The Research Council of Norway

The Transport 2025 programme

Work programme 2015–2024

Programme
Transport 2025 – TRANSPORT

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Work Programme
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Contents

1. Summary

The Transport 2025 programme is the Research Council's new strategic initiative on research and innovation in the transport field. The programme addresses road, rail, sea and air transport, as well as passenger and commercial transport – including collective transport.

In 2014, the Research Council prepared a strategy document as a knowledge base for transport research, entitled *Ingen vei utenom* ("No Road Around It"). The strategy document emphasises the need to take a comprehensive approach to the transport system and the need for innovative thinking and change in the sector. The Transport 2025 programme was established as a follow-up of this.

The Transport 2025 programme seeks to generate knowledge and solutions for use in the development of an integrated, future-oriented transport system that will meet the needs of trade and industry and society at large for effective, sustainable transport.

The Transport 2025 work programme identifies three thematic priority areas that will help to achieve the programme's objectives. These areas are:

1) An innovation-driven transport sector;

2) A sustainable transport system that helps to reduce greenhouse gas emissions and pollution of the local environment;

3) A transport system for future-oriented urban and regional development.

The work programme also outlines five cross-cutting structural priority areas. The Transport 2025 programme will work to:

- *develop world-class research environments in the transport field in Norway;*
- *ensure that the results of research and development (R&D) are utilised;*
- *enhance effective interaction between Norwegian and international research, especially in relation to EU framework programmes – including in particular the research programme Horizon 2020, in which transport is a priority area;*
- *increase interaction between education, research and attractive career opportunities in the transport field;*
- *enhance knowledge about the programme and transport research among relevant R&D environments, relevant users, public authorities and others.*

The programme has a duration of 10 years. In 2015, its start-up year, the programme has a budget of NOK 35 million. The programme receives most of its funding from the Ministry of Transport and Communications.

The Transport 2025 programme is targeted towards research institutions, the transport industry and its users and special interest organisations, and the public sector, including municipalities and counties.

2. Background

This work programme presents the framework for the Transport 2025 programme, a strategic research programme under the Research Council of Norway.

The transport field has been identified as the sectoral responsibility of the Ministry of Transport and Communications, which has the *National Transport Plan* as its most important steering document. The Research Council's strategy document for the transport sector, *Ingen vei utenom* ("No Road Around It"), however, shows that a sustainable, well-functioning transport system is a prerequisite for achieving most of society's objectives. This is also reflected in several government white papers in recent years which have highlighted transport as an important focus area; see for example the *white paper on Norwegian industrial policy (Meld. St. 39 (2012–2013))* and the *white paper Norwegian Climate Policy (Meld. St. 21 (2011–2012))*.

The *Long-term plan for research and higher education 2015–2024 (Meld. St. 7 (2014 –2015))* puts special emphasis on transport in the priority areas of climate, environment and clean energy. An effective, well-functioning transport system is also critically important for achieving the plan's objective of innovative, adaptable Norwegian industry.

Transport research is not a separate research field, but a combination of various disciplines that work to solve the common challenge of achieving a well-functioning transport system.

Transport research is defined as research that studies transport or logistics/traffic-related components and/or consequences. This applies to issues such as mobility and behaviour, performance, competitive conditions, business and socioeconomic ramifications of transport, and models and methods for transport analysis.

Development and use of ICT for management and control of transport, traffic and logistics also fall within the realm of transport research. This same is true for the development and use of energy carriers and energy systems in a transport context. Research on physical and electronic infrastructure is included, as is research related to risk, safety/security and the environmental impact of transport.

Several programmes and activities at the Research Council already encompass aspects of transport research. The Transport 2025 programme's sphere of responsibility does *not* cover the following two areas:

1) development and application of energy carriers and energy systems in a transport context (as this research area is covered by the Large-scale Programme for Energy Research (ENERGIX)), and

2) research and development related to physical infrastructure, such as concrete, asphalt and technical construction solutions (due to the programme's limited budget and because funding for this research area may be sought from the Programme for User-driven Research-based Innovation (BIA)).

2.1 Strategic perspectives

The Research Council has had several strategic initiatives on transport research in the past 10 years:

- Research on industry-oriented transport and intelligent transport systems (ITS) has been funded through the Programme on Intelligent Freight Transport (SMARTRANS).
- Research on transport safety and security has been funded through the Programme on Risk and Safety in the Transport Sector (RISIT) and the Programme on Safety and Security in Transport (TRANSIKK).
- Knowledge development and solutions that reduce environmentally harmful emissions from the transport sector are a strategic part of the Large-scale Programme for Energy Research (ENERGIX).
- Research on maritime transport is part of the Innovation Programme for Maritime Activities and Offshore Operations (MAROFF).

In addition, transport-related research is conducted under some of the Research Council's other programmes and activities. At present, no exact figures are available on the Research Council's total investment in the transport field, but investments in strategic activities have amounted to some NOK 100 million annually. This includes research on three technology areas – batteries, hydrogen and biofuels – as well as on maritime transport.

In connection with the conclusion of the SMARTRANS programme and the process towards further investment in transport research, the Research Council implemented a broad-based process which resulted in the strategy document as a knowledge base for transport research *Ingen vei utenom* ("No Road Around It"). The strategy document points to a fragmented sector, stating there is a clear need to view the transport system in a more integrated perspective and to boost Norwegian transport research substantially. Among the measures proposed was a new, broad-based research programme, Transport 2025, with start-up in 2015. The need for renewal and change in the transport system has been a key driver in the effort to draw up the strategy document and in the establishment of a new, consolidated transport research programme.

There have been no evaluations conducted of the Norwegian transport research groups. During the strategy process, data was compiled on the Norwegian transport research environment and industry. The data show that the transport field is characterised by a private sector that conducts very little research and by a strong public sector. This sets the stage for how the Transport 2025 programme will develop its instruments.

Research within transport research is carried out by a few large and several smaller institutions. The largest institutions within the sector are the Institute of Transport Economics, SINTEF, the Norwegian University of Science and Technology, and Molde University College/Møreforskning. Norwegian transport research has limited capacity and is somewhat fragmented viewed in relation to the pressing challenges in the field.

Participation in international research cooperation is essential for further expanding Norwegian transport research, deploying the knowledge acquired and taking part in the development of tomorrow's solutions for the transport system. Transport is one of the largest strategic areas within Horizon 2020. Consequently, it is crucial that the Transport 2025 programme helps to establish the best possible connection between the national research effort and international cooperation. This applies to Horizon 2020, groups of countries participating under the auspices of relevant ERA-NETs and the like, as well as to cooperation with individual countries within or outside of Europe.

This is in keeping with the Research Council's Strategy for International Cooperation 2010–2020 which emphasises that international activities are to be integrated into all of the Research Council's programmes. Moreover, this strategy is supported by the Norwegian Government's Strategy for Research and Innovation Cooperation with the EU (2014) which stresses that all of the Research Council's programmes should set aside funding for international cooperation. This applies to cooperation with the EU's research programmes, joint funding with multiple countries and/or with individual countries.

2.2 Scientific perspectives

Transport in Norway is expensive and time-consuming due to the country's long distances, mountainous terrain, varied climate and geographically dispersed population. Investment and operating costs are high, as are the costs for the transport of freight and passengers. A dramatic increase in urban population growth is expected to occur in the coming years, and good connections between residential and labour market regions will become a critical challenge. Together with more greenhouse gas emissions from the transport sector, this population growth will place additional pressure on the local environment.

Globalisation

Globalisation sets the premises for organisation and development of the transport sector, leaving less room for national or regional solutions. Product specialisation and changes in production patterns may affect the entire logistical system within companies, which in turn will affect the coverage, patterns and distribution of transport. Increased trade and higher private incomes have also resulted in a change in passenger transport involving more and longer holiday trips.

Climate and the environment

Greenhouse gas emissions from transport have increased by 30 per cent from 1990 to 2012, and they are expected to continue to increase up to 2030. Emissions from delivery vans and heavy lorries are expected to cause the greatest increase up to 2030. There are currently five million small sources of transport emissions that account for 30 per cent of the greenhouse gas emissions in Norway, and the number of emissions sources is expected to increase up to 2050.

Picture: Colourbox

Everyone takes a large number of emissions-related decisions each day, and the challenge is to lay a foundation for a system in which it is easy to choose climate-friendly solutions. General economic growth in society increases the demand for transport, and despite well-meaning political intentions to increase commercial transport on sea and by railway, the trend is towards more freight being transported on roads.

Commercial transport

Commercial transport is changing in step with increasing globalisation and the opportunities created by new technology. The growth of e-trade has changed what products are delivered where, and when. Norway has an industrial structure based largely on the extraction and sale of raw materials and the processing of goods – in part based on these raw materials.

Companies are spread throughout the country, and many are located along the coast. Trade and industry needs robust transport systems in order to be competitive. Logistics and transport are part

of the delivery chain for products and services. The transport buyer sets demands regarding time and quality. New ITS solutions may promote more effective use of transport modes and a better information flow in the logistics chains for “door-to-door” transport. Effective terminals are critical for a shift from road transport to sea and rail transport.

Urbanisation, urban and regional development

An increasingly larger proportion of the population lives in cities, semi-urban areas and other densely populated areas. Some Norwegian cities have the highest population growth in Europe. It is estimated that the Oslo area will have 40 per cent more inhabitants by 2040. If those people travel as much as they do today, it will result in 1.5 million new daily trips in the Oslo area in 2040. More people are choosing to live in the city their entire lives, which affects the demand for transport.

The percentage of 17- to 24-year-olds who choose to obtain a driver’s licence is on the decline. The growth of trends such as car sharing and urban bicycles are now an important aspect of the transport system, and these are easier to combine with other transport solutions. The National Transport Plan has a clear objective to address the growth in passenger transport through collective transport, cycling or walking.

A growing urban population also leads to more commercial transport and more distribution of goods in the cities. Traffic queues and poorly adapted freight reception facilities constitute a substantial cost for the business sector. This also results in conflicts between accessibility of roads for the distribution of goods and people’s mobility, and decreases the safety, security and enjoyment of pedestrians and cyclists. A growing number of companies are located in cities and semi-urban areas, resulting in greater mobility overall across municipal borders. Many semi-urban areas are experiencing pressure on the labour and housing market as well as on their infrastructure.

Demographics and lifestyle

About one-fourth of the Norwegian population will be above the retirement age as 2050 draws near. This will bring about changes in travel methods and car usage, which in turn will affect the overall traffic situation. Health and transport are connected: Lack of movement is a health risk. Today fewer employees do manual labour, daily activity has been reduced, and people tend to drive cars instead of walking. The younger generation has a different view of mobility from previous generations, as they put more emphasis on electronic communication and the use of ICT solutions.

New technology

The development of new technology, e.g. within ITS, may promote more efficient use of the transport modes and take better advantage of the infrastructure capacity. The development of ITS allows for more customised solutions. The use of real-time information and travel planners are obvious examples of this.

Picture: Shutterstock

Big data provides access to information that can be used to improve the transport system, accessibility and safety/security. Self-driving cars are currently being developed, and the estimated number of years it will take before these are commercially available is becoming increasingly shorter. However, use of the technology requires knowledge about how it can be introduced in the best possible manner with the fewest possible negative consequences.

Safety, security and emergency planning
Changes in transport patterns, increased globalisation, new working conditions, terror and the threat of terror attacks, climate change and extreme weather result in a changed risk scenario. In general, Norway has good transport safety and security, as well as years of experience with developing effective, targeted measures.

However, the vision of zero traffic accidents with fatalities or serious injuries in the transport sector has not yet been achieved. New threats result in new parameters for how safety and security should be addressed and how these must be viewed in connection with other objectives within the transport field and society at large.

This requires that we meet future transport and mobility needs with new solutions, which in turn challenges us to think along new lines regarding the transport system. This will demand a more integrated approach to transport in which challenges within road, rail, sea and air transport are viewed in connection with each other. This same holds true for passenger and commercial transport.

3. Objectives of the programme

Vision
Groundbreaking transport research that facilitates the implementation of an effective, emissions-free transport system.

Primary objective
The Transport 2025 programme seeks to generate knowledge and solutions for use in the development of an integrated, future-oriented transport system that will meet the needs of trade and industry and society at large for effective, sustainable transport.

The programme will achieve this by creating change and serving as a central hub for Norwegian transport research. This entails promoting cooperation between various actors that conduct or fund Norwegian transport research and/or actors that use the results from transport research.

The programme will create a framework for high-quality research of relevance for the sector, and encourage and support projects and actors that demonstrate a willingness to take major risks and the ability to think along new lines.

Secondary objectives
Throughout the programme period, the Transport 2025 programme will work to promote:

- a thematically balanced portfolio that fosters a sustainable, effective, safe, secure and accessible transport system;
- change in the transport system by funding projects that in the long term will generate new transport solutions for trade and industry, the public sector and society at large;
- development of and competence-building in Norwegian R&D environments, resulting in the launch of at least one Centre for Research-driven Innovation (SFI) or similar initiatives in the transport field;


Picture: Shutterstock

- the capacity of Norwegian transport research to meet the future transport needs of transport users and society at large;
- a higher level of expertise in transport research by providing funding for at least 20 doctoral research fellowships;
- effective interaction between Norwegian and international research, especially with regard to the EU framework programmes, so that at least half of the projects involve active international cooperation;
- innovative thinking and willingness to take risks by ensuring that the project portfolio includes projects based on bold ideas that involve ground-breaking research and innovation.

The programme has a duration of 10 years, and is a long-term initiative for the transport sector. Consideration will be given to conducting a midterm evaluation, depending on the portfolio and budgetary situation.

4. Priorities for the Transport 2025 programme

The Transport 2025 programme will take a comprehensive approach to the transport system. This means that the challenges within the individual modes of transport must be viewed in relation to each other. The same holds true for the challenges within passenger and commercial transport. The programme seeks to foster renewal and change in the transport system.

The programme will give priority to funding activities within the three thematic priority areas described below. The programme board views these areas as especially crucial for the development of a future-oriented transport system.

In addition, the programme has five structural priorities that will help to enhance quality and capacity in the Norwegian research and innovation system, as well as ensure good linkages between and greater application of the results from transport research.

4.1 Thematic priority areas

The programme has identified three thematic priority areas that will help to achieve its objectives:

1. **An innovation-driven transport sector**
   Research that enables the sector to be innovative and develop future-oriented solutions, including knowledge about future mobility, use of ITS, future safety and security challenges, organisation of the transport sector and implementation of transport projects.

   These are some of the areas in which new knowledge is needed in order to promote a more innovation-driven transport sector.

   Funding of innovation projects will be awarded in close cooperation with other programmes at the Research Council.

2. **A sustainable transport system that helps to reduce greenhouse gas emissions and pollution of the local environment**
   Research that takes a comprehensive approach to how we can effectively create a long-lasting sustainable transport sector, including knowledge about the implementation and impact of measures and instruments, how to influence travel habits and facilitate the

transition to more environment-friendly modes of transport, and the application of technical solutions.

These are some of the areas in which more insight is needed so that the transport sector can meet future climate and environmental challenges.

Knowledge development on the impact of transport on the climate and environment and on the facilitation of a green transition will take place in cooperation with other Research Council programmes, such as the Large-scale Programme on Climate Research (KLIMAFORSK), the Large-scale Programme for Energy Research (ENERGIX) and the Programme for Environmental Research for a Green Transition (MILJØFORSK).

3. **A transport system for future-oriented urban and regional development**
   Research that promotes integrated, sustainable urban and regional development, including new solutions for commercial urban transport, reduction of private car transport, development of an accessible transport system for all, comprehensive urban planning, safety for pedestrians and cyclists, use of new ITS in cities, knowledge about the impact of measures and instruments, knowledge about commuting and choice of residence, and development of effective labour market regions.

   These are some of the areas in which more insight in needed in order to develop a transport system for future-oriented urban and regional development.

   Knowledge development in this area will take place in cooperation with international activities, such as the Joint Programming Initiative (JPI) Urban Europe, the ERA-NET Smart Cities and Communities, and relevant activities at the Research Council.

Picture: Shutterstock

The areas discussed under each thematic priority area must not be regarded as exhaustive. The Transport 2025 programme will encourage innovative thinking around how three priority areas can be addressed.

4.2 Structural priorities

The programme will give priority to five areas that will bring about structural changes in the research and innovation landscape. The structural priorities revolve around ways to work and cooperate. The programme will therefore give priority to processes and forms of funding that help to:

1. **Develop groundbreaking research environments in the transport field in Norway**
   The Transport 2025 programme will help the Norwegian transport research community to achieve greater integration, increased capacity and better contact with the international research front. The programme will put special emphasis on:

- laying a foundation for collaboration and effective forms of cooperation in order to enhance quality in Norwegian transport research;
- helping Norwegian research environments to become attractive as international partners.

2. Ensure that R&D results are utilised

The Transport 2025 programme will provide funding for research that is relevant for transport agencies, policymakers, the transport industry and society at large. The programme will put special emphasis on ensuring that transport research under the programme is conducted in cooperation with relevant users and that it promotes:

- industrial development with special emphasis on new products, technologies, services or business models, including the transition to a sustainable transport sector that enables a low-emissions society;
- knowledge and solutions that are relevant for the public sector;
- good connections between research, trade and industry, and the public sector;
- knowledge about the impact of research for trade and industry and society at large;
- more research-based knowledge in future processes such as the National Transport Plan.

3. Increase interaction between education, research and attractive career opportunities in the transport field

The Transport 2025 programme will help to ensure that the current educational system within the transport field meets the future needs for knowledge. The programme will seek to:

- ensure recruitment of researchers and research groups to the transport sector in order to make the sector attractive as a workplace;
- build capacity with the appropriate expertise;
- increase interdisciplinary research and education;
- include students at higher levels in research projects and activities.

4. Enhance knowledge about the programme and transport research among relevant R&D environments, relevant users, public authorities and others

The programme will seek to increase cooperation between actors in the transport field, including researchers, trade and industry, and the public sector. The programme will also help to ensure that transport research and a career in the transport field is regarded as an attractive option. (See also Chapter 7 on communication).

5. Enhance effective interaction between Norwegian and international research, especially in relation to EU framework programmes

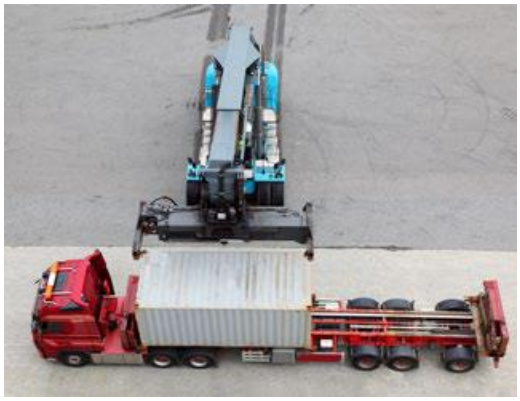
The programme will seek to position Norwegian research groups in international arenas and ensure national access to the global knowledge pool and international networks that provide support for meeting national challenges and knowledge needs. (See also Chapter 6 on international cooperation.)

5. Activities funded under the programme

The programme will provide funding for projects, processes and activities related to the thematic and structural priority areas described above. Together these will promote a comprehensive understanding of and/or change in the transport system.

The Transport 2025 programme will not fund projects on the development and use of energy carriers and energy systems in a transport context, as this is the responsibility of the ENERGIX programme. Innovation and development of concrete, asphalt and technical construction solutions, etc. may result in major improvements of the transport sector's physical infrastructure. However, due to its limited budget, the programme will not have the capacity to fund projects and activities in this area.

To encourage innovation and renewal, it is necessary to create a framework for cooperation and networks between academia, research institutes, trade and industry, public agencies and other agencies in the research and innovation system. The programme will therefore provide funding for various forms of networks, meeting places and events in order to increase cooperation throughout the entire value chain. In addition, the Transport 2025 programme will require researchers to establish close ties and a good dialogue with users of the research results.



Picture: Shutterstock

The transport field has a wide range of actors, and the challenges are complex. This calls for closer ties between various disciplines. The greatest contributions towards solving the challenges will come from new knowledge and insights emerging from new academic constellations and greater interdisciplinarity. More than ever before, knowledge development and innovation will take place in the interface between the social sciences, humanities, natural sciences and technology subjects. Such projects are often demanding and expensive to implement.

The programme will provide funding for a variety of measures that encourage and mobilise actors to increase their international cooperation and participation in Horizon 2020. Possible instruments include additional financial support for Norwegian participants in EU projects and funding for participation in strategic processes in the European research arena.

The programme will review its portfolio, funding announcements and forms of funding on an ongoing basis to ensure that these support the programme's primary objective and meet the needs of the sector. This will require close dialogue with the actors involved.

6. International cooperation

The Research Council's Strategy for International Cooperation 2010–2020 calls for international activities to be an integral part of the corresponding national activities. In other words, a number of ongoing and new transport-related initiatives in the European research landscape must be viewed as part of the overall research effort in this area. Similarly, bilateral cooperation with selected countries will be relevant as well. The Transport 2025 programme will therefore assess whether certain thematic areas within the transport field should be addressed through international cooperation, and in this case mobilisation measures for Norwegian actors will be especially important. The

programme will employ various instruments to help Norwegian research groups qualify to participate in international competitive arenas.

Transport is given high priority under Horizon 2020 in the Transport Challenge *Smart, Green and Integrated Transport*. Many of the areas covered by the EU framework programme correspond with Norwegian objectives for transport.

There are various opportunities within European research cooperation to collaborate across national research programmes, e.g. through the ERA-NET scheme and the Joint Programming Initiatives (JPI). For the Transport 2025 programme, it will be of relevance to participate in ERA-NET Logistics, which involves sustainable logistics solutions, and in JPI Urban Europe which focuses on the challenges and opportunities of urbanisation – in which transport plays an important role.

In addition to international cooperation within the EU, the programme will also attach importance to bilateral cooperation with countries with which Norway has much in common. Sweden is of special importance in this context, but other countries outside of Europe are of relevance as well.

The Transport 2025 programme will use a variety of instruments to mobilise and support Norwegian participation in international cooperation. The programme will draw up an international action plan describing the various instruments that the programme will employ to fulfil its aims and objectives. The international action plan will be updated each year based on the programme's experiences with, and opportunities arising from, the measures that give the best results.

7. Communication activities

Communication activities are intended to give a more visible profile to the Research Council's activities in the area of transport research and must be in keeping with the Research Council's communication strategy. The researchers themselves are responsible for disseminating results from their projects, but the Transport 2025 programme will help to motivate and pave the way for more and better dissemination from the projects.

Measures to be implemented under the programme are specified in the annual communication plan. The Transport 2025 programme has its own webpages, *forskningsradet.no/transport*, where all information about the programme – including active calls for proposals – is compiled.

Objectives

Communication activities under the programme will:

- Improve dialogue between the transport research community and society at large, and help to give a more visible profile to and simplify complex issues within the programme's area of responsibility;
- Highlight the strategic role of the Research Council in generating value creation for society and ensuring transport research of high scientific merit;
- Promote targeted communication on transport-related issues in cooperation with related funding instruments and research groups;
- Ensure that high-quality grant applications are submitted in response to the programme's funding announcements.

Target groups

- trade and industry, and business organisations;
- politicians and the public authorities;

- the research community;
- the general public.

Main principles

- Cooperate with related programmes/funding instruments to communicate with and disseminate results to various user groups at the overall or thematic level (see Chapter 9 on cross-cutting cooperation with related funding instruments);
- Cooperate on international instruments to give a more visible profile to Norwegian participation in international research efforts;
- Cooperate with research institutions (the researchers and communication departments) to publicise good examples of research results;
- Facilitate targeted communication efforts by setting requirements for the projects and actively following up their activities;
- Recycle texts and other material that have already been produced by disseminating them through more channels.

Channels

- The transport research conference – organised every other year in cooperation with relevant agencies and actors;
- Other meeting places for various target groups, from large conferences with a variety of topics and dialogue meetings to strictly academic conferences and meetings (designated events, collaborative events, presentations and participation in other's events);
- the Research Council's Support for Events funding instrument;
- Work to ensure that the Project Databank – the Research Council's compilation of figures and statistics related to research projects funded by the programme – is useful for the target groups;
- Press/media activities – use of national media, academic media and *forskning.no*, when relevant;
- The Research Council's own channels, especially the Research Council's main website *forskningsradet.no* and the programme's webpages *forskningsradet.no/transport.*

8. Budget

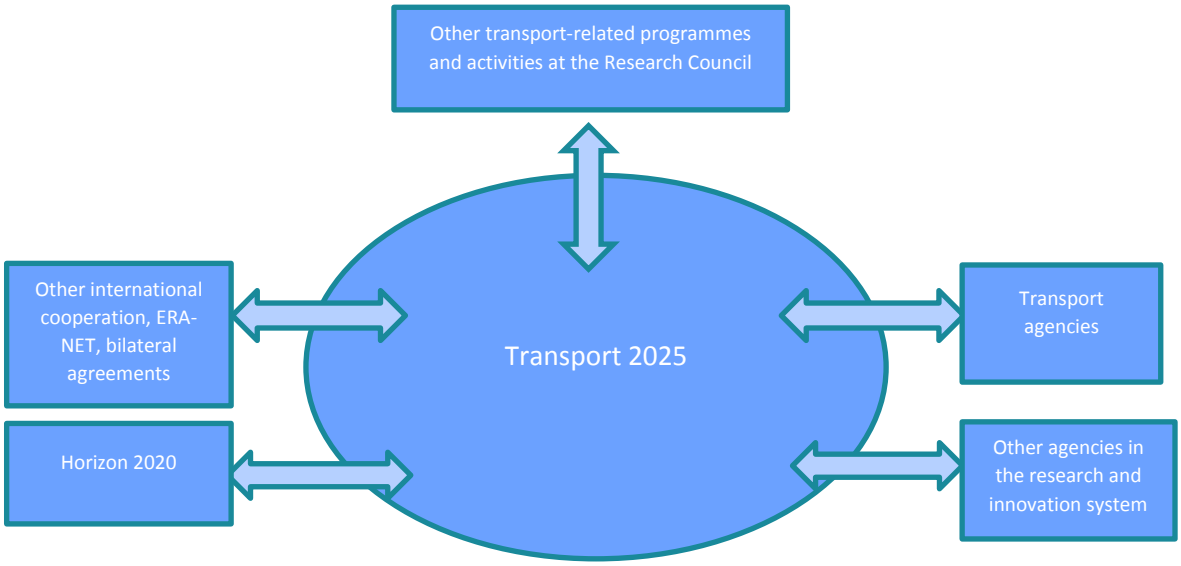
The Transport 2025 programme is being funded in its start-up year (2015) by the Ministry of Transport and Communication, and the total budget is NOK 36 million. With the TRANSIKK programme concluding in 2015, allocations from the ministry are expected to be incorporated into/transferred to the TRANSPORT 2025 programme from 2016. In a zero-growth scenario, the programme's budget will therefore increase by NOK 8 million to NOK 44 million annually.

Realising the programme's ambitions for a comprehensive perspective will require an increase of the programme's budget to NOK 80–100 million during the upcoming three years. The programme board will assess whether there is a need to change the priorities and objectives set out in the work programme in light of the current budget situation.

9. Cross-cutting cooperation within the Research Council and with transport research in general

Cooperation and coordination are essential if the programme is to achieve its objective of serving as a central hub for transport research. This will require greater interaction with other instruments within the Research Council, as well as with other agencies in the research and innovation system, such as Innovation Norway, the Industrial Development Corporation of Norway (SIVA), Enova, transport agencies and international arenas, see Figure 1.

Figure 1: The hub function



Cooperation with the Research Council's other programmes and activities

The Transport 2025 programme will cooperate with other Research Council instruments that incorporate aspects of transport research. Below is a list of transport-related activities at the Research Council. The aim is that the Transport 2025 programme, together with the Research Council's other programmes, will comprise a coordinated, comprehensive initiative in the transport field.

- The Programme for User-driven Research-based Innovation (BIA) is an open, competitive arena for trade and industry. Projects from a wide variety of fields compete for funding on the basis of scientific merit, level of innovation and the potential for value creation. The projects are initiated by companies themselves, and the driver behind the project is found in the companies' own strategies and needs. The BIA programme differs from other Research Council programmes, which are targeted at specific branches of industry or subject areas. The BIA programme's annual budget is NOK 544 million. In 2015, funding under the BIA programme will be open to projects from the entire transport industry. This means that companies in the transport field must seek funding for Innovation Projects for the Industrial Sector via the BIA programme. The BIA programme's portfolio of transport-related projects currently comprises about NOK 120 million.

- The Large-scale Programme for Energy Research (ENERGIX) provides funding for research on renewable energy, efficient energy use, energy systems and energy policy. This encompasses R&D in technology subjects as well as in the natural sciences, social sciences and humanities. The portfolio of transport-related projects amounts to about NOK 50 million annually, distributed among three technology areas – hydrogen, batteries and biofuels. The programme also encompasses the thematic area of energy policy, economics and society, which partly addresses the framework conditions for restructuring of the energy system.
- The Innovation Programme for Maritime Activities and Offshore Operations (MAROFF) includes sea transport research in its sphere of responsibility. The MAROFF programme promotes innovation and environment-friendly value creation in the maritime industries. The MAROFF programme's target groups are shipping companies, the shipbuilding industry, service providers and equipment suppliers to all types of vessels and aquaculture facilities. The portfolio of transport-related projects encompassing maritime transport and logistics comes to some NOK 20 million annually.
- The IKTPLUSS initiative is the Research Council's large-scale strategic initiative on information technology and digital innovation. The initiative generates knowledge and develops technology that will promote ICT solutions that increase productivity and efficiency. The IKTPLUSS initiative will also help to develop solutions to key societal challenges in areas such as health and care, societal security, public services and energy and the environment. ICT is a generic technology, and its application is critical for the development of a future-oriented transport system. The initiative was launched in 2015.
- The Large-scale Programme on Climate Research (KLIMAFORSK) has three secondary objectives: 1) to increase knowledge about natural and anthropogenic climate change, 2) to improve knowledge about the impacts of climate change on nature and society, and 3) to increase knowledge about transformation to a low-emission society and climate change adaptation. The transport field is especially relevant for objectives 2 and 3. Transport-related projects in the portfolio in early 2015 amounted to about NOK 20 million. The programme rotates its calls for proposals between its three thematic priority areas: in other words, the programme will issue a large call for each thematic area every third year.
- The Programme on Societal Security and Safety (SAMRISK II) seeks to generate new knowledge and a deeper understanding of the risk and threats facing society as well as the capability within society to deal with and maintain critical societal functions and safeguard the life, health and fundamental needs of citizens during events involving major stressors. Research activities under the programme are intended to enhance resilience, prevention, emergency planning, search and rescue services, crisis management, and learning. The programme identifies three main stressors: 1) incidents and accidents, 2) natural disasters, and 3) intentional acts. All three of these are relevant for the transport sector.
- The Programme on Safety and Security in Transport (TRANSIKK) takes a broad approach to the concepts of risk and safety/security within the entire transport field, i.e. road, rail, sea and air transport, as well as in passenger and commercial transport. The programme promotes research activities on topics that range from incidents that occur relatively frequently, such as road accidents, to accidents that occur rarely or may not yet have occurred in Norway. The programme is being concluded in 2015, and research on transport safety and security will be covered by the Transport 2025 programme.
- The SkatteFUNN Tax Incentive Scheme is a rights-based tax deduction scheme designed to stimulate R&D activities in Norwegian companies. The SkatteFUNN scheme is open to all branches of industry and all types of companies. It is the company that chooses the topic of the project. SkatteFUNN projects often have less focus on research and more focus on development than projects funded under Research Council programmes. More than 1 300

projects in the transport field have participated in the SkatteFUNN scheme over the past 10 years.

- The Programme for Environmental Research for a Green Transition (MILJØFORSK) is the Research Council's principal environmental research initiative. The programme seeks to increase knowledge about key environmental challenges and provide a better basis for a green transition. The MILJØFORSK programme addresses issues related to the status of resources and resource use, change processes and solutions for a green transition. Transport is a theme that extends across many areas of environmental research with regard to land use, environmental impacts and as a prerequisite for achieving a green transition. The programme was launched in 2015.
- The Programme on Democratic and Effective Governance, Planning and Public Administration (DEMOS) addresses the role public administration should play in a representative democracy. The programme also studies how the public administration can create a foundation for social development in various types of regions. The transport sector is a critical part of the national and local public administration. The DEMOS programme also provides funding for a substantial part of planning research, which in turn is highly significant for the development of the transport system. Urbanisation is a research area within the DEMOS programme as well. The programme was launched in 2015.

Cooperation with transport agencies

Figures from the strategy document as a knowledge base for transport research *Ingen vei utenom* ("No Road Around It") show that the transport agencies fund a large proportion of the total transport research conducted in Norway. Effective cooperation with the transport agencies is needed if the Transport 2025 programme is to succeed in becoming a central hub in a national initiative in the transport field. The Transport 2025 programme will establish and maintain good arenas for dialogue on knowledge needs, distribution of tasks and cooperation.

- The Norwegian National Rail Administration provides funding for R&D activity in the thematic areas of climate and the environment, detectors and data exchange, heavy axle loads, tunnels, energy supply, punctuality and implementation capacity.
- The Directorate of Public Roads, Norwegian National Roads Administration funds research within the agency programmes for durable roads, durable construction, natural hazards, infrastructure, floods and landslides, smarter road traffic with ITS, Nordic road water, less energy use in the Directorate of Public Roads, better safety and security in traffic, and winter operations.

Picture: Shutterstock

- The Norwegian Coastal Administration takes part in many projects under the Research Council, the EU framework programme and the Interreg programmes. The agency funds some of its own R&D activities as well.
- Avinor focuses on R&D activity in the area of biofuels and turbulence, and is active in the European Commission's SESAR joint undertaking.
- The Norwegian Maritime Authority participates as a user in several projects funded by the Research Council and the EU. The agency funds some of its own R&D projects as well.

Cooperation with other agencies in the research and innovation system

There is a great need to facilitate seamless coordination with other agencies in the research and innovation system to ensure effective transfer from research to implementation of new solutions, products and services. The Transport 2025 programme will work to improve the dialogue with Innovation Norway, SIVA and Enova.

10. Organisation

The Transport 2025 programme board is appointed by, and reports to, the Research Board for the Division for Innovation. The programme board will realise the programme's objectives by means of various activities. The guiding principles for these activities are set out in the Research Council's overall strategy, the guidelines from the Council's Executive Board and the Research Board of the Division for Innovation, as well as this work programme.

The tasks of the programme board are primarily strategic in nature. The members come from the research sector (universities, research institutes and university colleges), trade and industry, and public agencies. The members are personally appointed and represent only themselves. Membership of the programme board must represent a satisfactory geographic distribution and meet requirements regarding gender balance.

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