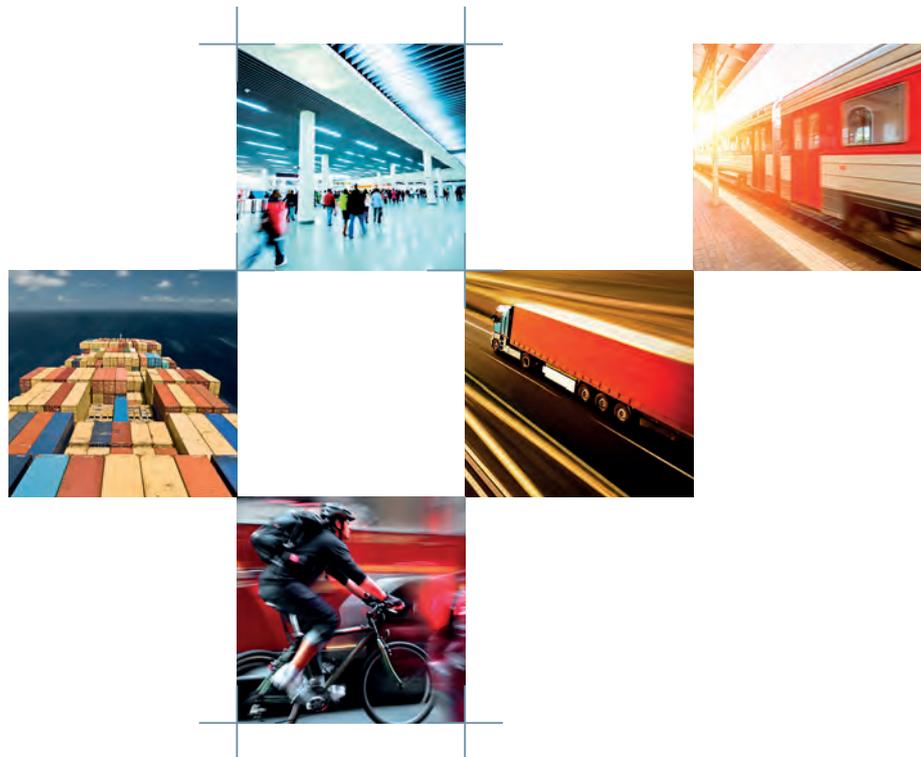


Work programme

In effect from 2018

Programme
Transport 2025 – TRANSPORT



Work Programme

In effect from 2018

The Transport 2025 programme

© The Research Council of Norway 2018

The Research Council of Norway
Visiting address: Drammensveien 288
P.O.Box 564
NO-1327 Lysaker
Telephone: +47 22 03 70 00
Telefax: +47 22 03 70 00

post@rcn.no

www.rcn.no

The report can be ordered and downloaded at
www.forskningsradet.no/publikasjoner

English translation: Glenn Wells and Carol B. Eckmann
Graphic design cover: Design et cetera

Oslo, December 2018

ISBN 978-82-12-03749-6 (PDF)

1 Contents

| | | |
|---|---|----|
| 1 | Summary | 4 |
| 2 | Background and challenges..... | 4 |
| 3 | Objectives of the programme | 7 |
| 4 | Thematic and scientific priority areas | 8 |
| 5 | Priorities for structuring the research effort..... | 10 |
| 6 | Cooperation with related instruments..... | 12 |
| 7 | Anticipated results, impacts and societal outcomes..... | 14 |
| | Results | 14 |
| | Impacts and societal outcomes..... | 14 |
| 8 | Resources and budget..... | 15 |
| 9 | Governance and organisation | 16 |

2 Summary

The Transport 2025 programme is the Research Council's strategic initiative on research and innovation in the transport field.

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 in 2015 as a follow-up of this. The work programme was revised in 2017.

The primary objective of the Transport 2025 programme is to increase knowledge and expertise for effective, safe and sustainable transport solutions for the future.

The programme will employ a variety of funding activities to promote *innovation, knowledge, expertise, pilot projects* and *demonstration activities* of relevance to one or more of the following secondary thematic objectives:

- Innovative mobility and transport solutions;
- An effective, safe and sustainable transport system;
- Knowledge concerning future transport needs.

As a basis for achieving the established primary objective and secondary thematic objectives, the Transport 2025 programme will work to promote the development of an effective research and innovation system. In this context, the programme will focus on the following priorities for structuring the research effort:

- Value-creation and industrial development with the long-term aim of increasing international competitiveness;
- Development of research groups that can participate at the international forefront in the thematic areas encompassed by the programme.
- Enhancing cooperation across sectors, disciplines and between private/public actors.
- Expanding expertise related to transport.

The Transport 2025 programme has received NOK 58.7 million from the Ministry of Transport and Communications for 2018. In light of the sector's important role in society and the potential for industrial development and innovation it entails, the Research Council is allocating additional funding of NOK 8.2 million from the Ministry of Education and Research's cross-sectoral funding. The programme is working together with Innovation Norway on the launch and implementation of the Pilot-T scheme, the Government's innovation initiative to promote new mobility solutions. The programme's total budget is NOK 67 million.

The Transport 2025 programme is targeted towards research institutions, the transport industry with its users and special interest organisations, and the public sector, including municipal and county administrations.

3 Background and challenges

A well-functioning transport system is critical for both economic and societal development. The transport field has a wide range of actors, with complex challenges extending across multiple sectors.

In order to provide the effective, sustainable transport solutions needed in the society of tomorrow, it is essential to maintain capacity and lay the foundation for a seamless, accessible transport system.

Research, innovation and knowledge-based testing have an important role to play in accelerating the pace of innovation and enabling the transport sector to implement new solutions. Specialised competency groups in the field of transport have been built up over many years, and these can provide expertise, knowledge and solutions that will benefit public and private actors. Good links between the business sector, the public sector and R&D groups are vital for efforts to succeed.

The Transport 2025 programme addresses a major societal challenge, and is part of the Research Council's follow up of the objectives set out in the Strategy for the Research Council of Norway 2015–2020: Research for Innovation and Sustainability; the Research Council of Norway's Strategy for Sustainability, 2017–2020: Research for Sustainable Societal and Industrial Development; the Strategy for the Research Council of Norway for an innovative business sector, 2016–2020; and the Research Council's strategy for innovation in the public sector, 2018. In particular, the programme is designed to ensure that investments in research have a positive impact on societal development, and to encourage companies to take advantage of the opportunities that these societal challenges entail. Additionally, the programme works to promote sustainable growth and value creation in the transport sector, in cooperation with R&D groups and the public sector.

In 2016, the Research Council provided a total of approximately NOK 237 million in funding for transport research. The bulk of this funding targeted environment-friendly energy for transport and sea transport. That same year, there were also 263 ongoing projects under the SkatteFUNN Tax Incentive Scheme, representing total budgeted project expenses of NOK 927 million and NOK 174 million in budgeted tax deductions. Transport-related issues are covered by a number of Research Council programmes. A large portion of transport research is financed directly by government agencies in the transport sector with the Norwegian Public Roads Administration, Directorate of Public Roads, providing the largest share through its annual research budget of approximately NOK 100 million. However, the transport industry itself invests very little in research. In 2014, the industry spent approximately NOK 200 million on in-house R&D and close to NOK 80 million on procurement of R&D services.

These figures show that there are large areas in the transport sector that are not covered under current funding activities. According to the National Transport Plan NOK 1 064 billion is to be invested over the next 12 years in modernisation of infrastructure and development of safer, more efficient and greener transport solutions. In order to ensure that investments are targeted towards future transport needs, it will be necessary to invest in research and innovation that focus on problems extending across current areas of responsibility, for example the various forms of transport (road, rail, sea and air), or problems involving considerations relating to sustainable transport on the one hand, and requirements regarding reliable, effective transport on the other. Taking full advantage of the potential for value creation inherent in technological development within the transport sector requires activities that will mobilise the business sector and promote cooperation between this sector, R&D institutions and public actors, encouraging an effective flow of expertise, technology and innovation culture that will benefit the public sector, trade and industry and society.

The Transport 2025 programme is funded by the Ministry of Transport and Communications, which has sectoral responsibility for transport research. The National Transport Plan 2018–2029, Meld. St. 33, together with the Ministry's R&D strategy for 2016–2022 (*FoU-strategi for Samferdselsdepartementet 2016–2022*), are both key steering documents for the Transport 2025 programme.

3.1.1.1

3.1.1.2 Challenges

Drivers of future transport needs and developments: Globalisation, new technology, changes in demographics and lifestyle are among the factors that will set the premises for organisation and development of the transport sector. Product specialisation has led to greater distances and higher transport volumes, and 3D printing may affect logistics and the transport sector in completely new ways. The rapid development in online shopping in most lines of business means that the greatest growth within the transport and logistics sectors is in deliveries to private customers, not business customers – a trend which is expected to increase in the years ahead. Digitalisation in the transport sector, combined with people's expectations about information, services and the use of time entails major changes in travel patterns and the use of transport in the years to come.

The Transport 2025 programme is the Research Council activity that provides funding for new knowledge about the drivers of future transport needs and developments. The Large-scale Programme for Energy Research (ENERGIX) is responsible for funding new knowledge about drivers and future incorporation of environment-friendly energy in the transport sector.

Climate and the environment: Transport is the biggest source of greenhouse gas emissions in Norway. Between 1990 and 2016, emissions increased by 24 per cent. Road traffic is responsible for more than half of these emissions. The greatest increase in emissions comes from private automobiles and aircraft. These energy-intensive forms of transport emit large amounts of CO₂. Thanks to technological advances, however, the amount of emissions from transport has not increased as much current usage patterns would suggest.

Most people take a large number of emissions-related decisions each day, and the challenge is to provide a system that makes it easy to choose climate-friendly solutions. General economic growth in society increases the demand for transport, and despite well-intentioned political ambitions to increase commercial transport by sea and rail, the trend is towards more freight transport on roads.

In 2016, the largest investment in transport research (NOK 330 million) was linked to climate, the environment and energy. Funding for research activity in this area is provided by the Large-scale Programme for Energy Research (ENERGIX), the Large-scale Programme on Climate Research (KLIMAFORSK), the Innovation Programme for Maritime Activities and Offshore Operations (MAROFF) and the Transport 2025 programme.

Urbanisation, urban and regional development: An increasingly larger proportion of the population lives in cities, semi-urban areas and other densely populated areas. More people are choosing to live their entire lives in the city, which affects the demand for transport. City Bike schemes have become an established part of daily life in most large cities and car-sharing is becoming increasingly common. The trend in housing construction and area development is moving towards closer integration with mobility solutions.

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.

The total amount of funding allocated for city-related research in 2016 was NOK 155 million. Issues related to city transport systems, commuting and residence, labour market areas, the organisation of

daily life, transport and land-use policies are covered primarily under the Transport 2025 programme and the Programme on Democratic and Effective Governance, Planning and Public Administration (DEMOS).

New technology: The development of new technology in the transport sector is taking place at a rapid pace. 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 before these are commercially available is steadily decreasing. New technology can lead to new transport solutions, better utilisation of capacity, new business models and strategic tools for decision-making as well as changes in mobility patterns. However, use of technology requires knowledge about how it can be developed and applied in a manner that promotes the best possible transport system for everyone overall with the fewest possible negative consequences.

The Transport 2025 programme is the major funder for research on the development and use of new technology for the transport sector. The Research Council's large-scale strategic initiative on information technology and digital innovation (IKTPLUSS) develops generic knowledge and competency that may enable future developments and applications within the transport sector possible.

Technology development involving batteries, biofuels and hydrogen technologies as well as infrastructure for battery charging and fuel are funded under the ENERGIX programme. The development and application of new technology within the maritime sector is funded under the MAROFF programme. Research involving harbours and ports is funded under the Transport 2025 programme.

Safety and security : The development of a digitalised, autonomous transport system will also change the definition of what comprises the major safety and security challenges in coming years. A rising number of cyclists and pedestrians in cities due to population growth and the zero-growth target for passenger car traffic mean that traffic-safety efforts targeting these groups must be intensified. New organisational models and operational models for the transport sector may also affect transport safety. In developing the transport system and implementing new transport solutions it is important to give adequate consideration to the potential impact on safety and security and for how to improve the level of safety for all forms of transport.

The Transport 2025, MAROFF and PETROMAKS programmes, along with the Programme on Societal Security and Safety (SAMRISK II), are the most important funding instruments under the Research Council for safety and security-related issues.

4 Objectives of the programme

Primary objective:

The primary objective of the Transport 2025 programme is to increase knowledge and expertise for effective, safe and sustainable transport solutions for the future.

Secondary objectives:

The programme will employ a variety of funding activities to promote *innovation, knowledge, expertise, pilot projects* and *demonstration activities* of relevance to one or more of the following secondary thematic objectives:

- Innovative mobility and transport solutions;
- An effective, safe and sustainable transport system;
- Knowledge concerning future transport needs.

As a basis for achieving the established primary objective and secondary thematic objectives, the Transport 2025 programme will work to promote the development of an effective research and innovation system. In this context, the programme will focus on the following priorities for structuring the research effort:

- Value-creation and industrial development with the long-term aim of increasing international competitiveness;
- Development of research groups that can participate at the international forefront in the thematic areas encompassed by the programme;
- Enhancing cooperation across sectors, disciplines and between private/public actors;
- Expanding expertise related to transport.

5 Thematic and scientific priority areas

The transport sector extends across many different areas of society. Knowledge and technological development from multiple subject areas, disciplines and sectors are required in order to solve the cross-cutting challenge of achieving effective, safe and sustainable transport and mobility of goods and people. Innovation and new knowledge about the operation and maintenance of infrastructure are also within the programme's area of responsibility.

1. An innovative transport system that makes use of new technology or business models

Automatisation and digitalisation are taking place in all modes of transport and operations associated with transport of passengers and goods, helping to create a more flexible transport system. A large number of pilot projects are being conducted around the world. The technological changes entail new challenges and opportunities for established actors and pave the way for a wider number of new actors to move into the sector than has previously been the case. The goal is for these changes to result in greater value creation and new solutions that lead to a safe, effective and sustainable transport system; thus there is a need to develop and test new technologies and solutions that can be rapidly deployed to the transport sector. At the same time, there is a need for knowledge to determine the best way to develop new technological solutions and of what must be in place to ensure that such solutions overall lead to the desired effect on the transport system. New technology brings new challenges to society, individuals and the business sector. Major investments are being made in infrastructure and new solutions, and it is important that future investments can accommodate future transport needs.

Examples of relevant technologies and research questions include:

- technological development for the transport sector;
- transport services, business and operational models, platforms and value creating networks;
- policy design, organisation and instruments;

- behaviour, user acceptance and human-machine interplay;
- security, protection of privacy, responsibility;
- opportunities, needs and investments in the transport system of tomorrow.

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

The transport sector (including fisheries and construction machinery) accounts for approximately one-third of Norway's total greenhouse gas emissions. Norway is committed to achieving a minimum 40 per cent reduction in greenhouse gas emissions compared with 1990 levels by 2030. In addition, the country has a target of becoming a low-emission society by 2050. To enable the transport sector to shoulder its share of emissions cuts, there is a need for research-based knowledge and innovation that lay the foundation for more environment-friendly transport and mobility solutions as well as for greater insight into what is required to encourage individuals and society in general to choose the most environment-friendly solutions whenever possible.

Examples of relevant research questions include:

- Development of new technologies, instruments and measures;
- New business and operational models and the spread of new solutions;
- The effects of instruments, policies and organisation;
- Knowledge about obstacles to and prerequisites for success;
- Intermodality, logistics and door-to-door distribution.

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

Regardless of its size, an attractive city is characterised by high-quality transport and short transits in everyday life. It is an objective of the National Transport Plan for the growth in passenger transport in the cities to be absorbed by public transport, cycling and walking. To be effective, a transport system must facilitate the transport of goods and products as well as of individuals in different stages of life with a variety of needs. Achieving a well-functioning urban region, which supports the ever-changing mobility needs of society, is closely linked with solutions for housing, land-use, commercial and transport development.

The design and implementation of transport policy instruments is currently divided between the central, county and municipal levels which are jointly responsible for developing adequate mobility solutions. There is a great need for new knowledge, new innovations and new working methods that provide more integrated urban mobility solutions. New services, business models and concepts can make it beneficial – environmentally, financially and in terms of time use – to choose other mobility and transport solutions instead of personal automobiles.

Examples of relevant research questions include:

- Land-use and transport planning and logistics in cities;
- Mobility patterns and behaviour;
- Impacts of instruments, policies and organisation;
- New business and operational models and the spread of new solutions;
- Obstacles to and prerequisites for success;
- Future transport flows and transport needs.

The Transport 2025 programme provides funding for activities within the three thematic priority areas aimed at helping to achieve the overall objective of more effective, safe and sustainable transport solutions for the future. The examples of research questions provided above are not exhaustive.

Research and innovation within the transport sector is to help to achieve the objective of safer, more sustainable transport that is accessible to all. The incorporation of gender and demographics perspectives in research and technological development is essential to achieving this. The development and application of new technology presents society with many dilemmas. While digitalisation may lead to the development of new services and products as well as a safer, more accessible transport system, it will also give rise to new questions and challenges, for example relating to ownership, accountability, protection of privacy and data security. The Transport 2025 programme will work to ensure that research and innovation processes in the transport sector are responsible, sustainable and accepted by society.

Transport is a priority area under the EU Framework Programme for Research and Innovation, Horizon 2020, and other relevant public/private partnerships associated with Horizon 2020 (including Shift2Rail, SESAR or Clean Sky 2). The most important thematic priorities in the Horizon 2020 work programme for transport in the period 2018–2020 are electrification and automation of transport, more sustainable air travel and transport safety. There is relatively limited EU support for, among others, maritime transport research or for a more closely integrated approach to transport that entails better interaction between transport planning and urban and regional planning, research on the drivers of transport needs and on solutions for pedestrians and cyclists. These are important areas for Norway, both to enhance the competitiveness of Norwegian industry (and maritime transport in particular) and to promote the successful transition to a zero-emissions, sustainable transport sector. In the case of EU calls for proposals that share an overlap, activities under the Transport 2025 programme will help to qualify Norwegian applicants to participate in Horizon 2020 funding arenas.

6 Priorities for structuring the research effort

A large proportion of transport research is commissioned by government agencies in the transport sector and other public sector actors. It is important that transport research is applied and viewed as beneficial for the sector. It is critical to incorporate a long-term approach that helps to increase participation, enhance quality and ensure relevance and capacity in research groups so as to benefit the public and business sectors as well as society at large over time. It is also important to allow room for problems that extend across currently established areas of responsibility and where funding is not obtainable from other actors. Investment in R&D from the transport industry is modest compared to corresponding industry investment in other key sectors. There is a need to develop relevant research and specialist groups that are able to cooperate with both established and new actors in the transport sector. This will promote increased value creation and business development in the sector and in the long run may help to trigger larger investment in R&D activities from the business sector.

Achieving this will require improved interactivity and knowledge transfer between the R&D community, the industry and the public sector. The Transport 2025 programme will employ a variety of funding activities and other forms of support to fulfil this objective.

Innovation Projects for the Industrial Sector/Public Sector is a key funding instrument for developing new mobility and transport solutions, encouraging restructuring of the sector and increasing value creation. The Project Owner must be a Norwegian company, industry organisation, public sector entity or organisation representing the public sector. An Innovation Project is to lead to value-creating renewal among businesses or contribute to innovation and sustainable value creation within the sector and for its users.

New understanding and solutions will arise in the interface between the social sciences, humanities, natural sciences and technology subjects. Mobility and transport are of vital importance to every individual as well as for ensuring the competitiveness of trade and industry. Each year, considerable public funding is invested in transport and infrastructure in the national budget. Developments in the transport sector also create a need for new expertise from areas not traditionally associated with the transport sector. There is a need to facilitate innovation, increased quality and capacity in Norwegian transport research. The Transport 2025 programme will provide funding for ***Researcher Projects requiring cooperation*** across sectors, disciplines and between private/public actors, with a framework that promotes the ***funding of more doctoral candidates***. The programme will also encourage the ***involvement of more master's students in projects*** with funding from the programme.

Technology-based change within the sector is taking place at a rapid pace, and will soon result in requirements for new, improved solutions. For the business sector, the technological changes will entail restructuring demands for established transport companies as well as an opportunity to take part in the value creation associated with new smart transport solutions. There is a need for support to companies ***willing to test and demonstrate new solutions***. ***The Pilot-T scheme*** is an initiative intended to allow actors to compete for funding for research, development and practical testing of innovative mobility solutions. The scheme will be carried out in cooperation with Innovation Norway and the government agencies in the transport sector to promote seamless coordination with other agencies in the research and innovation system and better utilisation of existing infrastructure.

The Transport 2025 programme will seek to encourage radical, groundbreaking research and to pave the way for new ideas, concepts and constellations of cooperation. The use of ***Idélab*** sandpit workshops is a potential method for bringing forth bold new ideas.

Social dialogue and meeting places: In order to ensure an effective knowledge flow between the business sector, the public sector and R&D groups, the Transport 2025 programme will make funding available for ***events, meeting places and networks***. The purpose may be to establish new cooperative constellations for the aim of seeking funding for national/international projects or to shed light on relevant issues across research groups and sectors.

Communication and dissemination is a key element of all Researcher Projects funded under the programme. The programme also seeks to encourage the ***communication and dissemination of research results*** and for transport-related problems to become part of ***public debate***. Therefore, funding will be provided for ***events*** within the thematic scope of the programme.

User participation: User participation in projects is crucial to ensure that the projects are of relevance and benefit to the business sector, the public sector and society at large.

Gender balance: The programme will work to achieve gender balance in its project portfolio. As a general rule, all Research Council calls for proposals specify that priority will be given to projects led by women project managers assuming that all factors relating to scientific merit and relevance are essentially equal. A total of 53.3 per cent of Transport 2025 projects started in 2016 are led by

women project managers, which is a 45 per cent increase over the previous year. The total proportion of women project managers in ongoing projects in 2016 was 35 per cent.

Internationalisation: Europe is an important arena for international R&D cooperation. The EU Framework Programme, Horizon 2020, covers themes and research areas of interest to actors in Norwegian transport research and industry. Participation in EU projects not only provides an important source of funding, it also gives Norwegian actors access to useful research findings and valuable contacts in Europe. The Transport 2025 programme administration will contribute in **activities to increase participation in activities** under Horizon 2020 and relevant public/private partnerships in connection with Horizon 2020 (Shift2Rail, SESAR, Clean Sky 2, etc.) and provide **information and advice** to companies and research groups seeking to participate in Horizon 2020 calls for proposals. The programme will also take steps to enable Norwegian businesses and research groups to establish contact with leading research groups abroad. 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). The Era-net Transport (ENT) has plans to continue its efforts as an independent network, and the Transport 2025 programme will follow the network closely to identify potential areas of collaboration. The Transport 2025 programme will also consider participating in JPI Urban Europe, which examines challenges and opportunities associated with urbanisation.

7 Cooperation with related instruments

Cooperation and coordination are essential if the programme is to achieve its objective of an effective, safe and sustainable transport system. 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, SIVA (the Industrial Development Corporation of Norway), Enova, government agencies in the transport sector and international arenas.

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 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, and it is the company itself 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.

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 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 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 promotes ICT solutions to increase productivity and efficiency. The IKTPLUSS initiative also helps to develop solutions to key societal challenges in areas such as transport, health and care, societal security, public services and energy and the environment.

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. Secondary objectives 2 and 3 are particularly relevant for the transport field.

The Programme on Societal Security and Safety (SAMRISK III) is designed to improve the knowledge base for societal security efforts. The programme is to shed light on vulnerabilities and dilemmas and help to prevent undesirable events, maintain critical societal functions and safeguard the life, health and basic values of inhabitants before, during and after major stressors. The programme identifies three thematic priority areas: 1) Social structures, values and trust, 2) Technology and societal security, and 3) New actors, organisational forms and responsibilities.

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.

Cooperation with government agencies in the transport sector: Figures from the transport research strategy document *Ingen vei utenom* ("No Road Around It") show that the government agencies in the transport sector fund a large proportion of the total transport research conducted in Norway. Effective cooperation with the government agencies in the transport sector is needed to develop an effective, robust research and innovation system that supports value creation and transformation and that can help to achieve the objective of an effective, safe and sustainable transport system.

Cooperation with other agencies in the research and innovation system: There is a great need to ensure maximum coordination of activities with other agencies in the research and innovation system to ensure effective transfer from research to implementation of new solutions, products and services. The Government's innovation initiative to promote new mobility solutions, the Pilot-T initiative, is designed to enable the Transport 2025 programme and Innovation Norway to provide seamless coordination along the entire chain from the research and development stage to testing and the market. Steps will also be taken to maintain good dialogue with SIVA, particularly regarding its Norwegian catapult support scheme, and with Enova in connection with its support for the implementation of effective energy and climate initiatives in the transport sector.

International cooperation: the Research Council's National Contact Point for transport-related activities under Horizon 2020 is a member of the Transport 2025 programme administration. The programme administration participates regularly in meetings in relevant EU transport research cooperation forums, and works with Norwegian stakeholders to provide input to future work programmes in the field of transport. In addition to international cooperation within the EU, the Transport 2025 programme also attaches 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 Europe are of relevance as well.

Norway is a well-established test arena for new transport-related technology such as electric vehicles and autonomous vessels/vehicles, and is a leader in research, development and implementation of enabling technologies in the maritime sector. However, much of the research and development carried out on basic technologies occurs outside Norway. It is essential for Norway to cooperate with leading research groups abroad to stay up-to-date on the research and technology front.

8 Anticipated results, impacts and societal outcomes

The Transport 2025 programme is to have a portfolio that incorporates all of its thematic and structural priorities, and that as a whole helps to fulfil the primary objective of the programme to increase knowledge and expertise for effective, safe and sustainable transport solutions for the future. This will be followed up through annual analyses of the project portfolio.

8.1.1 Results

The Transport 2025 programme's funding of R&D projects will be its main instrument for achieving its objectives, so the results of the projects will be the most important indicator of performance.

8.1.2 Impacts and societal outcomes

The Transport 2025 programme's secondary objectives are designed to lead to impacts which, combined, contribute to the long-term achievement of the programme's primary objective of increasing knowledge and expertise for effective, safe and sustainable transport solutions for the future. Different funding instruments and types of funding announcements will support different secondary objectives, and thus the projects funded will help to achieve the primary objective in different ways.

Secondary objective 1: Innovative mobility and transport solutions

Impact: The implementation and integration of new transport solutions in the transport system.

Indicator: Increased innovation in the form of new products/services (including business models), processes, methods, patents and licences, business areas and companies.

Secondary objective 2: An effective, safe and sustainable transport system

Impact: More and better expertise in the public administration, knowledge-based decision-making and innovative solutions.

Indicator: More accessible knowledge and expertise in the form of scholarly and popular science publication, reports and other activities related to dissemination and active dialogue, as well as better work processes and decision-making frameworks based on products/services (including business models), processes and methods.

Secondary objective 3: Knowledge concerning future transport needs

Impact: More knowledge-based decision-making and wider public debate on the transport system of the future.

Indicator: More knowledge in the form of scholarly and popular science publication, reports and other activities related to dissemination and active dialogue.

Secondary objective 4: Value-creation and industrial development in the aim of increasing international competitiveness

Impact: Norwegian actors gain success in international markets in one or more business areas.

Indicator: Increased innovation in the form of new products/services (including business models), processes, methods, patents and licences, business areas and companies.

Secondary objective 5: Development of research groups that can participate at the international forefront in the thematic areas encompassed by the programme

Impact: Norwegian actors gain access to European markets and industry, and Norwegian research groups and other actors gain access to, and are at the forefront of European and international research.

Indicator: Increased internationalisation activities in the form of a higher number of Personal Overseas Research Grants and Personal Visiting Researcher Grants, more Horizon 2020 proposals submitted on relevant topics with Norwegian participants and/or coordinators, and an improved success rate for these.

Secondary objective 6: Enhancing cooperation across sectors, disciplines and between private/public actors

Impact: More insight into and higher quality of the knowledge underlying future policy development and the public debate, better contact with world-leading international research groups and the development of relevant expertise for the public and private sectors.

Indicator: Increased interaction in the form of new actors as project participants and new cooperative efforts between actors.

Secondary objective 7: Expanding expertise related to transport

Impact: More widely available expertise for the public and private sectors which in turn promotes increased value creation for companies and a better knowledge base for policy design.

Indicator: Increased recruitment in the form of a larger number of funded doctoral and postdoctoral fellowships and master's students involved in the projects.

9 Resources and budget

The Transport 2025 programme has received NOK 58.7 million from the Ministry of Transport and Communications for 2018. In light of the sector's important role in society and the potential for industrial development and innovation it entails, the Research Council is allocating additional funding of NOK 8.2 million from the Ministry of Education and Research's cross-sectoral funding. The programme is working together with Innovation Norway on the launch and implementation of the Pilot-T scheme. The programme's total budget is NOK 67 million. In 2016, the Research Council provided a total of approximately NOK 237 million in funding for transport research. The bulk of this funding targeted environment-friendly energy for transport and sea transport. That same year, there were also 263 ongoing projects under the SkatteFUNN Tax Incentive Scheme, representing total budgeted project expenses of NOK 927 million and NOK 174 million in budgeted tax deductions.

Transport is one of the largest areas under the Horizon 2020 framework programme's seven societal challenges. The Transport Challenge is allocated a budget of EUR 6.3 billion for the period 2014–2020.

The Transport 2025 programme is an open-ended programme without a set conclusion date. This means that the programme can realise its objectives by means of regular and predictable strategic, thematic and financial activity over time. The work programme is based on a continuation of the 2018 budget level, with the opportunity to intensify activities under the Pilot-T initiative in keeping with signals from the National Transport Plan.

The Transport 2025 programme seeks to ensure a high degree of reliability and stable framework conditions for the business and public sectors and research groups. Therefore, it will be possible to seek Research Council funding for projects promoting innovation, knowledge, expertise, pilot projects and demonstration activities of relevance to one or more of the secondary objectives of the programme each year.

Portfolio management under the programme is to encompass projects across Research Council programmes and funding activities. This means that funding will be available for projects addressing all of the Transport 2025 programme's secondary objectives, but that in some years this may be as part of a collaborative effort with other activities or programmes at the Research Council or with international activities such as under ERA-NET cooperation.

10 Governance and 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 funding activities. The guiding principles for these activities are set out in the Research Council's strategies, the guidelines from the Council's Executive Board and the Research Board of the Division for Innovation, as well as this work programme.

The programme's priorities, research tasks and financial framework will be assessed and adjusted in relation to changes in the national budget and annual allocation letters from the funding ministries. The programme board's activities must be in compliance with the Research Council's overall principles and guidelines for the establishme



The Research Council of Norway
Drammensveien 288
P.O. Box 564
1327 Lysaker

Telephone: +47 22 03 70 00
post@rcn.no
www.rcn.no

Published by:
© The Research Council of Norway
Transport 2025 – TRANSPORT
www.forskningsradet.no/transport

Cover design: Design et cetera AS
Cover photo: Shutterstock

Oslo, December 2018

ISBN 978-82-12-03749-6 (pdf)

This publication may be downloaded from
www.forskningsradet.no/publikasjoner