

**EU TRANSPORT ACCIDENT,  
INCIDENT AND CASUALTY DATABASES:  
- CURRENT STATUS AND FUTURE NEEDS**

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## The European Transport Safety Council

The European Transport Safety Council (ETSC) is an international non-governmental organisation which was formed in 1993 in response to the persistent and unacceptably high European road casualty toll and public concern about individual transport tragedies. Cutting across national and sectoral interests, ETSC provides an impartial source of advice on transport safety matters to the European Commission, the European Parliament and, where appropriate, to national governments and organisations concerned with safety throughout Europe.

The Council brings together experts of international reputation on its Working Parties, and representatives of a wide range of national and international organisations with transport safety interests and Parliamentarians of all parties on its Main Council to exchange experience and knowledge and to identify and promote research-based contributions to transport safety.

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## **EXECUTIVE SUMMARY**

Accident and casualty databases are an indispensable tool to allow for objective assessment of the transport safety problem, the identification of priority areas for action and for monitoring the effectiveness of countermeasures.

Such databases at European Union level are needed to describe the current state of transport safety across the EU, to help define target levels of safety for each of the transport modes and to facilitate a data-led systems approach in defining strategies.

The process of creating a range of common data sources necessary for the development and monitoring of the Common Transport Policy began in 1993. Progress has been achieved, especially for road transport, but for other modes basic kinds of data are lacking at EU-level. In order to allow meaningful analyses within each mode and comparison across the modes, further progress is needed.

The purpose of this report is to review the progress made in the development of databases on accidents, casualties and exposure measures for each transport mode and, where gaps exist, to try to identify various options for EU action.

## **Conclusions and recommendations**

1. In order to accelerate the development of the activities recommended below and to ensure support annually in the EU budget, ETSC recommends that the development and operation of EU transport accident, incident and casualty databases should receive 100% funding by the Community and should be an explicit budget sub-heading within Line B2-7202 (transport safety) of the EU budget.

### **Road transport**

ETSC welcomes the progress that has been made so far with the development of road accident databases and Community action now needs to develop as follows:

2. Continue to support the CARE/CAREPLUS programme and set a target to expand the numbers of common variables within CARE, develop the convergence of the various national data sets and provide regular estimates of under-reporting for non-fatal crashes, particularly for the seriously injured.
3. Widen access to the CARE database, presently restricted by EU or national rules, at least to all relevant road safety research institutes within the EU.
4. Establish a limited scale, in-depth crashworthiness data collection programme to demonstrate the value of car crash injury data to the regulatory process. Implement a demonstration project to review future EU safety priorities.
5. Establish an injury and accident-reporting system, based on linked hospital and police information. Implement a demonstration project to identify injury priorities and changes in injury patterns due to vehicle design changes.
6. Review existing data collection activities in the areas of car, motorcycle and pedestrian accident causation to establish the value of data and their relevance to the competencies and priorities of the EU.

7. Ensure that that data collection and analysis is conducted by groups that do not have a stake in the financial consequences of the investigations. Make EU financial support for database activities conditional on the established impartiality of those responsible for managing them, as well as appropriate access.
8. Encourage and provide financial support for the collection of exposure data.
9. Set up a website-based road safety information system for public use comprising aggregated fatality, exposure and risk data for road transport in all EU Member States, information on national and EU road safety policies, laws (such as year and level of permitted alcohol, speed limits etc.), recent, important research results as well as an annual EU report on road safety developments.

## **Air transport**

There has been much progress in establishing better arrangements for the investigation and monitoring of air accidents in Member States. The following actions are now needed to allow the monitoring of EU aviation policies for their effect on safety, to provide a larger database from which safety studies can be drawn and to encourage best practice amongst Member States. The EU should:

10. Ensure full compliance with Council Directive 94/56/EC on accident investigation.
11. Bring forward a Council Directive for mandatory incident reporting, the establishment of a centralised EU database and for the establishment of a European confidential incident reporting system.
12. On establishing an European Air Safety Regulatory Authority, establish an organisation independent of this regulator to:
  - a. initiate and maintain a European database of accident and incident statistics as well as more general statistics for the accurate calculation of exposure data
  - b. initiate and maintain an EU system for monitoring the implementation and the effects of any safety recommendations
  - c. initiate safety performance indicators
  - d. initiate a database on injury causation
  - e. encourage further co-operation between the EU air accident investigation bodies.

## **Rail transport**

In view of the trend towards fragmentation of the rail industry across Europe and the pressure for more inter-operability, there is a need to ensure that these developments do not have an adverse impact on safety levels. In order to monitor the effect of Community policies in these areas and to facilitate data-led actions on rail safety, the EU should:

13. Introduce a Directive urgently requiring Member States to set up independent arrangements for rail accident investigation.
14. Establish an EU-wide system of mandatory reporting of rail accidents.
15. Ensure that reports of railway accident investigations are published.
16. Ensure that there are reports on all accidents in specified categories. ETSC suggests that as a minimum these categories should include fatal train collisions and fatal derailments.

17. Take the lead in organising a database of railway accident reports across Europe, accessible electronically.
18. Most reports are in narrative form, and it is these that should be made available in the first instance. The Commission should consider the merits of defining and extracting from the narratives a specified set of descriptive information.

## **Waterborne transport**

As with the road, rail and air sectors, effective EU policymaking on maritime safety which balances safety with economic and environmental objectives needs to be informed by a range of statistical and in-depth data on maritime and inland waterway accidents, incidents and casualties.

There is an urgent need for better arrangements to be set up to allow monitoring of EU maritime policies and to contribute to a better understanding of maritime safety needs. In particular, attention needs to be given as soon as possible to the following:

19. Bring forward urgently a Directive requiring Member States to set up independent arrangements for maritime accident investigation.
20. Establish an EU-wide system of mandatory reporting of maritime accidents and serious incidents for inclusion in a European central database.
21. Publish annually, in the meantime, annual summaries of maritime accidents in European waters and involving vessels registered in EU countries from the LMIS database to provide basic information on accident and casualty frequency.
22. In the event of an EU Maritime Safety Regulatory Authority being established, set up new organisational arrangements independent of this regulator to:
  - a) maintain a European database of accident and incident statistics as well as more general statistics for the accurate calculation of exposure data;
  - b) initiate and maintain an EU system for monitoring the implementation and the effects of any safety recommendations;
  - c) initiate safety performance indicators;
  - d) initiate a database on injury causation; and
  - e) encourage further co-operation between the independent accident investigation authorities in Member States.

# 1. INTRODUCTION

Accident and casualty databases are an indispensable tool to allow for objective assessment of the transport safety problem, identification of priority areas for action and resource and for monitoring the effectiveness of countermeasures.

Such accident databases are needed at EU level to describe the current state of transport safety across the European Union, to help define target levels of safety for each of the transport modes and to adopt a data-led systems approach in defining strategies.

The process of creating a range of common data sources necessary for the development and monitoring of the Common Transport Policy began in 1993. Progress has been achieved, especially for road transport, but for other modes basic kinds of data are lacking on an EU-level. In order to allow meaningful analyses within each mode and comparison across the modes, further progress is needed.

The purpose of this report is to review the progress made in the development of databases on accidents, casualties and exposure measures for each transport mode and where gaps exist, to try to identify various options for EU action.

This report has been compiled by a multi-disciplinary group of independent experts from across the European Union to provide a source of impartial advice to policymakers within the EU institutions. It sets out the important building blocks that are necessary for the further development of the Common Transport Policy towards a safer, sustainable transport system.



## 2. ROAD

### 2.1. Introduction

Recognising the benefits of a European road accident database, in November 1993 the Council of Ministers approved the creation of a Community data bank on road traffic accidents in Europe (CARE) OJ No L 329/63 (30.12.93)

The development of a Community-wide road accident database was strongly supported by safety professionals as an essential tool for informed decision-making to combat effectively the huge road safety problem throughout the European Union. The collection of disaggregated data would enable flexible and broad analyses of a large number of variables. It would provide at EU level the base level data set (see Table 1) needed to produce international comparable data on road crashes. It would enable objective assessment of the size of the road safety problem, the identification of areas for countermeasures having the largest potential for safety benefits, and contribute to the evaluation of the effectiveness of those countermeasures.

**Table 1: Levels of data, sources and functions (Sabey, 1990)**

<p><b>BASE LEVEL</b></p> <p><i>Main sources of data:</i></p> <p>traffic police accident reports national road transport statistics</p> <p><i>Functions:</i></p> <ul style="list-style-type: none"><li>• to access accident situations (who, where, when, what circumstances)</li><li>• to examine trends in traffic volume, risks and accidents, make forecasts</li><li>• to evaluate the effects of legislation and other countermeasures</li></ul>
<p><b>INTERMEDIATE LEVEL</b></p> <p><i>Main sources of data:</i></p> <p>traffic police accident reports observations at sites additional evidence from police officers or witnesses judicial reports</p> <p><i>Functions:</i></p> <ul style="list-style-type: none"><li>• to identify and diagnose hazardous road locations (where, how, what)</li><li>• to reconstruct accidents to determine useful countermeasures</li></ul>
<p><b>IN-DEPTH LEVEL</b></p> <p><i>Main sources of data:</i></p> <p>traffic police accident reports observations at sites additional evidence from police officers or witnesses interviews with road users involved clinical assessment of injuries technical inspection of damage</p> <p><i>Functions:</i></p> <ul style="list-style-type: none"><li>• to assess accident causes</li><li>• to assess injury causation mechanisms</li><li>• to study accident and injury prevention measures</li><li>• to further knowledge on vehicle safety, human tolerance and mechanisms of injury (injury reduction)</li><li>• to monitor the effectiveness of specific legislation and non legislative measures</li></ul>

One of the first studies undertaken by ETSC was a review of road accident and injury database needs following the initial development of a Community data bank on road traffic accidents in Europe (CARE) (ETSC, 1994).

In its report, ETSC set out recommendations for the further development of CARE over time and, bearing in mind the different levels of data needed to inform road safety policymaking, highlighted the need for parallel data collection activities. These were as follows:

Short term developments:

- Development of interfaces between the national databases as well as access tools;
- Development of recommendations for accident and casualty variables that need to be commonly defined, and recommendations for actual definitions, based on current best practice; and
- Discussion and research of the feasibility of collection of exposure-related data.

Medium term developments:

- Aggregation of data classifications within variables and combination of variables of each national accident database; and
- Development of a database for fatal accidents, containing variables in a standard format.

Long term developments:

- Application of generally accepted and cross-nationally applied definitions of the database variables;
- Extension from fatal accidents to include serious injury accidents; and
- Development of a parallel database of accident and injury causation variables.

Over the last few years, there have been several developments at EU level. The CARE database has been developed further and the Community research programme has supported the development of an in-depth injury causation protocol, STAIRS (Standardisation of Accident and Injury Registration Systems). The Commission has also supported industry initiatives such as the European Accident Causation Study (EACS) and the Motorcycle Accident In-Depth Study (MAIDS), accident causation projects co-financed by the car and motorcycle manufacturing industries. A pilot study is taking place to see how road accident data can be incorporated into the European Home and Leisure Accident Surveillance System (EHLASS).

Before reviewing these developments and presenting further recommendations for future action, it will be useful to have a closer look into the relationship between the different levels that are addressed by the above mentioned EU activities.

## **2.2. The co-ordinated approach**

At a broad level, data on the numbers and types of crashes occurring are needed to identify and order priorities and to understand the scale of the problem. At a more detailed level, an understanding of the circumstances resulting in crashes is needed to inform safety policy. Further still, knowledge of the injuries sustained and their causes provides an essential tool to monitor the consequences of changes in vehicle structures and to give feedback on the effectiveness of countermeasures. This knowledge will also enable safety strategy engineers within industry to produce improved design solutions.

In practice there is a continuum between the level of detail and the quantity of accident data. Resources are normally limited so that in any one database it is possible to have large numbers of cases with little detail or few cases in considerable detail. The choice made depends on the nature of the research questions to be addressed and also the manner in

which the database can be integrated with others to form a complete picture of injury and accident causation.

Clearly no single accident database will address all of the information needs of policymakers, as the range of questions is so diverse. A co-ordinated approach offers the best means to gain maximum value out of each separate system and to make use of synergies based on links between the general database and other more specialised databases. The co-ordinated approach will build these statistical links but it will also ensure that each relevant combination of detail, numbers of cases and accident and injury coverage is included within an overall structure. This co-ordinated approach already exists within the US National Automotive Sampling System (NASS) where there are four levels of data collected on a national basis with each providing a unique input into the policy-making agenda.

**Table 2: The US National Automotive Sampling System**

<b>NASS database</b>	<b>Coverage</b>
<b>General Estimates System</b>	Sample of 55,000 police reported accidents, weighted for national estimates (Basic information on road user types and minimal accident causation information)
<b>Fatality Analysis Reporting System</b>	All fatal crashes in US (enhanced police information)
<b>Crashworthiness Data System</b>	Stratified sample of 5,000 injury, tow-away accidents, weighted for national estimates (principally crash injury data)
<b>Crash Injury Research &amp; Engineering Network (CIREN)</b>	In-depth crash injury data based on seriously injured casualties (Solely crash injury data)

While the US system is not directly transferable to the European context, it illustrates the principle of the co-ordinated approach (NHTSA, 1995, 1996). A small number of European Member States utilise an equivalent integrated approach. The UK Department of the Environment, Transport and the Regions (DETR) funds the Co-operative Crash Injury Study (CCIS) together with a group of industry partners. The CCIS includes data collection of 1,500 accidents annually to monitor the causes of car occupant injuries and the effectiveness of safety countermeasures. The DETR has also recently implemented a new study using on-the-spot methods to explain the causes of accidents and pedestrian injuries and the two databases are related to the national accident database - STATS 19. In Germany, the Medical University of Hannover conducts research into injury and accident causation by investigating around 1,000 accidents annually, and this database is again linked to the national accident database maintained by the German Federal Highway Research Institute (BAST). Both UK and German in-depth studies use a statistical sampling approach to ensure the in-depth samples are related to the national accident population defined by the national database.

**2.3. Building blocks for a European Accident Database**

European data requirements need to take account of EU competence for road safety that covers to some degree or another all parts of the traffic system. The EU has explicit Treaty obligations to act on road safety. It has exclusive powers for ensuring both a high level of protection in car and motorcycle technical standards (Article 95) and the competence to act in any other area of road safety where the EU can add value over and above the efforts of Member States (Article 71). The EU has also established competence in several areas since the 1980s such as seat belt use in cars and driver licencing.

The main area of responsibility of the EU is in setting and adapting to technical progress requirements for the EU Whole Vehicle Type Approval (EUWVTA) of vehicles. This covers

cars and motorcycles now but is expected to be extended to buses and goods vehicle before long. Measures focus on the pre-crash phase on handling, braking and lighting, and the crash phase in which the main factors are those of crashworthiness, both structural (roadside furniture and vehicle) and occupant protective equipment performance. Historically, the crash protection measures have been proven more effective mechanisms to reduce car occupant crash injury. Unlike handling, braking and lighting, crash protection measures do not rely on appropriate driver behaviour to deliver benefits.

This balance of focus between accident causation and injury causation will also depend on the nature of the road user and existing political activity. On the one hand, there are many engineering opportunities to reduce car occupant injuries and this has been the main area of regulatory activity. While this may gradually change with time, the existing need is for an in-depth injury focussed data system.

There is also a need for injury and accident causation work aimed at improving the safety of motorcyclists, pedestrians and cyclists.

## **2.4. EU data requirements**

The EU needs several data sets in different levels of detail to support its activities. There is a need for the basic counting of crashes, injuries and fatalities in a similar way to national systems; this need is being covered by the CARE project.

At a more detailed level there is a demand for information on the main area of EU competency in road safety, that of vehicle safety standards and road user injury prevention. Regulations that exist in this area are all detailed in their specification and in the requirements they place on the vehicle, thus the data needed to provide feedback and future direction must also be detailed. Information about injuries has to come from hospital records but additional, linked data are needed to put injuries into the context of vehicle design and accident causation.

The data have to be sufficient to provide a reliable feedback yet also detailed enough to provide accuracy. The complete range of road users should eventually be addressed, although primarily, the main casualty groups are car occupants, pedestrians and two-wheelers.

Initially, the focus of new in-depth accident data collection should be crashworthiness and injury causation so that it remains manageable but this should be expanded to include relevant aspects of accident causation with time.

A feasibility study for the Commission on the dissemination of road safety information, containing relevant aggregations of data and on road safety policies, laws and recent, important research, has been completed. It is now time to develop such a website-based road safety information system in order to benefit more from recent research results, the CARE database, and the policies and laws that have been effective in some countries.

The key data needs for European policy support are as follows:

**Table 3: Data needs for EU policy support**

<b>Detail and coverage</b>	<b>Database purpose</b>	<b>Characteristics</b>	<b>Existing database</b>
All road user types	Counting of numbers and basic information on road user types and accident details	Low level of detail, large numbers of cases. Europe-wide coverage.	CARE, CAREPLUS Compilation of national accident databases to specify the European accident population
For all road user types a limited set of aggregated annual data on accidents of injured persons and fatalities in nearly all OECD and some other countries, supplemented by a set of national exposure data	Development of safety indicators such as fatality or injury rates. Analytical/statistical tool for international comparison and road safety policy formulation.	Aggregated national annual data (since 1970) on a limited set of variables and cross tabulations. Comparable fatality data (30-days), but nationally different definitions and coverage of injuries. Easy access to consistent traffic and accident data.	The International Road Traffic and Accident Database (IRTAD) under the auspices of the OECD (Road Transport Research Programme). Data are provided by relevant national institutes.
All road user types, injury reporting system	Monitoring of reporting completeness and injury patterns, identifying road safety priorities.	Linked hospital and police data, medium detail and numbers. Regional areas should be representative of EU	Some databases at national or regional level
Car occupant injuries and crashworthiness	Effectiveness of vehicle based injury counter-measures, changes in injury patterns, crash-worthiness priorities	In-depth crash injury database. High level of detail, lower number of cases that should be representative of EU.	Small number of independent systems. No existing EU system, but the STAIRS-project researched their harmonisation and its feasibility
Car accident causation	Priorities in accident prevention, accident reduction effect of new technologies, effectiveness of accident prevention measures	In-depth accident causation database. High level of detail of cases that should be representative of EU.	Existing study conducted (European Accident Causation Survey) by the European Car Manufacturers' Association (ACEA) – a major stakeholder
Pedestrian injuries and accident causation	Review of Directive effectiveness, future priorities in injury prevention, priorities in accident prevention	Main focus currently on injury causation, future expanding to accident causation. Selection of cases should be representative of EU.	Existing data on accident causation within European Accident Causation Study. Small number of independent systems existing
Motor-cyclist accident causation and injuries	Review of rider licensing, performance criteria of vehicles, priorities in accident causation, some detail information on injury causation	Main focus on accident causation. Some injury causation data. Selected cases should be representative of EU.	Existing study being conducted (MAIDS) by the motorcycle manufacturing industry - a major stakeholder.

A number of building blocks towards the integrated accident data system already exist. Most particularly the CARE database is part way towards providing a system that will enable basic counts of fatalities and reported casualties of all severities as well as provide basic details of the reported crashes. The STAIRS project, funded under the Fourth Framework Programme, researched the need and possibilities for an in-depth crash injury database to set the safety priorities in vehicle design and to provide feedback on regulation effectiveness. The Safety Rating Advisory Committee (SARAC) study will develop a methodology for rating the safety levels of car models using mass data such as national accident databases or insurance files. Each of the building blocks and their corresponding activities and needs are further discussed later.

The most important gaps in the existing EU accident data provision are in the areas of:

- Underreporting of single vehicle and injury accidents;
- In-depth crash injury database;
- Database linkage of hospital injury data and police accident data; and
- Systematic collection of exposure data.

The wider system envisaged, describing the injuries sustained by all road users and linked to summary information about the crash and vehicles involved, will provide a substantial, broad view of the crash injury situation. Moreover, it would enable the estimation of the underreporting of injuries in the police accident data. This is needed to avoid misguided road safety priorities due to the relatively much higher underreporting of vulnerable road user casualties (ETSC, 1994; OECD-IRTAD, 1994).

Any database must be independent of the major stakeholders, defined as those groups that have a financial stake in the research outcome, if it is to be used to inform policy and evaluate the effectiveness of safety systems in an impartial way.

#### **2.4.1. The CARE database – disaggregated data**

The CARE database comprises statistical information of reported road accidents in the European Union resulting in injury or death. The Council Decision (93/704/EC) requires Member States to establish road accident statistics and to communicate these data for a given year to the Statistical Office of the European Communities. The European Commission reported on the outcome of the first three years of CARE in COM (97) 238 final. (European Commission, 1997)

The database comprises annual national sets of accident data in their original form supplied by all the 15 Member States without harmonisation of individual variables. The Commission and Member States' aim in the pilot has not been to harmonise database variables, but rather to provide a framework of transformation rules in CARE to increase database compatibility using the methodology developed by the CARE PLUS group.

CARE is different from other international databases in that it contains data on individual accidents i.e. disaggregated data. To minimise both the time taken to implement the database and the inconvenience to the national administrations, the national data sets are integrated into CARE in their original national structure and definitions but without any confidential data. A framework was designed to enable access to the data at EU level.

Accident reports contain detailed information on accident location, injuries and vehicle, but the level of detail, the definitions and the number of variables vary significantly between the Member States. At the start, the process for data compatibility was very basic. Using the classifications in Table 1, CARE is an example of a base level database for the EU.

Each Member State is responsible for the quality of its data and is requested to validate its data after inclusion in the CARE database. In this way, it can be assured that the information from the CARE database corresponds to the information extracted from the national database.

CARE PLUS reported in June 2000, and proposed the extension of harmonisation of the national data, redefining the national variables into common variables, to include:

- location (urban, motorway, junction, type of junction)
- date and time
- light/weather conditions
- collision type
- accident severity
- type of vehicle(s) involved
- description of person(s) involved (driver, front/rear seat passenger, pedestrian)
- age and gender of those involved
- injury severity of those involved

The supplementary data from CAREPLUS 2 will include:

- country of registration
- nationality
- vehicle age
- driver experience (length of time license held)
- road surface
- road condition
- region, province
- speed limit.
- alcohol test
- alcohol test result
- carriageway type
- pedestrian/driver/vehicle manoeuvre.

Good progress has been made in the development of CARE and the principal need now is to start deriving useful information from the databases and to improve access.

The principal use of the CARE database lies in the statistical monitoring of developments and comparative analyses of national differences in variables and types of fatalities. Due to the different (under) reporting levels of injuries and accidents sustained by different types of road users in each country of the EU, the CARE database cannot be meaningfully used for comparative analyses of injuries. However, the CARE database is indispensable since it contains the disaggregated data as comparably defined records on individual accident and casualties from each EU Member State. As such, it is much richer than the aggregated data in a limited number of cross-tabulations from the IRTAD database of the OECD.

The CARE fatality database contains almost all road fatalities in the EU and its functional use is comparable to the Fatality Analysis Reporting System (FARS) in the USA. However, in contrast to the FARS system, its actual usefulness is hampered by the restrictive policies for access by the national authorities, whereby most leading road safety research institutes in the EU are not allowed to use the data. This is a serious drawback for the research exploitation of the wealth of information contained in the CARE fatality database. Moreover, as national experiences show, flaws in such databases are mainly detected by comparative research. These can then be cured.

### **2.4.2. The IRTAD database – aggregated data**

Since 1988, the International Road Traffic and Accident Database (IRTAD) has been maintained by BAST (Germany) under the auspices of the OECD. The principle sets of road traffic and accident data available for 29 countries on a yearly basis from 1970 onwards are:

- Population figures with a breakdown by age groups and single age bands (15-20).
- Vehicle population with a breakdown by vehicle types.
- Kilometrage classified by network areas and vehicle types.
- Number of injury accidents classified by road network areas.
- Fatality figures with a breakdown by types of road user, age and network areas.
- Hospitalised with a breakdown by types of road user, age and network areas.
- Network length classified by network areas.
- Seat belt wearing rates by network areas.
- Modal split.
- Area of State.
- Risk values: fatalities, hospitalised and injury accidents related to population or kilometrage figures.
- Monthly accident and injury data (three key variables).

The data, provided by relevant national institutes, are constantly checked for consistency within countries and over years. IRTAD is a traffic accident analysis tool that stimulates international standard definitions and spurs improvements in data collection and comparison. For example, the number of fatalities is available in corrected form (30 day recording period). Member countries were repeatedly encouraged to adopt the 30-day limit for the definition of a fatality and most countries have now complied. The definition for a seriously injured person as "hospitalised" (non-fatal victims who are admitted to hospital as in-patients) is to some extent workable, but nationally different registration coverage of seriously injured persons is present.

The IRTAD database is used as a prime source of international data required for annual reports and ad hoc studies at the aggregated level. The main advantage lies in the ease of quick reference. It allows the development of safety indicators and is used as an analytical tool for statistical comparisons and road safety policy formulations. It is the quickest way to achieving the goal of reliable, comparable and consistent traffic and fatality data for nearly all OECD countries. To be internationally representative on a global scale, IRTAD is open to all non-OECD member countries. The database is used by a wide range of public and private institutes on CD-ROM or on the Internet.

### **2.4.3. Injury reporting system**

In several EU countries, mostly in the northern and western regions, clinical hospital data on traffic injuries are linked with the police reported accident data on a national or regional level. This serves two purposes: (1) establishing the underreporting of registration of injury accidents by the police and (2) adding the detailed injury information to the registered data of accidents.

It is generally believed that almost all fatalities are registered, but a German study (Metzner, 1992) on linked hospital and police data estimated that up to 5 per cent could be missing from police data. A French study (Laumon et al., 1997) for the region of Lyon established that as many as 12 per cent of fatalities were underreported in the official police based registration. In Nordic countries, Great Britain, Germany and the Netherlands several studies on linked hospital and police data (see OECD-IRTAD, 1994, for summary) have revealed that many injuries from single vehicle accidents and injuries of pedestrians and cyclists are underreported to a varying extent in the official road accident registration systems of these countries. On average between 20-40 per cent of all serious injuries are not reported, while



the largest underreporting with respect to all (slight and serious) injuries is generally observed for cyclists. Up to 80 per cent of injured cyclists in traffic accidents are not reported. For the southern countries of the EU, no such studies on the completeness of the official registration of road accident injuries and fatalities are available.

It is evident that the statistical analyses and the monitoring of developments from the injury accident data in the national databases, and thus also from the CARE database, will be misleading, unless detailed corrections for fairly well known underreporting percentages are made. Therefore, it is urgently recommended that, in the short term, similarly designed national studies on the underreporting of injuries are periodically performed in every country of the EU. This will add value and so should be financially sustained and co-ordinated by the EU. The aim is that comparative national correction factors can be applied to the types of injury data in the CARE database to obtain reliable information on road injuries. This would then allow the correct estimation of the actual economic costs of road accidents (now probably underestimated by several tens of percentage points) and the proper priority setting for road safety improvement.

#### **2.4.4. In-depth crash injury database**

In-depth crash injury databases contain the necessary post-crash information for causal analyses of injury patterns in crashes. They contain the detailed injury and vehicle crash data generally gathered by teams of medical and technical experts and police specialists soon after a severe accident. These combined details of injury and vehicle deformation data of severe road accidents are indispensable for input to safety regulation on vehicles and restraint systems, which is the prime competence of the EU in the field of road safety. These databases exist for selection of severe accidents in a few regions of some countries in the EU, some states of the USA, and in Japan, especially where car industries are located.

The STAIRS project, funded under the Fourth Framework Programme, identified the need for a joint European in-depth crash injury database to set the safety priorities in vehicle design and to provide feedback on regulation effectiveness. The study also observed that there was a need for further work to refine certain crash investigation tools, particularly in the area of collision severity estimation, impairment measurement scales and analytic methods.

A further limitation concerns the routine conduct of post-mortem investigations in the case of fatalities. In some Member States this is performed as a routine event in the case of unexpected death and these reports can be used to provide essential information on causes of death. In some countries, however, this is not routine and the data on this important casualty group are missing. These countries should be encouraged to conduct post-mortem investigations where the data can be used to inform EU or national priorities.

Finally, although many of the data collection activities needed are primarily European, there is a need to build a wider international consensus on accident data, particularly at the levels of counting crashes and also in-depth data. Other territories, such as the USA, Canada, Japan and Australia, all have on-going studies at both levels and, as there is a deeper involvement of the EU in WP 29 in Geneva, there will be a need for a common understanding on the strengths and limitations of the data.

The STAIRS project has made great progress in defining the essentials for a European in-depth crash injury base and its statistical selection correction factors. Although some organisations with regional in-depth crash injury databases in several EU countries have agreed to cooperate and to work towards harmonisation of their databases, it is still a major task to initiate a completely pan-European in-depth crash injury database. Therefore, it is to be recommended that the EU initiate the first phase of work by initiating actions in a limited group of countries and then continuing to build once the system is operating satisfactorily.

#### **2.4.5. Accident causation databases**

Accident causation databases differ from the previously discussed databases in that they contain the necessary details of the pre-crash data, where the other databases either contain hardly any data on the pre-crash phase of the accidents or only post-crash data. Self-evidently pre-crash data are indispensable for the analysis of effective countermeasures to prevent road accidents. Since the focus on the relevant pre-crash data generally differs for accidents of different road users, there are activities on accident causation data gathering for car accidents, for motorcycle accidents and pedestrian accidents; the latter two for obvious reasons also include data that are relevant for the causation of injuries.

Some national accident causation studies have been carried out in several Member States, either in connection with the in-depth injury causation work (e.g. Medical University of Hannover) or by the police in routine recording of accidents and casualties in the national accident database system (eg. Great Britain).

##### Car accident causation

The Association of European Car Manufacturers (ACEA) conducts a European Accident Causation Survey on car accidents with financial support from the European Commission. The research interests of the car manufacturers for this study on the pre-crash conditions of car accidents is quite understandable, since improvement of pre-crash conditions may focus more on road infrastructure than on vehicle design. However, as stated earlier, great care must be taken that any database is independent of the major stakeholders if it is to be used to inform public policy and evaluate the effectiveness of safety systems in an impartial way.

It is recommended that further initiatives of the EU on car accident causation databases and research looking at vehicles and infrastructure are undertaken in a way that guarantees participation and management by independent parties albeit in cooperation with private sector stakeholders.

##### Pedestrian accident and injury causation

Within the European Accident Causation Survey of the ACEA and in a small number of independent studies (OECD, 1998), data are gathered on the causation of pedestrian accident and injuries. An ACEA study on the cost effectiveness of pedestrian-friendly car fronts in comparison to road infrastructure countermeasures prompted critical comment from the Forum of European Road Safety Research Institutes (FERSI) in the form of a letter, which illustrated the importance of impartial databases and research. It is recommended that the EU takes initiatives towards setting up a European database on pedestrian accident and injury causation.

##### Motorcyclist accident and injury causation

In the existing project MAIDS, while the data on accident causation and injuries are collected by independent road research institutes and involves the RTR-programme of the OECD, the main contractor is the Association of European Motorcycle Constructors (ACEM), who have full responsibility for the management and delivery of the project.

The share of single motorcycle accidents in motorcyclist fatalities and injuries is rather large. Therefore, it is recommended that any future study should also look at the causation of single motorcycle accidents and not to restrict the database to crashes between cars and motorcycles.

It is recommended that further initiatives of the EU in support of a motorcycle accident and injury causation databases and research are undertaken in a way that guarantees participation and management by independent parties albeit in cooperation with private sector stakeholders.

#### **2.4.6. Other related information**

The Commission is funding a 2-year project carried out on its behalf by the European Committee of Insurers (CEA). One of the tasks will examine whether the consumer information provided by the EuroNCAP programme can be expanded by linking it with consumer information generated by car safety ratings based upon real world crash data. The advisory committee for the study is SARAC (SAfety Rating Advisory Committee).

The membership of SARAC is wide-ranging embracing practical research experience from Monash University, Australia; The Highway Loss Data Institute in the USA; French and German Motor Manufacturing representatives; and European Insurance Organisations and some Member States producing car safety ratings.

There are six different crashworthiness-rating systems currently in operation. They are partly determined by the availability of the detail of real world crash data to which they relate. Significant variations occur between the different systems to the extent that some can also make use of damage-only data and some of detailed body region injury data. The project will examine the effect of these differences by using a common real crash data source from the USA and Finland. These data sets have been chosen to provide the maximum possible sample size and discriminate between specific car models.

The next step will be to examine to what extent existing rating systems, and modifications to existing rating systems to accommodate data restrictions, are correlated with EuroNCAP results. It has been agreed that real crash data sets provided by the DETR (UK), the LAB (France) and the University of Oulu (Finland) will provide the basis for calculating crashworthiness ratings. The strength of correlation will be examined for different real crash accident types (e.g. just 2-car accidents, or all accidents including single vehicle accidents) and for different levels of aggregation of EuroNCAP scores. The bottom line of this exercise will be to see to what extent relative scores produced from EuroNCAP are replicated in real world crash data. It is not known at the outset how many crash tested cars will be sufficiently represented in the real world crash database to provide reliable estimates of protection. The results of this research will be available in May 2001.

#### **2.4.7. Exposure statistics**

In order to be able to compare safety levels of road modes and road types of countries in the EU, the number of user/passenger/vehicle kilometres of the road modes on the road types of Member States must also be known. Risk assessment is not possible without this exposure data, nor the priority setting for road safety, as has been discussed extensively by the ETSC (ETSC, 1999.).

In several countries of the EU these exposure data are not gathered or only partially and/or unreliably gathered. For example, in Greece, where in recent years exposure data are gathered, the data imply an annual kilometrage of over 22,000 km. per motor vehicle. This is probably incorrect since the average of the other countries in the EU is about 14,000 km.

Therefore, the recommendations of the ETSC (ETSC, 1999) on the comparable gathering of exposure data in all countries of the EU are again brought to the attention of the European Commission and Member States.

## **2.5. Need for European activity**

Currently research groups, national organisations and industry are investigating crashes and collecting accident data. Each activity has a specified purpose and the structure of each system is optimised to meet that purpose efficiently. These systems do not however serve a European regulatory purpose so well and there is now a clear need for more co-ordinated European action as much decision making is now taking place on a European scale.

Since 1996, the European Commission has overall competence in terms of vehicle safety legislation through the Whole Vehicle Type Approval procedure and this currently covers cars and motorcycles. This places a responsibility on the Commission to ensure that appropriate safety standards are in place to ensure a high level of safety and this has been reinforced through the discussions over the European Union signing the Geneva Agreement. The Commission also has a duty to develop a road safety strategy for Europe, although the responsibilities must be shared with Member States. Finally, it also has competence for driver licensing issues. As part of this policy making, there is a continuing need to monitor and evaluate the effects of regulation and safety actions. Feedback will always be an essential component and has recently been included within the Front and Side impact Directives. In order to develop policy there is a need for a comprehensive set of crash injury databases to inform policy makers, direct the engineering development of new test procedures and to provide feedback on the effectiveness of existing regulation.

The decisions over vehicle designs are made on a European scale, the industry is either European or global, and it operates over many territories. Most industry groups do not utilise any systematic pan-European crash investigation and most frequently have to generalise based on regional or even local accident data. The availability of systematic accident data will also support the industry decision making and could provide a more substantial common ground for government-industry discussions.

In the field of vehicle design and crash protection there has been a very rapid rate of technological development over the past ten years. It has often not been possible for government or industry to conduct sufficient accident data to confirm that one generation of systems is effective before the new generation is being sold. One example concerns airbag systems, which were introduced to reduce driver injuries in mass-market cars in 1992, but it was not until 1996 that the first results on injury reduction became available. There is still no estimate of fatality reductions from airbag systems and the limiting factors are generally the small numbers of crashes investigated by any one group and also the untargeted approach that means that most crashes and vehicle types are included in a sample. Extending the crash data samples to cover a wider geographical area and restricting eligible cases to those that offer greater research value can improve the efficiency and speed of feedback. A database that only includes information on newer vehicles will provide as much useful information as one that is much larger but unselective. By combining results from a number of sample areas, it is possible to build a larger sample and obtain statistically significant results more quickly using a targeted approach on a European basis.

## **2.6. Conclusions and recommendations**

ETSC welcomes the progress that has been made so far with the development of road accident databases and Community action now needs to develop as follows:

1. Continue to support the CARE/CAREPLUS programme and set a target to expand the numbers of common variables within CARE, develop the convergence of the various national data sets and provide regular estimates of under-reporting for non-fatal crashes, particularly for the seriously injured.
2. Widen access to the CARE database, presently restricted by EU or national rules, at least to all relevant road safety research institutes within the EU.
3. Establish a limited scale, in-depth crashworthiness data collection programme to demonstrate the value of car crash injury data to the regulatory process. Implement a demonstration project to review future EU safety priorities.
4. Establish an injury and accident-reporting system, based on linked hospital and police information. Implement a demonstration project to identify injury priorities and changes in injury patterns due to vehicle design changes.
5. Review existing data collection activities in the areas of car, motorcycle and pedestrian accident causation to establish the value of data and their relevance to the competencies and priorities of the EU.
6. Ensure that that data collection and analysis is conducted by groups that do not have a stake in the financial consequences of the investigations. Make EU financial support for database activities conditional on the established impartiality of those responsible for managing them, as well as appropriate access.
7. Encourage and provide financial support for the collection of exposure data.
8. Set up a website-based road safety information system for public use comprising aggregated fatality, exposure and risk data for road transport in all EU Member States, information on national and EU road safety policies, laws (such as year and level of permitted alcohol, speed limits etc.), recent, important research results as well as an annual EU report on road safety developments.

## **3. AIR**

### **3.1. Introduction**

Member countries are obliged to report aviation accidents to the International Civil Aviation Organization (ICAO), but full reports are only provided for a minority of accidents and more than half the accidents are not officially reported at all.

To address this problem for European airspace, the EU Council of Ministers in 1994 adopted a Directive (94/56/EC) establishing the fundamental principles governing the investigation of civil aviation accidents and serious incidents. However, it has yet to be fully implemented throughout the EU although court proceedings have been instituted by the European Commission against two Member States - Luxembourg and Greece

In 1997, the European Parliament in its opinion of the Commission's air safety strategy called for the urgent establishment of a European data bank on air accidents, incidents and safety recommendations.

Further steps are now needed at EU level to allow monitoring of the Common Transport Policy as regards the aviation sector and to make possible the identification of data-led priorities for EU air safety policy. A range of information is needed.

- Information published annually on the number and severity of casualties in civil passenger air operations of aircraft registered in EU countries and operations within EU airspace.
- Information from incidents to permit the early identification of problems and the chance for rectification before they cause accidents, given that air accidents are relatively rare events.
- Confidential human factors information which shed light on the causes of incidents.
- Central publication of the accident investigation authorities safety recommendations following air accidents which are addressed to the regulators to reduce the likelihood of a recurrence.
- Information on injury causation to be compiled on a systematic basis to further understanding about fire protection and crash protection needs.
- Information on exposure data for the assessment of aviation risks, such as number of civil passenger aircraft flights, their annual flight kilometrage and number of passengers, all for aircraft registered in EU countries as well as for operations within EU airspace.

### **3.2. EU air accident and casualty statistics**

Article 9 of Council Directive 94/56/EC requires that all accident reports should be forwarded to the European Commission. However, as yet, no annual summary is available of total numbers of deaths and injuries in accidents involving EU registered aircraft or in the airspace of EU countries. Steps should be taken as soon as possible for an annual report to be presented by the Commission.

#### Data bank of safety recommendations

Article 9 of Council Directive 94/56/EC also requires that all safety recommendations of air accidents should be forwarded to the European Commission. However, as yet, there is no central database at EU level, nor of the actions that have resulted from these recommendations. This needs to be established urgently to allow input into EU air transport policymaking.

### **3.3. Aviation incident reporting**

#### Mandatory incident reporting

A pilot project has been completed which has demonstrated the feasibility of the centralised collation of incident information. The project called ECC-AIRS (European Co-ordination Centre for Aviation Incident Reporting Systems) was carried out by the Commission's Joint Research Centre to explore the scope for mandatory incident reporting within a European framework. Towards this end, a three-stage system was foreseen:

- Implementation of a system to co-ordinate existing databases which operate with different hardware, software and different methodologies;
- Establishment of minimum criteria to enable Member States to participate in a co-ordinated automated system; and
- Encouragement of Member States to introduce a regulation on incidents and set up their own system in a European framework.

A Commission proposal is under discussion to require Member States to introduce legislation to assure independent reporting of all reportable incidents (COM(2000) 847 final). To enable monitoring of EU air transport policies this legislation also needs to provide for a central EU database of reported incidents to be set up.

#### EU confidential incident reporting system

In order to tackle the problem of human error on the flight deck (which is present in the majority of commercial aircraft accidents), a database of self-reported errors in serious incidents is required in addition to the independent investigation of aircraft accidents and serious incidents.

The object of a confidential system is to gather those reports that a pilot, an air traffic controller or maintenance crew, might be naturally reluctant to submit to a system operated by the employer or licensing authority. There is evidence that mandatory incident reporting does not pick up the human factor sufficiently and evidence from existing national systems has shown their usefulness.

ETSC has set out recommendations for a European system in a report on Confidential Incident Reporting and Passenger Safety in Aviation (ETSC, 1996). ETSC recommended that a confidential aviation incident reporting programme should be established within the European Union. With a modest start up cost of around 700,000 Euro such a system should be funded centrally and operated from a co-ordinating hub with satellite reporting stations in different Member States.

The Commission's proposal for an incident reporting Directive requires Member States to introduce legislation to allow the setting up of confidential incident reporting databases but has not envisaged an EU-wide system. ETSC believes that an EU framework should be devised, that national 'hubs' should receive EU funding and that such funding should be conditional on compliance with best practice guidelines on the nature and operation of such databases.

### **3.4. Injury causation database**

Currently, about 40 per cent of air transport fatalities worldwide die in technically survivable air accidents. It is important, therefore, that more systematic information on injury causation is available to guide EU air crash protection policies.

Steps should be taken as soon as possible to establish EU mechanisms for the collection and analysis of such information.

### **3.5. Exposure statistics**

Exposure data are needed for air transport planning and policies and for the assessment of aviation and passenger risks (ETSC, 1999). The basic exposure data are the number of civil passenger aircraft flights, their annual flight distance kilometers and number of passengers, all types of data for aircraft registered in EU countries as well as for operations within EU airspace.

### **3.6. Conclusions and recommendations**

ETSC welcomes the progress made to date in establishing better arrangements for the investigation and monitoring of air accidents in Member States.

It is hoped that proposals for the publication annually of air accident statistics, the establishment of the centralised collation of a Mandatory Incident Reporting System and a European Confidential Human Incident Reporting System together with an EU data bank on safety recommendations and an EU database on exposure data can be brought forward as soon as possible.

This would allow the monitoring of EU aviation policies for their effect on safety, a larger database from which safety studies can be drawn and the encouragement of best practice amongst Member States.

These measures will also bring about the need for further developments in safety analysis methods in the Community research programme. Given the limited number of incidents and accidents, ETSC believes that additional safety performance indicators need to be developed.

#### Recommendations

1. Ensure full compliance with Council Directive 94/56/EC on accident investigation.
2. Bring forward a Council Directive for mandatory incident reporting, the establishment of a centralised EU database and for the establishment of a European confidential incident reporting system.
3. On establishing an European Air Safety Regulatory Authority, establish an organisation independent of this regulator to:
  - a. initiate and maintain a European database of accident and incident statistics as well as more general statistics for the accurate calculation of exposure data
  - b. initiate and maintain an EU system for monitoring the implementation and the effects of any safety recommendations
  - c. initiate safety performance indicators
  - d. initiate a database on injury causation
  - e. encourage further co-operation between the EU air accident investigation bodies.



## **4. RAIL**

### **4.1. Introduction**

The European railway systems have in the past been nationally rather than internationally oriented, though there are very long standing arrangements for the international movement of passenger and freight vehicles (but not locomotives) under the auspices of the International Union of Railways (UIC).

The UIC also assembles and publishes railway casualty statistics, and these are at present the only useable international data. However, the UIC data have the following limitations:

- Their reliability can be questioned, particularly because different railway systems may use different definitions of casualties (for example, some may include contractors' staff, and some may not); and
- The UIC does not assemble accident reports.

The European railway scene is now changing very rapidly, partly under EU pressure. The two major changes are:

(i) Fragmentation of the industry. Until a decade or so ago, all EU Member States had a single nationalised main line railway system. However, all States are moving in the direction of separating the provision of infrastructure from train operation, and some (Sweden, UK) have taken this a long way. There are many new potential new train operators, especially freight. This fragmentation requires a response to ensure the maintenance of safety. It also means that the UIC's statistical task becomes much more difficult; reports by a limited number of public companies are no longer sufficient to cover the whole industry.

(ii) There is pressure towards increased "interoperability", that is the movement of trains and locomotives across international boundaries. This requires steps towards the harmonisation of technical standards. At present, there is a Directive on the harmonisation of technical standards for high-speed lines, and a draft Directive on conventional lines. These Directives are in the process of being backed up by technical standards. All these developments have implications for the management and regulation of safety; the most important implication is that safety decisions will inevitably tend to move from national to European bodies.

### **4.2. EU rail accident and casualty statistics**

The EU Statistics Directorate has recently put forward a proposal for a new Council Directive on railway statistics, which is largely in response to the changes in the industry discussed above (COM(2000) 798 final). This proposed Directive requires Member States to collect specified statistical information on railways through the national statistical organisations, and report this to Eurostat. Most of the Directive is concerned with statistics on the operational and commercial activities of the railways. However, there is also a section on safety statistics; in addition, much of the activity data, such as train-kilometres, are also relevant, because it measures exposure.

The data are restricted to the main line railways (that is, they exclude metros and tramways), but they cover all main line operators. The Directive requires reporting of statistics on accidents, fatalities and serious injuries.

Accidents are defined as involving at least one railway vehicle in motion on a running line, and at least one fatal or serious casualty, or serious damage. They are subdivided into collisions (other than at level crossings), derailments, accidents involving level crossings, personal accidents involving moving vehicles, and others. Casualties are subdivided into passengers,

staff including contractors, and others, but excluding suicides. The definitions of fatalities and serious injuries are the same as those most commonly used for road accidents (for example, death must occur within 30 days of the accident).

The key statistics required are:

- Numbers of accidents in each category
- Numbers of fatalities by type of accident and category of person
- Numbers of serious injuries by type of accident and category of person

If these data are collected consistently and regularly, they will mark a substantial step forward from what are available through the UIC at present.

### **4.3. Rail accident investigation and accident reports**

It is desirable that railway accidents should be investigated, and they generally are. ETSC believes that the investigation of all serious accidents should be by independent accident investigation bodies (ETSC, 2001), though less serious accidents may be investigated by the regulator, or the railways themselves. In any case, the resulting report should be published. In many European countries, but not all, that is what happens. However, a system for assembling and making accessible these reports across Europe is missing. That is a serious lost opportunity.

The following are reasons why the assembly of such reports would aid safety.

- The frequency of serious railway accidents in any one country is (thankfully) low, so statistical analysis is hampered by small samples. The numbers of accidents for analysis is much larger for Europe as a whole than for any one country in isolation.
- Although there are many similarities in the different railway systems of Europe, there are also some significant differences, both in the safety systems (for example, for train protection) and in safety regulation and management (for example, in the role of the infrastructure manager). Comparative analysis of accidents at the European level could be expected to provide pointers as to the benefits of different systems and arrangements. In other words, it should provide a mechanism by which the different systems could learn from each other.

Accident reports are not statistics, and therefore could not reasonably have been included in the statistics directive. However, the EU should take the lead on organising a database of railway accident reports. The rapid development of the electronic production and storage of documents should make the task of assembling and retrieving accident reports much easier.

It will be necessary to define precisely which accidents would require a report to be included in the accident report database. It would obviously be sensible to specify a subset of those reported under the statistics Directive: ETSC suggests that as a minimum fatal accidents involving collisions (other than at level crossings) and fatal derailments. That would be a relatively small number, but it would include the most important accidents. It would be highly desirable to assemble reports from the past for a reasonable period, say 10 years, on the same definition.

Most railway accident reports take the form of a narrative, which in some cases is long. It is one thing to assemble and make available such reports; it would be another thing to analyse them in a systematic way. Assembling them and making them available is a straightforward (but vitally important) administrative task; reading them and analysing them requires expertise in the subject matter. It would be possible to suggest that as part of the task of assembly an 'expert' reads each report and extracts a specified set of descriptive information about each accident, which would then be available to any user for analysis and classification; this could save users having to read many reports. The alternative would be that users would have to read (and

perhaps translate) the narratives for themselves, and then extract whatever information was needed for their own specific purposes.

ETSC's suggestion is that the task is first confined to the relatively modest but important task of assembling the reports. Whether it would then be worth doing a generic analysis of them would depend on the numbers of reports, the contents of the reports, and the numbers and needs of users. It might turn out to be worthwhile in terms of economies of scale for users, but we would not want to jeopardise the basic task of assembly, which only a body at EU level can organise, by making the task too large.

#### **4.4. Exposure statistics**

The basic exposure statistics for the railway system are the annual number of train vehicle kilometres and passenger kilometres as well as the average passenger occupancy of trains.

These statistics are, in principle available, and together with the accident data they enable the comparative risk assessment in relation to other passenger transport modes, but the EU does not systematically gather the relevant exposure data for the railways in the countries of the EU. It is ETSC's recommendation to establish these exposure statistics on EU level as well.

#### **4.5. Conclusions and recommendations**

1. Introduce a Directive urgently requiring Member States to set up independent arrangements for rail accident investigation.
2. Establish an EU-wide system of mandatory reporting of rail accidents.
3. Ensure that reports of railway accident investigations are published.
4. Ensure that there are reports on all accidents in specified categories. ETSC suggests that as a minimum these categories should include fatal train collisions and fatal derailments.
5. Take the lead in organising a database of railway accident reports across Europe, accessible electronically.
6. Most reports are in narrative form, and it is these that should be made available in the first instance. The Commission should consider the merits of defining and extracting from the narratives a specified set of descriptive information.

## **5. WATER**

### **5.1. Introduction**

As with the road, rail and air sectors, effective EU policymaking on maritime safety which balances safety with economic and environmental objectives needs to be informed by a range of statistical and in-depth data on maritime and inland waterway accidents, incidents and casualties.

Fully comprehensive data on accidents and casualties in EU waterborne transport are however scarcely available and hardly accessible. Not all countries keep a systematic, publicly available record of the safety situation in their territorial waters or economic zones and the databases that exist are highly incompatible. Reporting at IMO level is incomplete. The best source of data, the Lloyds Maritime Information Service (LMIS), has major gaps. It does not, for example, include inland waterway transport, nor does it indicate accident causation factors.

Unlike the aviation sector, there are no arrangements at EU level for accident investigation and reporting and this now needs to be addressed, especially in view of the large number of initiatives being taken in other aspects of EU maritime transport policy.

### **5.2. EU maritime and inland waterway accident and incident reporting**

There is a strong case for the EU to bring forward a new Directive requiring Member States to establish arrangements for the independent accident investigation of maritime and inland waterway accidents. As in the case of EU aviation, Member States should also be required to forward all investigation reports of severe or, following IMO terminology, very serious accidents to the European Commission. This would, together with standardised reporting formats for all types of accidents and incidents, in turn allow the establishment of a central database. Analysis of the information stored in the database may result in safety recommendations to regulators in Europe.

Central EU databases on accidents and serious incidents need to include accidents occurring to commercial ships - inland waterway vessels, cargo vessels of less than 500 GT, fishing vessels, as well as vessels which are solely used for national traffic. These types of vessels, which are outside the scope of the IMO database, have a relatively high accident involvement compared to other vessels. Better information on the type and causes of accidents and incidents in these categories would allow a systematic analysis of the major problems and countermeasures in these categories.

In the meantime, annual summaries of maritime accidents in European waters and involving vessels registered in EU countries from the LMIS database should be published annually to provide basic information on accident and casualty frequency

### **5.3. Exposure statistics**

Exposure data are needed for maritime and inland waterway transport planning and policies and for the assessment of crew, passenger and vehicle risks. The basic exposure data are the number of waterborne transport trips for different types of vehicle, their annual distance in kilometres or nautical miles and number of persons onboard, all types of data for shipping registered in EU countries as well as for operations within EU waters. The ILO Convention 134, Prevention of Accidents (Seafarers) requires that Governments establish statistics concerning occupational accidents and prepare analysis of accident trends.

#### **5.4. Conclusions and recommendations**

There is an urgent need for better arrangements to be set up to allow monitoring of EU maritime policies and to contribute to a better understanding of maritime safety needs. In particular, attention needs to be given as soon as possible to the following.

1. Bring forward urgently a Directive requiring Member States to set up independent arrangements for maritime accident investigation.
2. Establish an EU-wide system of mandatory reporting of maritime accidents and serious incidents for inclusion in a European central database.
3. Publish annually, in the meantime, annual summaries of maritime accidents in European waters and involving vessels registered in EU countries from the LMIS database to provide basic information on accident and casualty frequency.
4. In the event of an EU Maritime Safety Regulatory Authority being established, set up new organisational arrangements independent of this regulator to:
  - a) maintain a European database of accident and incident statistics as well as more general statistics for the accurate calculation of exposure data;
  - b) initiate and maintain an EU system for monitoring the implementation and the effects of any safety recommendations;
  - c) initiate safety performance indicators;
  - d) initiate a database on injury causation; and
  - e) encourage further co-operation between the independent accident investigation authorities in Member States.

#### **6. FINANCING DATABASES**

In order to accelerate the development of these activities and to ensure support annually in the EU budget, ETSC recommends that the development and operation of EU transport accident, incident and casualty databases should receive 100% funding by the Community and should be an explicit budget sub-heading within Line B2-7202 (transport safety) of the EU budget.

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