Deliverable D4.3

Draft Recommendations for Transparent and Independent Accident Investigation - A Working Paper

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THE PRESENT DELIVERABLE IS A WORKING PAPER AND WILL BE USED FOR CONSULTATION.

THE DRAFT RECOMMENDATIONS CONTAINED IN THE DELIVERABLE SHOULD NOT BE TAKEN FOR A SET OF FINALISED RECOMMENDATIONS.

THESE DRAFT RECOMMENDATIONS WILL BE REPLACED BY THE NEXT WP4 DELIVERABLE, RECOMMENDATIONS FOR TRANSPARENT AND INDEPENDENT ACCIDENT INVESTIGATION, TO BE PUBLISHED IN OCTOBER 2007.

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LIST OF TABLES AND FIGURES

Tables

Figures

EXECUTIVE SUMMARY

There is a range of accident investigation procedures and protocols in place across Europe for investigating road accidents. However, as countries work towards meeting both their own road safety targets and those set by the European Commission, it may be that these existing investigations are no longer entirely suited to facilitating the decision making processes of road safety policy-makers or practitioners. Current practices for dealing with road accidents are quite different from those for aviation, rail and maritime accidents, as is the legislative framework regarding such investigations. Currently no comparable requirements or clearly formulated objectives exist for the organisation of transparent and independent road accident investigation.

This document aims to address this by presenting recommendations for transparent and independent accident investigation processes. The recommendations detailed in this document represent the culmination of knowledge gained from reviewing the current procedures for investigating road accidents in commercial companies, police forces, existing independent road accident investigation bodies as well as those for rail, civil aviation and maritime accident investigation.

Two small-scale pilot consultation exercises were undertaken in order to assess the appropriateness and relevance to users of the recommendations as they were being prepared. These consisted of interviews with certain key stakeholders, and a questionnaire. Key findings were that it would be feasible to establish an independent body for road accident investigation, but that the benefits of doing so should be explicitly stated and the legal framework within which such a body would operate should be clearly defined from the start, to prevent problems with existing institutions. It was also clear from the responses to the preliminary consultations that the cost of any proposed accident investigation body will be a fundamental determinant of the political response to moves to create such a body. Based on existing road accident investigation projects the cost of investigations ranged from €1,000 – €2,600 per accident.

The recommendations propose the establishment, in all Member States, of a body for undertaking transparent and independent accident investigations, and/or for supervising already existing investigation activities; gathering and managing accident investigation data and exploiting these data for research and road safety enhancement purposes.

The recommendations focus on four categories of issues:

1. **Institutional**, referring to the structure and functioning of the body responsible for road safety investigations;
2. **Operational**, detailing how the body carries out investigations;
3. **Data**, addressing issues surrounding the storage, retrieval and analysis of data generated by investigations; and
4. **Development of Countermeasures**, dealing with how investigation conclusions should be presented, used and disseminated.

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The recommendations intend to build on existing best practice. They are designed to be as realistic, feasible, and achievable as possible. To this end an 'Assessment Tool' has been devised, presenting questions with high (best practice), intermediate and low level 'answers' so that each member state can assess their own road accident investigation procedures. This will allow existing national systems to be built upon and ways of improving practices to be identified.

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DEFINITIONS

The following definitions should be applied to this document

Road vehicle accident*: Unintended event that involves at least one road vehicle in motion and leads to personal injury or property damage, or both

Injury accident*: Road vehicle accident in which at least one road user sustains an injury

Fatal accident*: Injury accident in which at least one road user sustains a fatal injury

Major accident: Accident that has to be considered as particularly serious because of the number of killed or injured victims, or because of the damage caused to the environment or property

Fatality*: Injury outcome resulting in death [within 30 days of the accident]

Accident investigation*: Acquisition of factual information regarding an accident. NOTE: An accident investigation can include on-scene elements, elements collected retrospectively, or both these

In-depth investigation*: Accident investigation conducted by an investigator with specialized knowledge

Multidisciplinary investigation*: Accident investigation conducted by a team of investigators with specialized knowledge encompassing several professional disciplines

On-scene investigation*: Accident investigation conducted at the accident scene with the purpose of collecting on-scene information before physical evidence (e.g. The vehicles involved) has been removed

Road user*: Person on the road
In this document, road user includes **Vehicle occupant***: Road user in or on a vehicle

Stakeholder: the groups and individuals who are in a position to take action, through policy or practice, to improve road safety or who gather, manage or hold accident related information, useful to road safety

Grant in Aid: A giving of federal or government funds to a state or local government to subsidise a public project

*** *ISO definitions. The terms and definitions taken from ISO 12353-1:2002 Road Vehicles - Traffic accident analyses, Part 1: Vocabulary, are reproduced with permission of the International Organization for Standardization, ISO. This*

standard can be obtained from any ISO member and from the Web site of ISO Central Secretariat at the following address: www.iso.org. Copyright remains with ISO.
Abbreviations:

AAIB: Air Accident Investigation Branch (UK)

AIS: Abbreviated Injury Scale (published by the Association for the Advancement of Automotive Medicine)

DfT: Department for Transport (UK)

ERSO: European Road Safety Observatory

ETSC: European Transport Safety Council

EU25: The current 25 European Union member states

GIDAS: German In-Depth Accident Study

HSE: Health and Safety Executive (UK)

MAIB: Maritime Accident Investigation Branch (UK)

NHTSA: National Highway Traffic Safety Administration (USA)

NTSB: National Transportation Safety Board (USA)

OTS: On the Spot study (UK)

RAIB: Rail Accident Investigation Branch (UK)

SRA: Swedish Road Administration

VALT: Finnish Motor Insurers' Centre

VSRC: Vehicle Safety Research Centre (UK)

1 INTRODUCTION

It is apparent both from the documentation gathered by other projects and SafetyNet work packages, that there is already a range of accident investigation procedures and protocols in place across Europe for road accidents (see for example, Deliverable D4.2 *Database Transparency* (SafetyNet, 2006), SafetyNet Work Packages 1[1] and 5[2], and the Pendant project[3]) However, as countries work towards meeting both their own road safety targets and those set by the European Commission, it may be that these existing investigations are no longer entirely suited to facilitating the decision making processes of road safety policy-makers or practitioners. Deliverable D4.1 of the SafetyNet project (SafetyNet, 2005) provides a detailed analysis of the accident investigation bodies that exist across Europe for different transport modes and in different countries. What is clear from this review is that current practices for dealing with road accidents are quite different from those for aviation, rail and maritime accidents, as is the legislative framework regarding such investigations. *Council Directive 94/56/EC of 21 November 1994, establishing the fundamental principles governing the investigation of civil aviation accidents and incidents,* requires Member States to set up aviation accident investigation bodies with a high degree of independence. *Directive 2004/49/EC of the European Parliament and of the Council on safety on the Community's railways* requires the Member States to establish, at national level, completely independent bodies responsible for carrying out accident investigations. In addition, *Council Directive 1999/35/EC of 29 April 1999 on a system of mandatory surveys for the safe operation of regular ro-ro ferries and high-speed passenger craft services*, requires the organisation responsible for investigating maritime accidents to be independent. Currently no comparable requirement or clearly formulated objectives exist for the organisation of independent road accident investigation. However, the European Commission paper, *Saving 20 000 lives on our roads*, states:

> *There are plans to develop independent road accident investigations along the lines of the existing European civil aviation regulations. …Such investigations, independent from those conducted by the judicial authorities or insurance companies should be geared to the causes of accidents rather than the question of who is responsible and should make it possible to improve the current legislation and practices. They should be carried out at national level on the basis of a European methodology and their findings should be communicated for assessment by a group of experts meeting within the Commission. These investigations, relating to a limited number of accidents will supplement the general road accident statistics and the detailed accident case studies carried out by multidisciplinary teams.* (EC 2003: 45, 5.6.2)

It is clear that road accidents are not directly comparable to accidents in other modes, the most obvious reason being the numbers involved. In 2003, the 116

[1] http://www.erso.eu/safetynet/content/care.htm
[2] http://www.erso.eu/safetynet/content/independent_accident_and_injury_databases.htm
[3] http://www.vsi.tugraz.at/pendant/

rail fatalities reported in the EU25 were dwarfed by the 46,719 road fatalities (EC, 2005). In France aviation accidents killed 85 persons in 2004 (Bureau d'Enquêtes et d'Analyses, no date), while the number of road fatalities amounted to 5,753 (killed at 30 days [ONISR 2005:12]). In 2004 the UK Department for Transport recorded a total of 55 fatalities relating to UK-operated aircraft in UK airspace, compared to 39 fatalities on the railway (excluding trespass and suicide) and 3221 on the roads (www.dft.gov.uk).

In addition to the disproportionately large numbers involved, road accident investigation practices differ substantially from those in other transport modes due to the differences in the way in which they are perceived and treated (see SafetyNet, 2006). Since the existing transport accident investigation bodies are thus not necessarily suitable models for road accident investigation, the following issues must be addressed, in order to determine the appropriate structure for investigating road accidents in a transparent and independent manner.

1. What should be the response of stakeholders to the need to investigate accidents?
2. What is the role of road safety stakeholders?
3. How do we identify new opportunities for casualty reduction through accident investigation?

By looking in detail at these issues, it is hoped to be able to make recommendations for transparent and independent accident investigation that are realistic, feasible and relevant.

1.1 The response of stakeholders to the need to investigate

Through the following chapters, these issues will be discussed;

1. Which stakeholders do we mean?
2. What drives the need to investigate?
3. What are we hoping any investigation will achieve?
4. When is there a "need to investigate" -
   - for all accidents?
   - when there are fatalities?
   - in the case of a major accident?
   - when specific road users are involved?
   - or when particular types of roads or vehicles are involved?

Currently the stakeholders are an informal collection of interests including the police (has an offence been committed?), insurance companies (is a resulting claim genuine?), academics (what can an accident contribute to the body of knowledge?), local, regional or municipal authorities (are the speed limits and signage adequate?), emergency services and hospitals (interested in alleviating

the accident outcomes), companies (does an employee need disciplining, or working practices need changing?), public health bodies (is an employer liable; has Health and Safety legislation been contravened?), the road infrastructure industry (has the roadway design contributed to the accident?) and vehicle manufacturers (has the design of the vehicle contributed to the accident or road user injuries?)

These recommendations will look for ways of transforming these separate approaches into a coordinated response.

1.2 The role of safety stakeholders.

Any new approach to road accident investigation requires the involvement of stakeholders, therefore, it is crucial to identify them and approach them for their opinions. Stakeholders are those groups and individuals who are in a position to take action, through policy or practice, to improve road safety or who gather, manage or hold accident related information, useful to road safety.

Stakeholders and potential data users of these recommendations include:

At European level

- policy makers within the European Commission

At each EU country level

- policy makers/government
- road designers/highways engineers
- police
- insurance companies
- independent research groups
- existing investigation bodies
- health and other authorities
- universities and engineering schools
- car manufacturers

It should also be borne in mind that the primary purpose of safety oriented accident investigation is to further progress towards road safety targets. Another key issue when consulting stakeholders is the possibility for identifying, through accident investigation, new opportunities for casualty reduction.

The main issues for consultation include:

- What level of resources should be put into transparent and independent road accident investigation? If this is determined on the basis of the number and cost of road accidents, how much would a road accident investigation organisation cost? Assuming the option of an independent investigation body is taken, a figure could be calculated on the basis of

the cost of the investigation bodies of the other modes, but this is unlikely to be affordable or realistic.

- Who should be asked to carry out road accident investigation? There is a great deal of existing expertise across Europe, especially in the national police forces. It would seem sensible to harness this expertise, even if police investigations are not primarily safety oriented.
- What type of accidents should be investigated?
- Who decides which accidents are investigated? How?
- How are the results of accident investigation turned into policy and/or legislation?

1.3 Where might the "new opportunities for casualty reduction through accident investigation" come from?

Will accident investigation address any potential areas for improvements that the current approach to road accidents has failed to highlight? (For example: roadside infrastructure, company vehicles)

Health and life expectancy have improved massively, to the point where transport (specifically road accidents) is now a significant contributor to ill-health, reduced life-expectancy and death. Road accident policy has focussed on the reduction of harm, rather than the mitigation of risk (as is the case with other modes). If we are to introduce a Road Accident Investigation Body modelled on existing maritime, rail and aviation investigation bodies do we also change the focus of road safety policy?

In UK road transport, the focus of the last 15 years has been casualty reduction. This has taken no account of levels of risk exposure. For example, pedestrian deaths decreased from 2939 to 1694 over the period 1971 to 1990. This would be seen as a success looking only at the absolute casualty totals. However, the number of 7 and 8 year olds allowed to walk unescorted to school decreased over the same period from 80% to 9%, and in only 3 years (1989 to 1992) the average annual distance walked per person in the UK decreased by an estimated 16% (Davis, 1996). If road accidents were considered within a wider public health remit, this would perhaps be thought to be a less desirable outcome. The regulatory focus of rail, maritime and aviation safety is more attuned to encouraging beneficial activities, whilst acting to manage the risks they present to people.

In almost every other area of industrial activity and every other mode of transport, the onus is put firmly on reducing the risks to those not involved in, but put at risk by, the activity in question (see UK Health and Safety at Work Act, 1974). In the public transport modes, those involved but not in position to control the activity, i.e. the passengers, are the focus when risks are assessed or action is taken for reducing risks. The situation in the case of road accidents is that although the majority of the casualties of road accidents are the people

inside the vehicle, a significant proportion are people outside the vehicles (e.g. cyclists, pedestrians, motorcyclists). If road accidents were looked at in the same way as other public transport accidents, and subjected to the same logic would this be likely to change?

> *We have in the Health and Safety Executive [UK], perhaps the best, most developed regulatory philosophy and practice in the world for enabling beneficial activities to proceed while assuring reasonable levels of risk for those exposed. Yet to date we have appeared completely incapable of applying those principles and practices where they most affect our lives and could deliver us the most benefit – on our roads.* (Taig, 1999)

1.4 What was the response to the need to investigate accidents in other modes of transport?

In determining the appropriate form for undertaking transparent and independent road accident investigation, there are a number of models we could examine. For example, most EU Member States now have independent maritime, aviation and rail accident investigation bodies. In the UK, there is also the Health and Safety Executive (HSE), which is responsible for monitoring and enforcement of health and safety at work regulations and which was, until recently responsible for rail safety cases and accident investigation. A number of countries already have some form of road accident investigation. For a description of these existing models of accident investigation, the reader is referred to the SafetyNet deliverable D4.1 (SafetyNet, 2005) and Annex C of this document.

Case Study – France: Organisation of Road Accident Investigation

In France the investigation of road accidents is undertaken by the Bureau d'Enquêtes sur les Accidents de Transport Terrestre (BEA-TT), established in 2004 to investigate all accidents involving land transport facilities. For road accidents the procedure of initiating an investigation (so far by a decision of the Minister of Transport) should be modified by the end of 2006. The Director of BEA-TT would, according to the foreseen procedure, initiate an investigation, either on request or with the approval of the Minister. In the conduct of its investigations BEA-TT is independent. In 2004 BEA-TT investigated 2 road accidents. Due to the wide sphere of responsibilities BEA-TT investigates mainly major accidents, but it can also conduct specific studies on certain types of accidents or incidents. BEA-TT publishes reports on its investigations.

Source: SafetyNet (2005: 57-59)

Case Study – Finland: Organisation of Road Accident Investigation

In Finland, 21 regional Road Accident Investigation Teams investigate all fatal accidents. The Road Accident Delegation, set up by the Ministry of Transport and Communications, steers the activity of the regional Investigation Teams. The system, set up in its current form by law in 2001, was originally established in 1967, when Finnish Motor Insurers' Centre (FMIC; http://www.vakes.fi/lvk/english/index.jsp) set up the Traffic Safety Committee of Insurance Companies (VALT) for the promotion of road safety. As a statutory organisation, FMIC participates in road safety work, as provided by the Motor Liability Insurance Act of 1959. In the current system VALT organises the actual road accident investigation activities. The Investigation Teams investigate all fatal accidents – around 370 per year – as well as other accidents, as defined by VALT, for specific safety research purposes. In all, the investigation teams study 400-500 accidents per year. VALT publishes individual accident investigation reports as well as an annual report.

Source: SafetyNet (2005:84-86)

1.5 What should accident investigation achieve?

1. Accident investigation should identify the factors leading to accidents including:
- physical/psychological (e.g. driver fatigue),
- social (e.g. acceptability of speeding),
- political (e.g. lack of will for more effective road safety enforcement)
- economic (e.g. incentives to take risk in road transport industry)
- engineering (e.g. road infrastructure and vehicle design issues)

2. Accident investigation should lead to the design and implementation of an effective plan for change.

3. The results of investigations should be used to challenge social attitudes to long-known dangers. For example, by identifying and working to remove inducements to take risks.

4. The lessons from accident investigations should not be lost, so that future accidents could be prevented.

1.6 The aims of the recommendations

These Recommendations intend to build on existing best practice. They are designed to be as realistic, feasible, and achievable as possible. They propose the establishment, in all Member States, of a body for undertaking transparent and independent accident investigations, and/or for supervising already existing investigation activities; gathering and managing accident investigation data and exploiting these data for research and road safety enhancement purposes. They also aim:

- To ensure the involvement of all relevant stakeholders and explore the legal, political and economic perspectives of safety oriented accident investigation.
- To facilitate the sharing of knowledge about current approaches and best practice, and enable links to be made between EU Member States and their existing or future road accident investigation organisations.
- To present an 'Assessment Tool', highlighting ways of improving the organisation and management of accident data collection, use and dissemination.
- To facilitate improvements in data collection, use and dissemination and allow a standard basic level of road accident investigation to be achieved across Europe.

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1.7 Structure of the Deliverable

Chapter 2 firstly sets out the hypothetical characteristics of a Road Accident Investigation Body. It then describes the conclusions of two small-scale pilot consultation exercises which were undertaken in order to assess the appropriateness and relevance to users of the draft recommendations as they were being prepared. These exercises consisted of interviews with certain key stakeholders, and a questionnaire distributed at a workshop at the 1st SafetyNet conference (Prague, May 2006).

Chapter 3 introduces a discussion on the costs involved in performing independent road accident investigations by examining the costs of investigating accidents in other transport modes, as well as the USA National Highway Traffic Safety Administration (NHTSA) and a number of European in-depth road accident investigation studies.

Chapter 4 presents the recommendations themselves. The chapter begins with a justification for an independent investigation body and a description of what a European road accident investigation system might look like. This is followed by a set of questions covering institutional, operational, data and reports, countermeasures and the dissemination of data issues, alongside high (best practice), intermediate and low level 'answers' which forms an 'Assessment Tool' that allows member states to evaluate their existing procedures. These questions are then discussed in relation to existing European publications (e.g. EC (2003) and Council Directives) and best practice recommendations are illustrated with case studies of existing road accident investigation practices.

Chapter 5 summarises the recommendations and cross references the relevant discussion section(s) of chapter 4. The benefits of transparent and independent accident investigation, as recommended in this document, are then illustrated by a detailed case study of a UK fatal accident investigation.

2 PRELIMINARY CONSULTATION

Two small-scale pilot consultation exercises were undertaken in order to assess the appropriateness and relevance to users of the Draft Recommendations as they were being prepared. These consisted of interviews with certain key stakeholders, and a questionnaire distributed at a workshop at the 1st SafetyNet conference (held in Prague, May 2006). The workshop attendees saw a presentation about transparent and independent accident investigation, and at certain points during the presentation were asked to respond on their questionnaires to the questions under discussion. The questionnaire and a breakdown of the number and types of responses can be found in Annex B.

In this Chapter the characteristics of an independent and transparent Road Accident Investigation Body will be set out. Then, for each of the key questions asked in the preliminary consultation, the main responses and key issues raised are presented in the relevant sections below. Extracts from the questionnaire responses have been used to convey the range of opinion.

2.1 The hypothetical characteristics of a Road Accident Investigation Body

There are several types of arguments in favour of the establishment of permanent, independent road accident investigation bodies working in a transparent manner. Most of the relevant arguments have already been explored in detail in our previous deliverables D4.1 *Bibliographical Study* (SafetyNet, 2005) and D4.2 *Database Transparency* (SafetyNet, 2006). We will therefore only reiterate the key points.

An investigation body must be permanent, so that the recommendations it formulates will not be ignored or forgotten. The investigating entity must not have responsibility for setting or enforcing regulations because this would put it in a position where it must investigate an accident that might have been caused or made worse by incomplete or faulty regulation. An accident investigation must be separate from any judicial enquiry because the purpose of the accident investigation is not to establish liabilities; it is to establish causes.

The investigating body must have an autonomous budget for functioning and carrying out its investigations because it must not depend on external financing for any particular investigation. It must not have relations, particularly financial ones, with any commercial organisations or those with other vested interests, so that safety remains its only objective. The investigation body should have a legal obligation to investigate certain accidents and the liberty to investigate any other accident or series of accidents so that it is free from any outside pressures for not initiating an investigation.

The investigators in charge of an accident investigation determine the scope and the methods of investigation. They must have access to all the necessary data, including evidence for a judicial enquiry, and be able to hear witnesses so that all relevant information for establishing the causes of the accident can be considered. The conclusions and the investigation report must be public and not subject to any external scrutiny before they are published so that public can trust that no outside pressures have altered the results of the investigation.

2.2 Is such a body feasible?

The main responses to this question seem to indicate that the introduction of a Road Accident Investigation Body might be difficult, but not impossible. The key obstacles could be summarised as being financial (lack of money and available expertise), political (lack of will to implement such a body), and legal (data protection, the status of such a body with respect to the police, the existing processes etc). Issues raised included:

- *In countries with a federal structure it would be very difficult to implement as a national body.*
- *It may not be possible to build teams with sufficient people with the right level of expertise, given the numbers of road accidents in some countries.*
- *Public indifference to the problem would make it difficult to get political support.*
- *The main obstacle is lack of funding – any other problems are small compared to this.*
- *Protecting the identity of individuals makes it difficult to share the lessons learnt in investigations.*
- *The legal framework does not allow for interviewing of witnesses by investigators, especially when the police are involved in a separate inquiry.*
- *Opposition from prosecutors/judiciary, who will not open files to an independent body, will make it difficult.*
- *It would need to develop a comprehensive, integrated process, and define the necessary cooperation between the key organisations, which are lacking at the moment.*
- *There are many vested interests who prefer things the way they are and who might stand in the way.*

2.3 Would it give us anything additional to what we are already doing?

Given the concerns raised by respondents about the lack of political will and public support for a new body for accident investigation, this is possibly the area that needs the most clarity. The people whose comments are reported here are "stakeholders" in road accident data; they are researchers, policy-makers and advisors to governments. If they remain unconvinced of the benefits of additional independent and transparent accident investigation, then it is unlikely that anyone outside the field will be convinced. It seems that the conclusions that can be drawn from the responses to this question are that there would be considerable benefits to enhancing existing practices, but that the case for making the additional investment needs to be very strongly put in order to be convincing:

- *The task of a police investigation is to find the responsible person. The task of an in-depth investigation would be to explore the real accident causes and to elaborate counter-measures.*
- *We have too much unusable, superficial and false data from the official sources. An independent framework must be established.*
- *In-depth study is necessary to develop appropriate active safety systems.*
- *It is not possible to learn the things we really need to know from "traditional" accident reporting. For a select type of accidents, in-depth data should be collected. The selection should be based on hypothesis.*
- *We know a lot about fatal accidents but very little about serious (and even less about slight)*
- *The case has not been made to demonstrate that it is worth investing more money to change the existing arrangements*.

2.4 Should there be a transparent and independent road accident investigation body in each country?

For the majority of respondents, there does seem to be a belief in the value of introducing a new transparent and independent Road Accident Investigation Body for road accidents, though there is less agreement over what its precise form and function should be. Suggestions range from a body that simply oversees and coordinates (possibly at European level) through one that would work alongside the police at national level, right up to a separate team undertaking 'on-the-scene' investigations. Unsurprisingly, one of the key issues raised is the level of resources that should or could be put into such a body; this will be one of the key determinants of the type of body that it is possible to introduce. Simply giving the police more money to investigate more accidents is not likely to be the most beneficial course of action since their investigations are unlikely to be sufficiently independent or transparent. Whilst it is recognised that national police forces have a great deal of knowledge and expertise in road accident investigation, there are more fundamental issues to be addressed than

simply the number of accidents they are able to investigate. These issues include comparability at European level, accuracy of data, the range of variables collected, dissemination of findings and the implementation of counter-measures (including primary legislation).

Questionnaire answers included:

- *The most important thing is communication between the countries, so "yes", if it can be used to promote information-sharing and cooperation between countries.*
- *Ideally yes, as a team of on-the-spot investigators for all accidents. In reality, further exploitation of the role of the police might be a good compromise.*
- *Yes, to work alongside the police but maybe collecting information with a slightly different focus (more in-depth, for example).*
- *If money was no object, would I want something that would provide additional benefit? Of Course! Unfortunately the additional costs must be weighed against the additional benefits.*
- *Yes – it seems to be the only way to collect quality data efficiently.*
- *In the current legal framework teams should work with the police. Only if the current framework is changed could a totally independent body be established.*
- *If it is done for aviation and rail (with such low casualty levels) then failure to do it for road is indefensible.*
- *In rail and aviation accident investigation, much can be learnt from an individual accident. In roads, in-depth studies should be done to learn from several accidents, but done in a universal way, following standards. It is not necessary that it is done by a Road Accident Investigation Body to achieve this.*
- *No – it would be better to just give more money to the police, to enable them to investigate a greater number of accidents.*

2.5 How many accidents would it investigate and what type (fatal, serious, geographically sampled?)

As might be expected, there is a wide variation in the number and type of accidents that respondents suggest should be investigated. A key issue to be resolved here is the question of whether the level of resources to be invested in road accident investigation should be determined on the basis of the accidents that "need" to be investigated, or whether the number and type of accidents should be decided on the basis of what is possible for a given level of investment. Suggestions for investigations were:

- *Accidents relating to specific problem areas which have been highlighted by the basic data.*
- *Some major accidents, perhaps those involving dangerous goods.*
- *Multi-fatal accidents.*

- *Sampling by topics, which are periodically reviewed. Investigation should be carried out as close as possible to the occurrence.*
- *Serious accidents and some fatals.*
- *A sample of fatal accidents, plus a sample of serious injuries plus "special cases" (something out of the ordinary)*
- *For all accidents collect basic level data and for serious accidents collect in-depth data*
- *General data should be collected by the police and detailed by accident investigators.*
- *All accidents including near-misses at basic level – this might become possible using data recorders, vehicle maintenance records etc.*
- *A representative sample of ALL accidents at in-depth level, plus some affecting a limited population (such as pedestrian or goods vehicle accidents)*
- *Any serious (or potentially serious) accident where anticipated findings can lead to new recommendations.*
- *There should be a dual approach combining in-depth investigation of major accidents with a statistically robust sample of all accidents.*
- *There should be a combination of on-the-spot and retrospective investigations.*
- *Whenever there is a loss that is considered significant (presumably this could be significant financial loss, or human loss etc)*
- *Accident cost exceeding a certain limit.*
- *Anything exceeding AIS 4+ at detailed level.*
- *A balance needs to be found between the number of accidents we investigate, the amount of information collected on each, and costs.*

2.6 Conclusions

The main conclusions that can be drawn from this preliminary consultation are:

1. It would be feasible to establish an independent body for road accident investigation, but that the benefits of doing so must be explicitly stated.
2. The legal framework within which such a body would operate must be clearly defined from the start, to prevent problems with existing organisations.
3. Some consideration should be given to the number and type of accidents to be investigated: While the analysis of existing investigation bodies would suggest that an independent body should have discretion over what to investigate, some recommendations would help with estimating costs.

3 COSTINGS

3.1 Introduction

It is clear from the responses to the preliminary consultations that the cost of establishing any proposed accident investigation body will be a fundamental determinant of the political response to moves to create such a body. It is also clear that its potential to pay for itself in the long term (by reducing accident costs) is very important to policy-makers. Using data from the European study UNITE (Nellthorp et al., 2001) a pan-European Standard for the Value of a Statistical Life (VOSL) is postulated to be €1.5 million (based on Beattie et al. [1999]). Using this value, the cost of the 40,000[4] fatalities alone in the EU25 can be calculated to be approximately €60 billion annually. If the costs for non-fatal crashes are included as well, it is estimated that the overall cost of road accidents (involving injury) in the EU25 could even approach €200 billion.

Annex 7 of deliverable 4.2 (SafetyNet, 2006) contains an analysis of the costs of different accident and casualty types, and some discussion about the basis on which decisions regarding safety investments should be made. This section does not repeat this analysis, but aims to produce some realistic costings for a proposed Road Accident Investigation Body, based on existing models. These costings vary according to the scope and depth of the investigations carried out by the organisations which are used as case studies.

3.2 Costing Accident Investigation on the Basis of the UK Rail, Maritime and Aviation Branches

Since there is no single body in the UK with dedicated responsibility for investigating road accidents, it is difficult to estimate the accident investigation component of the cost of road accidents. However, for the maritime, rail and aviation industries, these bodies exist, so their costs can be calculated. These calculations can be used to produce some broad estimates for the resources that should be invested in road accident investigation, given the relative scale of the problem across the different modes. Table 1, below, shows the staffing structure of the Air Accident Investigation Branch (AAIB), Maritime Accident Investigation Branch (MAIB) and Rail Accident Investigation Branch (RAIB).

[4] approximation

Table 1: Staffing structure of the UK accident investigation branches.

Personnel Status	AAIB	MAIB	RAIB
Chief inspector	1	1	1
Deputy CI	1	1	1
Principle Inspector	4	3	2
Inspector	26	10	6
Support staff	14	11	8
Total	46	26	18

Source : www.rail-reg.gov.uk

In addition, the RAIB also uses accredited agents. In cases where the accident location is remote, and it would not be possible for an investigator to arrive on-scene in time to record evidence that would otherwise be lost, accredited agents can secure and record the evidence. They are trained and appointed people from industry, and although they are not investigators, they are able to attend the scene very quickly. In this respect they might provide a useful model that any road accident investigating body could use.

Of course, since the scale of the accident problem on the roads far exceeds that in the other modes, one might expect that the resources invested in road accident investigations should exceed that in the other modes to a similar degree. However, it is unlikely that it could be practicable to carry out road accident investigation on the level or to the depth that it is in the other modes of transport. Nevertheless, it is perhaps reasonable to suggest that road accident investigation should attract at least the same level of funding as is deemed appropriate for the other modes, given the number of people affected annually. Table 2 below shows the costs of running the AAIB and MAIB, and estimates of the costs for the RAIB.

Table 2: Annual expenditure on UK accident investigation branches (£ and € thousands).

	Staff costs (£K)	Running & other cost (£k)	Total cost (£k)	Total cost (€k)	Approx investment/fatality (€k)
AAIB	2 720	916	3 636	5 366	98
MAIB	929	522	1 451	2 141	[5]
RAIB	1 000	400	1 400	2 066	53

Source: adapted from www.dft.gov.uk

Using the figures quoted in chapter 1 (p11) for fatalities on the roads, investment in a Road Accident Investigation Body at an equivalent level to that in the rail accident branch would lead to approximately €170 million of investment being required to fund the road accident investigation in the UK alone. Extended to the EU25, this would lead to a budget of €2.36 billion.

[5] Figure not available

3.3 Costing Investigation on the Basis of Existing Road Accident Investigation.

3.3.1 USA National Highway Traffic Safety Administration (NHTSA)

With approximately 42,000 fatalities per year, the United States is a reasonably good model for comparison with the European Union (EU25: 43,359 road deaths in 2004 [EC, 2006]). NHTSA, part of the US Department of Transportation, was established in 1970 with a broad road safety remit. Its activities include investigations, research, dissemination, and safety campaigns. According to www.artba.org its budget in 2005 was approximately $800 million, or $19,000 per fatality. Using this per fatality costing, performing road accident investigations and other safety related activities on a EU scale would cost approximately the same. At current exchange rates (August 2006) this would equate to around €625 million annually and €15,000 per fatality. More details on the activities and remit of NHTSA can be found on the organisation's website (http://www.nhtsa.dot.gov/)
perform

3.3.2 The cost of VALT's in-depth road accident investigation in Finland

In Finland the annual budget for the whole road accident investigation system is approximately €1 million and permits the investigation of 400-500 accidents per year, approximately 350 of which are fatal. This would give a hypothetical cost of €2,000-€2,500 for the investigation of one accident. Given that this budget includes the cost of actual investigations and a variety of other road safety activities, the real cost of one accident investigation may be lower. For more information on VALT's in-depth study see D4.1 (SafetyNet, 2005:84-86).

3.3.3 The cost of the Swedish Road Administration's (SRA) in-depth study

The SRA is responsible for co-ordinating and performing in-depth studies of all fatal accidents on the road network (see Appendix C). The total cost for the Swedish in-depth organisation in 2004 was approximately SEK 11 million (€ 1.2 million, Feb, 2006). For 2004, 430 fatal road accidents occurred excluding 29 accident due to illness (SIKA; The Swedish Institute for Transport and Communications Analysis, 2005). The accidents due to illness are investigated until natural cause of death is stated. The cost for the in-depth organisation includes investigation (approx. 70%), dissemination and recommendations and follow up concerning safety measures. The total cost of the SRA in-depth accident investigation was therefore approximately €2,600 per accident. Based on SIKA (2005), costs of investigating injury accidents in Sweden can be estimated as follows:

Table 3: Cost of investigating road accidents in Sweden based on the SRA model

Cost per SRA case (accident)	Total[6] injury road accidents 2004	Cost for 10% of injury accidents	Cost for 50% of injury accidents	Cost for all fatal accidents	Cost for all fatal accidents + 10% serious & slight
€2,600	18,029	€4,7 million	€23,5 million	€1.2 million	€5,8 million

3.3.4 UK On The Spot (OTS)

One existing model of road accident investigation, which was referred to by some participants in the preliminary consultation, is the UK OTS project. This is a project funded by the UK Department for Transport (DfT), the aim of which is to collect data from a representative sample of road accidents. According to the project website (www.ukots.org) investigating teams are deployed to the scene of an accident, generally within 20 minutes of the accident happening, using specially marked high conspicuity response vehicles. Teams operate rotating shifts to cover a representative sample of all days of the week and all hours of the night and day. The teams operate in two locations in the UK; Nottinghamshire in the Midlands and the Themes Valley region in the South of England.

All road traffic accidents notified to the police during the periods of operation are eligible to be included in the study. This gives a good cross section of accident types which is representative of the UK situation and allows the data collected to be compared to national data.

As well as at-scene data, information is also collected both from hospitals and coroners, observing strict rules regarding confidentiality and disclosure. In addition to this, where appropriate, questionnaires are also sent to the road users involved to attempt to obtain data not available at the scene.

Other follow-up activities include revisiting scenes if necessary and collecting traffic flow data where required. Once all of the data is collected, the incident is reconstructed in an attempt to determine a wide range of factors, including the causes of the crash and any injuries. This data is then assembled to form an anonymous case file on a database which can then be searched to provide detailed analyses. The costs detailed for OTS do not include any estimates for start-up costs as OTS used the expertise and resources of existing organisations. It is likely that for similar studies to be implemented at national or European level new organisations would have to be established in most countries.

[6] Includes fatal accidents

For phase 1 of the OTS project, which ran for 4 years from 2000 to 2004, the UK Department for Transport (DfT) invested £2,259,979 (approximately €3.3 million). This was intended to fund the collection of information for 1,500 accident cases. On this basis, the following cost estimates would apply, taking the UK injury accident totals for 2004 (CARE data):

Table 4: Cost of investigating road accidents based on the OTS model

Cost per OTS case (accident)	Total[7] UK injury road accidents 2004	Cost for 10% of UK injury accidents	Cost for 50% of UK injury accidents	Cost for all UK fatal accidents	Cost for all fatal accidents + 10% serious & slight (UK)
€2,200	213,043	€47 million	€234 million	€6.8 million	€53 million

3.3.5 German In-Depth Accident Study (GIDAS)

The project in Germany corresponding to the OTS in the UK is the GIDAS Project. This project carries out in-depth accident investigation in two cities in Germany: Hanover and Dresden. The sampling areas of these cities are statistically most representative of the country as a whole. In each City an accident investigation team investigates road traffic accidents with injuries or fatalities in two 6-hour shifts per day. These shifts change every week to cover periods of all 24 hours. Each team uses two rapid response vehicles and usually reaches the accident site within 20 minutes (average is 16 minutes) of the accident notification. The team is supported by a coordinator who operates in the control room of the base and informs the team about new accidents or other details.

The investigation team consists of technicians and medically trained personnel. With the medical investigator in one car, data about the persons involved and injury data can be collected at scene or from the hospitals, independently to the technical on-scene investigation of the technicians in the other car. If necessary follow-up activities like questioning of people in hospital or damage assessment of vehicles take place outside the two 6-hour shifts.

Table 5: Cost of investigating road accidents based on the GIDAS model

Cost per GIDAS case (accident)	Total German injury[8] road accidents 2005	Cost for 10% of German injury accidents	Cost for 50% of German injury accidents
€1,000 (approx.)	336,619	€34 million	€168 million

[7] Includes fatal accidents
[8] Includes fatal accidents

3.4 Conclusions

This chapter uses a number of different models to estimate possible costings for running independent Road Accident Investigation Bodies in Europe. The figures include approximate costs of:

- €170 million, in the UK only, and €2.36 billion for the EU25 using parity with the other transport modes as the basis; however in reality this level of investment would be unrealistic.
- €625 million for EU25 using the US NHTSA as the model. This is possibly the upper limit of likely investment.

Based on the EU25 figures for 2004 (EC, 2006), costs for road accident investigation for in-depth data collection would be as follows:

Table 6: Cost of road accident investigation in the EU25

		EU fatalities*	EU accidents
Year 2004 totals		43,359	1,299,190
			10% of EU road accidents
Cost of investigation: SRA	€ 2,600†	€ 113 million	€ 338 million
Cost of investigation: OTS	€ 2,200	€ 95 million	€ 289 million
Cost of investigation: VALT	€ 2,000†	€ 87 million	€ 260 million
Cost of investigation: GIDAS	€ 1,000	€ 43 million	€ 130 million

* The number of fatal EU road accidents is not available. The table uses the number of road fatalities instead.

†figure includes costs of investigation, dissemination and the making and follow up of recom
Source:
http://ec.europa.eu/transport/roadsafety/road_safety_observatory/doc/historical_evol.pdf

On this basis it can be calculated that the cost of investigating either 10% of the EU25 fatalities or 4400 accidents would cost between €4.3 million and €11 million. To put these figures in context, based on the figures stated at the beginning of this chapter, 4400 fatalities cost the EU25 €6.6 billion. It should also be noted that although the costings presented here focus on fatalities and fatal accidents, this is not intended to be the only focus of the recommendations in this document.

Whilst the figures quoted here only represent the approximate cost for road accident investigation, as set up costs have not been included, it nevertheless indicates that a significantly increased investment would be necessary to achieve any of the standards suggested in the preliminary consultation.

4 RECOMMENDATIONS

4.1 Introduction

The recommendations detailed in this chapter and chapter 5, represent the culmination of knowledge gained from reviewing the current procedures for investigating road accidents in commercial companies, police forces, existing independent accident investigation bodies as well as those for rail, civil aviation and maritime accident investigation (see the 'project plan', Annex A, for further details). These recommendations aim to build on existing best practice and to be as realistic, feasible, and achievable as possible.

The recommendations will focus on four categories of issues:

1. **Institutional**, referring to the structure and functioning of the body responsible for road safety investigations;
2. **Operational**, detailing how the body carries out investigations;
3. **Data**, addressing issues surrounding the storage, retrieval and analysis of data generated by investigations; and
4. **Reports, Countermeasures and the Dissemination of Data**, dealing with how investigation conclusions should be presented, used to develop countermeasures and disseminated.

Questions have been devised and presented with high (best practice), intermediate and low level 'answers' so that each member state can assess their own road accident investigation procedures (see Assessment Tool, section 4.2). This will allow existing national systems to be built upon and ways of improving practices to be identified. These questions are then discussed in relation to existing European publications and high level recommendations are illustrated with case studies of existing road accident investigation practices.

4.1.1 Investigation Institution Overview

Currently organisations responsible for road accident investigation vary across member states. These include insurance companies, police, teams based at research institutes and government departments. The European Commission has, however, as part of the Road Safety Action Programme, identified some problems:

> *At present, the investigations carried out by the judicial authorities or insurance companies are primarily intended to ensure reparation for damage caused by accidents and determine who is responsible under the provisions adopted by the legislator. However, these investigations are no substitute for the growing perceived need in Europe and the United States to have independent technical investigations the findings of which are targeted at the causes of accidents and how to improve the legislation.* (EC 2003: 46)

The preliminary consultation (Chapter 2) indicated that there is some support for the establishment of an independent body to be responsible for investigating road accidents, but there are perceived to be financial, political and legal obstacles to this. There were differences in opinion about whether the body should take a coordinator role at the European level, work along side national police forces or perform independent on-scene investigations.

Implementation of a single method of investigation across Europe might be difficult as each member state has its own environmental, cultural and political issues. However this does not preclude efforts to work towards the harmonisation of best practice in the EU member states. The idea is for member states to achieve as near as it is possible, the best practice for investigating road traffic accidents by building on existing procedures and expertise. Investigations should correctly identify the causes of accidents and generate recommendations to prevent future accidents. Mechanisms should exist to share this information with stakeholders, who are in a position to improve safety, in order to achieve changes and improve legislation. The existence of a dedicated independent Road Accident Investigation Body is likely to be the best way of achieving this:

> *As indicated at the Third Accident Investigation Conference organised by the European Transport Safety Council (ETSC) 'a permanent independent organisation not only guarantees independence of investigation; it also ensures that its recommendations are followed up by action'.* (EC 2003:46)

Therefore the recommendations will refer to an independent Road Accident Investigation Body throughout. The exact form this body will take in each member state is likely to vary, but again, best practice is aimed for. It is desirable that data is comparable to allow the identification of Europe wide issues and that findings are disseminated across Europe. To achieve this, some European level coordination is required.

The system therefore comprises of two levels, National and European. National priorities lie with independent accident investigation. The European level coordination would encompass issues such as the compilation, analysis and dissemination of in-depth road accident data on a European level.

European Level:

The European Commission is the driving force for the implementation of recommendations and should promote the adoption of the legislative and legal background that the whole system will depend on.

The European level coordination should promote cooperation between Member States' investigating bodies. The coordination should ensure that the variety of identified stakeholders are effectively involved in processes for enhancing in-depth accident investigation, data gathering and management. It should also ensure the follow up of the SafetyNet WP4 recommendations and, as necessary, formulate new recommendations on in-depth accident investigation.

The proposal for initiating such a European coordination constitutes a distinct future task in SafetyNet Work Package 4 (Task 4.5 'Pilot Committee').

Member State Level:

Within the national level are the separate independent Road Accident Investigation Bodies, one for each member state. Other specific roles performed by these organisations, over and above accident investigation, should be the highlighting of trends and the notification of common issues to the European level. For each member state there could be a group of National Stakeholders responsible for implementing safety recommendations.

Case Study – The French STRMTG

The French Service Technique des Remontées Mécanigues et des Transports Guidés (Technical Service of Cableways and Tracked Transports) is a permanent technical service attached to the Ministry of Transport. The service has regulatory and investigation activities. Every September it publishes a report on accidents that occurred during the preceding operating season. Before its publication, the report is submitted to the National Commission of Cableways. This commission is composed of representatives of the industry, the operators and consumer associations. All stakeholders are thus involved in enhancement of safety of cableways and tracked transports.

Source: SafetyNet (2005: 64-66)

4.1.2 When is there a need to investigate and what drives this need?

There is an '*obligation' for rail investigation bodies to investigate following 'serious accidents on the railway system*' (Directive 2004/49/EC: Article 19, 1) and they '*may investigate those accidents and incidents which under slightly different conditions might have led to serious accidents*' (Article 19, 2). However due to the number of road accidents and the differing definitions of accident severities in member states, this would not be a practical 'obligation' to impose on a Road Accident Investigation Body.

The preliminary consultation produced numerous different suggestions for the number and type of investigations required (section 2.4). As demonstrated by this consultation, there is, at present, little agreement among road safety professionals about whether accidents should be investigated by quantity, severity, geographical location or some combination or indeed which would be the most beneficial. There will be a need to take into account EC targets, such as reducing European road fatalities by 50% by the year 2010 (European Commission, 2001), so a focus on fatal accidents is necessary. If however, a fatality is viewed as a consequence of a serious accident then a focus on serious and fatal accidents would be necessary. This argument can also be

applied to slight and non injury accidents as preventing these may reduce the likelihood of a more serious accident. In addition, each member state is likely to have its own national targets which will need to feed into the remit of individual accident investigation bodies.

Case Study – Sweden: 'Vision Zero'

In 1997, the Swedish Government proposed a new direction for traffic safety activities. The proposed long term goal for the road safety was that no one should be fatally or severely injured within the road transport system. To achieve this goal, it was proposed that the road transport system should be designed and function according to the demands of Vision Zero. The Vision Zero is focusing on injury prevention and state that the humans' physical tolerance for crash severity should be normative for the road transport system development.

Vision Zero states that traffic safety is a 'shared responsibility'. System designers are responsible for the design, operation and the use of the road transport system and are therefore responsible for the level of safety within the entire system. Road users are responsible for following the rules for using the road transport system set by the system designers. If the road users fail to comply with these rules due to a lack of knowledge, acceptance or ability, the system designers are required to take the necessary further steps to counteract people being killed or seriously injured.

Source: Extract from H. Fagerlind: Report on Swedish Road Accident Investigation Bodies. See Annex C

No conclusion on this issue can be made before a more extensive consultation with stakeholders and potential data users is carried out. This will allow a clearer idea of the 'need to investigate' to be established.

Questions for Stakeholders and potential data users:

What type(s) of accidents should be investigated in order to benefit road safety?
Should a certain percentage of fatal, serious and slight accidents be investigated? At what level can this percentage be determined?
How should a serious and a slight accident be defined in road accidents?
Should a geographic sample of accidents be investigated?

4.2 Assessment Tool

The following tables display a number of questions along with high (best practice), intermediate and low level 'answers' that were devised with the aim of assisting each member state to assess their own road accident investigation procedures. A more detailed discussion of each question can be found in the section listed to the left of each question.

	Question	High level (Best Practice)	Intermediate Level	Low Level
4.3.1	Does an independent body exist to perform accident investigation?	A dedicated Road Accident Investigating Body exists that is independent in terms of its structure, finances and function.	No Independent Road Accident Investigation body exists. Road accidents are investigated by traffic police trained in accident investigation. Plus an independent body coordinates the collation of police information and assesses safety implications.	No Independent Road Accident Investigation Body exists. Accident investigation is carried out only by police officers with no specialist road accident investigation training.
4.3.2	Is the investigating body also the enforcing agency?	The investigating body is completely independent of the enforcing agency.	The investigating body is a subsection of the enforcing agency but functions independently.	The investigating body is also the enforcing agency leading to conflicts of interest.
4.3.3	Do the funding arrangements protect the independence of the body?	Funded by each national government or the EU by a 'grant in aid' but investigation body has control over its budget and the allocation of funds to areas of investigation.	Funding leads to potential conflict of interest, but independence is protected by legislation. Funding bodies do not have any functional control of the accident investigation.	Funded by organisations with vested interests leading to potential conflicts between the body's aim to further road safety, and its reliance on the funding bodies.

4.3.4	Does the body have autonomy over the decision to investigate and the focus of any investigation?	National and international policy objectives regarding road safety would feed into the investigation process, but would not determine it. The agency would be free to determine what is investigated, whilst considering the data needs of policy-makers and other stakeholders.	The type of accidents available for investigation are related to the criteria for police investigation, however the Independent Road Accident Investigation Body decides which of these accidents to investigate and the focus of the investigation.	The body is not free to select investigations, but instead has this pre-determined by an outside body.
4.3.5	Does the team attending the accident bring a range of expertise to cover all aspects of the factors contributing to the accident?	A multidisciplinary team investigates accidents, this allows for the examination of a very broad range of issues such as the condition of the car, the state of the road surface, and the health (mental and physical) of the involved drivers.	Dedicated traffic police with a high level of training (targeted at accident investigation), continuous professional development and guidelines regarding procedures at the scene of an accident.	The investigation is carried out solely by police officers who receive only very basic training in how to complete accident reports.
4.4.1	Is the investigation team automatically notified of an accident when it occurs?	One dedicated emergency services number alerts ambulance, police and accident investigators.	Calls requiring an ambulance at an accident scene automatically generate a call for the police to attend. Police notify accident investigators. Sublevels: (1) investigators respond immediately (higher level) (2) investigators are called in subsequently.	The emergency number alerts only the paramedics. Attendance of the police is then on an “ad-hoc” basis, not governed by any legislation or guidelines.

4.4.2	Is the spirit of the investigation safety focused or blame focused?	The investigation is purely safety focused.	The investigation is concerned with identifying who is at fault as well as assessing safety implications.	The investigation is purely blame focused.
4.4.3	Are there guidelines for investigation at the scene and interaction within the investigation team?	The investigation team works to a published independent investigation manual.	The investigation team works to detailed police guidelines.	The investigation team has no set guidelines or guidelines are not consistently followed.
4.4.4	Is there any law that states that the investigation body can access the scene?	Yes, the investigation body has the right to access the accident scene.	The investigation body can access the scene but in collaboration with the police.	No, the investigation body has no powers to access the scene and examine evidence.
4.4.5	Is there any law that states that the investigation body can take authority over preserving evidence at the scene?	The investigation body has the right to access and preserve scene evidence.	The police are responsible for scene preservation however the independent investigation body has the legal right to access and examine all evidence.	No, the investigation body has no powers to prevent contamination of the scene and removal of evidence.
4.4.6	Is the purpose of the investigation and the criteria for data acquisition disclosed to all the people involved in the accident?	All parties at the scene are fully informed about the purpose of and criteria for data acquisition.	Disclosure is made when a person at the scene enquires about the purpose of the investigation.	No disclosure about the investigation purpose and the criteria for data acquisition is made to the people involved.

4.5.1	Can the data that is collected about an accident be used as evidence? E.g. Can it be used in judicial processes? Do members of the investigation team act as witnesses in court cases?	No, because the investigation team cannot legally be called to act in this way. Therefore, data is protected.	The investigation team can be called to provide expert witness evidence without compromising independence.	Yes, because investigations are conducted by the police for judicial enquiry and not solely for safety purposes.
4.5.2	Are adequate arrangements made for data storage, analysis and retrieval?	Data is stored, retrieved and analysed in a systematic and confidential way according to a shared European methodology.	Some data is stored systematically and available for retrieval and analysis.	There are no arrangements for the systematic storage of data.
4.6.1	Are the results of the investigation widely available, and is the process transparent?	There will be good links between the investigation body, stakeholders and any other users of the information.	There are links between the investigation body and stakeholders but there are no systematic procedures for sharing results.	There is little sharing of information beyond the investigating body and the government department responsible for transport.
4.6.2	Do the results of investigations (reports and database) feed into the development of accident counter-measures, to work towards preventing accidents and meeting targets?	There are procedures set out in law for the sharing and implementation of safety recommendations.	Investigation findings and recommendations are shared with stakeholders, however there is no procedure for the implementation of these.	The results of investigations do not lead to the development of recommendations and countermeasures.

4.3 Institutional

4.3.1 Does an independent body exist to perform accident investigation?

The European Transport Safety Council (ETSC, 2001) suggests that an accident investigation body can only be genuinely effective if it is independent.

The concept of 'independence', in terms of accident investigation has been discussed extensively in D4.1 (SafetyNet, 2005). In summary, an independent body responsible for the investigation of road traffic accidents will be independent in terms of its structure, finances and functioning:

a) **Structural independence** is gained by being separate from regulatory bodies, including the judiciary, and granting legal status to investigations and investigators.
b) **Financial independence** is secured when the body has autonomy over their own budget; investigations are not related to external financing, and when the body is separate to and not financially dependent upon commercial organisations (e.g. motor industry).
c) **Functional independence** exists when legislation governs the categories of accidents to be investigated but the investigation body has autonomy to choose which individual accidents to investigate and the scope of and the methods used in the investigation. The body should also have the legal right to full access to all evidence and witnesses and be able to publish reports without further scrutiny.

The ideal would therefore be to establish a Road Accident Investigation Body that is fully independent as defined above. However, as an interim measure, in countries where there exists a trained accident investigation organisation that is not independent, an independent coordination body could be created. This body would be responsible for collating information collected by the police and other bodies and assessing the safety implications of their findings. The role of an independent road accident coordination body would be:

a) To review police reports and witness statements.
b) To identify safety issues and recommend improvements
c) To instigate additional safety investigations, if necessary, by soliciting help from other organisations.

Case Study – Swedish Road Traffic Inspectorate (Inspectorate)

The Road Traffic Inspectorate (Inspectorate) launched its operations on 1st January 2003. It is a supervisory authority that operates in collaboration with other players in the road safety sector in Sweden to influence system designers and closely monitors their activities so that the road transport system is as safe and sound as possible. The Inspectorate is part of the Swedish Road Administration and shares the same board but has an independent role and its own identity.

The Inspectorate is commissioned to follow the ordinance "Förordning (1997:652) med instruktion för Vägverket" [7] which states the following objectives:

1. To monitor and analyse conditions that could substantially affect the design and functioning of the road transport system through taking a holistic view of the road safety goals adopted by public authorities, municipalities and others.
2. In dialogue with the players referred to above, work to ensure that they apply a systematic procedure to prevent road accidents that result in death or serious injury.
3. To co-operate with other players to improve traffic safety on roads.
4. To initiate research and development within the road safety sector and monitor research of importance to the operations at the Inspectorate.

At this point 16 persons are working at the Inspectorate. The expertise covers operational analysis, road safety inquiry methodology, statistics and how quality management systems should be conducted and put into practice. Legal expertise as well as expertise in the field of communications and information is also found in the organisation. The budget for the Road Traffic Inspectorate is SEK 20 million per year (EUR 2.2 million, February 2006).

Source: Extract from H. Fagerlind: Report on Swedish Road Accident Investigation Bodies. See Annex C.

Case Study – Australian Transport Safety Bureau (ATSB)

The ATSB is an independent body that operates within a defined legal framework in the Australian Department of Transports and Regional Services. It has an organisational separation from transport regulators. The ATSB investigates, analyses and reports on transport safety. It conducts 'no blame' safety investigations in the transport areas of aviation, marine and rail.

The ATBS does not conduct safety investigations of road accidents, but acts as a coordinator. Its road safety activities include undertaking research projects to improve national road safety, research and statistical analysis, coordination of the National Road Safety Strategy and Action Plan, and publication of road fatality statistics. Most research projects are contracted out to academics or private sector specialists however, ATSB officers are responsible for overall project management, quality control and publication of findings. ATSB research and analysis reports are published and disseminated widely. These are publicly available on the ATSB website.

Sources: Department of Foreign Affairs and Trade (2004) and ATSB website: http://www.atsb.gov.au/road/road.aspx

4.3.2 Is the investigating body also the enforcing agency?

As discussed previously, it is important that the Road Accident Investigation Body is separate from enforcing or regulatory agencies to ensure structural independence. In his recommendations for the creation of an independent Rail Accident Investigation Body in the UK, Cullen (2001: 9.2) suggested that:

> *it [is] inappropriate for the safety regulator to carry out the function of investigation since it might be necessary for the investigation to examine the decisions and activities of the safety regulator itself.*

If the investigating body is also the enforcing agency a conflict of interest may result which could lead to ineffective investigations. Creating an investigating body as a subsection of the enforcing agency maybe a good compromise however it would still be open to criticism as illustrated in the case study below:

Case Study – USA: National Highway Traffic Safety Administration (NHTSA)

In the USA NHTSA is responsible for setting and enforcing federal safety performance standards for motor vehicles and equipment. The National Center for Statistics and Analysis (NCSA), a subdivision of NHTSA conducts road safety investigations. However NHTSA's independence has been questioned along with its ability to promote safety and regulate the industry at the same time.

Source: SafetyNet (2005: 15-17)

4.3.3 Do the funding arrangements protect the independence of the body?

If funding arrangements are to protect the independence of the body, the criteria for financial independence set out in section 4.3.1 should be met. It would not be desirable for the motor industry, for example, to directly fund safety investigations as this could jeopardise the impartiality of any recommendations resulting from investigation conclusions. This would also lead to a lack of transparency. However, if the body is funded by interested parties resulting from legal obligations, as is the case with funding of the Finnish road accident investigation system, attention should be given to the particular arrangements for safeguarding the transparency and independence of the investigation system.

Allocation of funds by each national government or the EU by means of 'grant in aid' would be most likely to protect independent with the proviso that the investigation body has control over its budget and the allocation of funds to specific areas of investigation. (In the UK grants in aid are used to fund the Air Accident Investigation Branch, the Maritime Accident Investigation Branch and the Rail Accident Investigation Branch).

4.3.4 Does the body have autonomy over the decision to investigate and the focus of any investigation?

It is expected that national priorities and European policy objectives regarding road safety would feed into the investigation process, but this should not determine it. Autonomy over the decision to investigate and the focus of investigation is required for an investigating body to have functional independence. This would allow the Road Accident Investigation Body to investigate accidents that fall outside of national and international criteria but carry significant safety implications.

It is likely that the conclusions of road accident investigations would have implications for a number of different road safety areas such as roadway design and road user behaviour. Whilst respecting EU wide recommendations for data collection (see section 4.4.3), it is important that the body should be free to determine the focus and scope of their investigations dependent upon the nature of the accident and the available evidence. The agency would remain autonomous with regard to what is investigated whilst considering the data needs of policy-makers and other stakeholders.

4.3.5 Does the team attending the accident bring a range of expertise to cover all aspects of the factors contributing to the accident?

A multidisciplinary investigation team would allow the investigation to address a broad range of issues such as the condition of the car, the road layout and the behaviour and health (mental and physical) of the involved road users. For each accident the investigation body should establish the most appropriate investigation team.

It is expected that investigators will be individuals with extensive experience of road safety. However, the Road Accident Investigation body should be able to draw on the expertise of other organisations, for example, in the areas of engineering, traffic control systems and psychology. Investigators should all receive thorough and comprehensive training in accident investigation to ensure uniform standard of data across the member states. Particular attention should be paid to the provision of training on photography, scale scene drawing, assessment of vehicle damage/defects and road infrastructure, and human factors.

In addition, the Road Accident Investigation Body should consider recruiting and placing on-call a team of experienced and trained interviewers to assist in conduct of interviews and the taking of witness statements. Disaster management response organisations and universities may be able to provide personnel on such a basis. In the most severe accidents, there may be a need to provide teams who are able to interview the personnel and passengers involved within a rapid time-frame. Coordination with other agencies will be the key to ensuring that precious resources and effort are not duplicated.

Case Study – UK: Rail Accident Investigation Branch (RAIB)

Personnel, working as RAIB investigators, have a background in the rail industry, such as rolling stock and infrastructure. They undergo stringent tests and comprehensive interviews before undertaking a one year training period in order to standardise expertise. A specialisation is thereafter encouraged.

Source: Interview undertaken by the VSRC (Vehicle Safety Research Centre) with an RAIB inspector.

Case Study – German In-Depth Accident Study (GIDAS) Expertise

The GIDAS accident investigation team consists of two parts: The **Technical Investigators** and the **Medical Investigator**.

The **Technical Investigators** usually have a technical background and are specially trained in accident investigation techniques. They collect information at the accident scene on the following topics:
Traffic environment; weather conditions; documentation and measurement of accident traces for scaled drawings; pictures of the accident site, vehicles and damage; vehicle condition before the accident; detailed deformation data of the inside and outside of the vehicles; damage to the environment and the use of safety equipment.

The **Medical Investigator** has a medical background (medical student) and collects personal information about the road users, including detailed injury information and previous medial conditions.

For further information see: http://gidas.bast.de/eng/index.html

Case Study – Finland: VALT (Finnish Motor Insures' Centre) accident investigation team members.

Each member of the VALT accident investigation team acts as the expert in their own field and is the contact person for the authorities and organisations in their area of knowledge. They work together to investigate traces on the road, the environment and vehicles and to draw conclusions about sequences of events. The VALT accident investigation teams consist of:

Police Member: contact person whom the emergency services can notify that an accident has occurred; leads the investigation at scene; organises the production of photographs and scene sketches; communicates vehicle and road user information to other members of the team.

Vehicle Specialist: investigates technical condition of vehicles and damage, the use of vehicle safety equipment and injury causation.

Road Specialist: investigates issues relating to traffic environment, weather and conditions; prepares a scene sketch based on measurements of the onset of braking, sliding and impact traces, vehicle and loose object positions.

Physician: investigates injury causation; the physical and psychological condition of involved road users; and the severity of injury.

Psychologist: evaluates the actions of involved parties and the psychological state of involved road users, and obtains historical information about the health of the involved parties.

If the accident investigation requires expertise that is beyond that of the team members, an external expert is invited to perform a specific investigation or make a statement about a topic.

Source: VALT (2003: 49-52)

Based on the guidelines set out in both the UK Road Death Investigation Manual (ACPO, 2004) and the Finnish VALT methodology (VALT, 2003), a proposed level of staffing and training has been developed for the Road Accident Investigation Body investigation team.

The team should be composed of a number of basic positions although the size of the team is dependant on the resources needed for a particular accident. The team should be headed up by a principal investigator whose coordination role will tie in the expertise from the Road Accident Investigation team, forensic experts, external experts and the Police. The roles and training requirements are outlined below:

Principal Investigator

Roles
Case and scene management
Coordinating with Police forensic investigations
Coordinating with Police scene and vehicle investigations
Financial and resource allocation to specific accidents
Interview coordination
Writing and supervising the production of investigation reports

Training
Scene and case management
Investigation set up and strategy
Forensics
Policy
Interviewing
Scene and vehicle examination
Medical training
All training outlined in subsequent roles (below)

Working with the principal investigator should be two sub sections of expertise and knowledge. These areas centre around the need to tie physical evidence (scene, vehicles) with psychological and physiological data (interviews, injuries). Both positions are expected to have a working knowledge of the other although specialities will lie with one role more than another. The positions, roles and training details are outlined below.

Accident investigator

Roles
Data collection
Scene examination
Vehicle examination
Evidence collection and coordination
Liaison with police and emergency services
Investigation report writing

Training
All of the above plus knowledge about interviewing and liaisons. Specialist knowledge drawn from other fields.

Interview and liaisons Specialist

Roles
Interviewing the crash participants
Interviewing witnesses, police and emergency services
Liaising with members of the public
Collecting medical data
Liaising with members of the media

Training
All of the above plus knowledge in accident investigation and specialist knowledge drawn from other fields.

The construction of the investigation team reflects the work already completed in developing a suitable knowledge base by both the UK police and VALT although many other countries also have a similar team structure.

4.4 Operational

4.4.1 Is the investigation team automatically notified of an accident when it occurs?

Alerting members of the investigation team should take place according to the procedure and order agreed on between the emergency services and the investigation team. Procedures should be in writing and state the member of the investigation team acting as contact person, how information is communicated and the time frame within which this should occur. Standard information about an accident should be communicated to the Road Accident Investigation Body to enable the investigation team to determine whether or not the accident falls within the scope of the team's investigation programme.

Case Study – Notifying the German In-Depth Accident Study (GIDAS) team.

The GIDAS accident investigation team in Hanover is automatically notified by the police control centre and the rescue control centre which is operated by the fire brigade. The operators of both centres use a computer system to enter the details of the incoming emergency calls. When a traffic accident with injuries occurs, the GIDAS accident research unit is automatically notified by this computer system.

When one control centre receives an emergency call relating to an traffic accident with injuries, they will inform the other so the police inform the rescue centre and visa versa. In this way the GIDAS research unit is notified by both centres' computers. Additionally the GIDAS coordinator has access to the police and rescue radio and may call the control centres for further information.

For further information see: http://gidas.bast.de/eng/index.html

The method of investigations which gives the most information is to arrive on the scene as soon as possible following an accident. Any delay in the investigation reduces the quality of the information available, and therefore the reliability of accident reconstruction and understanding of the accident, for example, witnesses may forget vital details, and traces caused by the accident may have disappeared.

Therefore, the best practice scenario would be for the Road Accident Investigation team to be notified of an accident at the same time as the emergency services. This could be achieved through the adoption of 112 as the Europe wide emergency services number (eSafety, 2002: 50, recommendation 12) and the eCall initiative (see case study below).

Case Study: eCall

Swift notification of accidents may be achieved by accessing the eCall communication chain. eCall is an eSafety initiative allowing car occupants to make an emergency call from their vehicle in the event of an accident. This emergency call would be either generated manually by vehicle occupants or automatically via activation of in-vehicle sensors when an accident occurs. This allows standard information, including information about the accident such as time, location and vehicle description, to be communicated to a dedicated call centre. At this point both the emergency services and the Independent Accident Investigators would be notified.

Source: eSafety (2005) http://www.escope.info/en/ecall_toolbox/

Although attending the scene of the accident shortly following an accident is the ideal, it is acknowledged that in some circumstances an investigation may be carried out retrospectively, for example, if notification is delayed or the consequences of the accident change over time.

4.4.2 Is the spirit of the investigation safety focused or blame focused?

There is often a mixture of blame and safety focus in an accident investigation. Ideally, accidents should be investigated from a safety perspective with the aim of avoiding recurrence. Although the judicial process suggests that authorities should be investigating to examine whether there is someone at fault (e.g. has caused the accident), this is not as satisfactory as taking a more independent holistic approach, keeping an open mind when investigating accidents. This enables all causal and contributing factors to be taken into account and subsequently understood.

EU directives for the establishment of independent accident bodies for non-road transport emphasise the need to focus on safety rather than blame:

> *The sole objective of occurrence reporting is the prevention of accidents and incidents and not to attribute blame or liability*. (Directive 2003/42/EC: on occurrence reporting in civil aviation. Article 1)
>
> *A safety recommendation issued by an investigating body shall in no case create a presumption of blame or liability for an accident or incident.* (Directive 2004/49/EC: on safety on the community's railways. Article 25, 1)

The European Commission, as part of the Road Safety Action Programme, states that investigations "*should be geared to the causes of accidents rather than the question of who is responsible*" (EC 2003: 45, 5.6.2). A purely safety focused investigation is therefore the most desirable when investigating road

accidents. However this does not preclude cooperation with other investigating bodies when deemed appropriate.

4.4.3 Are there recommendations for investigation procedures and interaction within the investigation team?

The European Community Directive outlining the investigation procedure for rail accidents states:

> *The investigation shall be carried out with as much openness as possible, so that all parties can be heard and can share the results.* (Directive 2004/49/EC: Article 22, paragraph 3)

In this way an investigation can be seen as fair. One way of enabling 'openness' and, as discussed in section 4.4.2, safety focused investigations is to have written procedures for accident investigations that detail protocols for scene examinations and interaction between members of the investigation team.

Case Study – Finland: VALT guidelines for interaction within the investigation team.

The investigation team begins the investigation together at the accident scene. The general characteristics of the accident are clarified and the investigation sequence decided. Each member then conducts their own scene investigations, but communicates their findings to members whose investigation overlaps. The VALT Method document recommends that the team members meet together following the scene examination to share information and construct an initial reconstruction. Continued communication between members is encouraged in order to identify missing information and contradictions.

Source: VALT (2003: 11-12)

In the UK police investigations into fatal road accidents are guided by the Road Death Investigation Manual (ACPO, 2004). The Finnish road accident investigation organisation, VALT, has a comprehensive methods manual that details procedures for all aspects of the investigation method, including notification and coordination with the emergency services at the scene; interaction between team members; preparation of investigation reports and guidance for data acquisition, protection and disclosure (VALT, 2003).

Case Study – UK: Road Death Investigation Manual

In the UK, the only nationwide body that exists to carryout road accident investigation is the police force. Guidelines for investigating fatal accidents are set out in the Road Death Investigation Manual:

> *A national criteria should exist to enable the whole police service to work to a consistent standard of professional investigation. The Manual seeks to achieve this.* (ACPO, 2004: 2)

This means that the personnel to be involved, the elements to be investigated, the actions on arrival at the scene and any follow-up actions are all laid out in a procedure that is followed by attending officers for every single fatal accident.

Detailed methodologies for data collection will not be described here because a number of European projects have already used European methods of data collection for both on-scene and retrospective investigation. See SafetyNet Work Package 5, task 2[9] for an example of on-scene macroscopic accident investigation. Further recommendations concerning on-scene data collection management are provided in the SafetyNet project's Work Package 1[10]. European methodology for two types of retrospective data collection has been explored. Firstly the Pendant project's Work Package 2[11] involved trained accident investigators attending recovery garages to examine vehicles and collecting road user injury data from medical reports. Secondly, SafetyNet's Work Package 5, task 1[12] involves collecting data from existing fatal accident reports. Information on all SafetyNet work packages can be found: http://www.erso.eu/safetynet/content/safetynet_work_packages.htm.

Information should be collected about the circumstances leading up to the accident, the vehicle, the road environment, the road user behaviour, the consequences, and any resultant injuries. Therefore, the pieces of data collected should build a complete picture of:

a) What took place
b) Why it happened
c) The consequences
d) How the accident and/or injuries could have been prevented

In order for investigations to be "*carried out at national level on the basis of a European methodology*" (EC, 2003: 45, 5.6.2), an investigation manual should be produced to document the basic level of data collection for all accident investigations. This document should include concise and explicit accident investigation protocols enabling consistency in basic level data collection across the member states. The accident investigation manual should be a published document and freely available in order to reinforce the openness and

[9] http://www.erso.eu/safetynet/content/independent_accident_and_injury_databases.htm
[10] http://www.erso.eu/safetynet/content/care.htm
[11] http://www.vsi.tugraz.at/pendant/
[12] http://www.erso.eu/safetynet/content/independent_accident_and_injury_databases.htm

transparency of investigations. This will be important in order to achieve a transparent Independent Road Accident Investigation Body.

4.4.4 Is there any law that states that the investigation body can access the scene?

As stated in section 4.4.1, access to the scene of an accident is important in order to collect the best data. When setting out the principles which should govern the investigation of civil aviation accidents, Council Directive 94/56/EC states that the investigation should have "*a legal status that will enable the investigators in charge to carry out their task in the most efficient way and within the shortest time*" (Article 5, 1) and "*shall be authorized inter alia to: (a) have free access to the site of the accident…* " (Article 5, 2).

Similarly, for rail investigations, Directive 2004/49/EC, states:

> *In accordance with the legislation in force in the member states, and, where appropriate, in cooperation with the authorities responsible for the judicial enquiry, the investigators should, as soon as possible, be given: (a) Access to the site of accident…* (Article 20, 2).

The Road Accident Investigation Body should be given similar legal rights for scene access.

Case Study – German In-Dept Accident Study (GIDAS) on-scene procedures.

The GIDAS accident investigation team consists of two parts: the Technical Investigators and the Medical Investigator.

Each part of the team reaches the accident scene in its own vehicle in order to operate independently of the other part of the team. While the Technical Investigators may be operating at the accident scene, the Medical Investigator may follow an ambulance to the hospital to gain an early interview.

The investigations at the accident scene and especially the interviewing of road users, is done as independently from the police investigations as possible. As the team may not mark accident traces (e.g. with chalk) without permission of the police, the markings of accident traces are taken from the police and may be endorsed following the police investigation.

For further information see: http://gidas.bast.de/eng/index.html

4.4.5 Is there any law that states that the investigation body can take authority over preserving evidence at the scene?

The civil aviation and rail directives referenced in section 4.4.4, also state that investigators, in cooperation with the judicial authorities, should have access to a list of all evidence and a right to remove evidence from the scene for analysis; access to on board recorders, results of examination of the bodies of victims or tests from bodies of victims and the opportunity to interview witnesses.

The National Transportation Safety Board (NTSB) in the USA has similar rights of scene preservation and access to evidence. See case study below.

> Case Study – USA: The National Transportation Safety Board (NTSB)
>
> NTSB is responsible in the USA for investigating all civil aviation accidents and significant accidents in the other modes of transport (maritime, rail, road and pipeline). NTSB investigators have immediate access to the site of an accident and can take any necessary actions to preserve and safeguard evidence. They can also remove material, test it and take samples as necessary for the investigation as well as access to any material or document relevant to the investigation and post mortem reports.
>
> Source: SafetyNet (2005: 12-14)

Access to evidence and safety focused investigations would be greatly facilitated by granting Road Accident Investigators the legislative right to take authority over preserving evidence at the scene.

Road Accident investigators should have a legal right to:

a) Access to all the vehicles involved in the accident
b) Access to evidence in vehicles including data stored in on board data recorders such as tachographs.
c) Access to information about the rescue operations.
d) Examine traffic regulatory systems and records of their use and installation
e) Examine roadside installations (e.g. street lighting, crash barriers) and records relating to their use and installation.
f) Access to records relating to the road layout design and road surface materials.
g) Examine the results of medical examinations and post mortem reports for injured road users.
h) Question all witnesses

4.4.6 Is the purpose of the investigation and the criteria for the data acquisition disclosed to all the people involved in the accident?

It is important for public relations and the Road Accident Investigation Body's transparency that all parties at the scene are fully informed about the purpose of and criteria for data acquisition.

The purpose of the investigation and criteria for data collection should be disclosed to all people and agents involved in the accident. They should receive honest and open explanations about what the investigation is for and who will use the data collected. The answering of interview questions should be optional and would not be incriminating and the contact details of those conducting the investigation and interviews should be disclosed to the road users and witnesses involved.

Case Study – German In-Depth Accident Study (GIDAS) Disclosing Information at the Accident Scene.

The members of the GIDAS investigation team have uniform jackets labelled "accident research" to be identifiable at the accident scene. When the team arrives at the scene it introduces itself to the involved people and states that the investigation is carried out by order of the Federal Highway Research Institute (BASt). It is pointed out that the investigation is carried out solely for research reasons and that it is done independently of the police investigation. Moreover it is said that answering questions and granting access to vehicles and medical information is voluntary and that the collected data is protected by the data protection laws.

The findings of the investigation are not disclosed to any party. Only pictures of the accident site, taken by the investigation team can be requested in written form. The only possibility to access the accident investigation data is by court order.

For further information see: http://gidas.bast.de/eng/index.html

Case Study – Finland VALT: Disclosing information at the accident scene

At the start of the investigation the team leader introduces the investigation team…and says that the investigation is regulated by law, shows evidence of his or her authority by presenting an identity card…and describes…the purpose of the investigation and the nature of the information to be asked for, and the roles of the [investigation] team members.

The respondents are told that replying [answering questions] is voluntary but important for both improvement of road safety and prevention of similar accidents in the future…and that the use of all information received in the interview is bound by [Finnish data protection law] and that respondents are entitled to get the investigation report when completed.

The leader of the investigation team gives all parties involved in the accident a presentation card of the investigation team with contact details and an explanation of the purpose of the investigation.

Source: VALT (2003: 43)

4.5 Data

4.5.1 Can the data that is collected about an accident be used as evidence?
E.g. can it be used in judicial processes? Do members of the investigation team act as witnesses in court cases?

Ideally the data that is collected about an accident should not be used to give evidence about fault because this affects the data gathering process and would compromise independence. In Finland the availability of data collected by VALT is limited by law to safety uses. See Case study below.

Case study – Finland VALT: Limiting data use for the purposes of safety.

In Finland, each report that is produced as a result of a road accident investigation is available to be used in any safety work, including communication, education, and research. However, the uses to which reports can be put, are restricted to those relating to safety and exclude judicial use. Therefore, a disclaimer is added to every investigation report below the signatures of the authors:

> *This accident has been investigated and the investigation report has been written in accordance with Act No. 24/2001 for the improvement of road safety. The investigation does not address liability for the accident or liability for damages. Use of this investigation report for purposes other than improvement of road safety must be avoided and no information contained herein may be linked to personal data.*

Source: VALT (2003: 45)

Finnish legislation limits the use of road accident investigation data to road safety work. As a result, any use of the investigation data for purposes other than road safety work poses problems with the interpretation of the data, e.g. in respect of the question of guilt (VALT, 2003: 43).

It is apparent that even in the most advanced systems of accident investigation, there is sometimes still the need to go to court. When the situation does arise there is a requirement for legislation to be put in place to protect aspects of the data. See Case Study overleaf.

Case Study – Finland VALT: investigators appearing in court.

> *When they [accident investigators] appear in Court, investigation team members act in accordance with the Code of Judicial Practice, as witnesses performing a public duty who may not witness about anything that they have to keep confidential in their role as investigators. Such information includes e.g. details of health, crime and other personal matters listed in… the Openness Act. It is particularly important that all basic information given voluntarily is kept confidential in accordance with… the [Openness] Act. Attention must also be paid to the privacy protection defined in the Personal Data Act.*

Source: VALT (2003: 48)

Data collected by the Road Accident Investigation Bodies should be protected by law in each country so that the data never needs to be disclosed to anyone else, including the police or any other enforcing agency.

4.5.2 Are adequate arrangements made for data storage, analysis and retrieval?

As part of the Road Safety Action Programme, the European Commission (EC, 2003:45, 5.6.2) suggests that independent investigation "*will supplement the general road accident statistics and the detailed accident case studies carried out by multidisciplinary teams. The databases built up in this way will be made available to researchers*" and "*findings should be communicated for assessment by a group of experts meeting within the Commission*".

There is therefore a requirement for Road Accident Investigation Bodies to collect accident data in a structured manner, and to store this information for future use. All information collected should be entered onto a database to allow analysis. This is likely to include general accident data (e.g. vehicle detail and road conditions) as well as witness and expert witness statements. An integrated database system is required to link all the different types of data and stages of the investigation. This should include management information at a national level so that individual accident investigations can be monitored.

The system should allow all data relating to individual accidents to be retrieved as well as comparisons to be made between accidents. It should also allow the production of performance statistics on the number and type of accidents investigated and the resources involved.

Management of data is likely to be a significant task and a dedicated database manager is required to fulfil this role. Another role assigned to the database manager would be to manage data accuracy and completeness, and to interrogate the data in response to information requests. Some of the most critical, frequent or difficult interrogations may be conducted automatically, or

via the use of pre-prepared programming scripts. Analysis of investigation data may indicate the need for adjustments in the data collection stage. Information about the requirement for adjustments should be feed back to the accident investigators and if appropriate shared at the European Level.

The protection of data has been addressed in the investigation of civil aviation accidents:

> *The sensitive nature of safety information is such that the way to ensure its collection is by guaranteeing it confidentiality, the protection of its source and the confidence of the personnel working in civil aviation* (Directive 2003/42/EC: 11).

The Road Accident Investigation Body should ensure that data is stored securely according to confidentiality requirements of the Member State. No data containing information that would lead directly to the identification of persons involved in the accident should be released to a third party. Information may be made available for research or analysis purposes but this should be restricted to a format which does not permit identification or attribution.

4.6 Reports, Countermeasures and the Dissemination of Data

4.6.1 Are the results of the investigation widely available, and is the process transparent?

Results of accident investigations should take on two forms. Firstly individual accident reports and secondly, aggregated data from the database system.

It is important for transparency that individual accident reports are produced within a set time frame and follow a set structure. Directive 2004/49/EC (Article 23, 2) on rail accident investigations states "*The investigating body shall make public the final report in the shortest possible time and normally no later than 12 months after the date of the occurrence.*" It also requires the investigation report to follow the structure described in the Directive and declares that "*the report, including the safety recommendations, shall be communicated to the relevant parties… and to the bodies and parties concerned in other member states*."

Reports should be written in the form which is the most appropriate according to the investigation, however, the general structure of these reports should be decided upon at Community level and documented publicly. As a minimum, individual accident reports should:

a) Briefly state how the investigation was undertaken and what evidence, including witness reports, the conclusions were based upon.
b) Set out the identified cause(s) of the accident and other factors which may have increased the severity of the accident.
c) Make recommendations designed to prevent reoccurrence

Recommendations should be developed independently from the stakeholders however the Road Accident Investigation Body should, where necessary draw on external expertise to ensure that any recommendations are useable, realistic and likely to be adopted.

As the results of independent accident investigations "*will supplement the general road accident statistics*" (EC, 2003: 45, 5.6.2) basic accident data should be analysed and published annually in the Member States statistical output about accident rates. In addition to this, the accident files (from national databases) should be compiled within a European database to allow "*assessment by a group of experts meeting within the Commission*" (EC, 2003: 45, 5.6.2). National safety recommendations should be examined in order to assess their applicability on a Europe wide level.

Solutions to avoid future road accidents are often multidisciplinary, for example educating drivers about the importance of seat belt use combined with roadside improvements. This kind of solution requires comprehensive coordination and communication within and between safety agencies (Whitelegg and Haq, 2006). Whitelegg and Haq's assertion emphasises the importance of disseminating the findings of the data. This process in itself promotes transparency as it allows other organisations and policy makers to scrutinise the data and recommendations.

The results from transparent and independent road accident investigations should be disseminated within the European road safety community following the drawing up of findings and conclusions. The reports on investigations, findings and recommendations provide crucial information for the further improvement of road safety and should be made publicly available at both national and European Community level. This process allows policy makers to determine the correct course of action when implementing recommendations and countermeasures. European level in-depth data, resulting from the compilation and analysis of data from individual member states, should be disseminated across all the Member States. This could be achieved through the European Road Safety Observatory (ERSO) (See http://www.erso.eu/index.html).

Each year the Road Accident Investigation Body should publish an annual report concerning the group's activities over the elapsed year. These reports should be made publicly available and contain results of studies, information on recommendations and details of current and planned national legislation changes. This process will also enhance the transparency of Road Accident Investigation Bodies.

4.6.2 Do the results of investigations (reports and database) feed into the development of accident counter-measures, to work towards preventing accidents and meeting targets?

The important element here is the network of communications between different stakeholders, in terms of the sharing of information resulting from the investigation. Recommendations developed from investigations should be passed to the relevant stakeholder for implementation.

This process for the development of recommendations and countermeasures to accidents will give the greatest gain in the improvement of road safety throughout Europe. Currently the systems which are solely based on police investigations can be seen as a continuous loop (see Figure 1). Figure 1 depicts a generalised approach to how accident investigations are carried out across Europe and is not designed as the definitive approach.

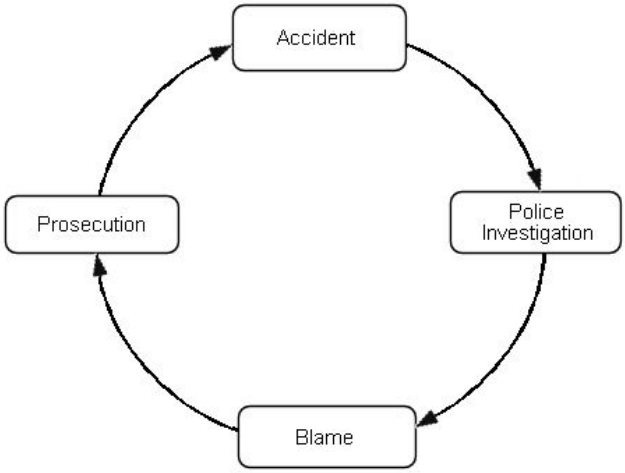


Figure 1: Closed loop police investigation diagram[13]

The recommendations set out in this document will address this continuous loop of accident investigation and set out mechanisms that will allow countermeasures to be applied and acted upon. The generalised approach for this is shown overleaf in Figure 2. It is not envisaged that independent road accident investigations will replace police investigations, rather that they will compliment them and allow safety implications to be fully addressed.

[13] informed by Labbett (2006)

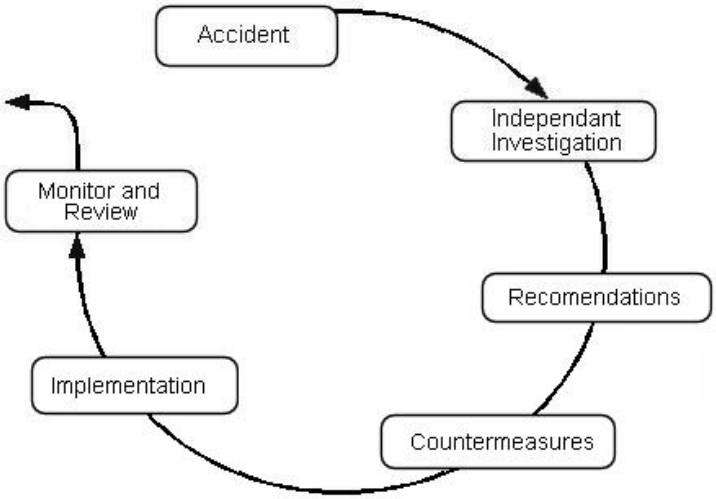


Figure 2: Independent accident investigation solution[14]

The recommendations that arise from the Member States' accident investigation reports should be acted upon in a timescale dependant on the complexity or urgency of that particular issue. The organisations and stakeholders should have a legal obligation to respond to the recommendations and justify their planned actions within this timescale. This should allow an implementation time frame which is both achievable and relevant to the specific issue. The response should detail how any resulting countermeasures, once put in place, are monitored and maintained.

The process of implementing plans should also confirm that the recommendations are usable and realistic at Member State level and additionally whether there is wider scope at a European level.

It is important that the Road Accident Investigation Body also plays a coordination role by maintaining a current record of:

a) the recommendations of Road Accident Investigation Body accident investigations;
b) the responses of all the organisations to which the respective recommendations are directed; and
c) the state of progress towards implementation in relation to stated timescales

[14] informed by Labbett (2006)

Case Study – UK: Walkers Snack Foods

Walkers Snack Foods is a large manufacturer and distributor of snack foods operating within the UK. They are responsible for a large fleet of HGVs (Heavy Goods Vehicles) and have a sophisticated accident and incident recording and feedback system. Information about HGV accidents are risk assessed and collected and entered into a management database.

Accidents that are considered high or medium risk (those which result in injuries causing the driver to be absent from work) result in a more detailed investigation and the driver's manager is required to generate an action plan with the aim of preventing reoccurrences. This is then passed to senior management within 24 hours who reviews whether the action plan has been initiated.

Data in the management database is routinely analysed and used to identify areas where driver training is needed. A specially trained team of drivers (Safety Action Team) recommend action to reduce future accidents and these recommendations are incorporated into training programmes.

Source: Interview conducted in Oct 05 by VSRC with Walkers Snack Food's Health and Safety Manager, Transport Manager and Safety Technician.

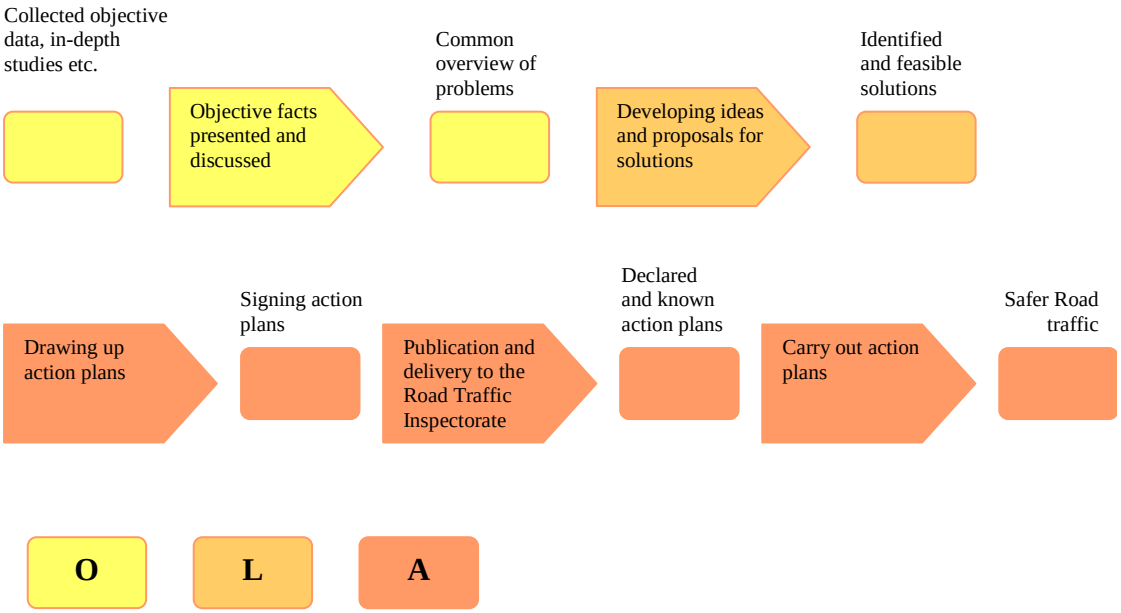
Case Study – The Netherlands: The Dutch Safety Board.

The Dutch Safety Board investigates disasters and incidents in all policy areas. This promotes an understanding of the interrelationship between different events, enabling improved measures to prevent a repetition of such events in the future.

Source: www.safetyboard.nl

Case Study – Sweden: The OLA Methodology

The results from the Swedish Road Administrations's in-depth road accident studies can be used in many ways and one of them is the OLA methodology. OLA is the abbreviation for objective data, list of solutions and addressed action plans. (Objektiv fakta, Lösningar, Avsikter). In the OLA processes the system designers easily can be involved in a specific traffic safety problem based on Vision Zero (see case study p32). OLA is a methodology where different system designers join together to contribute to solving a common problem. The methodology gives each system designer a chance to take measures from fact and to make the road safety better. The methodology is used both on regional and national level.



Source: Extract from H. Fagerlind: Report on Swedish Road Accident Investigation Bodies. See Annex C.

5 SUMMARY OF RECOMMENDATIONS

The following recommendations are set out to reflect the four categories of issues discussed in chapter 4. Each recommendation is followed by a reference to the section of chapter 4 from which it was derived.

5.1 Institutional

1. The Road Accident Investigation Body should be independent in its structure, function and finances and its investigations should be carried out with as much openness and transparency as possible. Its investigations should be independent of regulatory authorities, manufacturers, and organisations whose vested interests lie in the data collected. [4.3.1/4.3.2]

2. The Road Accident Investigation Body should have control over its own budget and should not rely on external funding to carry out investigations.[4.3.3]

3. National and international policy objectives regarding road safety should feed into the investigation process but would not determine it. The agency should remain autonomous with regard to what is investigated whilst considering the data needs of policy-makers and other stakeholders. [4.3.4]

4. Individual countries should have the autonomy to investigate accidents that are of interest to their national priorities. [4.3.4]

5. Independent accident investigation should be carried out by one or more dedicated multi-disciplinary teams with specialist knowledge across a number of relevant areas. [4.3.5]

6. Accident Investigators should have extensive experience and knowledge of road safety. Investigators should receive additional and comprehensive training in accident investigation to ensure uniform standard of data across the member states. [4.3.5]

7. The investigation team should also have access to external expertise. This expertise may lie, for example, in Engineering, Traffic Control Systems and Human Factors. [4.3.5]

8. For each accident, the investigation body should establish the most appropriate investigation team. This may involve drawing on the expertise of other organisations. [4.3.5]

9. The Road Accident Investigation Body should recruit and place on-call a team of experienced and trained interviewers to assist in the conducting of interviews and the taking of witness statements. [4.3.5]

5.2 Operational

10. The Road Accident Investigation Body should be notified of accidents at the same time as the emergency services to allow immediate access to the accident scene. [4.4.1]

11. Alerting members of the investigation team should take place according to the procedure and order agreed on between the emergency services and the investigation team. Procedures should be in writing and state the member of the investigation team acting as contact person, how information is communicated and the time frame within which this should occur. [4.4.1]

12. Standard information about an accident should be communicated to the Road Accident Investigation Body to enable the investigation team to determine whether or not the accident falls within the scope of the team's investigation programme. [4.4.1]

13. Scene examinations should take place as soon as possible following an accident in order to gain accurate information and record volatile data. [4.4.1]

14. Investigations should be safety focused and kept separate from the judicial enquiry into the same accident. The aim of data collection should be to establish the immediate and underlying causes of the accident and injuries. [4.4.2]

15. An investigation manual should be produced to document the basic level of data collection for all accident investigations. This document should include concise and explicit accident investigation protocols enabling consistency in data collection across the member states. [4.4.3]

16. The accident investigation manual should be a published document and freely available in order to reinforce the openness and transparency of investigations. [4.4.3]

17. Data collected, according to the investigation manual, should build a complete picture of:

    a) What took place
    b) Why it happened
    c) The consequences
    d) How the accident and/or injuries could have been prevented [4.4.3]

18. Member states should define, in the framework of their respective legal system, the legal status of the investigation that will enable the investigators to carry out their task in the most efficient way and within the shortest time. [4.4.4/4.4.5]

19. Road accident investigators should have the legal right, where appropriate in cooperation with the authorities responsible for the judicial enquiry including the police, to:

    a) Access to the scene of the accident
    b) Access to all the vehicles involved in the accident
    c) Access to evidence in vehicles including data stored in on board data recorders such as tachographs.
    d) Access to information about the rescue operations.
    e) Examine traffic regulatory systems and records of their use and installation
    f) Examine roadside installations (e.g. street lighting, crash barriers) and records relating to their use and installation.
    g) Access to records relating to the road layout design and road surface materials.
    h) Examine the results of medical examinations and post mortem reports for injured road users.
    i) Question all witnesses [4.4.4/4.4.5]

20. The purpose of the investigation and criteria for data collection should be disclosed to all people and agents involved in the accident. They should receive honest and open explanations about what the investigation is for and who will use the data collected. The answering of interview questions should be optional and the contact details of those conducting the investigation and interviews should be disclosed to the road users and witnesses involved. [4.4.6]

5.3 Data

21. Data that is collected about an accident by independent accident investigators should not be used to give evidence about fault or blame including in a court of law. [4.5.1]

22. Data collected should be protected by law in each country so that the data never needs to be disclosed to anyone else, including the police or any other enforcing agency. [4.5.1]

23. The Road Accident Investigation Body should collect and record all information relating to a specific accident in a database. This should be stored in a structured manner enabling future retrieval. [4.5.2]

24. An integrated road accident investigation data management system should be developed. This should include a road accident database with a linked storage system for road user, witness and expert witness accounts and a tool for progress tracking and managing individual investigations. [4.5.2]

25. A Database Manager should be appointed in each member state and be responsible for the management of data accuracy and completeness plus the analysis of the data. [4.5.2]

26. The data collected should be stored securely according to the confidentiality requirements of the Member State. [4.5.2]

27. No data containing information that would lead directly to the identification of persons involved in the accident should be released to a third party. Information may be made available for research or analysis purposes but this should be restricted to a format which does not permit identification or attribution. [4.5.2]

5.4 Reports, Countermeasures and the Dissemination of Data

28. Data should be reported in two main ways within each Members State, by individual accident and by aggregate data from multiple accidents. [4.6.1]

29. Reports should be written in the form most appropriate to the investigation however, the general structure of these reports should be decided upon at Community level and documented publicly.
As a minimum individual accident reports should:

    a) Briefly state how the investigation was undertaken and what evidence, including witness reports, the conclusions were based upon.
    b) Set out the identified cause(s) of the accident and other factors which may have increased the severity of the accident.
    c) Make recommendations designed to prevent reoccurrence [4.6.1]

30. Recommendations should be developed independently from the stakeholders however the Road Accident Investigation Body should, where necessary draw on external expertise to ensure that any recommendations are useable, realistic and likely to be adopted.[4.6.1]

31. National recommendations should be discussed at a European Level to assess their Europe wide applicability.. [4.6.1]

32. The reports on investigations, their conclusions and recommendations should be made publicly available within an appropriate time scale at both National and Community level. [4.6.1]

33. Each year the Road Accident Investigation Body should publish an annual report concerning the group's activities over the elapsed year. These reports should be made publicly available and contain results of studies, information on recommendations and details of current and

planned national legislation changes. [4.6.1]

34. Basic accident data should be analysed and published annually in the Member States' statistical output about accident rates. [4.6.1]

35. The accident files (from national databases) should be compiled within a European database for analysis at a European level. [4.6.1]

36. The results from independent road accident investigations should be disseminated within the European Community following the drawing up of findings and conclusions. European level data, resulting from the compilation and analysis of data from individual member states, should be disseminated across all the Member States. [4.6.1]

37. Recommendations developed from investigations should be passed to the relevant stakeholder(s) for implementation. The stakeholder(s) should have a legal obligation to respond to the recommendations and justify their planned actions within this timescale. The response should include how any resulting countermeasures will be implemented, monitored and maintained. [4.6.2]

38. The Road Accident Investigation Body should play a coordination role by maintaining a current record of:

    a) the recommendations of Road Accident Investigation Body accident investigations;
    b) the responses of all the organisations to which the respective recommendations are directed; and
    c) the state of progress towards implementation in relation to stated timescales [4.6.2]

5.5 Case study example: How Independent Accident Investigation could improve existing practices.

This case study demonstrates the level of accident investigation that is available today through the police forces in the UK. It is intended to highlight the differences between this and the independent accident investigation recommendations and is not in anyway an indictment of the processes and procedures that currently exist.

On August 29th 2002 a motorcyclist was killed while undertaking advanced rider training. The motorcycle, according to witnesses, appeared to crash for no reason. According to his instructor who was following at that moment "*I was completely happy with the speed he was going. I just couldn't see any reason for [the crash] at all*".

The rider and instructor were approaching a left hand bend at a place called Dukes Hill in West Sussex, England. This section of road runs through rural countryside and undulates along its length. At the site of the accident the road rises towards a summit where the bend is situated. The weather conditions were fine and dry.

The trajectory of the fallen motorcycle and rider was such that it took them into the oncoming lane and into the path of an oncoming vehicle.

On initial inspection of the scene there appeared to be nothing wrong with the road or the position and speed of the fallen motorcyclist. However on closer inspection the motorcyclist's instructor discovered a 6-8 inch patch on the crashed motorcycles front tyre which appeared wet. This 'wet' patch later turned out to be tar, tar from a badly finished road repair.

The type of road repair that uses tar in this manner is called Overbanding and is used for the edges of small road repairs and patches. The tar is designed to be applied to set specifications dictating the width, depth and skid resistance of the material. The repair at this site had not met these specifications.

On investigation the tar was found to be "*like freshly chewed chewing gum. It was really soft to the touch*". Soft enough even, for the police road temperature thermometer to sink into its surface.

At this point in a regular police investigation the process turns to highlighting blame and finding fault. At this stage there were three clear areas of investigation, the motorcyclist involved in the accident, the driver of the vehicle involved and the contractor responsible for the road surface.

In light of the statements from witnesses and the weight of evidence directed towards the road surface the police could rule out the rider and driver, this left one line of investigation.

> The road repairs were the responsibility of a regional water company who had sub-contracted the repair to an outside company. This company had, in turn, sub-contracted the work to another independent company.
>
> The inquest into the riders death heard that the sub-contractor responsible for the final laying of the Overbanding had improperly laid the surface. The regional water company were fined £500 for failing to ensure the highway was repaired to the set standards and a verdict of accidental death was recorded.

In a normal police investigation, the type regularly completed all over the UK, the case would be closed with the blame firmly shouldered by the guilty party - in this case the regional water company.

However, due to additional evidence which came to light shortly after the case was closed, the accident investigation process took an important step towards the ideals detailed in this report.

> In early July, seven weeks before the fatal motorcycle accident, another motorcycle crash had occurred at the very same corner in exactly the same circumstances. In this case the rider was uninjured although the bike was extensively damaged leading to the rider chasing claims through the local council. These claims centred on the poor road surface and in particular the hazard caused by the overbanding.
>
> The rider submitted a detailed report to the local council contained photographs and text outlining at least four different hazards in the location of the accident. The report also, according to the rider, "*put words to the effect that if you don't do something about the road someone will have a serous accident, and those words came back to haunt me unfortunately*".

With this additional evidence the police could finally see the whole picture of poor record keeping and cover ups committed by the local water authority, council and sub-contractors. This evidence is useful in the current police investigation process as it adds weight to the charges therefore aiding the prosecution in these cases. It does not however, due to its lack of independence, have the power to influence legislation and change on a National or European level. This outcome differs from the ideal resolution achievable through independent accident investigation.

In this case an independent investigation would be able to recommend changes in legislation regarding road repairs on corners for the protection of motorists. This approach does not focus on a small group like the local council but will

recommend the change is applied across a National or European area reducing the risk to millions of other road users.

Sources:

- British Broadcasting Corporation transcript of their 'File on 4' programme, 'Dangerous Roads' (BBC, 2005)
- 'Lawyers to decide on biker death charges' an internet news report detailing the case (The Argus, 2004)
- Discussions with the investigating police officer.

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SafetyNet: http://www.erso.eu/safetynet/content/safetynet.htm

Pendant: http://www.vsi.tugraz.at/pendant/

UK OTS: www.ukots.org

Germany GIDAS: http://gidas.bast.de/eng/index.html

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7 ANNEX A: PROJECT PLAN FOR THE DEVELOPMENT OF RECOMMEDATIONS

The information collated in this document is based on progress so far, encompassing Steps 1, 2 and 3.

Step 1: Review of best practice

This exercise has focused on gathering information from actual users of systems currently in place for accident investigation, both intrinsic to road transportation, and extrinsic to other transport/industry modes. It can be suggested that much of the information relates to the "inputs" (data collection).

(A) Organisations who have a 'driving' workforce have been contacted e.g. postal/delivery companies etc. in order to understand strategy protocols regarding road accident investigation and gain knowledge of the approaches followed when a road accident occurs amongst a workforce.

(B) A representative proportion of police forces across Europe have been contacted, in order to understand the approaches used in road accident investigation and the legislation/background to these methods.

(C) A cross-section of independent accident investigation bodies (including Government related) have been contacted in order to gain an understanding of strategy protocols regarding road accident investigation and the methods followed when a road accident occurs within their remit.

(D) The accident investigation processes within the other main modes of transport (air, maritime, rail) have been re-examined.

Within activities [A]-[D], structured interviews were used to understand the methods employed. Additionally the wider research literature was reviewed to record any processes that could be considered. All the methods ascertained were critiqued in order to identify techniques that could be incorporated into the recommendations for transparent and independent road accident investigation.

Step 2: Identification of users

A list of potential users of the best practice recommendations is continuously being compiled for each country represented by the project partnership. These users include:

- National public administrations, e.g. ministries and departments
- Bodies directly involved in accidents, e.g. police, dedicated investigation bodies (where they exist)
- Insurance companies
- Industry, e.g. vehicle manufactures, road constructors
- Research and scientific institutions, e.g. public/private institutions, universities
- Professional associations, e.g. freight transport associations, unions

- Other, e.g. road users associations, charities, AA, RAC

This list of potential users and other interested parties is required for Step 4 & 5: Assembly of "top level" opinion and Period of Consultation.

Step 3: Preparation of draft procedure

The knowledge acquired from examining current procedures for investigating accidents (Step 1) has assisted in the development of a set of 'best practice' recommendations for transparent and independent road accident investigation. These recommendations cover issues surrounding the investigative institution (the structure and functioning of the body responsible for road safety investigations) operations (how the body carries out investigations); Data (storage, retrieval and analysis); and Reports, Countermeasures and the Dissemination of Data.

Step 4: Assembly of "top level" opinion

Although the sponsors of the work will be given opportunity prior to this exercise to inform the direction of the project during routine project monitoring, this exercise will focus on gathering other "top level" opinion. Therefore the expert opinion of (senior) practitioners and policy makers (stakeholders) across Europe will be sought. Generally, these individuals do not themselves conduct accident investigation but rather use the results of such systems to inform policy decisions. It is anticipated that most of the information will relate to the "outputs" (data and resulting recommendations and countermeasures. The aims of this consultation include: gathering general feedback on the draft recommendations, identifying anticipated difficulties with the proposed methods in the recommendations and indications of who else should be involved in the consultation process.

Step 5: Period of consultation

The draft procedure will be circulated to the identified contacts in Step 2 and feedback and comments will be asked for. A workshop will be conducted in order to gather expert opinion from those identified in steps 2 and 4. In the workshop, the ideas in the draft recommendations will be presented and expert feedback from these policy makers and practitioners will be obtained. Additionally, interviews will be conducted with other nominated contacts from Steps 2 and 4 (non-workshop attendees) where the ideas in the draft recommendations will be presented and additional expert feedback from practitioners and policy makers will be obtained.

Step 6: Period of iteration

The results of the Step 4 and 5 consultations will be complied and the draft best practice recommendations adjusted accordingly. The revised recommendations will be re-circulated to the consultation group (Steps 2 and 4) and feedback requested.

Step 7: Preparation of final recommendations

Upon receipt of final comments and feedback in Step 6, a set of full recommendations will be produced. This will be in the form of a report in October 2007.

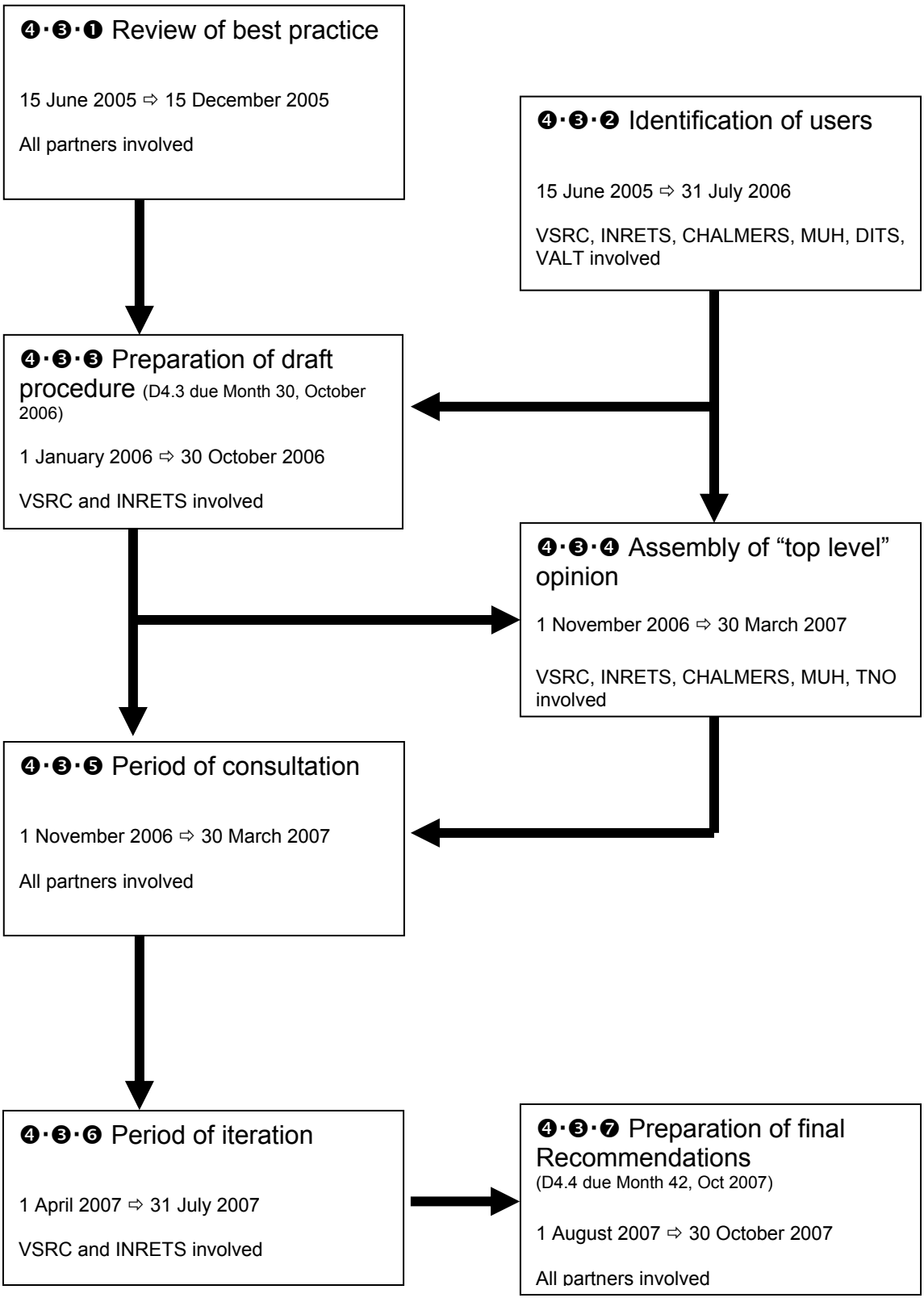

Figure 3. Detailed project plan of the combined WP4 Tasks 3 and 4

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8 ANNEX B: CONSULTATION QUESTIONNAIRE RESPONSES

8.1 Blank Questionnaire

WP4 Questionnaire

Your Name (optional) .....

Your Country .....

Question 1/8:
Road Accident Investigation: Where do you see yourself on the ladder?

Question 2: Road Accident Investigation: Does it have to cover its costs?

A: YES / NO (please circle and comment)

COMMENTS:

Question 3: Should there be an independent Road Accident Investigation Board in each country?

A: YES / NO (please circle and comment)

COMMENTS:

Question 4: Accident Investigation: What good practice do you have in your country?

A:

Question 5: What problems have you come across that have stopped you from having an independent accident investigation process in your country?

A:

Question 6: When should an accident be investigated? What level of data – basic or in-depth?

A: WHEN	DATA LEVEL

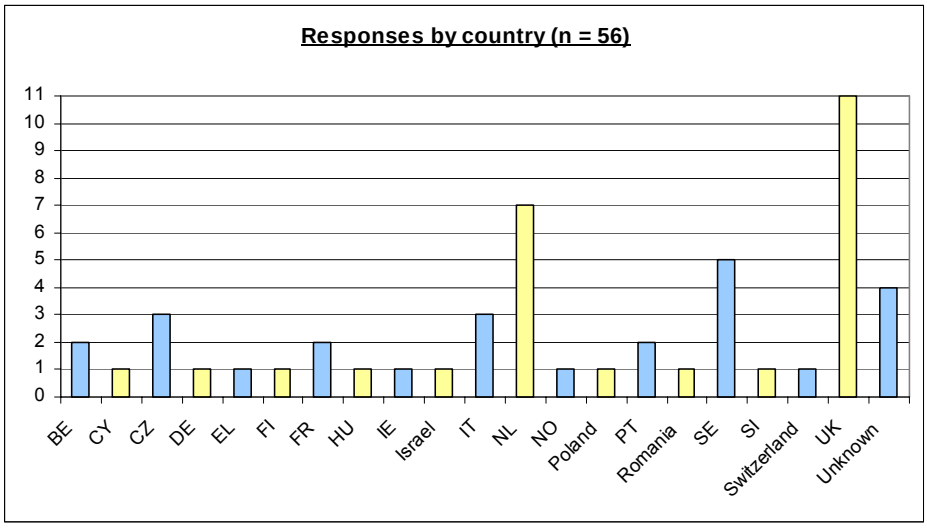
Question 7: VOLUNTEERS – Would you like to be involved in the consultation process?

A: Please write your details below and leave your business card.

NAME	E-MAIL ADDRESS	What type of work are you involved in? (circle all that apply)
		Policy maker Scene Investigator Researcher Data User Manufacturer Other (please state) .....

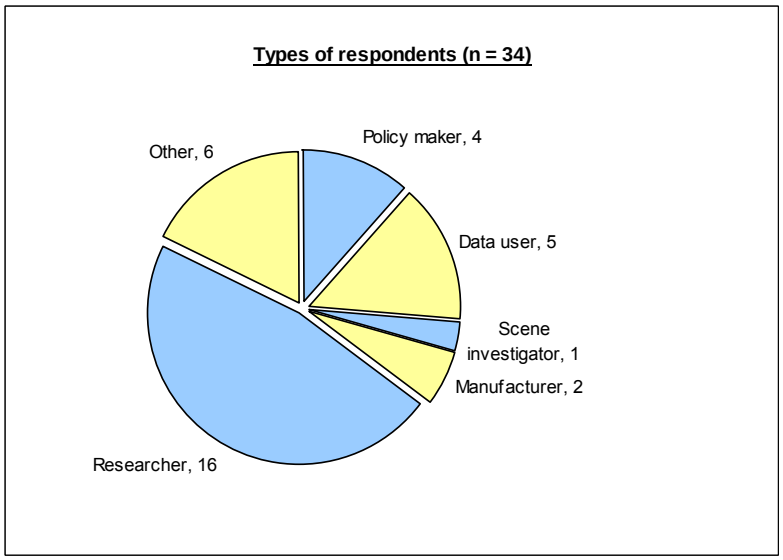
8.2 Questionnaire Responses

8.2.1 Respondent information



The countries with the highest number of responses were the UK, Netherlands and Sweden.

Out of the 56 individual responses, 34 listed their occupation, as detailed below.



The main contributions came from researchers in the field of accident investigation.
The 'Other' category included:

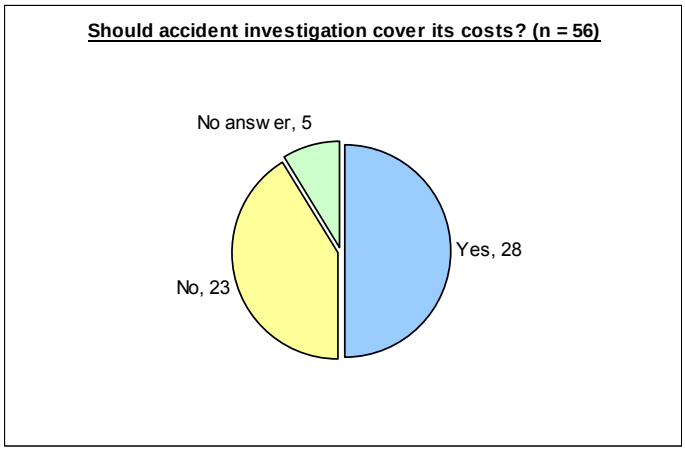
- International road safety policy consultant
- Road safety analyst
- Accident reconstructor
- Data producer

Overall, views were expressed from a wide range of stakeholders.

8.2.2 Q1 and Q8) Road Accident Investigation: Where do you see yourself on the ladder?

Respondents were asked to rank their country's road safety performance on a ladder at the start of the workshop, best practice being the top of the ladder. They were then asked to do the same again after the workshop when they had thought more about the issues. 14 respondents rated their country's road safety performance more positively following engagement with the key issues, 18 were more negative and 13 did not change their opinion.

8.2.3 Q2) Accident Investigation – Should it cover its costs?

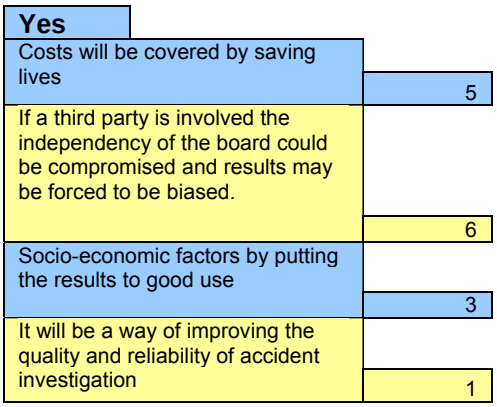


There was a fairly even split of opinions on whether accident investigation should cover its costs. Below are the main comments made to accompany the answers given.

No	
Benefits outweigh the costs. Putting money into accident investigation will be re-gained by saving lives.	5
Cost should not be an issue, and money should come from an independent source (government or third party)	7
It is a public service so the board should not have to fund itself	1
The cost can be covered by fines or taxes	2

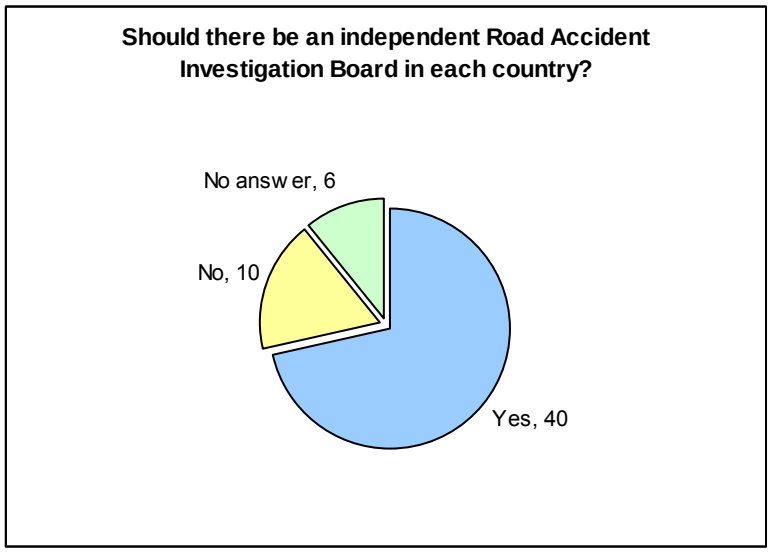
The key comment given by those who did not think accident investigation should cover its costs focused on the fact that money should not cause a problem and funds should come from a third party source. Further common

responses referred to the fact that the benefits will eventually outweigh the costs in terms of lives being saved.



Concerns were raised about the independence of results if an accident investigation board relied on other sources to fund activities. Although covering costs by saving lives was given as a reason why some thought that accident investigation did not need to cover its own costs, others cited this as a reason why accident investigation should cover its costs, as money put in could be recovered by saving lives.

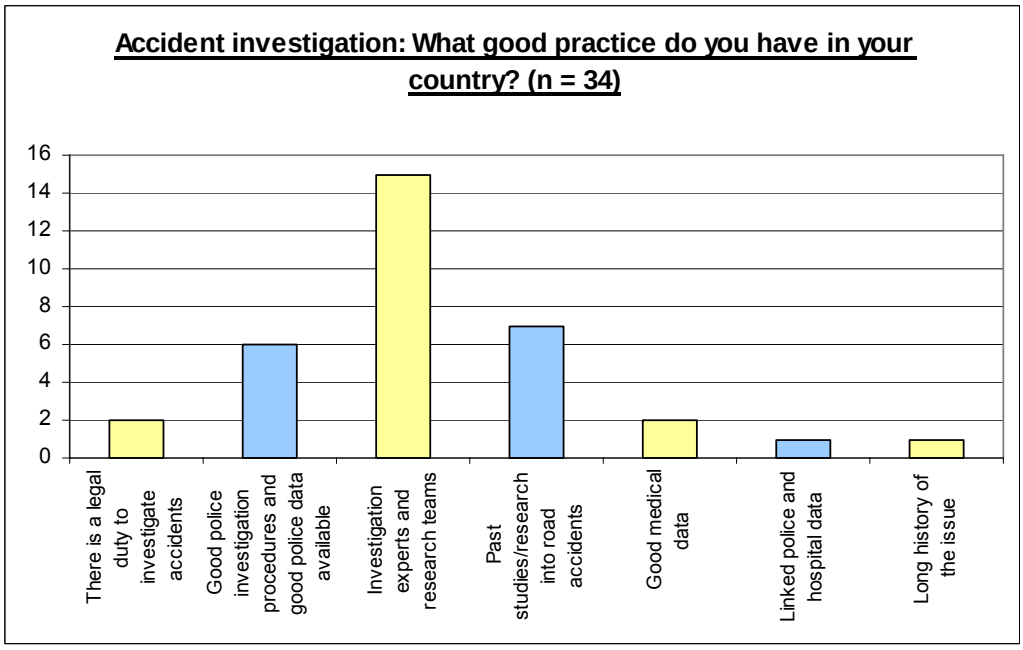
8.2.4 Q3) Should there be an independent Road Accident Investigation Board in each country?



The vast majority of respondents agreed that it would be a good idea to have an independent body investigating road accidents.

Not many respondents disagreed with the idea of an independent board, but those who did generally believed that better use should be made of police investigation and existing systems. Half of the 'No' responses came from UK participants.

8.2.5 Q4) Accident Investigation: What good practice do you have in your country?

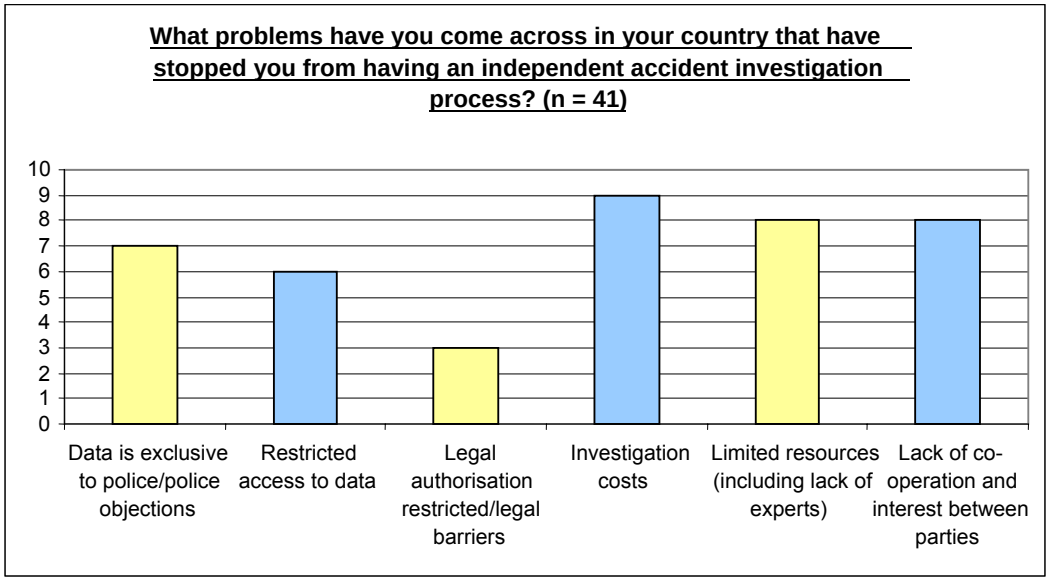


The majority of respondents said that their country had past experience of investigation which was carried out by experts or research teams. Other good practice included:

- Experience with past studies
- Good police investigation procedures
- Good medical data

Nearly all countries were able identify at least one example of good practice that took place in their country.

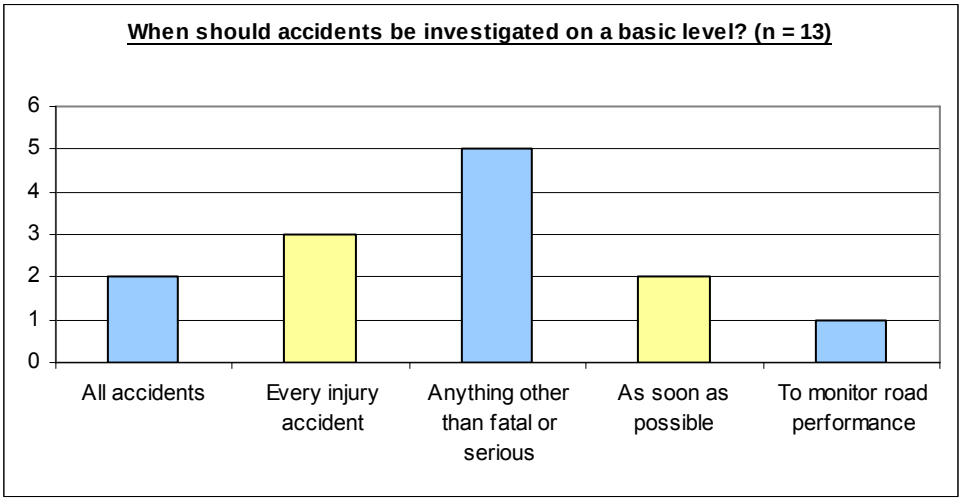
8.2.6 Q5) What problems have you come across in your country that have stopped you from having an independent accident investigation process?



Respondents were asked to list any problems they could foresee in establishing an independent accident investigation body.

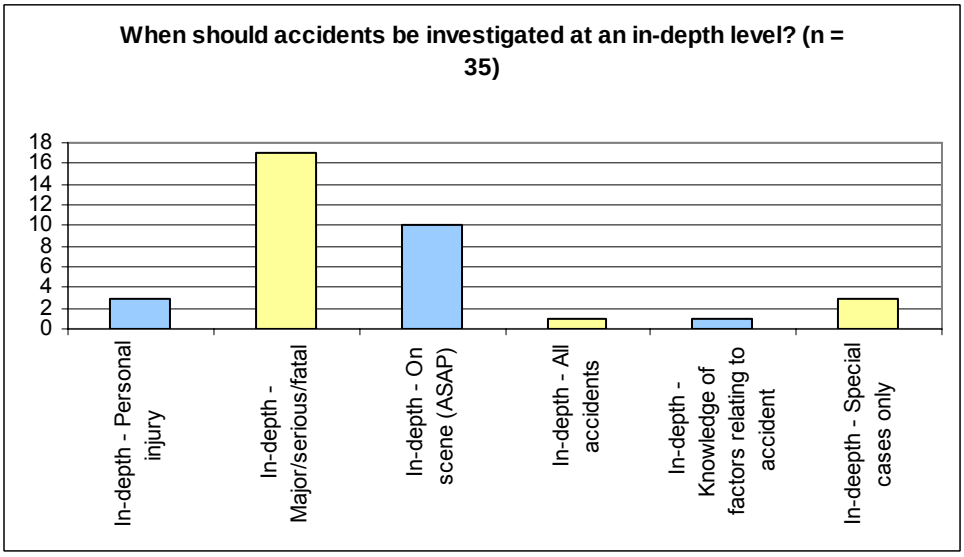
The main problem cited was the cost of the investigation procedures. Limited resources and lack of co-operation were also commonly suggested factors that might inhibit the activities of an independent accident investigation board.

8.2.7 Q6) When should an accident be investigated? What level of data – basic or in-depth?



The majority of respondents who thought basic level data should be collected specified that it would be appropriate for any accident other than fatal or serious. However the wording of the question led some respondents to answer in terms of the time period between the accident and investigation.

On the whole most respondents (35) thought that it was more important to collect in-depth data, as shown below.



Most respondents thought that in-depth data should be collected when a serious, fatal or major crash occurs. Other comments suggested that it would be a good idea to collect the data on the scene as soon as possible to ensure the collection of highly perishable variables (for example, weather and lighting conditions).

Annex C: Report
Swedish Road Accident Investigation Bodies

Contract No: TREN-04-FP6TR-S12
Acronym: SafetyNet
Title: Building the European Road Safety Observatory

Integrated Project, Thematic Priority 6.2 "Sustainable Surface Transport"

Project Co-ordinator:
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Project Start Date: 1st May 2004 **Duration:** 4 years

Report Author(s): Helen Fagerlind, Chalmers University of Technology

Date of issue: August 2006

Transport

Project co-financed by the European Commission, Directorate-General Transport and Energy

TABLE OF CONTENTS

Transport
Project co-financed by the European Commission, Directorate-General Transport and Energy

Executive Summary

Sweden is one of the countries in the European Union with the lowest fatality rate in road accidents. Sweden has focused on road safety and especially the fatal accidents for many years. The Swedish long-term road safety goal is that there should be no fatalities or serious injuries in road traffic, the so called Vision Zero.

In 1996 the Swedish Government commissioned the Swedish Road Administration (SRA) to implement a new information system to improve the police reported accidents according to Vision Zero. The new information system STRADA (Swedish Traffic Accident Data Acquisition) contains information from the police, which is the base for national statistics, and information from emergency hospitals with details about the personal injuries. One major improvement gained from STRADA is that the accidents for vulnerable road users have been visible through the registration from the emergency hospitals.

The Swedish Road Administration is responsible for co-ordinating and performing in-depth studies of all fatal accidents on the road network (both national and local roads). A thorough investigation is performed and information is collected from the police, the rescue services and ambulance. The in-depth investigators perform data collection at the accidents scene and examine the vehicles involved in the accident. When the data collection phase is finished the accident data is presented to a multidisciplinary analysis team which include people with expertise in different areas. Once the accident has been analysed, an assessment is made of the factors that caused the fatal injuries.

The results from the in-depth studies can be used in many ways and one of them is the OLA methodology. OLA is the abbreviation for objective data, list of solutions and addressed action plans. OLA is a methodology where different system designers join together to contribute to solving a common problem. The methodology gives each system designer a chance to take measures from fact and to make the road safety better. The main objective is to be able to implement more safety measures by several actors in various parts of the road transport system.

The Swedish Accident Investigation Board (SHK) investigates all civil and military aircraft accidents. SHK also investigate maritime, rail and other major accidents. The group of “other major accidents” include for example fires in buildings and major road accidents.

The Road Traffic Inspectorate (Inspectorate) launched its operations on 1 January 2003. It is a supervisory authority that will operate in collaboration with other players in the road safety sector in Sweden to influence system designers and closely monitor their activities so that the road transport system will ultimately be as safe and sound as possible.

Transport
Project co-financed by the European Commission, Directorate-General Transport and Energy

1 Introduction

Sweden is one of the countries in the European Union with the lowest fatality rate in road accidents (Figure 1). Sweden has focused on road safety and especially the fatal accidents for many years. The Swedish long-term road safety goal is that there should be no fatalities or serious injuries in road traffic. This goal was ratified by the Swedish Parliament in 1997 and is based on the "Vision Zero" programme [1]. The Vision Zero (Chapter 0) is based on the insight that people sometimes make mistakes and that all road accidents can not be prevented. On the other hand when accidents do occur it is possible to prevent people from being killed or seriously injured. To increase road safety several steps have been taken, for example, the Swedish Road Administration's (SRA) in-depth studies (Chapter 0) and the OLA methodology development (Chapter 4).

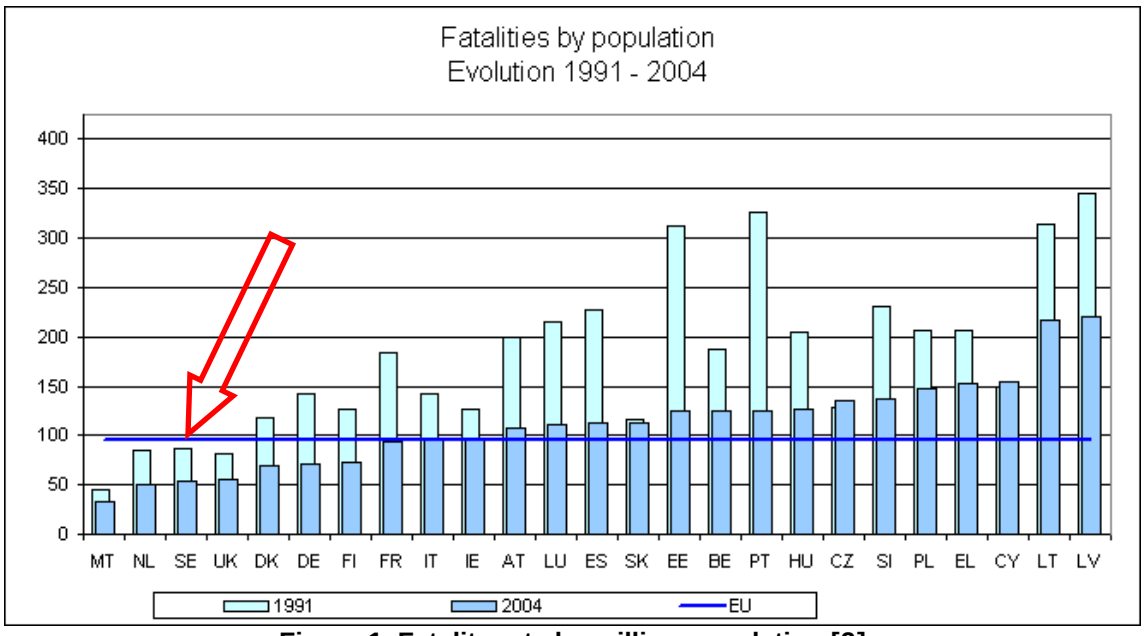


Figure 1. Fatality rate by million population [2]

Accident data collection procedures in Sweden are explained in Appendix A.

1.1 Vision Zero

In the government bill "Vision Zero and the Traffic Safety Community" [3] the government 1997 proposed a new direction for the traffic safety activities. The proposed long term goal for the road safety was that no one should be fatally or severe injured within the road transport system. To achieve this goal it was proposed that the road transport system should be designed and function after the demands of the Vision Zero. The Vision Zero is focusing on injury prevention and state that the humans' physical tolerance for crash severity should be normative for the road transport system development.

The Vision Zero state that Traffic safety is a “shared responsibility”: System designers are responsible for the design, operation and the use of the road transport system and are thereby responsible for the level of safety within the entire system. Road users are responsible for following the rules for using the road transport system set by the system designers. If the road users fail to comply with these rules due to a lack of knowledge, acceptance or ability, the system designers are required to take the necessary further steps to counteract people being killed or injured.

1.2 Swedish Road Administration (SRA)

The Swedish Road Administration works to provide individuals and the business community with good conditions for transport and travel.

The SRA has been commissioned by the Swedish Government with the overall sector responsibility for the road transport system. This involves issues relating to environmental impact, road safety, accessibility, transport quality, regional development and gender equality. Its responsibility also includes intelligent transport systems, public transport, adaptations for disabled persons, commercial traffic, applied research and development and demonstration activities in the road transport system.

The SRA is also responsible for the exercise of public authority within this sector as well as the planning, construction, operation and maintenance of state roads.

The SRA’s improvement initiatives are characterised by three distinguishing features: customer orientation, a holistic approach and efficiency. These provide the basis of the SRA’s management system.

1.3 Overview of Swedish Road Accident Statistics

1.3.1 National Statistics

The number of fatal accidents and the number of persons killed has decreased since the year 2001. The severe accidents were on the other hand on its highest levels during 2002-2003 with almost 500 more severe injured than the average during the past 10 years. The slight accidents have constantly increased since 2001 (Table 1).

Table 1. Swedish national accident statistics [4]

Year	Fatal Accidents	Fatalities	Severe Accidents	Severely Injured	Slight Accidents	Slightly Injured
1995	519	572	3 137	3 965	11 970	17 208
1996	488	537	3 048	3 837	11 785	16 973
1997	493	541	3 067	3 917	12 192	17 363
1998	490	531	3 004	3 883	12 020	17 473
1999	516	580	3 113	4 043	12 205	17 921
2000	535	591	3 104	4 103	12 131	17 929
2001	511	583	3 100	4 058	12 185	18 272
2002	490	560	3 420	4 592	13 037	20 155
2003	460	529	3 446	4 664	14 459	22 439
2004	430	480	3 082	4 022	14 517	22 560
Average	493	550	3 152	4 108	12 650	18 829

2 Swedish Traffic Accident Data Acquisition (STRADA)

In 1993 the Swedish Government commissioned the Swedish Road Administration (SRA) to improve the national statistics to make preventive traffic safety measures more effective. The old system had some quality problems which led to unrecorded cases, underestimation of the traffic safety problems and wrong priorities in the traffic safety area. In 1996 the Swedish Government commissioned the SRA to implement a new information system based on the report “Injury and Accident Statistics of Road Traffic” [5].

It was important to improve the police reported accidents according to Vision Zero (Chapter 0). Co-operation with the emergency hospitals was undertaken to gain more information about the personal injuries resulting from road accidents. The system started 1998-2000 as a project in each of SRA’s seven regions where also the police and the emergency hospitals were represented. There was a transitional period during 1999 to 2002, and from 2003 all police jurisdictions were reporting to STRADA. Approximately 55 % (February 2006) of the emergency hospitals are involved in STRADA and reports personal injuries from road accidents to the system.

2.1 Objective

The new STRADA information system should:

- support the work with traffic safety on national, regional and local level
- form the basis of injury and accident data to make it easier to take measures for safer road traffic
- minimize the duplication of work and decrease the cost within the public administration

2.2 Organisation

The STRADA organisation is divided into three main parts:

- management and development of the system, data storage, technical administration and support, and the disposal of data by the SRA
- data input from the police
- data input from the emergency hospitals

There are thirteen persons (approximately ten man-years) involved in STRADA at the SRA. The organisation is spread among the seven regions and the headquarters where the main administration is located.

The police reports road traffic accidents into STRADA. The organisation within the police differs between the jurisdictions. In some regions the local offices report directly to STRADA while in other regions all reports are sent to a central office where special administrators input the accidents into STRADA.

Approximately 55 % of the emergency hospitals (40 hospitals, February 2006) are reporting injuries to road users which are caused by an event on the road into STRADA. Each hospital has at least one person in charge of the input procedure but several persons can input the data. Approximately 70 % of the personnel costs are funded by the SRA.

The STRADA system annually cost approximately SEK 15 million (EUR 1.6 million, Feb, 2006).

2.3 Accident Selection

The police report all injury accidents where they are called on scene. The national statistics are based on the police reported accidents [4].

The emergency hospitals report all injured road users that have come to the emergency by ambulance or by themselves including pedestrian or cyclists falling on the street without any other vehicles involved. Collisions between rail vehicles (mostly trams) and pedestrians or cyclist are also reported (which is not reported by the police). Neither the “falling” accidents nor the “rail” accidents are included in the national statistics.

2.4 Procedure

The STRADA application is split into three parts. Input for police, input for hospitals and an analysis tool to extract accidents.

2.4.1 STRADA Police (input)

When an accident occurred and the police are called to the scene the police use a form (informationsunderlag vägtrafikolycka) which briefly describes the accident circumstances, such as whether and road conditions, type of road, road user injury severity etc. (Appendix B). This form is used as a base when the accident is entered into the STRADA database. When the accident is uploaded to the main server other information is retrieved from, for example, the vehicle and driving licence registry.

2.4.2 STRADA Medical Care (input)

When the patient has been treated at the hospital a traffic accident injury journal is filled in by the patient, for example, accident description, passive safety equipment used, collision partner etc. (Appendix C). The hospital enters the case into the STRADA database based on the traffic accident injury journal, and completes it with the diagnosis of the specific injuries (Appendix D) which are coded according to AIS 98 [6].

2.4.3 STRADA Extract Manager (output)

In the main database the accidents from the police and the hospitals are linked together by three criteria:

- date and time of the accident
- social security number
- place of accident

When using the Extract Manager there are several different parameters that can be chosen in the selection, for example, location, date, time, police or hospital records, type of accident etc. When all selections have been made the accidents are collected from the main server and are presented on a map (Figure 2). The police or hospital report can be viewed for each accident or a statistical report can be created. Not all accidents have both police and hospital record.

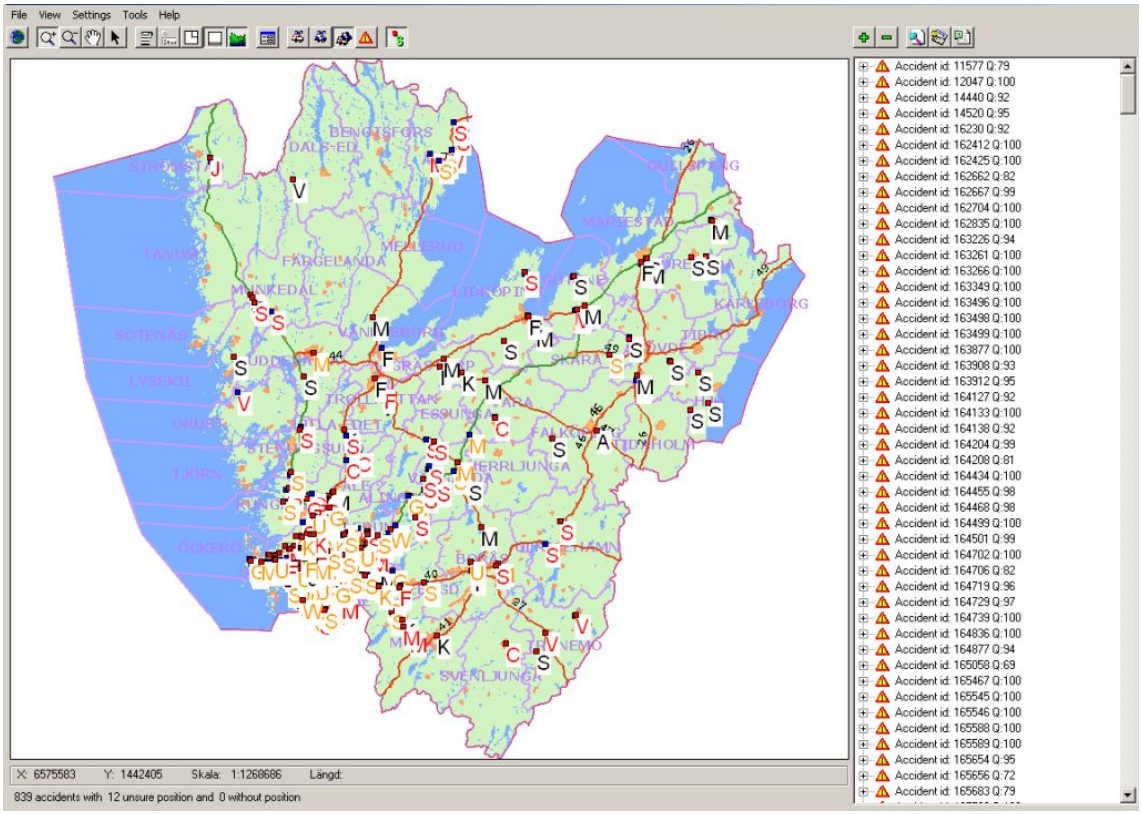


Figure 2. STRADA Extract Manager, Västra Götaland county, all accidents 2005 (Copyright Lantmäteriverket. Ärende nr M2004/5067)[extracted 12 April, 2006]

2.5 Safety Measures

One major improvement from STRADA is that the accidents for vulnerable road users have been visible through the registration from the emergency hospitals. Local offices around Sweden use the information to, for example find dangerous places for pedestrians and bicyclists. Pedestrians or cyclists falling because of slippery road material can cause a lot of costs for the county. These accidents is not reported by the police and have shown be a large part of the accidents within urban areas.

One important result from the system is that the accident numbers for pedestrians and cyclists have become more accurate. For example in the county Skåne, where all emergency hospitals have been reporting accidents

since 1999, they found that injured cyclists in STRADA in the year 2000 was 1685 persons compared to the official statistics which was only 616 persons. Even higher numbers were found for pedestrians where 1578 injured persons where reported in STRADA but only 256 persons in the official statistics. The numbers from STRADA highlight the problem for pedestrians and cyclists.

In Gothenburg the previous injury reporting system ADA which is similar to STRADA have been used. It contributed for example to make the bus stops less wide so the buss cannot be passed by another vehicle. The speed limit 30 km/h outside school areas during school hours was changed to be applied round the clock. ADA showed that accidents around the school yard involving children occurred during most awake hours.

In Stockholm the police are using STRADA to plan their activities. They have found that the road accident statistics can be connected to crimes like drunk driving and unlawful driving. The accident statistics have for example helped them to plan when and where they shall have alcohol and driving licence controls.

2.6 Confidentiality

The material is confidential since STRADA contains information from the hospitals with details about the injuries for the road users involved in accidents.

3 Swedish Road Administration's in-depth Study

The ordinance "Förordning (1997:652) med instruktion för Vägverket" [7] from the Swedish Parliament in 1997 stated that the Swedish Road Administration (SRA) is responsible for co-ordinating and performing in-depth studies of all fatal accidents on the road network.

3.1 Objective

The objective of the SRA in-depth studies is to:

- gain knowledge about fatal road accidents
- learn more about fatal accidents and identify their probable causes to the accidents
- to document the scene of the event and the injury outcome

3.2 Organisation

The SRA consists of seven regional offices and one headquarters based in Borlänge. In each of these regions in-depth studies are performed on all fatal accidents which have occurred in the region. The regions differ in size and traffic flow which make the accident rate within the regions differ between 37-128 fatal accidents per year during the period 1998-2002.

Each regional in-depth organisation consist of one co-ordinator and one or more accident investigators. Other persons that work full or part-time in the in-depth organisation are; vehicle and traffic engineers, traffic safety experts, behavioural scientists, road designers, road maintenance personnel, statisticians, medical doctors, medico-legal investigators and administrators. The sizes and competences of the regional organisations differ and approximately 1.4 to 4 man-years are used for this activity within the regions. This number also corresponds to the number of fatal accidents within each respective region. The total cost for the Swedish in-depth organisation in 2004 was approximately SEK 11 million (EUR 1.2 million, Feb, 2006).

3.3 Accident Selection

The SRA investigates all fatal accidents on the Swedish road network (both national and local roads). The definition for a road traffic accident from the official statistics [4] is used and it reads; an event which caused personal injuries or material damage that occurred on a road and where at least one moving vehicle participated. If the fatality is caused by illness or suicide the accident is still investigated in some cases since this conclusion can be made in the final stage of the analysis.

3.4 Procedure of the in-depth studies

The investigators at SRA are informed by the Traffic Information Central (TIC), the Police, SOS Alarm, the media or other information sources that a fatal accident has occurred. The investigators go to the accident scene retrospectively within 1-5 days after the accident. On the scene, information about the point of collision (if any), rest positions, the road layout, the road equipment etc. is collected. The investigators also examine the vehicles involved with respect to the; condition of the vehicle, performance of possible passive and active safety systems, external and internal deformations etc. In Appendix E the variables collected is presented. An in-depth report, pictures and sometimes video is used for documentation.

More information is retrieved from the Police, for instance through hearings of survivors of the accident, Police vehicle inspections, drawings of the accident scene and autopsy reports. Medical and rescue services are also contacted and information such as time of alarm, arrival to and leaving of the scene and arrival to the hospital is reported. Sometimes they also answer a survey especially designed by the SRA. The rescue services write a report about the rescue on scene which the SRA uses in some cases. This report is part of the Civil Protection Act.

Other sources within the SRA are also used, for example STRADA (Chapter 2). In STRADA it is possible to retrieve information about number of accidents on the same location including detailed information about the injuries of the occupants. This is very valuable information if the in-depth team, for example, propose a reconstruction of a junction. The investigators also have the possibility to look into the maintenance performed on the scene before the accident occurred and compare with temperature information from the weather stations.

When the data collection phase is finished the analysis of the accident begins. The data is presented to the analysis team which include people with expertise in different areas (Chapter 0). External members can also attend the analysis meetings, for instance the police, rescue and medical services, local authorities and traffic safety researchers. Once the accident has been analysed, an assessment is made of the factors that caused the fatal injuries. The factors is classified into three groups; excessive force, excessive risk or beyond system restrictions.

- Excessive force
  When the road user have done their best to follow traffic regulations and have used safety equipment. They have however made an error that resulted in a fatal collision forces, due to the design of the road environment in combination with the prevailing speed limit.
- Excessive risk
  When road users are injured due to insufficient personal protection. The most common scenario is not wearing safety belt. Another example is cyclist not using cycle helmets.

- Beyond system restrictions
  When the road users have consciously and have serious violated regulations that have a great bearing on the severity of the collision. The most common scenario is greatly exceeding the speed limit.

3.5 Safety measures resulting from the in-depth studies

The summaries and analysis produced by the in-depth studies are used as basic data for road safety measures at the SRA at both a regional and national level. Immediate changes of the accident spots are common, for example installation of guardrail near dangerous roadsides, increasing the visibility in junctions, removal of rocks and trees from the roadside and decreasing the speed limit in junctions etc.

In one region a safety barrier strategy has been developed from the in-depth studies. All fatal single vehicle accidents in curves where investigated and it was found that most of them happened in the outside of the curves. From these findings it was decided that if safety barriers should be installed on a road distance the outside of curves should be prioritised.

The problem with pedestrians get run over by trucks at pedestrian crossing with traffic light have been identified. The stop line is too close to the pedestrian crossing why the driver cannot see a pedestrian on the crossing in certain angles. The region has decided to increase the distance from the stop line to the pedestrian crossing on all places with this problem.

It is not only the road environment that is improved, the awareness of the effects of alcohol and drugs are also improved by presenting concrete proofs from the in-depth studies and the autopsy reports. This has led to increased focus on the issue and encouraged the use of alcohol ignition interlocks in vehicles. The in-depth studies also provide information and knowledge that can be used by other authorities, organisations and research institutes. The in-depth studies are also used as basic data for long term work in road design and vehicle development, as well as by the police in traffic surveillance and other road safety efforts. The fatal accidents are presented at management level in the regions at SRA and it results in increased awareness, responsibility and commitment among the management.

3.6 Confidentiality

The material in the in-depth studies is classified to be confidential. The in-depth reports do not contain any information that can identify the persons or vehicles in the accident.

4 The Swedish Road administration's OLA Methodology

The results from the in-depth studies can be used in many ways and one of them is the OLA methodology. OLA is the abbreviation for objective data, list of solutions and addressed action plans. (Objektiv fakta, Lösningar, Avsikter). In the OLA processes the system designers easily can be involved in a specific traffic safety problem based on Vision Zero (Chapter 0). OLA is a methodology where different system designers join together to contribute to solving a common problem. The methodology gives each system designer a chance to take measures from fact and to make the road safety better. The methodology is used both on regional and national level. OLA is a step forward in the continuous work on Vision Zero. Examples of system designers are:

- The Swedish Road Administration (SRA)
- Local authorities
- Other road managers
- Vehicle manufactures
- The Police
- Rescue services
- Freight companies
- Purchasers of transport services
- Politicians and civil servants working with community planning

4.1 Objective

The main objective is to be able to implement more safety measures by several actors in various parts of the road transport system. The OLA process should lead to less severe and fatally injured people in the road traffic. It shall be achieved by making sure that concrete and relevant countermeasures are accomplished through the action plans. The countermeasures can be both short term and long term. The more system designers that contributes and carries out their action plans the safer the road traffic gets. The OLA process is based on voluntary commitments by the system designers [8].

4.2 Organisation

There are national and regional OLA organisations. The National organisation spends approximately 2 man years which include several people working with the OLA process. The regional organisations differ a lot because of size of region and number of fatal accidents. At least one person (not full-time) in each region is assigned to handle the OLA process. The budget for the national activities in 2006 is approximately SEK 2.1 million (EUR 0.2 million, February 2006).

4.3 Accident Selection

The accidents where the OLA method applies is fatal accidents which have been identified during the SRA in-depth studies (Chapter 0). In each of the seven regions 10 % or 7 fatal accidents should go through a regional OLA process (numbers are calculated from the mean value for the last three years). During the analysis of the fatal accidents the accidents that need special attention is selected.

National OLAs is often initiated from the regions where the in-depth analysis team have seen a trend in specific fatal accidents. When a national OLA is performed all accidents concerning the specific problem in the country is used. The aim is to perform approximately five national OLAs every year. Ten national OLAs have been performed to date (February 2006):

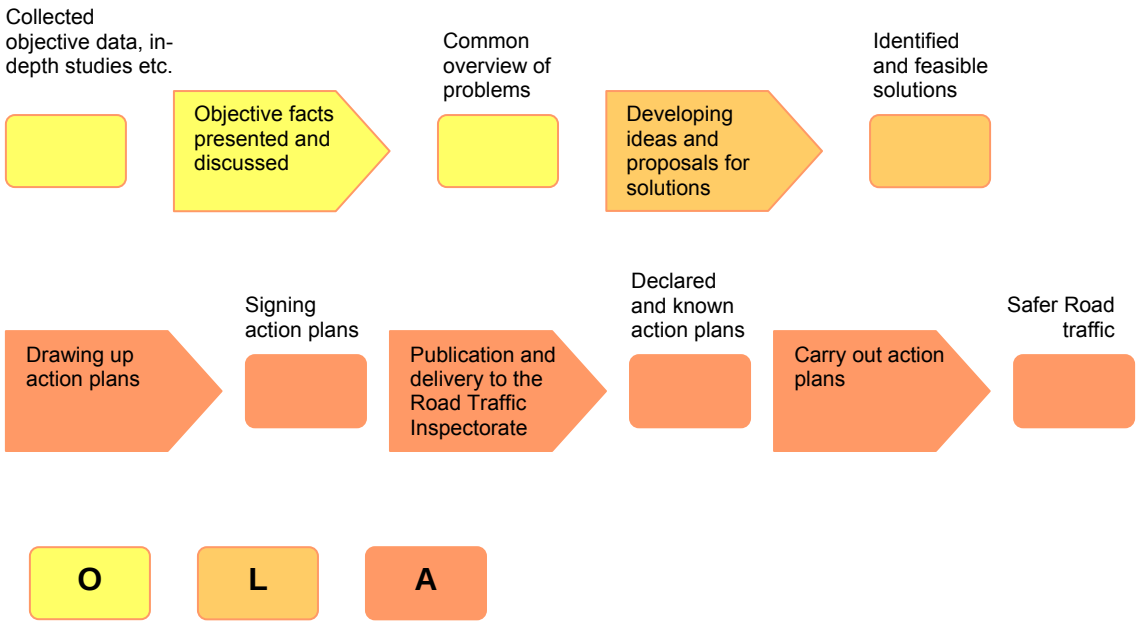
- **Alcohol-OLA – vehicle journeys and transports without alcohol**
  Drinking and driving is a big problem, approximately 20 % of the fatal accidents in Sweden are related to alcohol.
- **Bus-OLA – safer bus journeys**
  Travelling by bus is a safe way of travelling compared to other road conveyance. Bus-OLA originated in January 2003 when a severe bus accident happened. In the beginning of 2006 another major bus accident happened with 9 fatally and 26 severely injured people.
- **Slippery-OLA – safer travelling in the winter time**
  Many people die today because the driver could not handle their vehicle in case of a very slippery road surface.
- **Motorcycle-OLA – safer motorcycle rides**
  The bike riding population has increased, today there are approximately 250 000 motorcycles in traffic in Sweden. Unfortunately the accidents have increased as well and during 2004, 57 (of 480 fatalities) motorcycle riders were fatally injured.
- **Moped-OLA – safer moped traffic**
  The increasing numbers of moped riders killed probably originates in the higher number of mopeds sold.
- **Schenker-OLA – six steps for increased traffic safety within the freight company Schenker**
  In the autumn 2003 the freight company Schenker took the initiative to cooperate to change the negative development of heavy goods vehicles (HGV) involvement in fatal accidents.
- **Heavy-OLA – safer heavy goods vehicle traffic (two, rural and urban)**
  When HGV is involved in accidents it often leads to severely or fatally injured people.
- **Trash-OLA – safer refuse collection**
  Trash-OLA is a continuation of Heavy-OLA where several fatal accidents with reversing refuse trucks were found during the process.
- **Young-OLA – young drivers between 16-24 years**

Young drivers, between 16-24 years of age, are more often involved in road accidents compared to other age groups.

Two OLAs are underway (February 2006); one is looking into the issue of at-grade junctions and the other is looking into the issue of safer traffic for elderly people (>65 years) which accounts for 25 % of the road fatalities in Sweden.

4.4 OLA Methodology

The OLA methodology is based on the thinking that the system designers always have the responsibility for the safety in the road transport system (Vision Zero). The injury severity to the road user and the road users inclination to make mistakes is the base when the list of solutions and action plans are proposed.



4.4.1 O – Objective Data (Objektiva fakta)

An OLA starts with data collection for the specific problem which is performed by the SRA. The information from the in-depth studies that initiated the OLA are the base and gives a good picture of what caused the fatality in the accidents. A literature review is performed and offers the state-of-the-art and more knowledge about the problem area. The official statistics gives the problem a size and show trends. After all material has been collected the SRA gathers the appropriate system designers to try to get a common view of the problem(s). The chain of events is described from the fatal accident(s) that initiated the OLA process and facts and knowledge from system designers involved is also taken into account.

4.4.2 L – List of Solutions (Lösningar)

Proposals and ideas to take measure, on both short and long term, are discussed in the second phase. It is an open round table discussion and the system designers discuss ideas about possible solutions. The discussions should be creative and based on what each system designer can do individually or what they together can contribute with, to generate safer road traffic. Questions to be answered are:

- What can my organisation do?
- What is needed from other organisations?
- Do we need co-operation between organisations?

A – Addressed Action Plans (Avsikter)
In the third phase an explanation of the action plan should be done for each system designer based on the problem(s) discussed. The explanation of action plans is a description of what shall be done, when and by whom. The extent and motive for the countermeasures shall also be specified to make possible adjustments visible. The action plan shall be made available for the public by for example SRA's web page, seminars or through media. All action plans are also delivered to the Swedish Road Traffic Inspectorate by routine. The system designers are responsible for implementing and following up their own action plan. Annually tree years after an OLA has been finished there is a meeting with the participants to follow up the results.

4.5.3 Action Plans Resulting from OLAs

As mention above the system designers are responsible for implementing and following up their own intension. Nationally SRA reassemble the OLA groups (for each OLA) one year after the action plans were made to discuss if the involved partners has fulfilled their action plans. At the SRA they have a follow up procedure for their action plans.

Some action plans resulting from national OLAs are presented below.

- Heavy-OLA – The Swedish Work Environment Authority evaluates travels and transports from a work environment perspective and performs inspections.
- Bus-OLA – The bus association perform quality controls within their activities.
- Moped-OLA – Investigation about registration and driving licence are performed. The insurance companies do not compensate damages if the engine has been tuned.
- Young-OLA – Increased usage of alcohol ignition interlocks in vehicles. The so called "syllabus B" for supervisors is introduced with compulsory risk and supervisor education. Volvo Cars are testing their Multi Lock-system, which includes alcohol interlock, belt buckle ignition interlock, and a programmable speed limiter ignition key.
- Schenker-OLA – Specific companies make quality controls of their systems.

- Alcohol-OLA – Saab Automobile perform field studies with the ”alco-key”.
- Mc-OLA – For motorcycles with engine power of 25 kW or higher and a power/weight ratio higher than 0.16 kW/kg the age limit is increased from 21 to 24 years. Honda is introducing ABS-system on almost all models.
- Slippery-OLA – The 25 most frequent car models on the market is equipped with electronically stability programs.

4.6 Confidentiality

On national level all OLAs are publicly available on the SRA’s webpage. On regional level the OLAs should be publicly available but it is a bit more difficult since regional OLAs often contain one fatal accident which makes it easy to identify.

5 Swedish Accident Investigation Board

The Swedish Accident Investigation Board (SHK) was established in 1978 to investigate all civil and military aircraft accidents. Since then their field of activities has expanded to include maritime, rail and other major accidents. The group of “other major accidents” include for example fires in buildings and major road accidents [9].

The activities are regulated by the Act “accident investigations” (1990:712 – lagen om undersökning av olyckor), by the ordinance “accident investigations” (1990:717 – förordningen om undersökning av olyckor) and by the ordinance “instructions for SHK” (1996:282 – förordning med instruktion för Statens haverikommission).

5.1 Objective

Their main objective is to investigating accidents and incidents for the purpose of improving safety by:

- As far as possible find the course of event and the causes that led to the accident and injuries
- Provide a basis for decisions, aiming to prevent a similar event or to limit the effects of such an event
- Provide a basis for an assessment of the operation of the public rescue services in connection with the event and, if there is ground for it, suggest improvements in the rescue services procedures

5.2 Organisation

SHK currently employs 20 people (august 2006) including accident investigators and administrators. There are also a number of external experts; technical, operational, medical or behavioural science expertise, which the SHK seek advice from in different cases.

The Director General and two of the investigators have legal training and experience as judges. Other expertise among the investigators are:

- flight operational specialist knowledge
- flight technical specialist knowledge
- marine operational specialist knowledge
- marine technical specialist knowledge
- specialist knowledge of population protection and the rescue services
- general technical specialist knowledge of e.g. rail communications

5.3 Road Accident Selection

An investigation of a road accident is initiated if:

- several people has been serious or fatally injured
- extensive damages on any property or the environment has arisen and an investigation is important from a safety point of view.

If an event (near-accident) could have lead to an accident the event should be investigated if:

- it could have lead to a serious accident
- it indicates essential defects on (vessels), vehicles etc.
- it indicates other essential shortcomings in a safety point of view

There is no official limit for the number of people killed for an investigation to take place, but it is often major accidents with several fatalities. However, the accident will always be investigated if it is required from a safety point of view, in order to be able to prevent future accidents of the same kind.

5.4 Investigation Methodology

When it comes to using a particular investigation method, the SHK follows the international Chicago convention for civil aviation and the regulation stipulated by the convention.

The SHK is right now developing a new handbook for accident investigations, containing, for instance, new checklists.

At this point there are a number of documents used; “Lists of first measures at a major accident”, “Checklist for accident scene investigation”, “SHK report”, “Info about the event/Report”, “Aircraft Accident and Incident Investigation - Annex 13 to the Convention on International Civil Aviation”

These documents mainly concerns how the accident investigations are supposed to take place, and they also work as a support for the accident investigators, in order for them to be able to work in a structured manner.

An investigation takes place in three steps; gathering of facts, processing and analysing the facts, and writing a report. One thing included in the first part (the gathering of facts) is documenting the accident scene. In short, this is done by:

1. Roping off the scene
2. Filming or in another way making sure volatile traces are secured
3. Looking into the safety of the scene
4. Taking notes on who witnessed the accident
5. Securing documentation on the vessel carried on-board
6. Getting hold of maps of the area, drawing sketches
7. Reporting to the chairman of the investigation

Apart from the above, normally, when an accident occurs everything known from previous experience can be of interest. For example if a road accident occurs, SHK investigates the vehicle technically, looks at the safety

management system (for companies), the education of the person using the vehicle, how the reports of known errors are handled (for companies), if there were a history of illness with the person handling the vehicle, if the person were using any medication. Apart from the above mentioned the investigators also pay attention to matters concerning the road and roadside, for instance, incline/decline, curves, state of the road and if the road was built in accordance with valid regulations. There are also interviews made with all persons involved in the accident; e.g. where were they seated, were they injured and if so in what way, what was their opinion on the course of events, and other questions to get the best possible picture of the accident, from the persons involved.

During the investigation process there are meetings held to look at what has been done thus far and what needs to be looked into further. The agenda for these meetings include for instance:

- deciding on a time schedule
- putting together an activity plan (who does what and when)
- raise ideas needed to be looked into further
- make necessary revisions of the activity plan
- going through drafts of the facts part of the report
- sketching the analysis
- preparing, writing and publishing the report

5.5 Safety Measures

The SHK make recommendations in each accident to the different authorities such as the Road Administration, the National Police Board or the Rescue Service Agency. It is up to each authority to make sure that the recommendations are followed but are obliged to respond to SHK whether they will take measures or not.

5.6 Confidentiality

The reports from the SHK are publicly available at SHK's webpage.

6 Swedish Road Traffic Inspectorate

The Road Traffic Inspectorate (Inspectorate) launched its operations on 1 January 2003. It is a supervisory authority that will operate in collaboration with other players in the road safety sector in Sweden to influence system designers and closely monitor their activities so that the road transport system will ultimately be as safe and sound as possible. The Inspectorate is part of the Swedish Road Administration and have the same board but have an independent role and its own identity.

6.1 Objective

The Inspectorate is commissioned to follow the ordinance "Förordning (1997:652) med instruktion för Vägverket" [7] which states:

1. To monitor and analyse conditions that could substantially affect the design and functioning of the road transport system through taking a holistic view of the road safety goals adopted by public authorities, municipalities and others.
2. In dialogue with the players referred to above, work to ensure that they apply a systematic procedure to prevent road accidents that result in death or serious injury.
3. To co-operate with other players to improve traffic safety on roads.
4. To initiate research and development within the road safety sector and monitor research of importance to the operations at the Inspectorate.

6.2 Organisation

At this point 16 persons are working at the Inspectorate. The expertise covers operational analysis, road safety inquiry methodology, statistics and how quality management systems should be conducted and put into practice. Legal expertise as well as expertise in the field of communications and information is also found in the organisation. The budget for the Road Traffic Inspectorate is SEK 20 million per year (EUR 2.2 million, February 2006).

7 Other Investigation Activities in Sweden

There are several other accident data collection activities in Sweden. For example the insurance company Folksam have a research unit concentrating at injury prevention. Sweden's two car manufactures Volvo Cars and Saab Automobile AB have been active in the area for many years. There are also universities for example Chalmers University of Technology and Umeå University that perform accident investigations for both accident and injury prevention.

References

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2 http://europa.eu.int/comm/transport/care/index_en.htm [8 Apr 2006]
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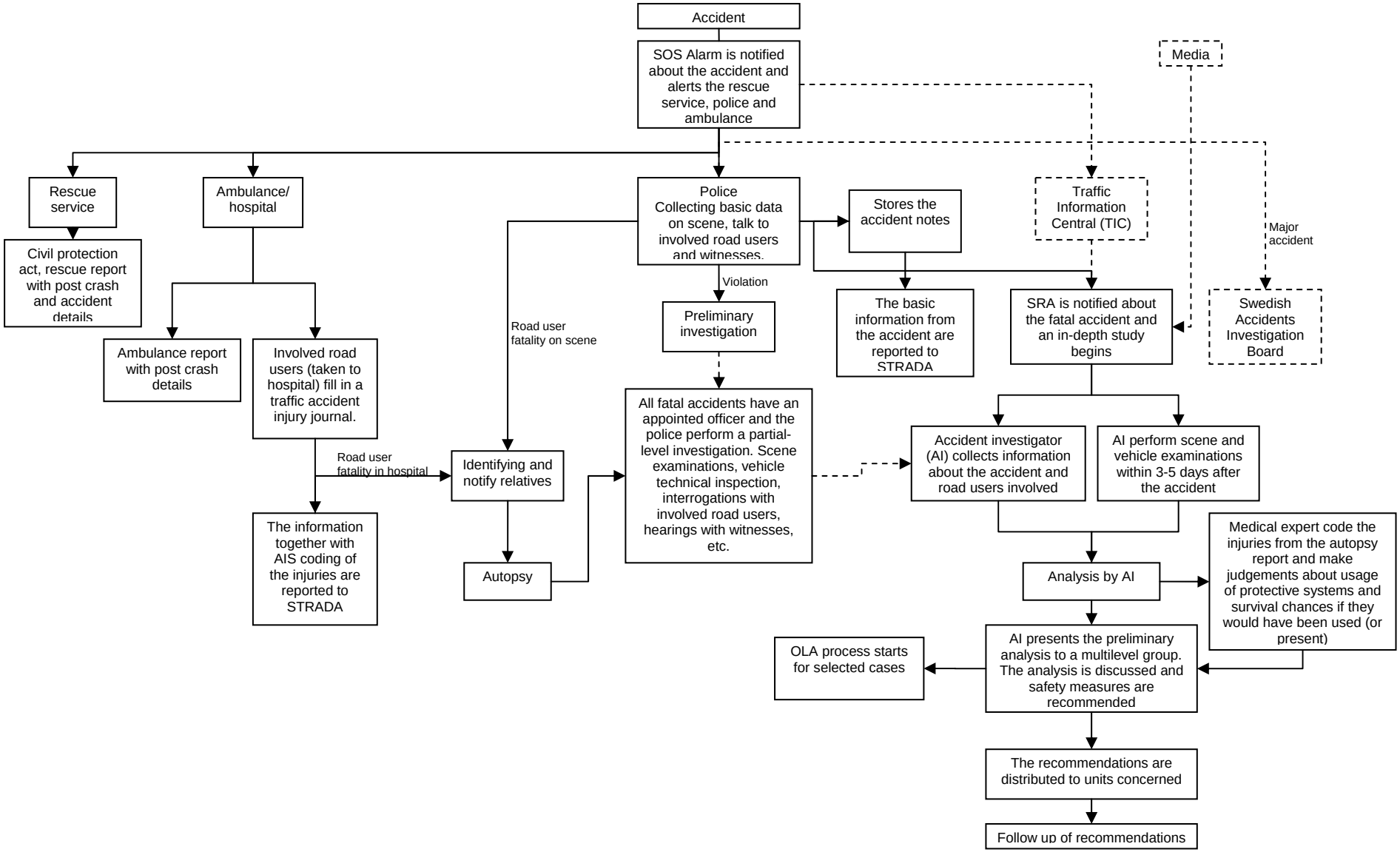
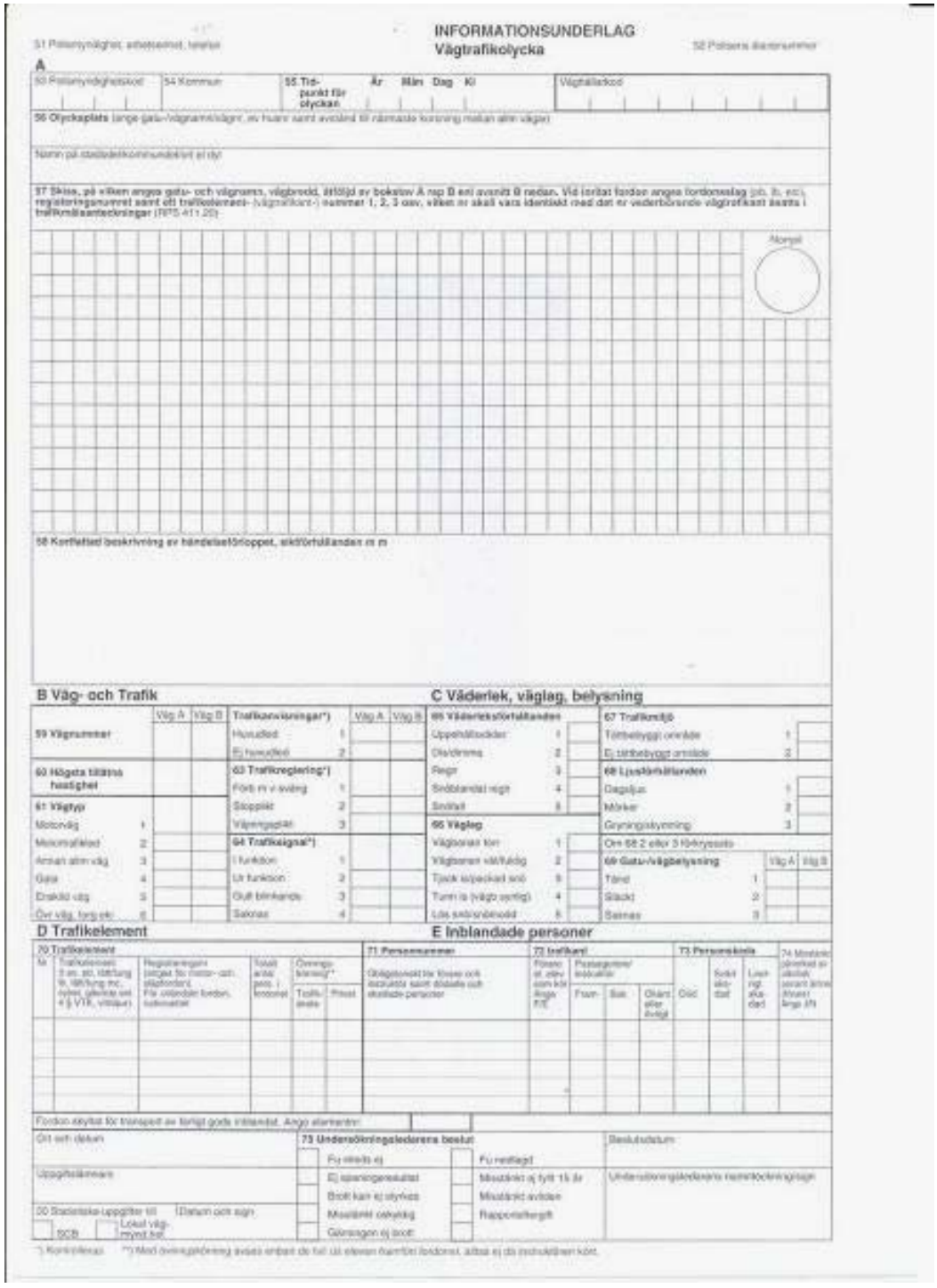
8 Hydén, Ch., Jotoft, H., Löfgren, E., Risser, R., Utvärdering av Vägverkets djupstudie- och OLA-arbete, Bulletin 228, Lund Tekniska Högskola, Institutionen för Teknik och Samhälle, Trafik och väg, Lund 2005
9 Årsredovisning avseende räkenskapsåret 2005 för Statens haverikommission, Dnr A-20/06 2006

Transport
Project co-financed by the European Commission, Directorate-General Transport and Energy

Annex A Accident Data Collection procedures in Sweden



Annex B Police form “Informationsunderlag Vägtrafikolycka”



INFORMATIONSUNDERLAG
Vägtrafikolycka

A

55 Tid-punkt för olyckan: År Mån Dag Kl

56 Olycksplats

57 Skiss, på vilken angivs gatu- och vägnamn, vägbredd, åtföljd av bokstav A resp B enl avsnitt B nedan. Vid ortsat fordon angivs fordonsslag (pb, lb, etc), registreringsnummer samt ett trafikelement- (vägmarkant-) nummer 1, 2, 3 osv, vilken nr skall vara identiskt med det nr vederbörande vägtrafikant avsatts i trafikmiljöanteckningar (RPS 411:20)

Norrut

58 Kortfattad beskrivning av händelseförloppet, skadeförhållanden m m

B Väg- och Trafik

59 Vägnummer — Väg A / Väg B

60 Högsta tillåtna hastighet

61 Vägtyp: Motorväg 1; Motorvägsliknad 2; Annan allm väg 3; Gata 4; Enskild väg 5; Övr väg, torg etc 6

Trafikanvisningar*): Huvudled 1; Ej huvudled 2

63 Trafikreglering*): Förb m v sväng 1; Stopplikt 2; Väjningsplikt 3

64 Trafikmiljö*): I funktion 1; Ur funktion 2; Ouft blinkande 3; Saknas 4

C Väderlek, väglag, belysning

65 Väderleksförhållanden: Uppehållsväder 1; Dis/dimma 2; Regn 3; Snöblandat regn 4; Snöfall 5

66 Väglag: Vägbanan torr 1; Vägbanan våt/fuktig 2; Tjock isl/packad snö 3; Tunn is (vägb synlig) 4; Lös snö/snöblandad 5

67 Trafikmiljö: Tättbebyggt område 1; Ej tättbebyggt område 2

68 Ljusförhållanden: Dagsljus 1; Mörker 2; Gryning/skymning 3

Om 68:2 eller 3 Körkrysselo

69 Gatu-/vägbelysning — Väg A / Väg B: Tänd 1; Släckt 2; Saknas 3

D Trafikelement

70 Trafikelement — Nr; Trafikelement (t ex, str, tätbefolkat, lb, lätt/tung mc, cykel, gående vid 4 § VTK, viltdjur); Registreringsnr (anges för motor- och släpfordon). För utländskt fordon, nationalitet; Totalt antal pers. i fordonet; Ömmings-klassig*: Tryck-skada, Priset

71 Personnummer — Obligatoriskt för klosser och skadade samt dödade och skadade personer

72 Inkl kön* — Förare; Passagerare/ bilbarn: Fram, Bak, Okänt eller övrigt

73 Personskada: Död; Svårt skadad; Lätt sig. skadad

74 Misstänkt påverkad av alkohol, narkotika, läkemedel eller lättflyktiga ämnen

Fordon skyltat för transport av farligt gods inblandat. Ange klassnr:

Ort och datum

Upprättelsemans

Ev Statistiska uppgifter till SCB; Datum och sign; Lokal väg-myndighet

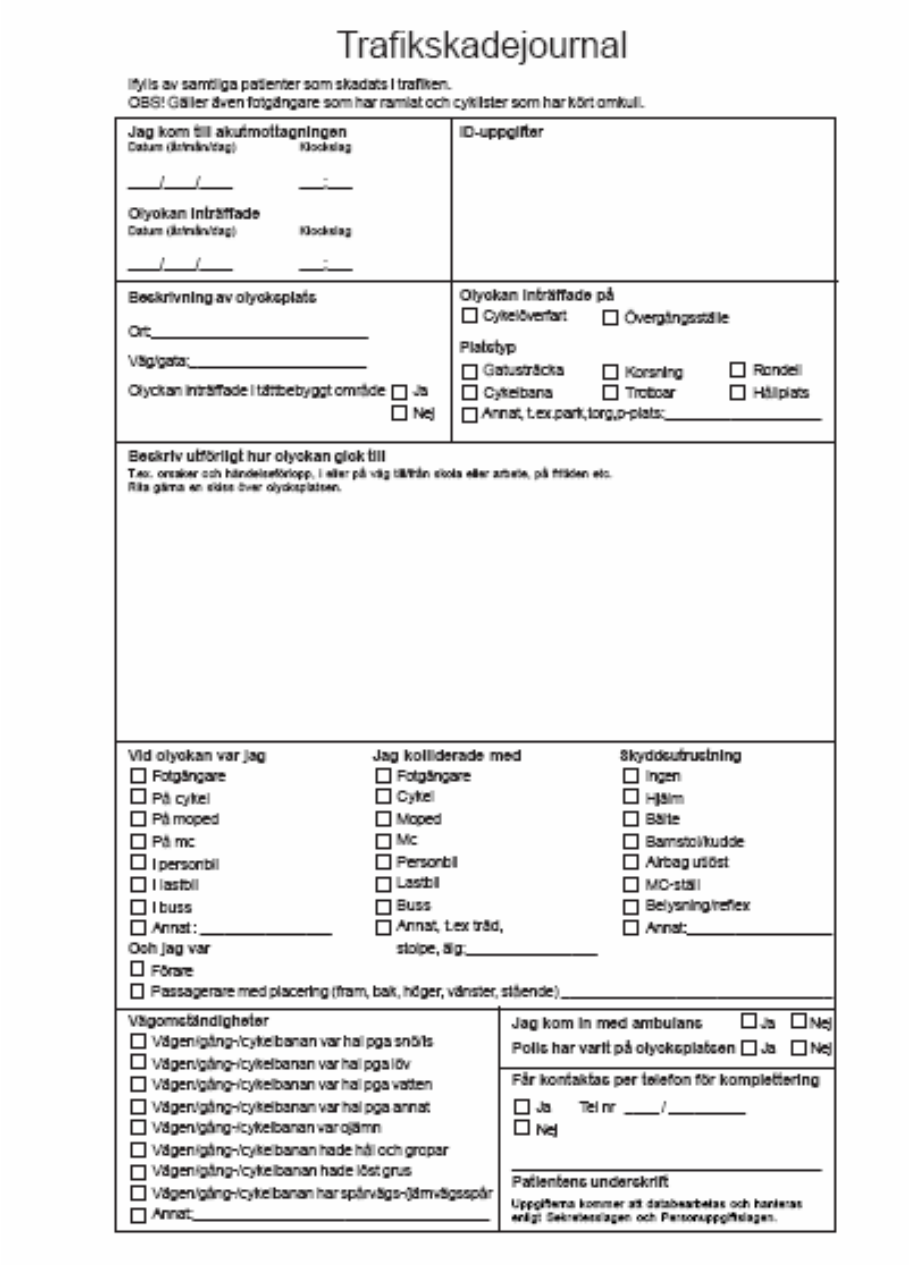
73 Undersökningsledarens beslut: FU inleds ej; FU nedlagd; Ej spaningsresultat; Misstänkt ej fyllt 15 år; Brott kan ej utredas; Misstänkt avliden; Misstänkt oskyldig; Rapporthelhet; Gärningen ej brott

Beslutsdatum

Undersökningsledarens namnförtydligande

*) Kombinerbara **) Med överkryssning avses enbart de fall då eleven framför fordonet, alltså ej då instruktören kör.

Annex C Emergency Hospital Traffic Accident Injury Journal



Trafikskadejournal

Ifylls av samtliga patienter som skadats i trafiken.
OBS! Gäller även fotgängare som har ramlat och cyklister som har kört omkull.

Jag kom till akutmottagningen
Datum (år/mån/dag) Klockslag
____/____/____ __:__

Olyckan inträffade
Datum (år/mån/dag) Klockslag
____/____/____ __:__

ID-uppgifter

Beskrivning av olycksplats
Ort:_____
Väg/gata:_____
Olyckan inträffade i tättbebyggt område ☐ Ja ☐ Nej

Olyckan inträffade på
☐ Cykelöverfart ☐ Övergångsställe

Platstyp
☐ Gatusträcka ☐ Korsning ☐ Rondell
☐ Cykelbana ☐ Trottoar ☐ Hållplats
☐ Annat, t.ex park,torg,p-plats:_____

Beskriv utförligt hur olyckan gick till
T.ex. orsaker och händelseförlopp, i eller på väg till/från skola eller arbete, på fritiden etc.
Rita gärna en skiss över olycksplatsen.

Vid olyckan var jag
☐ Fotgängare
☐ På cykel
☐ På moped
☐ På mc
☐ I personbil
☐ I lastbil
☐ I buss
☐ Annat: _____

Jag kolliderade med
☐ Fotgängare
☐ Cykel
☐ Moped
☐ Mc
☐ Personbil
☐ Lastbil
☐ Buss
☐ Annat, t.ex träd, stolpe, dig:_____

Skyddsutrustning
☐ Ingen
☐ Hjälm
☐ Bälte
☐ Barnstol/kudde
☐ Airbag utlöst
☐ MC-ställ
☐ Belysning/reflex
☐ Annat:_____

Och jag var
☐ Förare
☐ Passagerare med placering (fram, bak, höger, vänster, stående):_____

Vägomständigheter
☐ Vägen/gång-/cykelbanan var hal pga snöfs
☐ Vägen/gång-/cykelbanan var hal pga löv
☐ Vägen/gång-/cykelbanan var hal pga vatten
☐ Vägen/gång-/cykelbanan var hal pga annat
☐ Vägen/gång-/cykelbanan var ojämn
☐ Vägen/gång-/cykelbanan hade hål och gropar
☐ Vägen/gång-/cykelbanan hade löst grus
☐ Vägen/gång-/cykelbanan har spårvägs-/järnvägsspår
☐ Annat:_____

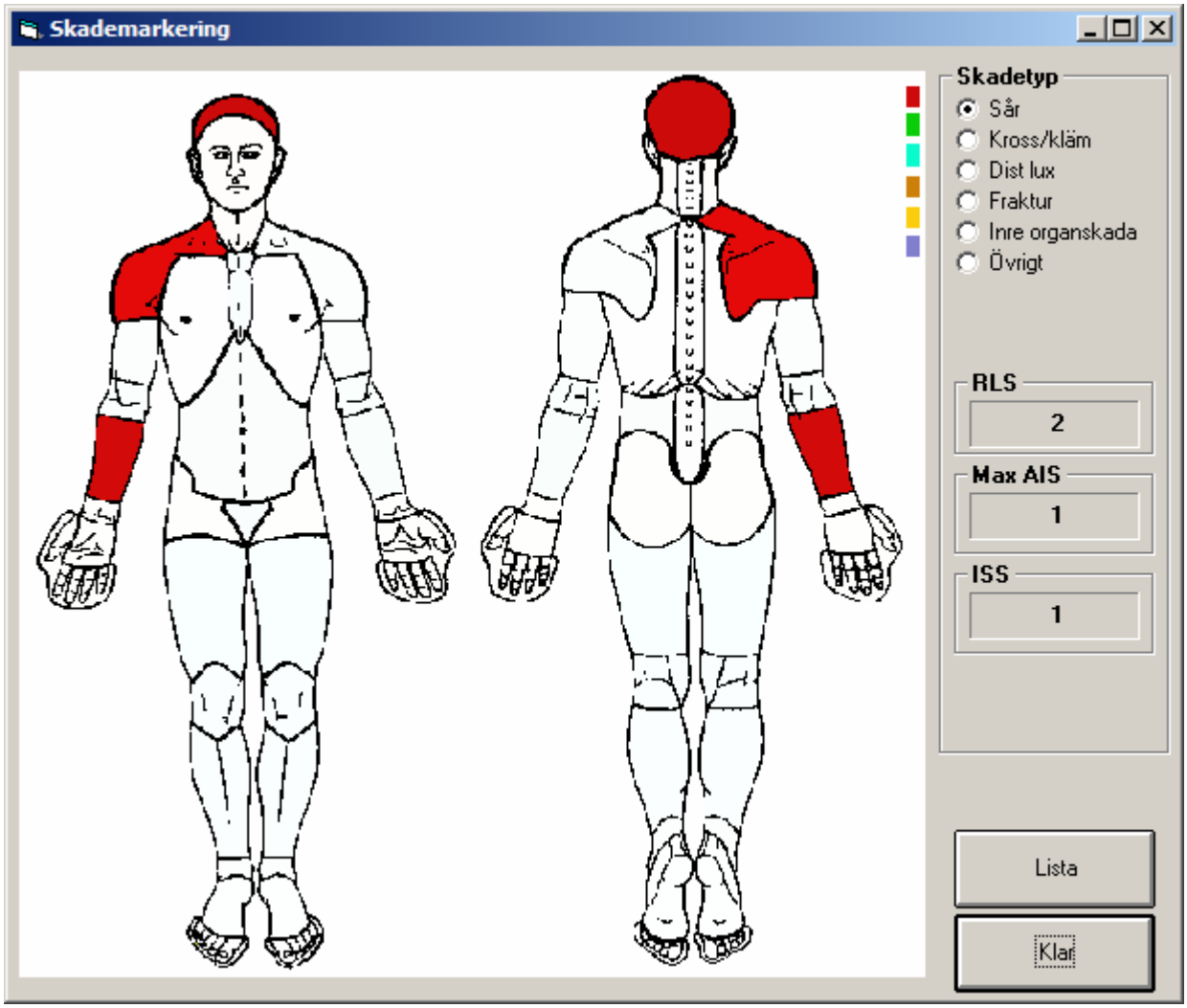
Jag kom in med ambulans ☐ Ja ☐ Nej
Polis har varit på olycksplatsen ☐ Ja ☐ Nej

Får kontaktas per telefon för komplettering
☐ Ja Tel nr ____/_____
☐ Nej

_____
Patientens underskrift

Uppgifterna kommer att databearbetas och hanteras enligt Sekretesslagen och Personuppgiftslagen.

Annex D Input of the Specific Injuries in STRADA Medical Care



Annex E Variables for the SRA's Fatal Accident In-depth Studies

Accident Data

- Accident Type
  - Single, meeting, passing, rear-end, turning, crossing, bicycle, pedestrian, wildlife and other
- Date Time and Place of Accident
  - Date, time, county, municipality, city
- Accident Description
  - Short description of the chain of events and the collision events

Vehicle Data

- Vehicle type
  - Passenger car, truck, bus, MC, moped, bicycle, trailer or other type of vehicle
- Make, model, model year
- Trailer
  - make, model model year
- Owner of vehicle
  - Private, company, etc.
- Mechanical failure
  - Describes the vehicles possible failures (Police mechanical inspection)
- Cargo
- Load Path
  - PDOF Principal Direction of Force
- Vehicle Deformation
  - Exterior; front, right, rear, left, top, undercarriage
  - Interior; driver, passenger front, passenger back
- Safety Belt System
  - Type, pretensioner, functionality
- Other Protective Systems
  - Front airbag, side airbag, inflatable curtain, functionality
- Tyres
  - Type, manufacture, dimension, summer/winter tyre, tread
- Tachograph
- Foreign registered vehicle
  - Country, VIN, weight, body type

Road User Data

- Road-user Category
  - Driver, passenger front and/or back, motorcycle, moped, bicycle, tractor, pedestrian.
- Placement in vehicle
- Age and Sex
- Injury Severity
  - Fatally, serious, slight, non injured(according to the police)
- Description of injuries
- Cause of Injury
  - Impact, penetration, acceleration, entrapment, ejection, drowning, fire
- Natural Death/State of Ill-health
- Suspicion of Suicide
- Medication
- Alcohol and Drugs
- Protective Systems, Usages and Function
  - Restraint system, child restraint system, helmet,
- Classification
  - Excessive force (road-user did there best to prevent the accident)
  - Excessive risk (no safety belt, no helmet etc.)
  - Beyond system restriction (road-user consciously and seriously violated regulations)
- Evacuation, Rescue and Medical Care
  - Evacuation problems due to vehicle
  - Entrapment
  - Ambulance times; alarm, arrive at scene, leave the scene with patient, arrival to hospital
- Type of Travel
  - Private, to or from work, commercial traffic etc.

Accident Scene and Surroundings

- GPS coordinates
- Environment
  - Urban/rural area
- Speed Limit
  - Permanent, temporary
- Light and weather conditions and state of the road
- Vehicle Trajectory
  - Yaw marks, brake marks, roll-over, collision angle, etc.
- Point of impact/s and impact objects

  - Multiple collisions, kind of object, distance to road-object, etc.
- Roll-over/pitch
- Road type
  - Description, junction, geometry, width of road and recovery zone, drop-off, camber, elevation, road material, deformations, AADT, visability etc.
- Roadside area
  - Description of the roadside area, road equipment, slope gradient, ditches
- Road equipment
  - Description, signs, signals, road markings
  - Road restraint system, type and function