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Consolidated Resolution on Road Traffic (R.E.1):
Multi-Disciplinary Crash Investigation (MDCI)

Consolidated Resolution on Road Traffic (R.E.1)

Multi-Disciplinary Crash Investigation (MDCI)

Revision 3

Submitted by the Governments of Finland and Sweden

This document aims to amend Consolidated Resolution on Road Traffic to include multidisciplinary crash investigations. It is proposed to insert it into the R.E.1 as Chapter 17.

Chapter 17

Multi-Disciplinary Crash Investigation (MDCI)

17.1 Context

17.1.1 Crash investigations and resulting countermeasures

(a) One common approach to road safety is mainly based on a premise where individual road users are solely responsible when crashes occur. This view has been enabled by, and is in turn constitutive of, findings claiming that human error is the cause of approximately 95 per cent of road crashes.

(b) An important contribution to these findings is that crash investigations historically have followed a model based on the assumption that "human error" caused the mishap. Crash investigations have focused on the personnel closest to the mishap in order to find the "root cause" of the crash. That has lead to the incorrect conclusion that improving road user behaviour is the most effective road safety strategy and hence measures has primarily been sought in persuading road users to adopt error-free behaviour. Such measures often consist of legislation, information, education and police surveillance.

(c) To be able to take effective road safety measures it is however of utmost importance not only to rely on statistical figures and analyses or investigations to apportion blame and liability to identify road safety measures. There is a need to also seek a deeper understanding of the underlying and contributing factors of the road safety problems to identify effective countermeasures.

(d) Further there is a growing awareness among traffic safety professionals that a multidimensional systems approach is required today to effectively address road safety issues. Instead of focusing on one element of traffic safety in isolation (engineering, enforcement or education), there is a need to build bridges and relationships between all the elements that influence road safety, and to understand how the various elements affect each other at all times.

(e) The systems approach focuses on the relationships and dependencies between the various individual elements of the traffic system and the organisational levels which influence those relationships. For that reason there is a need to engage different competences in the work of investigating road traffic crashes in order to look at them from different systemic angles.

(f) It cannot be stressed enough that the objective of MDCI is to prevent crashes or their consequences – not to apportion blame or liability. For that reason a very clear boundary between MDCI:s and investigations to distribute legal responsibility must be created. If not, there is a great risk that the information flow to the investigators will be seriously hampered if the involved parties suspect that the information will be used for liability matters. (see 17.6.1)

(g) It must also be stressed that MDCI is not another or different tool for collecting statistical data about the magnitude of a road safety problem and its prevalence in time and space. Such data is of course valuable for many reasons, e.g. identifying and prioritizing problem areas, but will seldom give any detailed information about the contributing and underlying factors which is necessary to understand why the crashes and injuries occur. Instead it is a valuable tool to get a deeper understanding of the underlying crash and injury mechanisms of a limited number of crashes, e.g. a certain type of crashes. (see 17.6.1)

17.1.2 Human error approaches

Human error is often defined as unwanted or inappropriate actions leading to an undesired outcome. Broadly, human error models can be categorised as either person models focusing on the errors made at an individual operator level (e.g. driver) or system models focusing on the interaction between wider systemic failures and errors made by individual operators.

17.1.3 The person approach

The person approach focuses upon the errors that operators make when operating in the system. Such errors are seen to emerge from psychological factors in individuals such as aberrant mental processes, including forgetfulness, inattention, poor motivation, carelessness, negligence and recklessness. Error management based on the person approach is focusing on countermeasures aiming at reducing variability in human behaviour through e.g. legislation, enforcement training, education and information campaigns.

17.1.4 The systems approach

System approach models treat human error as a systems failure, rather than solely an individual operator´s failure. These models consider the presence of system wide latent conditions and their role in shaping the context in which operators make errors. Unlike the person approach, human error is no longer seen as the primary cause of crashes. Instead it is treated as a consequence of latent failures created by decisions and actions at all levels in a system (e.g. government, local authorities, organisations/companies and their different management levels).

In principle at least, the systems perspective approach is now the dominant approach in most safety critical domains where it is often denoted Human Factors or MTO (Man, Technology and Organisation). Current road safety approaches in large parts of the world is based on “Vision Zero” or “Safe System Approach”, two expressions of an identical policy which is built on a systems perspective approach.

17.1.5 Crash investigation in relation to human error approaches

It must be understood that the outcome of an crash investigation and hence the precondition of MDCI to become an effective tool for road safety work is very much depending on the approach to human error. The approach fundamentally forms the basis for the investigation and analysis and hence constitutes which data should be collected. Another important precondition is that those conducting the collection and analysis of crash data and information are competent and understand these working conditions.

17.2 A framework of MDCI

17.2.1 General approach

(a) It is important to establish the fact that MDCI is not a detailed crash investigation method. First and foremost it is a general approach to crash investigation based on a systems approach to crashes and human error which is described above. Hence there is no detailed operational manual for carrying out the investigation. The purpose here is to give some important guidelines and examples of what to think of when establishing and conducting MDCI:s.

(b) The most paramount question that MDCI should answer is why a crash occurred and also, which is very important to stress, why the consequences became serious. The question why must be asked several times, not only on the human level, but also on the technical (e.g. vehicles and infrastructure) and organisational (e.g. organisations responsible for the building and maintenance of infrastructure, professional transport companies and authorities) levels in order to identify latent conditions and contributing factors to the crash and its consequences. It is of utmost importance to understand these conditions and factors in detail in order to be able to learn from them and consequently identify and implement effective measures with a systems approach. It is not enough if the investigation concludes that the crash occurred because the road user did not follow the rules. Instead it must conclude why the road user did not follow the rules and why the consequences became serious. It is first then effective measures can be taken. A brief example:

(c) A professional driver is driving his truck 70 km/h. The driver falls asleep and drives off the road. The truck hits a rigid lamppost and the driver is killed. Following questions could be asked:

(i) Why did the truck drive off the road? Because the driver fell asleep (many crash investigations end here);

(ii) Why did the driver fall asleep? Because he had volunteered to take an extra shift outside the permitted driving hours even though he was very tired (he needed the money). Another answer to the question could be that the truck was not equipped with a driver alert system. From this answer further questions could be asked which may result in answers showing that vehicle manufacturers do not find economical or other reasons for marketing such devices and politicians or authorities who are not willing to pass laws or regulations stipulating that the manufacturers must install such systems in their vehicles;

(iii) Why was the driver able to take the extra shift? Because the employer did not have a management system or similar to prevent the driver from driving outside the permitted driving hours;

(iv) Why didn´t the employer have a safety management system? Because the legislation does not provide that and hence there is no authority supervision;

(v) Why was a rigid lamppost placed in close proximity to the road? Because the regulations governing the design of the road permitted such design.

(vi) Why did the regulations permit such design? Because the road authorities do not have a systematic way of investigating crashes e.g. as a part of a safety management system.

(vii) Why do the road authorities not need a safety management system? Because politicians are unwilling to pass a law which may increase societal costs.

(d) What can be learned from this crash is that important contributing, indirect or underlying causes can be found on other levels of the system which imply measures other than ones directed towards the direct causes connected to the actual situation and the road user. Informing, educating or punishing drivers will hardly solve the underlying system problems of rigid lampposts in close proximity to roads, employers not taking responsibility for safety of their drivers and politicians not willing to pass laws.

17.2.2 Basic preconditions for MDCI

It is of utmost importance to secure information about occurred crashes. This is particularly important if information and data are going to be gathered on the scene of the crash. Such information can be achieved from the police, emergency services, alarm centres etc. and should be secured by legislation, formal agreements etc.

17.2.3 Access to data sources

Access to different information and data sources related to the crash which are important for the analysis must be secured. Examples of such information and data are driver´s licence data, vehicle data, infrastructure data (technical data about the road and its surroundings), injury data (hospital data, autopsy reports etc.), rescue data, organisational information (e.g. information about the road safety work of the road authorities and buyers and sellers of transports, safety management systems) etc. It is important to establish a long term accessibility through legislation, formal agreements etc. and not only to rely on personal contacts. When it comes to MDCI there may also be a need for establishing new sources. This depends on which information or data that is needed.

17.2.4 Legal aspects

The legal framework in a country may hamper the accessibility to important information for the accomplishment of MDCI. The legislation can be very complex and differ a lot from country to country. Hence it is impossible to give any detailed criteria or advice how to deal with these issues. On a very general level however a piece of advice is the importance of dealing with issues of secrecy and personal privacy~~. Experiences can nevertheless be found in the operational descriptions from Sweden~~ ~~**in annex VIII and Finland in Annex VIII bis.**~~ (moved to17.6.1 (c).

17.3 Conducting MDCI

17.3.1 Investigation method

(a) The outcome of an crash investigation and hence the prerequisite of MDCI to become an effective tool for road safety work is very much depending on the approach to human error. For that reason the investigation method used for MDCI must be based on the systems approach to human error.

(b) There are several specific methods described in the literature which are based on such an approach. Some examples are:

- MTO Analysis (Man, Technology and Organisation);
- AcciMap;
- STAMP;
- FRAM (Functional Resonance Accident Method);
- AEB (Accident Analysis and Barrier Function Method);
- TRIPOD-BETA;

(c) None of these investigation methods are solely developed for road traffic crash investigations. But in some cases, e.g. the MTO Analysis, they could quite easily be adapted and used for MDCI. The details of the different methods and their usability for MDCI will not be further elaborated.

(d) It must also be concluded that the investigation method is not the paramount issue when investigating a crash. Instead it is to apply a systems approach.

17.3.2 Collection of data and information

(a) The operational work to gather data and information and practical tools for that work is rather basic and not specific to MDCI. The preconditions in the form of a systems approach, the specific investigation method used and the crash or crash type of interest very much governs which information and data that are of interest. As mentioned above it is though important to guarantee access to the data and information sources.

(b) Generally a rather large amount of information and data are needed to cover the different levels of the road transport system in which the crashes occur. Hence it is impossible to present a list of detailed information and data which should be gathered to answer all questions for all types of crashes when applying a systems perspective approach. For this reason MDCI is not an effective tool for the analysis of e.g. all crashes in a country. The most effective way to use MDCI is probably for thematic analysis of certain crash types which have been indicated by statistical or quantitative analyses.

(c) An information source which should not be forgotten is testimonies from people (e.g. involved persons, witnesses and experts) collected by interviews or by hearings. Such information is often important in order to be able to answer the question why on different levels of the system.

(d) Further the choice and collection of data and information needs to be as unbiased and as objective as possible. Otherwise there is a risk that the assumptions about the nature of crashes guide the investigation resulting in that it finds what it looks for.

17.4 Analysis of road crashes

17.4.1 Composition of an analysis team

(a) MDCI is based on a systems approach to human error. This means that there is a need for a multidisciplinary team to carry out the crash analysis in order to understand the complex interactions among the components of the transport system leading to crashes and injuries. As a basic requirement the team should consist of at least the following expert competences:

- vehicle mechanics (dynamics and crash properties);
- road design and traffic engineering;
- human factors (HF) and behavioural science;
- medicine (injury mechanisms);
- crash investigation method.

(b) The members of the analysis team should also have very good knowledge and understanding of the systems approach to human error. They must of course also be as independent and objective as possible. The team may also call on other experts depending on the analysis.

17.4.2 Reconstruction and analysis of the crash and its consequences

To be able to analyse why a crash occurred and/or why the injuries arose it is important to understand what happened. Such reconstruction of a crash must be based on factual findings. There are different practical tools for the reconstruction of vehicle paths etc. on the operational level. But it is almost even more important to reconstruct what happened or rather what did not happen on an organisational level (e.g. road authorities, vehicle manufacturers and sellers and buyers of commercial transports). This must also be reconstructed. Further it is important, if possible, to reconstruct the situation which surrounded or framed the assessments and actions of the road users to be able to understand why the road user acted the way he or she did.

17.4.3 Formulation of findings and recommendations

(a) The analysis team has a responsibility to base their findings and recommendations logically on factual data and information. Findings and recommendations must never be based on speculations. If the team form hypotheses which are not covered by the data material they must consider gathering complementary data and information.

(b) The findings and recommendations must further be based on a systems approach to human error. They should therefore be based on the analysis of what happened and especially why it happened, both from a crash and injury perspective, on different levels of the system. It means that they principally should be aimed at system countermeasures which have a documented safety effect on crash or injury reduction.

(c) Countermeasures aimed directly at the road user in order to correct his or her behaviour should only be proposed if there is clear proof that they will have a long term safety effect. In most cases the behaviour and errors are only a symptom of systemic problems that other road users also may be vulnerable to. The underlying, latent system factors which shape the behaviour or contribute to the injury outcome will still remain in the system. It must also be noted that countermeasures on a higher level in a complex, dynamic system often are more stable or resistant to different pathways to crashes.

17.5 Learning from MDCI

(a) The purpose of MDCI is to learn from failure. But one of the most difficult challenges is to spread the lessons learned and get the recommendations implemented in reality and followed up by different stakeholders and organisations in the road transport system. It is not enough to write reports and spread them quite widely to these stakeholders and hope that they will get the message and consequently act according to the recommendations.

(b) The learning must in some way be integrated or internalized in a systematic way in an organisation. This means that there has to be some kind of learning culture in the organisation and preferably learning also should be an integral part of a quality assurance system or safety management system (e.g. ISO 39001, a management system standard for road traffic safety). Probably the most effective way of learning from MDCI is if an organization (e.g. a road authority responsible for designing, building and maintaining road infrastructure) carries out own MDCI:s as a part of a safety management system.

(c) In the railway area in Europe, legislation stipulates that infrastructure providers and railway companies must have a safety management system of which the investigation of crashes and incidents is an integral part. It could be considered to impose such legislation for important stakeholders also in the road transport system.

(d) In several countries there are specific crash investigation authorities which objectively investigate crashes in different areas of society. These authorities often issue recommendations which at least other public authorities must implement and follow up.

(e) Another less legal way to learn from MDCI is to gather different stakeholders, both private and public, to discuss the analysis and findings of a certain crash or type of crashes and how they can contribute to different countermeasures within their field of formal or informal responsibility.

17.6. Recommendations

17.6.1 Regarding MDCI

(a). From a strict safety perspective a crash investigation should be a fact finding activity to learn from the experience of the crash, not an exercise designed to allocate blame or liability.

(b) The emphasis in conducting investigations should be on identifying the underlying causes in a chain of events leading to a crash, the lessons to be learned, and ways to prevent and mitigate similar crashes or injuries in the future. Hence crash investigation should be used to gather information and data to be able to analyse crashes so that the human and system contributions can be identified. The findings **should then be** used to develop measures to ensure that similar crashes do not occur again or that the consequences of them are mitigated or reduced.

(c) MDCI should be used for identifying the direct causes and especially the contributing or underlying factors of the crash and its consequences from a systems approach in order to get enough knowledge for implementing effective risk reducing countermeasures to prevent future crashes or their consequences. **Experiences can nevertheless be found in the operational descriptions from Sweden in annex VIII and Finland in Annex VIII bis.**

(d) The outcome of an crash investigation and hence the precondition of MDCI to become an effective tool for road safety work is very much depending on the approach to human error. MDCI should hence take its starting point in a human error approach based on a systems approach, e.g. the Safe System approach or other contemporary Human Factors models. (see para ex 10)

~~It cannot be stressed enough that the objective of MDCI is to prevent crashes or their consequences – not to apportion blame or liability. For that reason a very clear boundary between MDCI:s and investigations to distribute legal responsibility must be created. If not, there is a great risk that the information flow to the investigators will be seriously hampered if the involved parties suspect that the information will be used for liability matters~~. (moved to paragraph 17.1.1 (f))

~~(d) It must also be stressed that MDCI is not another or different tool for collecting statistical data about the magnitude of a road safety problem and its prevalence in time and space. Such data is of course valuable for many reasons, e.g. identifying and prioritizing problem areas, but will seldom give any detailed information about the contributing and underlying factors which is necessary to understand why the crashes and injuries occur.~~ (moved to paragraph 17.1.1 (g))

(**e) Different competences should be engaged in the work of investigating road traffic crashes in order to look at them from different systemic angles.** (see para ex 5)

(f) To ensure access to information about occurred crashes, information collected by the police, emergency services, alarm centers, etc. there may be a need to secure this by legislation or formal agreements. (see para ex 18)

(g) Access to different information and data sources related to the crash which are important for the analysis should be secured e.g. driver´s licence data, vehicle data, infrastructure data (technical data about the road and its surroundings), injury data (hospital data, autopsy reports etc.), rescue data, organisational information (e.g. information about the road safety work of the road authorities and buyers and sellers of transports, safety management systems) etc. (see para ex 19)

(h) The issue of data secrecy and processing of information relating to personal privacy should be subject to special attention. (see para ex 20)

(i) A thematic analysis of certain crash types which have been indicated by statistical or quantitative analyses could be preferred to an analysis of all crashes. (see para ex 26)

(j) The choice and collection of data and information should to be as unbiased and as objective as possible. (see para ex 28)

17.2.6 Regarding the analysis of road crashes

(a) The crash analysis team should be composed of experts with expertise indifferent domains (vehicle mechanics; road design and traffic engineering; human factors and behavioural science; medicine; crash investigation method etc.). (see para ex 29)

(b) The members of the analysis team should also have very good knowledge and understanding of the systems approach to human error. (see para ex 30)

(c) The analysis team should only base its findings and recommendations on factual data and information. *(*see para ex 32)

(d) The findings and recommendations should be based on a systems approach to human error and principally should be aimed at system countermeasures which have a documented safety effect on crash or injury reduction. (see para ex 33)

(e) Countermeasures aimed directly at the road user in order to correct his or her behaviour should only be proposed if there is clear proof that they will have a long term safety effect. (see para ex 34)

17.6.3 Regarding learning from MDCI

(a) The follow-up to the multidisciplinary investigations should be to communicate the lessons learned from these investigations, work towards the effective implementation of the recommendations and their implementation by the various parties and organizations of the road transport system. (see para ex 35)

(b) The learning should be integrated or internalized in a systematic way in an organisation and should be an integral part of a quality assurance system or safety management system (e.g. ISO 39001, a management system standard for road traffic safety). *(*see para ex 36)

(c) It should be considered in the field of road transport system the implementation of safety management systems as already exists in the field of European railways. (see para ex 37)

Annex VIII

Multi-Disciplinary Crash Investigation (MDCI) in Sweden

(see Chapter 17, Recommendation 17.6.1 (c))

1. In Sweden MDCI is called In-depth studies (reference to this name will appear in the text) and have been conducted by the Swedish Transport Administration (STA, formerly the Swedish Road Administration), on all fatal road traffic crashes in Sweden since 1997. The main focus of the In-depth studies is to increase insight how to prevent fatalities in the road transport system.

2. All analyses are based upon the possibilities for the designers and professional users of the system to create a safe road transport system. The basic idea is that there must have been a flaw in the system causing the fatality if a fatal injury has occurred. A flaw in the system is deemed as a deviation from a safe road transport system. Such a deviation could

be:

(a) A circumstance where a condition considered a precondition for safety is not fulfilled, e.g. not using a seat belt, hence being thrown out of the vehicle and sustaining fatal injuries. The reason for the specific deviation in the system needs to be handled to increase safety. In this case the deviation not using a seat belt shows a system that allows use without complete safety which indicates that a measure needs to be taken to prevent further similar system failures;

(b) A circumstance where all preconditions for safety are fulfilled in the system, e.g. a belted and sober driver who are keeping the speed limit in a safe car on a safe road, but still sustains fatal injuries. It is then obvious that the system is not as safe as considered and that the preconditions must be revised.

3. Deviations from the preconditions for the safe system design that cause fatalities can be found when analyzing a single crash or multiple crashes of a similar type. The collected data and information may therefore be analysed both on an individual (single crash) and aggregated (multiple crashes of a similar type) level to find these deviations causing fatalities. By implementing recommendations from the In-depth studies the preconditions for what is considered a safe road transport system design is altered and pushed to a higher level of safety.

4. This **annex w**ill here after follow the structure presented in the framework for MDCI and consist of six sections, where each section includes:

(a) A general part, ~~in “normal font”~~, that show the basic routines **and work conducted regarding In-depth studies in Sweden;**

(b) A part with examples~~, in “italic font”,~~ that show how MDCI was used in four specific cases:

(i) where case 1 and 2 show how MDCI can be a part of an organizations quality management system; and

(ii) case 3 and 4 show how MDCI can be a successful tool for encouraging stakeholders to act.

5. The following cases will be used:

Case 1 – Concrete pillar within the deformation zone of a crash barrier

6. A young woman loses control of her vehicle after overtaking another car on a highway, causing it to skid into the median barrier. As she tries to recover control over the car it skids over the driving lanes into the side barrier. The car crashes into and penetrates the side barrier and hits a concrete pillar behind the barrier. The woman sustained severe injuries and died 2 weeks later.

Case 2 – Barrier failure

7. A vehicle collides with the median barrier, causing the barrier to be pushed down and run over. One of the barrier pillars hooks on to the vehicle´s undercarriage and makes it airborne for a short period of time, during which the roof of the car collides with a lamp post and the driver is thrown out of the car. The driver is subsequently killed due to being crushed between the car and the barrier. Shortly thereafter the car comes to a hold against a section of the median barrier away from the initial collision.

Case 3 – Airbag did not inflate

8. A vehicle run off the road in high speed and moves some 50 meters in the road side area before colliding with a stone wall. In the collision the driver is thrown forward and up towards the roof at the same time as the front end of the vehicle is pushed inwards towards the driver. The driver is killed immediately due to the injuries sustained in the impact.

Case 4 – Stakeholder cooperation

9. A truck-driver turns right in an intersection located in an urban area. The truck driver hits and knocks a bicyclist over. Subsequently, the bicyclist is run over by the truck. Due to repeated crashes between bicyclists and trucks with a similar pattern, the STA invited a number of stakeholders to participate in a joint process to find effective measures.

10. The joint process was divided into three meetings:

(a) Meeting #1 was focused on informing the participating stakeholders on the issue by introducing the facts derived from the In-depth studies.

(b) Meeting #2 was a follow-up meeting on meeting #1. The stakeholders have had a chance to reflect on the stated facts and were encouraged to introduce and discuss possible measures.

(c) Meeting #3. During the final meeting the stakeholders would state their intentions to take measures within their area of responsibility in relation to the information gained during meeting #1 and #2.

11. The method of working is called “OLA” (which is a Swedish abbreviation for Objective findings-Solutions-Intentions) and was introduced in 2006 to invite more stakeholders to take part in the road safety work. The method is based on facts derived from the In-depth studies. Findings by the analysis team are introduced to the stakeholders. They on their part form a team that analyse what measures can be implemented to prevent the chain-of-events leading to the fatal outcomes of the crashes.

I. Access to information sources of crash occurrence

12. The In-depth studies rely on two major information sources to get knowledge of the occurrence of a fatal crash; regional traffic control centres and the police. Regional traffic control centres act in cooperation with the emergency service centre in the same region and

notifies crash investigators by sending a pre-set text message to the crash investigators mobile phone.

13. Not every fatality is determined at the crash site, nor do all fatalities occur at the crash site. For that reason there is a need for a second central information channel (the police) to STA. Information from the police about road traffic fatalities is routinely sent to the STA by fax as soon as possible after the fatality is known. The information is a standard document that is filled in by the police after every road traffic crash (regardless if there are fatal, serious or slight injuries).

14. Both information channels are secured through signed agreements between the police and the STA as well as regional traffic control centres and the STA.

Case 1 – Concrete pillar within the deformation zone of a barrier

15. The first indication came directly from the police a couple of hours after the crash. Through his contacts within the police force the officer was able to contact the STA crash investigator and could report a suspicion that the side barrier had not worked as it was supposed to (as the car had been able to deflect the barrier and to such extent that it crashed into a concrete pillar in close proximity to the barrier). When the female driver died two weeks later the police sent the information about the crash in accordance with the agreement between the STA and the police.

Case 2 – Barrier failure

16. The police sent the information about the crash in accordance with the agreement between the STA and the police.

Case 3 – Airbag did not inflate

17. The police sent the information about the crash in accordance with the agreement between the STA and the police.

Case 4 – Stakeholder cooperation

18. After each crash, the police sent the information about the crash in accordance to the agreement between the STA and the police. Crash investigators quickly identified the crashes between trucks and bicyclists as an issue to address in an OLA-process where it was introduced.

19. The STA and the crash investigator then acted as an information source when the stakeholders were assembled.

II. Access to data sources and collection of data and information

20. The crash investigator routinely collects data from:

(a) The police: As a first step an initial report is sent with information about the crash site and the vehicle(s) involved in the crash are located. At a later stage the police investigation is sent to the STA. Data is transferred between the police and the STA through an agreement between the two authorities. STA crash investigators also keep in contact with the police through the entire investigation;

(b) The National Board of Forensic Medicine: For legal reasons, an autopsy is generally performed on each person killed in a road traffic crash. In the vast majority of cases, a forensic toxicology test is performed for the same reason. The autopsy and forensic toxicology test is included in the police investigation. The STA has also established direct contact to allow a direct exchange of information between the two authorities;

(c) The crash site: The crash investigator collects data on the crash site after the rescue operation is finished. Normally the investigator collects crash site data within 5 days of the crash. During the examination of the crash site the investigator collects data about parameters that are regarded as important to the crash investigation. However a set certain of parameters must always be collected;

(d) The Swedish Transport Agency: This authority has overall responsibility for registers of vehicles and driving licenses in Sweden. The crash investigators has direct access to and can collect data and information directly from a database kept by the agency;

(e) The vehicle: The crash investigator collects data about the vehicle. During an examination of a vehicle the investigator collects data that is considered important to the crash investigation. However a set certain of parameters must always be collected;

(f) The Swedish Transport Administration: Information needed about roads is supplied through personal contacts and databases within the organization. The contacts may also be involved in the analysis team at a later stage;

(g) The rescue service: The rescue service has access to primary information about the rescue operation and photos of the crash site. Mainly, the investigator collects this data through direct contacts with the rescue service.

21. Other data sources are possible to use depending on relevance and if cooperation in the specific case is possible. Examples of such data sources are:

(a) The manufacturer of the specific vehicle involved in the crash;

(b) The road authority (if not the STA) in the form of a municipality or privately owned road open for public traffic.

Case 1 – Concrete pillar within the deformation zone of a barrier

22. The crash investigator used all mentioned data sources. However, some data sources were more crucial to the case.

23. Information from the police arrived first which made it possible to locate and examine the vehicle. Due to the fact that the crash site was a part of a high-density highway, the crash site was restored before the crash investigator had time to examine it. The crash investigator visited the crash site at a later stage of the investigation and received important data and information from the police and the rescue service as well as persons employed by the STA to reconstruct the crash site. Information collected from the National Board of Forensic Medicine gave an important insight how the young woman had sustained the injuries that caused the fatality. In addition to the standard data collected, the crash investigator collected data and information specifically about the side barrier and road side area.

Case 2 – Barrier failure

24. The crash investigator used all mentioned data sources. However, some data sources were more crucial to the case.

25. Information from the police arrived first which made it possible to locate and examine the vehicle. While examining the vehicle, the crash investigator found that the median barrier had attached to the undercarriage of the car. Due to the fact that the crash site is a part of a highway, the crash investigator had difficulties to access the location of the crash and contacted the persons employed by the STA to reconstruct the crash site to

gain the data and information needed about the crash site. At this time the crash investigator learns about the median barrier and acknowledges that it could have been a factor. Subsequently, the crash investigator contacted experts on barriers within the STA to gain further knowledge about the specific type of barrier used. The crash investigator also contacted road maintenance personnel of the STA for further information about the ground conditions.

Case 3 – Airbag did not inflate

26. The crash investigator used all mentioned data sources. However, some data sources were more crucial to the case.

27. Information from the police arrived first which made it possible to locate and examine the crash site and the vehicle. During the examination of the crash site the crash investigator learned through additional contacts with the police that the police had strong indications that the fatality was the result of a suicide. The crash investigator continued to collect data and information and examined the crash site carefully. When the crash investigator examined the vehicle he found that the airbags did not inflate during the crash. Through vehicle experts in the STA the crash investigator was able to contact the vehicle manufacturer. This lead to a joint examination with vehicle manufacturer, which enabled the crash investigator to gain further information and knowledge about the crash.

28. The autopsy later show that the airbags most likely could not have prevented the fatality in this case.

Case 4 – Stakeholder cooperation

29. In each of the fatalities caused by the specific crash type the crash investigators used all the data sources. However, some data sources were more crucial to the cases.

30. In the cases of crashes between right-turning trucks and bicyclists, police data and information were particularly important as the truck normally did not have any traces of the crash when the crash investigator is able to examine it. The witness reports taken by the police were also important to the crash investigator. The crash site and the vehicles were then examined. The autopsy normally confirmed the suspicion that the bicyclist had been run over.

31. Data and information from the crash investigation then served as the data source used for the stakeholders’ cooperation group.

III. Legal aspects

32. In Sweden, it is possible for authorities to share data and information through the principle of public access. The principle entitles the general public to access official documents. Documents that are received or sent out by the Government Offices and other government agencies, e.g. letters, decisions and inquiries, usually constitute official documents .The principle also grants officials and others working in central government, municipalities, agencies, etc. to have freedom of communication. This means that, with some exceptions, that the STA is enabled to cooperate with important stakeholders, as the police, the rescue service, etc. However, the communication must be done in accordance with the laws on confidentiality.

33. To be able to receive data and information about use of drugs and alcohol or other information that could be of harm to a person’s integrity, the STA also has been ensured further confidentiality through a paragraph in the law on confidentiality.

IV. Investigation method

34. The In-depth studies are a part of a safe system approach and use the principles of Vision Zero as a foundation for the investigation method. As mentioned in the introduction the purpose of the investigations to find flaws in the transport system causing the fatalities. Flaws are compared with a model for safe road traffic, which is defined by the principles in Vision Zero. The model describes, from a system perspective, the way a number of factors interact in order to achieve safe road traffic. The starting point of the model and the prerequisite for a safe journey is the psychological and physical conditions and limitations of the human being. The main limiting factor is human ability to withstand external violence, which can be considered given and constant. The passive safety, or injury mitigation capability of the system, is determined by the safety standard of the vehicles and the roads/streets added together. The total injury mitigation capacity of these components determines the safe speed of the system. If a higher speed is desired, the safety performance of vehicles, roads/streets and/or road user must be increased. Deficiencies in the system design must be compensated by a lower speed.

V. Composition of an analysis team

35. The guidelines for the In-depth studies conducted by the STA state which competences that should be included in the analysis team. Competences could be retrieved both internally (within the STA) and externally (other stakeholders). Experts that always are included in the analysis team, due to the aim of the In-depth studies, are:

(a) An crash investigator. In most cases the investigator/investigators who conducted the investigation;

(b) A road safety expert. The expert represents specific knowledge of road safety issues;

(c) A road designer, or a similar expert with general knowledge of a technical aspects as well as its safety features and safety performance;

(e) A vehicle engineer, or a similar expert with general knowledge technical aspects as well as its active and passive safety features;

(f) A behavioural scientist, or a similar expert with good knowledge about human factors;

(g) A physician, or a similar expert with a good knowledge about human physical conditions to sustain collision forces as well as how drugs, age, illnesses, etc. affect a person´s precondition to act safely within the system boundaries;

36. Other competences may be included if needed, e.g. the police, the rescue service, pathologists, road maintenance, road regulations, etc. General competences involved in a pre-investigation analysis could also be included in the analysis team.

Case 1 – Concrete pillar within the deformation zone of a barrier

37. In addition to the expertise always included in the analysis team, an expert within the road maintenance area and a person within the unit that plans investments in the road infrastructure were included in the analysis team.

Case 2 – Barrier failure

38. In addition to the expertise always included in the analysis team, an expert within the road maintenance area was included in the analysis team.

Case 3 – Airbag did not inflate

39. In addition to the expertise always included in the analysis team, no other expertise was used. (The vehicle manufacturer's expert involved in the vehicle examination was invited but was not able to take part.)

Case 4 – Stakeholder cooperation

40. An analysis have been made following every crash investigation between a truck and a bicyclist. In addition to the expertise always included in the analysis team, expertise of some of the involved vehicle manufacturers have been used.

41. The stakeholder cooperation group have among others included; vehicle manufacturers, representatives of municipalities, the police and trucking organizations.

VI. Reconstruction and analysis of the crash and its consequences

42. All conclusions made by the analysis team must be derived from facts. The objective of the analysis team is to:

(a) Reconstruct the most probable chain of events in the pre-crash, crash and post-crash phase of the crash;

(b) Conclude which factors contributed to the fatal injury. If possible also conclude which factors contributed the crash occurrence;

(c) Suggest possible measures to "break the chain of events".

Case 1 – Concrete pillar within the deformation zone of a barrier

43. In this description only the part of the reconstruction relevant for the findings and conclusions is included:

(a) After the initial collision the car crosses all three driving lanes (all in the same direction as the crash occurred on a highway). The car drifts into the side barrier almost head on. Behind the barrier, within the deformation zone of the specific type of barrier, a bridge pillar made of concrete is located. It is concluded that the deformation zone between the side barrier and the concrete pillar is too small which causes the car to crash head on with the pillar;

(b) The combination of the crash between the car and the side barrier at a large angle and the concrete pillar being located in the deformation zone causes the fatal injury. It is also concluded that a similar chain of events is possible even if the collision angle with the side barrier is smaller;

(c) Possible measures are presented in "Formulation of findings and recommendations".

Case 2 – Barrier failure

44. In this description only the part of the reconstruction relevant for the findings and conclusions is included.

(a) As the car crashes with the median barrier, it is pushed backwards and down because the soil is too soft to keep the barrier pillars in place. As the barrier is pushed down one of the pillars is pulled up out of the ground and connects to the undercarriage of the car. The barrier is torn from the next couple of pillars. After travelling a couple of meters with the pillar and barrier connected to the undercarriage the car is thrown into rotation when the barrier finally holds to the pillars. At this time the driver is thrown halfway outside of the car;

(b) When the car again crashes with the median barrier the driver is caught between them and crushed. The driver is subsequently drawn completely out of the car. It is determined that the driver had not been wearing a seat belt;

(c) Possible measures are presented in “Formulation of findings and recommendations”.

Case 3 – Airbag did not inflate

45. In this description only the part of the reconstruction relevant for the findings and conclusions is included.

- The vehicle has drifted off the road in a narrow angle. Thereafter it has travelled at a high speed about 50 meters in the road side area. When crashing with a stone wall the front of the vehicle is raised and the driver, who is not wearing a seat belt is thrown towards the compartment ceiling. The high speed of the vehicle allows almost the whole front end to be pushed into the compartment. After that the car is thrown back onto the road. When the deceased is retrieved from the wreck, the police finds a suicide note.
- The driver is killed immediately by the severe injuries sustained when the front end of the car is pushed into the compartment.
- The collision and subsequently the injuries are due to a suicide. However an important finding is discovered and is presented in “Formulation of findings and recommendations”.

Case 4 – Stakeholder cooperation

46. In this description only the part of the reconstruction relevant for the findings and conclusions is included.

47. The chain of events described in case 4 is a general description of repeated events found in numerous crashes involving trucks and bicyclists. In the analysis of every crash, the analysis team concluded these specific events to be important factor which contributed to the fatality and crash occurrence. The general description formed the basis for further analysis made by the stakeholders.

- All fatally injured bicyclists had been close to the right hand side or just in front of the truck-driver compartment at a signalized intersection in an urban area. In all cases the driver is also unaware of the position of the bicyclist. As the light turns green both road users start their motion. The truck-driver has the intention to turn right and the bicyclist has the intention to ride their bike straight through the intersection. As the truck driver begins to turn right, the truck collides with the bicyclist and knocks the bicyclist over. The truck-driver is unaware of the collision and continues to turn the vehicle. The bicyclist, now lying on the ground, is run over by the truck.
- The fatal injury is sustained when the bicyclist is run over.
- Possible measures are presented in “Findings and recommendations following the analysis”.

VII. Formulation of findings and recommendations

48. The In-depth studies aim to increase safety by addressing all parts of the transport system. Findings and recommendations may therefore be directed to all stakeholders involved in designing and operating the transport system. Within the STA, a recommendation is provided to the part of the organization that can make the adjustment needed to increase safety.

Case 1 – Concrete pillar within the deformation zone of a barrier

49. When analyzing the crash the analysis team concluded that the concrete pillar is standing within the deformation zone of the barrier. The road maintenance competence informed the analysis team that the barrier had been moved closer to the pillar to ensure more roadside surface. The analysis team was also informed that barriers had been moved in the same way along a long stretch of the highway in the region due to a specific roadside project.

50. The analysis team recommended that the highways in the region where the project had been carried out should be investigated, and subsequently, if more non-yielding objects were found a list of how and when they should be taken care of should be established.

Case 2 – Barrier failure

51. When examining the car, the STA investigator discovered that the barrier had stuck to the undercarriage of the car. To follow up the finding the STA investigator contacted the entrepreneur who was responsible for the maintenance the specific road and its installations. It was discovered that the pillars holding the median barrier were standing in soil too soft to hold the pillars when the car collided with the barrier. This caused the pillar to bend down which in turn caused the barrier to bend down as well. The analysis team concluded that if the pillars would have been installed correctly the pillars would have kept the pillars in place and the barrier would have been likely to withstand the collision. Subsequently the barrier would have worked as intended and stopped the chain of events.

52. The analysis team recommended the STA to form a strategy on how to ensure that barriers are set up in ground conditions that can support the pillars.

Case 3 – Airbag did not inflate

53. When examining the vehicle the investigator found that none of the frontal airbags had deployed. Even though the crash investigator has information that the fatality was caused by a suicidal act the STA investigator decided to investigate the airbags to ensure that there was no deviation from the required functionality. For that reason the investigator contacted the vehicle manufacturer. In the joint examination the STA investigator and the vehicle manufacturer found that the brutal impact force also disconnected the airbag system. Their findings worked as an input to the vehicle manufacturer to improve their airbag systems. The information was also important knowledge gained for the vehicle experts of the STA.

54. No recommendations were submitted by the analysis team to the vehicle manufacturer.

Case 4 – Stakeholder cooperation

55. The analysis team found that in each case the truck-driver had been unaware of the bicyclist standing on the right hand side of the truck. The analysis team concluded that this is a crucial factor to handle to prevent the fatal injuries and therefore recommended that

measures to ensure the visibility of the bicyclists should be implemented to prevent the initial collision.

VIII. Implementation of findings and recommendations

56. Depending on the stakeholder, the knowledge of the implementation of a recommendation varies. In general the follow up is made:

- through contacts between the STA and the stakeholder. The STA has no possibilities to force any stakeholder to act. The aim is instead to encourage stakeholders to make changes that increase safety,
- through contacts between the Crash Investigation unit and the part of the STA with a possibility to make changes that increase safety.

57. For this reason the In-depth studies can be seen as a part of safety management system which the STA uses to improve safety within their organization. The OLA-cooperation method, which was described above and which case 4 is based on, is also a method for the implementation of findings and recommendations.

Case 1 – Concrete pillar within the deformation zone of a barrier

58. The investigation to seek out more non-yielding objects behind barriers was carried out by the STA. The investigation showed a number of objects that could jeopardize safety if a similar chain-of-events would take place in the location of the discovered object. A list of how and when the issues should be taken care of was therefore established. The STA has been working with objects on the list, systematically minimizing the injury risks through a similar chain-of-events. In most cases the STA has changed the type of barrier in the vicinity of a non-yielding object.

Case 2 – Barrier failure

59. The STA was updating its strategy for barriers at the time of the crash. The findings and recommendations from the analysis group were implemented into the new strategy for barriers. The findings also initiated a research project on the subject of ground conditions to ensure that the barrier pillars work as expected.

Case 3 – Airbag did not inflate

60. The finding served as an input to the vehicle manufacturer to improve their safety systems. The information is also valuable insight gained for the vehicle experts of the STA and spread through their work.

Case 4 – Stakeholder cooperation

61. During the stakeholder cooperation meetings the idea of “bicycle boxes” was brought up. The principle is that the stop line for motor vehicles at a signalized intersection is drawn further back from the intersection. This creates a box for bicyclists to reside in during the time when given a red light. The box gives the truck-driver increased visibility over the bicyclists at the intersection as well as relocating the bicyclists from the dangerous area on the right hand side of the truck. This idea is subsequently systematically implemented in the urban area of Stockholm.

62. The findings also have served as an input to the truck manufacturer to improve their safety systems. Active research includes radar systems (that e.g. cover the right hand side) and other measures to reduce the risk of being run over.

Annex VIII BIS

Multi-Disciplinary Crash Investigation (MDCI) in Finland

(see Chapter 17, Recommendation 17.6.1 (c))

I. Road accident investigation

1. Road accident investigation teams carry out the investigation of all fatal road and cross-country accidents in Finland (since 1970). Accidents resulting in serious injuries or only in material damages are also investigated. Other than fatal accidents are usually studied with a limitation based on time or region or, for example, to clarify a particular issue.

2. Investigation is regulated by legislation on the investigation of road and cross country traffic accidents (24/2001). The investigation is steered and supervised by the Road Accident Investigation Delegation set up by the Ministry of Transport and Communications. The Road Accident Investigation Delegation comprises representatives of e.g. the Ministry of Transport and Communications, Ministry of the Interior, Ministry of Justice, Ministry of Education, Ministry of Social Affairs and Health, Finnish Road Administration, Vehicle Administration, National Authority for Medicolegal Affairs, Accident Investigation Board Finland, Central Association of Motor Traffic, Finnish Transport Workers' Union and Liikenneturva, the Central Organisation for Traffic Safety in Finland. The Finnish Motor Insurers' Centre takes care of the maintenance of road accident investigation, the use of the investigation results and the information service.

3. In Finland the Safety Investigation Authority (former Accident Investigation Board) www.turvallisuustutkinta.fi/en/Etusivu investigates all major accidents regardless of their nature. If Safety Investigation Authority decides on the commencement of investigation, the investigation under act 24/2001 shall discontinue. Nevertheless, the information on the investigation shall also be available to the investigation scheme operating under act 24/2001.

II. The road accident investigation teams

4. Investigation of road and cross-country accidents is performed by the road accident investigation teams (20 in all). A road accident investigation team shall comprise a Chair, a Vice Chair and a sufficient number of members who shall represent expertise sufficient from the standpoint of accident investigation. The team members are:

- a police member, Chair;
- a vehicle specialist member;
- a road specialist member;
- a physician member;
- a psychologist member;
- other experts, for example railway expert, depending on the accident in which special expertise is needed.

5. While carrying out their investigation work, the road accident investigation teams shall be independent bodies to ensure neutrality and impartiality of the investigation. The investigation teams do not take a stand on issues of liability or compensation.

III. Investigation method: VALT METHOD 2003 (revised)

6. Considering the VALT METHOD 2003 the important points are analysis of the origin of the accident and production of countermeasures (Risk Accumulation Model, VALT). The latest VALT METHOD was composed in Turku University under guidance of professor Esko Keskinen.

A. The origin of the accident

7. The starting point for this accident investigation method is analysis of risk factors that had an immediate effect and those in the background. The examination of risk factors is extended to touch upon how serious consequences also materialize. In this way the risk factors are divided into those which affected the origin of accident and those that had affected to serious consequences.

B. Production of countermeasures and proposals for safety improvement

8. The foundation for the creation of safety proposals is the concept that, firstly, all those types of factor that could have possibly prevented the crash, and secondly, those factors that could have prevented death or lessened injuries are sought.

9. The starting point for the proposals for safety improvement is an attempt to find the inhibiting or preventive possibilities in each immediate risk factor and those in the background which have had an effect. The safety recommendations are in turn formed from the preventative possibilities. The safety recommendations are systematically analyzed in connection with every accident.

Important concepts:

- The key event (what took place);
- Risk factors (why it happened):
- Immediate risk factors;
- Background risk factors.
- Damages and factors which have affected the consequences (why serious consequences);
- Injuries, causes of injuries and safety devices (why serious consequences);
- Possible preventive measures in accidents, improvement proposals and safety recommendations (how to prevent the incident, how to prevent the consequences).

IV. Operation at the scene of the accident and the members cooperation

10. The accident investigation teams receive information about accidents either from the Emergency Response Centre or from the local senior police officer. According to the law

members of the investigation teams are entitled to have access to the place of accident and carry out investigations, inspect the vehicles and obtain information, for example, from official register to establish the reasons for the accident.

11. The investigation team begins the investigation together at the accident scene if this is possible. With police and rescue staff on the scene of accident, the crash place, the directions of travel of those involved, together with other people, the marks found, and the general characteristics of the incident are clarified. After this the investigation team agrees on the investigation sequence, such as, for example, interviews with those involved, the checking of vehicles, the need for special investigations, assistance in moving or lifting, etc. After this the members begin their own investigation at the scene.

12. Having arrived at the site, the investigation team examines and records the points where those involved stopped and the marks that remain. On the basis of the findings the road specialist or possibly another member of the team draws a sketch of the scene, including sequences of the events before the impact, the places and positions of vehicles at the moment of impact and final position. In addition, the location of those involved is marked on the sketch at, for example, one second intervals, before the crash and after it. In the sketch the dimensions are shown with, at least, the path of displacement, together with the braking or skidding tracks and stopping points, and the sketch is made as far as possible to scale. The drawing is attached as an annex to the investigation folder.

13. The member specializing in reconstruction makes the calculated reconstruction of the movement of the vehicles before and after the crash. From this calculation one can obtain the information required about speed before the key event and at the moment of impact, for processing of the incident and for recording on the forms.

Data to collect:

- Information about the driver by interviewing the driver/pedestrian or their relative or eyewitness;
- Examining the vehicle on scene, information from Vehicle Traffic Information System (Finnish Transport Safety Agency);
- Examining the road, weather and environment on scene;
- Autopsy and other forensic medical documentation, medical case summary;
- Records of preliminary police investigation, information of warnings, offences and driving bans;
- Event marks and drawings for reconstructions and crash severity;

14. Accidents are investigated and data is collected using a standardized VALT Method (2003) and standard forms under legislation. Standardization of the method increases the the quality and usability of the information obtained.

V. Objectives

15. The objective is to produce information and safety suggestions to improve road safety through studying road and cross-country traffic accidents. In practice, files are collected in the field investigation and they are available to the traffic safety work as laid down in the data protection legislation.

- In the field investigation, information from accidents is collected on the investigation forms and concerns those parties involved, the events and circumstances. These form the basis for the event description and analyses, and from them an accident database is created;

- In the reconstruction of the accident, the course of the event and calculations to avoid the incident are examined. Reconstruction gives essential information for analysis and for the computer-based accident records;
- In the analysis of the accident, explanations for the accident, the factors that increased the probability of the accident and suggestions for safety measures are all examined thoroughly;
- On the basis of the process described above, an investigation report is written, an investigation folder is compiled from the documents collected, and filed with the Finnish Motor Insurers' Centre. The investigation report includes, for example, a description of the course of the accident, the factors resulting in the accident, the results of the accidents, and safety improvement proposals made by the investigation team. After completion, the investigation report is a public document. Other documents gathered in connection with the investigation are confidential. The investigation material gathered in connection with the investigation constitutes the accident information register. The data in the accident information register may be handed over without charge to be used in scientific and statistical research and in road safety work by the authorities;
- During the investigation or after, the investigation team makes recommendations for local improvements. The collected information and results of analyses are used in research, training, reporting and in another practical traffic safety work, and for the development of investigation and research-based traffic safety work. Furthermore, information is important part of Finnish national road safety work.

VI. Findings and recommendations implemented

16. According to the law after conclusion of the investigation, a report shall be prepared on the findings. The investigation report shall contain a report on the course of the accident, the factors that led to the accident and the consequences of the accident as well as the Road Accident Investigation Team's recommendations for road safety action.

17. The Road Accident Investigation Teams may submit proposals to authorities for road safety action to be taken on the basis of the recommendations. The Road Accident Investigation Delegation may also decide on the submission of proposals prompted by the investigation.

18. In year 2012 road accident investigation teams submitted over 2,000 recommendations for road safety action. Also during the investigation or after, the investigation team makes recommendations for local improvements. Furthermore, the investigation team makes a service advice to Trafi (Finnish Transport Safety Agency) about defects or malfunction in a vehicle’s structure, equipment or safety equipment that threatens safety and demands immediate interfere with the problem.

19. In a law there is nothing written about implementation. However, FMIC has followed the implementation and negotiated with authorities of implementation of safety proposals.

VII. Accidents investigated

- Year 2012, 400 accidents investigated, of which:

- 255 fatal road accidents, of which:
  - 207 motor vehicle accidents;
  - 28 pedestrian accidents;
  - 20 cyclist accidents;
- 145 other accidents (Accidents resulting in serious injuries or only in material damages or fatal cross-country accidents);
- 5 fatal cross-country accidents;
- 24 motorcycle and moped accidents with injured persons;
- 42 heavy vehicle road accidents with injured occupants or with major property damages;
- 21 all terrain vehicle or snow mobile accidents with injured occupants;
- 43 other accidents resulting in serious injuries or only in material damages.

VIII. The history of road accident investigation

- First accident was investigated 8.3.1968;
- Computer database since 1970;
- Legislation in 2001;
- VALT Method, last revision in 2003;
- Investigation forms in web since 2009.

IX. Financing

20. The operations of road accident investigation are financed with the road safety charge collected in connection with motor liability insurance premiums. The size of the charge is confirmed annually by a decree issued by the Ministry of Social Affairs and Health.

X. Regular statistical publications from the accident information register

- VALT Annual Report: A summary report on fatal accidents investigated during the year;
- VALT Preliminary Report: A quarterly preliminary review of fatal accidents;
- VALT Preliminary data on alcohol-related road accidents: A preliminary review of fatal alcohol-related road accidents in the previous year.

XI. International cooperation

21. Cooperation has been done with European MDCI projects such as SafetyNet and Dacota. In SafetyNet project the requirements for conducting and promote the creation of transparent and independent road accident investigations in all Member States according to

a common European investigation methodology http://erso.swov.nl/safetynet/fixed/WP4/sn_wp4_d4p5_final.pdf were established.