

**Research and innovation in freight
transport – national and
international priorities**

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Summary

This report presents the results of several studies of research and innovation (R&I) priorities within the transport sector.¹ By R&I priorities, we mean the distribution of resources among R&I objectives, including how resources and investments vary among organisations, industries, and countries. The studies aimed to assess whether R&I priorities in the transport sector agree with the R&I goals in the National Freight Transport Strategy: *to develop better conditions for efficient, high-capacity, and sustainable freight transport*. To this end, a diversity of R&I initiatives is needed.

Sweden holds a leading position in the areas of R&I, climate action, and digitalisation. Relative to other EU member states, Sweden also makes larger investments in research and development (R&D), particularly in the transport sector. In 2020, the GDP of Sweden represented 3.7% of the EU's collective GDP (of the 27 member states). The share of the EU's total R&D expenditure was 5.4%, and 6.8% of the EU's expenditure on transport R&D. Sweden's automotive industry stands for roughly 20% of the Swedish industry's total investments in R&D, and 80% of total Swedish R&D expenditure in the transport sector.

Compared with other EU member states, Sweden distinguishes itself with a relatively strong profile within automotive technology, energy-related technologies, infrastructure, and, in particular, in the field of connected and autonomous vehicles. Sweden has a weaker R&I profile in the area of network, control and management systems, as well as in smart services.

Chalmers University of Technology is Sweden's largest recipient of European and national funding of transport R&I. The Swedish Transport Administration, Vinnova (Swedish innovation agency), and the Swedish Energy Agency are the three largest public investors in this field. Several R&I organisations are located in Gothenburg, including Chalmers, Research Institutes of Sweden (RISE), and the automotive industry. Together, they form a strong R&I cluster. Lindholmen Science Park acts as co-ordinator of public-private partnerships and R&I programmes in the areas of logistics and freight transport, including Tripe F and CLOSER.

Sweden's R&I profile is in line with the government's green transformation strategy for the transport sector: (1) a more transport-efficient society, (2) more energy-efficient transport modalities, and (3) a greater share of renewable fuels. Roughly 10-20% of the public R&I expenditures goes to the areas of logistics and freight transport. By way of comparison, 8% of EU financed R&I is allocated to transport.

The development of information and communication systems for increased transport collaboration and efficiency is a central topic in European R&I. This is also, to a lesser extent, the case in Sweden where new vehicles and energy-related technologies are more dominant themes of R&I. This is particularly the case as regards investments in Swedish start-ups and scale-ups,² which focus more heavily on new energy technologies than on new digital transport markets.

Interviews with start-ups in the transport sector and major purchasers of transport services in Sweden revealed market expectations of changes in transport systems. New vehicle and energy technologies, alternative fuels, and electrification drive major changes in the short term. In the long term, investments in connected and autonomous vehicles will play an even larger role, changing transport infrastructure and services in more fundamental ways.

¹ R&I includes both research and development (R&D) and innovation activities. R&D indicates both knowledge and business development, not necessarily with the aim of leading to new production processes or products (goods and services). Innovation activity, per definition, aims towards the latter two.

² The terms "start-up" and "scale-up" refer to new firms with new products, goods, or services. They are generally high-tech companies.

Digitalisation of transport systems is a prerequisite for major changes. New digital systems and platforms for planning, procurement, and administration of logistics and transport services connect market players and enable a faster, more integrated, and flexible control of supply chains and warehousing. However, the primary goal is then on business and product development, not on transport efficiency at a societal level, national, regional, and local planning.

Collaborative systems of transport management, planning, and coordination are a common topic of European and Swedish R&I in logistics and freight transportation. In the Transport Research and Innovation Monitoring and Information System (TRIMIS), managed by the European Commission, this field of research is called *Collaborative logistics ecosystem*, including projects on transport sharing within a limited geographical area or along certain freight routes. More general research and project evaluations have shown that these initiatives tend to be rather short-lived and difficult to scale up.

The market potential for horizontal transport collaboration and optimization is limited due to highly competitive transport markets. Still, there is an increasing emphasis on joint developments of new business models that can stimulate information and data sharing. Less attention is being paid to the role of public policy, regulation, and requirements in shaping transport efficiency, other than as measures for mitigating climate change. Although potentially beneficial to companies and for competitiveness, the low level of market transparency leads to fragmented transport information and planning.

Part of the problem is limited evaluation of R&I activities in the transport sector. Standardised data on R&I objectives, methods, and results are needed for systematic monitoring, including information on the phase and maturity of new technologies, operational measures, and systems. Regular and systematic monitoring is required for the wider sharing of information on best practices, experiences, and progress towards transport policy objectives. Such monitoring could also clarify the diversity and impact of transport efficiency initiatives, as well as general drivers of transport innovation.

Several government agencies are currently developing new systems and processes for R&I monitoring and information sharing. It remains to be seen if, and when, this will result in accessible and standardised data for regular and systematic monitoring of R&I objectives, methods, and results.

VTI, the Swedish National Road and Transport Research Institute, could play a central and important role in such an effort. VTI's national project catalogue has a unique potential to serve as a national register of transport R&I projects. To serve national monitoring and assessment, additional data, standardisation, and system development are required, including data on project budgets and participants.



Transport Analysis is a Swedish agency for transport policy analysis. We analyse and evaluate proposed and implemented measures within the sphere of transport policy. We are also responsible for official statistics in the transport and communication sectors. Transport Analysis was established in 2010 with its head office in Stockholm and a branch office in Östersund.