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Connecting Authorities for Safer Heavy Goods Traffic in the Baltic Sea Region

ANALYSIS OF TRANSPORT RISKS

Empirical Results from the Baltic Sea Region in 2010/2011

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Baltic Sea Region Programme 2007-2013

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EXECUTIVE SUMMARY

The aim of this report is to analyse transport risks that may occur in road transport and to describe and to analyse the equipment that is used in road controls in the Baltic Sea Region (BSR). Furthermore, it will be identified which kind of equipment is used to reduce different kind of transport risks.

In the report it is shown that due to the geographic location and the dynamic economic development, logistics has a central role in the BSR. Therefore, it is important to establish beneficial conditions for logistics in the BSR to cope with current challenges in road freight transport. This also includes the reduction of risks for logistics service providers, manufacturers, and commercial enterprises.

The report summarizes the results of a survey and two workshops about risk identification and the allocation of equipment used by the police authorities to the different transport risks. It is shown that different equipment can be used to avoid different kind of transport risks. Furthermore, the advantages and disadvantages of used equipment in road controls in the BSR are listed, that should be considered when police authorities are investing in risk analysis IT solutions and related tools.

The results of the report provide the basis for developing measures and strategies to deal with risks and to detect deficiencies. While the aim of this report is to analyse the transport risks from the police authorities' point of view, an additional risk analysis will be done in a next step of the Connecting Authorities for Safer Heavy Goods Traffic in the Baltic Sea Region (C.A.S.H.) project that is focussing the perspective of business practice.

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LIST OF ACRONYMS

ASSET	= “Advanced Safety and Driver Support for Essential Road Transport”
BSR	= Baltic Sea Region
C.A.S.H.	= “Connecting Authorities for Safer Heavy Goods Traffic in the Baltic Sea Region”; this project
DRUID	= Driving under the Influence of Drugs, Alcohol and Medicines
EC	= European Commission
EU	= European Union
EUCARIS	= European Vehicle and Driving Licence Information System
GDP	= Gross Domestic Product
HGV	= Heavy Goods Vehicle
KonTraG	= Gesetz zur Kontrolle und Transparenz im Unternehmensbereich
LogU	= Institute of Business Logistics and General Management
LPI	= Logistics Performance Indicator
PDA	= Personal Digital Assistant
R&D	= Research and Development
TISPOL	= European Traffic Police Network
TUHH	= Technische Universität Hamburg-Harburg (Hamburg University of Technology)
TÜV	= Technischer Überwachungs-Verein (Technical Inspection Association in Germany)

1 INTRODUCTION

This study is part of the C.A.S.H. project - Connecting Authorities for Safer Heavy Goods Traffic in the Baltic Sea Region. The C.A.S.H. project is part-financed by the European Union (EU) (European Regional Development Fund) through the Baltic Sea Region Programme 2007-2013. To find out more about the programme, visit http://eu.baltic.net/.
In the following, the project and its regional partners will be described. Furthermore, the purpose of this study is explained.

1.1 Project introduction – C.A.S.H.

The C.A.S.H. project aims to develop practical solutions to make international road freight transport safer, more predictable and affordable in the Baltic Sea Region (BSR). The project intends to do this by:

- improving co-operation between authorities
- harmonising training of inspection officials
- testing safety equipment and IT systems to be used by relevant authorities

The C.A.S.H. project is due to run for three years, from September 2009 to September 2012. The project will benefit not only the authorities inspecting the traffic through harmonised practices, but logistics business as a whole. The project is co-ordinated by Turku School of Economics in Finland, as part of University of Turku.

The C.A.S.H. project partnership is made up of 13 organisations in eight countries around the BSR (Figure 1), including:

- police and other authorities dealing with road traffic safety
- regional councils
- research institutes

Figure 1 The locations of the C.A.S.H. partner organisations and countries

With about one million road haulage companies in Europe and over 560,000 million tonne kilometres of goods transported annually on the roads of the BSR, road freight transport is big business.

Despite similar regulations, authorities in European countries may apply different practices and equipment to inspect the traffic. This puts additional pressure on road haulage companies that have to comply with regulations while they are already facing the challenges of a very competitive market.

In addition, more than 1,300 fatalities involving a heavy vehicle took place in the BSR in 2007, equal to 10 % of all accidents.

This is why 13 organisations from eight countries in the Baltic Sea area created the C.A.S.H. project. The project brings together police officers and other authorities inspecting Heavy Goods Vehicles (HGVs) in the Baltic Sea area in order to spread good inspection practices across the region.

To find out more about the project and the different work packages, as well as a list of the participating countries and organisations, please visit the project website www.cash-project.eu.

1.2 Purpose of this study

This research paper “Analysis of Transport Risks – Empirical results from the Baltic Sea Region in 2010/2011” is part of work package 5 – “Equipment, Safety and Risk” – of the C.A.S.H. project.

The aim of work package 5 is to support related equipment and risk analysis investments through equipment testing in practical use and through analytic work. This work package is not meant for the investments themselves, but to provide useful information for equipment and IT investments outside the project.

Work package 5 is divided into three activities: (1) Equipment testing, (2) security issues, and (3) risk analysis methods.

These activities are led by the following coordinating partners and comprise the following sub-activities:

(1) Equipment Testing

- Recommendations for the BSR roadside checks
- Recommendations for the BSR road police corps when investing in up-to-date digital tachograph analysis
- Creation of a traffic police equipment database and a network of equipment experts in the BSR

(2) Security Issues

- Plan for improved cross-border cooperation in procurement of HGV control equipment
- Plan for improved cross-border research and development (R&D) cooperation with HGV control equipment users, manufacturers and technology agencies

(3) Risk Analysis Methods

- Risk analysis methods and frameworks applied in HGV traffic control
- Recommendations for the BSR road police corps when investing in risk analysis IT solutions and related tools

This report aims to identify and analyse risks that might occur in transport. Thereby, the transport risks from the police authorities' point of view are considered. Furthermore, the advantages and disadvantages of used equipment in road controls in the BSR are described. The information should help road police corps when investing in risk analysis IT solutions and related tools.

2 THEORETICAL BACKGROUND

In the following, the BSR will be described as part of the EU and the economic development will be discussed. In addition, logistics in the BSR will be highlighted and fundamentals of risk management will be explained.

2.1 The Baltic Sea Region as part of the European Union[1]

The BSR is situated in the North-East of the European mainland and consists of Denmark, Estonia, Finland, Northern Germany, Iceland, Latvia, Lithuania, Norway, Northern Poland, Northwest Russia and Sweden. The region has 60 million inhabitants, approximately 500,000 less in comparison to the highest value in the year 1997. The Nordic countries (Denmark, Finland, Norway, Sweden) account for roughly 45% of the population (Baltic Development Forum 2009).

According to the ”Global Competitiveness Report 2009-2010“ published by the World Economic Forum, the countries Sweden, Denmark, Finland and Germany belong to the world's most competitive countries. The companies in the BSR not only have access to the consumers of their area, but also to the markets of the other EU member states as well as Russia, comprising 640 million inhabitants in total (World Economic Forum 2009).

The gross domestic product (GDP) shows that the BSR has evolved into an important European growth region over the last ten years. With growth rates between seven and nine percent in 2007, the Eastern European EU member states Estonia, Latvia and Lithuania were above the average growth of the EU. However, in the Nordic countries and Germany there was only an increase between one and five percent (cf. figure 2). Strong growth rates are recorded in the BSR prior entering the world economic crisis. Nevertheless, the economic differences between regions are still visible (Kersten et al. 2007).

[1] This subchapter is based on an excerpt from a paper submitted by the same authors to ”Deutsch-Russischer Logistik und SCM Workshop DR-LOG 2011” (May 2011) and is published in the conference proceedings (see Kersten et al. 2011).

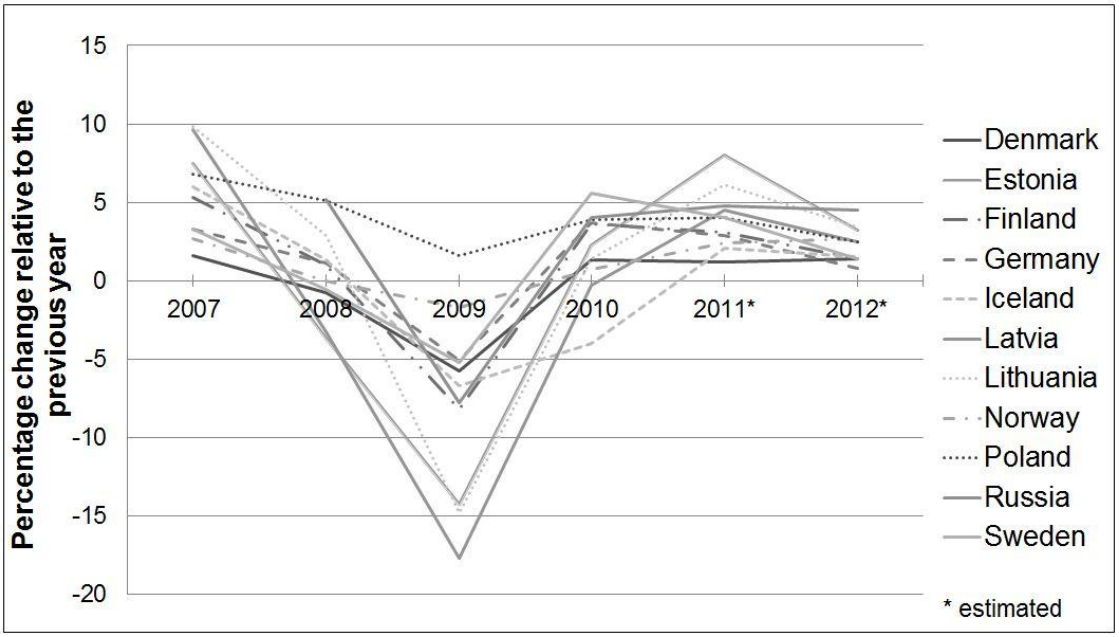

Figure 2 GDP growth rates. Growth rates are relative to the previous year in the BSR (European Commission 2011). Values for Russia are estimated for 2010 and projected for 2011 and 2012 (International Monetary Fund 2011).

The crisis shows its effect in the BSR. It is reflected particularly in the Baltic States (Estonia, Latvia, Lithuania) and even leads to an increase of the economic differences between developed and transitional countries in the BSR. Only Poland had a low positive growth rate during the crisis. The downturn in Russia was not as high as in the Baltic States. The predicted values for 2011 reflect an economic recovery in the whole BSR, but it seems that the growth rates in the near future will be on a lower level than before the crisis (Baltic Development Forum 2009).

In the following chapters an overview about the logistics in the BSR as well as about the fundamentals of risk management will be given before in chapter 3 the empirical results of transport risks and used equipment in road controls will be described.

2.2 Logistics in the Baltic Sea Region[2]

Due to the geographic location and the dynamic economic development, logistics has a central role in the BSR. Many goods are transported from Russia as a resource-rich country via the BSR to Central and Western Europe. The Baltic Sea forms a major axis for freight transport in Europe. Freight traffic is split up into road and rail traffic, pipelines, air freight, inland water transport and shipping in this region (Eurostat 2009).

In 2006, road freight services accounted for 45.6% of the entire transport volume of the EU-27, shipping for 37.3% and rail for 10.5%. In national freight traffic, the predominance of road freight transport is even more obvious since it amounts to almost 80% of tonne-kilometres in the EU-27 (Eurostat 2009). Road transport offers greater flexibility than other types of traffic. Figure 3 provides an overview of the existing road infrastructure in the BSR and shows a dense road network, which is characterized by a good connection between the Baltic ports and the hinterland. Regionally, however, it has a different density or different forms.

The BSR includes four of the ten largest logistics markets of the enlarged EU-29[3]: Germany, Poland, Finland and Norway. The German and Polish logistics markets are not completely included in the spatial separation of the BSR. Nevertheless, the following figures highlight the importance of logistics in this region. The total logistics expenditure referred to GDP is above-average in the BSR (8.7%) compared to the EU-29 (7.1%). In addition, Finland (14.4%) and Estonia (14.5%) had the highest proportion of logistics expenditure of GDP in 2008. Both in the BSR and in the EU-29, Germany by far had the highest volume of transport (3,597.3 million tonnes per year) as well as the highest logistics expenditure in 2008, € 218.1 billion (8.8% of GDP) (Klaus et al. 2009).

[2] This subchapter represents an excerpt from a paper submitted by the same authors to ”Deutsch-Russischer Logistik und SCM Workshop DR-LOG 2011” (May 2011) and is published in the conference proceedings (see Kersten et al. 2011).

[3] This means all countries of the EU-27 as well as Switzerland and Norway.

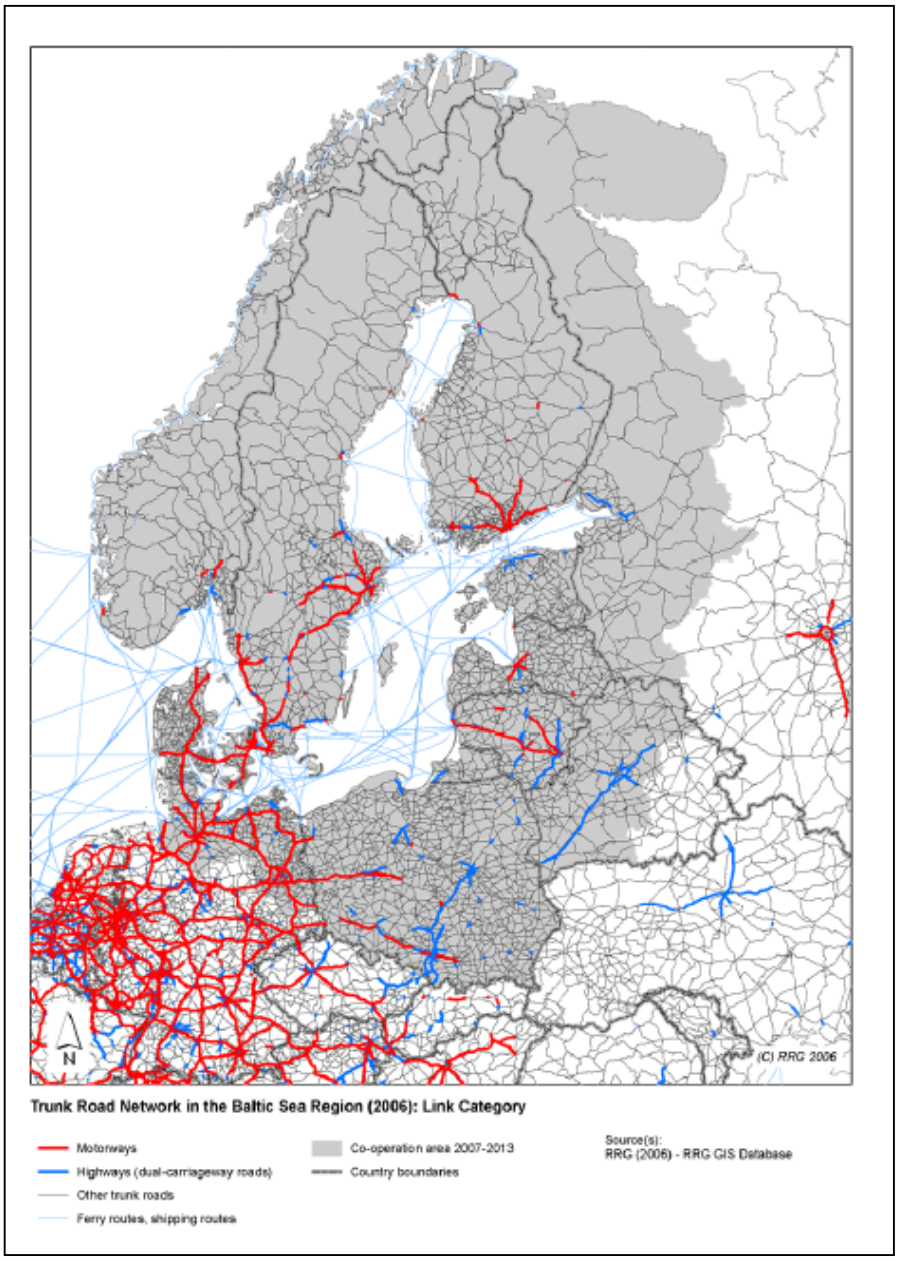

Figure 3 Road infrastructure in the BSR in 2006 (Schürmann/Spiekermann 2006)

The Logistics Performance Indicator (LPI) of the World Bank highlights the different development stages of logistics in the countries of the BSR. The evaluation of the LPI is mainly based on the following indicators: “Efficiency of the customs clearance process, quality of trade and transport-related infrastructure, ease of arranging competitively priced shipments, competence and quality of logistics services, ability to track and trace consignments, frequency with which shipments reach the consignee within the scheduled or expected time” (Arvis et al. 2010). With these measures, the LPI ranked Germany as best logistics performer in 2010. Overall, three countries of the BSR

(Germany (1st), Sweden (3rd), Norway (10th)) are ranked within the top ten of 155 countries. Finland and Denmark are ranked 12th and 16th and also belong to the top performers. The development of logistics in the Eastern European countries is not yet equal to the Western European ones. Poland (30th), Latvia (37th) and Lithuania (45th) are at least in the first third of logistics performers worldwide (Arvis et al. 2010).

The brief overview of logistics in the BSR highlighted that road freight transport plays a decisive role. As today's business models as well as production and logistics systems (Just-in-Time, highly distributed production, outsourcing etc.) place increasing requirements on logistics operations, it is important to establish beneficial conditions for logistics to cope with these challenges. The allocation of adequate infrastructure and areas for the settlement of logistics enterprises are important issues. Furthermore, it is highly demanded to reduce risks for logistics service providers, manufacturers, and commercial enterprises as well as for the transnational road freight transport itself.

2.3 Fundamentals of risk management[4]

Within the framework of decision theory, risks result from the uncertainty of future events, named the sources of risks or uncertainty (Gabler Wirtschaftslexikon 2004). On the one hand, in the case of certainty, it is doubtless which state of environment will occur. On the other hand, uncertainty in the broader sense encompasses risk as well as uncertainty in the narrower sense, depending on the level of knowledge about the probability of occurrence. In the case of risk, subjective or objective probabilities of occurrences are known. In the case of uncertainty, the decision maker only knows the potential states of the environment (Bamberg et al. 2008 and Laux 2005). In 1921, Knight already distinguished between measurable uncertainty, also known as risk, and non-measurable uncertainty (Knight 1921).

Even if risk is understood as related to its effect, there are different approaches between the disciplines. In the field of mathematics, the construct "risk" is defined as value-free, while in the field of business economics it is mainly understood as the opposite of a "chance", thus a

[4] This subchapter represents an excerpt from a paper submitted by the same authors to "Deutsch-Russischer Logistik und SCM Workshop DR-LOG 2011" (May 2011) and is published in the conference proceedings (see Kersten et al. 2011).

potential loss or damage (Holzbaur 2000 and Diederichs 2004). This paper follows the latter approach.

It is necessary to implement risk management in enterprises to manage risks and their potential negative effects. Otherwise, enterprises could be endangered to the effect that profits are not realised. In Germany, e.g. the board of managing directors of limited companies and accordingly the management of companies with other corporate structures are obligated by law (KonTraG) to take measures, especially incorporating a monitoring system, to identify risks at an early stage, which endanger the continuance of the company. The undertaken measures are controlled in the annual audit. Similar acts are in force in the other BSR countries (Kajüter 2007).

In dependence on the generic management process, the risk management process characterises a systematic approach to cope with risks. The process encompasses four stages: identification, assessment, management, and control (Burger/Buchhart 2002).

Different potential risks can occur in companies. One approach to distinguish risks is to differentiate between the view of risks regarding their source or their impact. There are also other classifications which depend on their concept or purpose. Eberle (2005) for example differentiates between the focus of flow, level of decision making, and level of risk. For the flow he describes logistical, financial, informational, and legal risks. On the level of decision, there are strategic, tactical, and operational risks. And finally on the level of risk, he distinguishes between bagatelle, small, medium, large and existence risks. Rogler (2002) differentiates between supply, production, distribution, financial and personnel risks, depending on their area of operation. In the field of supply and distribution, transportation risks might occur. These risks are related to the terms default, quantity, quality, costs, and time.

3 EMPIRICAL RESULTS ON TRANSPORT RISKS AND USED EQUIPMENT IN ROAD CONTROLS

In the following, empirical results on transport risks and used equipment in road controls will be presented. At first, qualitative research methods are distinguished from quantitative methods. Then, the methodology, structure and content of a survey consisting of a questionnaire and its supplement on the used equipment in road controls are described. Afterwards, the methodology, structure and results of two workshops on transport risks and on the application of equipment in road controls to detect transport risks are explained.

3.1 Qualitative and quantitative research

Usually, empirical research is classified into two research families, also known as general strategies, i. e. qualitative and quantitative research. Table 1 shows their differences.

Table 1 Differences between qualitative and quantitative research (Blaxter et al. 2006)

Qualitative paradigms	**Quantitative paradigms**
Concerned with understanding behaviour from actors' own frames of reference	Seeks the facts/causes of social phenomena
Close to the data: the "insider" perspective	Removed from the data: the "outsider" perspective
Grounded, discovery oriented, exploratory, expansionist, descriptive, inductive	Ungrounded, verification oriented, reductionist, hypothetico-deductive
Process-oriented	Outcome-oriented
Valid: real, rich, deep data	Reliable: hard and replicable data
Holistic	Particularistic

Very often, quantitative research aims at the gathering of facts, while qualitative research is about understanding the behaviour of aspects from a different perspective. Therefore the former can be called particularistic and outcome-oriented, whereas the latter is usually process-oriented and holistic (Blaxter et al. 2006).

On the one hand, quantitative research mostly takes an “outsider” perspective and strives for reliability, i. e. by collecting data which tends to be replicable. On the other hand, qualitative research methods work discovery oriented as well as exploratory and aim to achieve deep data. The researcher usually takes the “insider” perspective (Blaxter et al. 2006).

Empirical results which are described in this report are gained by the application of a survey as well as two workshops. The use of a questionnaire in order to conduct a survey can be regarded as quantitative research and workshops with a focus group may be seen as qualitative research. However, the two research families bear resemblances.

Quantitative research is used for testing theory in many cases and strives for a statistical analysis of an observable section of reality. It may also be utilized in order to explore an area and generate hypotheses and theory, though. Furthermore, quantitative approaches (e.g. large-scale surveys) can collect qualitative (i. e. non numeric) data by asking open ended questions (Blaxter et al. 2006).

3.2 Survey on the used equipment in road controls

In spring 2010 (March until May), the authors conducted the first part of the empirical study to analyse the status quo of used equipment in road controls. A supplementary questionnaire - the second part of the survey - was subsequently sent out to the same authorities in order to get more precise answers and to gain more information on the advantages and disadvantages (pros and cons) of the equipment. The participating authorities in the study are listed in table 2. In total, members of nine authorities from seven countries answered the questions. In addition to the six police authorities who are project partners, the German Landespolizeiamt Schleswig-Holstein, the Lithuanian Police Traffic Supervision Service as well as the State Road Transport Inspectorate under the Ministry of Transport and Communications of the Republic of

Lithuania took part in the survey. The supplementary questionnaire was answered by each country once.

The participants in the survey mainly occupied leading positions of units related to the control of HGV. While some participants were traffic specialists or were responsible for the control of HGV, others were experts in the field of dangerous goods.

Table 2 Participating authorities in the survey

Country	**Authority**
Denmark	Danish National Police
Estonia	Police and Border Guard Board
Finland	National Traffic Police of Finland
Germany	Hamburg Waterways Police
Germany	Landespolizeiamt Schleswig-Holstein
Lithuania	Lithuanian Police Traffic Supervision Service
Lithuania	State Road Transport Inspectorate under the Ministry of Transport and Communications
Norway	National mobile police service
Sweden	National Police Board

The aim of the study was to gather information on used equipment in road controls as a first step in order to be able to compare the application of equipment in the different regions of the BSR and to learn from each other. The insights gained also mean to support other activities within the C.A.S.H. project, e.g. training in work package 3, field exercises as well as staff exchanges as part of work package 4 and equipment testing within work package 5. Below, the methodology as well as the structure and content of the survey will be described.

3.2.1 Methodology of the survey

In the following, a survey is explained as a research approach and its advantages as well as disadvantages are listed. Last but not least, types of survey questions are highlighted.

Survey as a research approach

If participants in a study answer questionnaires in written form, the method on hand is a survey (Bortz/Döring 2002). The questionnaire usually encompasses a set of questions which the respondents are asked to answer (Hair et al. 2007).

The research approach is suitable for homogenous groups, in case the content of the questionnaire is highly structured and if the interviewer does not need to intervene (Bortz/Döring 2002). These requirements apply to the situation which has been described in chapter 3.2.

The questionnaires have been sent to the members of the authorities by email and they also sent them back by email. Although the literature reveals that questionnaires handed out face-by-face tend to have a higher response rate (Blaxter et al. 2006), there has been no problem in this regard. The reason for that is probably that the participants of the survey were mostly project partners. In the other three cases, the questionnaires have been forwarded to the mentioned authorities and they were asked to participate by people who knew them.

Advantages and disadvantages of surveys

The choice of a survey as a research approach has advantages as well as disadvantages.

On the one hand, the researcher does not necessarily know who answered the questionnaire and whether the participant maintained the order when giving the responses. Furthermore, the time duration for filling in the questionnaire remains unknown. On the other hand, a survey is highly standardized (Bortz/Döring 2002). That means that the answers of the participants should be relatively easy to compare. In this case, the advantage outweighs the disadvantages.

Another advantage often mentioned in the literature is the anonymity the respondents feel when answering a questionnaire in written form (Bortz/Döring 2002). However, this aspect is supposed to be less important in the current situation since most participants are project partners.

Types of survey questions

When designing a questionnaire, the researcher has a range of categories to choose from in order to formulate the questions.

Open ended questions are comparatively easy to phrase because the answers are completely given by the respondents. Therefore, if the researcher does not know the possible answers, it is recommendable

to use an open ended question. Furthermore, selecting an open ended question can be useful if the alternative answers the researcher can think of, will influence the experts (Hair et al. 2007). While the first aspects apply to the situation, the last facet is not appropriate in the current case. Whereas open ended questions are likely to provide the researcher with rich information and insight into the answer, the participants in the survey have to be willing to articulate and spend the time to give a complete and comprehensible answer which may take the researcher considerable time and effort to understand.

Closed questions are more time consuming and difficult to formulate. However, when phrasing them, preparations can be made to facilitate data collection, data input and computer analysis. They are very often used in quantitative studies, e.g. in (large-scale) surveys (Hair et al. 2007). Closed questions can make use of the following types of questions: Quantity or information, category, list/multiple choice, scale, ranking and complex grid or table (Blaxter et al. 2006, p. 181).

3.2.2 Structure and content of the survey

The survey on used equipment in road controls comprised both open ended as well as closed questions. In the literature, hints are given on wording questions as well as on questionnaire layout and presentation which have also been taken into account (see Blaxter et al. 2006).

The questionnaire and its supplement consisted of the following sections:

- Part A: General Information
- Part B: Basic Traffic Control
- Part C: Weight Control
- Part D: Load Control
- Part E: Concluding Questions

In **part A**, the participants in the survey were asked for the name of their organisation, their contact details, the business unit they were working for and for their position within their unit/organisation. All of the questions in this section were open ended questions.

Part B contained questions about documents which the police authorities control, i. e. driving license, vehicle registration certificate, cargo documents and others. Databases exist for these documents. Furthermore, the participants were asked about equipment needed for distance control, alcohol and drug control as well as driving and resting hours and about problems that occur when checking these aspects.

The police authorities use breath, urine, saliva and blood tests for alcohol and drug control and a Personal Digital Assistant (PDA)/laptop as well as special software for checking driving and resting hours. Equipment used for distance control are speed guns, clocks, videos and lasers. Last, personal/police car equipment was the object of inquiry. The appliances used for distance control as well as binoculars, telescopes, mobile brake testers/stands, infrared cameras, fumes meters and measuring instruments (radioactive, alcohol, gas) have been mentioned as personal/police car equipment. The questions of part B were either of category type, complex grid or open ended.

Concerning Weight Control in part C the members of police authorities were requested to give information on total weight and load distribution by listing the guidelines followed, indicating the applied equipment, reporting problems and stating additional equipment that would be useful. A complex grid was used for this. Equipment mentioned for part C are cameras, calculators, tension force examiners, protractors, software and measuring tape/wheel.

With regards to load control in part D, the centre of gravity, sliding, tilting, the rigidity, vehicle, restraining methods and support equipment were addressed with a complex grid. Like in part C, the participants were asked for guidelines followed, used equipment (weigh bridge/scales), problems occurring and additional equipment that would be helpful.

Finally, questions on recently purchased equipment, plans for investments in the near future, suggestions regarding work package 5 and equipment testing, this questionnaire as well as on any additional comments were incorporated in category or open ended mode in part E.

All equipment mentioned by the participants will be specified in chapter 4. The questionnaire and its supplement are displayed in appendices 1 and 2.

3.3 Workshops on transport risks and on the application of equipment in road controls to detect transport risks

Two workshops on transport risks and on the application of equipment in road controls in order to detect transport risks have been held within the C.A.S.H. project in June 2010 and in February 2011. They are explained in the following. While the aim of the first workshop was to identify transport risks from the perspective of police authorities, the

second workshop dealt with the allocation of the used equipment in road controls – captured with the survey described in chapter 3.2 – to the detected transport risks.

Below, the methodology of the workshops as well as the structures and results of the workshops will be highlighted.

3.3.1 Methodology of the workshops

In the following, workshops of focus groups are explained as a research approach and advantages as well as disadvantages are listed.

Workshop of focus groups as a research approach

A focus group is a gathering of individuals who discuss and comment on a certain topic from their personal experience. These meetings of persons are also known as “collective activities”, “social events”, “organised discussions” or “interactions”. Usually, a moderator motivates the participants to interact so that insight is provided into the content of a conversation and the way how the members of the focus group speak about the specific topic (Eriksson/Kovalainen 2008).

In this case, focus groups are used as part of a multi-method research design since the results were first gained through a survey and a focus group. Afterwards the insights were brought together by a second focus group.

Advantages and disadvantages of workshops

Selecting a workshop of a focus group as a research approach both has advantages as well as disadvantages.

On the one hand, people who either think they do not have enough expertise or who assume they have nothing to say feel confirmed to make contributions. Moreover, those who do not like to be interviewed on their own are also encouraged to take an active part. In addition, participants may feel motivated to analyse questions themselves and to develop their own analyses (Eriksson/Kovalainen 2008).

On the other hand, focus group research does not have a defined end and the outcome is hard to be predetermined. Furthermore, some people may be intimidated and consequently may not be willing to talk in a group. The background of participants may also lead to different results. Besides, geographical distance and associated costs can be an obstacle to a focus group (Eriksson/Kovalainen 2008, p. 179-182).

Since the focus groups took place in combination with regular project meetings and discussions on further topics, the last-mentioned aspect was supposed to be of little importance. However, the focus group workshops were involved with accurate planning. Likewise, the background of participants was taken as a given since the group was made up of project partners who were either members of police authorities or researchers. In general, the above mentioned advantages were assumed to overbalance the disadvantages.

In the following, the structures and results of the workshops on transport risks as well as on the application of equipment in road controls to detect transport risks are explained.

3.3.2 Structure and results of the workshop on transport risks[5]

To be able to develop suitable and efficient logistics strategies to minimize risks in transnational road freight transport, it is necessary to identify transport risks at first. For this purpose, the authors conducted a workshop within the C.A.S.H. project with representatives of road police authorities from Denmark, Estonia, Finland, Germany, Lithuania, Norway and Sweden as well as researchers from Germany, Finland, Latvia and Lithuania. The workshop took place with 25 participants in Tallinn, Estonia, in June 2010.

The participants from police authorities were mainly in leading positions of units related to the control of HGV. Some were even specialists in the field of dangerous goods. The researchers either worked in the area of business logistics or they were psychologists conducting studies in the field of logistics. The workshop aimed at finding as many transport risks as possible before starting to cluster the risks through a discussion.

As a result of the workshop, different kinds of risks were identified. They have been clustered according to the categories truck driver, company, truck and external risks (see figure 4).

The highest number and diversity of risks have been found within the category of truck driver risks. Furthermore, within this category risks have been classified into state, intentional erratic behaviour and unconscious erratic behaviour risks. Risks in the category “truck” have

[5] This subchapter represents an excerpt from a paper submitted by the same authors to ”Deutsch-Russischer Logistik und SCM Workshop DR-LOG 2011” (May 2011) and is published in the conference proceedings (see Kersten et al. 2011).

also been listed several times. Truck risks include risks in the field of basic equipment (condition of vehicle) as well as risks related to supplementary equipment. Risks in the category “company” were mentioned less often. Last but not least, some external risks were mentioned by the participants of the workshop. They were classified into the sub-categories infrastructure, human behaviour and environment.

Although many transport risks have been named, the outcome of the workshop leads to the conclusion that possibly it is not an exhaustive overview of transport risks, especially as the main focus was on truck driver risks and representatives of logistics companies did not attend the workshop.

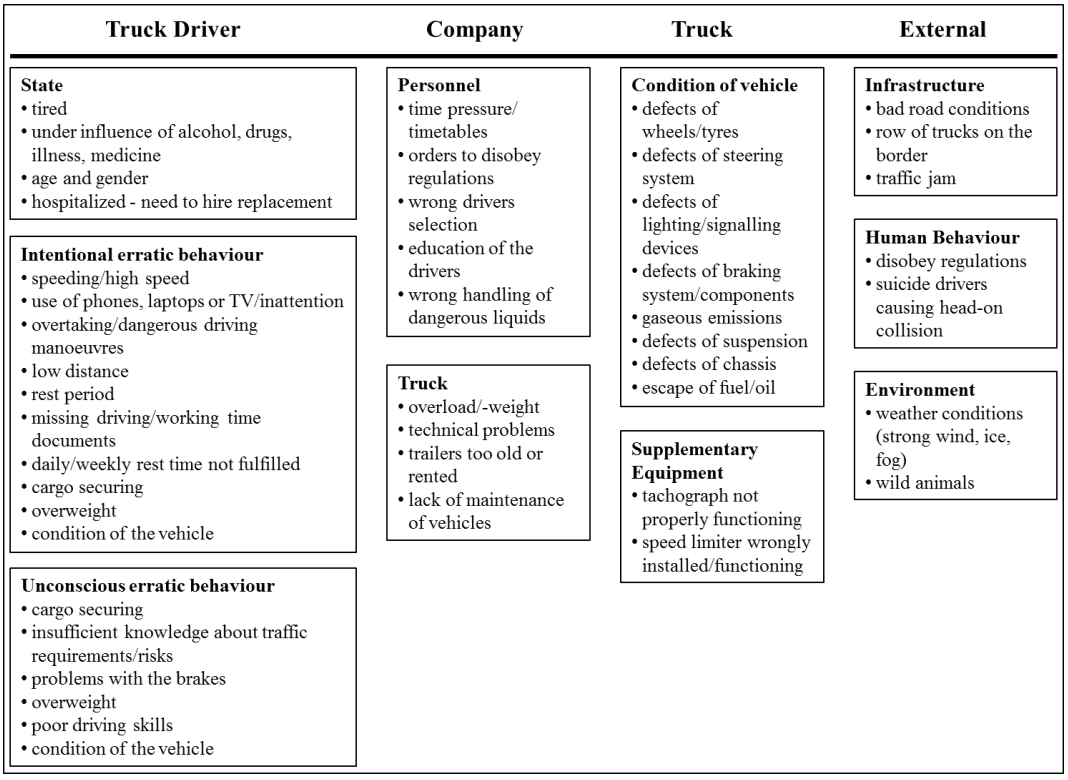

Figure 4 Workshop results on transport risks

However, the identified risks in the field of transport show that due to their diversity a successful risk management must consider different perspectives. This is the reason why the C.A.S.H. project was initiated.

Within the different work packages of the C.A.S.H. project all stakeholders will be considered. Different perspectives are covered by scientists, psychologists, representatives of state authorities as well as by representatives of companies.

3.3.3 Structure and results of the workshop on the application of equipment in road controls to detect transport risks

In February 2011 an additional workshop was organised to discuss the adoption of the survey results. It took place in Hamburg (Germany). The workshop was organised by the Institute of Business Logistics and General Management (LogU) at Hamburg University of Technology (TUHH) and joined by participants from Finish and German police authorities and German researchers working in the area of business logistics. The workshops dealt with the application of equipment in road controls to detect transport risks. During the workshops the results from the IT equipment survey and the results from the first workshop have been combined (cp. chapter 3.2.2 and chapter 3.3.2). To achieve the results different workshop materials were used.

During the first workshop in June 2010 the risks have been clustered according to the categories “Truck Driver”, “Company”, “Truck” and “External” as described in chapter 3.3.2 (see figure 4). In a first step of the second workshop in February 2011 every transport risk that has been identified during the first workshop had been written on a card and been affixed at a pin board. In addition, the used equipment that has been identified by conducting the survey (c.p. chapter 3.2.2) has also been written on a card and been affixed at the pin board.

In a second step of the workshop it has been discussed which kind of equipment can be used to avoid which kind of transport risks. Therefore, the used equipment was allocated to the different transport risks on the pin board.

The results of the workshop can be seen in tables 3 to 5 (the used equipment is described in detail in chapter 4). The tables below show the workshop results for the categories “Truck Driver”, “Company”, “Truck” and “External”. Here it can be seen, that different equipment that have been clustered according to the categories “Basic Traffic Control”, “Weight Control” and “Load Control” is applied in road controls to detect several transport risks:

- In the category “Basic Traffic Control” a PDA or laptop helps e.g. to check the rest period and the speed of the truck.
- By using binoculars and telescopes it can be seen whether the truck driver used e.g. a phone while he is driving or whether he drives dangerous manoeuvres.

- In the category “Load Control” a camera, calculator, tension force examiner, protractor and software can e.g. be used to detect oversized or overweight load distribution.
- In the category “Weight Control” weigh bridges and scales help to detect overload and overweight.

Table 3 Workshop results (Truck Driver)

category	category / risk	equipment	Basic Traffic Control								Load Control		Weight Control
	risk		tests (breath, urine, saliva,blood), DRUID	binoculars, telescopes	database for documents	PDA/laptop+ software, speed gun	video, clock, laser, no legislation, by evidence, by witness	mobile brake tester/stands, infrared cameras	fumes meter	measuring instruments (radioactive, alcohol, gas)	camera, calculator, tensionforce examines, protractor, software	measuring tape/wheel	weigh bridge / scales
Truck Driver	State	tired											
		under influence of alcohol, drugs, illness, medicine	x										
		age and gender			x								
		hospitalized - need to hire replacement											
	Intentional erratic behaviour	speeding / high speed				x							
		use of phones, laptops or TV / inattention		x									
		overtaking / dangerous driving manoeuvres		x									
		low distance					x						
		rest period				x							
		missing driving/working time documents			x								
		daily/weekly rest time not fulfilled				x							
		cargo securing								x			
		overweight/load distribution									x		x
		condition of the vehicle		x									
		oversized									x	x	

Table 4 Workshop results (Truck Driver, Company)

category		category / equipment / risk	Basic Traffic Control: tests (breath, urine, saliva,blood), DRUID	Basic Traffic Control: binoculars, telescopes	Basic Traffic Control: database for documents	Basic Traffic Control: PDA/laptop+ software, speed gun	Basic Traffic Control: video, clock, laser, no legislation, by evidence, by witness	Basic Traffic Control: mobile brake tester/stands, infrared cameras	Basic Traffic Control: fumes meter	Basic Traffic Control: measuring instruments (radioactive, alcohol, gas)	Load Control: camera, calculator, tensionforce examines, protractor, software	Load Control: measuring tape/wheel	Weight Control: weigh bridge / scales
Truck Driver	Unconscious erratic behaviour	cargo securing								x			
		insufficient knowledge about traffic requirements/ risks								x			
		problems with the brakes						x					
		overweight/load distribution									x		x
		poor driving skills		x									
		condition of the vehicle		x									
		oversized									x	x	
Company	Personnel	time pressure/ timetables				x				x		x	x
		orders to disobey regulations				x				x		x	x
		wrong drivers selection				x				x		x	x
		education of the driver				x				x		x	x
		oversized									x	x	
		wrong handling of dangerous liquids								x			
	Truck	overload/-weight											x
		technical problems						x					
		trailers too old or rented											
		lack of maintenance of vehicles						x					

Table 5 Workshop results (Truck, External)

	category		Basic Traffic Control								Load Control		Weight Control
category	risk	equipment	tests (breath, urine, saliva,blood), DRUID	binoculars, telescopes	database for documents	PDA/laptop+ software, speed gun	video, clock, laser, no legis-lation, by evi-dence, by witness	mobile brake tester/stands, infrared cameras	fumes meter	measuring instruments (radioactive, alcohol, gas)	camera, calculator, tensionforce examines, pro-tractor, software	Measur-ing tape/ wheel	weigh bridge / scales
Truck	Condition of vehicles	defects of wheels/tyres		x									
		defects of steering system											
		defects of lightning/ signalling devices		x									
		defects of braking system/ components						x					
		gaseous emissions							x	x			
		defects of suspension											
		defects of chassis		x									
		escape of fuel/oil		x									
	Supple-mentary equipment	tachograph not properly functioning				x							
		speed limiter wrongly in-stalled/functioning				x							
Exter nal	Infrastructure	bad road conditions											
		row of trucks on the border											
		traffic jam											
	Human Behaviour	disobey regulations				x							
		suicide drivers causing head-on collision											
	Environment	weather conditions (strong wind, ice, fog)											
		wild animals											

The use of different equipment depends on the one hand on the police authorities' facilities and on the other hand on the country specific legal aspects.

The workshop results also show that there does not exist equipment for all transport risks: external risks, like weather conditions, traffic jam or wild animals cannot be reduced by the use of equipment. Furthermore, some risks related to the condition of the vehicle, e.g. defects of steering system or defects of suspension cannot be identified straightaway during a security check. Therefore the police authorities must contact experts from organisations, which do certified vehicle inspections (e.g. Dekra AG or the Technical Inspection Association (TÜV) in Germany), to detect these kinds of technical risks.

Nonetheless, an exhausted and tired truck driver who does not violate the regulations can be a risk in road traffic. He might be inattentively and delayed in reaction. In this case, here it is not only the responsibility of the police authorities to counteract this risk. In the first instance it should be the task of the driver and the driver's company to avoid this.

The insights gained provide the basis for developing measures and strategies to deal with risks and to detect deficiencies. Furthermore, the perspective of business practice should be analysed in a next step of the C.A.S.H. project. Additionally the perspective of business practise should be compared to the police authorities' view to analyse how both stakeholders can help detecting and reducing transport risks.

4 ADVANTAGES AND DISADVANTAGES OF USED EQUIPMENT IN ROAD CONTROLS IN THE BALTIC SEA REGION

The following part is based on the survey of used equipment in road controls which was introduced in chapter 3.2. In addition, information which was gathered during the executed C.A.S.H. Joint Exercises and other C.A.S.H. events since the end of 2009 were used to evaluate used equipment in road controls in the BSR.

4.1 Basic Traffic Control

The “Basic Traffic Control” of HGVs persists of the control of the driving license, vehicle registration certificate, cargo documents, specifics of dangerous goods transports and the open category “miscellaneous”.

Police authorities in the BSR have the opportunity to access tools to control **national driving licenses** of HGV drivers. Each country administers its own system. These national databases enable police officers to effectively and efficiently check national driving licenses. All required information is available for police officers. Furthermore, it is possible to access the information in an easy and fast way. The reported disadvantages consider additional functionalities and the partial limited availability in police cars. A useful functionality which was reported by one of the partners would be to get access to a digital photo of the person in question. Furthermore the control of old driving licenses may be finical. Overall these national databases have only minor disadvantages.

The control of **foreign driver licenses** is more complex than the control of national driver licenses. Currently, 110 different models of driving licenses exist within the EU Member States (European Parliament 2006). This fact leads to a high complexity of the control of foreign driver licenses. This is especially an important issue in matters of the validity and authenticity of foreign driver licenses. Since police officers have no efficient access to foreign databases on the road, it is currently time-consuming to control these licenses. It is possible to request the needed information through the European Vehicle and

Driving Licence Information System (EUCARIS), but this system is mostly only accessible in the office.

EUCARIS (https://www.eucaris.net/) is a communication network between the official national registration authorities and is operational since 1994. All BSR countries are participating in this initiative. Furthermore, it is part of the legal framework of the EU (European Union 2008; European Union 2008a). EUCARIS enables police authorities to access the national databases of the participating countries and request information about vehicle registrations and driving licenses.

EUCARIS has not been mentioned by many of the asked police officers and the published statistics show that the usage is very diverse within the EU and BSR. The system had overall roughly 10 Mio. inquiries in 2010. The origin of 43% of these inquiries was the Netherlands, where the system was developed. All inquiries from countries within the BSR accounted for 48%. The highest share within this region had Lithuania (28%), but Denmark, Finland, Norway as well as Poland had not been using EUCARIS at all (EUCARIS 2011). This circumstance highlights the importance of cooperation and best practice exchange between police authorities in the BSR.

Police officers have been interacting with the complexity of foreign documents for many years and produced relief by using handbooks or initiatives like EUCARIS or the Transport Document System (Humphrey 2011).

This was established by the European Traffic Police Network TISPOL (https://www.tispol.org/) in the year 2001. The system allows online access to more than 500 transport related documents with translations into several European languages (Lautenslager 2010). This helps police officers to easily check validity and authenticity of foreign documents, but such handbooks involve a continuing updating effort.

Furthermore police officers appreciate the introduction of one EU-wide legal driver license, but they have to handle the current situation until the complete adjustment of the directive 2006/126/EC. On the basis of this directive all EU Member States should replace their national driving licenses with one EU-wide license until 19th of January 2033 (European Union 2006).

The advantages and disadvantages of used tools in the BSR for controlling **vehicle registration certificates** are similar to the previous description of driving licenses. National databases exist which allow police officers the control of vehicle registration certificates of their own

country. The disadvantages of these national systems are on a very detailed level and have to be discussed between experts of the authorities.

In addition, they are able to check foreign vehicle registration certificates through the transnational cooperation within the BSR, but this procedure is time-consuming compared to the access to national databases. These circumstances lead to additional time and effort for police officers. In particular, the control of special issues like the check of sufficient insurance, validity of technical inspection or authenticity of the vehicle registration certificates is more difficult relative to the control of domestic HGVs. Examples to overcome these challenges is the already mentioned Transport Document System or EUCARIS. Furthermore it is possible to use IT solutions (e.g. scanner and software) to control the validity of national and foreign documents. Such IT solutions are going to be tested within the C.A.S.H. project.

In some countries of the BSR specialised authorities control **cargo documents.** In other countries it is one element of a “Basic Traffic Control” of police officers. In any case, police authorities depend on the cooperation with specialized authorities to be able to effectively check cargo documents. The control of cargo documents is a complex task as there are many relevant regulations especially for international transports. In some cases the sender or receiver even has to provide additional information to enable a sufficient check, which leads to time-consuming controls. It can be helpful to use checklists as some police authorities do within the BSR. Even better would be the use of databases. Some databases have been already realised but it is challenging to handle the existent variety of used languages for cargo documents. The legislator could ease the control of cargo documents by reducing the variety of valid documents. Furthermore, police authorities should exchange best practices about how to control cargo documents.

Within the BSR the control of **dangerous goods transports** is mostly done by specialised authorities. These authorities need additional information about the cargo and have to take international regulations for the transport of dangerous goods as a basis. **C.A.S.H. report 1:2010** highlights that dangerous goods transports belong to the most problematic regulatory factor from the enforcement point of view in some BSR countries (Alvarez-Tikkakoski et al. 2010, p. 57). Handbooks and checklists are helpful tools and provide necessary information to conduct sufficient controls. The use of databases is recommended as well. Some countries already successfully operate

such databases which support the police authorities and it is recommended to exchange experience in this field beyond the C.A.S.H. project.

The national legislation differs regarding the **minimum distance** of HGVs in the BSR. This effects the enforcement, but on a technical level police officers have adequate control equipment available. In general the distance between HGVs can be controlled stationary, out of a police vehicle or with handheld devices. Each method has its advantages and disadvantages. Stationary devices are very accurate, but require markings on the road or at least two control points. The use of police vehicles is very flexible, but expensive and labour intensive. Handheld devices are useful to address people directly, but the evaluation can be complex. The use of all methods seems to be advantageous. The EU funded project ASSET (Advanced Safety and Driver Support for Essential Road Transport) researched about technical solution for the distance control (ASSET 2009).

The enforcement of **alcohol and drug** offences is not in the focus of the C.A.S.H. project as bottlenecks seem to be more in the legislation than in control equipment. The DRUID (Driving under the Influence of Drugs, Alcohol and Medicine) project handles for example this issue (http://www.druid-project.eu/). The project is funded by 6th Framework Programme of the European Commission (EC) (http://ec.europa.eu/research/fp6/index_en.cfm).

The gathered information regarding the control of **driving and resting hours** will be published in the upcoming C.A.S.H. report ”Regulatory framework for the application of digital tachographs in the Baltic Sea Region. Legal and practical information for transport enterprises and public authorities”.

The complete equipment of police cars is crucial for effective and efficient control of HGVs. A basic functionality is the communication by **radio**. As some countries are introducing digital radio at the moment, it is recommended to exchange lessons learned with countries who introduced digital radio already. Furthermore, the availability of **online databases** is for example the precondition for the easy and fast control of driving licenses, vehicle registration certificates, and cargo documents. Police officers criticize the low availability of such systems.

In addition to the previously mentioned categories, police authorities were asked to provide information regarding other issues of interest during “Basic Traffic Controls”. Some authorities highlighted that the control of oversized/-overweight transports is a challenging task similar to the check of dangerous goods as certain regulations apply.

Furthermore commercial transport licenses and international transports are in the focus of police authorities during “Basic Traffic Controls”.

4.2 Weight Control

The applied load on infrastructure is impacted by the gross weight and of the weight distribution of HGVs. Too heavy HGVs or dissimilar distributed freights cause damage on infrastructure and induce high costs for reinstatement work. Furthermore, overweight is a risk which can lead to traffic accidents. Therefore the enforcement of regulations regarding the gross weight and weight distribution of HGVs is a significant task for police authorities within the BSR. The EU attempted to align the national regulations by approving the Council Directive 96/53/EC in the year 1996 (European Union 1996). This directive regulates the maximum allowed dimensions and weights in national and international traffic. Based on this directive EU Member States have their national regulations. The control of these regulations can be performed with the help of scales.

Police authorities differentiate between stationary and mobile scales. Stationary scales cause less technical problems but the regional availability is limited. Often, police officers have to accompany HGVs to stationary scales to be able to control them. As this procedure is time-consuming, the employment of mobile scales can be beneficial. Police authorities in the BSR have mobile scales of different manufacturers and use a different number of scales per check point. It is possible to check the gross weight and weight distribution of HGVs with only two scales. Software calculates the requested information. Figure 5 illustrates this method.

Figure 5 Weight control of HGV with 2 scales and levelling mats

As an HGV driver has to manoeuvre each axle on the scales during the weighing procedure, it can be time-consuming and error-prone. During a C.A.S.H. Joint Exercise, a weighing system of this kind was presented to the C.A.S.H. partners in August 2010.

The use of one scale per axle is a more precise method, but the adjustment of scales to the distance between the axles for each individual HGV is time-consuming as well. Figure 6 shows this method which was presented during a C.A.S.H. Joint Exercise in January 2011.

Figure 6 Weight control of HGV with one scale per axle

More advanced weighing systems allow HGV to constantly drive over the scales. Due to this the weighting takes only a short time, but this method is not as precise as the above mentioned systems. Weighing systems which allow HGVs to drive over with high speed are used for a so-called “pre-scan”. Conspicuous HGVs can afterwards be checked with more precise systems.

For all mobile weighing methods it is required to have adequate control space. In some countries this is a problem as it is not possible to use scales on roadsides and not enough parking areas are available. Furthermore, it is difficult to define the weight distribution of HGVs with pendulum axles. Different weather conditions affect the usability of all available weighing devices in the BSR.

4.3 Load Control

Insecure freight is of high risk for all road users. If cargo falls down, people and objects can be harmed. But insecure freight is also of high risk for the HGV driver as it might destroy the driver’s cap in an accident.

The enforcement of regulations regarding load control is very important for the safety on roads. Therefore all countries in the BSR have their national regulations concerning the adequate securing of freight. Furthermore, international organisations released standards or guidelines (e.g. European Commission 2006) regarding this topic. Nevertheless, police authorities and HGV drivers have to consider several different regulations within the BSR (Roth 2011). During the Joint Exercises organised by the C.A.S.H. project, police officers reported that not only the regulations differ, but also the enforcement. Figure 7 shows the load control during a C.A.S.H. Joint Exercise in August 2010.

Figure 7 Load control of HGV

The sufficient securing of freight is based on several factors which are controlled by police authorities. First of all, the condition of the HGV is important. Furthermore, it is important to use the right type of HGV for the respective freight. This is especially the case for freight which is difficult to secure or which is wider, longer or higher than the maximum allowed dimensions of an HGV.

Overloaded and/or -weight HGVs must have a special permit and are subject to special regulations. These permits are issued on national level. Some countries within the BSR seem to issue permits more freely than others. This can affect road safety as well as the competition between market participants and should be regulated on the European level. Other factors which influence the security of freight result from physical phenomena such as sliding, tilting, rigidity and the centre of gravity. HGV drivers or loaders as well as police officers have to be trained to be able to sufficiently control load freight. Within the C.A.S.H. project, police officers joined a special training regarding the securing of freight in November 2010. Figure 8 illustrates a tilting test which was performed during this exercise. In addition a course and test to achieve an EU wide recognised certificate about cargo securing was offered within the C.A.S.H. project in November 2011.

Figure 8 Tilting of a container to test the securing of freight

Police authorities in the BSR use different equipment to carry out load controls. Within the C.A.S.H. project police officers have the opportunity to learn about the different functionalities of used equipment. Basic tools are measuring or calculating instruments. This can be measuring tape, a protractor or as in figure 9 shown a cargo strap tension examiner.

Figure 9 Instrument to test the tension of cargo straps

In addition, police authorities use software to calculate the right amount of cargo straps to secure freight. Although equipment and

knowledge to perform load controls is available within the police authorities in the BSR, police officers observe that the existing regulations are insufficient. Especially for international transports it is important that uniform and specific regulations regarding load control exist.

4.4 Other equipment

During the C.A.S.H. Joint Exercises, police officers identified the need for an infrared camera which is useful to detect defects on brakes as well as on axles and wheels. An infrared camera visualizes the temperature of objects. As brakes warm up during operation, it is possible to identify non-functional ones by measuring the temperature. Furthermore it is possible to measure the temperature of liquids, which is especially important for dangerous goods of a certain temperature range. In addition, users are able to control the fill level of liquids. With existing control equipment it is only possible to check these issues at parked HGVs. These cameras can be installed at stationary control points or used as handhelds. Handheld infrared cameras enable users to control moving HGV. The on-going EU project ASSET highlights the advantages of stationary infrared cameras (ASSET 2009).

C.A.S.H. police officers reported that the main advantage of infrared cameras would be the fast detection of non-functional brakes. The next step within the C.A.S.H. project will be to test handheld infrared cameras in the field and to analyse their advantages and disadvantages.

4.5 Necessity of investments

The C.A.S.H. police authorities rated the necessity of investments for new control equipment in the questionnaire about pros and cons of used equipment. It was possible to gather an individual rating for each C.A.S.H. partner within the BSR. The needs are diverse as each partner uses different equipment within each category. The results are the basis for further discussions within the project.

Seven C.A.S.H. partners named necessities of investments from their point of view. In the following, it is indicated in brackets how many partners ranked each category with the most or second highest value: Driving license (3); Vehicle registration certificate (3); Cargo documents

(2); Distance control (2); Driving and resting hours (equipment/software) (5/4); Personal/police car equipment (radio/online databases/braking system (ABS)) (3/4/3); Weight control (4); Load control (3). The detailed results are available for each project partner in the C.A.S.H. intranet.

5 CONCLUSION

The results of the survey and the workshops show that there exist a plenty of equipment that can be used to detect and to avoid transport risks. Control equipment exists to avoid nearly all kinds of risks. But the police authorities use different equipment in the BSR. The usage depends on country-specific regulations as well as on the police authorities' facilities.

Many regulations are harmonised within the EU, but there are still national differences within the BSR. One example are regulations regarding the minimum distance between HGVs. Some EU Member States have not introduced such regulations yet. Another issue are the regulations of cargo securing which varies between the countries in the BSR. Such national differences make it complex for companies to fulfil all national laws. The current situation implies that it could happen that a legally loaded HGV has to be secured in a different way, if the HGV crosses the border. This situation is cumbersome for companies and police authorities.

In general, the long-term objective should be a harmonisation of regulations and used control equipment regarding road freight transport in all Baltic countries. But this is a long process that on the one hand needs time and on the other hand all participating countries have to agree on this as a common goal. Until then the police authorities should be aware of the different advantages and disadvantages of the equipment used in road controls to detect transport risks. Therefore, they should seize the opportunity to exchange their experiences with other police authorities. The first step is to share information about used equipment in each country. The second step is to report about advantages and disadvantages of this equipment. The third step is to enable police officers to gain experience with control equipment of different countries. These steps are supported within the C.A.S.H. project. Furthermore, it is necessary that the experts within the national authorities cooperate. The experts are responsible for the assessment and acquisition of new equipment. Therefore, they keep close contact to the industry and are up to date about new products or technologies. A good way to keep informed is to visit trade fairs for example, but often the individual contact to companies is helpful as well. As the

market for control equipment is strongly affected by national laws, many companies do not advertise their control equipment on an international level. For police authorities it would be an advantage to tender on an international level.

Furthermore, many systems have been developed on a national level. This is especially the case for databases. As each system has advantages and disadvantages, it is recommended to exchange such information as well. Police officers reported for example that it would be helpful to have access to photos of controlled persons. If such functionality is already implemented in another country, it would be helpful to exchange information regarding this topic.

Finally, it is important to spread the information about existing initiatives which have the aim to ease the control process of police officers. On the one hand, the awareness level is important that such initiatives can be used beyond national borders as it is a time-consuming and bureaucratic act to introduce these in each country. On the other hand, it is necessary that experiences about these initiatives are exchanged to improve the user-friendliness and functionality.

6 SUMMARY AND OUTLOOK

The aim of this report was to analyse transport risks that may occur in road transport in the BSR and to describe and analyse the equipment used in road controls in the BSR. Furthermore, it was identified which kind of equipment is used to reduce different kinds of transport risks. To achieve these results a survey and two workshops have been conducted.

After a short introduction the theoretical summary was described in chapter 2. It was shown that due to the geographic location and the dynamic economic development, logistics has a central role in the BSR. It is important to establish beneficial conditions for logistics in the BSR to cope with current challenges in road freight transport. This also includes the reduction of risks for logistics service providers, manufacturers, and commercial enterprises. Furthermore, the fundamentals of risk management have been described.

Chapter 3 contains the empirical results on transport risks and used equipment in road controls. First the differences between qualitative and quantitative research have been explained. Afterwards, the methodology, structure and content of the survey had been illustrated. In addition, the workshops on transport risks and on the application of equipment in road controls to detect transport risks have been summarized. Furthermore, the allocation of equipment used by the police authorities to the existing transport risks show that different equipment can be used to avoid different kinds of transport risks.

In chapter 4 the advantages and disadvantages of used equipment in road controls in the BSR were listed. Thereby, the equipment has been clustered according to the categories “Basic Traffic Control”, “Weight Control”, “Load Control” and “Other Equipment”. It shows that there exist several advantages and disadvantages that should be considered when police authorities are investing in new equipment.

Within chapter 5 recommendations for police authorities within the BSR are given. International cooperation is the key to further improve the ability of police authorities to control HGVs.

The results of the report provide the basis for developing measures and strategies to deal with risks and to detect deficiencies. While the aim of this report was to analyse the transport risks from the police

authorities' point of view, an additional risk analysis will be done in a next step of the C.A.S.H. project that is focussing the perspective of business practice.

APPENDIX 1. QUESTIONNAIRE

TUHH
Technische Universität Hamburg-Harburg

C.A.S.H.

Questionnaire

Work Package 5: Activity 5.1 - Equipment Testing

One of the aims of the C.A.S.H. project is to test state-of-the-art safety and security equipment and IT systems used in the control of heavy goods vehicles (HGV).
This questionnaire is designed to identify the used equipment, followed guidelines and different methods used in the control of HGVs by the different police organizations involved in the project. All questions refer to HGV - please keep this in mind. Please answer all questions as detailed as possible. You will need approximately 30 minutes to complete the questionnaire. Thank you very much for your help!

Part A: General Information

Name of your organization:

Your contact details:

- Name:
- Address:

- Phone:
- Email:

In which business unit are you working?

What is your position within your unit/organization?

TUHH
Technische Universität Hamburg-Harburg

C.A.S.H.

Part B: Basic Traffic Control (Excluding Weight and Load Control)

In this part of the questionnaire we would like to gain insight into basic traffic control.

1. **Documents**

What kind of documents do you control?

Driving license? ☐ Yes ☐ No

Do you use a database/handbook to check national licenses? ☐ Yes ☐ No

If yes, which one (e.g. TDS*)?

Do you use a database/handbook to check foreign licenses? ☐ Yes ☐ No

If yes, which one?

Are there specific problems concerning the control of the driving license?

Vehicle registration certificate (VRC)? ☐ Yes ☐ No

Do you use a database/handbook to check national VRCs? ☐ Yes ☐ No

If yes, which one?

Do you use a database/handbook to check foreign VCRs? ☐ Yes ☐ No

If yes, which one?

Are there specific problems concerning the control of the vehicle registration certificate?

Cargo documents (CD)? ☐ Yes ☐ No

Do you use a database/handbook to check national CDs? ☐ Yes ☐ No

If yes, which one?

Do you use a database/handbook to check foreign CDs? ☐ Yes ☐ No

If yes, which one?

Do you use an additional database/handbook to check CD of dangerous goods (DG) transports? ☐ Yes ☐ No

If yes, which one?

* Transport Document System http://www.nsfrits.eu/en/featured-news/ns-frits-addresses-transport-security.html

Are there specific problems concerning the control of the cargo documents?

Other documents? ☐ Yes ☐ No
If yes, which ones?

Are there specific problems concerning the control of other documents?

2. **Distance control**
What kind of equipment do you use?

Are there specific problems concerning the distance control?

3. **Alcohol and drug control**
Which tests do you use for which drugs? Please specify the used equipment:

	Alcohol	Marihuana	Heroin	Cocaine	LSD	Others?
Breath testing						
Blood testing						
Saliva testing						
Urine testing						
Others						

Are there specific problems concerning the alcohol and drug control?

4. **Driving and resting hours**
Which guideline do you follow:
On national level?

On EU level?

What kind of equipment do you use?

Which software (e.g. OCTET) do you use?

With which software did you gain experience in the past?

What are the most popular manipulations regarding the tachograph?

How can you detect such manipulations?

Are there specific problems concerning the control of driving and resting hours?

5. Personal/police car equipment

What equipment do you use during basic traffic controls?

- Radio? Please specify:

- Do you use special clothes, which is helpful for the traffic control?

- Do you have access to online databases? ☐ Yes ☐ No
  If yes, to which ones?

- Equipment for measurements?

- Do you test the braking system of an HGV? If so, do you have equipment to test it?
  How do you detect failures of the ABS system?

- Others?

What kind of equipment is missing?

Do you have any problems regarding your existing equipment?

Part C: Weight control

In this part of the questionnaire we would like to gain insight into the weight control. Please fill out the following table.

	Do you follow national and/or EU guidelines, which specify the allowed total weight or load distribution? Please name the source.		Do you use national or EU guidelines to calculate the total weight and load distribution? Please name the source.		What kind of equipment do you use to check the calculated total weight and load distribution (please specify the number of units of your equipment you use additionally to the description (e.g. how many scales)?	Which labels do matter regarding your work?	Please report problems regarding the weight control.	Please let us know which additional equipment would be helpful.
	National	EU	National	EU				
Total weight								
Load distribution								

Part D: Load control

In this part of the questionnaire we would like to gain insight into the load control. Please fill out the following table.

	Do you follow national and/or EU guidelines for the load control? Please name the source.		Do you use national or EU guidelines for calculations regarding the load control? Please name the source.		What kind of equipment do you use for the load control (e.g. strength tester; calculator)?	Which labels do matter regarding your work?	Please report problems regarding the weight control.	Please let us know which additional equipment would be helpful.
	National	EU	National	EU				
Centre of gravity								
Sliding								
Tilting								
Rigidity								
Vehicle								
Restraining methods								
Support equipment								

Source: Cargo Securing for Road Transport - http://bookshop.europa.eu/is-bin/INTERSHOP.enfinity/WFS/EU-Bookshop-Site/en_GB/-/EUR/ViewPublication-Start?PublicationKey=KO7606419

TUHH Technische Universität Hamburg-Harburg

C.A.S.H.

Part E: Concluding questions

1. Did you purchase new equipment related to HGV control in the last two years?
   ☐ Yes ☐ No

   If yes: What did you purchase?

   What did you replace?

   Do you plan to invest in new equipment in the near future? ☐ Yes ☐ No
   If yes: What are you going to purchase?

   What are you going to replace?

2. Do you have any suggestions regarding work package 5 / activity 5.1 - equipment testing?

3. Which equipment should be tested during the C.A.S.H. project?

4. Do you have any questions regarding this questionnaire?

5. Would you like to add something which was not considered yet?

Thank you very much for your help!

If you have any questions, please do not hesitate to contact us:

Police of Finland
erkki.vikman@poliisi.fi
Hamburg University of Technology (TUHH)
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Baltic Sea Region Programme 2007-2013

APPENDIX 2. PROS AND CONS

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Questionnaire

Work Package 5: Activity 5.1 - Equipment Testing

One of the aims of the C.A.S.H. project is to test state-of-the-art safety and security equipment and IT systems used in the control of heavy goods vehicles (HGV).

We are currently preparing a recommendation for the BSR Road Police Corps when investing in risk analysis IT solutions and related tools. The following questions are based on the previous WP5 questionnaire about used control equipment. Please help us to identify advantages (PROS) and disadvantages (CONS) of used equipment. You will need approximately 30 minutes to complete the questionnaire. Please send us your answers to max.feser@tuhh.de until **13th of May 2011**. Thank you very much for your help!

If you have any questions, please do not hesitate to contact us:

Hamburg University of Technology (TUHH)
Institute of Business Logistics and General Management (LogU)
Prof. Dr. Dr. h. c. Wolfgang Kersten, Dr. Meike Schröder, Carolin Singer and Max Feser

Part-financed by the European Union (European Regional Development Fund and European Neighbourhood and Partnership Instrument)

Baltic Sea Region Programme 2007-2013

I. General Information

1. Name of your organization

_____

2. Your contact details:

_____ _____
Name Function

_____

_____
Address

_____
Phone

_____
Email

Country: template

II. Basic Traffic Control

Driving License:

Equipment	To control	PROS	CONS
National database	*National* driving licenses	e.g. easy to use; fast access to information	e.g. missing information about…
Interpol Handbook	*Foreign* driving licenses		
TDS	*Foreign* driving licenses		

Vehicle registration certificate (VRC):

Equipment	To control	PROS	CONS
Interpol Handbook	*National* vehicle registration certificates (VRC)		
TDS	*National* vehicle registration certificates (VRC)		
Interpol Handbook	*Foreign* vehicle registration certificates (VRC)		
TDS	*Foreign* vehicle registration certificates (VRC)		

Cargo Documents (CD):

Equipment	To control	PROS	CONS
If any equipment in use, please specify:	*National* cargo documents (CD)		
Ask from the Custom Authority	*Foreign* cargo documents (CD)		

Distance control

Equipment	To control	PROS	CONS
Video and clock	Distance / speed control		

Driving and resting hours			
Equipment	**To control**	**PROS**	**CONS**
If any equipment in use, please specify:	Driving and resting hours		
Software			
If any, please specify:	Driving and resting hours		
Software in the past			
If any, please specify:	Driving and resting hours		
Personal/police car equipment			
Radio	**To control**	**PROS**	**CONS**
If any, please specify:	General control		
Online databases			
National database	General control		
Braking system / ABS			
If any equipment in use, please specify:	General control – brake testing		
Others			
Radars (handheld)	General control		
Radar (fixed)	General control		

III. Weight Control

Equipment	To control	PROS	CONS
Wheelscales (please specify)	Total Weight		

Calculating system (please specify)	Load distribution		

IV. Load Control

Equipment	To control	PROS	CONS
Wheelscales	Load Control		

V. Concluding questions

Please rate the necessity of investments in new control equipment for the following categories from low to high:

	Relevance *low* ⟺ *high*				
Driving License	☐	☐	☐	☐	☐
Vehicle registration certificate (VRC)	☐	☐	☐	☐	☐
Cargo Documents (CD)	☐	☐	☐	☐	☐
Distance control	☐	☐	☐	☐	☐
Driving and resting hours (equipment)	☐	☐	☐	☐	☐
Driving and resting hours (software)	☐	☐	☐	☐	☐
Personal/police car equipment (radio)	☐	☐	☐	☐	☐
Personal/police car equipment (online databases)	☐	☐	☐	☐	☐
Personal/police car equipment (braking system / ABS)	☐	☐	☐	☐	☐
Weight control	☐	☐	☐	☐	☐
Load control	☐	☐	☐	☐	☐

Do you have specific recommendations for investments?

Do you have any other comments?

Thank you very much for your help!

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1:2010 Compliance and Enforcement of Regulations of International Road Haulage – Exploratory Findings in the Baltic Sea Region in 2009
Authors: Eduardo Alvarez-Tikkakoski, Tomi Solakivi, Lauri Ojala, Harri Lorentz, Sini Laari

1:2011 The Impact of Market Structure on International Road Freight Safety – A Cross Case Analysis of Finnish Firms and Finnish and Estonian Competent Authorities in 2010-2011
Authors: Eduardo Alvarez-Tikkakoski, Tomi Solakivi, Lauri Ojala, Harri Lorentz

2:2011 The Market Structure Analysis For International Road Freight Transport in Latvia
Authors: I. Kabashkin, Y. Kryukov, Medvedev, A.

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C.A.S.H. project aims to develop practical solutions to make international road freight transport safer, more predictable and affordable in the Baltic Sea region. The project intends to do this by:

- **improving co-operation between authorities**
- **harmonising training of inspection officials**
- **testing safety equipment and IT systems to be used by relevant authorities**

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