



# Research Programme on Safety and Security in Transport – TRANSIKK 2010–2015

Summary of final report

Programme  
Safety and security in transport – TRANSIKK

# Research Programme on Safety and Security in Transport (TRANSIKK), 2010–2015

## Summary of final report

# Introduction

**Programme name:** Safety and Security in Transport (TRANSIKK)

**Primary objective of the programme:** The primary objective of the TRANSIKK programme was to enhance transport safety and security by strengthening the knowledge base available for policy development, transport administration and transport implementation.

**Programme period:** 2010–2015

**Programme board:** The membership of the programme board was approved in April 2010 in a meeting of the responsible division research board. The actual period of activity of the programme board ran from the beginning of 2011 to the end of 2015.

Representatives of the Ministry of Transport and Communications and a number of the relevant government agencies and research institutions were reappointed after having been programme board members for the research programme Risk and Safety in the Transport Sector (RISIT, 2002–2009). This led to a significant level of continuity between the RISIT and TRANSIKK programme boards. A total of five new members and a new chair were appointed to the TRANSIKK programme board. Thanks to the positive experience in establishing a meeting place between researchers and users under the RISIT programme, the TRANSIKK programme was strongly oriented towards users, with substantial user representation in the programme board. There were four representatives from the user community serving as members of the TRANSIKK programme board.

# Finances

The programme was funded by the Ministry of Transport and Communications, the Ministry of Trade, Industry and Fisheries, the Norwegian Public Roads Administration/Directorate of Public Roads, the Norwegian National Rail Administration, Avinor AS and the Norwegian Directorate for Civil Protection.

*Programme's sources of funding:*

<i>Ministry of Transport and Communications</i>	NOK 44 million
<i>Ministry of Trade, Industry and Fisheries (2014–2015)</i>	NOK 1 million
<i>Ministry of Fisheries and Coastal Affairs (2010–2013)</i>	NOK 4 million
<i>Ministry of Trade and Industry (2010–2013)</i>	NOK 2 million
<i>Norwegian Public Roads Administration/Directorate of Public Roads</i>	NOK 6 million
<i>Norwegian National Rail Administration</i>	NOK 3 million
<i>Avinor AS</i>	NOK 3 million
<i>Norwegian Directorate for Civil Protection</i>	NOK 1.8 million

Total disposable budget available:

NOK 64.8 million

## Activities

### Most important activities during the programme period

#### Priority areas set out in the work programme and requirements to applications granted funding

The programme board's first task was to draw up the work programme, based on needs identified by the relevant agencies in the final report of the RISIT programme, the programme's predecessor, as well as input from the research community. The primary objective of the TRANSIKK programme – to enhance transport safety and security by strengthening the knowledge base available for policy development, transport administration and transport implementation – was translated into concrete actions through three secondary objectives:

- a. To fund research of high scientific merit and relevance to the programme's users in road, rail, sea and air transport within the programme's three thematic priority areas.
- b. To strengthen Norwegian research groups and to promote cooperation between research groups and across scientific disciplines within the field of transport safety and security.
- c. To establish more meeting places for researchers and users and facilitate active knowledge sharing and discussion of research results.

The TRANSIKK programme provided an important supplement to research funded directly by the Ministry and government agencies by providing funding for research that extends across the various modes of transport, for more long-term research and for a number of large-scale projects.

The TRANSIKK programme generated new knowledge and expertise within three thematic priority areas:

- d. Regulation, governance and management: How can the transport system as a whole best be regulated and governed to enhance transport safety?
- e. Safety culture: How can the safety culture of each mode of transport be maintained and developed? And what is the relationship between safety culture and the safety and security of the transport system as a whole?
- f. Technology and transport safety and security, where there was a need for research-based analyses to identify both the potential and the challenges associated with new technology.

The TRANSIKK programme set strict requirements for high academic quality. In addition, the programme focused on strategic priorities involving future safety and security challenges; research that extends across different modes of transport and disciplines; and, building expertise within research groups and promoting researcher recruitment.

The programme also stipulated that researchers were to participate in *international cooperation* in order to enhance the quality of Norwegian research and broaden the knowledge base available for policy designation. The projects were encouraged to include international researchers, and

Norwegian researchers were given the opportunity to develop applications for funding under European or Nordic programmes.

The TRANSIKK programme required research results to be of sufficient calibre to qualify for *publication in top scientific and international journals* and to be disseminated at international conferences as well as to key users. One means of achieving the latter was to ensure that projects were visible in the public debate and the implementation of measures directed towards specific user groups.

Another strategic objective underlying the programme was to satisfy the need for *researcher recruitment and competence-building*. Projects were thus expected to incorporate doctoral work. To build up relevant research groups, the programme supported groups with potential to function as specialist research hubs for transport safety and security.

**The TRANSIKK programme’s three calls for proposals**

Application deadline	Applications received	Funding sought	Projects awarded funding	Funding allocated	Application success rate
February 2011	18	NOK 104 million	4	NOK 27.5 million	22 %
September 2012	15	NOK 43 million	5	NOK 14.9 million	33 %
November 2013	16	NOK 56 million	4	NOK 15.9 million	25 %

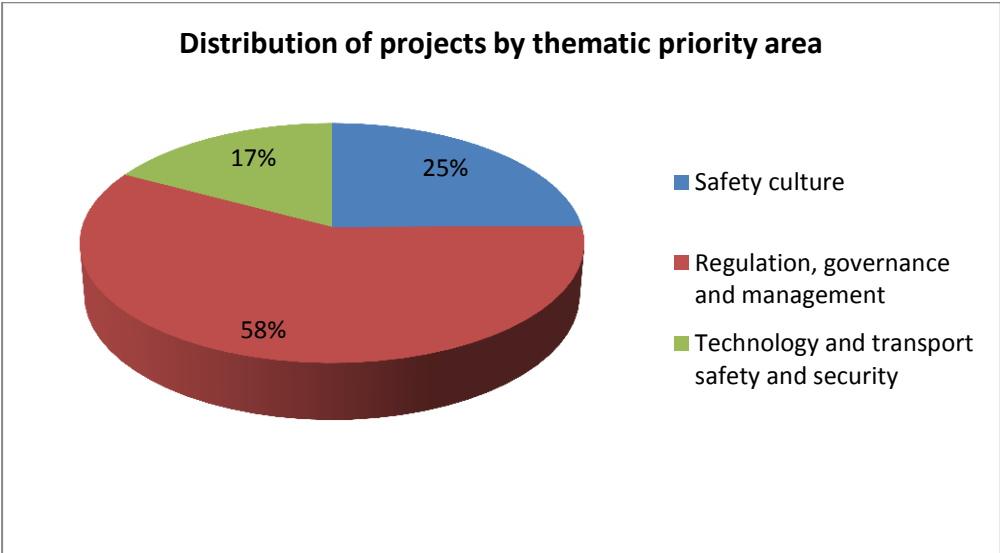


Figure 1: Distribution of projects by programme thematic priority area

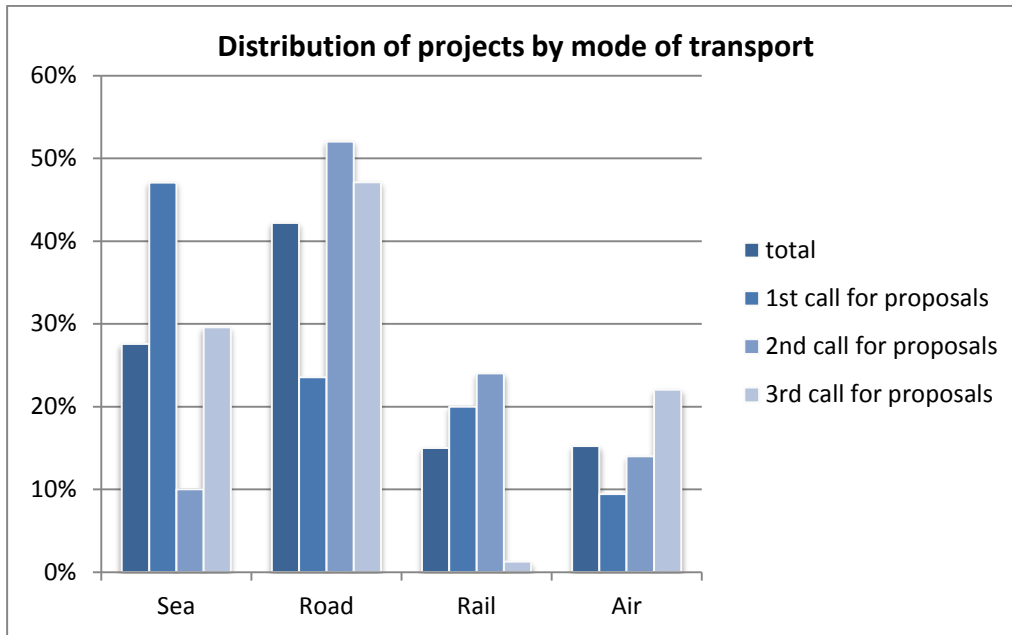


Figure 2: Distribution of projects by mode of transport

## R&D projects under the TRANSIKK programme

Project Owner	Project title
Institute of Transport Economics	Improving the knowledge base for systematic management of fatigue and reduced vigilance in transport operators
Institute of Transport Economics	Prospects for improving transport safety: analysis of safety potentials, efficiency of policy priorities and barriers to successful policy
Norwegian University of Science and Technology (NTNU)	Regulative rationalities and safety culture development.
University of Bergen	Safety culture and sustainable safety performance in the maritime transportation sector
Norwegian University of Science and Technology (NTNU)	Priority of safety and security in future urban transport systems
Institute of Transport Economics	Safety in Numbers - uncovering the mechanisms of interplay in urban transport
Institute of Transport Economics	Increasing foreign actors in road and sea transport of goods in Norway: safety challenges and regulatory measures
Institute of Transport Economics	Behavioural adaptation, risk perception and vulnerable road users: Prediction of outcomes of Intelligent Transport Systems (ITS)
University of Stavanger	Real-time management of transportation systems - The role of reliability professionals in dealing with drift.
Norwegian University of Science and Technology (NTNU)	Professional competence, standardization and safety in aviation and the maritime industry

Institute of Transport Economics	Work-related accidents in road, sea and air transport: prevalence, causes and measures
Institute of Transport Economics	A historic reconstruction of research on the economic valuation of road safety as a scientific research programme
Institute of Transport Economics	Unregistered Transport - Mobility, Safety and new Technologies

## Challenges ahead

Six particularly important areas for further research on transport safety and security have been identified. These challenges will be addressed under the recently launched Transport 2025 programme.

### 1. Digitalisation and “big data”

The effects of communication systems between road and vehicle or between vehicles and various GPS-based systems are not yet known. Digitalisation also overlaps with the issue of big data, which so far has only been utilised on a limited scale in the field of transport safety and security. There is great potential in the use of big data for transport planning, e.g. to better understand commuter behaviour, customise information, and influence travellers’ actions via real-time information. There is also untapped potential in freight transport, but the use of big data is linked to protection of personal information.

Particularly in the field of shipping, a great deal of data is being generated, although its content is variable and its processing quality is low. In addition, different institutions are responsible for different data. Standardisation of this data, including data related to maps, and a shift towards applying big data to develop future intelligent monitoring tools will be among the largest and most interesting challenges within the transport sector.

### 2. Safety management systems

Safety management systems and their impacts were identified as a thematic area in need of research. The safety and security efforts within the organisations are now much more widely documented than previously, due in large part to inspection, but the actual impact of this documentation is still unclear.

### 3. Automation, autonomous vessels/vehicles

The rapid-paced emergence of new technology is accompanied by new challenges relating to traffic safety. There is a need for research on the consequences of advances in vehicular technology in terms of behaviour, safety and public acceptance. This research involves ways in which new vehicular technology contributes to traffic safety, and areas in which this technology may pose a risk to traffic safety (e.g. driverless vehicles). In this context, there will be a substantial need to develop regulatory frameworks, as the concept of responsibility under the Road Traffic Act, for instance, will be challenged by new technological solutions that fully or partially take over for human drivers. Moreover, automation in all sectors will make it necessary to introduce stricter requirements for

surveillance and monitoring of technology, which in turn will place new demands on human operators within the system and bring the issue of fatigue more to the forefront.

Accident statistics indicate there is still room for improvement when it comes to understanding the interaction of human operators with complex technology, as well as training and experience related to automated systems and emergency situations.

#### **4. Safety for non-motorised transport**

In general there is weaker accident data on non-motorised transport. There are also a number of poorly understood mechanisms, such as the underlying factors in the “safety in numbers” effect, or the effects of wearing a helmet when cycling. Increased focus on sustainable modes of transport may lead to challenges, as pedestrians and cyclists are at greater risk than drivers, meaning that greener transport patterns will likely lead to higher accident figures.

Protecting the safety of the elderly and the disabled will also be important, and relevant solutions may be linked to technological development in this area, such as new types of vehicles and intermodal systems.

#### **5. Effects of globalisation and internationalisation on safety and security**

Although safety and security culture is well addressed in most sectors, it is a dynamic phenomenon that requires constant attention. For example, there is no overview of safety culture among foreign or international operators.

Internationalisation creates new, transnational thematic frameworks, for instance that conditions from outside Norway have an influence on what happens in Norway. Standardisation of regulations takes place on the basis of international needs, but the consumers are local, and the rules do not give consideration to specifically Norwegian conditions, such as those linked to climate and topography. Cabotage and international operators can lead to challenges rooted in different traditions, cultures and priorities.

Companies within the aviation industry in particular are subject to internationalisation. Airlines used to operate out of one country and were subject to that country’s regulatory framework. Now, airlines may be registered in one country, their aircraft registered in another and their crews from several other countries. These are completely new organisational models about which more knowledge is needed. Relevant research topics may involve regulatory and legal aspects, as well as challenges related to language, culture or training.

#### **6. Safety and security consequences of deregulation and competitive tendering**

Internationalisation also increases the proportion of foreign or international operators, and leads to changed conditions due to competitive tendering, new procurement processes and added price pressure. This may lead to dilemmas for operators, e.g. when it comes to safety margins and investment in training in relation to costs.



The growing trend of competitive tendering extends across industries. Further research on how this affects safety and security will be valuable, especially related to questions such as how to establish good contractual requirements for safety and security within competitive procurement processes, or how the relationship between the contracting authority and customer demands affects safety. The more intensive competitive situation is also tied closely to issues relating to the work environment, such as when the work environment represents a safety risk, and the degree to which employers are responsible for discovering high-risk employees (such as in the case of the Germanwings accident).

Very little is known about the effects of increased bureaucratisation and juridification of safety and security activities, which emphasises the translation of formal requirements, on local practice, and the effects of this restructuring on such efforts. The complexity of the regulatory framework appears to be leading actors to outsource less of their efforts to enhance safety and security, which changes the parameters of how these activities are organised.



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Published by:

© The Research Council of Norway  
Safety and security in transport – TRANSIKK  
[www.forskningsradet.no/transikk](http://www.forskningsradet.no/transikk)

Cover design: Design et cetera AS  
Cover photo: Shutterstock

Oslo, July 2016

ISBN 978-82-12-03545-4 (pdf)

This publication may be downloaded from  
[www.forskningsradet.no/publikasjoner](http://www.forskningsradet.no/publikasjoner)