

R&D-Report

Maritime Transport and Logistics in Northern Norway: Current and Future Development

Report 2 of the BEAR Project
RCN/320266

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Nord University
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*Report 2 of the BEAR Project RCN/320266
Business School, Nord University, Bodø
March 2026*

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Preface

Report 2 is the second of six reports to be generated by the BEAR Project. These reports analyse maritime transportation in Northern Norway, a region of profound economic and strategic importance to the whole of Norway; together, the reports contribute to increasing our understanding of maritime activities in the region. Report 2 provides a comprehensive analysis of the maritime transportation and logistics system in the region, focusing on logistical challenges as well as potential future solutions and maritime development strategies.

The BEAR Project was made possible through generous funding from the Research Council of Norway (RCN/No. 320266) under the grant "Collaborative and Knowledge-Building Project to Meet Societal and Industry-Related Challenges", with financial support from the Norwegian Ministry of Foreign Affairs.

This collaborative endeavour is led by the Centre for High North Logistics (CHNL) at the Business School of Nord University in Bodø. Project partners include the Kunnskapsparken Bodø AS, Akvaplan-niva AS, Tschudi Kirkenes AS, and Sør-Varanger Utvikling AS.

The BEAR Project was subject to delays due to the travel and meeting restrictions imposed by the Covid-19 pandemic. The initial scope of the project also had to be modified as a result of new geopolitical conditions. The project was initially designed to study maritime transport infrastructure across the Barents Euro-Arctic Region (BEAR) and included two university partners in North-West Russia. However, the start of the war in Ukraine in February of 2022 necessitated a fundamental restructuring of the project's objectives and workplan. This restructuring excluded the initial Russian partners.

In response to the new conditions, the project's focus strategically shifted to a more in-depth study of the maritime transportation and logistics system in Northern Norway. This new scope also includes an assessment of cross-border transport connections with Northern Sweden and Northern Finland, reflecting the new geopolitical and logistical realities in the High North.

We trust that this report, and additional reports to that will follow, will provide a robust and essential knowledge base for policymakers, industry stakeholders, and researchers. It is our hope that this work will contribute to the development of a more resilient, efficient and sustainable transportation system for Northern Norway.

The BEAR Project Team,

March 2026

Executive Summary

This second report of the BEAR Project provides a comprehensive analysis of the current state and future potential of the maritime transport and logistics system in Northern Norway. Situated in Europe's northern periphery, the region's economic development is highly dependent on the efficiency of the transport system that serves it. Maritime transport has historically been a lifeline for Northern Norway, supporting key industries in the region (such as oil and gas, fisheries, aquaculture, and mineral extraction) and connecting all coastal communities. However, this report reveals a critical disconnect between the strategic importance of maritime transport and its current state of decline. Despite long-standing government policies aimed at shifting freight from the road network to seaborne transport, maritime logistics in Northern Norway are hindered by several challenges. As a result, inefficient maritime transport in the region increases the reliance of the local transportation system on less sustainable road transport.

The transportation system in Northern Norway is a complex network in which each mode faces significant limitations. The maritime sector, the primary focus of this report, is characterized by an aging coastal fleet, a fragmented and decentralized port structure, and inadequate infrastructure. In contrast, road transport has become the dominant mode for many types of cargo, particularly high-value, time-sensitive goods like fresh seafood (although air transport plays a small role, especially for goods with particularly high lead-time requirements, such as king crabs). Trailer trucks offer levels of flexibility and short lead-times that the current maritime system cannot match. However, road transport is regarded as cost-inefficient and environment unfriendly. The road network, especially the county roads, is of a low standard, poorly maintained, and highly vulnerable to frequent winter closures. Additionally, the railway system has a limited geographic reach, terminating at Bodø and Narvik. It is also subject to severe capacity constraints due to its single-track lines. In addition, intermodal connectivity between sea, road, and rail remains severely underdeveloped.

One of the central findings of this report, drawn from a review of government reports (including government-funded research reports) and stakeholder interviews, is that Norway's national transport policies are inconsistent with its investment priorities. The National Transport Plan (NTP) and the Green Shipping Program explicitly call for a modal shift to more environmentally friendly sea and rail transport. However, with the railway network facing severe capacity constraints and no immediate plans for northern expansion due to high cost, the maritime sector remains the only viable alternative for large-scale transport. However, the allocation of funds tells a different story. The maritime sector receives a small share of the national transport budget (approximately 3%), while the vast majority is directed towards road and rail projects. Underfunding means the maritime sector lacks resources for infrastructure modernization, fleet renewal, and technological advancement, making maritime transport less competitive than road transport.

a. Maritime transport in Northern Norway faces multiple challenges

This research report, supported by in-depth interviews with 43 regional stakeholders (informants), reveals certain challenges in maritime transportation in Northern Norway. The fragmented and inefficient governance of port structure is a primary obstacle. Historically, a

decentralized approach has led to a fragmented port structure with numerous small, economically unsustainable ports. While the state regained ownership of fishing ports in 2023, the port sector remains fragmented. This lack of coordination creates intense internal competition rather than regional cooperation and prevents the development of an organized and efficient network. Stakeholders are disappointed with the absence of a central governing authority in the seaport sector, one similar to Avinor for airports and Bane NOR for railways. This leads to a lack of coordinated investment, preventing the realization of economies of scale. Coordinated investment could concentrate resources to address major problems: for example, some ports face significant capacity limitations that impede cargo handling during the peak season. There is a pressing need for investment for the modernization and expansion of these ports, particularly to establish Onshore Power Supply (OPS) infrastructure and better accommodate innovative transport solutions (e.g., intermodal transport). Intermodal transport involves additional transshipment processes that can pose a risk of damage to goods and equipment, if port handling capacity and facilities are limited. However, improved intermodal connectivity can optimize transportation of cargo and passengers.

Operationally, low and imbalanced cargo volumes are a critical issue. This is particularly true of the north-south container flow and leads to empty or half-empty ships on voyages that are economically and environmentally costly. The problem is exacerbated by a heavy reliance on road (approximately 80%) and rail (approximately 20%) transport for the region's most valuable export: fresh seafood. Currently, sea transport handles a negligible share of these time-sensitive goods. The long and unpredictable transit times of sea transport make it uncompetitive for perishable goods, which now account for a massive volume of truck traffic heading south. This not only increases pressure on the vulnerable road network but also critically diminishes the cargo base available for shipping, creating a vicious cycle of declining volumes and reduced services. In addition, the outdated and uncompetitive fee structures of fishing ports further deter shipping lines.

Furthermore, the reliability of maritime services is a major concern for businesses. Coastal shipping's lack of fixed, predictable time schedules undermines "just-in-time" logistics, forcing cargo owners to opt for the greater predictability of road transport, even at a higher cost. This unreliability stems from an aging and often unsuitable domestic fleet. Many vessels are old, inefficient, and ill-equipped for the demands of modern logistical systems like container transport. The report highlights a scarcity of suitable container ships and specialized vessels, with stakeholders noting that Northern Norway often receives outdated vessels while newer ones are allocated to more profitable routes. There is a vicious cycle: without a reliable cargo base, there is no motivation to invest in new ships, and without modern, reliable ships, it is impossible to attract sufficient cargo.

b. A strategic roadmap for an economically viable and resilient maritime future

Grounded in the opinions of stakeholders, this report proposes a series of workable suggestions for how the potential of maritime transport can be unlocked to ensure the sustainable development of Northern Norway. These recommendations address the core operational and governance-related failures of the current transport system in Northern Norway.

First and foremost, a fundamental shift in governance is required. The report advocates the establishment of stronger state supervision and ownership, potentially through a state-

controlled port development company or a similar centralized authority. This body should be delegated to implement national strategies and rational investments based on logistical needs. Crucially, it must integrate ports into the Total Defence concept, enforcing the new Port Preparedness Regulation to ensure infrastructure meets both logistics demands and military security requirements. Such a structure could end inter-municipal competition and ensure that funding is used to create a more connected, efficient and cost-effective maritime logistics system.

This new governance model must be supported by a clear investment strategy that prioritizes the maritime sector. This includes not only increasing the sector's overall funding allocation within the National Transport Plan but also fostering public-private partnerships (PPPs) to finance major infrastructure projects. PPPs can leverage private sector expertise, efficiency and capital while ensuring the development aligns with public goals and industry needs. The mining industry may be one of the beneficiaries of the updated maritime infrastructure; Northern Norway is rich in natural resources. Several large industrial projects are currently being planned. Exports of raw commodities, as well as products that have undergone further industrial processing, rely on maritime transport to international markets. In addition, to accelerate the renewal of the domestic coastal fleet, the government must implement targeted incentive schemes. These programs are essential for the renewal and upgrading of ships, particularly those maintained by small, family-owned shipping companies. These companies are the backbone of the coastal fleet but lack the resources for such upgrades.

The new managing body should focus on improving the efficiency and reliability of maritime logistics services. Efficiency can be achieved through cargo consolidation, digitized online booking systems for real-time visibility, and the adoption of supercooling technology to enable the sea transport of perishable goods. The report recommends the development of a "hub-and-spoke" model, where cargo is consolidated at a few major regional ports for onward transport. This may create the critical mass needed to build up regular shipping services. Shipping companies, in turn, should adopt a "service-first" approach, providing fixed-time schedules and real-time logistics information to build market confidence. These hubs must be developed as multimodal terminals, with significant investment in facilities and information systems, to streamline the transfer of freight among ships, rail, and road.

The maritime transport system in Northern Norway could be divided up into separate transport and logistics clusters. This is a core strategy to overcome the current fragmentation of the system. Road and railway corridors should connect maritime logistics clusters and cargo bases within the Nordic North, extending across national borders and supporting freight and passenger transport in the region. This logistics system, supported by state-led partnerships, would favour regional cooperation over competition. In addition, all infrastructure planning should include early and meaningful consultation with Sami communities to protect their traditional livelihoods and cultural rights.

Finally, all suggestions proposed in this report should be considered and implemented within the context of a broader strategic perspective that recognizes Northern Norway's geopolitical significance. Strengthening cross-border collaboration with Sweden and Finland is not only important for economic efficiency, but also for enhanced regional security and military mobility. It is therefore necessary to develop a joint Nordic transport plan based on the 2025 Nordic Transport Preparedness Cooperation Agreement. This strategic view also calls for

innovative infrastructure solutions, such as floating ports, to rapidly expand capacity for both civilian and military purposes. By implementing these integrated strategies, Northern Norway can transform its maritime sector into a connected, efficient and cost-effective system capable of supporting its future economic growth and security.

1. Introduction

The BEAR Project will produce six reports dealing with maritime activities in Northern Norway (*Table 1*). The first three reports cover transport-intensive industries and maritime cargo-base (Report 1); the maritime transportation and logistics system (Report 2); and seaports (Report 3). All three reports were completed at the same time, relying on the same quantitative and qualitative datasets and applying mixed methods analysis.

Table 1: The six reports of the BEAR Project

Report No.	BEAR Report
1	Transport-intensive industries and the maritime cargo-base in Northern Norway, published in March 2026.
2	Maritime transport and logistics in Northern Norway: Current and future development, published in March 2026.
3	Seaports in Northern Norway: Current challenges and future development strategies, published in March 2026.
4	Environmental risks of shipping and port activities in Northern Norway (working title).
5	Maritime intelligent transportation systems: Emerging technologies and applicability for Northern Norway (working title).
6	The significance of effective transport systems for regional socio-economic development in Northern Norway (working title).

1.1 Background

Northern Norway is characterized by its sparsely populated landscape, mountainous terrain, and numerous fjords and islands. These features create challenges for the development and maintenance of efficient transportation systems. The severe winter climate frequently disrupts land-based transportation, leading to road closures and substantial delays. In addition, the transport infrastructure in the Nordic North (Northern Norway, Northern Sweden and

Northern Finland) is divided along national boundaries into distinct national transport systems. East-west transport across national boundaries is limited: of the 12 border crossing stations with neighbouring countries, only two are open 24 hours a day, which hampers regional socio-economic development. This geographical and climatic reality highlights the critical importance of maritime transport as a primary mode of transport in the region. For centuries, sea transport has been the primary lifeline for coastal communities, facilitating the movement of people, connecting industries and the markets, and supporting the export of the region's fishery products and natural resources from the mineral sector.

In terms of cargo volume handled by sea, a 2002 report from the Institute of Transport Economics (TØI) provides a crucial baseline: at that time, 87% of exports from Northern Norway were transported by sea. Ships even carried a remarkable 24.8% of the volume of time-sensitive fresh fish exports from the entire Northern Norway region.¹

Today, however, the situation has changed. Because of cargo owners' concerns that the long lead-time of sea transport from Northern Norway to European markets degrades product quality and reduces its market value, about 70%–80% of fresh farm-raised salmon and fresh wild-caught cod is currently transported from Northern Norway by trailer trucks, with the remaining 20%–30% transported by railways (both the Ofoten Line and the Nordland Line). This situation is inconsistent with the long-standing EU and Norwegian policy that 30% of road freight travelling over 300 km should be shifted to other modes of transport, rail or waterborne transport, by 2030.²

Currently, road transport seems to be the dominant mode with key corridors along the E6, E8, and E10 highways, and a significant volume of traffic transiting through Finland and Sweden via border crossings at Kilpisjärvi and Kivilompolo. By contrast, rail and sea transport are less competitive. The railway's geographic reach is limited: it terminates at Bodø and Narvik and is thus unable to directly serve the vast coastlines of Troms and Finnmark. In addition, maritime transport is widely perceived as inflexible, unreliable, and having long lead-times. Although a pilot project by the Green Shipping Programme has shown that a sea-based solution could reduce transport costs by 20%–30% and greenhouse gas emissions by over 70%, this new solution requires new high-tech green ships that utilize LNG systems to cool their freezers or cold rooms.³ However, lower transport cost and emissions can be achieved more easily, and perhaps even sooner, by autonomous vehicles.

The core challenge for maritime transport is not simply to be cheaper and greener, but to match or exceed its road counterpart on the attributes that matter most to cargo owners: short lead-times, punctuality, predictability, and reliability. In order to strengthen the competitiveness of maritime transport in Northern Norway, the authors review existing

¹ Olav Eidhammer, Inger Beate Hovi, and Marit Killi, *Freight transport within, to and from Nordland and North-Norway*, Transportøkonomisk institutt (2002), <https://www.toi.no/publications/freight-transport-within-to-and-from-nordland-and-north-norway-article17776-29.html>.

² European-Commission, WHITE PAPER Roadmap to a single European transport area towards a competitive and resource efficient transport system, (Publications Office of the EU, 2011); Thorkel C. Askildsen et al., *Nasjonal transportplan 2025-2036 - Godstransport, eksport og industri* (2024).

³ Kystrederiene, "Fish transport – salmon from road to sea," updated 19.10.2023, 2020, accessed 06.11, 2022, <https://greenshippingprogramme.com/pilot/fish-transport-salmon-from-road-to-sea/>.

literature and identify two major knowledge gaps currently hindering the development of a more connected, efficient and cost-effective maritime logistics system in the region.

First, there is a lack of an updated and integrated cargo flow analysis for the region. The most recent comprehensive study of Northern Norway's freight flow can be traced back to 2002.⁴ More recent high-level studies, such as the government's major Concept Selection Investigation (KVU) on transport solutions for the Northern Norway, excluded maritime transport from their analysis.⁵ Without an updated and comprehensive understanding of cargo flow and the current state and major challenges of maritime transportation in Northern Norway, it is impossible to design policies to effect a modal shift. Policymaking is currently based on a two-decade-old map of the logistical landscape.⁶

Second, there is a need for applied research on collaborative logistics and port consolidation models. The problems of low and imbalanced cargo volumes and a fragmented port structure are well-identified. Potential solutions, such as creating cargo consolidation hubs or implementing hub-and-spoke logistics systems, are often proposed. However, key questions remain unanswered: What are the optimal locations for consolidation hubs? Where does the investment for infrastructure improvement come from? What governance models are needed to foster effective collaboration among port authorities in the same region and between port authorities and private actors? Answering these practical, applied research questions is essential to move from diagnosing the problem to implementing a workable solution.

1.2 Significance and aims of the study

The aforementioned challenges of maritime transport and the identified research gaps create a clear need for an in-depth analysis of maritime transport in Northern Norway. This study is aimed at promoting a more connected, efficient and cost-effective maritime logistics system in Northern Norway, characterized by intermodal transport connections with road and rail. It seeks to provide best-practice examples of logistics services in Northern Norway. By placing the maritime system at the centre of its investigation, this research differs fundamentally from previous studies that have either marginalized or entirely overlooked its role.

In order to achieve this goal, the study (1) evaluates and analyses current maritime logistics operations and intermodal sea-land connections in Northern Norway; and (2) suggests ways to increase the share of overall cargo flow utilizing maritime transport, considering logistics cost and emissions. The study moves beyond a simple description of the status quo to provide actionable recommendations designed to overcome the identified challenges and unlock the full potential of sea transport.

This project aligns with the Norwegian government's objective to "provide an efficient, accessible, safe and environmentally friendly transport system that covers society's needs for transport as well as promoting regional development". The project is also in line with the Norwegian National Transport Plan (and other state transport policies and priorities) and the

⁴ Eidhammer, Hovi, and Killi, see note 1.

⁵ Statens-Vegvesen et al., *Konseptvalgutredning (KVU) for transportløsninger i Nord-Norge* (2023), www.vegvesen.no/globalassets/vegprosjekter/prosjekter/kvunordnorge/andre-dokumenter/kvu-hoveddokument.pdf?v=4acb8b.

⁶ Eidhammer, Hovi, and Killi, see note 1.

United Nations Global Sustainable Development Goals (Agenda 2030). In this context, the study proposes a more connected, efficient and cost-effective maritime logistics system that will represent a high degree of innovation in the following areas:

a. New data on transport flows and logistical needs and challenges: The study provides critical new data and knowledge regarding transport flows and logistical needs and challenges in Northern Norway, and these findings can be extended to the whole Nordic North region. By analysing detailed shipping data and conducting extensive interviews with key maritime stakeholders, this report fills the knowledge gaps left by previous studies, offering a comprehensive understanding of vessel movements, cargo volumes, and the challenges faced by the industry.

b. Latest logistics technologies and concepts: The study assessed the latest logistics technologies and concepts available to promote the most efficient, reliable and profitable logistics operations while minimizing environmental impact. Suggested transport and logistics solutions will create economic and logistical benefits. This includes exploring innovations in cargo consolidation, intermodal terminal selection, vessel technology, and digital logistics platforms that can enhance reliability and reduce costs.

Findings from this project have the potential to contribute to society in several ways:

c. Reinforcing Northern Norway as an important supply region for natural resources: An improved logistics system has the potential to strengthen Northern Norway as an important supply region for raw materials and refined industrial products for the European and global markets. By making maritime transport more efficient and reliable, the region's key industries can improve their competitiveness and secure more resilient supply chains.

d. Increasing business and industrial cooperation and trade: An improved logistics system and enhanced connectivity have the potential to increase business and industrial cooperation and trade. Better transport links can foster greater economic integration both within Northern Norway and with neighbouring regions in Sweden and Finland, creating new opportunities for businesses and strengthening the regional economy.

e. Improved logistics will reduce emissions and negative health impacts: A successful modal shift from road to sea is one of the most effective measures for reducing greenhouse gas emissions, local air pollution, road congestion, and accidents, contributing directly to national climate goals and improving public health. Shipping businesses and logistics service providers in Northern Norway will benefit from an improved transport system and increased connectivity.

f. Other social benefits: Increased regional mobility will also improve access to health services, enhance the well-being of the local population, promote increased educational opportunities, increase local job prospects, and promote cultural activities. For remote coastal communities, a robust logistics network is fundamental to their viability and quality of life.

1.3 Research questions

To guide this analysis the report is structured around the following core research questions:

(1) What is the current state of the maritime transportation system and sea-land transport connections in Northern Norway? (addressed in Sections 3, 4 and 5). The question seeks to

establish a detailed baseline by mapping the existing infrastructure, services, cargo flows, and key obstacles hindering performance. (2) To what extent does the current logistics solution meet market needs, and what barriers and bottlenecks exist that need to be overcome to meet these needs more effectively? (addressed in Section 6) This inquiry delves into the specific requirements of the region's industries and communities, assessing the gap between demand and supply in logistics services and identifying the critical points of failure. (3) Which are the best-practice examples (solutions) to improve logistics services in Northern Norway? (addressed in Section 7) This question focuses on identifying and evaluating concrete, practical, and innovative strategies to address the identified challenges, drawing on successful models from elsewhere and tailoring them to the unique context of the region.

1.4 Report structure

The report is organized into nine sections to systematically address the research questions. Following this introduction, Section 2 details the methods of analysis employed in the study, including the collection and analysis of secondary data and semi-structured interviews conducted with maritime stakeholders. Section 3 provides a comprehensive assessment of the current state of the overall transportation system in Northern Norway, covering maritime, road, railway, and air transport, as well as intermodal connections. Section 4 examines Norway's national transportation policies and priorities. Section 5 presents an analysis of maritime transport and logistics services, including vessel types, shipping routes, and the Norwegian and foreign companies operating in the region. Section 6 synthesizes the findings from stakeholder interviews to present a thorough discussion of the key challenges facing maritime transportation. Building on this analysis, Section 7 proposes a series of concrete suggestions aimed at overcoming these challenges and improving the system's effectiveness. Finally, Section 8 provides the conclusion and Section 9 derives key recommendations from the study.

2. Methods of Analysis

To conduct a comprehensive analysis of the maritime transportation system in Northern Norway, a convergent parallel mixed-methods design was deemed essential for complementarity and completeness. The quantitative data (shipping statistics) reveal patterns in the sailing routes vessels take, and the qualitative data gathered from logistics service providers' websites and through personal interviews explain the underlying causes of these patterns. This methodology is designed to integrate quantitative data on shipping and seaport activities with qualitative insights from key industry stakeholders, government reports and academic literature. By collecting both forms of data simultaneously and merging them during interpretation, this study achieves triangulation. The combination of quantitative and qualitative data provides a holistic understanding of the system's current state, challenges, and future opportunities. The data were collected from the following sources: official port call data from Norwegian Coastal Administration (Kystverket); vessel data from the Clarkson World Fleet Register; automatic identification system (AIS) data; semi-structured interviews with maritime stakeholders; publicly available information from industry websites; and existing literature and official documents.

Quantitative analysis of port call data, vessel characteristics and voyage patterns: The quantitative foundation of this study is a detailed dataset of port call statistics for the year 2021, provided by the Norwegian Coastal Administration. This dataset serves as the primary source for mapping and analysing the dynamics of maritime transport in the region. The analysis focuses on four key attributes: 1) Port-to-port connectivity: mapping the voyages between key ports in Northern Norway and other domestic and international destinations to identify major shipping routes and trade corridors. 2) Vessel characteristics: analysing the composition of the fleet serving the region, including vessel types, deadweight tonnage (dwt), age, and ownership (Norwegian vs. foreign), using data retrieved from the Clarkson World Fleet Register. 3) Voyage patterns: differentiating between domestic and international voyages with the help of AIS (provided by Spire Marine/ShipView Platform) to understand the major ship types in different sea routes. 4) Traffic patterns and intensity: quantifying the number of departures and arrivals at key ports to identify the main logistical hubs and measure their level of activity. The quantitative data enable a systematic and evidence-based assessment of vessel movements, fleet characteristics, and the geographical structure of maritime logistics. Analysis of the data provides an understanding of cargo flows and operational patterns.

While the 2021 port call dataset may appear dated due to the extended project lifecycle, it remains a comprehensive and robust foundation for analysis due to the region's stability. The validity of this data is supported by three key factors. a) Stability of trade patterns: Although there have been gradual developments since 2021—such as growth in the aquaculture segment, the introduction of new low-emission vessels, and evolving environmental regulations—Northern Norway has not experienced transformative shifts in its core logistical structures. Consequently, the major shipping routes and trade corridors have remained consistent, supporting the continued relevance of the conclusions drawn from the 2021 data. b) Trade with Russia: We acknowledge that post-2021 sanctions have impacted specific cargo flows and in particular reduced transport services by Russian vessels in Northern Norway (mainly reefer vessels) as well as port services to Russian vessels (e.g., repairs, supply, and maintenance). However, this decline in bilateral trade does not invalidate the study's primary findings. c) Structural consistency: While the fleet has naturally aged and quantitative data on recent new vessels into this market is not available, the structural characteristics of the fleet and port infrastructure have not undergone major changes during this period. The shifts that have occurred have been gradual, ensuring that the data remain representative of the current operational situation.

Review of online sources: The official websites of various port authorities and logistics services providers in Northern Norway were reviewed. The online sources provide both quantitative and qualitative data, including information on the range of services offered, available facilities and equipment, the main cargo types handled, and strategic development plans.

Qualitative data from semi-structured interviews: To complement the quantitative data and obtain the opinions of practitioners involved in the maritime sector, a series of semi-structured interviews (43 in total; each lasting about one hour) were conducted with key maritime stakeholders across Northern Norway (see *Table 2*). All informants were at the upper management level and represented port authorities (PA), logistics suppliers (LS, RL; transport companies), cargo owners (CO), business networks (BN), energy utilities (EU), maritime industry (SY), and a governmental organization (GA).

This qualitative approach is essential for understanding current challenges, drivers for decision-making, stakeholders' key considerations, and their vision for the logistics industry. This information is not apparent in statistical data. The semi-structured interviews ensured the same questions across all interviews at different locations, while providing interviewers with some flexibility to ask follow-up questions and dig into specific topics. The interview transcripts provide rich contextual narratives and thorough understanding of the maritime industry, serving as the foundation for the report's findings and recommendations. All personal data, including audio recordings made using the Dictaphone app, are stored on secure servers at nettskjema.no/. The final report presents data in an anonymized or de-identified format to protect the privacy of individual stakeholders.

Table 2: Stakeholders in Northern Norway participating in interviews

Type of organization	Number of interviews	Codes of transcribed interviews
Port authority	13	PA5, PA6, PA7, PA13, PA14, PA15, PA16, PA17, PA18, PA19, PA21, PA22, PA23
Logistics supplier (transport company)	15	LS1, LS2, LS4, LS12, LS14, LS15, LS18, LS20, LS21, LS23, LS24, LS25, LS27, RL1, RL2
Cargo owner	7	CO1, CO9, CO17, CO20, CO21, CO23, CO25
Business network	4	BN10, BN14, BN16, BN17
Energy utility	2	EU8, EU15
Maritime industry	1	SY3
Government	1	GA11

Policy document reviews: A comprehensive desk review of existing publications and official documents was conducted. This review covers a wide range of sources, including government reports like the National Transport Plan and KVV (Konseptvalgutredning), previous and ongoing research projects like the Green Shipping Program, academic articles on logistics and transport economics, and reports produced by industrial organizations. This review informs an understanding of the existing policy framework and previous analyses of the region's logistical challenges. It ensures the study builds upon, rather than duplicates, existing knowledge.

3. The Current State of the Transportation System

3.1 Transportation in a peripheral area

It is difficult and expensive to construct transport infrastructure in Northern Norway. The area, located in Europe's northern peripheral region, is vast and sparsely populated (approx. 480,000 residents; representing about 10% of Norway's total population) with long distances between urban centres. The landscape is mountainous with extensive fjords and large number of islands, and limited land available for development. Most of the area lies north of the Arctic Circle, enduring harsh winter weather and snowstorms that frequently close roads, particularly in mountain passes. The area is ecologically sensitive and has high ecological conservation value. Future infrastructure development in Northern Norway must not weaken sustainable reindeer husbandry and indigenous peoples' right to cultural practices. This places limits on large-scale industrial development and the future expansion of land-based transportation systems.

The government's goal is for Northern Norway to have an effective, reliable and environmentally friendly transport system that connects the region and brings its people together, makes people want to live and work in the High North, promotes utilization of natural resources, enhances regional socio-economic development, and ensures safety, security and preparedness for the region's residents.⁷ Today much of the transport infrastructure is considered to be of low standard, and is often in poor condition. Transport and logistics services tend to be limited, and those services that are available are expensive owing to the long travel distances within the region. The extensive variation in topographic features, together with industrial and settlement patterns, makes it challenging to design a holistic transport solution for the whole region. Land-based freight transport between Northern and Southern Norway mainly uses the infrastructure of neighbouring Sweden and Finland.

The development and future sustainability of Northern Norway is impacted by several demographic challenges. The whole area is characterized by negative population growth, an aging population, and in particular a declining rural population. There is a gender imbalance. The area is also known to lack a highly skilled labour force. Another issue is the statutory rights of the Sami to cultural practices including reindeer grazing, which has led to conflicts between grazing rights and large-scale energy projects (e.g. wind farms) and transport infrastructure projects (e.g., railways).

The region is rich in natural resources. Northern Norway primarily exports commodities, resulting in a considerable cargo imbalance between exports and imports. The local industry often needs to ride out significant price fluctuations in the commodity market and in freight shipping rates. The export industries are more distant from the European market than similar industries further south in Europe. Other industrial activities, including manufacturing, generate low volumes of cargo for export.

⁷ KVV for transportløsninger i Nord-Norge see note 5.

3.2 *Maritime transportation*

Norway is traditionally a maritime nation with strong historical and economic ties to the sea. Sparsely populated and remote fishing communities, along with small urban and industrial centres, are dotted along the coast, each with its own seaport. This makes maritime transport the most logical means of transportation both between coastal communities and for the export and import of industrial and consumer goods. For several decades shipping has been the most important means of transporting fish and fish products in Norway. To preserve the fish for transport and later consumption, it was first salted, smoked, dried, or frozen. These methods of preservation made shipping these commodities by far the most practical, affordable, and environmentally friendly form of transport, despite the long distances by sail to European fish markets.⁸ But without some form of product preservation that can lengthen the shelf-life of fresh fish products, maritime transport can no longer compete with road or rail for the transport of fresh fish from Northern Norway to European markets. This applies to all perishable goods.

The region's mountainous geography and rugged coastline, with its system of long, steep, and deep fjords and countless islands, makes the construction of land-based transportation infrastructure difficult, time-consuming, and very expensive. It is impossible to connect all the coastal and island communities to the road and railway system, but maritime transportation already provides such connections. Winter weather conditions have a much greater impact on transport mobility on land than on sea. Fjords are perfect places for ships to seek shelter from the effects of severe winter storms, whereas land-based trailer trucks are greatly impacted by heavy snowfall, snowdrift, snow avalanches, and icy roads.

A maritime transportation system is a network of several interconnected components—fairways (waterways), shipping channels, seaports, vessels, landside and seaside connections—and the system's users (shipping companies and logistics providers), who transport people and freight to and from the waterfront.

Fairways determine vessels' sailing routes. Their characteristics (depth, width, currents, tides, ice conditions) affect vessels' size, speed, and safety. Seaports serve as crucial interfaces within maritime transport systems, bridging sea and land transportation as they interact with vessels (berthing, loading/unloading), with land transport (trucks, trains, pipelines), and with hinterland industries and markets. Well-developed seaside and landside connections enable the smooth transfer of goods between vessels and inland transport networks, but bottlenecks on either side can cause delays and increased costs. Inadequate land connections will result in long delays for trucks and trains entering and exiting the seaport area.

Good seaside connections require well-maintained shipping channels to seaports, efficient harbour infrastructure, seaport facilities, navigation and communication systems, and seaport services (e.g., pilotage, towage).⁹ Navigation and communication systems ensure safe and efficient navigation by providing information and guidance to vessels, interacting with

⁸ Nilssen, F., Solvoll, G., and Mathisen, T.A., *Miljøvennlig transport av fersk torsk til europeiske markeder*. FOU-rapport nr. 100, Nord University, Bodø (2023).

⁹ See Report 3 of the BEAR Project for detailed information on seaports in Northern Norway.

vessels, shore-based authorities, and meteorological services.¹⁰ Effective landside connections rely on efficient road, rail and pipeline systems, along with intermodal facilities that enable the transfer of cargo between different modes of transport.

Shipping along the coast of Norway is regulated by the navigation rules of the Norwegian economic zone,¹¹ which includes recommended sailing routes for near-shore coastal shipping, and use of a traffic separation scheme (TSS) further from the coast for high tonnage vessels (over 5,000 gross tonnage) and vessels carrying hazardous material. Several recommended routes and main fairways for navigation have been charted in Norwegian internal waters. This is essential as most of Northern Norway's shipping activities take place within internal waters, whereas larger vessels sail for significant distances within the Norwegian territorial sea further from the coast after calling at ports, or are required to sail much further from the coast and follow the TSS (*Figure 1*).

¹⁰ See forthcoming Report 5 of the BEAR Project for detailed information on maritime intelligent transportation systems.

¹¹ Kystverket, "Kart," (Kystverket, 2025). <https://kart.kystverket.no/>.



Figure 1: Norwegian internal waters with several recommended sailing routes and main fairways for navigation (several short red lines). The internal waters extend shoreward from the coastal baseline. The baseline marks the beginning of Norway's 12-nautical mile wide territorial sea zone (green area). Beyond that is the contiguous zone, which also is a 12-nautical mile wide zone. The light blue line marks the outer border of the 20-nautical mile coastal navigation area. Furthest from the coast is the traffic separation scheme (TSS). Source: www.kystinfo.no

3.3 Road transportation

In Northern Norway, freight transport by road is subject to several challenges and limitations. Years of insufficient maintenance have reduced the standard of part of the road network. According to government sources, challenges include roads with poor bearing capacity, no road cover or damaged asphalt with potholes, no or limited road shoulders, and roads that

need tunnel upgrades and bridge maintenance and/or replacement.¹² This applies to much of the county road network (fylkesvei) which provides important transport connections between sparsely populated coastal areas and the National and European road network further inland. These county roads are now used to transport high volumes of fresh fish on large trailer trucks from fish landing sites (for wild-caught fish) and slaughterhouses (for farm-raised salmon), located along the coasts of Finnmark, Troms and the northern part of Nordland.

The roads were not built with today's trailer trucks and heavy freight volumes in mind. Some of the roads are too narrow to allow trailer trucks to pass oncoming traffic, leading to frequent road accidents. Many of the roads have tight curves and steep gradients, making driving a truck along them extremely challenging and dangerous. On some roads, both the width and curvature of certain stretches has had to be modified to accommodate larger trucks with trailers.¹³ The steep topography frequently leads to landslides or (in the winter) avalanches, closing roads for several hours or days. Another concern is that many of the trucks are hired from foreign truck companies and driven by foreign nationals who have less experience of driving on Norwegian county roads, particularly in the wintertime.¹⁴

Winter is the most challenging time of year for road freight. Northern Norway faces severe winter weather conditions that can paralyze the road network, presenting a formidable challenge for heavy vehicles.¹⁵ The weather can change quickly and lead to roads icing over or heavy snowfall and snow drifts impacting accessibility and visibility. Avalanches can sometimes force traffic into lengthy detours or render the area inaccessible. Mountain passes, with their steep gradients and curvatures, are frequently closed for several days during the winter months.¹⁶ This can lead to long lines of trucks waiting in queues for several hours or even days for assistance to get through the pass.¹⁷ The delay can cause their cargo to quickly lose its monetary value, especially if the cargo is fresh fish or other time-sensitive produce.¹⁸ Long distances and demanding weather and driving conditions challenge the cost-effectiveness of road freight. Driving a heavy vehicle over long distances also requires the driver to obey mandatory rest times at designated rest stops; two drivers may be needed on long voyages.

Several stretches of the National/European road network in Northern Norway also have accessibility and predictability challenges. Conditions vary but much of the infrastructure can no longer fulfil its function without significant maintenance, major or minor improvements, or new investments.¹⁹ Due to these challenges, much of the freight transport between Northern Norway (north of Tysfjord) and Southern Norway takes place via Sweden and Finland.²⁰

¹² Konseptvalgutredning (KVU), see note 5.

¹³ Konseptvalgutredning (KVU), see note 5.

¹⁴ Informant LS12 (2022).

¹⁵ Informant CO21 (2023).

¹⁶ The mountain pass over Båtsfjordfjellet (between Båtsfjord and Berlevåg) has been closed to 65 times every winter due to snowstorms.

¹⁷ Informant CO1 (2023).

¹⁸ Informant CO21 (2023); Informant PA19 (2023).

¹⁹ Konseptvalgutredning (KVU), see note 5.

²⁰ Konseptvalgutredning (KVU), see note 5.

If the road network in Northern Norway is to continue to be the main transport mode for seafood, then there is a pressing need for capacity and quality upgrades of the whole road network. This is necessary to support the expected growth in seafood exports and to provide robust logistical alternatives.²¹ The current condition of the road network is considered vulnerable and a bottleneck for future business development in Northern Norway,²² as already discussed in a report published more than 15 years ago.²³ However, road construction projects in Norway are typically known to take a long time to complete.²⁴ This is partly due to very hard bedrock and elevated and rocky topography, which makes construction difficult. Detailed environmental impact assessments must also be performed before any work is begun. By the time new road construction or maintenance work is completed, regional logistics will already have been greatly impacted because of reduced or redirected traffic flows or even the closure of the road.²⁵ The construction or upgrading of new infrastructure for the National/European road network is the responsibility of the central government, whereas the maintenance of county roads is the responsibility of the regional county municipalities.

3.4 Railway transportation

Railway capacity in Northern Norway is limited, with existing tracks struggling to accommodate increasing freight traffic. This raises questions about the railway system's ability to handle future demand.²⁶ There are only two railway lines in Northern Norway, both single track except for a limited number of crossing-loops. The Nordland Railway (Nordlandbanen) extends for 729 km from Trondheim through Mosjøen, Mo i Rana, Fauske to Bodø, with about 430 km of the track in Nordland. The Port District of Salten (Sørfold) is only 15 km away from Fauske Railway Station via road E6. The other line is the Ofoten Railway, extending for 42 km from the port of Narvik to the national border with Sweden and onwards to Kiruna (this is called the Ore Line in Sweden). From Kiruna the line extends further into Sweden to Boden/Luleå and from there to southern Sweden. The Narvik to Oslo section running through Sweden is 1,960 km long, and the travel time is around 26 to 30 hours.²⁷ The Ofoten Railway runs on electric power, while the Nordland Railway is diesel-powered (*Figure 2*).

²¹ Informant PA21 (2023).

²² Informant LS23 (2023); Informant PA13 (2022); Informant PA19 (2023); Informant PA21(2023); Informant CO21 (2023); Informant EU15 (2022).

²³ Dag Slotfeldt-Ellingsen and Karstein P. L. Sandvik, *Industriutvikling i Nord-Norge frem mot 2030 - En situasjons- og fremtidsstudie utført av SINTEF og NORUT*. (2009), <https://www.sintef.no/globalassets/upload/konsern/media/2009-08-21-industriutvikling-i-nord-norge-frem-mot-2030.pdf>.

²⁴ Informant PA21 (2023).

²⁵ Informant PA21 (2023); Informant CO21 (2023).

²⁶ Informant RL1 (2023).

²⁷ Narvik Havn, "Knutepunkt Narvik," updated 15.02.2023, 2022, accessed 06.11, 2025, <https://www.narvikhavn.no/knutepunkt-narvik/>.



Figure 2: The railway system in Norway.²⁸

Long distances between crossing-loops of sufficient length on the Nordland Railway limit its capacity for freight transport and the number of train departures per day. Currently the maximum length of freight trains on the line is 600 meters, requiring extended crossing-loops to manage the traffic effectively.²⁹ Frequent departures in regional train traffic also contribute to capacity challenges. Bottlenecks and limited slot capacity around the largest cities on the Nordland Railway (Trondheim and Bodø) also reduce the potential for increasing the route offer for long-distance trains. These capacity constraints affect freight transport in particular and are a growing problem.³⁰ The only solutions would be to build several crossing-loops or a

²⁸ Visitnorway.com, "Top 10 Norwegian train travel tips," updated n.d., n.d., accessed 07.11, 2025, <https://www.visitnorway.com/plan-your-trip/travel-tips-a-z/10-norwegian-train-travel-tips/>.

²⁹ Informant RL1 (2023); Informant RL2 (2023).

³⁰ Konseptvalgutredning (KVU), see note 5.

double train track. There is also a pressing need for a double track on the Ofoten Railway.³¹ In addition to limited capacity, regularity has been pointed out as a challenge for the railways. This is particularly applicable to the Ofoten Railway, but any improvement will require cooperation with Sweden for the entire section between Narvik and southern Sweden.³² The current track requires extensive annual maintenance and reinforcement due to heavy loads (iron ore) and several curves on the track that have already led to derailments.³³

The railways compete with road transport for reliability, quality, price and flexibility. But the current capacity limitations of the railways put additional pressure on the road transportation system, increasing road wear-and-tear, accidents, and atmospheric emissions. Investments in new railway lines would improve capacity, connectivity, and provide intermodal transport solutions. However, previous feasibility studies, costs estimates and discussions³⁴ suggest this is likely to be at best only a long-term solution, and it is not currently envisaged in the Norwegian Transport Plan (NTP).³⁵ What is included are new double tracks and crossing-loops for the two existing railways, improving their carrying capacity, and the upgrading of selected tunnel sections and railway freight terminals. As mentioned earlier, elevated topography makes the construction of railway tracks difficult and expensive, requiring the construction of railway tunnels and bridges even for relatively short distances. Electrification of the Nordland Railway is important from an environmental perspective.³⁶ About 30% of the volume of seafood produced in Northern Norway in 2021 was transported south along the two railways in refrigerated containers.³⁷ Seafood exports from Nordland are predominantly transported by rail. On their return voyages back north, the trains transport various refrigerated consumer goods (groceries, fruits and vegetables) leading to a more balanced pattern of north-south trade. Nearly half (47%) of the grocery items transported into Northern Norway in 2021 came by train.

3.5 Air transportation

Northern Norway is one of the world's most demanding regions for air traffic. There are 27 airports (including Svalbard) of which nine have long runways (2,000 m or longer).³⁸ There are eight short-haul airports in Nordland, nine in Troms/Finnmark and one short runway in Ny-Ålesund on Svalbard and helipad on Værøy. A new airport in Mo i Rana is under construction and expected to open in 2027. In Bodø, the plan is to move the existing airport to a different location to free up land for urban development; the new airport is expected to open

³¹ Hilde-Gunn Bye and Birgitte Annie Hansen, "Ofoten Railway Line Needs a Double Track by 2035," [highnorthnews.com](https://www.highnorthnews.com/en/ofoten-railway-line-needs-double-track-2035), updated 11.01.2024, 2024, accessed 07.11, 2025, <https://www.highnorthnews.com/en/ofoten-railway-line-needs-double-track-2035>.

³² Konseptvalgutredning (KVU), see note 5.

³³ Norwegian Safety Investigation Authority, "Report on derailment at Straumsnes station Ofotbanen on 9 December 2021," [nsia.no](https://nsia.no/Rail/Published-reports/2022-04), 2022, accessed 07.11, 2025, <https://nsia.no/Rail/Published-reports/2022-04>.

³⁴ Possible new railway linking Fauske-Narvik-Tromsø; and another new railway linking Kirkenes and Rovaniemi in Finland.

³⁵ Konseptvalgutredning (KVU), see note 5; Regjeringen, National Transport Plan 2022–2033, Meld. St. 20 (2020–2021) Melding til Stortinget, (2021); Informant RL2 (2023); Informant LS23 (2023).

³⁶ Informant LS15 (2023); Informant RL1 (2023); Informant CO21 (2023).

³⁷ Konseptvalgutredning (KVU), see note 5.

³⁸ Airports in Northern Norway with runways of 2,000 m or longer are in: Bodø, Tromsø, Alta, Bardufoss, Andøya, Harstad/Narvik, Kirkenes, Lakselv and Svalbard.

in 2029/2030. Excluding cruise tourism, air transport is the key means of passenger transport to and from Northern Norway.

Winter weather conditions and mountainous topography require the highest competence from airlines and airports. These flight services provide important connections between northern towns and the capital Oslo and are highly valued by northerners, particularly for longer passenger journeys, facilitating both social and business development. It is an important principle in Norway that everyone should have access to good emergency services and healthcare, regardless of where they live. Air transport strengthens the preparedness and security of the local population. Good flight connections also increase the attractiveness of remote locations as places of current and future settlement and allow skilled workforces to reach industrial facilities in the High North.³⁹

However, air transport faces challenges due to harsh weather conditions during the winter, which often result in flight cancellations, and the high prices and limited flight offerings that result from the concession system of the regional airport network.⁴⁰ Many of those who live in Northern Norway must change planes one or more times to reach their destination.⁴¹ This can lead to long waiting times or the need to find extra accommodation. When the journey consists of several flights, the total ticket price increases considerably.

Air transport is an option for high-value freight but comes with a high cost per weight. Finding enough freight volume to make flights worthwhile can be an issue for smaller airports, although more companies are combining cargo to increase the numbers of flights scheduled.⁴² Air freight hubs could be considered for high profit industries such as the fresh fish industry. The airports of Narvik, Tromsø and Bodø are the busiest airports for air freight, while Tromsø Airport has the greatest number of air passengers. The low number of inhabitants in Northern Norway means a low passenger base per airport. The costs of operating a flight route vary with flight distance and with the size of the aeroplane.

In general, it is more expensive to operate per kilometre on short routes, and small planes mean a higher cost per seat than larger ones. There are many small airports in Northern Norway and therefore many short routes served by small aircraft. In Southern Norway, on the other hand, there are fewer airports and travel times to the airports are often longer, which in return provides a greater market basis for each airport. This allows a better route offer and lower prices. But could a reduction in the number of regional airports in Northern Norway improve the air transport services, which are currently characterized by expensive fares, high operating costs, and a movement of passengers from smaller to larger airports? A study from Helgeland in Nordland County discusses the benefits and drawbacks of such a transition.⁴³

³⁹ Informant LS1 (2022); Informant CO9 (2022).

⁴⁰ Informant BN14 (2022).

⁴¹ Average 25% of air passengers living in Northern Norway must change planes; this figure is 50% for those living in Lofoten/Vesterålen, Helgeland and in Finnmark (based on Avinor's travel survey, 2019).

⁴² Informant LS1 (2022); Informant PA7 (2022).

⁴³ Terje Andreas Mathisen and Gisle Solvoll, "Reconsidering the regional airport network in Norway," *European Transport Research Review* 4, no. 1 (2012).

3.6 Multimodal transport connections

Intermodal facilities play a crucial role in efficient cargo flow, as intermodal transport is typically more flexible, less costly and less polluting,⁴⁴ but freight terminals must be further developed to accommodate more traffic and to make transshipment more efficient. Ship-and-truck intermodal connections are the most common in Northern Norway. Several seaports in Nordland have access to the Nordland Railway (Helgeland, Mo i Rana, Fauske, and Bodø) or the Ofoten Railway (Narvik), but despite favourable connections the seaports lack facilities for efficient ship-and-rail transfer. Freight terminals for direct rail-and-truck transshipment also need to be developed. Narvik's freight terminal was recently expanded to improve rail-and-truck transshipment.⁴⁵ There are also opportunities to improve direct ship-and-rail transshipment in Narvik. Finally, some ports in Finnmark rely only on ship-to-ship transport connections.

3.7 Ferry connections

Northern Norway has over 40 ferry connections. In several coastal areas and islands ferries are the only connection to the main road network. Some of the ferry routes are an integral part of the National/European road transportation system, as is the case on E6 crossing the Tysfjord. In the winter the ferry departs once or twice per hour during the day, and every two hours at night. Local businesses have criticized the available ferry capacity and transport frequency at other ferry connections, stating their uncertainty about both outgoing and incoming transport.⁴⁶ Other ferry operators close completely or partially at night, forcing businesses to adapt their production accordingly, and by so doing limit their overall production capabilities. Another complaint is that the ferries are expensive and require advance payment, but at the same time provide very limited on-board services. The ferry operators need to offer more reliable and frequent routes with timetables drawn up according to the needs of local businesses and the population, including the need for connections to other means of transport. Such revised schedules would help to reduce the number of bottlenecks leading to delays. Bridges and underwater tunnels have replaced many earlier ferry routes.

3.8 National border-crossings

Northern Norway has 12 border crossing stations with neighbouring countries. Seamless cross-border connectivity between Norway, Sweden and Finland is a good asset of the current transportation system. This cross-border connectivity allows the transport of industrial goods, consumer goods, and passengers between the three countries with relative efficiency.⁴⁷ The border crossings are mainly road connections, but also by rail through the port of Narvik to Kiruna in Sweden and onwards to other ports in the Bay of Bothnia and Southern

⁴⁴ Arnab Bhattacharya et al., "An intermodal freight transport system for optimal supply chain logistics," *Transportation Research Part C: Emerging Technologies* 38 (2014).

⁴⁵ Njål Svingheim, "Narvik godsterminal øker kapasiteten," *jernbanedirektoratet.no*, updated 28.11.2023, 2022, accessed 07.11. 2025, <https://www.jernbanedirektoratet.no/jernbanemagasinet/narvik-godsterminal-okerkapasiteten/>.

⁴⁶ Konseptvalgutredning (KVU), see note 5.

⁴⁷ Informant PA6 (2022); Informant LS2 (2022).

Scandinavia. One of the challenges of the current border crossings is that only two customs stations (E45 Kivilompolo in Finnmark and E8 Kilpisjärvi in Troms) are open 24 hours a day; all the others close at night. This unnecessarily restricts both the volume and timing of transport of goods (e.g., fresh fish) to markets further south.⁴⁸ The closure of the border crossing on E10 Bjørnfjell is problematic. Although Finnmark is well-positioned for railway connections to Russia and the Trans-Siberian Railway, allowing the possibility of reaching markets in Asia, current geopolitical challenges make this unrealistic.⁴⁹

4. Norway's Transportation Policies & Priorities

The development of Northern Norway's transportation system is to a great extent guided by a national policies and strategic priorities. This section reviews the key governmental objectives influencing investment, policymaking, and the future direction of transport in the region. It discusses the financial allocations outlined in the National Transport Plan, the long-standing but challenging ambition to shift freight from road to more sustainable sea and rail alternatives, and Norway's commitment to pioneering green shipping. Furthermore, this section also reviews the previous Concept Selection Investigation (KVU) study for Northern Norway and points out why this investigation failed to build up an efficient and connected logistics system in the region. The authors also consider the crucial perspective of indigenous rights in infrastructure development.

4.1 The National Transport Plan

The National Transport Plan 2025-2036⁵⁰ details how governmental funds should be allocated between different modes of transport during the next twelve-year period. Of the total available funds (NOK 1,208 billion) 45% will go to improving the national road network and 8% to transport-related development in urban areas. Strengthening railway transport in Norway will be assigned 41% of the allocated funds. Finally, improvements to the coastal maritime transport system (basic infrastructure and coastal management) will receive 3% of total funds. These funds are to be used to promote more efficient, safe and environmentally friendly maritime transport that facilitates business development and settlement in coastal areas while also contributing to national defence and emergency preparedness. The National Transport Plan 2025-2036 also includes financial support of 3% of state funds for the relocation of Bodø Airport and the construction of a new airport in Mo i Rana. The transport sector's share of overall expenditure in the state budget was almost 5% in 2024.

4.2 Modal shift of freight from road to sea and rail

Despite limited government funding for maritime transportation compared to other modes of transportation in both the current and previous versions of the National Transport Plan, a stated government policy goal during the last two decades has been to shift as much freight as

⁴⁸ Konseptvalgutredning (KVU), see note 5.

⁴⁹ Informant LS1 (2022).

⁵⁰ Regjeringen, National Transport Plan 2025–2036, Meld. St. 14 (2023–2024) Report to the Storting (white paper), (2024); Askildsen et al., Short Nasjonal transportplan 2025-2036 - Godstransport, eksport og industri.

feasible from road to sea or rail.⁵¹ The key objective has been to provide safer, more environmentally friendly, and more cost-effective means of transport.⁵² Shifting cargo from roads to sea or rail could play an important part in reducing congestion on the roads, improving safety by reducing the number of road accidents, reducing local pollution and wear and tear on the roads, and reducing the transport sector's greenhouse gas emissions by about 1.5 million tonnes of CO₂-eq over the period 2021-2030.⁵³ Transferring freight from road to sea or rail is therefore a sound climate and environmental measure, even if it is a shift to vessels using conventional fuel technology.⁵⁴

Government efforts continue to promote maritime transportation, but additional incentive schemes are needed. The EU set the same policy goals in a Transport White Paper⁵⁵ published in 2011. Consequently, the EU and Norway both plan to transfer 30% of freight requiring transport for more than 300 km from the road network to sea or rail by 2030, and 50% by 2050. For shorter distances, no other means of transport can compete with trailer trucks. In Norway this policy applies mainly to the domestic transport of general cargo (break bulk) and containerized cargo. But this long-awaited transfer of large volumes of domestic cargo from Norwegian roads to sea has not yet materialized.⁵⁶ On the contrary, road transport by heavy trailer trucks has been increasing much faster than sea transport for the last several years and is predicted to further increase in the years to come.

In 2024 39.0% of Norway's domestic freight was transported by sea, 4.5% by rail, and 56.4% by road (measured as total transport performance in tonnes-km). Unlike domestic trade, Norwegian foreign trade has mainly been serviced by ships. In 2023, 84% of foreign trade freight volume was transported by sea, while 13% was transported by road and 3% by rail.⁵⁷ But foreign trade by trailer trucks has also rapidly increased during the last ten years, both in terms of imports (about 22% measured by weight⁵⁸) and exports, though the volumes are much lower than those transported by sea. This road transport mainly passes through border crossings with Sweden. In the same time period, imports by rail have increased by only 1%.

It has been suggested that if more of the imports Norway receives from the other Nordic countries and Northern Europe arrived by ship or rail, then it would be more likely that continued domestic transport of these goods within Norway would also be by ship or rail.⁵⁹

⁵¹ Highlighted first in: Jernbaneverket et al., *Nasjonal transportplan 2006 - 2015, Strategiske utredninger*, (2004); Hans Silborn, "Freight transport policy and measures in Norway" (PIARC (World Road Association) meeting and seminar, Ouagadougou, Burkina Faso, 13–15 June 2005).

⁵² Regjeringen, *The Government's action plan for green shipping*, (regjeringen.no, 2019).

⁵³ Miljø-direktoratet, "Klimatiltak - redusere utslipp nasjonalt," updated n.d., 2020, accessed 07.11, 2025, <https://www.miljodirektoratet.no/ansvarsomrader/klima/klimatiltak/>.

⁵⁴ Regjeringen, *Short The Government's action plan for green shipping*.

⁵⁵ European-Commission, *Short WHITE PAPER Roadmap to a single European transport area towards a competitive and resource efficient transport system*.

⁵⁶ Riksrevisjonen, *Riksrevisjonens undersøkelse av overføring av godstransport fra vei til sjø og bane*, Dokument 3:7 (2017-2018) (riksrevisjonen.no, 2018).

⁵⁷ Jardar Andersen, "11403: Domestic goods transport, by mode of transport 2010 - 2024," ed. Statistics Norway (2025). <https://www.ssb.no/en/statbank/table/11403/>; Bjørg Langset Flotve, *Transport volumes in Norway 1946–2023* (2024), <https://www.toi.no/publications/transport-volumes-in-norway-1946-2023-article39150-29.html>.

⁵⁸ Christian S Mjøsund et al., "Nordiske virkemidler for overføring av godstransport fra veg til sjø og bane," *TØI-rapport 1706* (2019).

⁵⁹ Mjøsund et al., "Nordiske virkemidler for overføring av godstransport fra veg til sjø og bane."

This could mean that regional transport infrastructure development in the other Nordic countries can impact the mode of transport in and out of Norway. The issue then becomes which measures and incentive schemes in the Nordic countries are most effective in strengthening maritime transportation and Nordic transport infrastructure development. The initial objective of the Joint Barents Transport Plan (JBTP, latest version 2019⁶⁰) was to develop a more efficient transport system within the whole Barents Region with improved internal connectivity and external connections to world markets. These plans quickly changed as a result of Russia's invasion of Ukraine in February 2022. The new security picture in the North, with Finland and Sweden becoming members of NATO, redirected the focus of the JBTP towards strengthening cross-border transport infrastructure within and between Northern Norway, Northern Sweden and Northern Finland.

4.3 Norway's commitment to green shipping

Maritime transport and fisheries account for about 8.6% of Norwegian greenhouse gas emissions, and the Norwegian government wants to reduce this by 50% by 2030.⁶¹ Several reports and documents have outlined the Norwegian government's policies and priorities for reducing greenhouse gas emissions from the maritime sector. The government's climate policy was presented in the Climate Action Plan 2021-2030.⁶² The overall emission cuts outlined in the Action Plan are meant to reduce greenhouse gas emissions in Norway by 50% by 2030, compared with a 2005 baseline. Emissions from domestic shipping and fishing vessels are also included in Norway's commitments under the Paris Agreement.⁶³ The overall long-term target is a zero-carbon society (i.e. carbon-neutrality) in Norway by 2050 (the EU's target is a 55% reduction of greenhouse gas emissions by 2030 relative to 1990, and net zero by 2050). While the 2050 target is sufficiently far in the future for carbon neutrality to be a remote possibility, the target of emission reductions of 50% by 2030 is only four years away; this is a very pressing deadline given currently available zero-emission fuels and technologies, high electricity prices, and ongoing global geopolitical tensions.

As transportation accounts for almost a third of Norway's greenhouse gas emissions, much emphasis has been placed on reducing emissions from that sector. The government's Action Plan for Green Shipping⁶⁴ describes its policy for cutting domestic greenhouse gas emissions from shipping, which includes changes to regulatory measures and requirements and economic instruments such as taxation of greenhouse emissions, with funding instruments such as Enova and low-risk innovation loan financing from private banks and equity. In cooperation with municipalities and port authorities, the government also aims for Norwegian ports, wherever feasible, to be emission-free by 2030. It is vital for the development of a

⁶⁰ The-Barents-Euro-Arctic-Council, *Joint Barents Transport Plan* (2019), <https://www.vegvesen.no/globalassets/nyheter/jbtp2019-main-report-190910.pdf>.

⁶¹ PwC, "Nord-Norge er med på å drive utviklingen innen hydrogen og ammoniakk," kbnn, updated n.d., 2022, accessed 07.11, 2025, <https://www.kbnn.no/artikkel/nord-norge-er-med-pa-a-drive-utviklingen-innen-hydrogen-og-ammoniakk>.

⁶² Regjeringen, Norway's Climate Action Plan 2021-2030, Meld. St. 13 (2020–2021) Report to the Storting (white paper), (2021).

⁶³ United Nations, "The Paris Agreement," (treaties.un.org, 2015). https://treaties.un.org/pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXVII-7-d&chapter=27&clang=_en.

⁶⁴ Regjeringen, Short The Government's action plan for green shipping.

green shipping sector that seaports provide onshore power, charging facilities, and adequate bunkering services for low-and zero-emission fuels.

To further show Norway's commitment to green shipping, the government co-sponsored the Green Shipping Challenge⁶⁵ with the United States at COP26 and was one of the initiators of the Clydebank Declaration⁶⁶ on global green shipping corridors. The commitment to reduce emissions from shipping by 50% by 2030 requires Norway to commit to a fleet of 700 low-emission and 400 zero-emission ships (owned by Norwegian shipping companies); establish a green shipping corridor along the Norwegian coast; and provide zero-emission fuels, bunkering, and recharging capabilities at seaports.

The Norwegian government is ready to use several policy measures to encourage the required technological change, including taxes, incentives, subsidies, bans, and government procurement measures. But these policy goals need to be executed in close cooperation with shipping companies, which will take a big financial hit by constructing new fleets of vessels running on very costly low-or zero emission fuels, with much less energy density than conventional fuels.

The new technology is still very immature and widespread use will not be possible for some time;⁶⁷ even future supply is likely to be limited.⁶⁸ But binding agreements have already been made to drastically reduce greenhouse gas emissions in the Norwegian maritime sector. To advance the Norwegian government's maritime strategies and plans, several private companies together with governmental organizations established a public-private partnership, the Green Shipping Program,⁶⁹ financed partly by public allocations from the state budget but mainly by the private members themselves.

4.4 Opportunities for future growth in the maritime industry

The Norway's 2007 maritime strategy stated that it should be a world-leading maritime nation, providing the most innovative and environmentally friendly solutions.⁷⁰ The maritime industry includes the shipping industry, the shipbuilding industry, and service and equipment suppliers for all types of vessels and offshore activities. Norway is banking on the drive towards a low-emission society by 2050 also providing great opportunities for future growth in the maritime industry and opportunities for value creation. The International Maritime Organization (IMO) has agreed to reduce greenhouse gas emissions in international shipping by 20% by 2030 and 70% by 2040, achieving net-zero by 2050 (compared to 2008 levels). This is in addition to new requirements for improved energy efficiency in the design of new

⁶⁵ Næringslivets-Hovedorganisasjon, "Green Shipping Challenge," nho.no, 2022, accessed 07.11, 2025, <https://www.nho.no/tema/energi-miljo-og-klima/artikler/2023/green-shipping-challenge/>.

⁶⁶ COP26: Clydebank Declaration for green shipping corridors, (Glasgow 2023).

⁶⁷ Dorthe Alida Slotvik et al., *Nordic Roadmap. Future Fuels for Shipping. Insight on Green Shipping Corridors – From policy ambitions to realization* (2022), https://futurefuelsnordic.com/wp-content/uploads/2022/11/Green-Corridor-Paper_Nordic-Roadmap.pdf.

⁶⁸ DNV, *Strategies for meeting the earliest decarbonization targets* (2024), <https://www.dnv.com/expert-story/maritime-impact/strategies-for-meeting-upcoming-decarbonization-targets/>.

⁶⁹ "Green Shipping Program," updated 29.10.2024, 2016, accessed 07.11, 2025, <https://greenshippingprogramme.com/>.

⁷⁰ Regjeringen, *Steady as she goes - The Government's strategy for environmentally friendly growth in maritime industry*, (2007).

ships, and also in ship operations. This will lead to significant global demand for low-emission technologies to equip the global shipping fleet. Norway is a leader in the global maritime sector,⁷¹ and the government wants to make full use of the opportunities arising from the greening of the economy.⁷²

But the pace of change must increase substantially to achieve climate and green shipping ambitions, with 93% of the global fleet still running on conventional fuels.⁷³ The maritime industry in Norway must be ready to develop, design and construct some of the specialized zero-emission vessels of the future. Norwegian companies are already supplying zero- and low-emission technologies to the world market. Importantly, Norway must find cost effective ways of carrying out the transformation and at the same time ensure that it provides growth opportunities for the Norwegian economy by boosting Norwegian exports of green solutions. This is needed to counteract the high costs of the energy transition and remain competitive. The same necessity for continued economic growth during the energy transition was recently echoed in the Draghi Report⁷⁴ to the European Commission.

4.5 KVV transport solutions for Northern Norway⁷⁵

In 2022 the Norwegian Ministry of Transport asked several governmental transport agencies⁷⁶ to jointly investigate possible transport solutions for Northern Norway.⁷⁷ The transport solutions were meant to address several needs identified at national and regional scales. At the national level, suggested transport solutions in Northern Norway were expected to facilitate the utilization of natural resources, ensure public safety, security (including security of supply), and reinforce civilian-military preparedness. Northern municipalities, on the other hand, put more emphasis on better transport connections to neighbouring communities to gain access to a larger labour market and various public and private services.

The KVV study identified several challenges along with possible solutions that could strengthen the transportation system in Northern Norway. Surprisingly, the study decided from the start to exclude analysis of the maritime transportation system, focusing instead only on land-based transportation by road and rail.⁷⁸

The study suggested the construction of a new North Norway Railway (Nord-Norgebane⁷⁹) between Fauske, Narvik and Tromsø. But the study showed that construction of the railway would require the construction of many railway tunnels and railway bridges through

⁷¹ International Trade Administration, "Norway Country Commercial Guide - Shipping, Maritime Equipment & Services," trade.gov, updated 20.01.2024, 2024, accessed 07.11, 2025, <https://www.trade.gov/country-commercial-guides/norway-shipping-maritime-equipment-services>.

⁷² Regjeringen, Short The Government's Action Plan for Green Shipping.

⁷³ DNV, "Decarbonizing maritime: Overcoming challenges with innovation and ingenuity.," updated n.d., 2024, accessed 07.11, 2025, <https://www.dnv.com/expert-story/maritime-impact/decarbonizing-maritime-overcoming-challenges-with-innovation-and-ingenuity/>.

⁷⁴ Mario Draghi, The Draghi report: A competitiveness strategy for Europe, Luxembourg: Publications Office of the European Union, 2025.

⁷⁵ KVV means in English "Concept Selection Investigation".

⁷⁶ Transport agencies include: Statens Vegvesen, Jernbane-direktoratet, Kystverket, Avinor.

⁷⁷ Konseptvalgutredning (KVV), see note 5.

⁷⁸ Appendix 48 in the main KVV report.; Statens-Vegvesen et al., Konseptvalgutredning (KVV, see note 5.

⁷⁹ Konseptvalgutredning (KVV), see note 5.

mountainous terrain and come with a high price tag (estimated NOK 153 billion⁸⁰). Upgrades of both the Nordland and Ofoten Railways were also recommended. New or upgraded road alternatives on the E6 between Fauske and Tromsø were analysed, as was a new ferry-free road (bridge or tunnel) across the Tysfjord. The KVVU study did not suggest any new transport solutions for the remainder of Northern Norway, namely Nord-Troms, Finnmark and the coastal regions. Several upgrades of National/European and county roads were suggested, with cost estimates to be prioritized through the National Transport Plan (NTP) process.

4.6 Indigenous peoples' perspective and rights in Northern Norway

Of the approximately 100,000 Sami people living across Northern Norway, Northern Sweden, Northern Finland, and on Russia's Kola Peninsula, only around 10,000 continue the traditional practice of reindeer herding, fishing and gathering. Reindeer meat is a vital part of Sami diet and for some families their only source of income. Norway has ratified ILO Convention 169, a UN agreement guaranteeing indigenous groups like Sami a voice in matters affecting their own culture and livelihood. However, the Sami feel that consultations often amount to simply being provided with information, followed by negotiations on mitigating the harm of pre-determined projects, leaving them to salvage the best possible outcome from what they perceive as inevitable decisions.⁸¹

Herders have faced increasing pressure from various competing interests encroaching on their traditional grazing land, with infrastructure projects such as roads, railways, high-voltage power lines, dams, windmill farms, and mining operations all contributing to the loss of grazing territory.⁸² The construction of windmill farms⁸³ and railways⁸⁴ has been at the centre of the conflict. The Sami have proposed establishing designated zones where windmill farm development is prohibited to provide herders with greater certainty about the future of their livelihood. During the past century, the cumulative impacts of infrastructure development have resulted in a 70% reduction of undisturbed reindeer habitat in Norway, significantly

⁸⁰ Konseptvalgutredning (KVVU), see note 5.

⁸¹ Kevin McGwin, "Wind energy conflicts show how Arctic renewable energy projects can founder", arctictoday.com, updated 17.07.2025, 2020, accessed 07.11, 2025, <https://www.arctictoday.com/wind-energy-conflicts-show-how-arctic-renewable-energy-projects-can-founder/>.

⁸² Erik Engelen, Iulie Aslaksen, and Jørn Kristian Undelstvedt, "Utbygging får konsekvenser for reinbeiteområder," ssb.no, updated n.d., 2020, accessed 07.11, 2025, <https://www.ssb.no/natur-og-miljo/artikler-og-publikasjoner/utbygging-far-konsekvenser-for-reinbeiteomrader>.

⁸³ Atle Staalesen, "Norway outlines powerful electrification of its North," thebarentsobserver.com, updated 08.08.2023, 2023, accessed 07.11, 2025, <https://www.thebarentsobserver.com/industry-and-energy/norway-outlines-powerful-electrification-of-its-north/140821>; thebarentsobserver.com, "Sami Parliament takes state of Norway to court," updated 26.06.2024, 2024, accessed 07.11, 2025,

<https://www.thebarentsobserver.com/news/sami-parliament-takes-state-of-norway-to-court/109859>; Orlando Jenkinson, "Exclusive: Sami council leader opposes planned 800 MW wind farm in Norwegian Arctic", windpowermonthly.com, updated n.d., 2023, accessed 07.11, 2025,

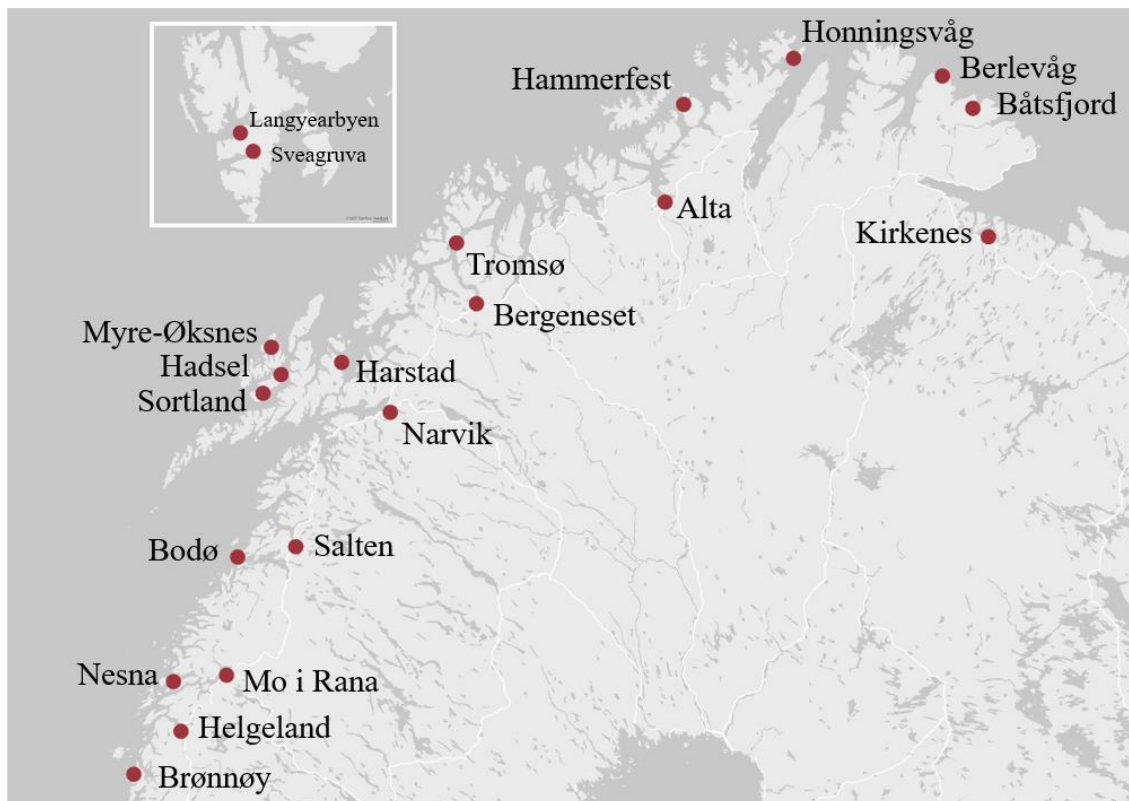
<https://www.windpowermonthly.com/article/1836922/exclusive-sami-council-leader-opposes-planned-800mw-wind-farm-norwegian-arctic>; Shannon McKeown-Gilmore, "Norway ends dispute with Sami people over construction of wind farm on indigenous land", jurist.org, updated n.d., 2024, accessed 07.11, 2025, <https://www.jurist.org/news/2024/03/norway-ends-dispute-with-sami-people-over-construction-of-wind-farm-on-indigenous-land/>.

⁸⁴ Saami-Council, "Arctic Railway plans are an ongoing threat to Sámi reindeer herding," updated n.d., 2021, accessed 07.11, 2025, <https://www.saamicouncil.net/news-archive/arctic-railway-plans-are-an-ongoing-threat-to-smi-reindeer-herding>.

altering traditional herding practices by disrupting reindeer migration routes.⁸⁵ Future infrastructure development in Northern Norway must be designed in a way that it does not weaken sustainable reindeer husbandry and indigenous peoples' right to continue their cultural practices.⁸⁶

5. *Transport Services Provided by the Shipping Fleet*

The Norwegian Coastal Administration (NCA) provided statistical data on shipping activities connected to 21 seaports in Northern Norway and Svalbard for the year 2021 (*Figure 3*). On the mainland, six are in Finnmark, three in Troms, and 10 in Nordland. Ten of the ports are classified as major ports by Statistics Norway.⁸⁷ Only vessels transporting cargo (excluding fishing vessels) were selected for further analysis. This included offshore supply vessels and ferry/passenger ro-ro vessels.⁸⁸ Another selection criterion was the length of the vessels. Only vessels longer than 24 metres were included.



⁸⁵ Scott Wallace, "Dodging Wind Farms and Bullets in the Arctic, National Geographic ", [nationalgeographic.com](https://www.nationalgeographic.com/history/article/160301-arctic-sami-norway-reindeer), updated n.d., 2016, accessed 07.11, 2025, <https://www.nationalgeographic.com/history/article/160301-arctic-sami-norway-reindeer>.

⁸⁶ KVV Interim Report ILKA Reindrift highlights challenges and opportunities in relation to reindeer husbandry during the construction of new roads and railways. Statens-vegvesen et al., *Delrapport Reindrift – virkninger av nye veg- og jernbane- korridorer på strekningen Fauske-Tromsø* (2023).

⁸⁷ SSB, "Classification of port district," (2018). <https://www.ssb.no/en/klasse/klasseifikasjoner/11>.

⁸⁸ More information on the vessel types that were included in the study or excluded from it can be found in the Data & Methods section.

Figure 3: The 21 key ports in Northern Norway and Svalbard analysed in this study.

The selected seaports are referred to as “key ports”. The statistical dataset from NCA provided data on vessels departing from one key port and arriving at another key port; vessels departing from “other ports” and arriving at the key ports; and vessels departing from the key ports and arriving at other ports. Analysis identified 767 unique cargo vessels which provided transport services at the key ports in Northern Norway in 2021. A total of 16,211 voyages (port-to-port) directly connected the vessels to the 21 key seaports and 225 other ports located in Northern Norway (Figure 4). Beside ports in Northern Norway, the vessels calling at the key seaports in 2021 also called at 257 ports in other parts of Norway, as well as ports in more than 30 foreign countries.

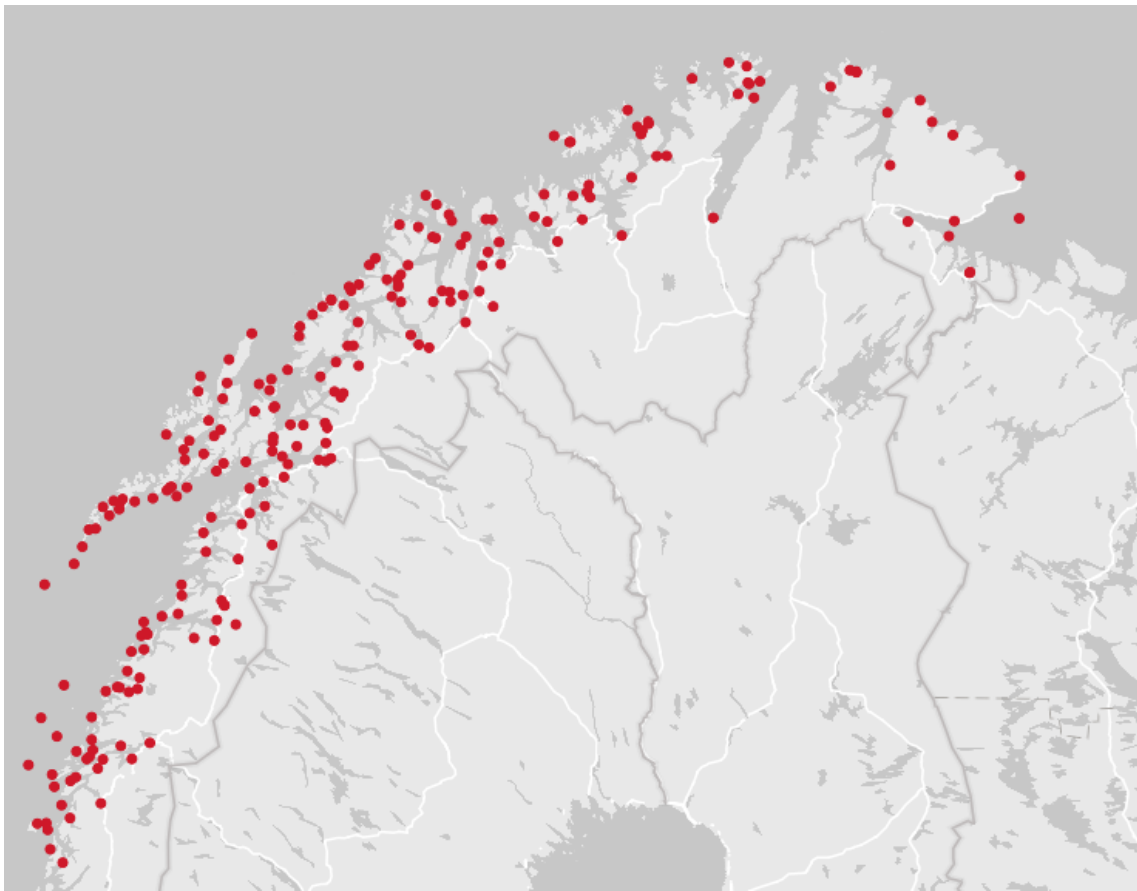


Figure 4: Locations of “other ports” in Northern Norway serving as arrival or destination ports for vessels calling at the key ports in 2021.

5.1 Domestic and international shipping

The vessels calling at the 21 key ports in Northern Norway in 2021 were categorized as involved in either domestic shipping or international shipping. Domestic shipping was defined as shipping between two of the key ports or between one of the key ports and another domestic port (domestic-domestic), whereas international shipping was defined as shipping between a key port and a foreign port (domestic-foreign or foreign-domestic). This

categorization made it possible to investigate several aspects of shipping traffic to and from Northern Norway's key ports.

Domestic shipping vessels commonly follow the main fairways for navigation in Norwegian internal waters, with larger vessels entering territorial waters 12 nautical miles further from the coastal baseline (see *Figure 1*).⁸⁹ But the most distinctive feature of domestic shipping is that most vessels remain within Norwegian internal waters (*Figure 5*). The vessels follow established navigational routes between numerous islands and along the coast. The majority of domestic shipping vessels are owned by Norwegian shipping companies. Voyages by larger vessels between the mainland and Svalbard, and between the mainland and offshore oil and gas platforms on the Norwegian continental shelf, are included in domestic shipping as special shipping activities.

Vessels involved in international shipping take part in the export of industrial products such as alloys, iron ore, industrial mineral products, and frozen seafood, primarily to the European market (*Figure 6*). In addition to Norwegian ports, these vessels make port calls at several foreign ports throughout the year. In 2021, the most common export destinations were with the Netherlands, Germany, Russia, United Kingdom, Sweden, Denmark, Spain, France, Poland, and Iceland. These larger international shipping vessels sail further from the coast within the Norwegian territorial sea zone. The largest bulk carriers and tankers are required to sail still further from the coast and obey the traffic separation scheme (TSS) in place along the Norwegian coastline (see *Figure 1*). Upon leaving the ports of Narvik and Mo i Rana, large bulk carriers proceed to the recommended TSS routes. Depending on the foreign destination port, the vessels may continue following the TSS or head west towards the United Kingdom or other countries. South of the port of Trondheim, the TSS runs close to the 12 nautical mile territorial sea zone of Norway. The use of TSS routes therefore less pronounced in the southern part of Norway than in the northern part.

⁸⁹ Kystverket, "Kart."

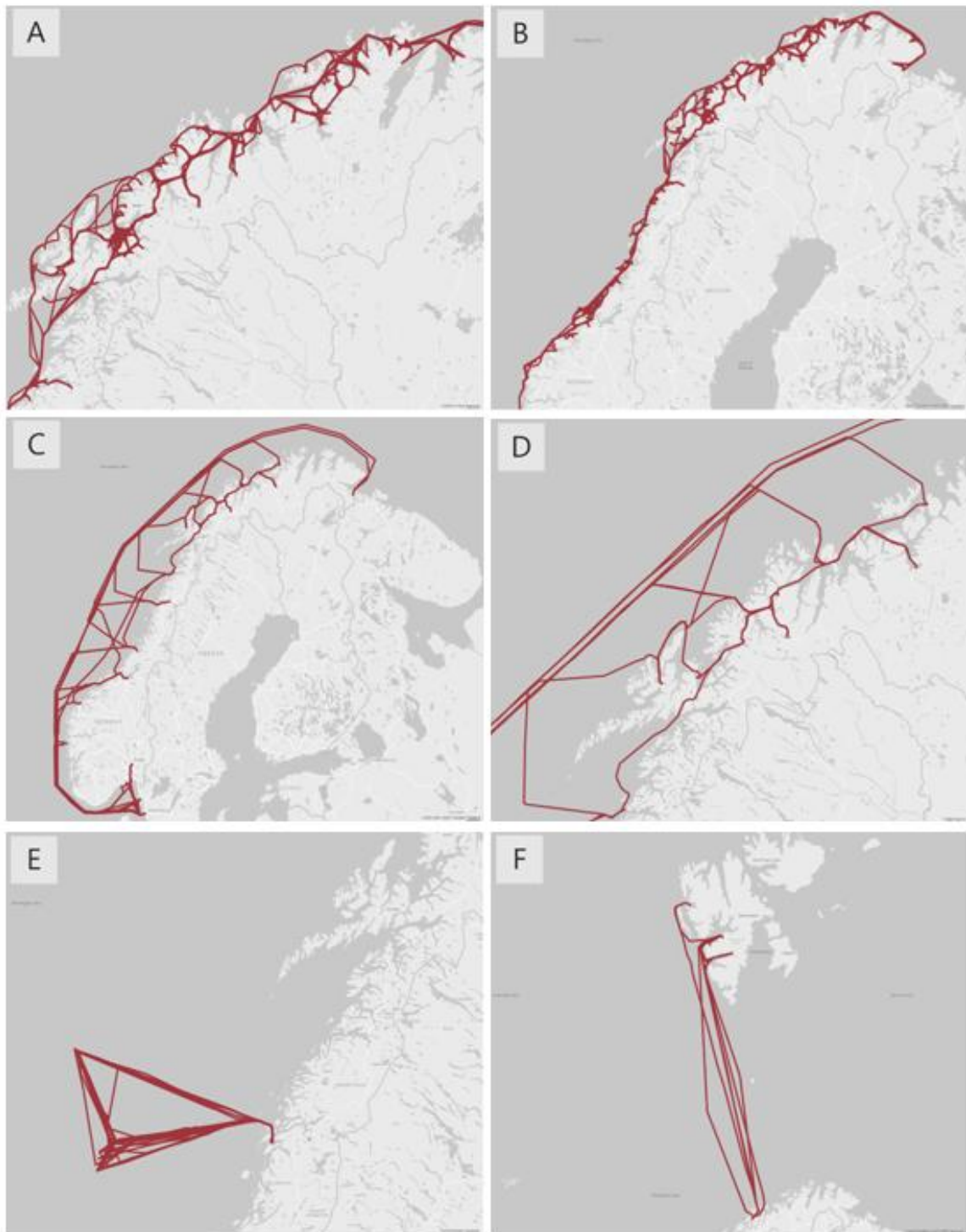


Figure 5: Examples of sailing tracks of vessels in domestic shipping in Northern Norway in 2021. A) General cargo vessel of 750 dwt, Ro-Ro vessel of 850 dwt, and tanker of 730 dwt. The vessels operated from January 1 to December 31. B) Same as map A but zoomed out. C) Tanker of 14,830 dwt operating from January 1 to December 31. D) Same as map C but zoomed out. E) Supply tug of 6,200 dwt operating from January 1 to March 26. F) General cargo vessel of 3,390 dwt operating July 1-31.

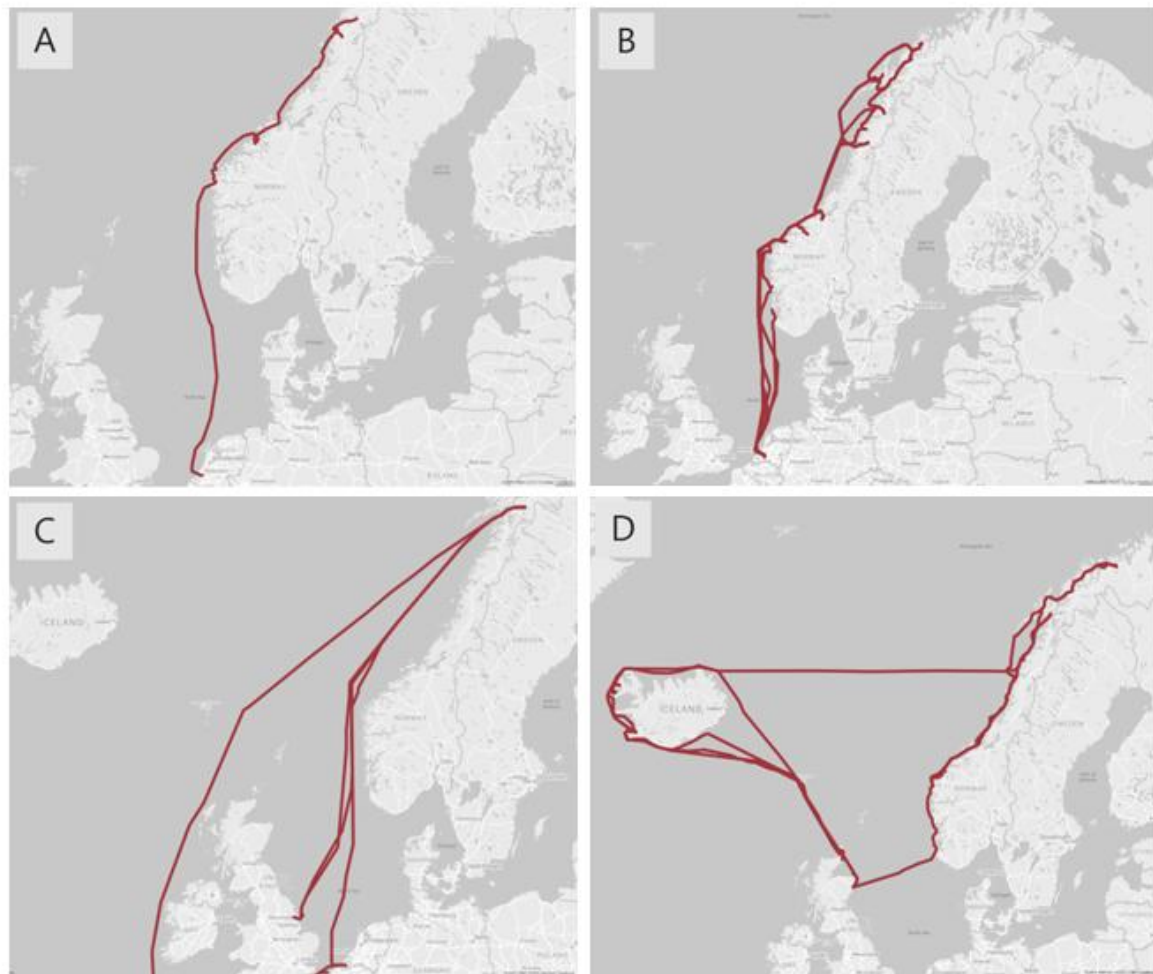


Figure 6: Examples of sailing tracks of vessels in international shipping in Northern Norway. A) General cargo vessel of 12,100 dwt operating September 12-21. B) Container vessel of 11,200 dwt operating January 1 to February 28. C) Dry bulk carrier of 178,929 dwt operating April 1 to May 10. D) Refrigerator of 2,400 dwt operating November 10 to December 31.

5.2 Vessel types and other vessel characteristics

A total of 767 unique vessels called at the key ports in Northern Norway in 2021, making a total of 16,211 port-to-port voyages, of which 89% were in domestic shipping (14,501). A total of 529 vessels took part in domestic shipping and 508 vessels in international shipping. This means that several vessels participated in both domestic and international voyages throughout the year. The average dwt for vessels in domestic shipping was 3,112 tons, whereas for international shipping it was 34,670 tons. Thus, the cargo capacity of vessels used in international shipping was about 11 times greater than those used in domestic shipping. Several vessels involved in domestic shipping were less than 1,000 dwt. In general, most vessels were in the range 1,000-5,000 dwt: 337 vessels with 10,666 voyages (Table 3).

General cargo vessels were the most common type of vessel in domestic shipping, followed by tankers, refrigerators, and ro-ro vessels. In international shipping, larger general cargo vessels and medium to very large dry bulk carriers were the most common vessel types and undertook the greatest number of voyages. A large majority (74%) of the dry bulk carriers

were only involved in international shipping (*Table 4*). The shipping fleet in Northern Norway is getting very old: 36% of the vessels were more than 20 years old. This is particularly true for general cargo vessels, with 48% of these vessels over 20 years old (*Table 5*). The ports in Northern Norway with the greatest number of yearly ship departures (or ship calls) were Tromsø, followed by Helgeland, Bodø, Mo i Rana, Harstad, and Hadsel (*Tables 6, 7 and 8*).

Table 3: Number of vessels, voyages and shipping companies based on DWT range in Northern Norway in 2021.

DWT categories	No. of vessels	No. of voyages	No. domestic voyages	No. international voyages	No. of shipping companies	Sum DWT	Avg. DWT
0 - 1 000	100	2 937	2 900	37	66	1 972 027	671
1 000 - 5 000	337	10 666	9 813	853	137	29 405 182	2 757
5 000 - 10 000	97	1362	1 137	225	51	9 339 880	6 857
10 000 - 15 000	42	669	581	88	20	8 441 452	12 618
15 000 - 50 000	18	140	66	74	13	3 594 367	25 674
50 000 - 100 000	92	231	4	227	68	16 457 159	71 243
100 000 - 170 000	14	40	0	40	10	5 076 290	126 907
170 000 - 215 000	67	166	0	166	47	30 128 604	181 498
TOTAL	767	16 211	14 501	1 710	368	104 414 961	6 441

Table 4: Numbers of different types of vessels based on DWT range in Northern Norway in 2021.

DWT categories	General cargo	Dry bulk Carrier	Tanker	Re-frigerator	Ro-Ro vessel	Palletised cargo	Container	Supply tug	Other	TOTAL
0 - 1 000	18	0	10	2	34	1	0	17	18	100
1 000 - 5 000	249	0	24	20	10	7	0	17	10	337
5 000 - 10 000	47	6	22	7	1	1	0	8	5	97
10 000 - 15 000	21	0	17	0	0	0	4	0	0	42
15 000 - 50 000	7	6	4	0	0	0	1	0	0	18
50 000 - 100 000	0	87	0	0	0	0	0	0	5	92
100 000 - 170 000	0	14	0	0	0	0	0	0	0	14
170 000 - 215 000	0	67	0	0	0	0	0	0	0	67
TOTAL	342	180	77	29	45	9	5	42	38	767

Table 5: Age distribution of different types of vessels in Northern Norway in 2021⁹⁰

Age groups (years)	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50+	TOTAL
General cargo	17	61	61	39	67	44	16	14	16	7	342
Bulk carrier	40	96	35	6	1	0	1	0	1	0	180
Tanker	10	8	19	17	5	7	3	1	4	3	77
Refrigerator	0	0	5	1	2	4	9	3	5	0	29
Ro-Ro vessel	1	6	0	10	7	7	1	1	8	4	45
Palletised cargo	0	0	0	1	1	2	2	0	3	0	9
Container	0	0	3	2	0	0	0	0	0	0	5
Supply tug	3	12	12	3	1	2	2	3	2	2	42
Other	14	3	3	2	5	1	0	3	4	3	38
TOTAL	85	186	138	81	89	67	34	25	43	19	767

Table 6: Number of vessel departures from ports in Northern Norway based on vessel type in 2021.

Departure port	No. of departures	General cargo	Dry bulk carrier	Tanker	Re-frigerator	Ro-Ro vessel	Palletised cargo	Container	Supply tug	Other
Longyearbyen	140	89	1	27	1	0	0	0	9	13
Sveagruva	46	43	0	2	0	1	0	0	0	0
Kirkenes	372	56	0	57	115	139	2	0	0	3
Båtsfjord	294	28	0	47	209	2	6	0	0	2
Berlevåg	39	18	0	6	9	1	1	0	0	4
Honningsvåg	236	76	1	47	59	26	10	0	0	17
Hammerfest	231	104	0	58	41	15	11	0	0	2
Alta	308	164	21	50	20	22	21	0	0	10
Bergneset	453	286	0	66	78	0	22	0	0	1
Tromsø	1,834	781	12	296	347	203	157	4	5	29
Narvik	430	175	220	12	4	14	2	1	0	2
Harstad	847	459	0	144	51	105	72	4	4	8
Sortland	464	142	0	18	191	88	22	1	0	2
Hadsel	625	437	0	99	4	6	18	59	1	1
Myre-Øksnes	408	289	0	92	20	0	7	0	0	0
Salten	142	96	5	2	0	0	8	28	1	2
Bodø	1,038	543	12	152	64	122	130	0	9	6
Mo i Rana	903	609	55	65	13	3	38	92	26	2
Nesna	89	50	0	0	13	8	10	0	8	0
Helgeland	1,239	442	2	121	44	42	75	0	453	60
Brønnøy	213	119	0	23	18	20	32	0	1	0
TOTAL	10,351	5,006	329	1,384	1,301	817	644	189	517	164

⁹⁰ Information on the age of vessels (the year of construction) was retrieved from the online Clarkson World Fleet Register.

Table 7a: Number of vessel departures from 21 key ports in Northern Norway to foreign ports in 2021

Key port	No. of international departures	No. of vessels	No. of ship companies (owners)	No. of different countries (routes)	Sum deadweight tons (dwt)	Average deadweight tons (dwt)
Longyearbyen	24	8	6	5	194,541	8,106
Sveagruva	0	0	0	0	0	0
Kirkenes	42	19	17	3	250,391	5,962
Båtsfjord	35	17	9	2	104,717	2,992
Berlevåg	0	0	0	0	0	0
Honningsvåg	10	7	7	8	682,592	68,259
Hammerfest	6	6	6	3	15,274	2,546
Alta	2	2	2	2	22,826	11,413
Bergneset	25	6	4	10	97,708	3,908
Tromsø	76	35	23	24	263,863	3,472
Narvik	211	153	100	28	24,000,993	113,749
Harstad	18	8	6	5	181,179	10,066
Sortland	6	5	3	3	82,136	13,689
Hadsel	39	19	8	6	112,159	2,876
Myre-Øksnes	10	9	3	8	43,893	4,389
Salten	11	10	4	5	38,255	3,478
Bodø	13	12	9	6	139,847	10,757
Mo i Rana	262	144	68	52	2,877,651	10,983
Nesna	1	1	1	1	9,278	9,278
Helgeland	93	51	29	34	814,511	8,758
Brønnøy	0	0	0	0	0	0
TOTAL	884	512	305		29,931,814	33,860

Table 7b: Number of vessels arriving at 21 key ports in Northern Norway from foreign ports in 2021

Key port	No. of international arrivals	No. of vessels	No. of ship companies (owners)	No. of different countries (routes)	Sum deadweight tons (dwt)	Average deadweight tons (dwt)
Longyearbyen	15	8	8	7	118,381	14,798
Sveagruva	1	1	1	1	3, 570	3, 570
Kirkenes	43	22	19	10	247,275	11,240
Båtsfjord	44	16	10	7	117,306	7,332
Berlevåg	3	3	2	1	21,195	7,065
Honningsvåg	8	4	4	6	580,707	14,518
Hammerfest	2	2	2	2	5,977	2,988
Alta	1	1	1	1	18,736	18,736
Bergneset	19	10	7	11	65,471	6,547
Tromsø	76	36	23	21	342, 926	9,526

Key port	No. of international arrivals	No. of vessels	No. of ship companies (owners)	No. of different countries (routes)	Sum deadweight tons (dwt)	Average deadweight tons (dwt)
Narvik	200	151	101	26	23,792,177	157,564
Harstad	17	5	4	4	166,186	33,237
Sortland	7	5	4	6	38,317	7,663
Hadsel	37	14	6	12	91,661	6,547
Myre-Øksnes	6	5	2	6	19,284	3,857
Salten	45	34	10	8	236,485	6,955
Bodø	9	9	6	6	88,724	9,858
Mo i Rana	190	104	54	58	2,505,330	24,090
Nesna	0	0	0	0	0	0
Helgeland	103	62	34	26	894,659	14,430
Brønnøy	0	0	0	0	0	0
TOTAL	826	492	298		29,354,367	35,538

Table 8: Domestic and international departures from the key ports in Northern Norway in 2021 and the number of “other” domestic and foreign ports connected to the key ports.

Key port	No. of departures	No. of domestic departures	No. of international departures	No. of other domestic ports connected to the key port	No. of other foreign ports connected to the key port
Longyearbyen	140	113	27	15	3
Sveagrauva	46	46	0	2	0
Kirkenes	372	229	143	16	2
Båtsfjord	294	110	184	21	1
Berlevåg	39	24	15	6	0
Honningsvåg	236	141	95	26	7
Hammerfest	231	163	68	35	3
Alta	308	239	69	42	2
Bergneset	453	336	117	61	9
Tromsø	1,834	1,426	408	136	22
Narvik	430	202	228	27	27
Harstad	847	678	169	93	5
Sortland	464	317	147	54	3
Hadsel	625	446	179	80	5
Myre-Øksnes	408	194	214	69	9
Salten	142	68	74	28	4
Bodø	1,038	856	182	108	5
Mo i Rana	903	469	434	91	51
Nesna	89	56	33	16	1
Helgeland	1,239	840	399	128	33
Brønnøy	213	152	61	38	0

Table 9: Number of vessels operated by Norwegian and foreign shipping companies

Total No. of vessels	No. of shipping companies	No. of Norwegian shipping companies	No. of foreign shipping companies
76	1	1	0
19	1	1	0
15	1	0	1
13	1	0	1
10	1	1	0
9	2	1	1
8	3	0	3
7	2	2	0
6	5	1	4
5	12	6	6
4	14	6	8
3	17	9	8
2	60	18	42
1	248	73	175
TOTAL	368	119	249

5.3 Shipping services

Many of the shipping companies servicing local communities and industries in Northern Norway are family-owned businesses with a long tradition in coastal and short-sea shipping. Some offer specialized services focusing only on one type of industry or industrial product (e.g., aquaculture and farmed salmon). Other, mainly larger, companies provide more general transport and logistics services, making available different types of vessels for different cargo types, with international connections to Europe and beyond. These larger companies provide their customers with multimodal transport solutions to bring cargo to its destination. By providing ship management services and managing vessels (and crew) from several other shipping companies in addition to the vessels they own themselves, some companies become more full-service logistics providers.

A total of 368 shipping companies provided transport and logistics services in Northern Norway in 2021: 119 Norwegian companies and 249 (68%) foreign companies. The Norwegian companies made 11,209 voyages or 69% of all voyages. One Norwegian shipping company operated 76 vessels and another Norwegian company 19 vessels. Seventeen shipping companies operated six or more vessels, including seven Norwegian companies (*Figure 9*). Most of the shipping companies used one to three vessels, with 248 shipping companies operating only one vessel in Northern Norway in 2021. General cargo vessels outnumbered all other vessel types in domestic shipping, both in terms of number of vessels (about 60%) and number of voyages (about 47%). In international shipping, larger general cargo vessels and dry bulk carriers were the most common vessel types and made the greatest number of voyages.

Coastal passenger ferries

Two shipping companies jointly manage several large coastal ferries that make scheduled calls at 34 ports located on the coastal route between Bergen and Kirkenes (referred to as the “Coastal Express”). The shipping companies have an agreement with the Ministry of Transport whereby the state purchases maritime transport services for 24 hours a day and 365 days per year. The agreement specifies capacity for both passenger transport and cargo transport. The agreement requires a minimum of 150 pallet spaces, of which 20 are for refrigerated goods and 20 for frozen goods. These large coastal ferries mainly transport passengers along with limited amounts of cargo (ro-ro cargo; vehicles). Other companies operate ro-ro ferries that connect road segments across fjords or connect several island communities with the mainland and are considered part of the road transportation system. A total of 45 ro-ro vessels were operating in Northern Norway in 2021, making a total of 817 port departures from the key ports. This includes ferry connections across Vestfjorden and Tysfjorden. Northern Norway has over 40 ferry connections, and many smaller industries in Northern Norway depend on ferries for freight transport.

General cargo vessels (multi-purpose vessels)

A total of 342 general cargo vessels were working in Northern Norway in 2021, conducting 5,006 departures from the key ports (*Table 6*). Most of the vessels (249) were 1,000-5,000 dwt (*Table 4*). The largest vessels ranged between 5,000 and 50,000 dwt. General cargo vessels provide a range of different services for local industries, including the aquaculture industry. They transport fish feed and other chemicals to fishing ports and remote fish farms deep within fjords. Specialized vessels also collect and transport silage from fish farms with fish waste from reception centres and processing facilities to other plants where the byproducts are refined into feed ingredients. The tonnages of these vessels are commonly less than 1,000 dwt.

Many of the companies operating general cargo vessels in Northern Norway serve the metal and chemical industries in Nordland, and transport aluminium, steel products, fertilizers, and cement to the European market. These are larger general cargo vessels of 5,000-50,000 dwt. The departure ports are Mo i Rana, Salten, Helgeland (Mosjøen) and Hadsel (Stokmarknes). These same vessels also import raw materials to Northern Norway for further processing and refining. Many of the vessels are fitted with powerful cranes for self-loading and self-discharging of break-bulk cargo. The ports with the highest numbers of departures with general cargo are Tromsø and Bodø, but almost completely for the domestic market. Regular cargo transport to Longyearbyen on Svalbard is by general cargo vessels and ro-ro vessels of 1,000-5,000 dwt and tankers of 1,000-10,000 dwt. The port of departure on the mainland for these services is commonly Tromsø.

Other shipping companies focused on the building and construction industry in Northern Norway provide general cargo vessels with heavy-lift cranes to unload project cargo and building materials (including construction modules). Depending on the kind of cargo, these companies may also operate their own conveyor belts for unloading. This enables unloading close to the place of use (i.e. the construction site) and does not necessarily require the use of a quay. Freight that easily fits on pellets is transported on palletized cargo vessels, of which nine were operating in Northern Norway in 2021. These vessels ranged from 1,000 to 5,000 dwt in size and made 644 departures from the key ports (*Table 5*).

Reefers/refrigerators

Several shipping companies operated 29 reefer/refrigerator vessels transporting frozen fish from ports in Northern Norway, commonly once a week. The vessels departed from key ports 1,301 times during 2021. Most of the voyages were from Tromsø, Båtsfjord, Sortland, and Kirkenes (*Table 6*). The vessels transport frozen seafood in temperature-controlled compartments and in containers for both the fishery and aquaculture industries. The companies also commonly provide cold storage services. Refrigerator vessels are commonly in the 1,000 to 5,000 dwt range. Some of the vessels transport frozen seafood southbound, then break-bulk and general cargo (i.e., consumer goods) on their return voyage. In 2021 several Russian reefers transported frozen seafood (cod) from the ports of Kirkenes, Båtsfjord, and Tromsø to the Netherlands and Germany.

Container vessels

Containerized goods are commonly transported on the decks of general cargo vessels and refrigerator vessels. Actual container vessels (i.e., cellular container vessels) are uncommon in Northern Norway, but in 2021 five such vessels called at the ports of Mo i Rana, Hadsel (Stokmarknes), Salten (Mosjøen), Tromsø, Harstad, Sortland and Narvik, making a total of 189 voyages (*Table 6*). These vessels were in the 10,000 to 15,000 dwt size range, averaging 11,281 dwt. The vessels were owned by shipping companies from Germany (two vessels), the Netherlands (one vessel) and Norway (one vessel). Another larger fully cellular container ship called at the port of Narvik; this was owned by a shipping company from the United States.

Dry bulk carriers

A total of 180 dry bulk carriers were operating in Northern Norway in 2021, making 329 shipments from the key ports (*Table 6*). The shipments with the largest volumes were iron ore concentrates shipped from the ports of Narvik and Mo i Rana on dry bulk carriers in the 50,000 to 215,000 dwt size range, mainly to Germany, Netherlands, and the UK. Smaller dry bulk carriers of 15,000-50,000 dwt, fitted with excavators allowing them to self-load and self-discharge bulk cargo, serve the industrial mineral industry in Northern Norway. The mining sites are frequently located in remote locations without proper port infrastructure. Cement bulk carriers (5,000-10,000 dwt) are designed and equipped to carry powdered cargo in fully enclosed compartments, which enables dust-free operation, and discharge it directly into trucks or other shore facilities. Several vessels transported gravel, sand, and crushed stone aggregates for the construction industry. A large majority of the dry bulk carriers were only involved in international shipping (90%).

Tankers

Another important coastal shipping service is performed by the tankers which operate along the entire coast. A total of 77 tankers made 1,384 departures from the key ports in 2021. The tankers ranged in size from less than 1,000 dwt to 15,000-50,000 dwt. Several of the ports act as fuel hubs for the shipping industry as well as storage for refined fuel for the local aviation industry. For example, in 2023 about 550,000 tons of fuel was transported to the port of Tromsø. The tankers serve the bunkering needs of the shipping fleet, the needs of regional petroleum and chemical industries, and provide diesel and gasoline for use at petrol stations, as well as other petroleum products. Some companies provide oil bunkering at sea to fishing vessels in the Barents Sea, so they do not have to waste valuable time by going onshore to fill

up their tanks. In 2021 several oil tankers, ranging from 5,000 to 15,000 dwt, called at the ports of Helgeland (Mosjøen and Sandnessjøen), Alta, Tromsø, and Bodø. Liquefied natural gas (LNG) tanker of 5,000 dwt also called at the port of Helgeland (Mosjøen). LNG is regularly shipped to the EU on large LNG tankers from Melkøya LNG plant in Hammerfest, and crude oil on tankers from the Goliat Oil Platform in the Barents Sea. These shipments were initially excluded from the data provided by the Norwegian Coastal Administration.

Offshore supply tugs

A total of 42 supply tugs supported various operations along the coast and on offshore oil platforms and other installations on the Norwegian continental shelf in 2021. Most of the tugs operated from Helgeland, making 453 departures (*Table 6*). They are a crucial mode of transportation for offshore operations. The largest tugs are around 5,000-10,000 dwt in size.

Other vessel types

Thirty-eight vessels of other types called at the key ports in Northern Norway in 2021, conducting a total of 164 voyages. These vessels included a cable laying vessel, a diving support vessel, deck cargo ships, heavy load carriers, landing craft, LNG tankers, LPG tanker, passenger ships, passenger/cruise vessels, a salvage ship, a standby safety vessel, and a work/repair vessel. The LNG tankers had anchorage in the port of Honningsvåg and were all connected to the Yamal LNG project at the Russian port of Sabetta.

Transit traffic

Increased transit traffic in Norwegian waters is the result of growing shipping activity along the Northern Sea Route (NSR) by Russian-operated LNG and crude oil tankers, as well as Chinese general cargo and container vessels.

6. Challenges in Maritime Transportation

To investigate ongoing challenges in maritime transportation in Northern Norway a total of 43 semi-structured interviews⁹¹ were conducted with key maritime stakeholders (informants) located in the region. Each interview lasted about one hour. Stakeholders agreed that an efficient transport system is crucial for the development of Northern Norway but emphasized that the transport system should be tailored to local needs. They identified several transport and logistical obstacles and other challenges which collectively weaken or hamper the effectiveness of the current transportation system. Challenges identified through analysis of the interviews are discussed in the subsections below.

6.1 Limited state funding for maritime transportation

The Norwegian government has set ambitious targets for low-or zero emission maritime transport by 2030. The government has also for several years had a policy goal of increasing the proportion of goods transported by sea and rail rather than by road. The implementation of

⁹¹ Information about semi-structured interviews is found in the Methods of Analysis section at the beginning of this report.

the latter policy has not been successful, particularly in Northern Norway. In the updated National Transport Plan 2025–2036, the government proposes an allocation of NOK 34 billion to the Norwegian Coastal Administration, representing about 3% of the central government’s financial budget for the transport sector. This indicates a continued pattern of relatively modest shares of funding being directed toward the maritime sector nationally, with the result that no substantial resources are available to improve maritime transport infrastructure in Northern Norway.

Our informants highlighted this imbalance in resource allocation, and that the North feels overlooked.⁹² As one stakeholder stated, “despite government policies advocating the shift of cargo transport from road to sea, the actual support provided has been insufficient, resulting in outdated vessels and inefficient maritime transport that struggles to compete economically with road transport”.⁹³ Our informants were in consensus that public investment in maintaining and developing new infrastructure is critical to improving the maritime transportation system, but “the policy instrument system we have today has too little financial means, and far too little funding to make the changes needed”.⁹⁴ Similarly, the current government subsidy mechanism needs to be revised to serve the purpose of cargo transport by sea. They emphasized that significant infrastructure developments, such as establishing new quays and related infrastructure, require substantial public investment due to high construction costs, which smaller municipalities struggle to finance independently.⁹⁵

Stakeholders stated that there are not enough incentives for cargo owners to move more cargo by sea rather than road under the current system.⁹⁶ For smaller shipowners the cost of retrofitting or constructing new vessels to use hydrogen or ammonia fuel is too high for them to take on without solid government subsidies. The importance the stakeholders assigned to local and regional politicians and business leaders positively influencing decisions indicates a need for a more unified regional stance on transportation priorities.⁹⁷ Some stakeholders questioned the state's role in subsidizing, and therefore prioritizing, certain maritime infrastructural projects which demand extensive resources and several years of financial commitment.⁹⁸ Furthermore, stakeholders expressed concerns regarding the unpredictable nature of governmental subsidy schemes and frequent changes in regulations, which hinder stable planning and investment in maritime infrastructure by shipping companies:⁹⁹ “Things are changing that make it unpredictable to operate a Norwegian shipping company with Norwegian crew and Norwegian pay and working conditions”.¹⁰⁰

6.2 *Decentralized approach to investments in seaport infrastructure*

Stakeholders voiced concern over what they perceived as disproportionate public spending on port infrastructure without a cohesive strategy. The decentralized approach to investments, compounded by a complex regulatory landscape, significantly hampers the deployment of

⁹² Informant CO1 (2022).

⁹³ Informant SY3 (2022).

⁹⁴ Informant LS18 (2024).

⁹⁵ Informant PA19 (2023).

⁹⁶ Informant PA5 (2022); Informant SY3 (2022); Informant EU15 (2022).

⁹⁷ Informant CO1 (2022); Informant PA16 (2023); Informant PA17 (2023).

⁹⁸ Informant LS21 (2023); Informant CO1 (2022).

⁹⁹ Informant LS21 (2023).

¹⁰⁰ Informant LS21 (2023).

efficient and standardized logistical practices, leading to inefficiencies and escalating costs.¹⁰¹ A common view shared by informants was that the current landscape of decentralized ports, each with its own infrastructure, does not effectively consider transport economics. The practice of constructing numerous politically motivated fishing ports has led to a level of saturation that does not necessarily serve the larger transport economy, as the ports do not always align with the most significant fishing areas.¹⁰² One informant specifically stated that “a standardized approach is required to ensure ports within the region align better, particularly regarding green infrastructure investments. It becomes politically driven competition with every municipality demanding their own port, leading to high resource use without achieving cohesive solutions”.¹⁰³ There is no overarching authority administrating all seaports in Norway, like the Norwegian Public Roads Administration in the road transport sector and Avinor in the air transport sector. Many ports have their own development strategies, and financial constraints create barriers between neighbouring ports.

The stakeholders recognized a need to streamline and consolidate operations to enhance economic and logistical efficiency. The call is for a more unified collaborative effort among municipalities to foster effective infrastructure solutions while steering clear of competitive pitfalls.¹⁰⁴ This includes the need for cost reduction, standardization, and regional adaptation of port infrastructure, to achieve more adequate collective solutions in which synergies between ports can be leveraged for shared benefits, moving away from local competition in port construction. Some stakeholders suggest learning coordination and prioritization from airport management. That means giving priority to the regional logistics hubs and reducing investments in smaller seaports. Collaboration across municipalities facilitates the creation of efficient logistics solutions.

6.3 Limited collaboration among maritime stakeholders

The informants also agreed that there is limited collaboration among public and private maritime stakeholders, among cargo owners and shipping companies, and among the logistics operators themselves to find common transport solutions in Northern Norway. A key challenge is therefore the fragmentation of maritime actors, who often advocate individually rather than collectively, thereby reducing their overall influence and effectiveness in regional logistics planning.¹⁰⁵ Despite this fragmentation, informants also highlighted some successful examples of joint logistical practices. One such model involves cargo fleets shared between competitors, a practice which can optimize vessel usage, reduce emissions, and prevent journeys being made by half-empty vessels.¹⁰⁶ Moreover, they emphasized the broader need to consolidate cargo volumes and strengthen cooperation across logistics networks to achieve greater reliability, efficiency, and environmental sustainability.¹⁰⁷

As a result, there are no great incentives to change current practices. Informants pointed to the lack of a clear and supportive framework provided by the government to incentivize a shift

¹⁰¹ Informant LS15 (2023).

¹⁰² Informant BN17 (2023).

¹⁰³ Informant PA17 (2023).

¹⁰⁴ Informant PA17 (2023).

¹⁰⁵ Informant PA17 (2023).

¹⁰⁶ Informant CO25 (2023).

¹⁰⁷ Informant PA16 (2023).

from road to sea transport. They expressed frustration that political intentions to promote maritime logistics are not matched by practical support or funding mechanisms, making it economically unfeasible for businesses to change their existing practices.¹⁰⁸

The local industry is encouraged to move beyond the traditional practice of reliance on trailer trucks towards more collaborative projects that explore alternative transport solutions such as rail and maritime operations.¹⁰⁹ Public-private partnerships are critical to developing maritime infrastructure that serves the needs of both industry and the local population. Here, private actors need to provide a forecast of their future logistical and infrastructure needs and collaborate with public actors to provide the necessary investment. Nevertheless, our informants suggested that achieving successful partnerships depends significantly on improving trust and communication between stakeholders. Several stakeholders pointed to examples where coordination between public port authorities and private logistics or energy actors has enabled infrastructure development, particularly when public authorities provide access to land and regulatory frameworks while private companies invest in the supporting logistics systems.¹¹⁰

Informants indicated that the development of more effective logistical solutions requires key stakeholders to reach an agreement on the direction of logistics planning and investment. They emphasize the need for coordination at both regional and national levels and highlight that successful initiatives must involve a combination of local engagement and support from central actors and institutions.¹¹¹

6.4 Low volumes in general cargo/container shipping

The low volumes of general cargo/containerized cargo currently transported by sea in both Troms and Finnmark counties mean carriers must make multiple port calls en route to either collect or deliver cargo at remote seaports and coastal communities. Nevertheless, according to our informants “many voyages are done by half-empty vessels, wasting fuel, and impacting the overall sustainability of operations”.¹¹² If the volume of general cargo heading to Finnmark is considered insufficient it is typically unloaded in Tromsø, and the continuing transport done by road.¹¹³ For a destination in Hammerfest this will take an extra five days from Tromsø by truck.¹¹⁴ As a result, the limited amount of general cargo brought to Finnmark by sea also means a limited number of ships available for transporting fish products out of Finnmark. Hurtigruten formerly offered this type of service, but their new ships have been built for the tourist trade and cargo transport is very limited.¹¹⁵ The low cargo volumes in Finnmark result in shipping companies not achieving economies of scale and logistics service providers and cargo owners believe transporting cargo by sea to and from Finnmark is rarely cost-effective. One informant noted that logistics services can be unpredictable: “if I order something today to be delivered in Kirkenes, I wouldn't know if it would come here or if it

¹⁰⁸ Informant PA5 (2022); Informant SY3 (2022); Informant BN10 (2022).

¹⁰⁹ Informant PA16 (2023); Informant PA17 (2023).

¹¹⁰ Informant PA13 (2022); Informant PA17 (2023); Informant GA11 (2022).

¹¹¹ Informant PA17 (2023); Informant PA22 (2023); Informant LS23 (2023).

¹¹² Informant CO25 (2023).

¹¹³ Informant LS2 (2022); Informant PA6 (2022).

¹¹⁴ Informant LS2 (2022).

¹¹⁵ Informant CO9 (2022).

would be thrown off in Hammerfest or Båtsfjord. If they don't have any goods to take with them from Kirkenes, they will not come".¹¹⁶

General cargo/container volumes are greater in Nordland as the result of greater population (Bodø) and more concentrated industrial activities in Mo i Rana and Helgeland. This issue with low cargo volumes in coastal shipping in Northern Norway could to some extent be resolved by the consolidation of cargo from several smaller ports to a central port location. Both Bodø and Tromsø already act as intermodal terminals in the region.

Local aquaculture and fishing industries increasingly rely on large trailer trucks to transport their fresh farm-raised salmon and fresh wild-caught cod to European markets, consequently by-passing the seaports. As a result, "other local companies cannot produce large enough cargo volumes which could be brought to a seaport and regularly transported by sea".¹¹⁷ Only a handful of coastal shipping companies provide today's transport and logistics services with general cargo, including containerized goods and frozen seafood. Low general cargo throughput at ports clearly affects the incentives of maritime logistics suppliers to provide such services, resulting in minimal competition and challenges in scheduling maritime transport. Our informants mentioned the "dominance of few players in specific sectors, which restricts flexibility and innovation in logistics solutions".¹¹⁸ But the current situation makes it challenging to operate a profitable transport service by sea without government subsidies. On the other hand, the public sector is often reluctant to invest in maritime infrastructure at smaller ports, which can require continued subsidy assistance to sustain operations.¹¹⁹

6.5 Lack of fixed time schedules for coastal transport services

Industries in Northern Norway need to rely on regular shipments of their products to international markets. General and containerized cargo shipped along the Norwegian coast often lack such fixed time schedules, which can be costly for cargo owners, jeopardizing "just in time" logistics. Some of the coastal carriers have predetermined weekly routes, mainly servicing the larger ports without covering the whole region. As pointed out by one informant "time is key to keep the business running as if the cargo does not arrive at a predetermined time, the logistic provider needs to rent storage space at the port until the product can be forwarded". This lack of reliability in scheduling maritime transport was mentioned by several stakeholders as one of the driving forces for the movement of goods by road rather than by sea. Cargo owners typically do not know exactly when a ship will be able to collect cargo and when it will arrive at the destination port.¹²⁰ This complicates the coordination between sea and land transport.¹²¹ Any mismatches between the time at which cargo is scheduled to arrive and the ship's schedule will lead to financial losses and increased storage costs.

The inconsistency and unpredictability of maritime operations complicates planning and undermines the potential advantages of sea transport. As stated by one informant "this

¹¹⁶ Informant BN10 (2022).

¹¹⁷ Informant LS20 (2024); Informant LS24 (2024); Informant LS2 (2022).

¹¹⁸ Informant CO20 (2023).

¹¹⁹ Informant PA21 (2023).

¹²⁰ Informant PA17 (2023); Informant CO9 (2022).

¹²¹ Informant LS4 (2022).

unpredictability, coupled with the absence of economic incentives that might offset the disadvantages of slower maritime transport, often leads businesses to opt for road transport despite its higher costs and environmental impact”.¹²² The unpredictability of transporting goods by sea also includes delayed imports of needed equipment and materials and can lead to multiple orders being in transit concurrently, complicating inventory management.¹²³

6.6 Problem of sea transport with perishable goods

Sea transport cannot currently compete with road transport for cargo such as fresh fish or live king crabs that need to reach global markets quickly from production sites in Northern Norway.¹²⁴ Sea transport from Northern Norway to European markets simply takes too long, impacting the quality and subsequently the monetary value of the products.¹²⁵ About 80% of fresh farm-raised salmon and fresh wild-caught cod is currently transported from Northern Norway by trailer trucks, with the remaining 20% moved by railways (both Ofoten Line and the Nordland Line).¹²⁶ As mentioned above, the lack of sea transport of fresh fish is impacting the cargo volume that could otherwise be handled by ports. But increasing transport by sea will become an urgent necessity, as the Norwegian aquaculture industry has a goal of doubling production by 2030 and quintupling it by 2050.¹²⁷ Norwegian roads have become bottlenecks, as they do not have the capacity to manage such growth in a safe and efficient manner. Stakeholders are exploring innovative solutions to enhance logistical options for perishable goods. To increase sea transport of refrigerated (non-frozen) fresh fish, more advanced vacuum packaging and cooling systems (supercooling) need to be developed to keep the produce fresh for a much longer time.¹²⁸ Such prior processing would allow larger volumes of seafood to be transported by sea.

Part of the fresh fish products transported by trailer trucks from Northern Norway is loaded onto large cargo planes in Oslo for further export to international markets. Some of the cargo is flown directly to Oslo from the airports in Tromsø, Narvik, Bodø and Kirkenes. The city of Kirkenes may be the only city in the world which has only 3,400 residents but two direct flights to the capital every day. “The reason is that the holds of the airplanes are full of cargo”. According to one informant, airlines make more profits from cargo owners in Northern Norway than passengers.¹²⁹ In Norway, there are two major air transport service providers: DHL, which is responsible for international transport, and Jetpak, which handles domestic delivery. However, the cost of air transport is very high and can only be justified for high

¹²² Informant PA17 (2023).

¹²³ Informant CO21 (2023).

¹²⁴ Informant RL2 (2023); Informant CO21 (2023).

¹²⁵ Informant CO1 (2022).

¹²⁶ Nilssen, F., Solvoll, G., and Mathisen, T.A., Miljøvennlig transport av fersk torsk til europeiske markeder. FOU-rapport nr. 100, Nord University, Bodø (2023).

¹²⁷ SjømatNorge, *Aquaculture 2030 Think globally, act locally*, Norwegian Seafood Federation (2024), https://sjomatnorge.no/wp-content/uploads/2014/04/Havbruk-2030_final_EN_pdf.pdf.

¹²⁸ Eivind Dale et al., *GRØNT KYSTFARTSPROGRAM: Samfunnsøkonomisk analyse av pilotstudie «Fisk fra vei til sjø»*, DNV GL Maritime and Menon Economics (Kystrederiene, 16.04 2018), https://www.kystrederiene.no/wp-content/uploads/2018/08/Rapport_Fisk-fra-vei-til-sjo.pdf; Informant LS20 (2024).

¹²⁹ Informant LS1 (2022).

value and time-sensitive goods.¹³⁰ Most seafood is exported directly by trailer trucks to Sweden and Denmark, for further processing and market integration.

6.7 The cost of cargo transport

As one informant stated: “The price of transport services is a key decision factor for cargo owners. If sea transport offers financial gains, then it will be a preferred solution”.¹³¹ Road transport is currently favoured by some industries (namely aquaculture, fresh cod and live crab fisheries, consumer goods and other perishable goods) due to greater flexibility and shorter travel time, but maritime transportation is the most important mode for larger bulk volumes on longer distances. Ships can transport large volumes of goods in a much more cost-effective way than trucks and railways.

Road transport by trailer trucks is the quickest mode of travel and a financially attractive option for transporting fresh produce, driven by the relatively low rental and labour costs of foreign trucks and drivers. Most of the trucks transporting goods between Northern Norway and the EU are hired from foreign trucking companies and driven by foreign nationals. Due to the imbalance between export and import cargo volume in Northern Norway, trailer trucks are known to drive empty all the way to the north to be loaded with fresh produce (e.g. farm-raised salmon) and then driven back south. “We’ve had to drive empty trucks from the south of Sweden up to Kirkenes to get the fish out. It’s very unfortunate when we’re in those situations”.¹³² To avoid such practices it has been suggested that cargo owners should only use transport companies that have secured return cargo to ensure more efficient transportation, and that the authorities should perhaps tax journeys made with empty trucks to discourage this practice.¹³³

6.8 High cost of using the seaports and outdated fee structure

There is a consensus that the cost of sea transport is typically lower than its rail and road counterparts, particularly for longer distances. However, the current transport situation in Northern Norway complicates matters, especially when smaller and old-fashioned fishing ports are used in the supply chain. Smaller ports do not have customer systems where port users can easily find their invoices. Instead, users often receive several invoices from different port actors for multiple services.¹³⁴ The ports are also self-financed, which tends to lead to higher port charges.¹³⁵ The higher the cost, the lower the number of port calls, and vice versa. This vicious circle has led an increasing number of cargo owners to avoid transporting their cargo by sea.¹³⁶ An informant representing a shipping company said that the costs of using the seaports are completely unreasonable, and that the further north a port is located the more expensive it will be.¹³⁷

¹³⁰ Informant LS4 (2022); Informant PA7 (2022).

¹³¹ Informant LS24 (2024).

¹³² Informant CO20 (2023).

¹³³ Informant LS23 (2023).

¹³⁴ Informant PA15 (2023); Informant PA17 (2023).

¹³⁵ Informant LS15 (2023).

¹³⁶ Informant PA18 (2023); Informant PA21 (2023).

¹³⁷ Informant LS21 (2023).

Financial considerations influence port operations and the handling of cargo. Understanding and managing port costs is vital for the economic viability of port operations and the logistics of cargo movement. But lack of coordination between different modes of transport leads to unnecessary bottlenecks and delays. Consequently, several seaports are struggling to attract cargo due to outdated cost structures. Smaller ports, particularly in remote areas like Finnmark and Nord-Troms, find it difficult to adopt a cost-reduction mindset that could enhance their attractiveness and cargo handling.¹³⁸ These smaller ports often rely on limited vessel services like Hurtigruten and occasional cargo ships, constraining their operational capacity and economic sustainability. However, not all ports are economically viable due to current operational costs and the additional costs that must be paid to attract more cargo. Instead, there is a push to use larger ports like Tromsø and Bodø more efficiently to ensure significant cargo volumes and maintain more environmentally friendly operations¹³⁹.

6.9 Limited seaport capacity

There is a pressing need for the modernization and expansion of port facilities to better accommodate innovative transport solutions.¹⁴⁰ Some ports face significant capacity limitations that impede cargo handling at critical periods during the peak season. This can lead to significant logistical bottlenecks.¹⁴¹ Our informants described some seaports as overcrowded in peak seasons, leading to scheduling conflicts that result in port space being occupied by other vessels, delays in receiving raw materials, or the reloading of vessels failing to take place at prescheduled times.¹⁴² The seaports struggle to offer competitive services due to increased operational costs and the need for more extensive use of port facilities.¹⁴³

The reliance of the aquaculture industry on road transport has provided limited incentives to increase seaports' capacity for handling more cargo, or to provide better intermodal logistical solutions. As pointed out by one informant, "lack of funding of fishing ports over many years has now led to a large maintenance and renewal needs".¹⁴⁴ This can be seen in the lack of support infrastructure, such as warehousing and storage capacity, that limits the supply chain services of logistics providers. Port facilities which can maintain constant temperatures for refrigerated containers of perishable goods such as seafood are also essential.¹⁴⁵ There are, however, marked differences in seaport capacities and services between larger and smaller coastal communities.

Some seaports have developed their capacities to provide specialized services to local industries, such as a shipyard and service facilities for the fishing fleet, or to export-oriented companies such as the power-intensive industries. Several smaller seaports have depth and width constraints at their quays, limiting access by larger ships. Other ports have tidal ranges of several meters between high and low tide, affecting the use of roll-on and roll-off vessels

¹³⁸ Informant PA15 (2023); Informant CO21 (2023).

¹³⁹ Informant LS14 (2023); Informant LS15 (2023).

¹⁴⁰ Informant PA16 (2023).

¹⁴¹ Informant PA15 (2023).

¹⁴² Informant CO25 (2023).

¹⁴³ Informant LS14 (2023); Informant PA19 (2023).

¹⁴⁴ Informant LS12 (2022).

¹⁴⁵ Informant CO21 (2023).

and limiting their capacity to increase cargo transport by sea. There is also limited availability of tugboats to assist larger vessels.¹⁴⁶ Ports that implement more advanced solutions in terms of the flexibility and efficiency of cargo handling operations have greater growth potential than ports that hold on to outdated practices.

6.10 Unbalanced north-south container flow

The container flow to and from Northern Norway is unbalanced. Various consumer goods are transported in containers to consumers in Northern Norway from European container hubs like Rotterdam. The aquaculture and fishing industries in Northern Norway can play an important role by filling southbound containers on return voyages with packaged frozen fish products (including salted, dried, and smoked products), and in so doing produce more balanced transportation system.¹⁴⁷ For this to be a possibility the containers need to be constructed with temperature-controlled refrigeration units (such as those provided by Thermo-Transit).¹⁴⁸ However, a significant number of southbound containers are still either empty or loaded with empty packages and pallets to be returned for re-use. An informant responsible for the operation of the railway terminal in Narvik and cargo distribution up to Kirkenes acknowledged that 75% of their terminal activities are related to cargo flow from south, with the rest of the terminal's capacity used for handling internal goods in the region; fish is the major southbound cargo, but volumes are low.¹⁴⁹ This unbalanced north-south container flow is a major challenge for transport in Northern Norway, particularly in Finnmark and Troms, and applies to all three modes of transport (sea, rail and road).¹⁵⁰ As previously mentioned the opposite can also be true when seafood facilities in Northern Norway, which rely on transport of fresh fish on trailer trucks, drive empty trucks from the south of Sweden all the way up to Finnmark to load seafood before driving back south.

An additional challenge for the seafood industry is that fish yield is not consistent throughout the year, with noticeable peaks in salmon yields during the autumn and in the cod fisheries during the winter months.¹⁵¹ Diminishing fish quotas in the Barents Sea¹⁵² also impact transport volumes, as do changes in fish migration patterns.¹⁵³ These fluctuations in production make it challenging to establish fixed logistics, as the demand for transport can swing from 300 tons in one week to a mere 15 tons in another, complicating logistical planning and fleet utilization.¹⁵⁴ That is to say, the role of seafood in balancing container logistics is not always effective. Nevertheless, several of our informants believed that the seafood industry will fill a significant portion of southbound containers with frozen fish in the years to come.¹⁵⁵ They suggested using an incentive scheme to encourage cargo owners and logistics service providers to fill southbound containers, or levying taxes on the transportation

¹⁴⁶ Informant CO17 (2022).

¹⁴⁷ Informant RL1 (2023).

¹⁴⁸ Informant CO20 (2022).

¹⁴⁹ Informant RL2 (2023).

¹⁵⁰ Informant RL2 (2023).

¹⁵¹ Informant CO20 (2023).

¹⁵² Informant CO20 (2023).

¹⁵³ Informant PA7 (2022).

¹⁵⁴ Informant CO20 (2023).

¹⁵⁵ Informant RL1 (2023); Informant LS23 (2023); Informant CO20 (2023); Informant CO21 (2023).

of empty containers. Other industries that are currently being established in Northern Norway will also contribute to a more balanced container flow.

Several industries in Nordland produce industrial products for export, requiring long-distance transport to international markets, but limited imports. This highlights again the overall logistical challenge of balancing demand and supply within the region's transportation system, with exports southward accounting for much larger volumes than imports northward.¹⁵⁶ As mentioned above, this lack of returning cargo can lead to half-empty or empty vessels sailing north or empty trailer trucks driving north to be reloaded with commodities for the international market further south.¹⁵⁷

6.11 Lack of suitable container vessels in coastal shipping

An informant highlighted that container transport requires compatible infrastructure and vessels.¹⁵⁸ The scarcity of container ships suitable for the region's shipping needs is impacting the transport of containerized goods. This includes specialized ships that can efficiently load containerized cargoes directly onto railways. Such transfers of goods from ship to rail are needed in certain areas. The lack of such capabilities prevents logistical optimization and the utilization of sea transport to its fullest potential.¹⁵⁹ Our informants mentioned the need for investment in new and modern vessels to replace the current aging fleet, "including modern vessels that can carry containers and promote a greater degree of containerization in Northern Norway, which is not the case today".¹⁶⁰

One informant noted that "the ships currently in use are so old that they have to operate at low speed, and there has been too little investment in new vessels, highlighting the urgency of renewing the fleet to meet present and future needs".¹⁶¹ Another stated that vessels currently in operation have frequently caused damage to goods during transport due to low vessel speed (and resultant long transit times). An example of a transport service was mentioned by an informant referring to now-defunct container vessel, which operated reliably between Bodø and Tromsø with around 20,000 twenty-foot equivalent units (TEUs) annually. However, the vessel was eventually decommissioned due to its age and high operational costs. The informant stressed that such service models, supported by newer and more efficient ships, could greatly improve logistical reliability and cost-efficiency.¹⁶²

The new container ships would need to be faster and more reliable, able to support timely and safe delivery of cargo.¹⁶³ According to a port authority representative, even though larger logistics actors possess modern container ships, "the old ships come here" and "the further out in the region you go, the older the ships" indicating that Northern Norway would still receive outdated vessels while newer ones would be allocated to more profitable routes.¹⁶⁴ In addition, this stakeholder emphasized the need to enable container operations in smaller

¹⁵⁶ Informant CO20 (2023).

¹⁵⁷ Informant CO20 (2023).

¹⁵⁸ Informant PA23 (2024).

¹⁵⁹ Informant PA22 (2023).

¹⁶⁰ Informant LS24 (2024).

¹⁶¹ Informant LS23 (2023).

¹⁶² Informant PA16 (2023).

¹⁶³ Informant CO21 (2023).

¹⁶⁴ Informant PA23 (2024).

regional ports by combining containers with trolleys, which could extend container transport into smaller communities: “trolleys are also needed because that is what works in the rural areas and in the small fishing ports”.¹⁶⁵ The same informant also pointed out the lack of port equipment necessary to handle containerized cargo and that “if you do not facilitate containers, then you will not get them either”.

6.12 Challenges of intermodal connections

Our informants agreed that intermodal logistics are a challenge for the current transportation system in Northern Norway: “A deep-water port and efficient and reliable hinterland connections by road and/or rail is a good indicator of optimized port services for connecting to international markets”.¹⁶⁶ However, lack of coordination between different modes of transport currently leads to unnecessary bottlenecks and delays. Intermodal transport also involves additional transshipment, which can pose a risk of damage to goods and equipment if the port’s handling capacity and facilities are limited. Road transport is therefore preferred by many cargo owners and logistics service providers, and offers the greater reliability required by “just in time” delivery models.¹⁶⁷

Improved intermodal connectivity would optimize the transportation of cargo and passengers both regionally and nationally. Some of our informants pointed out that “if the road network is properly upgraded, then it could promote additional upgrades of maritime logistics services, as the seaport network is key, and ports need expansion to accommodate larger vessels”.¹⁶⁸ Investments in new railways would also improve connectivity and provide better intermodal transport solutions; however, despite previous plans and discussions about railways linking Fauske-Tromsø or Kirkenes-Rovaniemi, this is seen as a solution in the longer-term future and is not currently envisaged as part of the current Norwegian Transport Plan.

6.13 Onshore power supply and safety measures

An additional challenge facing seaports in Northern Norway is the need to construct onshore power supply (OPS) infrastructure (high or low voltage for vessels at berth), as well as facilitate the generation and storage of alternative fuel sources. The seaports should become energy hubs for wide scale decarbonization of the shipping fleet.¹⁶⁹ The Norwegian government has already granted economic support (through Enova) to more than 90 OPS projects in Norway. Increased electrical (renewable) power is also needed to produce alternative fuel sources, such as hydrogen and ammonia, as shipping fuels. Despite the current national electricity surplus in Northern Norway, grid capacity will need to be greatly expanded to meet the expected increase in demand. This will include new investments in renewable energy.

Regarding the power supply, there is debate on the sustainability and future viability of different energy sources. While offshore wind is viewed sceptically by some stakeholders as a subsidized industry without a long-term future, others see significant potential in optimizing

¹⁶⁵ Informant PA23 (2024).

¹⁶⁶ Informant BN16 (2022).

¹⁶⁷ Informant LS2 (2022).

¹⁶⁸ Informant PA14 (2023); Informant EU15 (2022); Informant LS20 (2024).

¹⁶⁹ Markus Steen et al., "Implementing decarbonisation measures in Norwegian ports," *Transportation Research Interdisciplinary Perspectives* 23 (2024).

existing hydropower plants.¹⁷⁰ Hydrogen production will require a revision of existing safety regulations in ports, for example when it comes to transporting liquified hydrogen on ships and storing hydrogen at seaports or near passenger terminals. Onshore power for cruise ships is a high-cost measure compared with onshore power for vessels in ordinary traffic.

Some of our informants expressed concern that the power generated by new types of ship engines running on green fuel is less reliable compared to conventional fossil fuels, and would be a disadvantage for ships facing strong winds and heavy seas.¹⁷¹ One informant explained this technological uncertainty by stating that while battery operation was considered, “it simply does not provide the power needed,” requiring a fallback to diesel engines to ensure reliable operation.¹⁷² Additionally, ships running on alternative fuels can carry less cargo: “Another issue is that the ship fuel tanks for alternative fuels are twice as large (as a result of lower energy density compared to fossil fuels) so you lose cargo capacity”.¹⁷³

7. Maritime Transport Strategies & Solutions

This section discusses three main strategic goals and logistics solutions that could make the maritime transportation system in Northern Norway more effective and reliable. As in the previous section, information from the semi-structured interviews with several key maritime stakeholders provides the foundation for further analysis and the resulting findings on how to overcome current challenges. Each strategic goal is further divided into several supporting actions. The first strategic goal is to establish public-private partnerships to prioritize regional infrastructure investments. The second is to identify several actions that will improve maritime transport and logistics services. The third is to strengthen cross-border cooperation and connectivity.

7.1 Public-private partnership to prioritize infrastructure investments

7.1.1 The need for unified regional stance on maritime transport priorities

State and local governments play an important role in the development of the transportation system. The authorities allocate funds to maintain and expand existing transport infrastructure and develop new infrastructure that serves the needs of industry and the local population. But this work should not be done in isolation. Public and private actors need to work together to address the weaknesses and bottlenecks of the current transport system and find ways to improve transport infrastructure and logistics services.¹⁷⁴ Greater involvement of local port authorities and logistic suppliers is needed in the decision-making and planning processes, especially in anticipation of future infrastructure needs and environmental considerations.¹⁷⁵ In this way, more innovative bottom-up solutions can emerge, as opposed to potential top-

¹⁷⁰ Informant CO21 (2023).

¹⁷¹ Informant CO17 (2022); Informant LS27 (2024).

¹⁷² Informant CO17 (2022).

¹⁷³ Informant LS27 (2024).

¹⁷⁴ Informant BN14 (2022); Informant BN16 (2022); Informant PA14 (2023); Informant PA21 (2023).

¹⁷⁵ Informant PA22 (2023); Informant LS23 (2023).

down logistics solutions designed only by government agencies.¹⁷⁶ Here, the role of government agencies is to act more as a coordinating body connecting the industry (cargo owners) and the logistics suppliers (shipping companies). Government support is needed to motivate businesses to take risks and develop new value chains that rely on transport by sea.

7.1.2 The need for increased state investment in port infrastructure

Public investment in infrastructure is crucial for addressing Northern Norway's transportation challenges, and financial commitment to the upgrading of seaports and railways emerges as a central theme. This is due to the difficulties small- to medium-sized ports in peripheral areas face when trying to attract long-term private investment. Our informants highlighted the importance of good dialogue with governmental decision-makers and politicians when seeking to secure funding and support for infrastructure projects.¹⁷⁷ Municipalities in Northern Norway also need to actively advocate for their infrastructure projects, underscoring the broader challenge of securing support and resources at both the regional and national levels.¹⁷⁸ Investment in upgrading and expanding port infrastructure benefits local industries. The condition of the regional transport system is a key parameter that private investors and capital investment funds evaluate when choosing a location for their future industrial activities.¹⁷⁹ If a municipality has good transport infrastructure more industries and associated businesses will be established in there, and there will be a corresponding need for an increased labour force.¹⁸⁰

Investments must be made in modernizing port infrastructure. However, such investments have typically been characterized by substantial initial investments in port construction, dredging, and equipment acquisition, and long payback periods. This means that it takes a considerable amount of time for the investment to generate sufficient revenue to cover the initial costs. These characteristics discourage both municipalities and private investors, especially in a region where a relatively dispersed population and small markets limit economies of scale.

Smaller ports serving local communities may struggle to generate sufficient revenue to justify large-scale investments. Potential investors must address the demand risks associated with revenue uncertainty. This explains why some private port users and port service providers are moving into terminal operations rather than investing in hard infrastructure. Shipping companies can more accurately forecast port calls and space requirements than port authorities, giving them greater confidence in any investment decisions.

7.1.3 Government control and the organization and management of seaports

Local municipal port authorities play a central role in port governance in Norway, but private firms can play a significant role both as service providers and owners of selective port facilities and terminal infrastructure. Private port operations typically lead to more efficient and competitively priced port services. Though many of the ports or individual terminals are

¹⁷⁶ Informant GA11 (2022).

¹⁷⁷ Informant CO21 (2023); Informant LS15 (2023).

¹⁷⁸ Informant PA19 (2023).

¹⁷⁹ Informant PA13 (2022); Informant BN14 (2022).

¹⁸⁰ Informant BN14 (2022).

fully private and serve specific industries, larger ports tend to be public and owned by the local municipalities. No ports are state-owned. The involvement of private companies in the port sector has led to significant institutional changes in terminal management. This shift is largely due to the local municipalities' inability to make substantial investments in the port infrastructure. These changes have reduced the state's control and management of facilities that serve public interests. But state oversight and control is important when it comes to establishing national transportation priorities and policies in Northern Norway. Increasingly, this will include safeguarding the security of supply lines, civilian and military security, and preparedness. This constitutes an argument for more state involvement in the port sector.

In light of recent developments in the international security situation, Norwegian ports are regarded as vital assets. They are the logistical gateways for the reinforcement of critical supplies by allies during crises. A recent DNV Report (2025)¹⁸¹ underscores that these new responsibilities—security, sustainability, and digital integration—are considered intrinsic at the national level, yet the governance mechanisms remain at municipal level. In this case, where ports are governed primarily by the commercial and political interests of a single municipality, decisions regarding land-use and investment inevitably prioritize local returns. This often leads to the transformation of deep-water quays into residential waterfronts, which reduces national logistical capacity. DNV (2025) suggests that without a national mechanism, the cumulative effect of these local decisions will be a fragmented national network unable to support the state's strategic objectives in transport or defence.

The central government can safeguard its interests and control through public-private partnerships, creating a balance between state funding and privatization. The result can be a government-controlled port development company or organization¹⁸² with a broad mandate to develop the port and attract new customers—both port users and tenants—and address security and preparedness issues. The partnerships combine the private sector's expertise and resources with the government's objectives and commitment to addressing public needs. In the port sector such partnerships can become critical strategic tools for development by providing new avenues for financing port infrastructure, extending a port's influence on its hinterland, addressing supply chain bottlenecks, and promoting growth.¹⁸³

Today, there is no overarching governmental authority administrating Norwegian seaports, as is the case for road, rail and air transport. For example, the fully-state owned limited company Avinor AS operates most of the civil airports in Norway. It is the Norwegian Railway Directorate that acts as a coordinating agency for the railway sector. Norway has 13 railway freight terminals; these are operated mainly by Cargo Net, a partly state-owned railway company. The Norwegian Public Road Administration is responsible for the planning, construction, operation and maintenance of the national road network. The agency operates the fully state-owned limited company Nye Veier AS to assist in these efforts.

¹⁸¹ Rise, Ann, Iren Holm and Oda Myklebost. DNV: *Norsk Offentlig Havnesektor - Drivere og tiltak for en robust Norsk Havnesektor - Samfunnsbedriftene, Norske Havner*. (2025).

¹⁸² World Bank Group, "Public Private Partnerships in Ports / Port Reform ", updated n.d., n.d., accessed 07.11, 2025, <https://ppp.worldbank.org/sector/transportation/ports>.

¹⁸³ Behzad Behdani et al., "Port-hinterland transport and logistics: emerging trends and frontier research," *Maritime Economics & Logistics* 22, no. 1 (2020).

For the seaport sector, the Norwegian Coastal Administration has primarily served as a regulatory body enforcing environmental regulations. It is responsible for maritime safety and general accessibility in Norwegian waters. Norwegian seaports, whether owned and operated by local municipalities or privately owned, have followed their own development strategies. As a result, there is now a strong need to enhance economic and transport efficiency by streamlining and consolidating port operations to achieve more adequate collective solutions, allowing synergies between ports to be leveraged for shared benefits. The call is for a more unified collaborative effort to foster effective infrastructure solutions while steering clear of competitive pitfalls.¹⁸⁴ Some stakeholders suggested adopting the same coordination and prioritization measures for seaports as are currently practised for the management of airports.¹⁸⁵

Fishing ports in Norway have been state owned since the 1st of January 2023, with the Norwegian Coastal Administration regaining ownership of all fishing ports at that time. Based on the NCA's Status Report 2024, this shift serves as a model for future infrastructure organization that prioritizes strategic coherence, resilience, and societal security over fragmented local management. By centralizing management, the state can maintain a dedicated professional environment focused on port engineering, planning, and impact assessment. This contrasts with smaller, local ownership models where such specialized competence may be too costly to maintain. The state model facilitates a comprehensive approach to investigation and planning. Port strategies are evaluated based on national standards and long-term needs, ensuring that investments yield higher returns.

Resilience—the ability to withstand and recover from disruptions—is a critical performance index for future port structures. State management ensures that physical infrastructure (such as breakwaters or quays) is built to withstand extreme weather events, which are becoming more frequent due to climate change. Commercial or municipal entities might under-invest in such “over-engineering” due to budget constraints, but the state views it as a necessary baseline for safety. In addition, by viewing ports as nodes of logistics networks rather than isolated entities the state can plan alternative logistics routes. If one port fails, others are equipped to take over, ensuring the continuity of supply chains. Furthermore, state ownership ensures that port infrastructure remains relevant to current and future needs (for example, in terms of modern vessel sizes and fleet structures).

The performance of port infrastructure is ultimately measured by its reliability during crises. The state ownership model integrates ports directly into the Total Defence concept, creating a seamless link between civilian logistics and military requirements. The new Port Preparedness Regulation grants the state clear authority to instruct ports during security crises. This eliminates friction around the right of jurisdiction and ensures that ports prioritize national defence and civil protection needs. The establishment of a national Port Preparedness Committee has created a structured arena for cooperation. This improves performance by

¹⁸⁴ Informant PA17 (2023).

¹⁸⁵ Informant PA17 (2023); Informant LS2 (2022); Periklis Saragiotis and Peter de Langen, "Why ports should be managed like airports.," *brookings.edu*, updated 29.07.2016, 2016, accessed 07.11, 2025, <https://www.brookings.edu/articles/why-ports-should-be-managed-like-airports/>.

standardizing training, exercises, and communication protocols across all designated ports, fostering a culture of preparedness that is difficult to achieve in a fragmented ownership model.

The DNV Report (2025)¹⁸⁶ also supports the state management of ports. The report outlines a comprehensive reform agenda focused on establishing a national superstructure that integrates ports into the broader transport network while retaining local operational flexibility. The report suggests that the administrative responsibility for the port sector should be transferred from the Ministry of Trade, Industry and Fisheries to the Ministry of Transport. This strategic shift would help break down existing department barriers and ensure ports full integration into the National Transport Plan (NTP). In addition, the state should develop a binding National Port Strategy. This roadmap should ensure that regional ports align with national priorities rather than just local commercial interests. To support this, the establishment of a National Port Fund is recommended to address the sector's economic challenges. This fund would finance critical infrastructure projects that have high societal value but offer low commercial returns.

7.1.4 Financing the renewal of the domestic coastal fleet

Financing renewal of the domestic cargo fleet in Norway will be a daunting task. Public funding needs to be available for refitting vessels and purchasing new vehicles and vessels with low or zero-emission technologies. The aim is to reinvest in more efficient and less polluting vessels, a key element for more environmentally friendly maritime transportation. It takes much longer to renew a fleet of ships than a fleet of land vehicles. Incentives are needed to speed up the process; the private sector cannot take on this responsibility alone. As previously discussed, the shipping fleet involved in domestic trade in Northern Norway is mainly composed of relatively small vessels (1,000 to 5,000 dwt) transporting general cargo and containers, as well as liquid bulk and dry bulk cargo.

The sector includes small family-owned shipping companies that have limited capacity to accumulate enough investment capital and credit to undertake expensive fleet renewal projects. Today, vessels commonly operate on short-term service contracts with small financial margins and therefore limited financial security.¹⁸⁷ The shipping companies' activity and earning power is the basis for future fleet renewal on ordinary commercial terms. The creditworthiness of the coastal shipping companies appears to be the greatest barrier to the use of existing funding instruments in Norway. This has been acknowledged by the Norwegian government as a major obstacle to the building of a new domestic coastal shipping fleet with low or zero-emission technologies.¹⁸⁸

Of the 368 shipping companies providing transport and logistics services in Northern Norway in 2021, 249 (68%) were foreign. These foreign shipping companies provided selective logistics services. Enforcing strict emission-reduction measures might force these companies to terminate their logistics services, impacting local communities and industrial activities. Ways to resolve this dilemma and stimulate the renewal of the coastal fleet have not yet been

¹⁸⁶ Rise, Ann, Iren Holm and Oda Myklebost. DNV, see note 181.

¹⁸⁷ Sveinung Fjose et al., kartlegging av nærskipsfart – sammensetning, alder, lønnsomhet og utfordringer med flåtefornyelse, Menon Publikasjon nr. 19/2020 (2020).

¹⁸⁸ Regjeringen, Short The Government's Action Plan for Green Shipping.

forthcoming. The government has called for more knowledge to be gathered about the barriers to financing for vessels in this segment, and for better cooperation between public and private stakeholders.¹⁸⁹

7.1.5 Natural resource exploitation relying on maritime transportation

Northern Norway is rich in natural resources. Several large industrial projects are in the planning stages in the region. Exports of raw commodities, as well as products that have undergone further industrial processing, are reliant on maritime transport to international markets. Mines are often located in remote locations. Mineral processing needs to be located as close to the mining operations as feasible and as close to local mining ports as possible to minimize extensive road or rail transport. Continued natural resource exploitation and industrialization in the North is therefore dependent on an effective maritime transport system. Investments in maritime infrastructure should thus go hand in hand with the development of new industrial projects in Northern Norway.

A good indicator of an effective transport system is the degree of collaboration between cargo owners (industries) and logistics suppliers (transport companies) to find common transport solutions; however, every major industrial activity depends on a transportation system that responds to that industry's needs. As one of our informants stated, "the success of such endeavours depend on strategic location, alignment of industry needs with infrastructure development, and the collective pursuit of economic competitiveness, particularly in green corridors and sustainable transport solutions".¹⁹⁰ A partnership overseeing industrial development and transport needs should be established at an early stage between the private sector, the state government, the local municipalities, and relevant interest groups.

7.2 Improving maritime transport and logistics services

7.2.1 Inefficiencies and escalating costs of large number of small seaports

Many of our informants shared a common view that the large number of ports in Northern Norway, each with their own infrastructure, is economically unsustainable and is currently hampering the deployment of efficient and standardized logistical practices, leading to inefficiencies and escalating costs.¹⁹¹ Stakeholders recognized the need to streamline and consolidate operations to enhance economic and transport efficiency.

A government sponsored study published more than ten years ago analysing trends and developments in the freight transport sector in Norway concluded that the current port system was adequate and advised the government to maintain the existing number of ports.¹⁹² The conclusion stemmed from the recognition that reducing the number of ports could lead to increased door-to-door distribution costs outweighing any savings from economies of scale, owing to longer average distances to and from the ports. Additionally, it was argued that decreasing the number of ports might grant the remaining ports extra power in the market due

¹⁸⁹ The Government's Action Plan for Green Shipping.

¹⁹⁰ Informant BN17 (2023); Informant PA19 (2023).

¹⁹¹ Informant LS15 (2023).

¹⁹² EM Marskar et al., "NTP Godsanalyse delrapport 1: Kartlegging og problemforståelse," *Oslo: Avinor, Jernbaneverket, Kystverket, Statens Vegvesen* (2015).

to their subsequently greater geographic monopoly, potentially diminishing their incentive to offer lower service fees to port users.

Ten years later our informants stressed the need for a more unified, collaborative effort among neighbouring municipalities to come up with more effective transport solutions and shared benefits. This includes moving away from local competition in port construction and services to cooperation and sharing of port infrastructure,¹⁹³ and municipalities working together to strengthen the regional transport network. Port authorities also recognize the need to better understand and cater to the needs of port users. Among our informants there was a call for knowledge sharing and collective action to achieve common goals, illustrating the perceived value of cooperative projects and unified approaches to addressing logistical challenges.¹⁹⁴

7.2.2 Improving cargo and logistics services at seaports

To meet the evolving demands of the logistics sector, it is crucial to improve various seaport services by upgrading cargo handling facilities, storage and warehousing, and power infrastructure.¹⁹⁵ Such upgrades are critical for maintaining competitiveness and ensuring that logistical supply chains operate efficiently.¹⁹⁶ More efficient cargo handling can substantially shorten a vessel's stay in port and reduce ship turnaround times, leading to improved land-sea transport efficiency. Several planned industrial projects and activities in Northern Norway require improved port infrastructure. Examples include Narvik, which is planning a new extension to the city with an improved airport and a new container terminal.¹⁹⁷ Mo i Rana is also undertaking several projects to enhance maritime and logistics capabilities and a new airport.¹⁹⁸ Bodø is upgrading its port infrastructure and constructing a new cargo terminal, and the Bodø Airport will be relocated to free up land for development close to the city centre. Bergen is also relocating the cargo port from the city centre at Dokken to a nearby location at Ågotnes by 2027.¹⁹⁹ The current location generates a large amount of traffic through an urban area, and the old seaport also occupies a prime land area ideally suited for urban development.²⁰⁰ Already-established businesses near the old port need to adapt to these changes while striving to enhance their operational efficiency and adopting low or zero-emission technologies in their operations.²⁰¹

¹⁹³ Informant PA17 (2023).

¹⁹⁴ Informant PA15 (2023).

¹⁹⁵ Informant CO21 (2023).

¹⁹⁶ Informant BN17 (2023); Informant LS23 (2023).

¹⁹⁷ Narvik Havn, "Nye Narvik Havn," updated 20.01.2023, 2023, accessed 08.11, 2025, <https://www.narvikhavn.no/eiendom-og-areal/arealplanlegging/nye-narvik-havn/>. ForteNarvik, "Her bygges Narviks nye bydel," updated 06.07.2018, 2018, accessed 08.11, 2025, <https://fortenarvik.no/?p=741>.; Statens Vegvesen, "Ny adkomst til lufthavna på Evenes et sikret.," updated n.d., 2024, accessed 08.11, 2025, <https://www.vegvesen.no/vegprosjekter/europaveg/e10flyplasskryssetevenes/nyhetsarkiv/penger-til-e10-flyplasskrysset/>.

¹⁹⁸ Informant BN17 (2023); Informant CO21 (2023); Informant PA22 (2023).

¹⁹⁹ BergenHavn, "The freight port - Regional freight hub," updated n.d., n.d., accessed 08.11, 2025, <https://www.bergenhavn.no/en/docks/freight-harbor>.

²⁰⁰ Andreas Breivik Ormevik, Stein Ove Erikstad, and Kjetil Fagerholt, "Evaluating port development strategies for a modal shift: a Norwegian case study" (paper presented at the International Conference on Computational Logistics, 2020).

²⁰¹ Informant PA19 (2023).

7.2.3 Cargo collaboration and cargo consolidation

As discussed earlier, Northern Norway is faced with imbalance in general cargo (break-bulk) and containerized cargo, as more freight is transported north along the coast than is transported back south on the return voyage. The balance of the cargo volumes transported in each direction between Northern and Southern Norway determines the financial viability of the transportation system.²⁰² The current imbalance makes it difficult to profitably transport cargo by sea without government subsidies. The low volume of cargo transported by coastal shipping²⁰³ could be addressed by improving logistics services through enhanced cooperation between shipping companies. Collaborative efforts between logistics suppliers to optimize cargo capacity by sharing cargo space onboard vessels and consequently save fuel by reducing the number of half-empty vessels, could increase sustainability and reduce the environmental impacts of shipping.²⁰⁴

Consolidation of cargo from several smaller ports to a central port location would further promote logistical efficiency. Combining small shipments (for example, several pallets) from geographically dispersed suppliers into a single, larger shipment of containers optimizes space onboard the vessel and reduces shipping costs. This strategy makes transportation more economically viable, particularly for long-distance transport and in regions with lower shipping volumes like Northern Norway. The combined cargo could have either domestic or international destinations and could offer significant advantages to smaller exporters.

A digitized online information and booking system for available transport options was also suggested by our informants.²⁰⁵ Such an online system would make it possible for cargo owners to see which shipping companies provide transport and logistics services between several selected seaports, then compare transport capacity, how long the transport is scheduled to take, and total costs including shipping and port fees. The information could also include other alternative transport options beside sea transport. The cargo owner could then book the selected transport online. Online booking systems like this have been used in the aviation industry for several decades for booking flights between airports.

While a comprehensive, industry-wide system like Amadeus does not currently exist for maritime cargo, relevant actors are developing solutions to improve transparency and efficiency. For instance, Norlines is working on an internal project aimed at providing customers with better visibility into available ship capacity, arrival times, and prices, potentially in collaboration with the Norwegian Coastal Administration (Kystverket).²⁰⁶ Similarly, the port of Tromsø (Grøtsund) is involved in the “Sea in the North” (“Hav i nord”) initiative, which seeks to create an open data platform to consolidate information and improve communication between the numerous, often poorly integrated, systems currently used to manage vessel calls in Norwegian ports.²⁰⁷

²⁰² Informant GA11(2022).

²⁰³ Informant LS2 (2022); Informant PA5 (2022).

²⁰⁴ Informant CO25 (2023).

²⁰⁵ Informant LS15 (2023); Informant PA23 (2024).

²⁰⁶ Informant LS15 (2023).

²⁰⁷ Informant PA23 (2024).

7.2.4 Is maritime transport of perishable goods possible?

Transport of chilled fresh fish (including live king crabs) and other perishable goods on ships between Northern Norway and the European market is not currently feasible because the long duration of the voyage impacts the freshness of the produce. Sea transport of perishable goods could be encouraged by the development of a more advanced cooling system (supercooling) and vacuum packaging to keep produce fresh for much longer than is possible today. For frozen, salted, dried, or smoked fish, transport by sea is the ideal mode of transport. As mentioned earlier, the strong reliance of the aquaculture industry on road transport has provided limited incentives to increase fishing ports' capacity to transport more cargo by sea. The seafood industry could also promote the consumption of frozen fish rather than chilled fresh fish to customers on the grounds that it uses a more environmentally friendly means of transport, and that the quality of frozen fish is just as good as that of fresh fish.²⁰⁸

As an informant stated, “we must think more sustainably... there must be a way to correct this by imposing higher fees on land transport, making it harder for importers and exporters to simply say that their suppliers are responsible for transport, and then it comes by truck from Europe all the way to Nordkjosbotn, Tromsø, or Hammerfest. The government should impose such fees on road and rail transport, prompting northern customers to take a stand on transport issues. Sustainability and CO2 emissions should perhaps rank higher on the list when customers in the north request transport services”.²⁰⁹

7.2.5 Increasing the reliability of maritime transport services

Coastal shipping services must become more reliable to better serve industries in Northern Norway. Several of our informants pointed out that the lack of fixed time schedules for coastal shipping, and to lesser extent also for rail, impacts industrial production. Shipping companies therefore need to provide regular transport services before they see an increase in the amount of goods transported by sea.²¹⁰ As discussed above, establishing a real-time logistical information system and synchronizing the schedules of different activities and modes of transport (sea transport, ferries, border crossings, and railways) will lead to more optimized transportation of cargo and passengers, whereas lack of coordination between different modes commonly leads to bottlenecks and long delays. An informant also suggested that “perhaps one should accept that goods and products not being delivered every day, in exchange for strengthening sustainability goals through more reliable and efficient transport. This would allow transport of larger volumes with weekly services to few key ports in Northern Norway”.²¹¹

7.2.6 Reducing maritime transportation costs

Key maritime stakeholders, in particular port directors due to their significant influence, can play a vital role in facilitating increased sea transport and attracting more volumes by lowering port fees. This is particularly the case at smaller ports where this concept is yet to be

²⁰⁸ Informant LS27 (2024).

²⁰⁹ Informant LS27 (2024).

²¹⁰ Informant SY3 (2022); Informant CO9 (2022).

²¹¹ Informant LS27 (2024).

fully embraced.²¹² Cost reductions can also be achieved by improving ports' efficiency.²¹³ Similarly, the price of transport services is another key decision factor for cargo owners²¹⁴ which could be reduced by optimization of the transport system. "If including more sea transport offers financial gains, then it will be a preferred solution".²¹⁵ Industries producing large volumes of commodities (oil, LNG, ore) and processed industrial products (metals, alloys, cement, fertilizers) already use sea transport as their main mode of transport. The current sea transport of high-volume goods is much more cost effective than transport by roads and rail.²¹⁶ A new business case could be the sea transport of low-volume but high-value goods which would first require some technical pretreatment to prevent damage to the goods during long periods of transportation.²¹⁷ Another suggestion is increasing taxes and fees for trailer trucks on long-distance journeys, to favour sea transport.

7.2.7 Improving multimodal transport integration

Several domestic and foreign shipping companies provide maritime transport and logistics services in Northern Norway (see Section 5). It is increasingly important for larger seaports to develop into more multimodal logistics and service hubs, serving the needs of a wider geographical region. Such development is vital for enhancing the capacity, predictability, and overall quality of the supply chain.²¹⁸ These main hubs should provide seamless sea-rail-road connections, essential for increasing logistics resilience, and be capable of managing possible disruptions within one of the transport modes.²¹⁹ The limitations of the current road transportation system during the winter create pressure from industry to find alternative logistics solutions based on sea or rail transport.²²⁰

Both Bodø and Tromsø are future multimodal logistics and service hubs. Establishing a commercial sea route between the two port cities would further strengthen the coastal maritime transportation system and the strategic role of the two cities in Northern Norway.²²¹ Daily ship departures would be synchronized with the arrival and departure schedule of the Nordland Railway, delivering containers to Bodø from the Oslo region. Today, containers delivered from Bodø to Tromsø are being transported by trailer trucks. An alternative option being discussed is to extend the railway from Fauske to Tromsø.

Another possibility is to transport containerized goods from European hubs like Rotterdam directly to Northern Norway, instead of transporting them first to the Oslo region and then onwards by road or railway to Western and Northern Norway.²²² Today most goods

²¹² Informant CO21 (2023).

²¹³ Informant PA6 (2022).

²¹⁴ Informant LS2 (2022).

²¹⁵ Informant LS12 (2022); Informant SY3 (2022); Informant PA15 (2023); Informant PA16 (2023).

²¹⁶ Informant PA13 (2022).

²¹⁷ Informant BN10 (2022).

²¹⁸ Informant LS14 (2023); Informant LS15 (2023).

²¹⁹ Informant LS23 (2023).

²²⁰ Informant BN10 (2022).

²²¹ ASKO, "Green transport corridor between North and South Norway - Green Shipping Programme," grontskipsfartsprogram.no, updated 06.05.2025, 2024, accessed 08.11, 2025, <https://greenshippingprogramme.com/pilot/green-transport-corridor-between-north-and-south-norway/>.

²²² ASKO, "Logistics 2030: Realizing sustainable maritime transport," grontskipsfartsprogram.no, updated 01.10.2024, 2020, accessed 08.11, 2025, <https://grontskipsfartsprogram.no/pilotprosjekt/logistikk-2030-realisering-av-en-baerekraftig-logistikk-og-terminalstruktur-basert-pa-sjotransport/>.

transported from Europe pass through Oslo, regardless of their final destination in Norway. To increase transport efficiency and reduce storage costs, cross-docking would need to take place at the European container hub,²²³ and forwarding services at regional ports in Northern Norway used to make final deliveries to customers.

Intermodal land-to-sea transport can also be established for the last-mile distribution of goods to customers.²²⁴ This could benefit smaller industries and communities located close to a larger seaport (which would initially receive all the cargo) within a region characterized by a landscape of fjords and abundant islands, providing possibilities for extensive maritime shortcuts. A significant portion of the delivery could be serviced by smaller electric/hybrid ships rather than trucks.

7.3 Strengthening cross-border cooperation and connectivity

7.3.1 Strategic importance of maritime infrastructure in Northern Norway

As emphasized by one of our informants, “It is extremely important for our total preparedness that we have ports that are in operational condition along the world's longest coastline”.²²⁵ Northern Norway is a region of major geopolitical significance, as outlined in Norway’s High North Policy and other official documents.²²⁶ The Norwegian government plans to strengthen its armed forces in Northern Norway.²²⁷ This includes allocating public funds for the construction of a new port for the Norwegian Navy on the Trondenes Peninsula near Harstad in Troms, and the construction of additional buildings and facilities at the Ramsund Naval Station in Troms, which is the Navy’s main base in Northern Norway.²²⁸ The station’s port facility will be expanded and new buildings will be constructed to facilitate maintenance and operation, making the station a logistical hub for Norwegian and allied navy vessels. As Norway’s Minister of Defence stated in April 2024, “Having control of what is happening in our ocean areas is perhaps Norway’s most important task within NATO”.²²⁹

Construction of floating port infrastructure such as breakwaters and terminals is a quick way to extend existing port infrastructure or construct new infrastructure. This can be done by connecting several large modular concrete-caissons together and anchoring the large floating structure to the seabed. This could, for example, allow larger vessels with greater draft to dock

²²³ Cross-docking facilities immediately sort cargo based on destination, route, product type or customer order. Products from different suppliers are matched to specific customer orders or grouped for the same delivery destination using advanced logistical systems and software. The entire process relies on precision, coordination and real-time information. Advanced technologies such as barcoding, radio-frequency identification (RFID) and inventory management tools play a key role in optimizing workflow and ensuring accurate order processing.

²²⁴ Andreas Breivik Ormevik, Kjetil Fagerholt, and Stein Ove Erikstad, "Evaluating the potential for modal shift in last-mile cargo distribution through stochastic programming," *Maritime Transport Research* 1 (2020).

²²⁵ Informant LS18 (2024).

²²⁶ Regjeringen, Norway in the High North – Arctic policy for a new reality, (2025).

²²⁷ Regjeringen, Forsvarsløftet – for Norges trygghet Langtidsplan for forsvarssektoren 2025–2036, (2024).

²²⁸ Astri Edvardsen and Birgitte Annie Hansen, "The Norwegian Government To Strengthen Its Armed Forces Along the Coast," *highnorthnews.com*, updated 22.03.2024, 2024, accessed 08.11, 2025, <https://www.highbnorthnews.com/en/norwegian-government-strengthen-its-armed-forces-along-coast>.

²²⁹ Astri Edvardsen, Hilde-Gunn Bye, and Birgitte Annie Hansen, "Norway's Response to the Gravity: Four Main Measures to Strengthen the Armed Forces," *highnorthnews.com*, updated 12.04.2024, 2024, accessed 08.11, 2025, <https://www.highbnorthnews.com/en/norways-response-gravity-four-main-measures-strengthen-armed-forces>.

at the terminals.²³⁰ As discussed earlier, port construction in Norway is very difficult and expensive due to hard bedrock, elevated topography, and lack of level land for port and industrial activities. Floating port infrastructure, on the other hand, could be established at any strategic location along the coast. Such floating structures are easier to construct and cheaper than land-based infrastructure. The modular caissons can be mass produced at an industrial site and then shipped and reassembled at a given coastal location.

The floating terminals, extending further seaward but still connected to the mainland, would allow cargo to be loaded and unloaded and transported to and from the mainland. Floating platforms can also be used for storage and other port activities. The development of logistics clusters will also be of major strategic importance (see below). The infrastructure within the logistics clusters is intended to maximize regional multimodal connectivity, enhance mobility, and provide additional transport options through corridors which connect to other logistics clusters, forming a strategic transport network.

7.3.2 Nordic cooperation on transport infrastructure development

In January 2025 Denmark, Norway, Sweden and Finland, now all members of NATO, signed an agreement on Nordic Transport Preparedness Cooperation. This is an agreement to share resources to improve transport infrastructure and increase both civilian and military mobility. The hope is that the newly established cooperation arrangement will enhance Nordic security and resilience and create a more robust joint transportation system.

The transport systems of Northern Norway, Northern Sweden and Northern Finland are interconnected. Road and railway corridors extend across national borders and support freight and passenger transport within the Nordic North region. Though most of the corridors follow a north-south direction, others have a more east-west direction. The corridors extend all the way from Norwegian seaports bordering the Norwegian and Barents Seas to seaports in the Bay of Bothnia in the Baltic Sea (*Table 10*).²³¹ These corridors are likely to be of increasing geopolitical importance in the years to come. Sweden and Finland have also engaged in long-standing collaboration to provide maritime services in the Bay of Bothnia, including joint management of their icebreaker fleets.

The need to strengthen cross-border infrastructure in the Nordic North is caused by heightened security risks in Europe, fuelled by geopolitical tensions and instability in the aftermath of the Russian invasion of Ukraine in February 2022. It is a common Nordic objective to maintain the security of supplies within the region and support the continued exploitation of natural resources and associated industrial activities. Improved transport infrastructure should also allow increased military mobility and improved civilian-military preparedness. The ability to move military reinforcements as quickly as possible through the Nordic North region from the west to the east is now of strategic importance. The port of Narvik and the Ofoten/Iron Ore railway are considered of particular importance for the movement of allied forces, but several other strategic transport corridors also need to be established.

²³⁰ See Report 3 of the BEAR Project.

²³¹ The-Barents-Euro-Arctic-Council, *Joint Barents Transport Plan*. It included national transport objectives of Norway, Sweden, Finland, and Russia in the Barents Region.

The Norwegian government has recently assessed the conditions of its land-based transport infrastructure in Northern Norway.²³² The transport system is far from optimal and requires substantial upgrades and new infrastructure investments. The same applies to large parts of the Swedish and Finnish road and rail systems in the region. The construction of new transport infrastructure will take several years or even decades to complete and will require extensive investments. An important first step for the three countries is to agree to a joint regional transport plan and prioritize infrastructure investments.²³³ Earlier cooperation on a similar joint plan for the Barents Region was begun by the Barents Euro-Arctic Council (BEAC), but the plan was never finalized. A draft version was published in 2019.²³⁴

Table 10: Transport corridors between Norwegian ports bordering the Norwegian and Barents Seas and Swedish and Finnish ports in the Bay of Bothnia in the Baltic Sea.

Transport corridors	Road	Rail
Mosjøen-Kirkenes	E6 North-South (1684 km)	Nordland and Meråker
Mo i Rana-Umeå	E12 (492 km)	Storuman-Hällnäs (167 km) ²³⁵
Bodø-Skelleftå	95, 77, E6, 80 (379 km)	Nordland (140 km)
Narvik-Luleå	E10 (520 km)	Ofoten/Iron Ore (473 km)
Tromsø-Haparanda/Tornio	E8/99, E6 (620 km)	Tornio-Kolari (183 km) ²³⁶
Alta-Palojoensuu	E89, 93 (235 km)	
Kirkenes-Rovaniemi-Kemi	E75, 971, 893 (702 km)	

7.3.3 Establishing regional transport and logistics clusters

The maritime transportation system in Northern Norway could be divided up into separate transport and logistics clusters. A logistics cluster can be defined as a region with a high concentration of logistics activities relative to its total population or the size of its economy.²³⁷ Logistics clusters are often seen as the engines behind regional socio-economic development, because they attract a variety of economic activities and are increasingly measured in terms of added value rather than merely throughput.²³⁸ A logistics cluster's core should be formed by a limited number of logistics centres (such as larger seaports). These centres should be connected to multimodal transport networks and freight-generated industries and could also be connected with transport and industrial infrastructure in neighbouring countries.²³⁹

In Norway a disproportionate amount of money has been spent on developing several ports located close to each other geographically, requiring the same type of infrastructure, and

²³² Konseptvalgutredning (KVU), see note 5.

²³³ Statens-Vegvesen, "About Platform North," updated n.d., n.d., accessed 08.11, 2025, <https://www.vegvesen.no/om-oss/om-organisasjonen/internasjonalt-arbeid/platform-north/about-platform-north/>.

²³⁴ The-Barents-Euro-Arctic-Council, see note 231.

²³⁵ The Storuman-Hällnäs railway crosses the E12.

²³⁶ The Tornio-Kolari railway crosses E8.

²³⁷ Yossi Sheffi, *Logistics clusters: delivering value and driving growth* (MIT press, 2012).

²³⁸ Larissa M van der Lugt and Peter W de Langen, "The changing role of ports as locations for logistics activities," *Journal of International Logistics and Trade* 3, no. 2 (2005).

²³⁹ Luis C Blancas et al., "Competing with Logistics Clusters: Vignettes from the International Experience," (2022).

offering the same kind of port services.²⁴⁰ This also requires shipping companies to call at several ports, transporting low cargo volume at each port at a high cost per unit volume. Greater cooperation between neighbouring ports and some merger of ports would be more cost effective. Consolidation of cargo from several small ports and transport by smaller vessels to the main seaport (the centre) would further promote logistical efficiency.

Clusters of companies in the same geographical region (e.g., industrial parks) and trade integration can significantly enable technological upgrading through an increase in productivity resulting from better allocation of resources.²⁴¹ This includes not only transportation infrastructure but also reliable power infrastructure. Cargo transport between two main seaports representing two different logistics clusters would further increase cargo throughput; this is the case for the suggested container or ro-ro services between Bodø and Tromsø.²⁴²

A future strategic approach might involve fewer ports within each logistics cluster, but with increased industrial activity and cargo volume at the main port to ensure profitability and sustainability. Several port authorities need to collaborate and collectively share port infrastructure within the logistics cluster and cooperate to manage ship traffic. Standard containers would be used whenever possible to facilitate transfers between different modes of transport.²⁴³

The development of logistics clusters is based on market and demand considerations. It is therefore vital that the private sector plays a role through public-private partnerships with local and national governments, as this will ensure synergy and commercial cooperation. As previously discussed, what is envisioned is a regional governance structure which includes members of local municipalities and key logistics and industrial actors but is led by the state government. Each logistics cluster would therefore be governed by a single management organization. Such a management structure could better optimize the use of resources within each logistics cluster and therefore maximize each region's full potential, increasing government investments in port infrastructure based on demand and the long-term development of the transport and logistics system.

This should include specializing some of the ports within the logistics cluster to provide different port services, based on certain types of industries and cargoes. Larger vessels will only call at the main hub within each logistics cluster. This will allow improved economies of scale and lower transportation costs. A new logistics infrastructure will support new industrial activities within each region with access to international markets.

Increased partnership between regional maritime stakeholders and a logistics cluster's management organization, which will share responsibilities to optimize the transport system, will lead to increased public funding for future maritime infrastructure development. As previously stated, the government has been reluctant to invest in maritime infrastructure at

²⁴⁰ Morten Svindland, Jason Monios, and Harald M Hjelle, "Port rationalization and the evolution of regional port systems: the case of Norway," *Maritime Policy & Management* 46, no. 5 (2019).

²⁴¹ JD Nkurunziza, "Escaping from the commodity dependence trap through technology and innovation," *United Nations* (2021).

²⁴² Informant GA11 (2022).

²⁴³ Informant PA16 (2023).

ports with low cargo volumes, which may require continued subsidy assistance for several years to sustain port operations.²⁴⁴

8. Conclusion

This report analyses the complexities of Northern Norway's transport system. The central objectives of the study were to identify the challenges that hinder the development of maritime transport in the region and propose strategies to boost its share of overall cargo flow. The research aims to provide a clear, evidence-based roadmap for creating an effective, sustainable, and economically viable transport network that can support the region's economic growth. The analysis reveals that the transportation system in Northern Norway is under considerable pressure. Relevant attributes of the region include its peripheral geography, severe climate, and the inherent challenges of serving a sparsely populated area. While Northern Norway's maritime sector is historically and economically crucial, it is in a weak position compared with its road and rail counterparts. This is because of its aging fleet, fragmented and decentralized port infrastructure, and long-term underfunding.

Key findings from the investigation into the current state of transport, maritime services, and their challenges in Northern Norway include:

1. *Policy vs. reality:* There is an inconsistency between national transport goals and financial priorities. Despite national policies advocating a modal shift to sea freight, maritime transport receives much less state funding compared with road and rail, leading to a vicious cycle in which maritime transport undergoes decline and loss of competitiveness. The maritime sector receives a small share of the national transport budget (approximately 3%), while the vast majority is directed towards road and rail projects. Chronic underfunding means the maritime sector lacks resources for infrastructure modernization, fleet renewal, and technological advancement, which makes maritime transport less competitive than road transport.
2. *Systemic inefficiencies:* The performance of maritime logistics is diminished by operational shortcomings. These include low and imbalanced cargo volumes (particularly in north-south coastal shipping), a lack of fixed and reliable shipping schedules, and underdeveloped intermodal connections between sea, rail, and road transport. These factors make sea transport an unpredictable and often unviable option for many cargo owners.
3. *Inadequate infrastructure and fleet:* The shipping fleet in Northern Norway is getting old. Many vessels operate inefficiently and struggle to meet the demands of modern logistics, such as the requirements of container transport. Seaports suffer from a decentralized investment approach, leading to small, under-equipped seaports. Such seaports are typically characterized by limited capacity, inadequate infrastructure, and uncompetitive port fee structures. These drawbacks make it difficult for them to attract sufficient customers and cargo volumes.
4. *Barriers to competitiveness:* For time-sensitive and perishable goods, such as fresh seafood, sea transport is largely uncompetitive compared to road, rail, and air transport due to long

²⁴⁴ Informant PA21 (2023).

transit times. In addition, certain negative attributes undermine the economic viability of maritime logistics. These include high port costs, a lack of collaboration among stakeholders to consolidate cargo, and the absence of sufficient government incentives for cargo owners to move more cargo from road to sea.

5. Geopolitical importance vs. vulnerability: While the strategic importance of Northern Norway has increased due to NATO expansion and the Total Defence concept, existing maritime infrastructure is insufficient to support military mobility and security of supply. The fragmented port structure thus poses a risk to regional preparedness.

Limitations of the study. While this report provides a comprehensive analysis of the maritime logistics system in Northern Norway, several limitations should be acknowledged when interpreting the findings. First, the quantitative analysis of port calls relies primarily on data from 2021. While the rationale for using this dataset and its validity are discussed in Section 2, it must be acknowledged that the data do not precisely reflect the current state of maritime logistics in Northern Norway. Second, Northern Norway is characterized by a substantial volume of small-scale vessel activity. Performing a comprehensive study of their service networks is unfeasible. However, excluding vessels under 24 meters misses the “capillary” logistics network that serves the smallest coastal communities and aquaculture facilities. Consequently, this could potentially lead to an incomplete picture of the region's total maritime dependency.

9. Recommendations

Based on the conclusions provided above, this section presents a set of strategic recommendations designed to guide policymakers, industry stakeholders, and infrastructure planners towards creating a more connected, efficient, and cost-effective maritime transportation system in Northern Norway:

1. Establish stronger state oversight and governance: The central government should play a more significant role in the organization and management of seaports to safeguard national interests, including security of supply and civilian-military preparedness. A model of state ownership of ports is needed to facilitate a consistent national strategy; internal competition between neighbouring municipalities should be ended; Total Defence and societal security should be strengthened; and infrastructure investments should be economically rational and strategically aligned.

2. Prioritize and increase maritime investments: State funding for critical port and fairway infrastructure should be increased through the National Transport Plan. The current allocation is insufficient to address the large maintenance backlog, modernize facilities, and support the development of a maritime transport system. The government should enable major seaports to meet future demands by helping them attract long-term private investment. Targeted state incentives for the renewal of the domestic coastal fleet are essential to accelerate the transition to a modern, low- and zero-emission coastal fleet. These schemes will be especially beneficial for smaller, family-owned shipping companies trying to accumulate initial funding.

3. Foster public-private partnerships: Public and private stakeholders should work together to address the weaknesses and challenges of the current maritime transportation system. A more

unified, collaborative effort among neighbouring municipalities will reduce internal friction, enhance the efficiency of transport solutions, and produce shared benefits, facilitating the attraction of private capital for collaboration with the public sector.

4. Consolidate logistics and improve service reliability: Cargo from geographically dispersed suppliers should be consolidated at major regional ports for further maritime or land transport to create the critical mass needed for efficient, regular services. The purpose of these collaborative efforts between logistics suppliers is to optimize cargo capacity by sharing the cargo space onboard vessels. Shipping companies with consolidated cargo should adopt a “service-first” approach by committing to reliable, fixed-time schedules to build market confidence and provide a credible alternative to road transport.

5. Develop specialized seaports: Seaports tailored to specific industries and specific types of cargo have the potential to boost efficiency and economic resilience.

6. Enhance multimodal logistics: Major ports should be developed into modern, efficient multimodal terminals that streamline the transfer of freight between ship, rail, and road. This requires investment in intermodal facilities, modern handling equipment, and digital information systems in order to reduce bottlenecks (such as traffic congestion) and increase the predictability of the entire supply chain.

7. Strengthen cross-border and regional collaboration: Cooperation should be fostered between Norway, Sweden, and Finland to improve transport connectivity, harmonize regulations and develop integrated cross-border transport corridors. By working together, these nations can create more efficient, resilient, and integrated transport networks in the North. This joint effort would support industries in the region and enhance both economic efficiency and civilian-military preparedness and security of supplies.

8. Strengthening technological innovation: To modernize the maritime sector and enhance its competitiveness, the government and industry must prioritize the deployment of advanced technologies. This includes incentivizing the adoption of “supercooling” and vacuum packaging to make sea transport of fresh seafood feasible; developing an online booking system to provide real-time visibility of cargo capacity to facilitate consolidation and reduce booking friction; and utilizing innovative infrastructure solutions, such as floating ports, to rapidly and flexibly expand capacity for both civilian and military needs.