues to look at could include identification of common factors to address, assessment of the environmental impact of road safety measures and of the safety impact of environmental measures, impact of both environmental and safety measures on social equity (mobility, costs, quality of life), etc.

3.2.2.5. Improving stakeholders involvement in knowledge-based decision-making and implementation processes

Experts from a number of countries (Greece, Israel, Poland) indicated a need for an institutional arrangement for managing all the road safety processes together, where a clear subdivision of functions between the bodies involved takes place.

The main point is the multiple actors involved in the preparation of road safety programmes (and later in implementing them). At country level, the data and knowledge produced by each group of actors has to be made available to all, so that all sectoral components of the road safety programme should be prepared on the basis of the same information. A national database accessible to all stakeholders (national government, local authorities, police bodies, universities, research centres, industry, etc.) has been suggested with the complement of an electronic forum for actors to exchange and propose. The database should give priority to fatal crashes (at least for target setting).

All stakeholders are to be involved as early as possible in programme development. Failure to do this exposes programmes to non-cooperative attitudes, not from the public, but from some of the actors involved in RS: one expert gave as example the difficulties encountered in trying to implement safety audits on already existing roads. Some of the stakeholders are responsible for road safety at the regional or the local level; while they have to take on some of the national priorities for action, a national target and action programme should also take into account local goals and targets and local road safety policies. The local authorities should be provided with necessary tools and information and be encouraged to compare themselves to others and to use the evidence-based approach when implementing initiatives. Other stakeholders are non-governmental organisations and it is felt that they should also be involved early in programme development as they bring in resources (financial, manpower, expertise) which should be used at best.

For the scientists and key decision-makers involved in target setting and programme development, it is difficult to get such a process going, and the availability of a survey of good practice in at least the best performing European countries would be useful.

Some experts have stressed that, to support good practice in multi-sectoral road safety management, it is necessary to design data collection systems for “the assessment of the main stakeholders’ strategies and interests”.

3.2.3. Implementation issues

This area has not been considered in detail by the experts. In the interviews, only a few comments were provided. This can be explained by the fact that most of the experts responded are specialists of fact finding or programme development rather

than of practical implementation of safety programmes. However, general facts about implementation have been underlined such as needs for technical support in finding funds for measures, lack of monitoring of the implementation of successive measures in the same area of action and complexity of implementation processes.

It can be seen in Table 4 that the needs for Data and Tools indicated for the "Implementation" process have much in common with other RS processes and especially, with the "Programme development" needs.

3.2.3.1. Specific methodological needs

Experts have given little attention to the needs for data and tools in the sectoral implementation of safety measures. Information will have to be obtained through other channels, for example through a more detailed questionnaire survey.

Infrastructure

In the infrastructure area, the need for better and more detailed databases providing a description of road lay-out, signing and marking, safety devices, etc. has been stressed. The users' interface should make access to the database simple. Digital maps are also considered as a valuable tool as they facilitate the mapping of crashes, and these are not yet available in all European countries.

The need to adopt a sound common method to identify black-spots (high risk locations) on the basis of risk estimates has been mentioned by some experts, although others feel that the returns expected from black-spot treatment are dwindling as most of the severe crash accumulation locations on the main European roads have by now been treated.

It is to be noted that in the written contributions no experts commented on the implementation of safety plans or measures in urban areas or on a systematic approach of infrastructure improvement involving road safety audits of current construction, rehabilitation or heavy maintenance projects or the systematic inspection of the existing road network with a view to upgrading it or altering it in a "Vision Zero" perspective (eradication of fatalities and serious injuries).

At the same time, in the interviews, several experts underlined the importance of road safety audits and road safety inspections for the implementation of road infrastructure improvements. The data from those audits and inspections should be collected on a systematic basis.

Vehicles

In the area of safety measures addressing vehicles, the need for better information on the vehicles involved in crashes have been stressed: statistics should include age of vehicles, make, model, safety equipment, results of the last technical tests, etc. Exposure data needs to be improved.

In-depth analysis of crashes is found as an essential tool. A common methodology and training material should be made available.

Experts mostly feel powerless in the field of vehicle safety: they find that even proven cost-effective measures such as ISA (Intelligent Speed Adaptation), alcolocks, seat belt ignition interlocks, etc. are not introduced: "A major problem of road safety policy making today is that many promising measures for improving safety refer to vehicle technology, but that no country can unilaterally decide to make new vehicle safety technology mandatory. Since adopting new vehicle safety standards is based on international consensus, the process is slow and ineffective." Even more frustrating is

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the fact that some Intelligent Technology Systems (ITS) measures supposed to have a high effect on crash reduction are introduced while no evaluation studies have actually demonstrated that these systems were actually beneficial for safety; some experts even suspect that they could deteriorate safety by distracting drivers' attention from other tasks.

It seems that an overview of ITS on board vehicle systems, could be useful to clarify the situation.

Behavioural measures

The need for more in-depth knowledge of behavioural patterns is underlined: "basic knowledge and understanding (at a microscopic level) of user behaviour under normal and critical circumstances needs further advancement". This should help refine micro-simulation tools which are used in particular for infrastructure design, but could also help understand behavioural compensation processes. Thus, in-depth analysis of behaviour is not useful only to design measures directly addressing behaviour, but also to design other measures addressing the environment of road users and whose success relies on proper adaptation to normal behaviour or on adequate behavioural adaptation.

Experts find that improved and more rigorous enforcement of traffic regulations is necessary. However, automatic enforcement of particular traffic rules is a concern as the use of cameras is hindered by the consideration of private protection. In this field, the European enforcement directive has proved useful. There may be case for producing a fact-sheet on automatic enforcement in European countries, providing a state-of-the-art and a description of the legal and operational dispositions that proved necessary to implement the measure.

Some experts express needs for very operational tools, such as samples of spots and posters for road safety campaigns on different themes or a review of the contents of driver training programmes in European countries.

One road safety expert indicated that we would learn more about behaviour change from the public health sector. Applicable summaries on methods and tools of risk education from the public health sector would be useful for the road safety field.

Measures in the Health sector

Experts have concentrated on the treatment of traffic victims and would like to see diagnosis results on injury rates according to a medical injury scale, time in hospital and time in rehabilitation. A fact-sheet on the details of injuries and the hospital and health burden they represent in Europe would be useful (provided a common definition of injury severity is reached as mentioned before).

Although very little was written on emergency rescue systems, some experts are concerned with the provision of first aid at the crash sites. They express the need, for example, for a collection of examples of education programmes for ambulance drivers.

Surprisingly, no other health measures have been considered although the health sector is also involved in fact-finding (collecting data on injuries, investigating the long term effects of crashes and of trauma, etc.) and in prevention: reducing the impact of health-related factors on crashes and injuries (chronic alcohol or drug consumption, effects of some diseases or some medicines on driving abilities or performances, the design and implementation of health tests for professional drivers, etc.), providing health education oriented towards injury prevention, etc. The lack of comments on these issues seems to come out of a bias in the selection of experts

who are mostly representatives of the transport sector, the leading sector for road safety in European countries.

3.2.3.2. Funding issues

Experts first find that the issue of scarce funding is often a pretext for not progressing on the implementation of cost-efficient safety measures. Funding would often be found adequate if the money was spent wisely, which calls the attention again on the issues of evaluation processes and the availability of an updated review of cost-efficient measures (as seen in Section 3.2.2.2). One expert goes one step further in making the availability of funding the test of political will to implement safety measures: if the funding and the political will behind it are not there, “one should not start with implementation as all other points are a pure academic exercise”. From this, we can understand that, to implement a safety programme, the efforts should be more on raising political awareness than on justifying the amount of money spent.

However, justifying spending of public money has to be done. For this, existing tools and methodologies are found quite insufficient. What is most needed is a methodology to assess the costs of crashes, including, of course, injury costs: although various methods have been used in the past, what we need now is a common validated tool. It is to be noted that a lot of discussion will be necessary to get a consensus on the best method to use (for example, one which leads to the same order of magnitude for the cost of human life in European countries) and to get it accepted by decision makers.

We also need tools to assess the cost of road safety measures. These can take the shape of a database of the costs of selected road safety measures in European countries; however, to be applicable, this tool should be based on a standard method to estimate the costs, which details the elements to be taken into account in the implementation process of each type of measure. It would also be useful to provide guidelines to identify these elements of costs, based on all the resources to be mobilized for implementation (investments, technical aids, manpower, expertise, evaluation); such guidelines would also serve to identify the needs for funding and the availability of the relevant resources.

Some experts also remarked that it would be helpful to get centralised information on the potential funding sources for road safety measures, especially those addressing infrastructures. Also a need for information about the total expenditure on road safety in European countries, and international comparisons of this expenditure, has been expressed.

3.2.3.3. Monitoring implementation

All road safety measures should be monitored to keep track of the successive steps of road safety action and historical records of changes. The implementation processes of safety measures should themselves be monitored, in particular to provide feedback for cost assessments and the definition of optimal implementation conditions. This is currently not done or, at least, not done systematically and completely. Examples of good practice (if any) and methodologies could be useful.

3.2.3.4. Complexity of the implementation process and training needs

Implementation of inter-sectoral road safety programmes is considered one of the most difficult issues in road safety management. For one thing, once the action programme has been finalized, actors in each sector are responsible for implementing their part of it and there is no general process to ensure that they do.

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Little is known about good practice in extending inter-sectoral coordination from decision making to implementation.

The needs for training are multiple as there are many groups of actors performing very different tasks. Experts state that we have to develop methods to assess the training needs of individuals involved in implementation processes. Training tools will no doubt have to be developed, including training programmes and training manuals and material, and using various kinds of media (expert systems, simulation, games, etc.).

According to some experts, the information already available on European or other appropriate websites is useful and can be regarded as training material. However, access to the right information is not easy, especially for road safety actors who are new in the field. In general, material available in electronic format appears less practical than the good old manuals published as books where the reader could find immediately where the relevant chapters were. So, valuable information seems to be under-used. A user-friendly interface needs to be designed to help new users of road safety material find their way to the needed pages on the internet.

Few experts commented on the actual content of the necessary training tools. It is quite clear that a full assessment of needs has to be performed first in relation to the tasks to be performed, whether in fact-finding, programme development, implementation or monitoring and evaluation. For making a safety-based approach more applicable training tools are needed for various professional groups such as: for local authorities and town planners - to account for safety implications of various decisions; for major road authorities - for carrying out safety evaluations, selecting infrastructure improvements for black-spots' treatments, estimating consequences of selecting various road design features, etc.

3.2.4. Monitoring and evaluation issues

3.2.4.1. Tools and methods for monitoring, forecasting, and policy evaluation

Experts agree that it is necessary to monitor the road safety situation at the national level, yearly and quarterly. But they do not see the monitoring as a simple operation of collecting and counting crashes and fatalities: crash trends both global and those of specific road user groups, have to be analysed relatively to social and economic parameters as well as to exposure; behavioural trends have also got to be followed up through appropriate surveys. Moreover, the influence on safety trends of other external factors (such as weather conditions, for example) has to be highlighted, and short term monitoring at least should be based on seasonally corrected data. In order to do this, models have been developed which investigate the risk factors (or confounding factors) unrelated to road safety policies. Such models and the databases they are applied to need to be periodically updated. A suggestion was made to also monitor the trends in other transport modes.

Most experts feel that better data and tools than what is available now have to be developed for practical use. One expert suggests to use two different kind of models for short term and medium/long term monitoring: for the short term, the model would automatically correct the raw values for the transitory weather factors; for the medium/long term, a three-tiered model would be used (exposure to risk, crash risk, crash severity), for which exposure data would be necessary; the main effort would then be to gather harmonized exposure data for at least a sample of European countries.

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In the interviews, experts indicated the needs in a range of statistical models including statistical tools for a short-term trends analysis; statistical methods for isolating safety effects of specific policies; basic knowledge for developing forecast models. It was mentioned by some experts that monitoring trends should focus both on fatalities and seriously injured.

Some experts find that the decision-making trends and the main stakeholders strategies and interests also need to be monitored.

Forecasting crash and fatality trends is essential when setting a quantitative target both ambitious and attainable. It is also necessary to forecast the expected trends on a yearly and quarterly basis during the period of implementation of the targeted programme in order to check if the figures observed match the expected values and bring appropriate changes to the action programme if they do not. Forecasts should thus be produced systematically.

However, forecasting is a difficult exercise as modelling is complex and historical data is often insufficient. "The process of compiling reliable historical crash databases and the development of recognised forecasting techniques require additional input and efforts". It is suggested that three level models (exposure to risk, crash risk, crash severity) should be used for providing forecasts in the long term; this includes forecasts of mobility.

The global evaluation of road safety policies may be performed by means of global trend analysis, correcting for the effects of unrelated risk factors (weather, changes in traffic, etc.). Evaluation may also be based on performance indicators or on the intermediate targets set up when developing the action programme. However, just checking on such indicators, even if they are adequately defined, does not correct for the effects of the confounding factors unless more sophisticated comparison tools are used. One expert stated: "As far as I know, there are no methods for evaluating multi-measure initiatives".

It appears that this whole area deserves methodological development.

3.2.4.2. Tools and methods for the evaluation of safety measures

The importance of evaluating road safety measures systematically when implemented is strongly emphasized: "The fact that a lot of evaluation studies have been reported is no argument, as the effects of many road safety measures may change over time and knowledge needs to be continually updated". However, in many European countries, evaluation is not integrated into the road safety management process and therefore is not regularly performed: "If there is one area where we need to progress, it is detailed monitoring and evaluation of the measures implemented". Evaluation is not "valued as an important tool for the advancement of the transport system, this is an issue deserving improvement".

Many experts highlighted a need for reliable data on measures and interventions applied. A practical solution for a systematic collection of information on road infrastructure improvements would be in establishing databases maintained by the road authorities, which are responsible for the measures' implementation. Such databases would oblige regular reporting on the finished projects, including detailed information on the measure's characteristics, implementation period, costs, etc. Using such detailed information, a systematic evaluation of safety effects would become feasible.

Another source of information on the effectiveness of road safety engineering measures could be by having a representative sample of the work of local authorities

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(local and national highways agencies, etc.) audited, over many years, so that the expected reduction in injuries brought about by specific interventions could be estimated (the UK approach). Good information on the total costs (hidden costs included) of these interventions would also be necessary.

Evaluation is recognized as a difficult task. Measures whose effectiveness and efficiency have to be assessed may have effects in the short term (infrastructure, traffic, enforcement, etc.) or in the long term (education, driver training, vehicle regulations, etc.), which calls for different evaluation techniques. It is also necessary to consider the effects the road safety measures have outside road safety sector and conversely the road safety effects of measures taken in other policy sectors. Moreover, it is not enough to find out whether road safety measures work, it is also necessary to know why and how: without this knowledge, transfer of good practice from one country to another may lead to failure. Thus, evaluation should be qualitative as well as quantitative, which calls for more than crash and injury data (for example, behavioural indicators measured through surveys). Although some evaluation methodologies do exist and are well known, efforts have still to be made to outline the whole scope of evaluation needs and approaches.

The need to better integrate the evaluation methodologies already available at the European level into the policy making process at the national level is underlined. It is also noted that crash or injury data may not always be substantial enough to apply these methodologies. In some cases, this may involve defining and using surrogate data for crashes (such as traffic conflict techniques or road user behaviour observations). For this, it will be necessary to reach a consensus on which surrogate data should be used for specific measures and how to collect it.

In any case, as it was strengthened by one of the experts, the methodology for evaluation and respective indicators are to be defined before a measure is taken, where, in general, "monitoring and evaluation" should be considered as a basis for setting measures, and not as a terminal step in the process.

3.2.4.3. Reporting on road safety actions

Several experts emphasize that one of the most important tasks in road safety management is reporting by the agencies responsible for road safety on their actions and their results to the higher authority in control: either the Parliament or the Government. This is usually done once a year, more frequently in some countries. The process ensures that there is no relaxing in the implementation of the national road safety programme and that progress is made or changes are brought in.

The reporting to higher authorities requires a descriptive framework as well as an evaluation system using performance indicators or intermediate targets and based on reliable crash and injury data, treated through appropriate techniques to eliminate biases and confounding factors. Collecting information on the initiatives and measures implemented requires some institutional organisation as actors are involved at the national and the local levels. A review of good practice and the tools used for reporting would be useful.

It was suggested that the EU countries should develop norms and quality standards for RS measures, which would harmonize both the implementation and the evaluation of measures.

Table 4 below provides a comparative overview of the needs expressed by the experts in the interviews and written contributions respectively. This table also indicates whether each of the needs listed could be fulfilled by means of data (D) or tools (T).

3.2.5. Limitations

The experts have been consensual in expressing needs relating to the improvement of the quality of the evidence available to support decision-making in the field of road safety: The level of aspiration depicted by the consultation material is - with respect to data collection, methodological guidance and standards - actually quite high. One should however bear in mind two important aspects of the sample of experts who took part in the consultation when coming to that conclusion. First, the countries that have a longer experience of road safety data collection and research tend to be better represented (see Section 3.1). Although relatively refined evidence needs have been expressed, this should not necessarily be interpreted as an indication that more basic needs have been fulfilled already, or that more basic research methods are routinely used and mastered in all countries.

A second aspect of the sample that calls for attention is the fact that the majority of the contributions were obtained from persons directing a research group, or from scientists having an advisory function in the government. Road-safety decisions are made at various levels in every country. Other topics are likely to have come to the fore, and different (maybe even contradicting) opinions may have been expressed had this sample been less uniform (including actors from the local levels or members of political parties). However, given the aim to assess the needs to scientifically support decision-making processes, we believe that the present consultation succeeded in selecting the appropriate target group.

Consultation of a panel of experts

1. Fact finding and diagnosis issues

Interviews	Written contributions
1.1. Assessment, improvement and treatment of existing data	
<ul style="list-style-type: none"> - Better definitions for serious injuries D - Methods for assessing underreporting and for linking police and health databases T - Seminars and other training tools for fact-finding, interpreting the data (Training) - Targeted databases and information sources for searching relevant facts D - Disaggregated data for better problem examinations D - GPS support for data collection T - Risk ratios for specific types of infrastructure, road user groups D - International comparisons of trends in specific groups of road users, e.g. motorcyclist, elderly, notorious offenders D 	<ul style="list-style-type: none"> - Better common definitions for serious injuries/crashes for European countries D - Standardized methods for checking injury/crash data, assessing underreporting and for linking police and health databases T -GIS-based systems for data collection by the police T - Flexible tools to access crash and injury data T - Periodically updated basic fact-sheets on crashes and injuries in the European Union D - Exposure data D - Behaviour indicators D
1.2. Insufficient or missing data and needs for new tools	
<ul style="list-style-type: none"> - Definitions of behaviour indicators and their priorities D - Definitions of work related crashes (on the way to and from work) D - Establishing a system for collecting behavioural indicators T - Methods for collecting exposure data on walking and cycling T - Exposure data for motorcyclists and pedestrians D - Statistical methods for priority setting T - Road safety expenditures, also in comparison with expenditures on other policy areas (e.g. environment) D 	<ul style="list-style-type: none"> - Standardized methodologies for data collection on vehicles, roads, drivers, traffic T - Software for linking the databases T - Link to the database of work related crashes T - Common methodologies for collecting behavioural data and road users' attitudes T - Definitions of exposure indicators for international comparisons D - Definitions of common behavioural indicators D - Systematic collection of weather data, of disaggregated exposure data for specific road user categories, etc. D - Common method for identification of hazardous locations T - Quantitative risk acceptance method T - Descriptive analysis methodologies to identify crash and other patterns T - Common methodology for priority setting T - Comparative fact-sheets on costs of crashes in EU countries D - Common methodology to assess costs, including the data necessary and the means for collecting it T
1.3. Needs for a better understanding of road safety	
<ul style="list-style-type: none"> - Naturalistic driving studies and driving simulator studies T - Evaluation of impact of external factors on road safety, e.g. economy, weather, demography T 	<ul style="list-style-type: none"> - In-depth crash investigations and analyses of severe crashes D - Guidelines for crash investigations and analyses T - Fact-sheets on typical crash scenarios and the relevant causation factors in European countries D - Methodological tools for better understanding crash scenarios using surveys of user behaviour T
1.4. Integration of road safety with other sectoral policies	
<ul style="list-style-type: none"> - Examples of synergy between road safety and the environment agenda D - Values of fatalities, injuries per capita for comparison with health sector D 	<ul style="list-style-type: none"> - To create a synergy between road safety and the environment agenda – needs for data and tools to be defined (General)

Table 4: The needs expressed in experts' opinions: data (D) and tools (T) required for the performance of RS management processes

2. Programme development issues

Interviews	Written contributions
2.1. Tools for target setting and the selection and combination of safety measures	
<ul style="list-style-type: none"> - Statistical models (time series analyses and forecasting) for target setting T - Multi-factoral models for estimating the implications of safety measures (safety, quality of life, health) T - Results of combined effects of safety measures across the EU D - Efficiency assessment methodologies which integrate other implications of safety measures (health, mobility, environment, etc) T 	<ul style="list-style-type: none"> - Tools to determine ambitious but realistic targets T - Efficiency assessment methodologies which integrate other implications of safety measures (health, mobility, environment, etc) T - Models for estimating the combined effects of measures T - Forecasting a baseline scenario when developing a road safety programme T
2.2. Improvement of data and knowledge on the effects of road safety measures	
<ul style="list-style-type: none"> - Data on the efficiency of measures and policies implemented in local conditions D - Information on the efficiency of in-car technologies D - Summaries of good practice including the implementation conditions D - Examples of "best practices" and evaluations of their effectiveness – on ERSO site D - Standardized procedures and methods for carrying out the evaluations T - Databases with accumulated international experience on safety effects of various measures and interventions D - Information on frameworks for safety rules and regulations in the European countries D - Tools enabling quick search of recent findings/summaries of studies on specific issues T - Effectiveness of behavioural measures T - Overview of and information about measures that are taken in other countries with respect to specific target groups D - Detailed costs of safety measures and interventions D 	<ul style="list-style-type: none"> - Systematic updates of results of meta-analyses of safety effects and CBA/CEA ratios of safety measures D - Costs of safety measures in the European countries D - Comparisons of the frameworks in which measures are implemented D - Thematic reports on good practices in Europe concerning key problems D
2.3. Developing knowledge on public acceptance	
<ul style="list-style-type: none"> - Information on public attitudes concerning safety measures D - Comparative information from the countries concerning the acceptance of specific measures D 	
2.4. Integration of road safety with other sectoral policies	
	<ul style="list-style-type: none"> - Methodologies to identify common factors to be addressed when safety and environmental impacts are considered T
2.5. Improving stakeholders involvement in knowledge-based decision-making and implementation processes	
	<ul style="list-style-type: none"> - A national database accessible to all stakeholders D - Survey of good practice in at least the best performing European countries on involving all the stakeholders in the programme's development D - Data collection systems for "the assessment of the main stakeholders' strategies and interests" D

Table 4: The needs expressed in experts' opinions: data (D) and tools (T) required for the performance of RS management processes (cont.)

3. Implementation issues

Interviews	Written contributions
<p>3.1. Specific methodological needs</p> <ul style="list-style-type: none"> - Information from road safety audits and road safety inspections D - Information from the public health sector on the ways of risk education and changing behaviour D 	<ul style="list-style-type: none"> - Infrastructure: detailed databases providing a description of road lay-out, signing and marking, safety devices, etc D - Digital road maps for mapping crashes D - Sound common method to identify black-spots T - Detailed information on the vehicles involved in crashes D - Common methodology and training material for in-depth crash analysis T - Overview of safety evaluation results of ITS on board vehicle systems D - Tools for micro-simulation of road user behaviour in certain environment T - Fact-sheet on automatic enforcement in European countries, including legal and operational dispositions to implement the measure D - Samples of spots and posters for road safety campaigns D - Review of the contents of driver training programmes in European countries D - A fact-sheet on the details of injuries and the hospital and health burden in Europe D - Examples of education programmes for ambulance drivers D
<p>3.2. Funding issues</p>	<ul style="list-style-type: none"> - Methodology to assess the costs of crashes to be accepted by decision-makers T - Database of the costs of road safety measures in European countries D - Tools to assess the cost of road safety measures, including guidelines to identify elements of costs T - Information on the potential funding sources for road safety measures D
<p>3.3. Monitoring implementation</p>	<ul style="list-style-type: none"> - Good practice and methodologies for monitoring implementation T
<p>3.4. Complexity of the implementation process and training needs</p>	<ul style="list-style-type: none"> - Methods to assess the training needs of individuals involved in implementation processes T - User-friendly interfaces to help new users in finding road safety material in the internet D/T

Table 4: The needs expressed in experts' opinions: data (D) and tools (T) required for the performance of RS management processes (cont.)

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4. Monitoring and evaluation issues

Interviews	Written contributions
4.1. Tools and methods for monitoring, forecasting, and policy evaluation	
<ul style="list-style-type: none"> - Statistical methods for following-up trends T - Monitoring serious injury in addition to fatalities D - Statistical methods for developing forecast models T - Statistical methods for isolating effects of specific policies T - Crash prediction models for various road types T 	<ul style="list-style-type: none"> - Two kinds of models: for short- and medium/long- term monitoring T - Database on confounding factors for the models' development (weather, exposure, etc) D - Methodologies on evaluating trends/forecasting accounting for multiple factors and interventions T
4.2. Tools and methods for the evaluation of safety measures	
<ul style="list-style-type: none"> - Appropriate techniques for the evaluation of safety effects of various measures T - Reliable data on measures and interventions applied D 	<ul style="list-style-type: none"> - Detailed monitoring of the measures implemented D - Evaluation techniques for various kinds of safety measures T - Definitions of surrogate data applicable for some evaluations D
4.3. Reporting on road safety action	
<ul style="list-style-type: none"> - Norms and quality standards for infrastructure improvements and other RS measures D - Detailed information on the measures implemented D 	<ul style="list-style-type: none"> - Review of good practice and the tools used for regular reporting on the programme's implementation D

Table 4: The needs expressed in experts' opinions: data (D) and tools (T) required for the performance of RS management processes (cont.)

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3.3. Implications for DaCoTA

3.3.1. Work Package 1 – “Policy”

The results of the consultation of the panel of experts should be consolidated through a much more directive form of investigation, based on a questionnaire and addressing key persons in road safety management and policy-making in a broad sample of European countries.

The next task in WP1 will be to develop the investigation methodology and the questionnaire. The present consultation provides a basis to go forward on the questions dealing with the needs for data and methodological tools. In particular:

- we have obtained an overview of the issues which the experts have deemed important or very important; it will now be possible to formulate closed questions to clarify and get more in-depth insights into these issues; this will allow for the quantification of some of the answers and thus the identification of priorities;
- we found that the utmost attention will have to be given to structuring and phrasing the closed questions in order to ensure that they are well understood by the persons answering them and that none of them are skipped; this is all the more important as, in most countries, the original questionnaire in English will have to be translated;
- it is clear that even when questions are formulated as precisely as possible, there may still be some misunderstanding, due to language problems but also because an investigation of this kind reflects the experience of the researchers which is not always shared by the practitioners interviewed; thus it is advisable to get the future questionnaire filled in through direct interviews (which means face-to-face as much as possible) with the key road safety actors, so that clarification can be given when needed; in the next step of investigation, the WP1 partners should therefore be involved in information gathering as they have been involved here in interviews, although the type of exercise will be different;
- as expected, we found that each of the experts in our panel could express a qualified opinion only on part of our subjects of interest; in order to get comprehensive results with such a broad-scoped investigation, it is thus obvious that several actors will have to be consulted in each country selected in order to get answers to all questions; the members of the panel already consulted may be called upon to help identify other persons in their own countries who will be able to focus on particular topics they have not broached upon themselves.

The questionnaire to be developed also includes an investigation of the road safety decision making and policy-making framework in each European country. The questions on these issues will focus on institutional organisation and processes which have only been globally examined in previous European projects and need to be better known and understood. The closed questions will be developed mainly through the experience of some of the team members in this field. However, we found that, although the present consultation of experts did not focus on organisation and processes, some valuable indications have been provided by experts (for example, on reporting on road safety progress, integrating road safety into wider-scoped policies, etc.). These indications will enable us to enrich the investigation to come.

Finally, the issues identified by the members of our panel of experts will serve as a canvas on which the consultation on non-governmental stakeholders will be based. The methodology for this consultation is still under discussion, and the practical experience gained from this first task of WP1 will be most useful.

3.3.2. Work Packages 3 & 4 – “Data Warehouse” and “Decision support”

The importance of data and scientific information at European level had often been brought to the fore in the consultation process. The consulted experts recognise the importance of this information, and they consider the European level as the appropriate source of methodological and technical guidance (guidelines, best practices), and as the “place to be” for all information regarding the road safety activities (mostly the measures and legislations) undertaken in other member states. We have received many indications that European countries do look at each other, not so much to be able to tell who’s performing better or worse, but mostly to be able to know more about what the others are doing to improve RS, and to learn from each others’ experience.

This has direct and important implications for the data warehouse of WP3, the tools that are going to be developed in the framework of the WP4 of DaCoTA, and more generally for the future developments of the ERSO. In the following, the implications of the themes and discussion points that have been evoked by the experts are discussed.

3.3.2.1. Data warehouse design and development

The design of the DaCoTA system, as a data warehouse with knowledge, data links etc. may benefit from several suggestions and remarks of the expert panel. In particular, the data warehouse may address the need for linked databases of different types of road safety related data, as it will bring together accident, exposure, health, behaviour, measures, costs and other data. This was a key objective of the development of the data warehouse in the first place, and the consultation of the expert panel fully confirmed this need. Moreover, the need for improved accessibility to data, knowledge and tools will be addressed by means of the appropriate design of the data warehouse.

Assembly of national data

The data warehouse is intended to include a wealth of data from all European countries, by establishing standardised formats and disaggregation’s for viewing and using the data. The expert panel stressed the need to include not only accident data, but also risk exposure data, performance indicators, health indicators and causation indicators, which is already foreseen. Information on road injury under-reporting is an additional point, raised by the experts, to be considered while assembling the national data.

The need to routinely link national databases has been frequently expressed by the experts. More complete information about accidents should be available, and these often can be found in other, already existing databases: the vehicles involved (data from vehicle inspection, car registration centres, insurance companies), accident location (geographical information systems), the drivers (driving licence registration, data from the insurances), and the consequences (hospital or insurance data). Legal and practical obstacles that have been encountered to link different databases should be described and, if possible, solutions that proved efficient in some of the Member States. It would also be worth comparing the costs and efforts required for

appropriately relating the different data sources and those involved by a “mere” improvement of the accident data collection process (inclusion of additional information, use of software to support data collection by police officers...).

Alternatively, data from different sources can be linked ad-hoc in dedicated national surveys. For example, in the project SafetyNet, several EU countries have conducted surveys in which accident data were compared to hospital data, to assess the quality of the accident data and to evaluate the magnitude of underreporting⁴. Several experts have requested guidelines about how to implement such studies. Methodological guidelines for the use of national surveys to investigate underreporting could be derived from the experiences from the studies conducted in SafetyNet and published in a compact format, for example as a web-text or a short report.

Assembly of national information

The experts emphasized the need for gathering additional data, namely data on traffic rules, legislation and details on their practical implementation. They underlined the need to collect and organize the knowledge concerning the implementation of road safety measures in different countries, including not only their safety effects, but also the details and conditions of their implementation, as well as the implementation costs; this could be pursued within the development of the data warehouse.

Especially as regards the collection of accident cost data, which is also foreseen, the experts pointed out several questions that need to be taken into account by WP3, namely concerning the comparability of data between countries, the lack of appropriate and standardized methodologies for estimating these costs etc. Methodological guidance for cost evaluation has actually often been mentioned, and would consequently be found useful if made available on the ERSO website. The complexity of the question would however require a complete report (rather than a web-text or a short report) and is thus beyond the scope of the DaCoTA project.

The way these needs were prioritised by the members of the experts panel may serve as a guide to setting priorities in the collection of the related national information within WP3. Moreover, apart from gathering the above data and information, it is important to provide the user with all the necessary additional information for optimally using the data (see also section on meta-data below).

Establishing Links with External Files

In addition to the assembly of a variety of national and international data, within the development of the data warehouse, the establishment of links with national and international data files, research projects data and other stakeholders' data is also foreseen. This may further address the need expressed by the experts for improved accessibility to data and knowledge.

Organising Meta Data

Within the development of the data warehouse, all the related meta-data (sources, information, definitions, data quality, etc.) will also be collected. These meta-data will refer to all figures of each country and of each year included in the data warehouse. The expert panel stressed the need for more and more reliable data. They also pointed out the areas where data comparability and quality issues are more pronounced, e.g. behavioural data, road safety measures data and social cost data.

⁴ Note however, that hospital and police data are both subject to misreporting. Ideally multiple imperfect data sets should be joined on a routine basis as to arrive at the best possible estimation of victim numbers (c.f. Lyons et al, 2008).

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WP3 should therefore focus on providing all the necessary meta-data with priority on these issues.

Establishing Output Interfaces

The comments received during the consultation indicated that the accessibility of data and of the information is crucial. The knowledge and data accumulated by means of European projects up to now was often considered insufficiently available: confirming the necessity to assemble this knowledge in a common framework. The specifications for the output interface, the browser tool, will be developed together with a sub-set of the responding expert, to ensure an optimal accessibility.

The output of the data warehouse already includes an Annual Statistical Report and a set of Basic Fact Sheets. These serve as decision support tools and are particularly welcome by the experts as they can be very efficient for fact-finding, international comparisons etc. The experts stressed however the need for these tools to be standardized, to include enhanced data and information, as well as analyses results. Moreover, they should be regularly updated.

Country Overviews

WP4 plans to produce a new output format - country overviews allowing country comparisons on three main areas: (1) the primary outcomes (accident, accident victims, and social costs); (2) secondary outcomes (countries performances with regards to behaviours that are known to have important negative implications for RS (speeding, drink-driving, use of seatbelts...), and (3) information about R.S policies and measures and the general context in which these were taken.

The consultation revealed that the experts consider this context to be very important. A comprehension of the legal environment in which measures are applied is deemed necessary. There is a desire to learn from the others - that is to compare one's own experience of RS management with that of others - but the necessity to be more familiar with aspects in which the countries are not comparable was also expressed.

3.3.2.2. Analyses

Target setting

The need to monitor the development of road-safety and the necessity to set realistic road-safety targets was confirmed in the contributions of the experts. Forecasting crash and fatality trends is considered essential when setting a quantitative target that is both ambitious and attainable. WP4 will produce such forecasts at both the national and the European level.

Monitoring and evaluation

It is also deemed necessary to regularly check the developments to compare the actual achievements to the ones that are necessary to reach the target. The experts often expressed the need to increase the ability to disentangle the influences of actual RS actions – or changes in the RS system itself – from other, more external or accidental influences, such as the economic situation in order to better understand the evolution of the RS situation, and, ultimately, the impact of RS actions. Such fine-grained analyses will inevitably depend on the nature and quality of the data collected. Besides, it should be stressed that there is no existing methodology for such an evaluation (which implies the modelling of a global trend while correcting for

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the effect of risk factors that are unrelated to traffic). This concern is nevertheless in agreement with the automated approach that WP4 is aiming for: to enable routine updates of the analyses with little additional effort jointly with more elaborated models whenever data availability in a country allows it. By means of these more sophisticated models, WP4 will be investigating the possibility to include related (risk exposure, interventions, measures, etc.) and unrelated risk factors (development of the population, economical development, etc) into statistical models of the development of accident and victim numbers.

Webtexts

Many needs expressed by the experts concerned knowledge, and some of the knowledge is actually available. For those contents for which knowledge is available, an accessible format has to be found. This could be basic fact sheets, web-texts, or short reports. The web-texts are intended to provide a quick but thorough overview of key road-safety issues. The concern when creating them really was quick and easy access to quality information. The contribution from this panel of experts revealed several topics that could usefully be exploited in this format, and also that web-texts offering methodological guidelines could also be useful. Some other points of concern raised by the experts do not, however, lend themselves so easily to such a short format. Below is a short summary of the important topics (i.e.: mentioned several times) that have not been addressed in the previous sections and that could be the object of a web-text.

Road-Safety Topics:

As mentioned above, the need to be able to easily access information on road safety measures and their implementation in European countries has been very frequently mentioned. To some extent, the requested information has been collected in the EU project PEPPER, where the enforcement activities of selected countries concerning speeding, alcohol, and seat belt use are described. The results of the consultation indicate that the existing results of the PEPPER project – but also of other European projects (CAST, Sartre, and Supreme) – would need more advertisement, which they could receive by means of a web-text.

Some interest was also expressed for an overview of automatic enforcement methods; and in a related way, for an overview of ITS on-board systems (and their effectiveness if available)

Finally, several experts indicated that the need to take account of the agenda of other sectors was increasing. The ability to set priorities and to select measures that would offer benefits in both the RS and health sectors, or in the RS and environmental sectors, for example, is deemed increasingly important. Taking priority issues from other sectors into account is a good means to promote RS, and measures from which benefits are to be expected in other areas as well have more chances to receive funding. A summary of the most important synergies (and incompatibilities) between RS issues and key issues for the health and environment sector would consequently be useful and could make the object of a web-text.

Finally, information on the potential funding sources for RS projects and measures could also be treated in a web-text in a useful way.

Methodological guidelines:

Another type of knowledge need expressed, that could be addressed by means of web-texts, concerns methodological needs. The issue that has been mentioned first and foremost in this respect is the evaluation of the effectiveness of road safety measures (as well as recent results thereof). This, however, will require more work

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before a common framework can be presented. An ideal first step would thus be the preparation and publication of a full manual thereabout on the ERSO website.

However, for other methodological needs that have been mentioned there is considerable knowledge available that more could be made of, and could be more easily, accessible. Examples are, the completion of accident data with other data, and especially hospital data (according to the methodology established by the WP1 of SafetyNet); an applicable summary on the methods and tools for risk education that have been developed in the public health sector, as well as the determination of black spots, or road-safety audits.

3.3.2.3. Conclusion

Overall, the results of the consultation of the expert panel revealed that both WP3 and WP4 of DaCoTA would meet important needs for evidence-based road safety management. It was confirmed to a considerable degree that the work programme and main objectives of both Work Packages were at the correct direction as per the main needs and priorities for knowledge, data and tools to support road safety decision making.

Nevertheless, the experts provided very useful and insightful information for the enhancement and organization of the activities of DaCoTA WP3 and WP4. First of all, they provided specific recommendations for the development of the data and knowledge warehouse and decision support tools. Moreover, they indicated the areas where emphasis should be put, allowing to set priorities in the data and information collection.

3.3.3. Other Work Packages

The findings discussed in this deliverable will also be shared with the other DaCoTA Work Packages. Work Package 2 aims to set up a network of road accident investigation teams across Europe and to further develop harmonised investigation procedures, so for this work package, the needs for in-depth accident data will be of interest. WP2 will review the deliverable and use any specific needs to inform their future work.

4. SUMMARY AND CONCLUSIONS

In cooperation between DaCoTA WP1 and WP4, an Experts Panel was created and a consultation was launched for the preliminary assessment of knowledge, data and analysis needs within road safety management. The objectives of the consultation of this Experts Panel concerned the assessment of current needs for evidence-based road safety decision making in the European countries, which could also be exploited by other DaCoTA activities. In particular, it was intended to identify specific needs for knowledge, data and tools, which will be taken into account for the development of a data warehouse (DaCoTA WP3) and for the creation of useful and relevant road safety decision support tools (DaCoTA WP4). Moreover, the consultation of the Experts Panel serves as a first step towards the full assessment of current practices and future needs of knowledge-based road safety management, by means of a broader consultation of non-governmental stakeholders (DaCoTA WP1).

The members of the Experts Panel included members of the CARE National Experts group of the European Commission, as well as persons within the national road safety administration or scientific community of each country, suggested by the National Experts. The Panel was complemented with additional persons suggested by the DaCoTA partners. The Experts Panel eventually included a large number of members with extensive knowledge of road safety management processes and needs in their country, being either directly involved in decision making, or working closely with decision makers as advisors.

Two parallel consultation methods were implemented; a first one concerned semi-directive interviews carried out by members of the DaCoTA WP1 partners to members of the Panel from their own countries, and a second one concerned a request for written contributions in case of language or time constraints.

The synthesis of the results of this open consultation was carried out by means of the gathering and assessment of the Expert's contribution to a predefined matrix linking the basic road safety management tasks to the basic types of knowledge, data and tools needed. The outline of the interview results on the one hand, and of the written contributions results on the other hand, can be found in the Appendices of this report, whereas the overall synthesis of needs for evidence-based road safety management per task is presented in detail in Chapter 3.1 of the present report.

In the following sections, the contribution and the usefulness of the consultation of the Experts Panel is discussed, as regards two main points: first, the added value of the consultation is presented including a critical appraisal of methodological and procedural approach chosen in the present study, and second, the key messages identified from the consultation in terms of needs and priorities for evidence-based road safety management.

4.1 Critical appraisal of the consultation process

The consultation of the Experts Panel provided valuable information about the current practices and future needs for evidence-based road safety management in Europe. It is noted that such a process was launched for the first time at European level.

The added value of this process becomes clear when considering, for instance, the selection criteria of the Experts Panel. The proposed profile of the Experts, although not at all restrictive in terms of background and experience of the Experts, was

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formed around the basic idea of persons working at the interface between road safety science and road safety decision making. Although we could not obtain a contribution from each country, an important sample of answers was obtained, i.e. from best to worst performing countries, from old and new members of the EU etc.

It may be advisable, for other consultations to take place in DaCoTA, to establish a more direct, personal contact with the experts from whom a contribution is expected. Although official invitations from the EU commission appear to constitute of a useful incentive to participate, it may not be sufficient. Especially if the country representative in the National Experts group is not an expert with respect to the topic investigated, his or her role is more a liaising one. In those cases, the liaising role of the national experts should be clearly identified when they are addressed, asking them to help following up the participation of other experts selected for their country. While on the one hand asking all National Experts for their input forms a great opportunity to reach many people, focusing more selectively on a smaller group might increase these persons motivation to cooperate.

In this consultation, particular emphasis was given to the open nature of the questions, both within the interviews and the written contributions, allowing the experts to provide their own experiences, views and messages and to put emphasis on the issues they consider themselves important, without being "directed" by a detailed questionnaire to certain specific judgments. This type of open consultation determines the way the results are analysed. Rather than enabling a quantitative analysis a wealth of information on all aspects of road safety management in the European countries was provided. Of course, the analysis of such material requires time, and is fastidious. However, the synthesis of these results therefore serves as an overview of experiences with road safety management in the European countries and as an important collection of expert opinions on the needs and priorities for knowledge, data and tools to support road safety management. The results provide the necessary basis to design closed questions for a more systematic assessment of the knowledge needs encountered in decision-making processes. Of course, this method is not the most adequate for consultations that would be conducted to answer well-defined, closed research questions. In such a case, closed questions and questionnaires seem more advisable than interviews, and they may also offer the possibility to reach a larger number of experts.

A third considerable methodological contribution of the Experts Panel consultation concerns the creation of the proposed matrix for the assessment of the needs for evidence-based road safety management. In this matrix, the basic road safety management tasks were separated into their particular components, and were then cross-tabulated with distinct categories of needs (knowledge needs, data needs, methodological needs, tools needs etc.), allowing the linking of specific aspects of road safety policy making to specific benefits from using the necessary knowledge, data, methods and tools. Therefore, the matrix allows a linkage of these needs and benefits to road safety management tasks for the first time in a comprehensive and systematic way.

Finally, the information gathered through this process of organizing and carrying out the consultation includes not only the needs for knowledge, data, tools and analyses, but also the related needs for better road safety management processes and structures, allowing the integration of knowledge and decision support tools into policy making. From these results, the appropriate directions are given towards knowledge-based policy making in the European countries. Moreover, it is possible to set the priorities in the steps required towards this objective. These main directions and priorities, which are outlined in the following section, can be useful within DaCoTA, for the collection (WP3) and analysis (WP4) of data and information

intended to support road safety decision making. Furthermore, and most importantly, they can also serve as a broader guide towards the improvement of road safety management processes and practices not only by individual countries, but also at European Union level (WP1).

4.2 Key messages and recommendations

From the results of the consultation of the Experts Panel, a number of key issues were identified, concerning the promotion of evidence-based road safety policy making in Europe. In fact, not only a very wide consensus among Experts on these key issues was observed (i.e. the issues were raised by many Experts from different countries), but also a strong tendency to bring them forward (i.e. the issues were raised while discussing different topics and questions within the consultations). These key general messages can be outlined as follows:

- Road safety is a science, road safety policy making should be based on knowledge and only if it is treated seriously, reliable support to decision makers can be provided. Although these appear to be well known and intuitive statements, in practice they are still poorly, if at all, implemented in most countries.
- Part of the insufficient consideration of available knowledge, data and tools in road safety management is still due to a lack of awareness on the added value of evidence-based decision making. The need to promote science-based road safety policies and to increase awareness on the need for substantiation of road safety should be further addressed.
- The promotion of evidence-based policy making goes through the establishment of appropriate and specific procedures for its implementation.
- These procedures include on the one hand the institutional arrangements for road safety management to be carried out centrally (at national level) and by a single dedicated organization, while establishing the necessary links and interactive procedures for addressing local road safety management needs and processes.
- On the other hand, the compulsory consideration of scientific evidence for each road safety decision needs to be established, by means of appropriate procedures exploiting standardized methodologies, knowledge and data for carrying out the necessary analyses in each case.
- Once such procedures are implemented, it will become obvious that scientific evidence can also assist towards the acceptability of road safety policies, as well as towards a more efficient allocation of the, often limited resources for road safety.
- The integration of road safety with other policies, mainly within the mobility, health or environmental sectors would be an important next step for maximizing the benefits of evidence-based policy making.

Moreover, the results of the consultation of the Experts Panel include numerous useful remarks and recommendations on the various road safety management tasks, from fact-finding and assessment of the problem, to the development of road safety strategies and programmes, and from the planning and implementation of these programmes to the monitoring and evaluation of their effectiveness. These can be outlined as follows:

- Road safety management needs to be guided by ambitious yet realistic targets for the improvement of road safety.

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- A more sophisticated approach to cost-benefit and cost-effectiveness analyses is required, to assist decision makers in the selection of road safety programmes and measures.
- A methodology for priority setting in the selection of road safety measures is required.
- A most challenging related task, also calling for methodological developments, concerns the assessment of combined effects of road safety measures (as is typically the case when proposing a road safety programme). It is important to initiate research at European level, in order to come up with a standard methodology for carrying out such analyses in European countries.
- On the other hand, the richness of existing results on the road safety effects of various measures and interventions needs to be better exploited, by means of the creation of handbooks and databases with accumulated international experience on these questions. Nevertheless, it is often necessary to update this information, while it is equally important to include the case-specific conditions and limitations involved in reaching the optimal benefit of each measure and intervention.
- It is emphasized that the desirable improvement in road safety may depend on the current level of road safety of each region or country, e.g. the lower the road safety performance of a region or country, the higher the potential for road safety improvement.
- A total lack of information is observed as regards measures implementation data and information. Information and data on the procedures, conditions and costs for implementing the measures need to be made available at European level, to serve as a guide for scheduling and monitoring project implementation. In this context, standard methods to estimate programme implementation costs need to be developed.
- The evaluation task is most essential to the long term process of policy-making. It is stressed that, while it is the last step of evidence-based road safety policy making, it should also serve as the point of re-initiating the whole process of assessing the situation, selecting new measures etc.
- Among the various methodological developments required for monitoring and evaluating road safety programmes and measures (e.g. forecasting models, ex post assessment techniques), particular emphasis is given on the development of tools enabling not only the evaluation of the measures, but also of the identification of reasons and mechanisms that may lead to the more or less favourable outcome. This is a key question affecting the transferability of experience between countries.

Finally, the consultation of the Experts panel brought forward a number of specific questions and needs related to the data and methods required for knowledge-based road safety management. This is a rather heterogeneous group of particular issues, which is yet worth outlining, due to the emphasis put to these issues by several experts:

- Particular effort should be devoted to addressing the injury under-reporting issue in Europe and to establishing a common definition of injury severity. The optimal way for achieving this objective goes through the linkage of Police and Hospital data, which is only implemented partially and scarcely to a limited number of European countries, and should become a routine procedure.
- In several European countries, the question of reliably determining the accident location still needs to be dealt with. The use of Geographic Information Systems (GIS) and other related infrastructure should be promoted and a related

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framework for determining the accident location should be proposed at European level.

- Within this context, improved and standardised methods for the treatment of hazardous locations are required. Moreover, the integration of data from road safety audits and road safety inspections in these processes would be most useful.
- The lack of sufficient and reliable exposure data is still a major limitation of road safety analyses and may significantly affect the potential for evidence-based policy making in the European countries, regions and cities.
- A need for collecting more, and more reliable behavioural data is underlined. Only through the analysis of the attitudes, behaviours and responses of road users can road safety measured be fully assessed.
- The collection of more in-depth accident investigation data in the European countries may not only assist in the understanding of accident mechanisms and patterns, but also in the promotion of proved cost-effective vehicle technologies.
- The analyses of road safety outcomes should not be limited to a specific type of outcome. More specifically, the significant correlations between exposure to risk, accident risk and accident severity make that the simultaneous analysis and monitoring of all three components is required.
- The linking of road safety related databases (e.g. accidents, health, exposure etc.) would significantly facilitate evidence-based policy making, provided that the related data are cross-checked, the links are meaningful and accessibility for all parties involved is ensured.
- Within knowledge-based policy making in road safety, the promotion of new methodologies for analyzing road safety questions is equally important to the improvement and standardisation of existing methodologies. The added value of new methodologies such as simulator experiments, naturalistic driving studies etc. should be thoroughly explored.

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APPENDIX 1 REQUEST FOR WRITTEN CONTRIBUTIONS

Panel of Experts - Request for written contributions

1. Introduction

At a time when European countries have already greatly improved their performances in road safety and may find it more and more difficult to identify and design new interventions to continue towards zero traffic fatalities and serious injuries, the ambition of the European project DaCoTA is to promote knowledge-based policy-making in road safety as a way to identify new opportunities for action and target the most promising measures and policies.

Following suggestions from the European CARE/RSPI expert group and from the DaCoTA WP1 team (see the team members in Appendix 2), you have been invited by the European Commission to participate in a consultation of road safety Experts. The goal of this consultation is to provide a preliminary assessment of the needs for data and decision-support tools of policy-makers, policy advisors and other major stakeholders. The consultation will be a basis for a broader questionnaire-based survey which will be carried out mainly in countries of the European Union in 2010-2011. The results of the consultation will serve to further develop the data systems and tools integrated in the European Road Safety Observatory (ERSO) in order to make them more complete, relevant, and useful for road safety management.

The consultation takes place in two phases:

(1) *Written consultations* – You are requested to provide your expert opinion in writing according to the guidelines and definitions presented in this document. Please write as freely as you wish, on the topics which seem to you most relevant and/or in the areas where you have particular knowledge and experience. **Please note that we do not expect any individual Expert to cover the whole scope.**

(2) *In-depth interviews* - You may be contacted by one of the DaCoTA team members for an in-depth interview on the same issues as presented here. Again, your interviewer will expect you to give your opinion freely but may want to ask you a few questions to go deeper into the issues on which you will have chosen to contribute.

The content of all written contributions as well as of the interviews will be analysed by the DaCoTA team and a synthesis will be produced. The report will include the list of contributing Experts and the global synthesis of their opinions. The first draft should be ready in early May and sent to you so as to give you the opportunity to comment before final publication.

The written consultation will be open for **three weeks** after you receive this document. The DaCoTA team is looking forward to working with you and thanks you for your kind cooperation.

2. Scope of the consultation: description and definitions

Key tasks of road safety policy-making

By analysing the work processes of road safety policy-makers involved in multi-sectoral road safety management according to what is now accepted as “good practice” in Europe, we have pinpointed four major areas and the corresponding tasks: (1) assessment of the road safety situation (“fact-finding”), (2) road safety programme development, (3) preparing implementation, and (4) monitoring and evaluation.

(1) Fact finding

To develop knowledge-based road safety policies, policy-makers need to collect enough knowledge of road traffic accidents and injuries in order to get to get:

- a) a global diagnosis of the situation in their country: magnitude and main characteristics of the road safety problem, high risk groups and situations, risk and crash factors, long-term health effects, cost of accidents, etc.,
- b) Indicators and qualitative information to use for international comparisons,
- c) a factual basis to target the main characteristics of the road safety problem to address and to set up priorities for action,
- d) etc.

(2) Road safety programme development

Although the policy-making process differs from country to country, targeted road safety programmes are recommended as good practice. From this perspective, the following tasks are to be considered:

- a) Setting up a quantitative target of fatality or serious injury reduction over a defined period of time, either at the national level or integrating regional or provincial targets,
- b) selecting or designing the appropriate measures or interventions (multi-sectoral “packages” of measures) which address the priorities identified and are known or assumed to be efficient in reducing fatalities and serious injuries,
- c) Assessing the expected combined effects of the measures selected to ensure the quantitative target can be reached in due time,
- d) etc.

(3) Preparing implementation

For a programme to become operational, implementation processes have to be planned: actors involved, tasks, investments in material and technical aids, training. Knowledge of these implementation processes are required to evaluate the overall cost of the road safety programme and the needs for funding. Knowledge of the acceptability of the measures proposed for the public and the major stakeholders involved is also to be obtained in order to prepare implementation through appropriate communication and information.

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Implementation is mostly performed at the sectoral level (although “good practice” requires inter-sectoral coordination). Planning for implementation therefore covers the following areas:

- a) Measures addressing the road infrastructure,
- b) measures addressing transport and traffic
- c) measures targeting vehicles,
- d) measures targeting short-term or long-term changes in road user behaviour (enforcement, education, driver training),
- e) measures addressing health factors.

To these sectoral issues bearing on implementation processes, we have to add an intersectoral one:

- f) Costing the overall programme and defining funding mechanism.

(4) Monitoring and evaluation

Monitoring and/or anticipating changes in the road safety situation are usually a basis for short-term and longer-term policy-making. Moreover, evaluation of the action implemented is the key to accumulating knowledge and improving road safety management. In this area, we have identified four main tasks:

- a) Following up accident and injury trends (long-term, annually, quarterly, etc.),
- b) Forecasting changes in the road safety situation, forecasting future trends (this is also useful for targeted programme development),
- c) Assessing the overall effects on road traffic accidents, fatalities and injuries of the overall road safety programme or current road safety policies,
- d) Evaluating individual measures in the short and medium term (infrastructure, traffic, enforcement, etc.) or in the long term (education, driver training, vehicle regulations, etc.).

Needs for knowledge

Performing each of the tasks listed above requires particular data, knowledge and methodologies. The relevant tools for decision support can be classified as follows:

(1) Data

- basic data on accidents and injuries, exposure, background (availability, quality, time series, etc.),
- “composite” data: definition of relevant indicators,
- etc.

(2) Technical tools for data treatment

- data analysis,
- modelling, forecasting,

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- etc.

(3) Other “decision-support” tools

- methodologies (programming, evaluation, assessing and increasing acceptability, etc.),
- syntheses of knowledge on road safety measures, on implementation processes, etc.,
- aids to access relevant knowledge,
- etc.

(4) Training tools

- methods for assessing the needs for training of the actors involved in implementations processes,
- training programmes, training manuals,
- other training tools (expert systems, simulation, games, etc.).

Understanding the needs implies thorough understanding of policy-making tasks to be accomplished and of the processes involved. A matrix has thus been constructed, relating to the four major areas of policy making and the corresponding tasks to the four types of tools for knowledge. Each cell of the matrix represents specific needs. The matrix is presented in Appendix 1.

3. Guidelines for the written consultation process

Given the scope of the consultation detailed above, you, as an Expert, are requested to express your opinion according to the following guidelines:

Point 1

What, in your view, are the most important **tasks in road safety policy-making** which should be based on knowledge? Please describe these tasks as they are performed in your country of work and as you think they should ideally be performed based on your own experience.

You can select some or all the tasks listed above (and summarized in the matrix) or add tasks of your own choice according to your experience (the information you provide does not have to be limited to what is the current situation in your own country).

Point 2

For some or all of the tasks you have selected, please elaborate on **the needs for knowledge** (data, data treatment and training tools, methodologies, other “decision-support” tools, as described above) that you believe are necessary to inform the road safety policy-making tasks.

On this point again, you are expected to provide a brief description of current practice in your country of work and also to assess the needs in relation to what you consider “good” or “best” practice. You are also welcome to anticipate future needs in relation to foreseeable developments in road safety policy-making (integration with other policies, for example).

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Please bear in mind that we are particularly concerned by

- the full and unbiased assessment of the social, economical, and health impact of road accidents as a basis to define priority targets and to perform accurate international comparisons,
- the selection of appropriate safety measures or interventions addressing specific priorities and contributing to reaching the quantitative target (if any),
- stakeholders' involvement and the assessment of the acceptability of the measures planned.

Point 3

For each of the needs you have pinpointed, please assess the part you consider satisfied through the current offer of data, information and knowledge in your country and at the European level (see, for example, the European Road Safety Observatory, ERSO) and, to the contrary, what efforts are still needed on:

- data collections,
- the development of tools and methodologies,
- easy access to data and information for the stakeholders involved,
- etc.

The written consultation process is open for three weeks after you receive the current scope and guidelines. Please provide as much information as you can without spending too much of your time on quality of writing.

The matrix of tasks vs. needs provided as an appendix may help you visualize the scope of the consultation and serve as a checklist. However, we wish you to remember that you are not necessarily expected to contribute to all the cells but only to those for which you feel you have the appropriate knowledge and expertise and/or a stimulating opinion to express.

Members of the DaCoTA team will contact you requesting an interview or with brief additional questions if we require clarification or additional details to give us a better understanding of your expert opinion. If *you* have any question on the above request for contribution or need to clarify some point, please us.

Thanks again for taking part in our Expert panel.

Matrix of policy-making tasks and needs for knowledge

See definitions in section 2

Key road safety management tasks		Needs for knowledge				
		(1) Data	(2) Tools for data treatment	(3) Other “decision -support” tools	(4) Training tools	Others
Fact finding	(a) Diagnosis					
	(b) Priority setting					
	(c) International comparisons					
	(d) Others					
Programme development	(a) Target setting					
	(b) Selecting measures					
	(c) Assessing combined effects					
	Others					
Preparing Implementation	(a) Infrastructure					
	(b) Traffic, transport					
	(c) Vehicles					
	(d) Behaviour					
	(e) Health					
	(f) Costing and funding					
	Others					
Monitoring and evaluation	(a) Following up trends					
	(b) Forecasting					
	(c) Assessing effects of RS policies					
	(d) Evaluation of specific measures					

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	Others					
Other tasks						

APPENDIX 2 INTERVIEW GUIDELINES

Panel of Experts – Interview guidelines

Summary guidelines for preparing, conducting and analysing the expert interviews.

DaCoTA work package 1 partners will conduct road safety experts' interviews during March 2010. These interviews aim at gathering experts' opinions on their needs in terms of knowledge and tools necessary in the accomplishment of their tasks in road safety management. These interviews and the resulting analysis will pave the way for a wider, more complete and thorough study at a later stage of the project. The analysis conducted by the work package 1 will also provide input for work package 4.

Given these methodological and technical constraints, the experts' interviews will be *semi-directive*. The interviewers will let the experts express their views freely without formulating the research questions too directly and thus influencing unduly the experts' answers. The interviewers will make sure the experts will discuss the topics the work package 1 has identified, but avoid asking direct questions prematurely.

1. The conduct of the interview (semi-directive part)

Before actually starting, there is a need to agree with the expert on an approximate length for the interview. This is in fact something you probably have already discussed when setting the rendezvous, but it is necessary to re-check this when in situation. If you realize during the interview that the original timeframe will not be sufficient, arrange if necessary and possible, for a new rendezvous.

In any case, it is preferable, and you should choose to cover fewer broad themes in sufficient details, rather than cover superficially a great number of themes. You should start with the widest possible question or theme and progressively reformulate and add precision to your questions, relying on what the person says.

The questions in ***bold italic*** are formulated neutrally and thus are preferable to the more directly formulated questions (see end notes) which should be used only in last resort. However even those neutrally formulated questions cannot be used as such (if only because you will translate them). The actual questions you ask from the experts should nevertheless adopt a similar tone and form.

This document can thus only give you the framework for conducting the interviews, as well as some rules of thumb about how to ask for the experts' opinion. It is better to ask for what the expert does than for what he thinks. He will be more accurate in answering a question on his practices than he might on his opinions, and when you ask about what he does, he will eventually say what he thinks too. The interview therefore must serve for describing how the expert you are talking with goes about his business and what he thinks of the way things are.

The interview should start with a general statement on the background of the study and the purpose of the interview—something like:

The DaCoTA project is working on an assessment of the needs for data and decision-support tools of road safety policy-makers, policy advisors and other major stakeholders. You have kindly answered to our request for written consultation and agreed to discuss with us on some of the

issues of road safety management in (name of the country). I would like you to start by a brief description of your present work and of your past experience in road safety.

This description will certainly contain some usable key words. As the expert is personally involved in (or is more familiar with or more interested in) one of the four “key road safety management task” boxes (fact-finding, programme development, implementation planning or monitoring and evaluation), that theme is the one to cover first. If necessary, you can show and work on the (still empty) matrix.

How does your work fit into the bigger picture of road safety policies? What else is there going on in terms of road safety management tasks in your country? Can you tell me how these tasks are done?

The issue of the relative importance of tasks and the ideas the expert might have on the way things should be done may appear without a direct question. The fact that the expert chooses to talk about certain tasks and the way he talks about them is itself an indication on the importance he gives to them. However, if the expert is not clear enough on these issues, more precision must be sought.

Are the road safety management tasks you just described accomplished the way they should? Are those tasks the most important ones? Do the road safety policies focus on the right issues?

Once again, the abundance or lack of information, data and knowledge might come up in what the expert says. If it does, then you must make sure that all the aspects of the issue are sufficiently covered. If it does not, you must bring the issue in indirectly, that is by asking for more precision.

Why are those tasks not accomplished appropriately? What are the most important tasks and why are they not done? Why are the road safety policies not focusing on the right issues?ⁱ

It is possible that the expert does not consider the lack of information as a possible or most important source for difficulties in the domain or road safety management. He might indicate that problems arise for instance because of complicated decision-making processes. *Such answers would be precious, at least as precious as any answers pointing to a lack of knowledge.*

2. The conduct of the interview (directive part)

This paragraph ***concerns only those cases where you are still missing the information you want*** after you have covered all the themes and questions of the preceding paragraph.

Once you are sure that the subject knows there are other problems as difficult or even more difficult to overcome than the lack of knowledge (such as the complicated decision-making processes), you can start asking the more directly formulated questions (if you feel this is still necessary). Once again, there is no need to ask more detailed questions if you feel that the subject has given a full account.

While the questions will be more direct, you should still refrain from directing them too specifically—*Don't you think that...? I think that...now what is your opinion?* If you want to confront the subject with an opinion to see what his reaction is, use a more neutral formulation like: *Some people do things this way, others do things that way, what is your point of view?*

Some of the tasks in the matrix depend rather heavily on knowledge, others perhaps not so much. Which ones would you put in the first category and which ones in the second? Can you explain why?

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What type of knowledge is most relevant to those tasks that depend on it?

What kinds of information sources are available (at national/ European level)? Do you use them / are they used in the policy-making processes? Why / why not?ⁱⁱⁱ

That should cover the knowledge needs and, with the following question, the promotion of evidence based policy-making too.

What could be done to promote the use of information and the available information sources in the road safety policy-making processes?

These ones are for the specific needs.

Assessment of the impact of road accidents in terms of health impact— numbers of fatalities and injuries, impairments and other long term consequences—and in terms of social and economic costs can be useful in several ways. Would you say that they can be useful in the following tasks. Please comment.

- 1. In defining social priorities?***
- 2. In promoting road safety policy?***
- 3. In setting road safety targets?***
- 4. In making international comparisons?***

Are international comparisons an important basis for policy-making? If so, for which types of tasks (in particular) such comparisons are important? What types of comparisons would be the most useful?^{iv}

Finally, there are questions concerning the acceptability of planned measures.

Is the public acceptability of the planned measures given sufficient attention? Do you have some examples in mind where this issue has been successfully addressed? Do you have some examples in mind where this issue should have been addressed, but wasn't?

Are the stakeholders⁵ sufficiently involved in road-safety policy making? Do you have some examples in mind where attention has been given to stakeholders' involvement? Do you have some examples where attention should have been paid to that issue, but has not?^v

3. Concluding remarks

The interviews will probably last between 30 minutes and 2 hours each. The use of a recorder is a possibility, but the “complete” transcriptions of a recording are not any easier to make than the transcription of hand written interview notes, and usually take a lot longer to do. It is worth noting that the interview situation itself is all the more unnatural, when there is a “third person” (the recorder) listening and not missing a word that is being said. This alters the expert's behaviour as well as that of the person doing the interview. At best, use of a recording can help ensure verbatim sentences are accurately quoted in the minutes of the interview. It would be preferable to make hand written interview notes and ***transcribe these into “minutes” of the interview,***

⁵ Stakeholders include any person or group with an interest in road safety, either as road users or as participants in development and funding of programmes, evaluation of proposals, scientific production, advocacy for or lobbying against road safety, etc. Stakeholders may thus include institutional actors at the national, regional and local levels, private businesses (the automotive industry, insurance industry, road operators, etc.), professional organisations (transport operators, transport workers, insurance, medical or health associations, etc.), citizen groups and other NGOs.

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submitted to the approval of the expert. Due to the timeframe we have, this last step may have to be accomplished after the analysis work on the interviews has started, but it should not be skipped (and, hopefully, there will not be any crucial changes in the opinions recorded).

These approved “minutes” will contain condensed information about the ideas, actions, evaluations, etc. of the expert on the topic at hand. They should also contain direct quotes (phrases), if these seem particularly interesting or illustrate a point. From these minutes, the person having made the interview will extract the data and enter it into the matrix, along with any quotes that seem particularly relevant. The parts of the interview notes that are used in the matrix as well as the direct quotes must of course be translated into English, so that the partners can work on a synthesis of all of the important data and eventually agree on the global content.

ⁱ Can you describe in some details these tasks as they are currently performed in your country?

ⁱⁱ Of the various road safety management tasks listed in the matrix, which are the most important to you? — Based on your conception of the way these tasks should be performed, what would you change/improve in the way they are currently executed? — Are there other policy-making tasks, which are not mentioned in the matrix, that you would want to add to the list?

ⁱⁱⁱ Of all the tasks described in the matrix, are there some that, according to you, more crucially depend on knowledge than others? Which ones? Why? — Using the matrix as a guide, could you come back on some (or all, if you wish so) of the tasks you mentioned as important ...What type(s) of knowledge is (are) most relevant for this type of task? — To what extent are these knowledge needs already covered by the current information offer in your country and at the European level (for example, with the European Road Safety Observatory)? — Where, a contrario, are most efforts still needed?

^{iv} Do you consider that the full and unbiased assessment of the impact of road accidents (i.e., the health impact – numbers of fatalities/injuries, impairments..., but also the social and economic costs) is a necessary basis...

- ...to define social priorities – promoting road safety policy?
- ...to set safety targets?
- ...for international comparisons?
- ...

Do you consider international comparisons to be an important basis for policy-making in a country?

- For which types of tasks?
- What types of comparisons would seem most useful to you?

Do you consider the summaries of international experiences on (the efficiency of?) safety measures and interventions as useful tools for selecting proper measures in your country? For which topics? Which issues are most important? What is most lacking today?

^v Is there, according to you, sufficient attention paid to the acceptability of the measures planned by the public and the authorities? — Why?

- Do you have some examples in mind where this issue has been successfully addressed?
- Do you have some examples in mind where this issue should have been addressed, but hasn't?

Is there, according to you, enough attention devoted to the issues of the involvement of stakeholders* in road-safety policy making? – Why?

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- Do you have some examples in mind where attention has been given to stakeholders involvement?
- Do you have some examples where attention should have been paid to that issue, but has not?]

APPENDIX 3 WRITTEN CONTRIBUTIONS

Summary of Experts' opinions – Written Contributions

The summary is based on 18 written contributions from the following countries: Belgium, the Czech Republic, Denmark, Germany, Estonia, France, Italy, Latvia, Hungary, Malta, Poland, Portugal, Slovakia, the United Kingdom and Norway. Key words are data, tools (referring to data treatment or to decision support), processes (ranging from how to use or distribute data to policy-making patterns) and training (referring to training needs, contents or media).

Fact finding

Diagnosis

“It is important to underline that all the policies, the strategies and the actions aiming at improving road safety should be based on data and knowledge, not on personal interests or sudden political needs. “Processes

“There is a need for improving accident reporting. It is incomplete in all countries and has not improved recently. The police tend to misclassify injuries by severity. It ought to be technologically feasible to integrate electronically files kept by medical institutions, the police and insurance companies in order to improve accident reporting.” *data*

We need methods to link Police and Hospital Data in order to develop better assessment of the real number of road traffic casualties (cyclists). *Data*

A good practice to have a better overview of the road safety phenomenon is to perform comparisons with data sources other than police data, like hospital discharges and statistics on the causes of deaths. The tools to be used could be software to manage probabilistic and deterministic Record Linkage methods. *Data, tools*

In addition to accident data, we need hospital data including injury scale, time in hospital, rehabilitation time, etc. Exposure data should also be collected more systematically. *Data*

Methods and procedures of checking and improving data as well as a methodology of linking databases are needed. *Tools*

“Concerning data collection and analysis a major point is to computerize the data collection process starting from on-site accident data collection. Indeed some experiences carried out in Italy have shown that using laptops or tablet PCs for data collection at the accident scene has improved the quality, the quantity and the reliability of collected data and allowed also a quicker analysis on an aggregated basis.”... The main point is total data management, from on site data collection to data storing and analysis. *Data, processes*

Better data is needed on high risk groups such as motorcyclists and cyclists. *Data*

One common problem is the actual coverage of national accident surveys and statistics based on Police data; in particular, the missing values by variable should be a good indicator of the global quality of data. This message should be communicated

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to the Police target by the National or International road safety organisations, in particular through appropriate training tools. *Training*

“Data must be available at appropriate levels of disaggregation. Requirements regarding these levels are different according to the phase of work under consideration (in Portugal, for example, the lack of disaggregated data for a number of important safety and exposure indicators has been noted as a weakness for road safety planning).” *data*

The scope and structure of the data needed for road safety tasks “ranks from the aggregated traffic and accident data that enable international comparisons up to detailed characteristics of individual accidents that are needed, for example, for the identification of efficient measures on accident blackspots. Detailed knowledge obtained through in-depth accident investigation creates new possibilities to understand the complexity of accident circumstances and to discover new ways how to combat road accidents. “Data, *tools*

Planning must be based on adequate knowledge. This includes Registers of car, roads and drivers which should be linked to the accident database (in Italy, only the register of cars is well implemented and regularly updated, the Register of Roads has not been implemented, while the register of Drivers is not reliable, not updated, and anyhow the data is quite superficial, based only on Police reports). There should be linkages also between the Road Accident database and the Registers of Work Accidents and of Insurance companies (for detailed causes). *Data*

The use, not only of an accident database, but also of drivers and vehicles databases, is what allows us to get a good overview of the existing situation. *Data*

“An important issue is to link accident data with traffic flow data and infrastructures data in a common DB in order to make possible cross analyses.” *data, tools*

Planning must be based on a wide range of knowledge, including data and indicators on roads, vehicles, infrastructure, behaviour and human factors, emergency care, on the main road safety measures implemented, and on accident characteristics, injuries, traffic and external factors. This diversity of data is important to understand how road safety works. *Data*

The preparation of road safety policies is based on the collection and analysis of accident data, in relation to data on the vehicle fleet (horse-power of new vehicles), the driving test and the vehicle technical control test (pass/failure rates), enforcement (citations and penalties issued to professional drivers) and infrastructure (surfacing, signing, safety devices, public lighting, etc.). The cost of accidents is also important. *Data, tools*

“We need also data-collection systems on the behaviour and attitudes of the different groups of traffic participants as well as for the assessment of the main stakeholders’ road-policy strategies and interests.” *data*

The needs for knowledge to inform the road safety policy-making tasks include background data such as weather data, exposure to risk (see SafetyNet Deliverable D2.1 for a list of exposure data), demographic data, and behavioural data. *Data*

More efforts are needed on data collection, in particular: the systematic collection of weather data; disaggregated exposure data for specific road user categories (pedestrians, cyclists, motorized two-wheelers) or specific age groups (young/older drivers), according to the geographical level and to the type of road network; demographic data (which is usually not collected at all); and behavioural data (which is still insufficient). *Data*

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“Comprehensive, up-to-date, accident data is needed for recognition of the scope of road safety problems, and for raising public awareness. Reliable and relevant data enable the identification of the contributory factors of the individual accidents, and an unveiling of the background of the risk behaviour of the road users. It offers the best way to explore the prevention of accidents, and ways to implement measures to reduce accident severity.” *data, tools*

We should have access to the results of the court enquiries into the causation of the accidents. *Data*

The tools for data treatment which are needed include descriptive analysis methodologies to explore the problems, GIS technologies to see geographical disparities, and in-depth analysis to identify causes and factors of accidents. *tools*

“One problem is rather important and it is localisation of accidents on roads, especially on second class roads. There are lots of devices what might be used for this job, but until now we have not started to create common system for this work.” *tools*

We need tools or data analysis and the establishment of trends and patterns. *tools*

“One of the main focuses should be the analysis of fatal accidents, trying to better investigate the accident dynamics but mostly accident causes” which lead to possible countermeasures. There are examples of good in-depth accident data collection. *data, tools*

More efforts are needed on the collection of on-site accident data for accidents involving traffic injuries and fatalities. *data, tools*

The diagnosis should be based, not only on the extent of problem, but also on potential economic benefits. Hence the socio economic cost of accidents has to be assessed. *tools*

We need to organize easy access to information through publications, and websites. *Tools, training*

When laying down the bases for a national road safety programme, the dissemination of official data from different sources (police, health, others) to all the road safety actors involved is an important process. It would be useful to compare this process in European countries. *Processes*

The lack of data and knowledge on road accidents and the factors generating them is often the result of a lack of proper economic interest, or even of distorting interests produced by laws (for example, the “malus” type of system raising insurance premium for drivers involved in accidents) or the acceptance by policy-makers that “what is good for the car is good for the country”. *Processes*

Priority Setting:

Methodologies are needed for priority setting. *Tools*

“Priority setting is often based for a part on impressions (true or not) and for a part on reactions to actuality of the moment but not enough on facts and figures.” Priorities must be set on the basis of a combination of descriptive and risk indicators, to be defined. *Tools*

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While available data may be satisfactory, “procedures (analysis of performances and characteristics, assessment of risk factors, ranking of risk situations) doesn’t exist”.

Tools

Identifying priority targets require accident trends, data on age groups and common accident characteristics as well as research into accident causation to identify, in particular, the factors which increase accident severity. *data, tools*

“The problem is not the risk analysis methods, but the acceptance criteria. We have made a literature survey but can only find one nation with a quantitative acceptance method. Most countries use a form of qualitative criteria. It would be of great interest have a discussion of how to evaluate the results of such risk analysis”. *Tools*

“The current approach to identifying hazardous road locations remains primitive in most countries and should be replaced by state-of-the-art methods like the empirical Bayes method. Accident models need to be developed and regularly updated for this purpose.” *tools*

International Comparisons

EU accident data is to be used for international comparisons. *Data*

Europeans comparisons should be made “all things being equal” (after correction of national parameters). *Tools*

The definition serious and slight injury needs to be improved. *Data*

There should be more work done on common definitions of the variables used for international comparisons. *Tools*

For international comparisons we would very much like to have a standard definition of serious accidents. It is not worth using light injuries when we know that there is so much under-reporting. *Data*

We need easy-to-read data on exposure (veh-km, population, time in traffic, etc.) and on behaviour (safety belt, alcohol, speed, etc.) From the neighbouring countries and of the 5 best European members in the field. *Tools*

“Regular up-dating of basic fact sheets on accidents and injuries in European countries is useful as the data and information in the CARE database is not easy to work with.” *tools*

“Politicians often want to have comparisons with other European countries in order to be able to tell that we do better. This is a wrong attitude if you are not able to tell why and act on the why (basically learn from other countries about measures to use, but the general figures can’t give that answer).” *tools*

“There is the need for better international comparisons among countries as this provides a very good overview of the subject. In particular, more indicators are needed on the circumstances of the road accidents (like alcohol and drug related accidents).” *tools*

We need a unified definition for safety indicators within the EU and more generalized use of exposure indicators. *Tools*

Comparisons of the legal environment would be useful (in particular the Highway Codes). (Evaluation of the effects of updating a Highway Code?). *Tools*

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It is important for comparisons at the European level “to reflect the reality of differences not only in the safety level of individual countries but also in their road safety framework and their political, cultural, economic, social, legal circumstances and consequently in their chances to improve their road safety situation.” *tools*

Programme Development

Target Setting

“Quantified targets should be set; these should be long-term and ambitious, but in principle possible to realise if an effort is made.” *tools*

“It is important to set up a national target for the reduction of accidents and fatalities. Also a given time period has to be given and maybe some goal-points can be set up through the period.” *tools*

The definition of partial (intermediate) targets “will help monitor continuously the progress achieved during the whole period of a road safety strategy and will facilitate the introduction of potential changes in the programme implementation when necessary.” *tools*

Better tools are needed for target setting. *Tools*

“Several tools for estimating the current expected safety level are already available, however, the integration of these tools in practical procedures supporting decision making still needs further progress.” *processes*

“In general policy makers do not have a need for data collections as such. What they need is access to information about the general development of traffic safety, which means accident and injury trends. Trends should of course be used to address the targets in the safety action plans.” *tools*

Selecting Measures

“The central task identified as “Programme Development” must rely in knowledge arising from analysis made on two main vectors: Road accident related data and relevant contextual information. In this latter, aspects should be included that usually are specific to a Country or Region, such as culture, habits, legislation, history, organization, overall policies, stakeholders, etc.” *data*

“Important knowledge sources are originated as feedback from implementation and evaluation which give indications for setting up targets and selecting appropriate measures. This can be part of a dynamic process within the framework of the plan itself or can be achieved through the experience gained with similar plans already undertaken elsewhere.” *tools, processes*

“The data produced in European projects has become much more detailed and reliable with time. The problem is to transform these sources of EU projects’ data into a more continuous flow.” To achieve this goal, involvement of scientists into implementation and evaluation is necessary. *data, processes*

“A more sophisticated approach to cost-benefit is now required: we need a multi-factorial model. How do you consider lives saved, improvements in quality of life, improvements in overall health together?” *tools*

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“Tools for selecting measures have been proposed at the European level; they consider the most relevant aspects at stake, such as safety, mobility and the environment. However, their use in several Member States is hindered by lack of appropriate basic or surrogate data.” *data*

“Ideally speaking, measures should be selected according to cost-effectiveness, but political realities may make this impossible. It should therefore be an objective to remove road safety policy making as much as possible from any political influence.” *processes*

The preparation and implementation of road safety plans should be controlled by adequate scientific groups seasoned in major European projects. *processes*

Actions included in a targeted road safety programme involve all levels of administration. For each action a responsible body has to be pointed out. *tools*

“It should be noted that collaboration with municipalities (some of which have their own RS programmes) during State RS Programme development is one of the most difficult and important aspects, because the majority of all accidents occur in urban area. *Processes*

“To develop an effective road safety programme, it is necessary to conduct a broad survey of potentially effective road safety measures.” *tools*

“We need to collect information on Good (efficient and effective) practices.” *tools*

There is a need for reports on specific themes such as young drivers, motorcycles, heavy goods vehicles, etc., including recommendations for each theme. *tools*

We need an estimate of the cost of road safety measures in Europe. *tools*

The information we have on the efficiency of road safety measures goes back to a time when the numbers of fatalities in European countries were twice as high as now. We can now question whether these studies and results can still be used in countries with death rates as low as 4 – 5 (fatalities per 100 000 inhabitants). *tools*

We need “syntheses of knowledge on road safety measures, on implementation processes”. *tools*

“One of the pillars of programme development is the knowledge, best practice and experience achieved by best performing European countries in the accident reduction during last decade.” *tools*

Development of a national road safety programme involves “liaison between the government departments concerned and with the non governmental entities which are directly linked to road safety such as police, local wardens, land use planning authority, etc. in order to maximise the return on available resources which include financial, expertise and manpower resources.” *processes*

Assessing Combined Effects of Measures

We should have “an appreciation of the economic circumstances. Money is now constrained and we need to do better with less. The Total Place approach being piloted in Great Britain may offer some lessons here.” *tools, processes*

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“It is important to have an holistic approach that keeps together all road safety identified issues by analyzing, not only single actions, but also the relations between the different issues.” *processes*

“Models for estimating the combined effects of measures are currently primitive and more research is needed in this area.” *tools*

“In targeted programmes, what each action will provide to the reduction in fatalities and injuries has to be estimated in order to go first for the measures with the best expected benefit. A special programme has to be used because some of the actions affect more than one type of accident. You can't spare a killed person more than once even if three actions will spare the same person. The programme ensures that the number of fatalities spared is only counted once.” *tools*

“It seems there is a need for appropriate methodologies to assess the combined effects of proposed measures. It might be one of areas where need for knowledge is essential.” *tools*

More work is required on performance indicators. *Tools*

“Forecasting a baseline scenario when developing a road safety programme is difficult and more research is needed in that area.” *tools*

“It is to be feared that this task cannot be conducted without tremendous expense and discussion among experts. Therefore as much expertise as possible should be involved from the beginning.” *processes*

“A review of best practice experiences of already existing national "Road Safety Councils" in road safety programming as well as of regional and local expertise should be useful.” *tools*

Others: Widening the Scope of Actions

“How do we create synergy between the safety agenda and the environment agenda? Politicians are looking for policies that will help to save lives and reduce carbon. We need to offer examples of these.” *tools, processes*

Preparing Implementation

Infrastructure

We need a road database providing information on the road lay-out, safety equipment, signing and marking, etc. It should be possible to link accidents data with road data. Digital maps should be available. *Data, tools*

Easy access to data should be provided. In particular, digital mapping of accidents on the road networks should be available. *Tools*

“The current approach to identifying hazardous road locations remains primitive in most countries and should be replaced by state-of-the-art methods like the empirical Bayes method. Accident models need to be developed and regularly updated for this purpose.” *tools*

We need information on potential funding sources. *Tools, processes*

Vehicles

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We need better information in the vehicles involved in accidents: age, make, model, safety equipment. We also need better exposure data. *data*

In-depth analysis of accidents in an essential tool. A methodology and training tools should be made available. *tools, training*

“A major problem of road safety policy making today is that many promising measures for improving safety refer to vehicle technology, but that no country can unilaterally decide to make new vehicle safety technology mandatory. Since adopting new vehicle safety standards is based on international consensus, the process is slow and ineffective. It could be years before intelligent technologies like ISA, alcolocks, seat belt ignition interlocks or other safety innovations are made mandatory... Thus safety solutions that are known to be cost-effective are not introduced.” *processes*

“We see that many action plans are referring to ITS as safety measures that are supposed to have a high effect on reducing accidents. This might be true but we have seen very few studies that confirm this belief. Very few three capital letter systems have so far been able to document positive effect. Many, like GPS, have rather increased the accidents... Almost all new systems have to be handled by the driver and as such will take the attention away from the driving task. Do we really know if these systems increase safety?” *tools*

Behaviour

“Basic knowledge and understanding (at a microscopic level) of user behaviour under normal and critical circumstances needs further advancement, in order to improve the accuracy of micro-simulation tools already used at the design level.” *tools*

A review of contents of driver training programmes in Europe would be useful. *tools*

A sample of spots and posters for road safety campaigns would help. *tools*

Example of education programmes for ambulance drivers are needed. *tools*

Automatic photo surveillance can be used for various forms of control as a safety measure. “However, this use is hindered by the consideration for private protection. The enforcement directive is therefore of great safety interest.” *tools*

Improved and more rigorous enforcement of legislation is necessary. *tools*

Health

Some specific diagnosis results are needed such as rating of injuries on an injury scale, time in hospital, rehabilitation time, etc. *data*

Costing and Funding

“A problem often raised is lack of funding for road safety measures. Policy analyses for Norway and Sweden indicate that in both countries, current budgets for the road sector are fully adequate to fund all cost-effective road safety measures. There is no need, in these countries at least, to increase funding. There is only a need to spend funds wisely.” *tools, processes*

“If you can't find a strong political will behind the funding mechanism, you should not start preparing implementation. Then all other points are a pure academic exercise.” *processes*

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It would be useful to get guidelines or a methodology to assess the needs for and availability of resources (budgets, human, technology, etc.) before implementation of road safety measures. *Tools*

There is a need for tools to assess road safety costs and the needs for funding. Training is also lacking. *Tools, training*

We need methodologies to assess the cost of accidents (injuries, fatalities, loss of GDP etc) as well as the cost of safety measures. We also need a database of the costs of selected road safety measures. *Tools*

We need a standardized method for calculating injury cost. *Tools*

We need a tool to assess the socio economic costs from accidents. *Tools*

The assessment of the socio-economic costs of accident consequences is “important to decision-making processes. It is quite simple to summarize the material damages of vehicles involved and linked with damage on road and road equipment. Much more complicated is to assess the costs linked with personal injuries... Costs linked with loss of economic production and even more the indirect costs linked with personal suffering of victims and their families, social exclusion and similar consequences raise discussion and doubts”. We need standard methods to estimate costs, they should be validated, and the use of costs for decision-making at the national and local levels should be monitored. *Tools, processes*

Information on potential funding sources should be useful. *Tools*

Others: Issues related to the complexity of the implementation process

“Implementation is a difficult issue. In the Danish safety programme, for example, it is indicated that all road authorities should make separate plans for their own road network. But there is no instrument to ensure that it is done. This goes for the other sectors as well such as health safety programmes.” *Tools, processes*

Implementation of a national road safety programme involves multiple actors at the national and the local levels (for example, in Estonia, the Estonian Road Administration the Ministry of Transport and Communication and the municipalities finance or implement infrastructure measures, the Ministries of Transport and Interior are involved in traffic and transport measures, the Estonian Road Administration, the Ministry of the Interior and the Ministry of Education and Research implement behavioural measures, the Ministry of Social Affairs deals with Health measures). *Processes*

Implementation involves a good understanding of the level of acceptance of specific road safety measures by the general public. *Tools*

“Training tools are a difficult problem. Most of the information needed does exist, but it is now put on internet as linked documents which the user doesn’t access. The documentation is there but not used. The question is: how to get the road safety actors to use the information provided? In former times, they got printed manuals and were used to look into them when they wanted information. The same doesn’t seem to be the case now the manuals are electronic.” *training*

In general, aids to access relevant knowledge. *Tools, training*

“It is important to develop a web site where all the stakeholders involved in road safety management and research (e.g. local and national authorities, police bodies, national statistics institute including also universities and research centres) could

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access easily to data, in order to analyze them and to exchange results and opinions. The focus should be on fatal accidents.” *tools, processes*

We need “methods for assessing the training needs of the individuals involved in implementations processes; training programmes, training manuals and materials; and other training tools (expert systems, simulation, games, freebees, teaching aids, road safety promotional adverts, etc.).” *training*

“All road safety measures implemented should be monitored. This remains a neglected area. In particular, records of measures that have been introduced are not always kept or tend to be incomplete. When did this road get lighting?... When was this sign put up and when should it be replaced because its reflective properties have become too poor?” *processes*

We need more information of the implementation conditions of road safety measures. *Tools, processes*

Monitoring and Evaluation

Following up Trends

“Data analyses: there is a need for an interactive tool providing free access to data bases and statistical data for dissemination.” *tools*

We need tools to monitor road safety (accidents, casualties, “causes”) in the long-term, yearly and quarterly. *Tools*

“Monitoring in the short term should be done with the use of seasonally corrected data; an automatic correction of the raw values for the transitory weather factors should even be performed. On the contrary, monitoring in the medium/long term is a mere descriptive analysis, using a three level model (exposure to risk, accident risk, accident severity). There is no real explanatory model for the long term safety trend.” *tools*

“Short term monitoring does not require many skills or financial efforts to be implemented. But following trends in the medium term by a three level model can’t be implemented without exposure data. The main effort would be to gather harmonized exposure data for at least a sample of European countries. If a harmonized measure obtained by means of a survey at the European level is still out of reach today, a harmonized measure at the national or regional level and limited to a group of road users is a realistic goal.” *tools*

There is a need for better data and tools to monitor road safety. *Data, tools*

We need tools or data analysis and the establishment of trends and patterns. *Tools*

To monitor road safety, we need data on exposure and on behaviour. *Data*

Accident trends have to be monitored but also some behavioural trends, in particular speeds, through appropriate surveys. *Data, tools*

Modelling accident or fatality trends is useful to investigate risk factors which are not related to the road safety measures implemented. Both models and the databases used need to be periodically updated (yearly). *Tools*

“We should look into the connection between accidents and social and economic parameters as well as traffic and environment. There is a need for new models using

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variables based on not yet used external factors to explain accidents and injury trends.” *tools*

The behaviour and attitudes of the different groups of traffic participants and the main stakeholders’ road-policy strategies and interests need to be monitored. Data, *tools*

Forecasting

There is a need for tools to forecast accidents and injuries. *Tools*

Forecasting requires time series analysis tools. *Tools*

Three level models (exposure to risk, accident risk, accident severity) should be used for providing forecasts in the long term. This includes long term forecasts of mobility. *Tools*

It is important to forecast the accident and fatality trends on a yearly and quarterly basis in order to check if the figures for a given period match the expected value and to point out negative or positive developments. *Tools, processes*

Forecasting is required on a yearly basis while implementing a multi-annual road safety programme. *Tools*

Forecasts should be produced periodically (i.e. in a systematic manner). *Tools*

“There are limitations for accident forecasting techniques since there is insufficient reliable historical accident data... The process of compiling a reliable accident database for the purposes of forecasting using recognised techniques requires additional input and efforts.” *data*

Assessing the effect of Road Safety Policies

There is a lack of tools, processes (political will?), and training to assess the effects of road safety policies. *Tools, processes, training*

Training tools are needed for objective road safety impact assessment. *Tools, training*

“All accident plans are based on multiple road safety reduction measures. Many of them are introduced at the same time and this makes it difficult to ascertain the effect of each of them. As far as I know there are no methods for evaluating multi-measure initiatives. If I am wrong we would very much like to know about this.” *tools*

When the overall effects of road safety policies are assessed by means of global trend analysis, the assessment should be performed independently from the effects of other risk factors. *Tools*

The definition of partial (intermediate) targets “will help monitor continuously the progress achieved during the whole period of a road safety strategy and will facilitate the introduction of potential changes in the programme implementation when necessary.” *tools*

“Assessing the effects of road safety policies requires results from traffic surveys oriented towards road users’ behaviour”. *Tools*

“Using Police data on imposed fines and results of enforcement work as a complement to accident and fatality data could contribute to the assessment of the RS Programme as a whole.” *data*

Evaluation of Specific Measures

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“Road safety measures should be evaluated systematically. State-of-the-art techniques should be applied. The fact that a lot of evaluation studies has been reported is no argument, as the effects of many road safety measures may change over time and knowledge needs to be continually updated.” *processes*

“In some Member States, monitoring and evaluating safety measures are not regularly performed, as it is not valued as an important tool for the advancement of the transport system. This is an issue deserving improvement.” *processes*

“If there is one area where we need to progress, it is detailed monitoring and evaluation of the measures implemented.” *Processes*

It is important to assessing the response and effectiveness of individual measures in the short and medium term (infrastructure, traffic, enforcement, etc.) as well as in the long term (education, driver training, vehicle regulations, training courses, etc.). *tools*

Before-and-after evaluation of safety measures is necessary to design road safety programmes. *Tools, processes*

“Without research based knowledge linked with reliable and objective data, any progressive safety development cannot be achieved. Even a simple transfer of the best practice from other countries can lead to fiasco when its implementation is not sufficiently verified in the recipient country.” *processes*

Data on road user behaviour is required as a complement to specific accident data for the evaluation of specific measures *data*

To assess the effects of traffic education special behavioural surveys need to be undertaken. *Data, tools*

“In some cases, we don’t have enough data to assess the effect of implemented measures.” Getting significant data is particularly difficult for small countries. (So surrogate data would be useful?). *Tools*

“Sometimes it turns to be difficult to separate and thus evaluate the effect on RS of one individual measure. It’s easier to evaluate the effect of a group of measures.” *tools*

“At an aggregate level, each measure should be evaluated independently from other measures and from other risk factors.” *tools*

“A more sophisticated approach to cost-benefit is required: we need a multi-factorial model. How do you consider lives saved, improvements in quality of life, improvements in overall health together?” *tools*

Others: Monitoring Road Safety Actions and Reporting

“Road safety measures should be evaluated systematically. State-of-the-art techniques should be applied. The fact that a lot of evaluation studies has been reported is no argument, as the effects of many road safety measures may change over time and knowledge needs to be continually updated.” *processes*

“In some Member States, monitoring and evaluating safety measures are not regularly performed, as it is not valued as an important tool for the advancement of the transport system. This is an issue deserving improvement.” *processes*

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APPENDIX 4 INTERVIEWS

Summary of Experts' opinions – Interviews

Fact-Finding

Diagnosis

Accident forms are filled by policemen who are not trained to fill them in.

Need to know which road accidents occur while working or on the journey to work (already in STATS 19) - Need evaluation of number of injuries with lifelong consequences and injuries that are fully recovered from – lack of knowledge on the seriousness of injuries. We would need a classification of injury seriousness that would be easy to record at accident scene (rather than based on a medical approach) – Need to link accident statistics to hospital injury data (The police do not know the “story of the injury” while the hospital does not know “the story of the accident”), need for stabilised hospital injury data (i.e. rules for data entry changed several times) way to solve underreporting (track serious injuries that do not appear in national accident data or vulnerable road users single accidents - need to get information on the injuries that do not appear in police data (underreporting), possible “track”: inclusion of a question in national surveys (in UK, the national travel survey). – Need to find a way of measuring walking and cycling at a local level – Investigation of the safety implications of changes in the pattern of travel (in the sense of the successive types of transport modes used by the person to go from point A to point B), and this in relation to exposure

Data improvement currently “on the way” in the UK, that indicate the needs felt with this respect: work is done on the definition of serious injury, on the ability of the police to distinguish between more and less serious injuries, and to facilitate data collection by the police (based on the acknowledgement that police officers are not specifically trained in this respect, and/or may lack experience), use of hospital data and of questions in another national survey (National Travel Survey) to estimate the level of underreporting.

Data improvement currently “on the way” in Ireland, revealing the needs felt with respect to data quality and that focuses on the improvement of the information recorded by the police, specifically concerning human factors. ... There are needs for exposure data for vulnerable road users – motorcyclists and pedestrians. ... Ireland does not have a good definition for serious injuries, nor on their measurement. There is the desire there to distinguish between life changing injuries (with higher socio-economic costs) and more minor injuries.

Data and specifically indicators have gaps; Switzerland misses indicators on the prevalence of drunk drivers in traffic for example. There should be a distinction between must-have and nice-to-have RSPI Need for national data on black spot treatment.

Data are missing on other indicators than on “fatalities per capita”: we need reliable comparisons on injuries as well, and by road and road-user type. Ratios per kilometres driven are missing, also at national level (to the exception of motorways). ... No information is available on the prevalence of drunk drivers in Austria. A more institutionalised collection (and comparison) of behavioural indicator is required. ... Information on the share of accident on the way to and from work would be helpful.

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... What is the share of very severely injured persons (with high probability of long lasting disabilities)?

Basic accident data is not really a problem in Poland, but underreporting of injuries is. ... Databases do not contain accident locations.

Consistent principles for classifying injuries are needed in Poland. Slight injuries are not fully recorded in the Polish national accident database, which affects accident statistics. Uniform definitions and coding rules would also be necessary for coding one and the same accident in the different database (police, health care and insurance databases). Methods should be implemented to link the different databases and ensure easy use of all data. ... Data on the material and health effects of accidents.

Accident and exposure data, SPI. Seminars would consist of useful training tools for fact-finding. ... As regards the data, apart from the accident data, which are generally available, and the exposure data, whose need is underlined in several studies, particular focus should be given on the gathering of data and knowledge of road user behaviour. For example, road safety performance indicators belong in this category of data. However, even more detailed information is needed, not only on the behaviour itself of the road users, but also on their interaction with the vehicle and the road environment. ... In several cases, special experiments will be required and need to be gradually established. For example, naturalistic driving studies and driving simulator studies may provide important information on road user behaviour, and this information could not be obtained by other existing sources. ... Appropriate statistical models (multivariate models) and large databases are necessary for selecting measures. Multi-criteria analyses and meta-analyses of safety effects are also needed. Best practices could be disseminated by means of handbooks, manuals, and seminars.

The types and kind of knowledge required for this task are targeted databases and information sources (for searching relevant facts), both international and local databases (accident data and other data).

Usefulness of disaggregated data, to be able to re-examine a problem, notably. The example given was that of French data indicating that there was no problem with the elderly in France. But the elderly are there defined as 65+. Using disaggregated data, the elderly problem becomes visible from 75 years on. Given that this category makes only a small part of the original 65+ category, the problem was actually masked by the 65-74 ones. ... We have all data for infrastructure... but we do not have anything comparable on behaviour, while we say that 9 out of 10 accidents are the result of behaviour.... The role of the car is less important, but there again, we lack much information. ... We know where the biggest possible gains lie in terms of RS, but paradoxically, these are the causes that we know the least (example: we cannot comfortably demonstrate that the stakes of minor speed infringements amounts to those of important speed infringements) ... We should not believe that we know everything about alcohol or speed. Why does seatbelt wear remain problematic? ... We cannot just look at the statistics, we need surveys and studies.

The methods required for performing these tasks efficiently are well known from the international literature. The necessary data are also largely available in most countries, at least in terms of road accident databases. Particular effort should be made, though, for ensuring the reliability of the data and the accuracy of the data reporting process.... It should be stressed that the lack of data is not the most important question for evidence-based policy making in Greece. In several cases, the data and methods are available, but are not fully exploited. In a few cases, it may

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also be a matter of data accessibility. But in general, the most important problems and road safety effects can be analyzed with the existing data, despite their limitations and despite the additional data needs.

In Greece, for instance, there is a general impression that insufficient driver behaviour is the main reason for the country's poor road safety rank. However, if proper road safety analyses were carried out, it would most likely become obvious that deficiencies in the road infrastructure play a very important role. More specifically, if road safety statistics were used fully and properly, we might obtain very insightful information on the role of poorly designed or insufficiently maintained road environment elements (e.g. pavements, traffic signs, sidewalks etc.), affecting the number of accidents. ... In this context, determining the accident location is a critical issue of the data reporting process. The Police, typically responsible for the collection of such information, should be better trained and equipped.

From our confidential interviews (*with persons having been involved in accidents*) the picture of the situation gets quite different if compared with official statistics, derived from Police reports. We get the confidential descriptions of what really went wrong, not only during the accident, but also before (life style, driving style, effects of campaigns, policies etc.) but also of what is the gap between reality and the registration by police, by the insurance companies, by the health system etc. ... Probably a possible solution is the improvement of data collection networks both supporting police bodies that are in charge of data collection, both starting using informatics tools since data collection on-field. Another point related to data is the use of the data stored by the insurance companies. In their databases insurance companies have - for each crash - the synthesis of all the data collected: by police bodies, by expert witnesses, and by the court. This large amount of data could provide much information on road safety but, at the moment, they cannot be used for road safety purposes.

In Finland there is a lack of data on the injury severity. Liikenneturva, an organisation governed by public law whose task is to improve traffic safety in Finland by influencing people's traffic behaviour, asked Statistics Finland, the organisation for official statistics in Finland, to do something about this lack of data on injury severity. The response from Statistics Finland was that addressing the issue would mean, "more work for little use". There are a number of good practices that could be implemented in order to have reliable injury severity data, but for the moment it is just that Statistics Finland is reluctant to go forward with the issue.

A general concern in the Netherlands is that the quality of the registration of crashes and casualties is decreasing. In addition, road safety is improving which implies that the numbers of casualties are getting too small to be able to perform good analyses, especially on the regional level.

Priority Setting

Integration of other sectors

How do we create synergy between the safety agenda and the environment agenda? Politicians are looking for policies that will help to save lives and reduce carbon. We need to offer examples of these.

We need to be aware of other agendas, such as environment and sustainability (example: electric cars may have safety issues as they are more likely to be used in areas where people cycle more). ... Having evaluations of life years lost available helps in getting public health on board (this sector works with number of years lost), it is important to make RS a public health issue....

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The “epidemiological view” should be strengthened, (fatalities, injuries... *per capita*). This would make risk comparisons between health sectors easier (WHO, DG SANCO).

More information is needed on the exact location of the accidents (GPS support for data collection), accident maps (black spots), information of the risk ratios for specific types of infrastructure, for specific RU groups (especially vulnerable road users).

Data on the causes, high risk road-users and road sites. ... Data on behaviour (measuring behaviour in real conditions). ...

It is important to consider all the effects together (i.e. health, safety and environment) as such a combination enables to enhance the probability of intervention success. Also, frequently the interventions provide positive effects for all the three aspects. A road safety problem has a better chance for increasing social awareness when being promoted in combination with health and environment problems.

Improving the overall comprehension of the evolution of RS, improving explanation

We need to better explain ... We also need to evaluate the impact of external factors on road safety: we can explain some trends and variations but part of it has to do with other factors, such as the economy.

We also need to know whether the reduction of fatalities is due to the economy, and to work out what aspect(s) is causing the reduction in fatalities.

“(We) should have a look at external factors, such as the weather. E.g., did the strong winter that we just have had affect the number of road accidents?” ...”(Another) example is the relation between the economic situation and road safety”

We always think that it is the actions taken for enhance road safety, that affect the level of road safety and we try to evaluate the efficiency of these actions. But the level of road safety depends on many other factors than the measures we have taken. The measures have no built-in, clear effect on road safety. The measures usually aim at affecting the human behaviour. Beyond behaviour, infrastructure and vehicle, there is an external environment made of traffic density, economy, climate and weather etc. It is self evident that the main risk factor is the exposure. When we want to evaluate the effect of road safety measures, we must not forget to take in account the exposure and the external factors. We need to evaluate more that just the effect of an isolated measure.

Other comments

For priority settings statistical methods and tools including the results of meta-analyses are needed.

There is a need for prospective vision... to detect and analyze future issues.

Training needs: Training for database operators and those interpreting the data, for programme developer.

Programme Development

Need for more focused information/data

Concerning the programme development, there is practically no relation between fact-finding, the measures that are taken, and the objectives that we want to attain.

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We do not know the parameters that link them and we even miss indicators ... Traffic supervision: what would be the effect of being able to control one driver out of three each year in terms of number of fatalities? The same holds for seatbelt wear and the number of alcohol controls. The same reasoning could also be made for more specific groups, such as vulnerable road users group. Motorcyclists, for example, are expected to wear reflective clothing: how can we estimate the number of lives saved on the basis of such a measure? The result of measures is sometimes really limited.

Improved exposure data would be needed, so that exposure is known for cycling, walking, etc. ... More information would be needed on enforcement, as well as on the impact thereof (for example: what measure would be more effective: random or targeted breath tests? what is the impact of police activity, what indicator do we choose to measure this?).

We need to know how effective certain policies are, e.g. policing (enforcement vs. education), so that we better know how to target resources. More information would be needed about in-car technologies: are they beneficial or a distraction, we need to identify which technologies policy should support.

Effectiveness of enforcement in relation to the occurrence of violations, “good practices” in enforcement.

There is no information in Poland about the measures implemented in Poland, due to lack of time and money resources.

Knowledge-based policy making becomes most critical when legislation is involved, where the need for fully substantiated decision –making is particularly pronounced. Evidence-based legislation intervention should be a priority of road safety policy making. ... Ideally, for any programme or measure considered, either a general (e.g., national) or a specific one (e.g., local), the necessary data should be gathered and analyzed fully by means of appropriate (and preferably standardized) method. This would require that detailed data is available, not only as regards road accidents and exposure, but particularly road user behaviour data. ... A good practice would be to introduce procedures requiring an in-depth scientific explanatory memorandum to be provided for each programme, measure, or change in the legislation considered.

Different types of information are needed for programme development: such as knowledge on the quality levels of evaluations (how to distinguish between reliable and less reliable estimates); accurate information on safety measures and interventions implemented (for carrying out the evaluations of safety effects); databases with accumulated international experience on safety effects of various measures and interventions; quantitative methods for evaluating combined effects of safety measures. ... In Israel, a database with comprehensive information on the actual implementation of safety measures should be established and maintained.

Various assessments of the impact of road accidents should be performed, but these do not efficiently define the directions to be taken by the government or for public RS activities. The results of these assessments are not usable in the development of national road safety programmes and in assigning RS policy. Focused assessments are more useful in this respect, or assessments that direct the RS activities to certain issues, e.g., pedestrians, the elderly, children ... Summaries on the efficiency of various countermeasures would be useful, as well as tools enabling quick search of recent findings/summaries of studies on specific issues.

Statistical models (time series analyses and forecasting) are required for target setting.

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There is a need for information about behavioural measures, for example public campaigns and education, driver training, and alcohol and drug measures (e.g. alcohol). The type of information used/needed is effectively (preferably in terms of reduction of casualties) and costs. An important need concerns assessing combined effects of road safety measures, about which there is little information. An example is the effect of behavioural measures in combination with communication.

There is a need for integral assessment of road safety measures, which means that effects on other policy areas (e.g. on mobility, economics or the environment) should be taken into account. The other way around, there is a need to take into account the road safety effects of measures that are taken on other policy areas. Until now there has not been much attention for integral assessment of measures yet, nor for cooperation between policy makers in related fields. Drugs is an example of a topic where a broader cooperation may be fruitful.

Regional and local governments a need for information about specific measures, in particular information that helps selecting and prioritizing measures. They need for example advice about which measures to implement, which ones are appropriate in which situation, and their cost-effectiveness.

Improved evaluation of the costs and benefits

The training tools should also influence the decisions taken. If one is to implement a measure that asks a lot in terms of training... An example in Belgium is the use of saliva tests: We have estimated that 6 months at least would be necessary to have sufficient personnel from the police trained to their use in order to be able to apply the law. We should be able to inform the decision makers of such « quantifications » (as estimation of the time and money needed, this is also part of the « preparing implementation » task, and of the costing and funding part thereof). – When selecting measures, the costs associated to the training that might be needed to concretely implement them should be taken into account (example: training of the police officers to use saliva tests) – we should be able to quantify these costs and inform decision makers about them.

We need a more sophisticated approach to cost-benefit, a multi-factoral model (lives saved, improvements in quality of life and in overall health altogether) – becomes particularly important when casualties are falling and may have reached a level below which they cannot easily go. Example: Quality Audit as part of the Manual for Streets in UK: does not just look at casualty saving but also at effect on amount of cycling and walking, on safety felt...

It is necessary to take into account police, medical, and indirect costs, so as to have a value at disposal when looking at implementations. Having evaluations of life years lost available helps in getting public health on board (this sector works with number of years lost), it is important to make RS a public health issue....

There is also a need for financial evaluation. Cost-benefit analyses that have been carried out in 2002 in Ireland need reviewing. ...

A standard methodology across the Union would be helpful. ... Measures should not only be selected but also adjusted to local circumstances.

We do not know the costs of measures. Before we implement a road safety measure, we should be able to know how much it will cost and if the country can afford it.

In this framework, a number of relatively low-cost infrastructure interventions might bring impressive results in terms of road safety improvement. The data and international experience that could support the selection of such interventions are

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largely available, and it is mainly a matter of organization and programme for these to take place. If the dedicated methods for estimating the expected safety benefit from such low-cost interventions were carried out, it would become obvious that the processes and resources required for achieving this benefit are not too demanding and the benefits by far exceed costs.

There is a need for information about the expenditures on road safety in various countries, also in comparison with expenditures in other policy areas (for example expenditures to prevent or compensate environmental effects).

Need for European information and guidelines

We use information at international level, more than ever, mostly concerning measures. Internet has made this a lot simpler. Example: Motorcycle with a side-car, plus the possibility to attach a trailer to it? How is this regulated in the Netherlands? And in Germany, or in the UK? This is now very easy to find out thanks to the internet, and it would be even easier if institutions (the Commission, ERSO) would summarize that information for each member state. But not all information can be found in the databases (websites) that we consult: How are these rules applied? The sources of the law are multiple: the habits, the law texts, but also the legal doctrine, the comments that are made on a particular regulation. As example, how do other countries deal with the responsibility of the owner of a vehicle when an infraction is committed and the driver cannot be identified? In the UK; the vehicle owner is held responsible unless he/she can tell who the driver of the vehicle was at the moment of the infraction. Given that a driver could lie to protect him/herself, the comments to the law specify that the car owner has to be able to prove that the indicated driver was indeed present on the territory on the day the infraction was committed. This is the way things take place concretely, but it is not written in the law texts. These “unwritten” things should also be known. Another example is the 0,2 alcohol limit in the Netherlands about which we recently learned that there exists a 0,2 (?) measurement margin in the application. And there are similar question marks with respect to accident data. The speed limitations, as another example, are rather different from country to country, while we might have the impression that they are relatively uniform. ... These (international information) are very useful, primarily for the regulations, the support to policy-making and the evaluation of policies (“How have they done that there?, Why?...”) Still, what I said earlier about the nature of the decision-making process is also true for other countries (in France, for example, researchers from INRETS would say that the decision taken regarding the legal age to drive a motorbike is nonsensical, but that “this is the way it is...”)

Ireland has conducted two literature reviews dealing with scientific evidence, but also specifically with the actions that were taken in other countries, one about drug driving, the other about the effect to be expected from a decrease of the legal BAC limit from 0.08 to 0.05.

Studies on combined effects of measures should be carried out EU-wide and the results communicated. A standard methodology across the Union would be helpful.

There should be a database of effective road safety measures and a method for selecting the right ones ... What we need is basic knowledge for developing forecast models and practical knowledge and experience for developing road safety procedures and measures.

Concerning the ERSO, the most important thing is to change the way research projects are finalised: conclusions and recommendations should be formulated in a

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way that will help with the implementation. The ERSO should provide more examples of “best practices” and evaluations of effectiveness.

Standardized methods are needed (before-and-after odds ratios, cost-benefit and cost-effectiveness analyses). ... In other cases, countermeasures are introduced for specific road safety problems, without taking into account the experience from their implementation elsewhere, in Greece or in Europe (although related meta-analyses are often available, e.g. in related Handbooks).

Databases with accumulated international experience on safety effects of various measures and interventions – At European level, we lack of common (agreed upon) methods for carrying out various tasks, e.g. target setting, following up trends, forecasting, assessing effects of safety measures and interventions. It would be useful to develop best practice guidelines for performing various evaluation tasks in road safety; such guidelines should target road safety professionals (not the scientific community) and be relatively simple and applicable. ... The international comparisons are important: for identification of major safety problems of the country; for benchmarking; for evaluating safety effects of various measures/ interventions. On the other hand, the international comparisons are less important for road safety management in the country because the organizational structure is less transferable and differs among the countries. Also, summaries of international experience of safety effects observed are useful in the fields of road infrastructure, police enforcement, road user behaviour. Such summaries are less important in the fields such as education and adjudication. Lacking tools in the road safety field, on the international level are: a database with traffic laws and regulations, from the European countries; matching the definitions applied by traffic laws and regulations in road safety field

Then, the necessary data and knowledge from the international experience should be used by means of standard and appropriate methods in order to set the priorities, select the measures implement them and, most importantly, evaluate their results.

An overview of and information about measures that are taken in other countries with respect to specific target groups would be helpful for national policy making.

There is a need for a European model to estimate effects and costs of road safety measures, and to forecast road safety developments (number of casualties). The model should be suitable to apply in different countries. Such a model would require a lot of data, like number of casualties, effectiveness and costs of measures, and influence of external factor on road safety. To explore the possibilities for developing such a model, pilot studies should be done.

Public Acceptance

More knowledge about values, attitudes, i.e., acceptance, so as to enable us developing measures to affect public acceptance

Public acceptance is taken into account in the decision-making process, but not on the basis of objective data about public acceptance, more on the basis of the reaction of the media. ... Often, what is good for RS also limits the freedom – maybe the imagined freedom – of the driver. In this sense taking public opinion into account may be detrimental for the adoption of measures that are in themselves beneficial for RS.

We need comparative legal and enforcement data/information as well as on the experiences of other countries with respect to the acceptance/resistance of RU in relation to specific measures.

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We do not know what the driver understand from what we tell him/her. We do not measure impact; we measure audience a road safety campaign has.

... see also the "Public acceptance" discussion point at the end of the Appendix.

Preparing Implementation

Infrastructure

Road safety audits and road safety inspection

An additional note concerns the planning of implementation of infrastructure interventions. It is seldom emphasized that road safety audit and road safety inspection data and information may be particularly useful in the implementation of infrastructure interventions.

It is possible to assess the safety of a road that already exists or the safety of a planned road. However, in France the safety assessment of existing roads has not been initiated because the infrastructure management was not associated to the project from the beginning. If we want to go ahead with such projects we need to involve those who will be affected.

Behaviour

We would learn more about behaviour change from the public health sector. We need to learn how to best do risk education.

Monitoring and Evaluation

Poland should develop standard measures for all types of roads and define quality levels for different aspects of infrastructure (e.g.: horizontal and vertical markings) and road safety furniture. Such norms and quality standards should also be applied to other measures, for example driver training. If standards are implemented, RS measures and their evaluations will be harmonised across Poland and will be better monitored and evaluated.

An equally important dimension is the availability of sufficient time series of data, especially for monitoring the programmes and measures. ... In any case, the data should be analyzed by means of appropriate techniques, and in most cases some kind of statistical analysis is required, so that e.g. confidence intervals for the expected safety effects of the measures will be estimated. The selection of the appropriate modelling technique may also not be straightforward and require availability and accessibility of knowledge (tool).

Reliable data on measures and interventions applied, Statistical tools for trends' analysis, forecasting, assessing effects of policy and measures, especially combined effects

We take action, but action does not leave room to evaluation. Evaluation is not simple, but still we do have indicators available that we could use (number of fatalities, serious injuries, severity indicators...). Yet, this evaluation is not planned. ... An evaluation cannot take place if the people involved in the action are not involved in such an evaluative action from the beginning. ... We do not have the means to evaluate the efficiency of public policies. Some say that our budget is

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clearly insufficient. Should we know that what we are doing has an impact, we could ask for more.

For the tasks related to implementing and evaluating such interventions, a sufficient time series of road accident data would be adequate for implementing both blackspots identification techniques and before-and-after evaluations. ... It is also mostly important to have data and information on the details of the implementation of road safety studies interventions e.g. how many blackspots were treated, when, how etc. This information will be crucial for the evaluation of the safety effects of the measures.

Following-up trends

Need for statistical methods that separate/isolate the effects of specific policies.

Does the share of very severely injured persons develop differently from fatalities?

Forecasting

Traffic prediction models do largely exist for the motorway network, but accident prediction models need to be set up and adjusted to Austrian motorways.

What we need is basic knowledge for developing forecast models and practical knowledge and experience for developing road safety procedures and measures.

Assessing the effects of road safety policies

There is a need to be more aware of how specific interventions work.

Evaluation of specific measures

More information is needed about the effectiveness of road safety engineering interventions. This implies having a *representative* sample of the work of local authorities (local and national highways agencies, etc.) audited, over many years, so that the expected reduction in injuries brought about by specific interventions could be estimated. Good information on the total costs (hidden costs included) of these interventions would also be necessary.

There is no information in Poland about the measures implemented in Poland, due to lack of time and money resources. We should perhaps develop uniform procedures across the European Union for collecting "best practice" data and how they should be assessed.

Project-specific data are also seldom accessible. For example, in order to evaluate the effectiveness of a road safety measure, it is necessary to know the specific implementation features of the measure e.g. final costs. In several cases, this information is not accessible. ... Measures implementation data, e.g., cost of measures, safety effects, implementation period, etc. ... Project implementation data (period of implementation, costs...)

Road safety interventions are not studied sufficiently and globally. For example, no study on blackspots in urban areas has ever been initiated, although Greece has

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actively participated in the E.U. project DUMAS “Developing Urban Management and Safety”, dealing with the importance of road safety in urban areas. Monitoring and evaluation of the interventions almost never takes place.

Others: Monitoring road safety action and reporting:

Need more exposure data (and ways to calculate them) – appropriate for Ireland

It would be very helpful to have some data available on a periodical basis (accidents, traffic, accident costs, and so on) at both national and European level.

It should be made clear that the methodology for evaluation and respective indicators are to be available before a measure is taken. Hence, Monitoring and Evaluation are the basis for setting measures, not the terminal step in the process.

Additional Interview Topics

Promotion of evidence-based policy-making

Demonstrate the usefulness of evidence, communicating a lot about this, by all possible communication means, but one has to be very cautious to make the information accessible, communicating scientific evidence in an inaccessible way could just “kill” evidence-based decision making.

To promote the use of the available information and knowledge in the road safety policy-making processes, a change of awareness of road safety decision-makers is required. Currently, they prefer to act in accordance with gut-feelings to control the situation. They are not ready yet to move to evidence-based policy making in road safety. A possible incentive for moving to evidence-based policy making could be through adopting a conditional budgeting whereas a necessary condition for approving a budget for a certain measure/ intervention would be providing evidences of their expected safety efficiency. A similar demand already exists for obtaining financing for major transport projects: the expected benefits (mostly from better mobility and reduced transport costs) have to be evaluated and proven prior to getting a budget. A move to evidence-based policy making also depends on personal attitudes and experience of people keeping leading positions in the authorities. Those preferring a systematic approach usually ask for background examinations of local and international experiences and providing warrants for the solution selected. In general, there is a need in changing awareness of engineers and other road safety professionals, by teaching them a system approach and system management methods.

To promote the use of the available information and knowledge in the road safety policy-making processes, there is a need to prove the legislatures, leaders, decision makers, etc that these things work in practice. A possible way is to accumulate proofs of efficiency for each countermeasure considered. Existing examples: no doubt on the efficiency of safety belts; there are many proofs on the role of speed in accident occurrences and severity of consequences and therefore, no doubt in need for traffic calming measures in urban areas. Research findings can serve as incentive for promoting safety measures, especially when the findings are received in local conditions. Besides, key-position people in officialdom should define the issues for examination: to formulate the systems needs to be examined.

Information at European level

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We use information at international level, more than ever, mostly concerning measures. Internet has made this a lot simpler. Example: Motorcycle with a side-car, plus the possibility to attach a trailer to it? How is this regulated in the Netherlands? And in Germany, or in the UK? This is now very easy to find out thanks to the internet, and it would be even easier if institutions (the Commission, ERSO) would summarize that information for each member state. But not all information can be found in the databases (websites) that we consult: How are these rules applied? The sources of the law are multiple: the habits, the law texts, but also the legal doctrine, the comments that are made on a particular regulation. As example, how do other countries deal with the responsibility of the owner of a vehicle when an infraction is committed and the driver cannot be identified? In the UK; the vehicle owner is held responsible unless he/she can tell who the driver of the vehicle was at the moment of the infraction. Given that a driver could lie to protect him/herself, the comments to the law specify that the car owner has to be able to prove that the indicated driver was indeed present on the territory on the day the infraction was committed. This is the way things take place concretely, but it is not written in the law texts. These “unwritten” things should also be known. Another example is the 0,2 alcohol limit in the Netherlands about which we recently learned that there exists a 0,2 (?) measurement margin in the application. And there are similar question marks with respect to accident data. The speed limitations, as another example, are rather different from country to country, while we might have the impression that they are relatively uniform. ... These (international information) are very useful, primarily for the regulations, the support to policy-making and the evaluation of policies (“How have they done that there?, Why?...”) Still, what I said earlier about the nature of the decision-making process is also true for other countries (in France, for example, researchers from INRETS would say that the decision taken regarding the legal age to drive a motorbike is nonsensical, but that “this is the way it is...”)

European priorities are taken into account for priority setting in Belgium – Decision support tool?

One needs to know more about the international experience (“monitoring and evaluation” of measures in other countries, for example). ... International data are used at a global level, namely, in reference to the fact that Belgium is still among the last of the Western European countries in terms of RS performances. This information has much effect here in Belgium and is often used as « motivating » factor (by parliament members proposing new laws, for example). It is also sometimes used as a substitute for more appropriate data at national level. The other type of information available on the ERSO website is also used (information oriented around key issues, not only focussing on the relative performances of the member states). It has become a reflex here, « we go there first » to see what is available. It happened not later than this morning (the Secretary of State has asked for a study on the decrease of legal age to drive a motorbike) ... International comparisons are here mainly used as argument to show that we cannot stay inactive....

Make country comparisons within the limitations of the data (e.g.: comparison limited to the trends and not focused on the absolute figures, which are not comparable across countries) – Need to “work towards time when data is less incomparable than now”... Need more comparable data on injuries – The comparability of deaths has been overstated...the procedure for attributing deaths to road accidents in different countries need to be compared in detail

Comparing performance should lead to sharing of ideas and best practice. An “EU group” of RS officers might be useful (TISPOL is such a group, but it represents enforcement).

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Country comparisons are very important, the consultation currently held in the UK states that the aim is for the UK to have the best RS record in the world. This is also a means to learn from other countries. Sunflower and Supreme are considered very useful.

Information on accident/fatality prevalence is available at European level (ERSO; IRTAD; CARE), but for other important issues European overview is missing, such as for survey methodologies, RSPIs: training tools for survey methodology to measure these indicators (as those developed in SN) should be continued, and best practices should be made available, or “how to set up a successful road safety programme, or generally on results of research projects. ... Inter-regional comparisons should also be done: they have a higher potential to spark ambition amongst regional/local decision makers (example of a comparative analysis of RS in the different language regions of Switzerland which currently impacts on the dynamics of RS work there). ... Best practices should be better disseminated (as training tools), by way of seminars, for example. It could help the transfer of knowledge from West to East.

We would appreciate European help with unification of definition of serious injury ... “comparing Irish (rural roads, wet climate) pedestrian casualties to a Mediterranean country not appropriate ... The future proportion of elderly drivers was estimated by ETSC as % of population, and this way of measuring is not appropriate for Ireland. Statisticians proposed using a different model to take into account country factors – How do you realistically benchmark Ireland against other countries? How interpret statistical data in the context of the legal and the cultural issues of specific countries? ... Ireland has conducted two literature reviews dealing with scientific evidence, but also specifically with the actions that were taken in other countries, one about drug driving, the other about the effect to be expected from a decrease of the legal BAC limit from 0.08 to 0.05. ... ERSO data are useful. The fact sheets are used to communicate information from experts in a succinct way. It would be good to have more information there, and up-to-date information ... commissioned a literature review to assess evidence and actions taken in other countries... – Literature review of other countries experience and findings for evidence for change to 0.05” – We need to take account of country factors – Example of the EC cross-boarder enforcement guidelines: the solution consisting of tracing whether the car was registered in the original country is not helpful to Ireland, given the number of people there coming from eastern European countries with their own cars.

The impact of good practice reviews is generally poor: results are seldom made available to practitioners! ... We need all type of ratios: fatalities, injuries, accidents per capita, vehicles, vehicle km ... We need comparative legal and enforcement data/information as well as on the experiences of other countries with respect to the acceptance/resistance of RU in relation to specific measures – We need comparable data on behavioural aspects: speed levels, seatbelt use, alcohol, mobile phone use.... – Harmonised data on accident costs are required (insurance data may be useful in this respect). – International information on target setting would also be useful: how are targets set in other countries? Information on the target set by the commission as well (what kind of target will the commission set for the 4th RSAP?)

It is important to establish a system for collecting RS data, e.g., observatories. We could definitely use a “best practice” database, but we must remember that many of the problems are of local nature. It would be a good idea to share information about methods for road safety assessment and selection of measures, but they must be first verified in each country and cannot be directly transferred from one country to the other. ... We should perhaps develop uniform procedures across the European Union for collecting “best practice” data and how they should be assessed.

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Concerning the ERSO, the most important thing is to change the way research projects are finalised: conclusions and recommendations should be formulated in a way that will help with the implementation. The ERSO should provide more examples of "best practices" and evaluations of effectiveness.

In other cases, countermeasures are introduced for specific road safety problems, without taking into account the experience from their implementation elsewhere, in Greece or in Europe (although related meta-analyses are often available, e.g. in related Handbooks).

databases with accumulated international experience on safety effects of various measures and interventions – At European level, we lack of common (agreed upon) methods for carrying out various tasks, e.g. target setting, following up trends, forecasting, assessing effects of safety measures and interventions. It would be useful to develop best practice guidelines for performing various evaluation tasks in road safety; such guidelines should target road safety professionals (not the scientific community) and be relatively simple and applicable. ... The international comparisons are important: for identification of major safety problems of the country; for benchmarking; for evaluating safety effects of various measures/ interventions. On the other hand, the international comparisons are less important for road safety management in the country because the organizational structure is less transferable and differs among the countries. Also, summaries of international experience of safety effects observed are useful in the fields of road infrastructure, police enforcement, road user behaviour. Such summaries are less important in the fields such as education and adjudication. Lacking tools in the road safety field, on the international level are: a database with traffic laws and regulations, from the European countries; matching the definitions applied by traffic laws and regulations in road safety field

The international comparisons are important for defining ambitions and setting international standards. The comparisons should be reasonable: with "neighbors", with entities of similar "status", and with "the best in class". The international comparisons are essential for emphasizing "weak points" and providing accurate estimates. However, it is important to apply the correct indices and not to screen the data. Summaries of international experience as to safety effects of various measures are important but measures' implementation should be fitted to local conditions. Useful tools may be: those enabling quick search of recent findings/ summaries of studies on specific issues; knowledge summaries on specific issues for being informed on recent developments.

In order to do international comparisons you need disaggregated data. Data on population density, on urban/rural split, on the quality of roads, on the road use, on traffic density etc.

There is a need for more/better exchange of knowledge on European level, e.g. by extending ERSO website with (links to) road safety policy documents from all countries and contact details of policy makers.

Knowledge that is necessary to implement EU directives is needed, e.g. road protection scores.

Public acceptance

In the 80's, for example, it was almost impossible to implement speed cameras. This is now a far better accepted fact. How was this acceptance achieved? Another example: In Flanders there are a lot more roads where speed is limited to 70 km/h (as compared to Wallonia or Brussels): what should we do to make this acceptable to

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the majority of the population? ... We always wonder whether there is some support in the population. The wearing of reflective jackets is an example: there are people who wear them already, but we don't want to make something compulsory that is not done by 60-70% of the population. So we do not want to take measures for which there is no support at all in the population. However, we can work to create such a support ... We take this (acceptance) into account, sometimes too much maybe. Here in Belgium, we are very cautious in avoiding making people's life more difficult. We are scared to take measures that could hurt.

Public acceptance is taken into account in the decision-making process, but not on the basis of objective data about public acceptance, more on the basis of the reaction of the media. ... Often, what is good for RS also limits the freedom – maybe the imagined freedom – of the driver. In this sense taking public opinion into account may be detrimental for the adoption of measures that are in themselves beneficial for RS.

Get public on board but not driven by public

Road safety measures are not usually popular with the public in the initial phase.... Political and public support clearly helps, but we must know how to win support.

Public acceptability is considered as essential for introducing safety measures. However, the public frequently passes a "brainwashing" from the media. For example, the media does not accept the speed issue as safety related; as a result many effective measures on speed management (e.g. automatic enforcement) still cannot be promoted in the country. An opposite example concerns the regulation on obligatory use of safety belts, in the 1980s, which was supported by the media which in turn influenced the decision makers who promoted the regulation, which further brought on the change in the public behaviour. Another positive example – use of helmets by motorcyclists, where the regulation came following the public acceptance of the measure.

Public acceptance of the measure is essential for defining the initial position concerning the measure's introduction. For example, the safety belt regulation was introduced progressively, starting with a demand for front seats only outside urban areas; later it was extended to all seats and all areas. Examples of measures which were not promoted: a prohibition on using mobile phones by pedestrians while crossing a road; more serious punishment for demerit points. The public did not support the measures, the police was not ready to enforce and the proposals of measures were denied. At the same time, the level of public acceptance is sometimes assumed and not really known but still is used to reject the suggestion.

We do not know what the driver understand from what we tell him/her. We do not measure impact, we measure audience a road safety campaign has.

Full and unbiased impact of RS

The evaluation of the global impact of road safety is interesting, but mainly at the micro-level. At the macro-level, the argument of the economic gain is weakened by the fact that investments and gains respectively concern different institutions. All in all, the demonstration that gains will be associated to the investments has to be really strong in order to be convincing.

This information would be important from a financial point of view, but, given that there is not always a direct link... One can, for example, estimate that some measures are going to reduce the costs for society for a given amount of euros, but the person who decides (adopts the programme) will not be able to use the economy

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made to reinvest it: The whole of society and the state are those who will benefit thereof (unless we would be able to calculate very precisely the decrease in expenses for the social security).

Stakeholders involvement

The stakeholders are not sufficiently involved in road-safety policy making in Israel. There are many initiatives from the NGO bodies, however, officialdom does not know how to activate and use them properly. Some examples of involving stakeholders: pensioners volunteer in kinder-gardens to train safe behaviour on roads among children; the NRSA promotes establishing local community committees for promoting road safety in residential areas; introducing obligatory "safety officers" in companies with significant vehicle fleets, especially with trucks. There is evidence of positive influence of such control on drivers' behaviour, the state of vehicle fleet and the responsibility level of company's drivers.

The stakeholders are not sufficiently involved in road-safety policy making in Israel. The central government is frequently involved in decision making on issues which should be under the responsibility of local authorities. (Example: changing the location of traffic signs). More power should be given to local authorities. On the other hand, local authorities need road safety experts. The role of NGOs is to bother officialdom with urgent issues. Currently, the authorities take account of the opinion of the most powerful NGO in Israel – Or Yarok. It is the first and the only example of the NGO influence on road safety policy. Similar to insurance companies, other strong bodies capable to invest in road safety are required.

Need for data centralization

We have to consider which type of data is available. We have to evaluate the importance of different types of data. We need to improve the access to the different data sources available (e.g., we should link the vehicle registration data to the accident data, or use the police reports and those of the experts that are appointed by the judges)... later on in the interview, in the part on data needs, experts reports again, important because of the frequency with which those people are confronted to accidents. "There are also interesting data that we should be able to use from vehicle inspection. What I mean is that we would need further integration of different sources of data (another example: data from the insurances)".

We are pleading for the implementation of a centralised accident database, so that, whenever a PV is filled in by a police officer, the accident is automatically recorded in the national database.

We need data about vehicle registration, driving licences...

We need to combine data, measures, and so on, so as to improve what we do. ...

Ireland is currently exploring the possibilities of hospital data and other data sources and that of linking hospital data with accident data.

Uniform definitions and coding rules would also be necessary for coding one and the same accident in the different database (police, health care and insurance databases). Methods should be implemented to link the different databases and ensure easy use of all data.

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As reported above the road safety in Italy is not managed adequately for two main reasons. The first one is related to the lack of strong economical stakeholders pushing for an improvement of road safety.

Need for centralization of road safety management

“There is a need for collaboration, both on a vertical and on a horizontal axis, between different instances, at different levels, and with different competences.”

“We will need to be more coordinated. If we are to adopt a holistic approach based on vision 0 or sustainable safety, we need to break down the barriers between roads, vehicle and human”.

“A holistic approach is the key” (trying to work with other agencies and be aware of their agenda).

There is an institutionalised link between the political and expert level does not work as well as it should yet. – The interministerial coordination between the road and the health sectors is not institutionalised yet.

“What is lacking in Israel is the institutional arrangement for managing all the road safety processes together. A clear subdivision of functions between the bodies involved is required (double, triple treatment of blackspots).

Federalism can be an impediment to RS work when responsibilities are shared among too many institutions and interfaces are complicated.... Need for integrated road/traffic/accident databases. ... Linking hospital data to police accident records (to evaluate the share of severely injured persons).

What is most important is to build a system for road safety management which will include all the necessary organisations, ensure the use of research results, have clear procedures and access to a database of good practices. The system should be based on the experience from other modes of transport (aviation, rail), and use some of it in road transport.

In Greece, the existing knowledge and data is not fully exploited in road safety management tasks. In fact, more data and knowledge is available than what is currently used. (For example, the new Traffic Rules issued in 2007 introduced very high fines for road safety violations, without any justification. However, data on enforcement (number of controls and number of violations) are available and are regularly published in Greece, and consequently it would have been quite straightforward to estimate the fines required in relation to the number of violations expected. This was not considered and the fines were arbitrarily set, resulting finally in insufficient enforcement results.)... It is important to note that the analyses and recommendations for general issues (e.g. target setting, road safety programmes, legislation etc.) should be carried out centrally, e.g. by a central road safety research organisation, whether this is a ministry agency, a national research institute or a road safety observatory. This organisation should also be responsible for analyzing the international experience and adjusting it to the particularities of the Greek setting ... Then, extensive and systematic dissemination at all levels (national, regional, local) and related authorities and stakeholders should be ensured. It is stressed that regional and local authorities cannot cope alone with carrying out general and original analyses. On the contrary, the central administration should provide standardized tools, manuals and all necessary documentation, so that specific analyses for specific measures can be carried out by regional / local authorities. In parallel, close monitoring of specific interventions should be carried out at regional /

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local level. ... Most importantly, the tools and methodologies available are not adequately exploited in road safety policy making. For example, the lack for exposure data may be dealt with by using appropriate alternative techniques (e.g. the induced exposure method), but it is unlikely that such knowledge is available in road safety decision making. Moreover, knowledge and tools (e.g. software) for statistical analysis is often limited within the decision making processes. In other words, although methods and tools are available, their use takes place mostly within the scientific community and they are seldom known or properly communicated in policy making processes.

What is lacking in Israel is the institutional arrangement for managing all the road safety processes together. A clear subdivision of functions between the bodies involved is required. For example, concerning the treatment of black-spots on rural roads a number of concurrent processes take place for the last three-four years, without a clear co-ordination between them. ... For making the system approach more applicable training tools may be useful such as: for local authorities and town planners: to account for safety implications of various decisions; for major road authorities: for carrying out safety evaluations, selecting infrastructure improvements for black-spots' treatments, estimating consequences of selecting various road design features

Need for coordination of studies and research activities.

Greece suffers from a lack of organization as regards the implementation of the road safety strategies or programmes. There is no central organization officially responsible for planning, implementing and monitoring road safety policies. ... The primary focus should be put on the organization of road safety management. A single organization should be responsible for road safety policy, preferably of inter-ministerial or independent nature. The role of this organization would be both coordinating and scientific. Road safety knowledge and data analysis should be carried both in-house by this organization, or by other bodies (engineering firms, research institutes etc.) under its supervision. It would be equally important to define specific responsibilities for this organization and hire highly qualified scientists with not only great experience but also appropriate training in their specific area of responsibilities within the organization.

Importance of the accessibility and clarity of the information (evidence)

But numbers do not only need to be reproduced, they also need to be presented to the policy makers. Figures have to be clear, self-evident, attract attention,

Need better way of disseminating research that underpins policy (e.g.: accessibility of research reports on DfT website)

A couple is of paragraph clearly instructing on measures to be taken is more useful than a lengthy report ("How is a report going to tell me what should be done?").

The impact of good practice reviews is generally poor: results are seldom made available to practitioners!

Accident databases are not easily accessible. Procedures are needed to ensure that all stakeholders can access the information with some data accessible to the specialist only.

People managing databases should spend more time on increasing road safety awareness in Poland and Europe. Regular reports should be prepared for politicians,

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decision makers, and the mass-media to inform about changes (especially when they are positive) in RS, RU behaviour, and regulations that everyone should be familiar with. It is important to emphasize that accidents are a major social and economic problem; this will attract the interest of politicians and generate their support.

Then, extensive and systematic dissemination at all levels (national, regional, local) and related authorities and stakeholders should be ensured. ... On the other hand, the ERSO data are accessible, which is seldom the case for national data.

Importance of taking the “lower level” into account:

Some accidents are devoted much attention from the public opinion, but in some cases the circumstances may be so exceptional that it is impossible to tell whether measures are to be taken at the scale of the country. The public opinion will claim for measures, in that case, it would be helpful to be able to communicate objective information, and extract the RS issues from the emotional debate.

It is difficult to evaluate whether “local deaths” are part of the national trend. Local authorities need to know whether an accident that occurred is one that calls for measures (part of a long-term problem which the authority could do something about). There is a missing link: what sense can be made of accidents/events at the local level.

We have to try to facilitate access to data for local authorities and agencies (police, fire,...) ... We need to engage with local agencies and provide them with tools and information

Other stakeholders in Austria have little information on our data sources, more information/communication is required in that respect. Future knowledge basis should also focus on the lower level network. ... Local authorities should be encouraged to compare themselves to others and to use an evidence-based approach when implementing initiatives. ... We need to engage with local agencies and provide them with tools and information. -

It is important to note that the analyses and recommendations for general issues (e.g. target setting, road safety programmes, legislation etc.) should be carried out centrally, e.g. by a central road safety research organisation, whether this is a ministry agency, a national research institute or a road safety observatory. This organisation should also be responsible for analyzing the international experience and adjusting it to the particularities of the Greek setting ... Then, extensive and systematic dissemination at all levels (national, regional, local) and related authorities and stakeholders should be ensured. It is stressed that regional and local authorities cannot cope alone with carrying out general and original analyses. On the contrary, the central administration should provide standardized tools, manuals and all necessary documentation, so that specific analyses for specific measures can be carried out by regional / local authorities. In parallel, close monitoring of specific interventions should be carried out at regional / local level.

It would be useful to develop a Manual presenting tools and methods for carrying out various road safety management and evaluation tasks. Similar to the recommendation made concerning the European level, the local manual should target road safety professionals (not scientific community) and be relatively simple and applicable.

We take action, but action does not leave room to evaluation. Evaluation is not simple, but still we do have indicators available that we could use (number of

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fatalities, serious injuries, severity indicators...). Yet, this evaluation is not planned. ... An evaluation cannot take place if the people involved in the action are not involved in such an evaluative action from the beginning. ... What bothers me are the stereotypes. When one speaks of alcohol, one speaks of the “the youngsters” and of “the night”, the other action fields (action possibilities) are kept hidden. I’m thinking of “distraction”, for example, with the use of cell phone as an example. Saying that behaviour is the cause of 9 accidents out of 10, does not mean that there has been an infringement. It costs less to put the blame on the driver than on the infrastructure” (i.e.: these faulty behaviours could maybe be compensated by infrastructure adaptations, cf. forgiving roads).

Regional and local governments have an important role in road safety policy in the Netherlands, because they are responsible for implementing part of the road safety policy (infrastructure measures as well as public information and education). There a need to further improve of dissemination of information, including the results of international research, and to make the results (international) research more easily available for regional and local governments.

Lack of specific RS training:

System for supervising designers and licensing road safety management and traffic engineering staff.

Another major lack is training of professionals going to work in road safety, and especially lack of civil engineers with proper training in the road safety field.

What should be done to improve the current situation: training road safety professionals, including a test of knowledge; continuing road safety education programs for civil engineers; annual tests on road safety for engineers of major road companies; for people working in road safety education; to establish a mechanism demanding an obligatory update of road safety knowledge for those working in the field.