



Work programme 2010–2015

Programme
Safety and Security in Transport – TRANSIKK

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Safety and Security in Transport - TRANSIKK

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1. Summary

The research programme Safety and Security in Transport (TRANSIKK) has been established following the success of the research programme Risk and Safety in the Transport Sector (RISIT) and as a result of the need for continued research in this field. Like the RISIT programme, the TRANSIKK programme will take a broad approach to risk and safety and will promote research that extends across modes of transport. The programme seeks to promote research activities on topics that range from incidents that occur relatively frequently, such as road accidents, to accidents that occur rarely or may never have occurred in Norway. The programme seeks to generate knowledge on traditional issues of *safety* as well as on new challenges (*security*). A third key topic is *vulnerability*.

This work programme defines three thematic priority areas for research under the TRANSIKK programme. It also outlines five strategic priority areas. The three thematic priority areas are: (i) *Regulation, governance and management*, (ii) *Safety culture* and (iii) *Technology and transport safety and security*. The five strategic priority areas cut across all activities under the programme. The first of these is *a focus on future safety and security challenges*. In addition, like the RISIT programme, the TRANSIKK programme will provide funding for *research that extends across modes of transport and disciplines*, the programme will seek to *build expertise within research groups and promote researcher recruitment* and will give priority to *communication and knowledge sharing*. The programme's fifth important strategic priority area is *internationalisation*.

The aim is to establish the TRANSIKK programme as a long-term initiative, but the initial programme period will be 2010-2015, with project start-up in 2011. The programme's annual budgetary framework is expected to be approximately NOK 10 million with a total budget for the programme period of approximately NOK 60 million. The programme is headed by a programme board, which will play a strategic role in the development of the programme and is responsible for assessing grant applications. The Research Council administration is responsible for the day-to-day activities of the programme. The most important funding instruments employed under the programme are calls for proposals and funding for research projects. Throughout the entire programme period importance will be attached to communication and knowledge sharing as well as the programme's role as a meeting place.

2. Background

During the period 2002-2009 the research programme Risk and Safety in the Transport Sector (RISIT) generated research-based knowledge that has led to greater understanding of transport risk. While the development of knowledge in this area had previously primarily taken place within the various government agencies in the transport sector, the RISIT programme promoted research across modes of transport. This proved to be an innovative approach, also in an international context. The RISIT programme focused on three thematic priority areas: *visions for transport safety, understanding transport risk and organising risk management*. Research findings generated by the RISIT programme have been used as a basis for the formulation of policy as well as the development of concrete measures by the transport authorities and other players in the transport sector, for example in the preparation of the National Transport Plan for the period 2010-2019. However, the

political sphere, the public administration and industry are still facing many unsolved challenges. The need therefore remains to encourage continued research on transport safety and security. The success of the RISIT programme as a meeting place for the ministries, government agencies and researchers has played a key part in the decision to continue the research initiative in this field.

Transport accidents represent one of modern society's major health problems. In Norway alone some 250 people are killed and 11 000 injured in road traffic accidents every year. In shipping, air and rail transport the accident rate is lower, but when accidents do occur they are often more extensive. Shipping, air and rail transport differ from the road transport sector in that they are to a large extent "closed" transport systems involving professional players. Thus, there are important differences in the safety and security challenges confronting the different modes of transport. There are, however, also many common denominators, such as the way those involved understand and manage risk as well as the development of new technological solutions designed to enhance safety and security.

Over the past few decades attention has been increasingly focused on the vulnerability of the transport system. This can be attributed to many factors: the increasing integration and interdependence of the transport system, climate change and terrorism. Climate change brings a growing risk of avalanches, landslides and flooding of an as yet unforeseen magnitude. Although the transport sector has traditionally taken account of natural events in its planning, there will be a need for a broader and better knowledge base on how the sector is to meet future challenges arising as a result of climate change. Another important factor is terrorism or other incidents in which those responsible deliberately seek to inflict damage on the transport system. In spring 2010 the volcanic eruption in Iceland had a major impact on air transport, as the airspace above several countries in Europe was temporarily either completely or partly closed as a result of ash clouds. The various modes of transport are becoming progressively more interdependent: incidents that occur in one branch of transport may also have significant ramifications for other elements of the overall transport system. A power failure in one area, for example, will affect both rail and road traffic at the same time. Such incidents are particularly challenging if they are the result of an act of terrorism or similar terror-like attack.

Like the RISIT programme, the TRANSIKK programme will take a broad approach to the concepts of risk and safety and will promote research that extends across modes of transport. This means that the programme will promote research activities on topics that range from incidents that occur relatively frequently, such as road accidents, to accidents that occur rarely or may never have occurred in Norway. The programme also seeks to generate knowledge on traditional issues of *safety* as well as on new challenges (*security*). A third key topic is *vulnerability*: a system's ability (or lack of ability) to manage incidents when they occur. Experience gained from the RISIT programme shows that it is important to shed light on these issues across various modes of transport. The programme is particularly interested in projects that can make the authorities better equipped to indentify future challenges.

The broad thematic scope of the programme means that the projects will have to employ and develop a wide range of methodological approaches. In studies focusing on frequently occurring incidents, statistical methods may be used as a basis for developing measures and policy. For research on incidents that occur rarely, sometimes with several years between similar events, other analytical methods have to be designed and used. As regards the low-frequency incidents, there are specific challenges connected with the prevention of rare

events that have major repercussions, such as large-scale natural disasters, widespread collapses of infrastructure or acts of terrorism or terror-like incidents.

The TRANSIKK programme will focus on three thematic priority areas. These have been defined on the basis of input regarding the needs of the various government agencies in the transport sector, input from key research groups in the field and needs identified in the final report of the RISIT programme. The first thematic priority area focuses on regulation, governance and management: How can the transport system as a whole best be regulated and governed to enhance transport safety and security? The second thematic priority area focuses on safety culture: How can each mode of transport maintain and develop safety culture? And what is the relationship between safety culture and the safety and security of the transport system as a whole? The third thematic priority area focuses on technology and transport safety and security, where there is a need for research-based analyses that identify both the potential and the challenges associated with new technology.

3. Objectives of the programme

The primary objective of the TRANSIKK programme is to enhance transport safety and security by strengthening the knowledge base available for policy designation, transport administration and transport implementation.

In order to achieve this objective the programme has identified three secondary objectives. The programme will:

- (i) 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.
- (ii) Strengthen Norwegian research groups and promote cooperation between research groups and across scientific disciplines within the field of transport safety and security.
- (iii) Establish more meeting places for researchers and users and facilitate active knowledge sharing and discussion of research results.

The key target groups for research findings generated by the programme are the Ministry of Transport and Communications and the government agencies providing funding for the programme. Other important target groups include the government authorities and the transport industry as well as the general public.

4. Priority research tasks

As indicated above, the TRANSIKK programme will take a broad approach to the concept of safety and will focus on what is traditionally referred to as safety as well as on security, incidents related to breaches of security and illegal actions/acts of terrorism. The programme will study incidents that occur frequently as well as those that occur more rarely.

On the basis of input from government agencies, key research groups and the final report of the RISIT programme, the TRANSIKK programme seeks to generate new knowledge and expertise within three thematic priority areas:

1. Regulation, governance and management
2. Safety culture

3. Technology and transport safety and security

4.1 Regulation, governance and management

The Vision Zero policy for transport requires focus on the instruments that can be used to improve the governance of the sector. This encompasses policy, administration and operational implementation. Establishing good governance practices and organisational structures to promote safety and security in an overall perspective are important components of efforts to enhance transport safety and security.

Many issues of interest are related to the regulation of the sector at various levels. One of these concerns the relationship between internationally initiated provisions and their implementation in the Norwegian system. This poses a significant challenge in particular in shipping and air traffic. Different administrative levels in Norway may also have different understandings of how regulations introduced at the central level should be implemented at the local level. Finally in this context there are also challenges at the local level where several modes of transport interact and where the aim should be to view the various measures in an overall perspective. In all these cases the situation may be complicated by the fact that there are several different, partly overlapping laws and regulations.

The instruments that the authorities have at their disposal to enhance transport safety and security depend in part on the type of affiliation those involved in the various transport branches have to the state. The various forms of affiliation pose challenges for the authorities in terms of regulation, governance and management, in particular as regards the development of a comprehensive approach to transport safety and security and the establishment of effective control mechanisms and monitoring procedures. In recent years increasing attention has been directed towards internal controls, which now form an integral part of the overall control system in the transport sector. There is a need to enhance understanding of how optimal control and monitoring procedures can be developed and how the quality of an internal control system can be measured. One topic of particular interest will be to increase understanding of the interplay between these factors in a transport system that consists of a combination of several modes of transport. One specific challenge is learning. How can we ensure that the insight gained from the use of control systems in connection with accidents and other relevant incidents, as well as from ongoing control and monitoring activities, is converted into learning? This becomes particularly difficult when the operational foundation for the branch of transport is constantly being changed and tasks increasingly split up, as is the trend both internationally and in Norway. One example of this is the railways, where tasks are now to a larger extent divided between many different actors.

The priority given to various measures may be studied from several perspectives. Analyses of how different measures targeting the same problem are prioritised will be of interest, such as the prioritisation of awareness campaigns or driver assistance systems compared to infrastructure measures. It may also be interesting to examine the issue of prioritisation in a broader context, such as priorities between different objectives or cross-sectoral priorities. In addition, measures can be assessed from different time perspectives. The priority given to various measures may also depend on whether the measures are targeted towards the prevention of frequent or rare incidents or whether the focus is on *safety* or *security*.

How the sector is regulated and governed will have an influence on how the authorities and the agencies or enterprises involved are able to manage crisis situations. Management is also a question of identifying the types of incidents/crises the branches of transport should

be prepared to deal with and where the interface with other sectors lies. In addition, management may be a question of how far one sector is responsible for maintaining service production in another sector, for example how far does the power industry's social responsibility for the safe operation of transport extend? It may therefore be useful to take a closer look at how the regulatory and control framework for safety and security addresses major social crises or whether the regulations are targeted too much towards life and safety within the particular area of responsibility of the individual enterprise, or the individual workplace, cf. text above on internal control systems.

4.2 Safety culture

Safety culture is crucial for all modes of transport and has been a research topic for several years internationally, for example under the EU research programmes. Much of the international research in the field of transport safety has focused on understanding and describing safety culture, while less has been carried out on the normative area, i.e., on how a satisfactory safety culture can be established and developed.

An interesting question in this context is how to identify the mechanisms that are important for achieving safety culture that enhances the safety and security of transport users and employees in the transport sector alike. Organisational learning as a component of safety culture is a topic of particular interest. Another question relates to the extent of individual responsibility in a situation where procedures and systems designed to promote good safety culture are established at central level. A more general issue is the extent to which and in what situations gender is a significant factor.

Measures designed to improve safety culture have most frequently been targeted at companies and enterprises. A new and interesting topic of study will therefore be safety culture in the transport system as a whole, a system that consists of many independent players with differing safety cultures. Transport users wish to reach their destination safely without having to take particular account of the types of transport they are using on their journey.

Research on safety culture may take an individual perspective, focusing on how the individual can be encouraged to embrace a good safety culture. Alternatively the research can be conducted from a system-oriented perspective, with a focus on either one, several or on all of the players involved in a particular branch of transport or on several modes of transport together. A crucial issue here is how regulatory measures can promote the development of a satisfactory safety culture.

4.3 Technology and transport safety and security

The TRANSIKK programme raises two questions in particular related to this thematic area: How can new technology be developed and used in a way that will enhance the quality and safety and security of the transport sector and how can this new technology be introduced without or with minimal negative consequences? It is important to note that the programme will not be providing funding for the development of technology or its implementation in the form of products. There are, however, many important questions related to technology and transport safety and security that can be illuminated through more social science-oriented research.

The introduction of new technological solutions may, for example, raise completely new questions relating to responsibility: at what stage is the producer, the regulatory authority, the enterprise or the individual responsible for any potential repercussions brought about by

the introduction of new technology? In this context it is necessary to study transport as a socio-technological system taking into account the various connections and interdependencies; it is not enough to view the introduction of new technology in isolation.

Another interesting topic involves how regulatory measures and other measures may lead to the implementation of desired technology. An equally relevant topic will be to shed light on a situation where new technology is introduced via an external supplier and where society can decide retrospectively the circumstances under which the technology should be used. Society will be facing such issues more and more frequently as a result of expanding globalisation. The TRANSIKK programme seeks to generate knowledge on technology both at the level of the individual, such as in terms of driver assistance systems and the like, and on technology that supports the operational implementation of transport. Studies that focus on processes that incorporate regulatory measures, governance and safety culture, thereby linking the three thematic priority areas together, will also be of interest.

5. Strategic priorities

The activities of the programme will build on five strategic priority areas: (i) A focus on future safety and security challenges, (ii) Research that extends across different modes of transport and disciplines, (iii) Building expertise within research groups and promoting researcher recruitment, (iv) Communication and knowledge sharing, and (v) Internationalisation.

5.1 Focus on future safety and security challenges

One of the key aims of the TRANSIKK programme is to promote research that provides society with a better basis for meeting future safety and security challenges. The programme therefore seeks project proposals that identify trends and social or technological developments relevant to the strategic development and operationalisation of transport safety and security, within the three defined thematic priority areas. Developing new scenarios or analyses based on already developed scenarios may be relevant methods in this context. A future-oriented perspective should not, however, be solely based on the use of scenarios. It may also be important for the research to be grounded in analyses related to future safety and security challenges.

5.2 Research that extends across different modes of transport and disciplines

The need to develop knowledge on risk and safety across different modes of transport was one of the reasons for the establishment of the RISIT programme. The overall perspective taken by the RISIT programme proved to be an innovative approach also in an international context. The TRANSIKK programme will similarly encourage projects that incorporate research on at least two modes of transport. In special cases projects that study only one mode of transport may be awarded funding, if they can clearly show that the project activities have relevance for several modes of transport. Many of the research questions raised under this programme can best be addressed through interdisciplinary or multidisciplinary cooperation. In many cases an interdisciplinary or multidisciplinary project will be deemed most relevant from the perspective of the users. At the same time it is vital to avoid research that is detached from the field or has little scientific

merit. It is important that the grant proposals and projects explain why they have chosen either an interdisciplinary or monodisciplinary approach and why the chosen approach is the most effective way to provide answers to the questions to be addressed.

5.3 Building expertise within research groups and promoting researcher recruitment

One of the TRANSIKK programme's key secondary objectives is to increase knowledge in Norwegian research groups working in the field of transport safety and security. To achieve this objective the programme will promote researcher recruitment and provide funding for talented researchers at the beginning of their careers. Projects that seek to enhance the expertise of research groups working in this field will be encouraged.

In the allocation of funding, scientific merit and relevance relative to the work programme will be the most important criteria. All relevant research groups at the universities, university colleges and independent research institutes are eligible to receive funding under the TRANSIKK programme. One of the aims of the programme is to promote the development of specialist research communities. Projects should therefore support groups that focus on research on transport safety and security and that over time can act as specialist research hubs. Projects in which the project manager is a woman will also be viewed in a positive light, as this was something lacking under the RISIT programme.

As stated in its final report, the RISIT programme funded six doctoral fellowships in part or in full. Recruitment of new doctoral fellows is essential. At the same time it is important to ensure that young researchers are given the opportunity to further develop their expertise. In its funding announcements the TRANSIKK programme will seek projects that involve the participation of several researchers and that promote the recruitment of doctoral and/or postdoctoral fellows.

The programme will also encourage collaborative projects in which several research institutions cooperate to conduct research on common or related topics.

5.4 Communication and knowledge sharing

Publication of articles in international journals is the most important form of scientific dissemination. It presupposes critical and independent quality assessment and provides an important indicator as to whether the research under the programme is of high calibre. International publication, in peer-reviewed journals or in the form of books published by international publishing houses, is essential if the researchers are to take part in international research cooperation, ref. point 5.5 on internationalisation. Projects that are awarded funding must therefore have plans to publish their research findings in recognised international publications. Participation at international conferences and presentations of papers and posters will also be an important part of the scientific dissemination activity under the TRANSIKK programme.

The TRANSIKK programme emphasises that communication and knowledge sharing is a two-way process, especially in terms of the relationship between researchers and key users. Good research builds on existing knowledge. Previous experience gained by the government agencies is an important source of knowledge. The programme will encourage applications for projects that include clear aims and plans for communication and knowledge sharing both during the project period and in the concluding phase. In addition, it is important that the researchers participate at events and communicate their research findings at events outside the normal

channels of scientific communication. Dissemination measures should be targeted towards user groups, but it is also important that the researchers take part in the public debate. Researchers can use their knowledge and independent status to elucidate strategies and assessments that can form the basis for efforts to reduce risk and enhance transport safety and security.

5.5 Internationalisation

Internationalisation is one of four overarching aims of Norwegian research policy and is a key component of the Research Council's strategy. Important international collaborative efforts are taking place in the field of transport research, and participation in this will broaden the knowledge base available for policy designation and enhance the quality of Norwegian research.

In order to promote international cooperation the programme will:

- Encourage projects that involve cooperation with international researchers and research communities and whose budgets include provision for research stays abroad, visiting researcher grants and participation at international conferences.
- Encourage Norwegian researchers to submit grant proposals to the EU and the European Science Foundation as well as to NordForsk and other international research funding bodies.
- Establish ties with relevant Norwegian research groups and projects receiving funding from the EU and other international research funding bodies.
- Invite international researchers to participate at seminars hosted by the programme.
- Consider issuing separate funding announcements for support for internationalisation measures.
- Consider other measures that could lead to increased internationalisation.

6. Time frame, milestones and funding plan

One of the key objectives of the programme is to continue the competence-building efforts that were started under the RISIT programme (2002-2009). Developing specialist research communities requires a long-term approach, and steps will be taken to develop the TRANSIKK programme into a long-term and flexible research initiative. The initial programme period will be 2010-2015, with project start-up in 2011. The Ministry of Transport and Communications is contributing the greatest amount of funding, with an allocation of NOK 7 million. In addition to this, at start-up the programme has received funding from: the Norwegian Public Roads Administration, Directorate of Public Roads, Norwegian National Rail Administration (Jernbaneverket), the Ministry of Fisheries and Coastal Affairs (Norwegian Coastal Administration), the Ministry of Trade and Industry (Norwegian Maritime Directorate), Avinor AS and the Directorate for Civil Protection and Emergency Planning (DSB). The programme's annual budgetary framework is expected to be approximately NOK 10 million, with a total budget for the entire programme period of approximately NOK 60 million.

During the initial start-up phase in 2010 and 2011 the main activities of the programme will focus on completing projects conducted under the RISIT programme, issuing funding announcements and processing grant applications. An extra funding announcement will be issued in 2011-2012. Experience shows that this additional call for proposals will need to be more specifically targeted, so as to incorporate topics and research questions not adequately covered in the first call.

7. Overlap and cooperation with other programmes and activities

The TRANSIKK programme overlaps with several other initiatives both within and outside the Research Council. Of the initiatives administered by the Research Council, the research programmes Societal Security and Risk (SAMRISK) and Intelligent Freight Transport (SMARTRANS) are the most relevant. In addition, climate change is a key factor for future risk and safety challenges and the programme should therefore also be viewed in connection with climate research funded by the Research Council. Research activities carried out under the Programme for Strategic Transport Research under the Ministry of Transport and Communications as well as under other the government agencies may also be relevant.

Tasks will be handled through reciprocal exchange of information and joint meetings will be organised where appropriate to ensure coordination and constructive division of tasks. Co-funding of projects and/or joint funding announcements may also be relevant. To follow up the strategy to increase internationalisation the programme board will attach particular importance to communication activities and cooperation with Norwegian and, when relevant, international research groups that have been awarded EU funding for research on transport safety and security.

8. Programme organisation and instruments

8.1 Programme board and administration

The overall responsibility for the programme lies with the Research Board of the Division for Innovation at the Research Council. The programme is led by a programme board that acts on behalf of the Research Council in accordance with its mandate. The programme board will play a strategic role in the development of the programme, in identifying and establishing the thematic priority areas of the research, assessing grant applications and ensuring that the programme meets its established objectives. The programme board reports to the division research board via the division executive director and the director of the relevant department. The Research Council administration is responsible for the day-to-day activities of the programme.

The members of the programme board have been selected with a view to ensuring adequate expertise within the programme's scientific areas and representation of the interests of key users. Three observers have been appointed in order to ensure that all the government agencies providing funding are represented. Both deputy members of the programme board will be invited to all meetings with the right to speak and make proposals. Observers will also be granted the right to speak and make proposals but will not be entitled to vote. Appointments to the programme board are personal.

8.2 Allocation of funding to Researcher Projects

The most important funding instruments employed under the programme are calls for proposals and funding for research projects that the researchers themselves propose and implement. Guidelines regarding the programme's thematic and strategic objectives will be set out in the calls for proposals. Grant proposals must specify and explain how the project will help the programme to achieve its objectives. Proposals must also indicate how the anticipated project results will generate knowledge of significance for policymaking and the development of measures to enhance transport safety and security.

8.3 Communication activities

Communication and knowledge sharing will be vital throughout the entire programme period. The programme will draw up annual communication plans. Seminars and conferences will be key instruments in this context, both during the programme period and in the programme's concluding phase. The programme webpages will be developed as a good source of knowledge for central user groups, both through the publication of news items and through links to important publications generated by the projects. The programme board will also provide summaries of activities and publish its own reports containing key research findings from projects carried out under the programme. It may also be appropriate to contribute to the preparation of state-of-the-art reviews in the field. Before any decision is made to extend the programme beyond 2015, the programme board must provide a summary of activities carried out under the programme, an evaluation of the results and the financial grounds for continuing the programme.

8.4 Other instruments

One of the TRANSIKK programme's important secondary objectives is to establish more meeting places for researchers and users. The aim is for the programme itself to become an important meeting place. In keeping with this, follow up of and cooperation with the projects being carried out under the programme will be an essential component of the programme board's activities. The programme will attach importance to good reporting on the part of the projects, as regards both research findings and the implementation of main activities and milestones in the projects.

In line with the strategic guidelines the programme will promote projects that involve cooperation across disciplines and research groups, participate actively in international research cooperation and disseminate the results of their research through publication and other activities. All planned activities must be included in the budgets provided in the grant applications. The programme board is aware that new needs may arise during the project period. It may therefore be necessary to issue separate calls for proposals for activities of this kind.



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