Vastaanottaja

Kainuun Liitto

Asiakirjatyyppi

Raportti

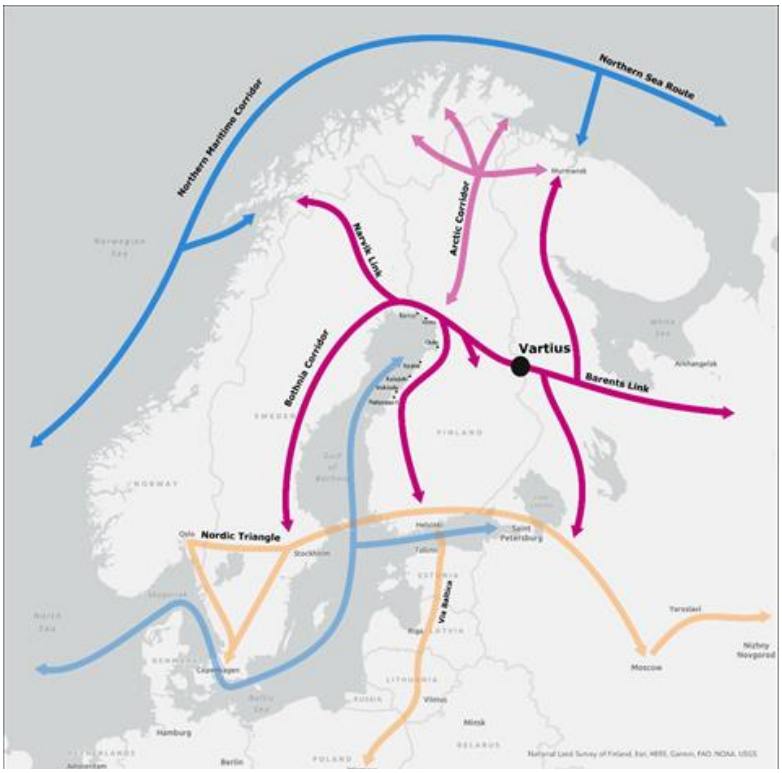
Päivämäärä

5.8.2021

Northern Axis

Barents Link

DIVERSIFYING FUNCTIONS OF VARTIUS/LYTTA BORDER CROSSING



REGIONAL COUNCIL OF KAINUU

Kolarctic CBC | CROSS-BORDER COOPERATION

Projekti	**Vartiuksen monipuolistuva rajaliikenne**
Projekti nro	**1510063266**
Vastaanottaja	**Kainuun Liitto**
Asiakirjatyyppi	**[Teksti]**
Versio	**[x]**
Päivämäärä	**dd/mm/yyyy**

Laatija	**Riku Ilomäki**
Tarkastaja	**[Nimi]**
Hyväksyjä	**[Nimi]**
Kuvaus	**Projektiraportti**

Ramboll
https://fi.ramboll.com

This publication has been produced with the assistance of the European Union. The contents of this publication are the sole responsibility of the project partners and can in no way be taken to reflect the views of the European Union.

Ramboll Finland Oy

Y-tunnus 0101197-5, ALV rek.
Kotipaikka Espoo

TABLE OF CONTENTS

1. INTRODUCTION

This report describes the current situation and future insights of the diversifying functions of Vartius/Lytta border crossing (VLBC). The study is ordered by the Regional Council of Kainuu that is a part of Norther Axis – Barents Link (NABL) project funded by the Kolarctic CBC program. The project aims at enhancing east-west transport connections in the northern axis and the Barents region. As a part of NABL project, this study offers detailed information especially of the development of road and rail traffic through VLBC.

The examination consists of three main themes, of which the first lists the goods that are either possible or not possible to import/export via VLBC. Secondly, the possibilities for launching container transport trough VLBC is evaluated. Thirdly the report presents potential transport time benefits of using VLBC instead of other border crossings for logistics flows on railroads between northern Scandinavia, Russia and far east. Methodologically, the study utilizes the existing literature and open-source information together with interviews with main stakeholders and selected case organizations.

The members of the steering group for the project are:

Petrova Tatiana, Kainuun Liitto
Schroderus Sanna, Kainuun Liitto
Nikola-Määttä Sanna, Kainuun Liitto
Arsenieva Anna, Kainuun Liitto
Sukuvaara Katja, Kainuun Liitto
Leinonen Markus, Kainuun Liitto
Huotari Jussi, Kainuun Liitto

The report is provided by Ramboll Finland Oy in a group consisting Project Manager Riku Ilomäki, Leading Expert Mirja Mutikainen, Special Advisor Timo Pohjosenperä and Trainee Lauri Veijalainen. The work is conducted between the 4th of May and the 5th of August 2021.

The project utilizes background information from multiple previous reports related to the transport and traffic development VLBC and the surrounding areas. The selected list of the reports are shown in Table 1. In addition, updated information was gathered through interviews with stakeholders such as customs officials, import/export companies and port operators.

Table 1. Selected list of previous related reports

Report name	Year	Orderer(s)	Maker(s)	Available (link)
LOGOKA: Statistical overview of transport & economy in the project region	2021	Karelia CBC -ohjelma	LOGOKA-hanke, Oulun yliopisto	https://kareliacbc.fi/fi/logokan-raportti-saatavilla-suomen-ja-venajan-valisesta-kaupasta-ja-liikennemaarista
Barents Region Transport and logistics	2021	Kainuun Liitto	WSP	https://kainuunliitto.fi/assets/uploads/2021/06/Barents_case_studies_report_tiny.pdf
JOINT BARENTS TRANSPORT PLAN	2019	Barents Euro-Arctic Transport Area (BEATA)	BEATA & ÅF Infraplan	https://www.barentsinfo.fi/beac/docs/JBTP2019_MAIN_REPORT_190910.pdf
Suomen satamien takamaatutkimus	2017	Liikennevirasto	Sito	https://julkaisut.vayla.fi/pdf8/lts_2017-55_suomen_satamien_web.pdf
Konttiliikenteen edellytykset Vartiuksen reitillä	2014	Kainuun liitto	Ramboll	https://docplayer.fi/3893320-Vartiuksen-konttiliiken-neselvitys.html
Barents Link – Kansainvälisen raideliikenteen markkinointi- ja kehittämiskonsepti Vartius-Kochkoma 2009	2009	Kainuun maakunta -kuntayhtymä	EP Logistics Oy	https://kainuunliitto.fi/assets/uploads/2020/09/B15-Barents-Link.-Kansainvalisen-raideliikenteen-markkinointi-ja-kehittamiskonsepri-Vartius-Kotshoma-2009.pdf
Vartiuksen kansainvälisen raja-aseman kehittämissuunnitelma 2008	2008	Barents Link Forum	Liidea Oy	https://kainuunliitto.fi/assets/uploads/2020/09/B13-Vartiuksen-kansainvalisen-raja-aseman-kehittamissuunnitelma_2008.pdf

2. VARTIUS IN BRIEF

VLBC is a border crossing between Finland and Russia, in the external border of EU. The Finnish side Vartius is located in Kuhmo, Kainuu region. In addition to passenger border crossing, both road and rail freight are enabled that makes VLBC the northernmost railway border station between Finland (EU) and Russia.

The import/export ratio of VLBC is unbalanced. In the year 2020 some 4.3 million tons were transported from Russia via VLBC (including the transit traffic), whilst the border crossing was used for only 0,2 million tons for export from Finland. Majority of the freight is iron ore concentrate that is transported on trains from Kostomuksha to Port of Kokkola where the material is further shipped into the international markets.

Figure 1: Vartius and main corridors (Source: Ramboll 2021)

Road transportations via VLBC are consisted of 30-75 trucks daily carrying mainly wood materials from Russia to Finland, and from Finland to Russia mostly paper, electronics components for processing and fish feed. Measured by weight, the road freight from Russia was (year 2020) 0,48 million tons from Russia and 0,017 million tons from Finland.

In addition to freight transport and passenger travelling between northern Finland and Russia, VLBC can serve railway and road connections from northern Sweden and Norway all the way to the far east and back. Via the multiple ports in northern Finland the connections can further be lengthened worldwide. Extensive usage of VLBC is, however, partly constrained by e.g. infrastructure, needed services and regulations.

3. FREIGHT TRANSPORT STUDY

This chapter analyses the circumstances for freight transport through VLBC. Firstly, the overview of the freight volumes are presented detailing road and railroad traffic. Secondly the key regulations and laws in EU, Finland and Russia affecting to exports and imports are listed. Thirdly the study forms a list of goods which are either possible or restricted to transport via VLBC. Fourthly the administrative hindrances for the moment are presented and analyzed also providing guidelines how to decrease the hindrances. Moreover, future import/export possibilities are studied in order to form information of the needed actions and infrastructure facilities in the

future with the expected volumes and frequencies in VLBC. Based on the analysis, the relevant goods and their volumes that could be exported / imported in addition to the current traffic are estimated. Finally, an assessment of the economic benefits for the related regions will be made for estimated additional traffic, especially for those products that are not currently exported/imported across the border.

3.1 Border crossing freight volumes Finland - Russia

Import and export

The aggregated monetary volumes in 2016 – 2020 for both import from Russia to Finland and export from Finland to Russia are illustrated in the next diagrams.

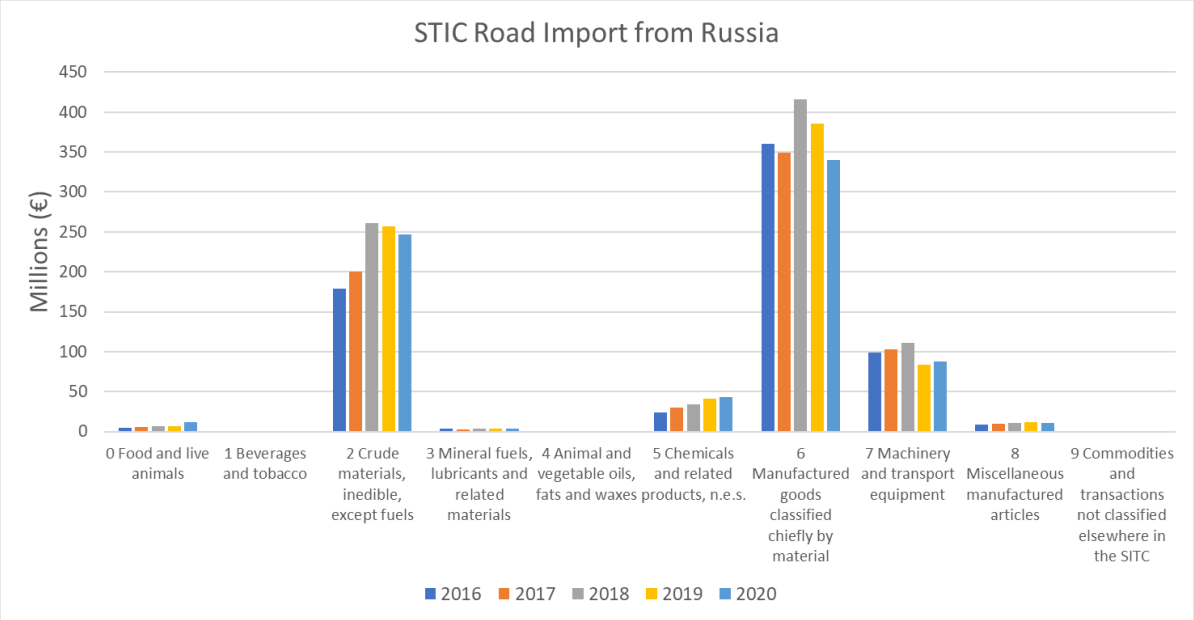


Figure 2: Value of import by road in 2016 – 2020 (Source: Finnish Customs)

Between 2016 – 2020 the main categories of goods (by value) imported from Russia to Finland by road were various manufactured goods, crude materials, and machines and vehicles.

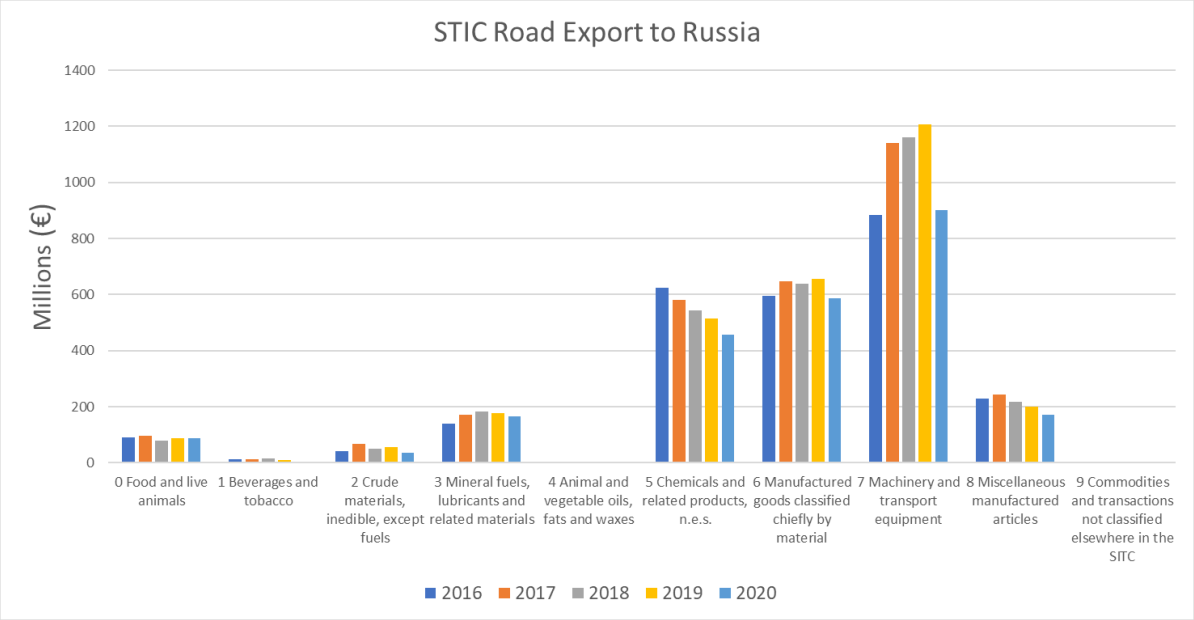


Figure 3: Value of export by road in 2016 – 2020 (Source: Finnish Customs)

Between 2016 – 2020 the main categories of goods (by value) exported from Finland to Russia by road were machines and vehicles, various manufactured goods and chemical products.

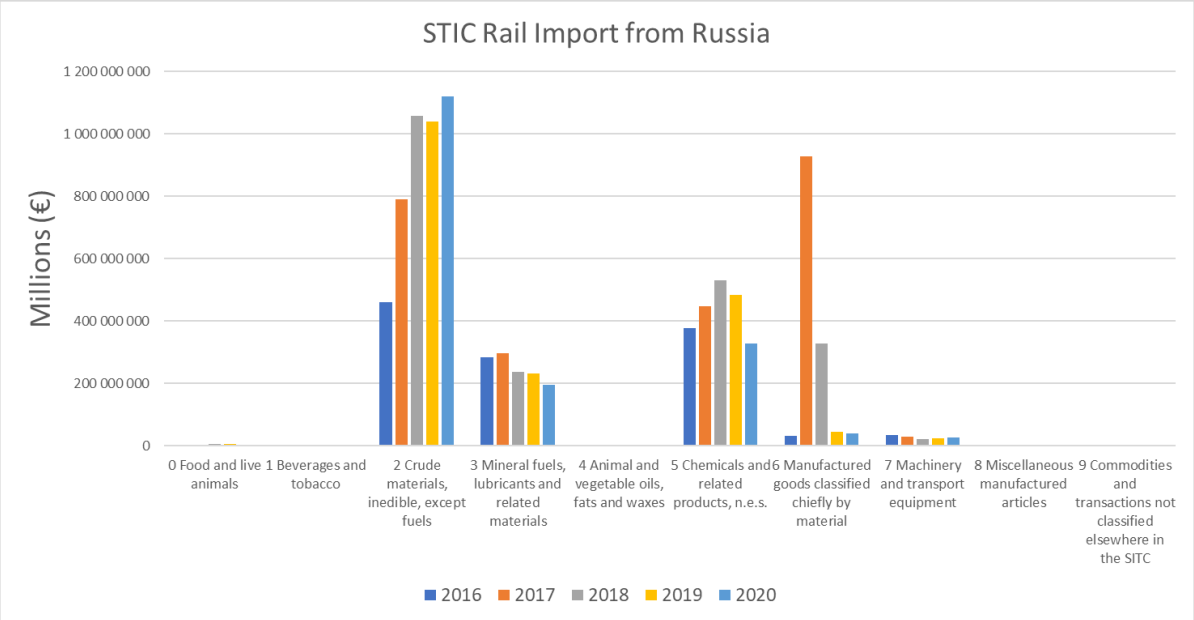


Figure 4: Value of import by rail in 2016 – 2020 (Source: Finnish Customs)

Between 2016 – 2020 the main categories of goods (by value) imported from Russia to Finland by rail were different crude materials, chemicals and mineral fuels and lubricants.

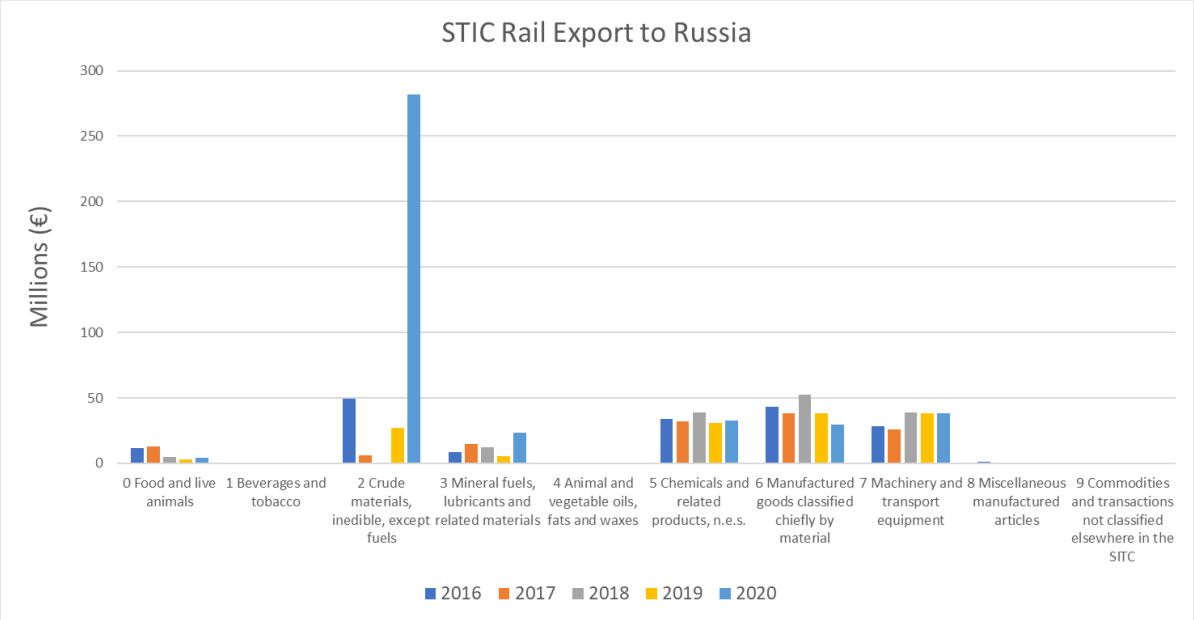


Figure 5: Value of export by rail in 2016 – 2020 (Source: Finnish Customs)

Between 2016 – 2020 the main categories of goods (by value) exported from Finland to Russia by rail were manufactured goods, machinery and vehicles and different chemicals. In the year 2020 the export of crude materials was notably increased.

Transito via VLBC

The volume of transito traffic from Kostomuksha to the Port of Kokkola is notable on the national level. Measured in transported tons, the railroad connection between Vartius and Oulu and further to Kokkola is one of the most heavily used railroads in Finland (Figure 6). Also compared on national level, the iron ore pellets via VLBC to Kokkola is the most notable transito traffic in Finland (Figure 7)

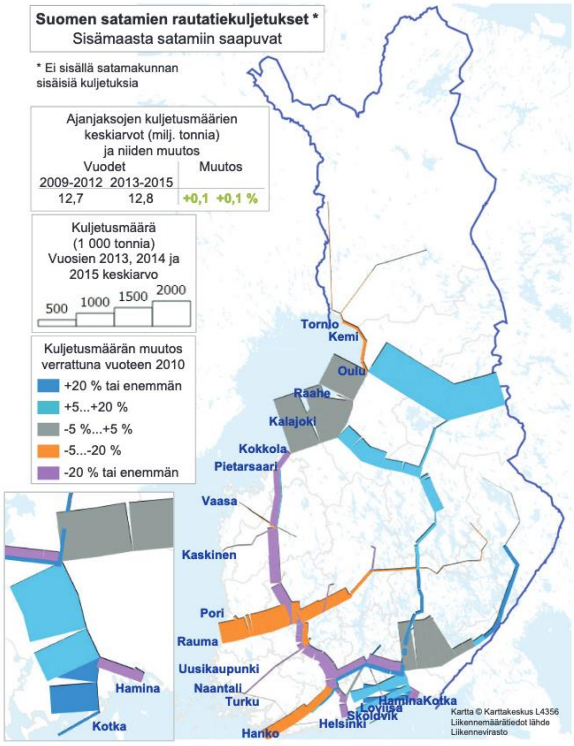


Figure 6: Railroad transports to the Finnish ports. Figure (source: Liikennevirasto – Satamien takamaatutkimus 2017)

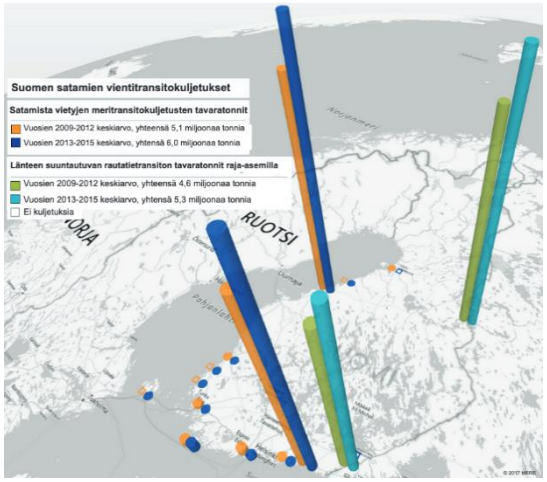


Figure 7: Export transito volumes from Finland (source: Liikennevirasto – Satamien takamaatutkimus 2017)

3.2 Current traffic volumes in Vartius/Lytta

General

The total amount of transported goods via VLBC in the year 2020 was 4.5 million tons.

Current transport flows through VLBC are strongly characterized by raw materials and products of mining sector and forestry. These form the highest transport volumes of both rail and road freight. Although rail freight is the most remarkable transport mode in volumes, road freight offers the needed availability and flexibility in transport frequencies and loading/unloading locations. Therefore, road transport system has vital role in offering the needed logistics solutions for the transport needs in the region.

Approximately 60 trucks pass VLBC daily (2019) varying between 30-75 trucks carrying goods to both directions. Export from Finland to Russia is mostly paper but also fish feed is transported, and electronics components that are sent to Kostomuksha for further production. Import from Russia by truck is mostly wood based materials such as wood chips, pellets, briquettes, timber, chemicals, building materials and saw dust, but also electronic parts (wiring systems for transportation industry) that come back to Finland after their production in Kostomuksha. Group of related logistics actors has been quite stabile. Occasional border crossings are few, traffic is mostly regular basis by regular actors.

Transito to ports

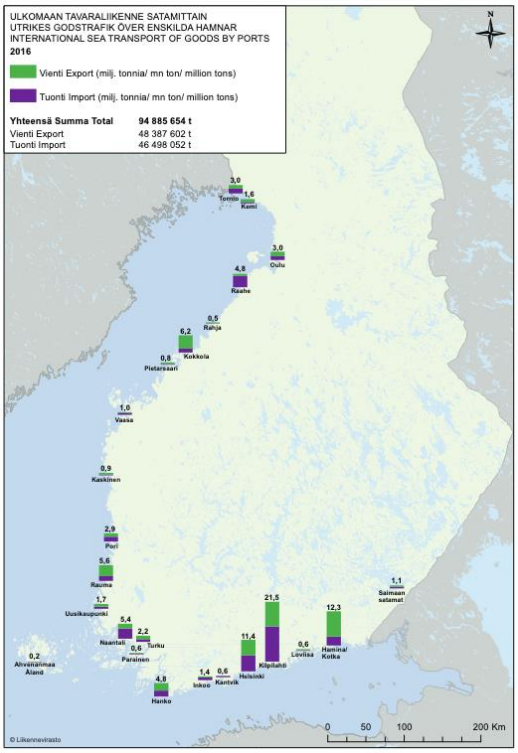


Figure 8:International sea transport of goods by ports 2016

As mentioned, iron ore pellet is the main freight transported by railroad via VLBC. 1-4 trains daily with average 60 wagons each are loaded from Kostomuksha mine and transported to Kokkola Deepwater Harbor where the material is further shipped to the international markets. Previously some of the wagons returned to Russia with aluminium oxide load but currently the trains run empty back to Kostomuksha.

In addition to Port of Kokkola, many other seaports have good connections to and from VLBC. In Finland from south to north: Port of Rahja (Kokkola), Port of Raahe, Port of Oulu, Port of Kemi and Port of Tornio are under 460 km range from VLBC via road or railroad.

The list of available seaports continues also with Swedish harbors: Port of Luleå, Port of Piteå and Port of Skellefteå and the connection to the deep-water Port of Narvik in Norway.

Each of the ports have certain features in their conditions, connections, and available services they offer. Therefore, the location is not the only factor when considering the best possible connections to or from VLBC.

Rail traffic

The following diagrams show the development of rail traffic from Russia to Finland via VLBC in 2016 -2021.

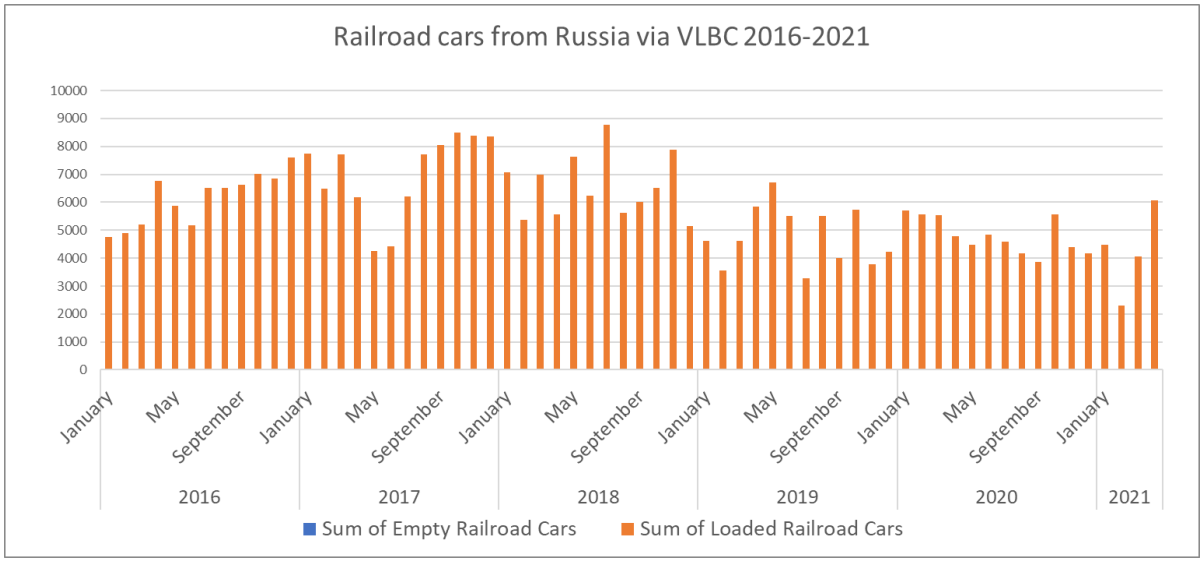


Figure 9: Monthly volumes of rail wagons in import traffic via VLBC (Source: Finnish Customs)

The number of freight wagons in import traffic varies typically between 4000 and 8000 loaded wagons per month (150 – 300 wagons per day).

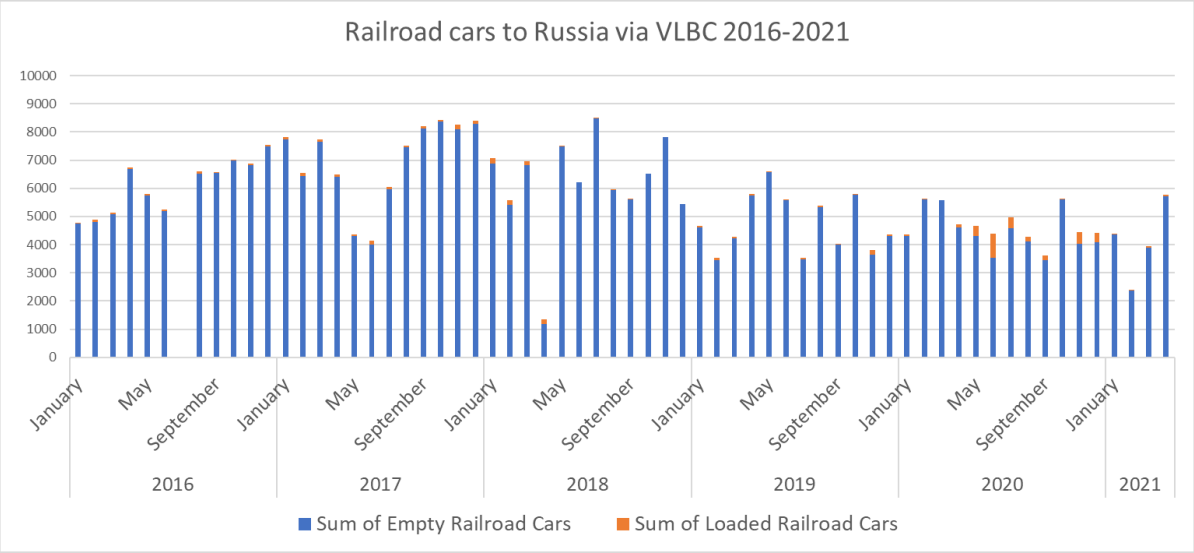


Figure 10: Monthly volumes of rail wagons in export traffic via VLBC (Source: Finnish Customs)

The number of freight wagons in export traffic varies typically between 4000 and 8000 wagons per month (150 – 300 wagons per day). They are mostly empty wagons returning to Russia, occasionally there have been some export cargo in wagons.

Road traffic

The following diagrams illustrate the volumes of truck traffic via VLBC.

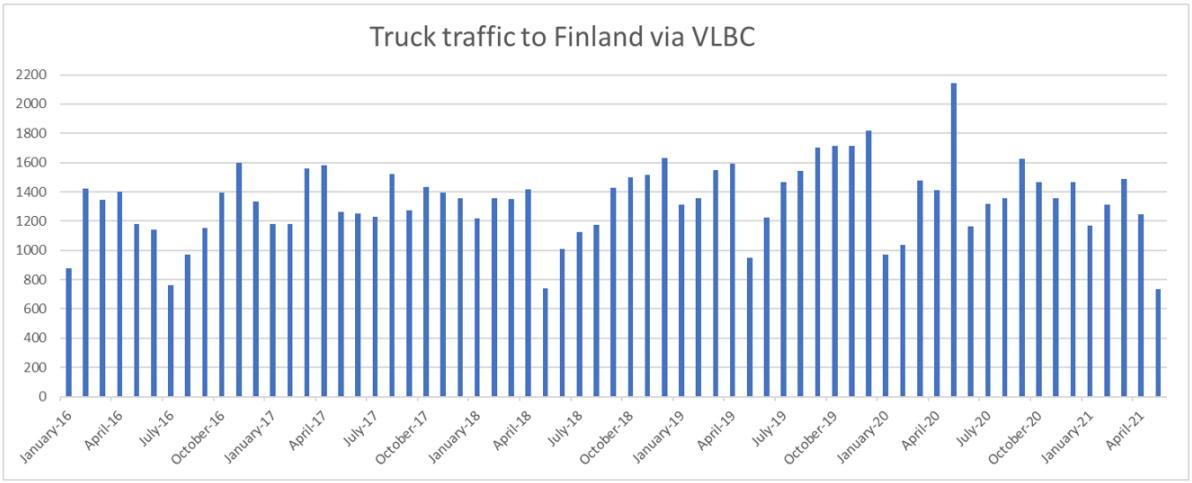


Figure 11: Monthly volumes of trucks from Russia to Finland (Source: Finnish Customs)

The number of trucks from Russia to Finland varies typically between 1000 and 1500 vehicles per month (30-50 vehicles per day).

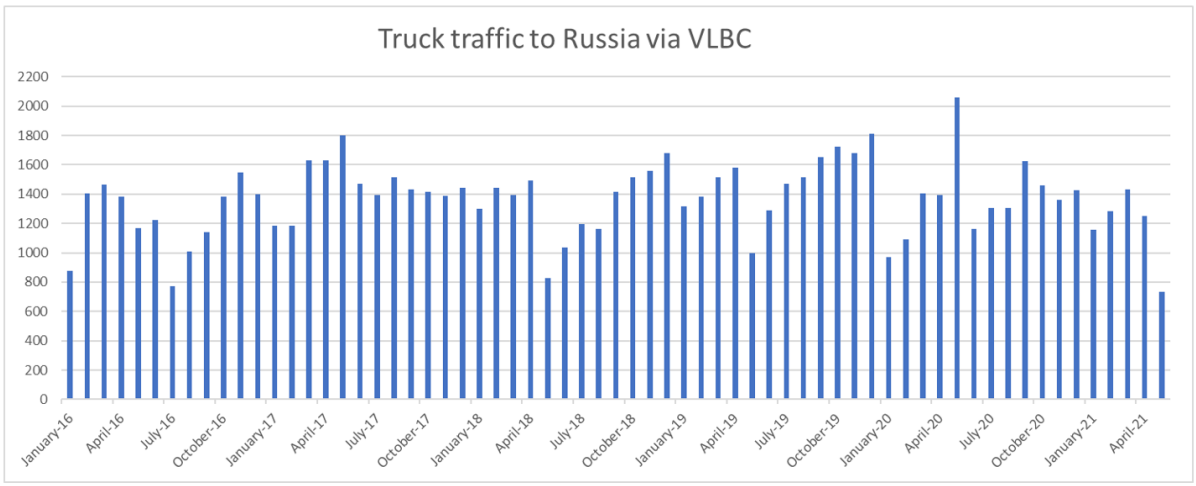


Figure 12: Monthly volumes of trucks from Finland to Russia (Source: Finnish Customs)

The number of trucks going from Finland to Russia varies also typically between 1000 and 1500 vehicles per month (30-50 vehicles per day). As the patterns are very similar with the traffic from Russia to Finland, most of the vehicles cross the border daily or several times a day to both directions.

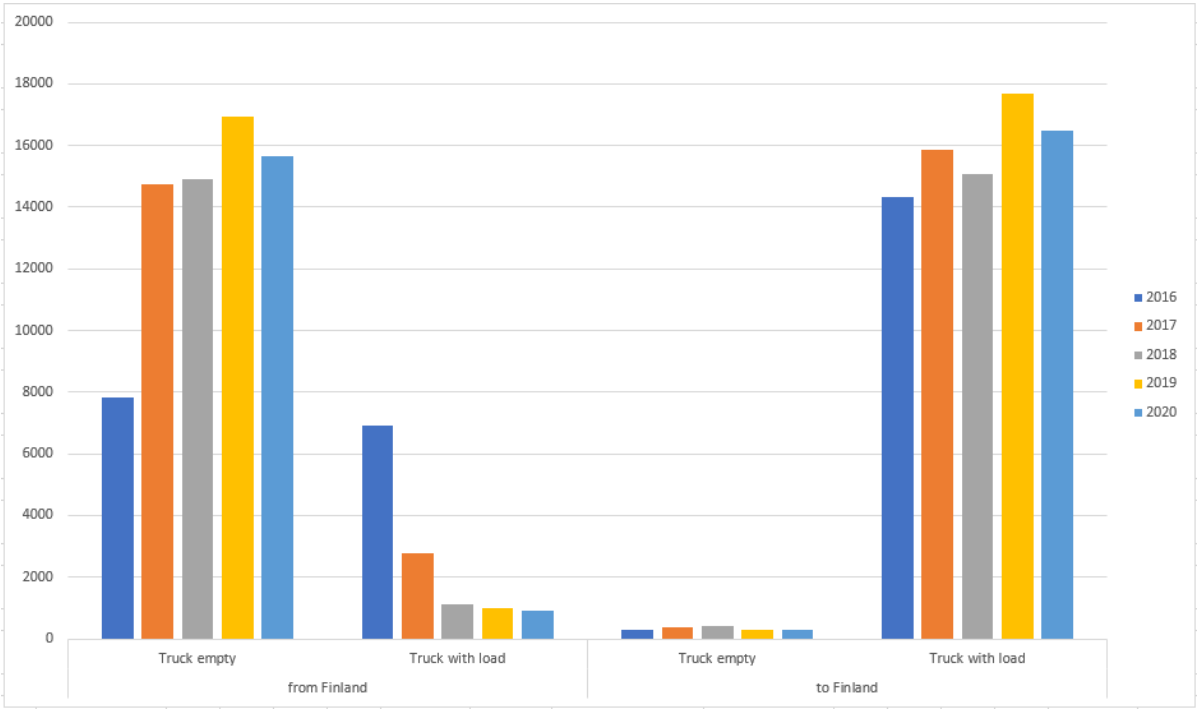


Figure 13: Truck Traffic Statistics 2016-2020 (Source: Finnish Customs)

Figures 13 and 14 illustrate the balance of the border traffic by trucks. Westbound trucks are loaded with cargo, whereas eastbound traffic is mostly empty trucks. The balance has been similar for years.

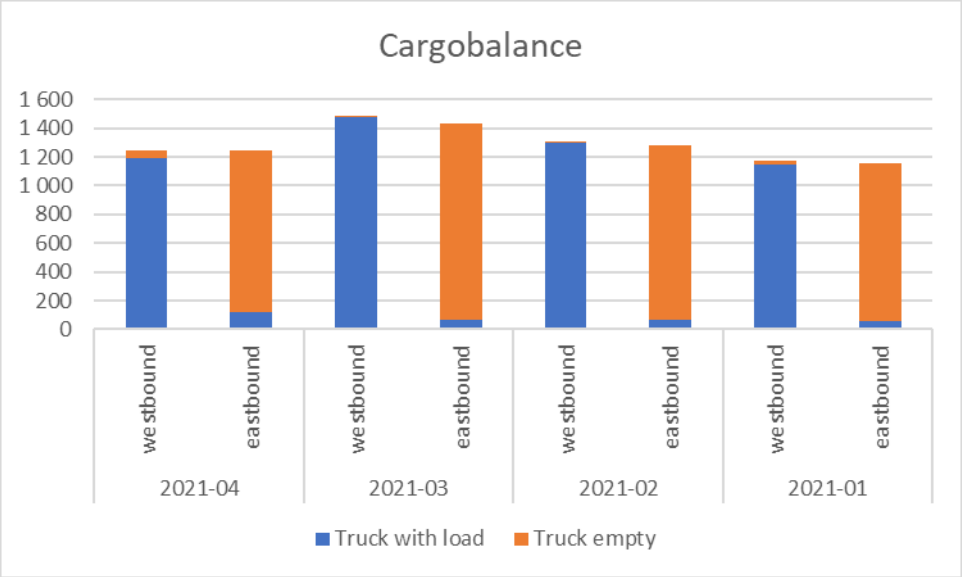


Figure 14: Truck Traffic Statistics January – April 2021 (Source: Finnish Customs)

3.3 Goods with import /export restrictions

The purpose of this subchapter is to analyze the various categories of goods or individual articles that are currently not possible and are possible to import/export through Vartius/Lytta border crossing. This analysis supports answering to the underlying main question "how the list of possible goods for import/export could be enlarged".

In general, restrictions regarding various goods in border crossing traffic, i.e. export and import articles are set out in various regulations and agreements, e.g.

- EU customs and border crossing regulations
- EU (and US) export restrictions, generally referred as sanctions
- International transport agreements in road and rail transport
- Agreements between Finland and Russia generally in road and rail transport and specifically related to specific articles
- Regulations and agreements on food exports to Russia and Asia
- Agreements and regulations related to the transport of dangerous goods

3.3.1 Restrictions by EU sanctions

Sanctions (such as export restrictions) are intended to influence political actions of another country or a group of individuals if they are considered to be a threat to international peace and security. As a result, sanctions such as export restrictions, generally apply to defense equipment, arms and ammunition, dual-use products and products needed in the nuclear, oil and gas, and shipbuilding industries.

At the moment Russia is facing following sanctions regarding goods

- The Council of European Union regulation (EU) No 833/2014
    - listed as below

CN code	Description
7304 11 00	Line pipe of a kind used for oil or gas pipelines, seamless, of stainless steel
7304 19 10	Line pipe of a kind used for oil or gas pipelines, seamless, of iron or steel, of an external diameter not exceeding 168,3 mm (excl. products of stainless steel or of cast iron)
7304 19 30	Line pipe of a kind used for oil or gas pipelines, seamless, of iron or steel, of an external diameter exceeding 168,3 mm but not exceeding 406,4 mm (excl. products of stainless steel or of cast iron)
7304 19 90	Line pipe of a kind used for oil or gas pipelines, seamless, of iron or steel, of an external diameter exceeding 406,4 mm (excl. products of stainless steel or of cast iron)
7304 22 00	Drill pipe, seamless, of stainless steel, of a kind used in drilling for oil or gas
7304 23 00	Drill pipe, seamless, of a kind used in drilling for oil or gas, of iron or steel (excl. products of stainless steel or of cast iron)
7304 29 10	Casing and tubing of a kind used for drilling for oil or gas, seamless, of iron or steel, of an external diameter not exceeding 168,3 mm (excl. products of cast iron)
7304 29 30	Casing and tubing of a kind used for drilling for oil or gas, seamless, of iron or steel, of an external diameter exceeding 168,3 mm, but not exceeding 406,4 mm (excl. products of cast iron)
7304 29 90	Casing and tubing of a kind used for drilling for oil or gas, seamless, of iron or steel, of an external diameter exceeding 406,4 mm (excl. products of cast iron)
7305 11 00	Line pipe of a kind used for oil or gas pipelines, having circular cross-sections and an external diameter of exceeding 406,4 mm, of iron or steel, longitudinally submerged arc welded
7305 12 00	Line pipe of a kind used for oil or gas pipelines, having circular cross-sections and an external diameter of exceeding 406,4 mm, of iron or steel, longitudinally arc welded (excl. products longitudinally submerged arc welded)
7305 19 00	Line pipe of a kind used for oil or gas pipelines, having circular cross-sections and an external diameter of exceeding 406,4 mm, of flat-rolled products of iron or steel (excl. products longitudinally arc welded)
7305 20 00	Casing of a kind used in drilling for oil or gas, having circular cross-sections and an external diameter of exceeding 406,4 mm, of flat-rolled products of iron or steel
7306 11	Line pipe of a kind used for oil or gas pipelines, welded, of flat-rolled products of stainless steel, of an external diameter of not exceeding 406,4 mm
7306 19	Line pipe of a kind used for oil or gas pipelines, welded, of flat-rolled products of iron or steel, of an external diameter of not exceeding 406,4 mm (excl. products of stainless steel or of cast iron)

7306 21 00	Casing and tubing of a kind used in drilling for oil or gas, welded, of flat-rolled products of stainless steel, of an external diameter of not exceeding 406,4 mm
7306 29 00	Casing and tubing of a kind used in drilling for oil or gas, welded, of flat-rolled products of iron or steel, of an external diameter of not exceeding 406,4 mm (excl. products of stainless steel or of cast iron)
8207 13 00	Rock-drilling or earth-boring tools, interchangeable, with working parts of sintered metal carbides or cermets
8207 19 10	Rock-drilling or earth-boring tools, interchangeable, with working parts of diamond or agglomerated diamond
8413 50	Reciprocating positive displacement pumps for liquids, power-driven (excl. those of subheading 8413 11 and 8413 19, fuel, lubricating or cooling medium pumps for internal combustion piston engine and concrete pumps)
8413 60	Rotary positive displacement pumps for liquids, power-driven (excl. those of subheading 8413 11 and 8413 19 and fuel, lubricating or cooling medium pumps for internal combustion piston engine)
8413 82 00	Liquid elevators (excl. pumps)
8413 92 00	Parts of liquid elevators, n.e.s.
8430 49 00	Boring or sinking machinery for boring earth or extracting minerals or ores, not self-propelled and not hydraulic (excl. tunnelling machinery and hand-operated tools)
ex 8431 39 00	Parts of machinery of heading 8428, n.e.s.
ex 8431 43 00	parts for boring or sinking machinery of subheading 8430 41 or 8430 49, n.e.s.
ex 8431 49	Parts of machinery of heading 8426, 8429 and 8430, n.e.s.
8705 20 00	Mobile drilling derricks
8905 20 00	Floating or submersible drilling or production platforms
8905 90 10	Sea-going light vessels, fire-floats, floating cranes and other vessels, the navigability of which is subsidiary to their main function (excl. dredgers, floating or submersible drilling or production platforms; fishing vessels and warships)

- The Council of European Union regulation (EU) No 692/2014
    - It shall be prohibited to import into the European Union goods originating in Crimea or Sevastopol

Russian Federation have set a federal law of 30 December 2006 No. 281-FZ "On the Special Economic Measures". The decree prohibits import into the territory of the Russian Federation of certain agricultural products, raw materials and foodstuffs originating from the countries, that have decided to impose economic sanctions against Russian legal entities and (or) individuals or joined such decision.

Russia allows the transit of products under sanctions from Finland through Russian territory to third countries. In this case, the products must not remain in Russia. Transport is possible through certain border crossing points. An electronic positioning seal must be used for transport.

The following table contains a detailed list of products that are prohibited to import to Russia based on the federal law "On the Special economic measures".

CN-code	Product
0201	Meat of bovine animals, fresh or chilled
0202	Meat of bovine animals, frozen
0203	Pork, fresh, chilled or frozen
0207	Meat and edible offal of the poultry indicated in line 0105, fresh, chilled or frozen
Out of 0210	** Meat salted, in brine, dried or smoked For the purposes of the application of this position, one should be guided both by a CN CODE, and the name of the product.
0301, 0302, 0303, 0304, 0305, 0306, 0307, 0308	Fish and crustaceans, molluscs and other aquatic invertebrates
0401, 0402, 0403, 0404, 0405, 0406	Milk and dairy products
0701, 0702 00 000, 0703, 0704, 0705, 0706, 0707 00, 0708, 0709, 0710, 0711, 0712, 0713, 0714	Vegetables, edible roots and tubers
0801, 0802, 0803, 0804, 0805, 0806, 0807, 0808, 0809, 0810, 0811, 0813	Fruit and nuts
1601 00	Sausages and similar products of meat, meat offal or blood; final food products based thereon
1901 90 110 0, 1901 90 910 0	Finished products, including cheese and curd(cottage cheese) based on vegetable fats
2106 90 920 0, 2106 90 980 4, 2106 90 980 5, 2106 90 980 9	Foods (milk containing products on the basis of vegetable fats)

Figure 15: List of prohibited goods of import to Russia (Source: government.ru)

3.3.2 Other restrictions per product category or article

Products of animal and plant origin

Authorities in Finland and Russian Federation, Finnish Food Authority and Russian Rosselkhoznadzor control imports and exports of plants, animals, and products of animal origin. TRACES system is used both for internal market trade between EU countries (animals and products of animal origin) and for imports from non-EU countries and for exports to non-EU countries.

TRACES, Trade Control and Expert System, is maintained by the European Commission and used by public authorities and companies. It is developed to verify the traceability and control of live animals, plants and feed, animal, organic, plant and wood products, among others.

The mandatory notification of Traces also extended to include plants and products of plant origin requiring a phytosanitary certificate, as well as food of non-animal origin subject to enhanced import controls. Former regulation was mainly limited to animal-based products.

Food and food contact materials covered by EU intensive surveillance, as well as fresh vegetables, fruits and berries covered by phytosanitary legislation, as well as live animals and food of animal origin and plants intended for planting, cut flowers and timber, can only be imported through certain Border Inspection Posts (BCP) approved for these product groups.

The phytosanitary requirements for timber imports are divided by coniferous and deciduous wood and the region of origin of the timber. There are different requirements for raw wood and sawn timber than for other timber. On 1 March 2021, the Finnish Food Authority has published a guideline listing the products required for the import of a phytosanitary certificate, as listed in the CN headings.

The physical health import declaration, CHED-PP, is submitted to Traces. Traces has been developed to verify, among other things, the traceability and control of live animals and plants, animal, organic and plant products, both in internal market trade between EU countries and in imports from non-EU countries. The phytosanitary certificate shows that the products to be imported have been processed and inspected in accordance with EU requirements and do not contain quarantine pests.

However, veterinary border controls are not be carried out on food and other animal origin products imported from Andorra, Liechtenstein, Monaco, Norway, San Marino and Switzerland. Either controls are not be carried out on fishery products or other fish intended for import from Iceland or the Faroe Islands, since the provisions of the internal market trade apply in those countries.

Import restrictions due to radiation (Chernobyl)

European Commission regulation (EU) 2020/1158 of 5 August 2020 on import conditions for food and feed originating in third countries following the Chernobyl nuclear power plant accident restricts products passing through the Vartius border station.

Article 5 of the Regulation gives the authorities a quantitative review obligation. In the case of road freight transport, the facilities and technology needed to fulfil the obligation exist only at the Vaalimaa border crossing point.

Article 5

Official controls upon entry into the Union
1. Consignments of the products referred to in Article 3(3) shall be subject to official controls upon arrival in the Union through a border inspection post and at control points.
2. The competent authorities of the border inspection post shall carry out identification and physical checks on 20 % of these consignments, including laboratory analysis of the presence of caesium-137.

The following table contains a detailed list of products subject to import restrictions due to Chernobyl-originated radiation, including various types of wild mushrooms, fruits and berries.

CN code	Description
ex 0709 51 00	mushrooms of the genus *Agaricus,* fresh or chilled, other than cultivated mushrooms
ex 0709 59	other mushrooms, fresh or chilled, other than cultivated mushrooms
ex 0710 80 61	mushrooms of the genus *Agaricus* (uncooked or cooked by steaming or boiling in water), frozen, other than cultivated mushrooms
ex 0710 80 69	other mushrooms (uncooked or cooked by steaming or boiling in water), frozen, other than cultivated mushrooms
ex 0711 51 00	mushrooms of the genus *Agaricus* provisionally preserved (for example, by sulphur dioxide gas, in brine, in sulphur water or in other preservative solutions), but unsuitable in that state for immediate consumption, other than cultivated mushrooms
ex 0711 59 00	other mushrooms provisionally preserved (for example, by sulphur dioxide gas, in brine, in sulphur water or in other preservative solutions), but unsuitable in that state for immediate consumption, other than cultivated mushrooms
ex 0712 31 00	mushrooms of the genus *Agaricus,* dried, whole, cut, sliced, broken or in powder, but not further prepared, other than cultivated mushrooms
ex 0712 32 00	wood ears (*Auricularia* spp.) dried, whole, cut, sliced, broken or in powder, but not further prepared, other than cultivated mushrooms
ex 0712 33 00	jelly fungi (*Tremella* spp.) dried, whole, cut, sliced, broken or in powder, but not further prepared, other than cultivated mushrooms
ex 0712 39 00	other mushrooms, dried, whole, cut, sliced, broken or in powder, but not further prepared, other than cultivated mushrooms
ex 2001 90 50	mushrooms prepared or preserved by vinegar or acetic acid other than cultivated mushrooms
ex 2003	mushrooms and truffles, prepared or preserved otherwise than by vinegar or acetic acid, other than cultivated mushrooms
ex 0810 40	wild cranberries, wild bilberries and other wild fruits of the genus *Vaccinium* , fresh
ex 0811 90 50	wild fruits of the species *Vaccinium myrtillus* , uncooked or cooked by steaming or boiling in water, frozen, whether or not containing added sugar or other sweetening matter
ex 0811 90 70	wild fruits of the species *Vaccinium myrtilloides* and *Vaccinium angustifolium* , uncooked or cooked by steaming or boiling in water, frozen, whether or not containing added sugar or other sweetening matter
ex 0812 90 40	wild fruits of the species *Vaccinium myrtillus* , provisionally preserved (for example, by sulphur dioxide gas, in brine, in sulphur water or in other preservative solutions), but unsuitable in that state for immediate consumption
ex 2008 93	wild cranberries (*Vaccinium macrocarpon, Vaccinium oxycoccos, Vaccinium vitis-idaea*), otherwise prepared or preserved, whether or not containing added sugar or other sweetening matter or spirit, not elsewhere specified or included
ex 2008 99	other wild fruits of the genus *Vaccinium* , otherwise prepared or preserved, whether or not containing added sugar or other sweetening matter or spirit, not elsewhere specified or included
ex 2009 81	cranberry juices of wild fruits (*Vaccinium macrocarpon, Vaccinium oxycoccos, Vaccinium vitis-idaea*), unfermented and not containing added spirit, whether or not containing added sugar or other sweetening matter
ex 2009 89	other juices of wild fruits of the genus *Vaccinium* , unfermented and not containing added spirit, whether or not containing added sugar or other sweetening matter

Figure 16: List of products restricted in regulation (EU) 2020/1158 (Source: European Commission)

3.3.3 Approved border control posts

Customs of Finland have released a list of approved control posts (BCP). In the list, Helsinki-Vantaa Airport, Vuosaari port and Vaalimaa road border station are approved border inspection posts for products under intensive control, fruit, vegetables, and berries. Animals can be imported through Vaalimaa and Helsinki-Vantaa, and products of animal origin can also be imported from Vuosaari.

The following table contains more detailed information on approved control posts.

1 **Border Control Post**	2 **Contact details (osoite, sähköposti, puh, aukioloajat, nettisivu)**	3 **TRACES-code**	4 **Type of transport**	5 **Inspection centre (Name, address and email)**	6 **Categories of animal and goods and specifications**	7 **Additional specifications regarding the scope of designation**	Note **Please note that all BCP's are existing BCP's.**
Helsinki airport	Finnish Food Authority /COOL Nordic Cargo Hub, Turbiinikuja 4, 01530 Vantaa, kasvinterveys@ruokavirasto.fi, +358295205201, 6am–6pm Finnish Customs, yritysneuvonta.lupa-asiakkaat@tulli.fi, +358 295 5202, 8am–4pm	FIHEL4	Airport		P/PP, PNAO-HC(food)(2), PNAO-NHC(feed)(2), PNAO - NHC(other)(2)		Previously listed as Vantaa
Helsinki-Vuosaari port	Finnish Food Authority, Seilorinkatu 13 / V28, 00980 HELSINKI, kasvinterveys@ruokavirasto.fi, +358295205201, 24/7	FIHELI	Port		P/PP, PNAO - HC(food)(2), PNAO-NHC(feed)(2), PNAO -NHC(other)(2)	Only packed goods	Previously listed as Helsinki
Vaalimaa	Finnish Food Authority, Vaalimaantie 2990, 49930 Vaalimaa, kasvinterveys@ruokavirasto.fi, +358295205201	FIVLA3	Road		P/PP, PNAO-HC(food)(2)	Only packed goods	
	Finnish Customs, Vaalimaantie 2990, 49930 Vaalimaa, yrity sneuvonta.lupa-asiakkaat@tulli.fi, +358 295 5202, 8am-4pm			Vaalimaantie 2990, 49930 Vaalimaa, kasvinterveys@ruokavirasto.fi, +358 29 520	P/ PP/ PP(WP)		

Figure 17: Detailed information on approved control posts. (Source: Ruokavirasto)

Status of Vartius – import of timber

The Vartius border crossing post has PP(WP) category approvement. Timber consignments requiring a phytosanitary certificate may be imported into Finland through the Vartius border station.

Hyväksytyt rajatarkastusasemat (BCP) / Godkända gränskontrollstationen (BCP) / Approved border control posts (BCP)

1	2	3	4	5	6	7	Note
Vartius	Kostamustie 6161, 88930 Lentiira, kasvinterveys@ruokavirasto.fi, +358295205201, 7am - 21 pm, tulli.fi	F I VRT 3	Road		PP(WP)		

Lyhenteet		**Förkortningar**	**Abbreviations**
PNAO	Muut kuin eläinperäiset tuotteet	Produkter av icke-animaliskt ursprung	Products of non-animal origin
-HC(food)	Asetuksen (EU) 2017/625 47 artiklan 1 kohdan d, e tai f alakohdassa tarkoitettujen edellytysten tai toimenpiteiden soveltamisalaan kuuluvat muut kuin eläinperäiset elintarvikkeet	Livsmedel av icke-animaliskt ursprung som omfattas av de villkor eller åtgärder som avses i artikel 47.1 d, e eller f i förordning (EU) 2017/625	Food of non-animal origin covered by conditions or measures referred to in Article 47(1)(d)(e) or (f) of (Regulation (EU) 2017/625
-NHC(feed)	Asetuksen (EU) 2017/625 47 artiklan 1 kohdan d, e tai f alakohdassa tarkoitettujen edellytysten tai toimenpiteiden soveltamisalaan kuuluvat muut kuin eläinperäiset rehut	Foder av icke-animaliskt ursprung som omfattas av de villkor eller åtgärder som avses i artikel 47.1 d, e eller f i förordning (EU) 2017/625	Feed of non-animal origin covered by conditions or measures referred to in Article 47(1)(d)(e) or (f) of (Regulation (EU) 2017/625
-NHC(other)	Muut kuin eläinperäiset tuotteet, jotka eivät ole elintarvikkeita eivätkä rehuja	Produkter av icke-animaliskt ursprung som varken är livsmedel eller foder	Products of non-animal origin, which are neither food nor feed
(2)	Ainoastaan pakatut tuotteet	Endast förpackade produkter	Packed products only
P	Kasvit	Växter	Plants
PP	Kasvituotteet	Växtprodukter	Plant products
PP(WP)	Puu ja puuperäiset tuotteet	Trä och trävaror	Wood and wood products
OO	Muut tavarat	Andra föremål	Other Objects

Figure 18: Vartius status in list of Approved border control posts (Source: Finnish Customs)

Status of Vartius – export of living animals and livelihoods

By decision of 20 October 2020, the Finnish Food Authority **has designated Vartius station as the place of exit for the transport of live animals** pursuant to Section 24 of the Animal Transport Act. Through Vartius, only transport batches containing livelihoods that fulfil the conditions laid down in the Animal Transport Regulation and the conditions laid down by the country of destination of the export may leave the customs territory of the Union. The point of exit of the keeper may only be used in cases where the operator wishing to export live animals has actually agreed in advance to export the animals with the authorities of the exporting country.

No livelihoods can be returned to Finland through Vartius once they have left the customs territory of the European Union.

3.3.4 Possibilities to enlarge the variety goods imported / exported via Vartius/Lytta

In general food products that are not in the sanctions list can be exported to Russia. Russia has lifted the ban on transit traffic for a range of products that were previously sanctioned. This includes agricultural products and foodstuffs. Goods for private use are not banned either.

New technologies and digitalization are creating new products and are also shaping traditional industries more sustainable and more friendly for environment. This development is fast and new innovations are common. Experimental approaching is a typical way. The lifecycle of new technology or solution can be hardly predictable, and it might be only a few weeks. It is heavily questionable to make investments to logistics assets focused for certain technology or customer.

Trending industries like mining, recycling, renewable energy production and related solutions, can open opportunities to enlarge the variety of goods. For example, production of biologically active food additives or medicinal products and materials for medical purposes are supported by The Republic of Karelia with certain tax compensation mechanism.

Existing infrastructure and administrative resources in VLBC are offering good possibilities to make try-out experiments with pop-up -actors and possible new industries.

Import / export of recycling products (waste and side streams)

Import and export of waste and side streams to between countries is regulated by EU directives and national laws. Especially transactions with non-EU and non-EFTA countries are largely prohibited.

The waste status can be overcome in EU countries by the End of waste (EoW) procedure. In the EoW procedure, waste material ceases to be waste if the conditions laid down in Section 5.4 of the Waste Act 646/2011 (the substance or object fulfils all relevant product requirements and requirements for the protection of the environment and human health for the specific use thereof and, when assessed overall, its use would pose no hazard or harm to human health or the environment.), are met and is therefore no longer subject to waste regulation. The procedure entered into force in 2018 with the reform of the Waste Directive and is intended to promote recycling by allowing the commercial recovery of waste and improving the status of waste-based material in relation to virgin materials. Currently, the EU end-of-waste (EoW) criteria are defined

for the following waste components : iron, steel and aluminium waste, glass cullet and copper waste.

A declaration of conformity shall be submitted for each batch of EoW produced or imported into the EU. The notification shall be submitted to the next holder of the EoW consignment and, if requested, to the supervisory authority.

The EU EoW criteria are only valid within the EU and national EoW decisions are only valid in the country where they were taken.

Based on increasing significance of circular economy to save natural resources, import and export of waste and side streams for recycling purposes could be a possibility to enlarge the variety of products in VLBC. This would require changes in regulations which currently restrict this kind of activity.

Import / export of biomass and sideproducts

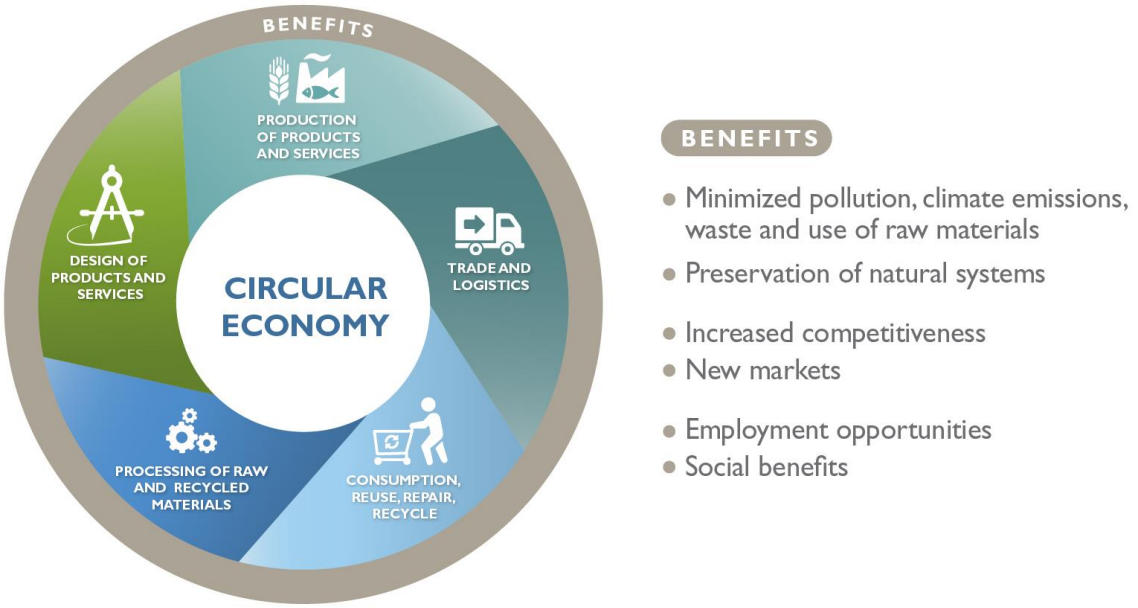


Figure 19: Sections and benefits of circular economy (Source: EU Biomass Use in a Net-Zero Economy study)

In this context the term ‘biomass’ means e.g. wood, residue & waste from forestry, agriculture, and other industries. Biomass is a valuable raw material for forest industry, like pulp and paper manufacturing, sawmills, and other wood product manufacturing. The energy industry uses woodchips and other side streams in heat and power production. The Finnish industry has been importing round wood and woodchips from Russia to Finland. The volumes have varied according to economic cycles and various restrictions

In general, biomass is valuable, limited and cannot cover all use needs. Especially use of wood for energy production is considered as an intermediate step towards non-fossil fuels. In the future, the biomass resources should be mainly directed to the manufacture of materials, pulp and other fibers and chemicals. The expectations for the future use of biomass exceed the sustainable supply on the horizon by 50-100%. However, the consumption of biomass substances should focus more clearly on, for example, the furniture industry, construction, pulp, and other

production of fiber, textiles and chemicals – instead of large-scale energy use. According to various studies, forest biomass will be replaced by more sustainable and competitive technologies in many traditional applications, such as energy production and fuel raw materials for passenger cars.

Despite this, bioenergy is likely to play an important role in highly specialized use, such as industrial heat production and possibly in aviation. In Finland the use of wood and wood fibers in pulp and bioproduct manufacturing, buildings, textile industry, package manufacturing and consumer product manufacturing is estimated to be increasing. This development could enlarge the volume and variety of forest biomass import from Russia via VLBC. Increasing concerns are, however, placed on the sustainability of forestry.

3.3.5 Administrative hindrances related to customs operations in Vartius

The purpose of this chapter is to analyze current administrative hindrances in border crossing freight transport, i.e. in import and export of goods, and identify possibilities to decrease or overcome them.

In general, the administrative hindrances are consequences of legal and regulatory processes and rules set by authorities.

In the basic process A TIR carnet is fixed by Customs or a copy of the T1 declaration is released. The passport control checks people's passports and visas. The customs checks, for example, the condition of the vehicle and the load bindings. If necessary, the vehicle may be directed for further inspection. Once customs clearance and passport control have been carried out, the vehicle is directed to the border area. Process is clear for regular users and time used for border-crossing hasn’t been a problem for interviewed drivers

The capacity of the border station is correctly dimensioned when considering current traffic volumes and infrastructure. The size of the railway yard and the road conditions (road category) on both sides of the border may limit or improve willingness to use the border crossing point, but the volume of population as well as the structure of trade and industry are more relevant as factors affecting the size of the activity.

The only administrative hindrance in current activities has been the intermittent imbalance in the processing times of border formalities, such as customs at Finnish-Russian border posts.

Customs procedures are well-defined and mostly electronically operated, so there are no major differences in the quality of operations between various border crossing points at Russian – Finland border.

Communication and means of communication are relevant to the customer's service experience. In addition to communication in cooperation with authorities, the used language and the compatibility and usability of information systems are relevant.

Customs' processes are well defined and smooth. Customs has consistently developed its operations and services for companies engaged in international trade. In Finland, the last customers moved to electronic customs processes in June 2021. The Russian customs is moving also to electronic services and will further improve and harmonize the process.

The opening hours of border posts have been harmonized and, except in exceptional cases, border traffic is smooth.

3.3.6 Administrative hindrances related especially to road traffic

The Finnish legislation allows heavy vehicle combinations up to a total weight of 76 tons. The maximum length is 34.5 meters and the maximum height is 4.40 meters. In domestic traffic, vehicle combinations with a total length of 25.25 m are mostly used.

Under the Russian legislation, the maximum permitted total weight of the vehicle combination is 40 tons and the total length is 18.75 meters. The maximum height is 4.0 meters. The most common used vehicle type is a semi-trailer combination with a length of 16.5 meters.

Structural differences in vehicles due to differences in legislation have caused that in practice, cross-border road freight transport is almost entirely carried out by Russian companies.

3.3.7 Administrative hindrances related especially to rail traffic

Overview of laws, regulations and agreements covering rail traffic

The rules for international rail traffic between Finland and Russia are set in the Agreement between Finland and Russia on direct international rail transport (1036/2016). The agreement opened rail traffic between Finland and Russia for all railway companies licensed in the EU so far the traffic takes place on the Finnish rail network. The agreement does not give Finnish operators the right to operate in Russia or Russian operators the right to operate in Finland, therefore the operator (and the locomotive) typically changes in border-crossing.

All railway border stations became open to all types of freight traffic. However, the goods must be transported through the border inspection post indicated by the consignor in the consignment note. The provisions of the agreement largely correspond to the COTIF Agreement on the International Carriage of Goods by Rail.

The transport company's liability for transport ends at the nearest railway border station at the national border, unless otherwise agreed between the transport companies.

Additionally, the following agreements define the set-up for rail traffic

- Agreement between the Finnish Ministry of Transport and Communications and the Russian Ministry of Transport on technical and operational matters pursuant to the Agreement on Direct International Rail Transport
- Agreements between the Government of the Republic of Finland and the Government of the Russian Federation regarding the Transport of Dangerous Goods in Direct International Rail Transport between Finland and Russia.

Administrative hindrances related to available rail operators

The availability of rail operators for border-crossing traffic is limited in Finland. Especially a new operator meets several administrative hindrances when setting up operations in Finland and in border-crossing.

The incumbent operator in Finland, VR Transpoint, has over a long time period developed operational relations and processes with Russian authorities. If VR Transpoint could be the operator, its knowledge and experience could be used to overcome administrative hindrances.

Other licensed rail operators in Finland are Fenniarail and Operail.

- Fenniarail Ltd is a private freight rail operator, which started domestic transport operations in 2016. In 2017, it started cross-border transport between Finland and Russia, e.g. transporting raw timber from border stations to UPMs production plants.
- Operail is a state-owned Estonian enterprise which has its origin in Estonian state railways Eesti Raudtee, later EVR Cargo. It has established two companies in Finland, Operail Finland Oy for rail transport and Operail Leasing Finland Oy for wagon rental business. The companies started their commercial operations in Finland in 2019.

Both Fenniarail and Operail have necessary licenses for their operations personnel and rolling stock in Finland. They transport still quite small volumes compared with VR Transpoint. However, they are both involved in border crossing traffic with Russia (Operail especially in Estonia) and have published the strategic intention to expand in Finland.

If a totally new rail operator (i.e. other than VR Transpoint, Fenniarail or Operail) would be required for the border-crossing traffic in Vartius-Lytta, it would have to develop its operations to the necessary level and to apply several certificates and licenses and make several agreements to actually start rail operation. If a totally new operator should be relevant, it would take at least 2-3 years to get the necessary licenses and permits and make the required agreements

As a conclusion, the existing rail operators in Finland, VR Transpoint, Fenniarail and Operail, are the most relevant from the viewpoint of managing cross-border administrative processes according to current rules. The challenge lies in the anticipated small volumes of the potential border-crossing traffic, which might not be interesting for VR Transpoint but could attract smaller operators.

3.3.8 Administrative hindrances related to food products

Export and import of food products is covered by several administrative procedures which are explained in this chapter. These procedures may present a hindrance for any company planning such a business.

Notification

The exporter must notify Finnish Food Authority of the intention to export food of animal origin to certain non-EU countries, e.g. to Russia and Kazakhstan. Notification of export intentions must be made approximately 6 to 12 months before the start of the export. The notification system (TRACES) is explained in more detail in chapter 3.3.2.

Confirming to the ATP agreement

Cross-border transport of food, and equipment used in such transport, is subject to the ATP agreement. The agreement covers e.g. requirements for the insulation and cooling capacity transport equipment and for transport temperatures of the products. Practically all international land shipments of frozen food are ATP shipments, as well as most of transports of refrigerated food. Compliance with the ATP agreement is monitored by Finnish Food Authority, which inspects and tests equipment used in international food transport and issues all ATP certificates for vehicles registered in Finland. In brief, if the food is perishable (such as pork or salmon), the transport equipment must in practice meet the hygiene, quality and temperature requirements of the ATP agreement, as well as any specific regulations of the country of destination.

Requirements for storages and cargo units

The storage facilities of food intended for sale must be notified to the supervisory authority (municipality and / or Evira) before the transport operation begins.

Requirements of food safety

Animal products (and animals) that may carry a risk of spreading animal diseases may only be delivered to a non-EU country by an operator registered by the Food Safety Authority (Evira). The exporter must ensure that the products are examined and inspected in accordance with the requirements of the country of destination, the country of possible transit, European Union legislation and any State agreements. For this purpose, the operator must apply for a veterinary certificate from a municipal veterinarian. It is also possible that the authorities of the country of destination require other certificates in addition to or instead of the veterinary certificate.

Requirements of traceability

An operator in food business, such as a transport company, must have the detailed information on food and food-producing animals. Only animals and animal products whose origin can be sufficiently verified may be delivered from Finland to a non-EU country.

Export permits to Russia

If food of animal origin or animals are exported to Russia, the exporting company must make an application to the Food Safety Authority and modify its self-monitoring and other activities to meet Russian requirements. The Russian authorities may grant an export permission only on the basis of a proposal from Finnish Food Authority.

It can be concluded that, even though sanctions and other restrictions regarding food products would be diminished, setting up a new business in food export and import would anyhow be quite tedious and a lot time consuming effort due to required administrative processes. Attractive long-term market conditions would be a necessary pre-requisite.

3.3.9 Administrative hindrances related especially to dangerous goods

International trade in hazardous chemicals is regulated by two international agreement: Rotterdam agreement and Stockholm Agreement.

The Rotterdam Convention concerns the application of the prior notified consent procedure (PIC=Prior Informed Consent) to certain hazardous chemicals and pesticides in international trade.

Stockholm Convention restricts persistent organic pollutants (POP=Persistent Organic Pollutants). The Stockholm Agreement has been implemented throughout the EU by means of the POP Regulation, i.e. Regulation of the Council of Europe and Parliament on persistent organic compounds and amending Directive 79/117/EEC (1), as last amended by Regulation (EC) No 1257/1999(4), lays down detailed rules for the application of this Directive. Regulation (EC) No 850/2004. the Stockholm Convention and the UN/ECE the POP Protocol to the Long-Range Agreement on Long-Range Air Pollution (CLRTAP) manufacture, use, import and export of chemicals covered by this Product.

The obligations of the Rotterdam Convention are laid down in the PIC Regulation, i.e. the Regulation of the European Parliament and of the Council on the export and import of dangerous chemicals (EC) No 1782/2003. 649/2012. The PIC Regulation is as such a direct and applicable right. PICasete contains certain provisions which go further than those contained in the Rotterdam Agreement.

In addition, the regulation includes a ban on the export of chemicals under the Stockholm Agreement and fine soaps containing mercury, metallic mercury and certain mercury compounds and mixtures to third countries.

Storage of chemical wagons is possible in the railway yards in Hamina, Kotka Mussalo, Kouvola, Kokkola, Niirala, Oulu, Riihimäki, Sköldvik, Turku and Vainikkala in Lappeenranta.

Nearest location from Vartius to hold wagons loaded with dangerous goods is Oulu.

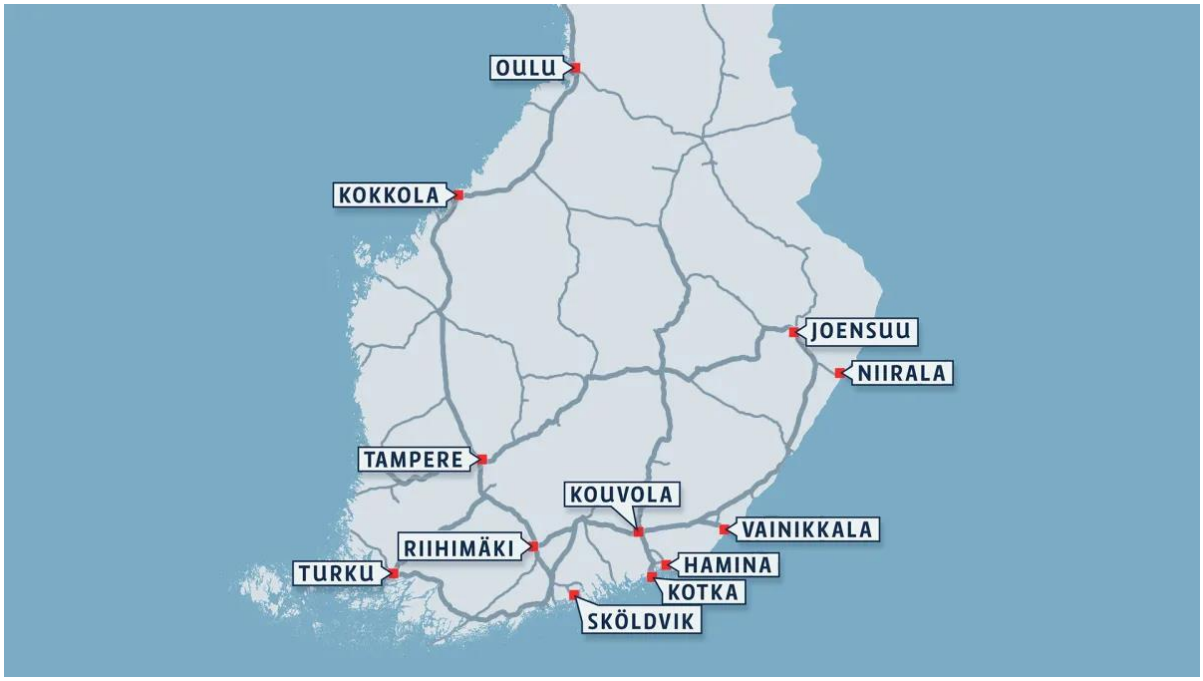


Figure 20: There are 12 railway yards designed for handling and storing dangerous goods in Finland (Source VR & Yle)

3.3.10 Solutions how to decrease hindrances

Expertise – food export

Export of food products from Finland to Russia has been recognized as one potential means of diversifying cross-border traffic in VLBC. However, this kind of business requires both the ecosystem of relevant actors and expertise to tackle regulatory and administrative hindrances. A project-based task force, i.e. a team of relevant practically oriented experts, could be a facilitator of new business approaches and logistics solutions via VLBC.

Expertise – sustainable border-crossing trade and logistics

Many global and national development trends enhance new types of trade activities, like materials feeding circular economy solutions, and new type of logistics solutions, like clean fuels for road logistics and shift from road to rail. As described earlier, there are regulatory and administrative hindrances in these areas. A project-based task force, i.e. a team of relevant practically oriented experts, could act as a facilitator of new trade activities and sustainable logistics solutions.

Local border-crossing trade for consumers

In export and import of food and consumer goods, one solution could be shopping centres close to the border, as has been done in Vainikkala and Nuijamaa. These shopping centres would serve Russian and Finnish households and individuals staying close to the border or being capable to arrange shopping tours between Russia and Finland. Functional public traffic and easy cargo

services for private people together with lightened travelling documents and good information of supplied services are crucial for success.

Overall, local solutions are possible when it is matter of operative hindrances like capacity of personnel. Administrative matters are nowadays settled as larger entities.

3.4 Infrastructure and facilities of Vartius/Lytta border crossing

The purpose of this chapter is to analyze restrictions created by the existing infrastructure and facilities in Vartius-Lytta. Based on this analysis, a list of potential actions to improve infrastructure facilities for import/export will be made.

Vartius border crossing point has been actively studied and developed. Development has been reasonable and long-term improvements rational. The effect of Barents Link Forum and other former projects are clearly visible.

Karelia CBC Project financed development project, completed 2021, is a project of road traffic arrangements at the Vartius border crossing point. It is including the construction of new lanes and the expansion of the inspection area. In addition, traffic control and lighting will be renewed. The area of the border crossing will be protected with fence and access gates will be built to the fence.

3.4.1 Restrictions related to road traffic infrastructure

Routes, roads and facilities

Vartius is connected to the rest of Finland's road network trough main road 89 to highways 5 and 22. Important road connections for border traffic also include regional road 912 connecting Vartius via main road 76 and 75, further to highway 6.

Figure 21: Vartius connection to road network. (Source: Väylä)

In Russia, the main road connection is the A-137, which leads from Lytta to Kochkoma and further to E-105, a Russian highway R-21 from St. Petersburg to Murmansk also known as Kola Motorway.

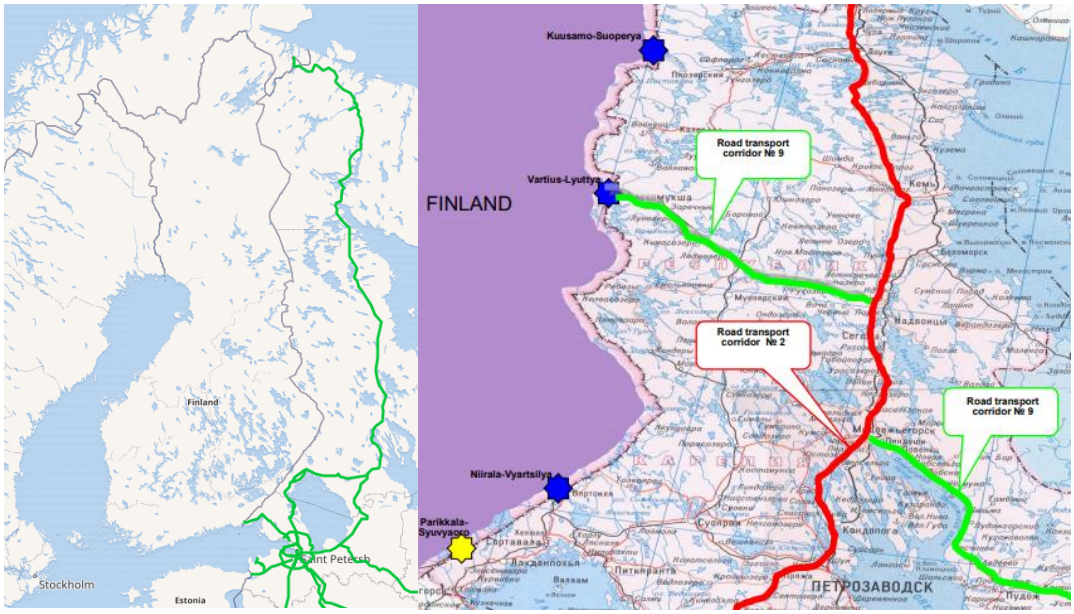


Figure 22: Russian federal highways (Source wikimedia maps; Aleksei Markov)

In 2020, the average traffic volumes of the main road 89 were between 175 and 660 vehicles per day, last 20 km leg from Finland to border direction was 330 vehicles per day. Middle section between border crossing point and junction highway 5 and main road 89 was the most quiet one with 175 vehicles. Last 50 km at main road 89, before junction highway 5 (E-63) was 450 to 650 vehicles.

The heavy traffic in traffic flow were markable more stabile. Near Vartius there were 80 heavy vehicles per day, in the middle section only 45 to 80 vehicles. In the last 50 km before junction highway 5 (E-63) there were 80 – 100 heavy vehicles per day.

Figure 23: Heavy vehicles traffic at main road 89. Numbers are average number of vehicles per day in year 2020. (Source: Finnish Transport Infrastructure Agency, Väylä)

The main road 89 is in good condition and the traffic capacity of the road is sufficient. However, the road is too narrow in relation to the target width, except for the border area. The width of main road 89 is between 6.2 and 7.0 m, which is well below the target width of the connection interval of 8.0 m.

In Russia, the A-137 is paved and in relatively good condition sections of Lytta – Kostomuksha – Ledmozero – Rugozero, but the 35 kilometers long road section from Rugozero to Kochkoma is not in proper condition to operate with heavy vehicles. Even the road is not in good condition, it is still used if it is shortest way to destination. Remarkable thing in the choice of the route is, that alternative routes to bigger cities and towards to greater population, for example Kajaani – Petrozavodsk via Niirala border crossing point, is 50 kilometers shorter.

Figure 24: Rural road A-137 from Kostomuksha to Rugozero is in good condition. (Source: Google Maps, Street view.)

Figure 25: Rural road A-137 between Rugozero and Kochkoma is narrow (Source Google Maps, Street view)

Figure 26: Rural road A-137 between Rugozero and Kochkoma is not in good condition. (Source Google Maps, Street view)

3.4.2 Restrictions related to rail traffic infrastructure

For the recent border crossing rail cargo, mostly the transit of iron ore to Kokkola, the rail infrastructure in VLBC has been in general adequate.

The changes in transit traffic are difficult to predict and the needs can vary even over a short period of time. Volume fluctuations can be large and destination ports can change. Transport routes and their needs can therefore change quickly. Also even already agreed transport is characterized by a difficult predictability , causing capacity challenges, especially at the border. The unpredictability of transport also occasionally poses challenges and shortages of free tracks in railway yards and ports. Due to the limited track lengths of railway yards and meeting points, transit traffic is characterized by freight trains having to be broken down during the journey. In addition, in ports, the railways pose their own challenges, as the railways of the ports may originally have been designed for a very different environment.

The Russian rolling stock (wagons) has vibration problems and lower speeds than Finnish freight wagons.

The most significant transito routes from Vartius to Kokkola and from Vainikkala to the ports of Kotka and Pori are already nearly overloaded railway parts.

Between Oulu and Vartius, there are high utilization rates of the peak hours and the route is already congested . This is due to long safety intervals in relation to the number of trains. Due to the long protection intervals and train encounters, the Oulu-Kontiomäki route is challenging in terms of punctuality, and the possibilities for adding trains are limited. The daily utilization rate is 51 %, and peak of utilization (between 18-19hrs) is above 85 %.
Punctuality challenges between Kontiomäki and Vartius are also caused by uncertainty about timetables for cross-border traffic. The daily utilization rate is 25%. There are slots in capacity available, but not for the current times. The high peak (13–14hrs) of utilization rate of capacity is more than 85%.

There are free short work breaks for maintenance between Oulu and Kontiomäki on several days after noon and in the early hours of the morning. However, there may not be a two-hour gap in the entire route.

Between Kontiomäki and Vartius, the traffic is congested during the day, and there are plenty of work breaks for maintenance, especially at night. The number of trains per day is 6. Increasing traffic in the direction of Vartius will be challenging unless any additional traffic across the border comes at a different time than it does today. Only individual trains can be added to the current running times, as only one train per hour can run in its direction between Vartius and Kontiomäki.

When the peak hour utilization rate exceeds the 75% limit, traffic's ability to recover from disruptions has deteriorated markedly and delays caused by the network easily start to recur. If the utilization rate exceeds the value of 85 % for a peak hour, the number of trains should no

F

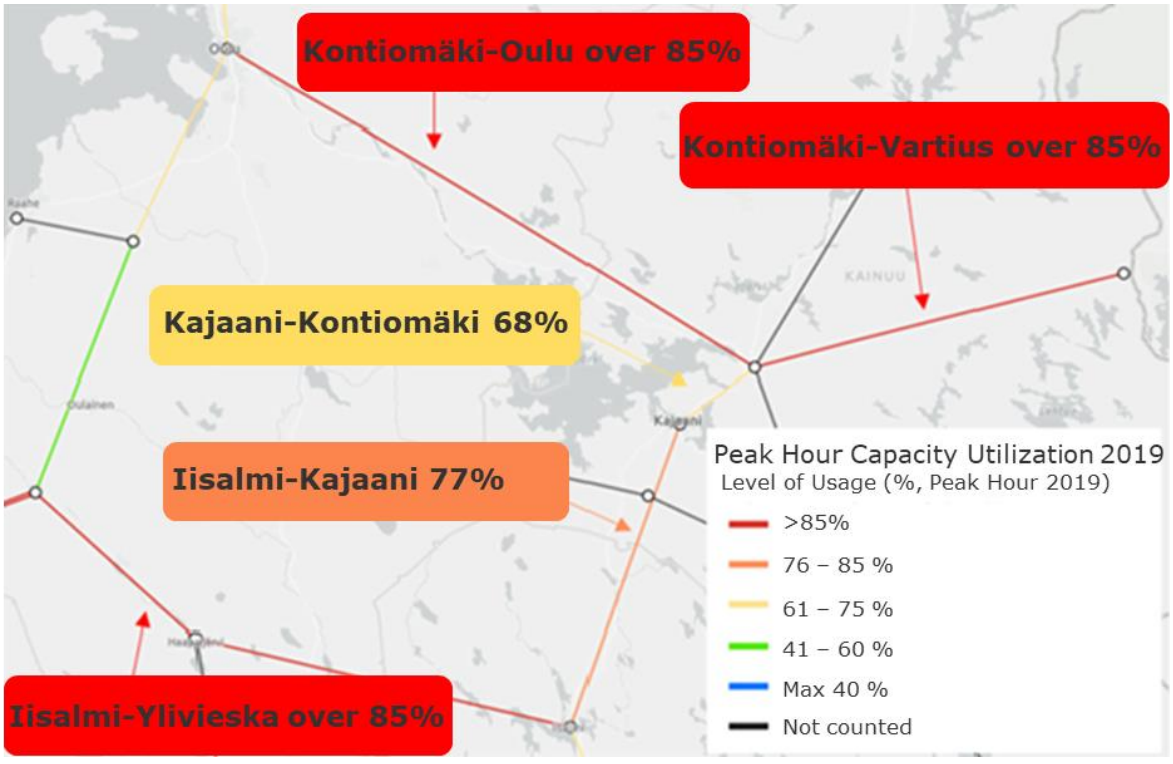


Figure 27: Peak hour capacity utilization rates in 2019

longer be increased without any changes to the traffic structure, remote control or track system that increase the transmission capacity.

On transit routes in the current situation, capacity utilization values exceed 85 per cent in peak hours on routes between Vartius and Kokkola and between Kouvola- Lahti and Luumäki–Kouvola. In practice, this means that, at the most congested times, there is no possibility of increasing freight traffic on these routes.

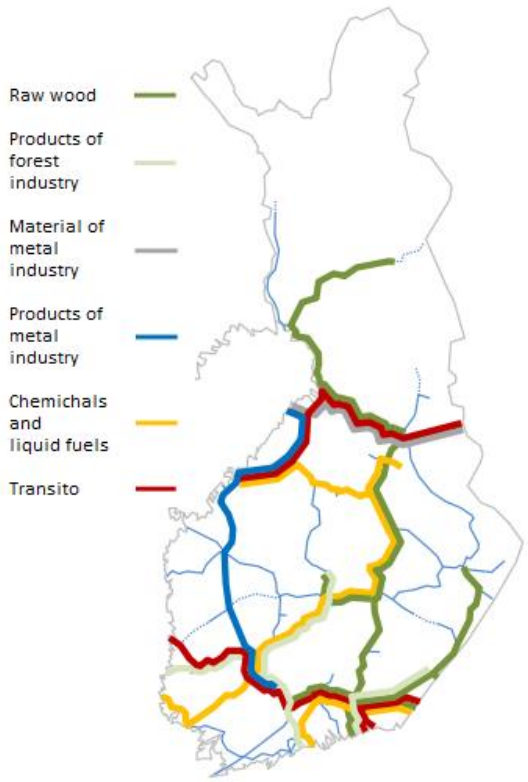


Figure 28: The main transport routes of the network by type of goods (Source: Väylävirasto)

There is a lot of uncertainty about transit forecasts. Volume fluctuations can be fast and large. Significant growth would pose significant challenges with existing actors. The amount of transit can also decrease.

The most significant development activities for transit traffic relate to the load-bearing capacity (maximum axel weight) of the network and the dimensions of the encounters. If the railway section has investment needs for other reasons, preparing for the growth of transit traffic may support larger investments.

3.4.3 Potential actions to improve the infrastructure and facilities in Vartius/Lytta

Finnish Transport Infrastructure Agency has made plan for actions for Kokkola – Vartius railway connection. As a conclusion from chapter 3.5.2, Vartius railway capacity is more reasonable to expand as a part of larger overall plan.

Vartius railway yard's capacity is challenging, especially if volumes increase. The westbound locomotive needs always an empty rail to return and to be able to turn after delivered loaded wagons before it can eastbound with empty wagons.

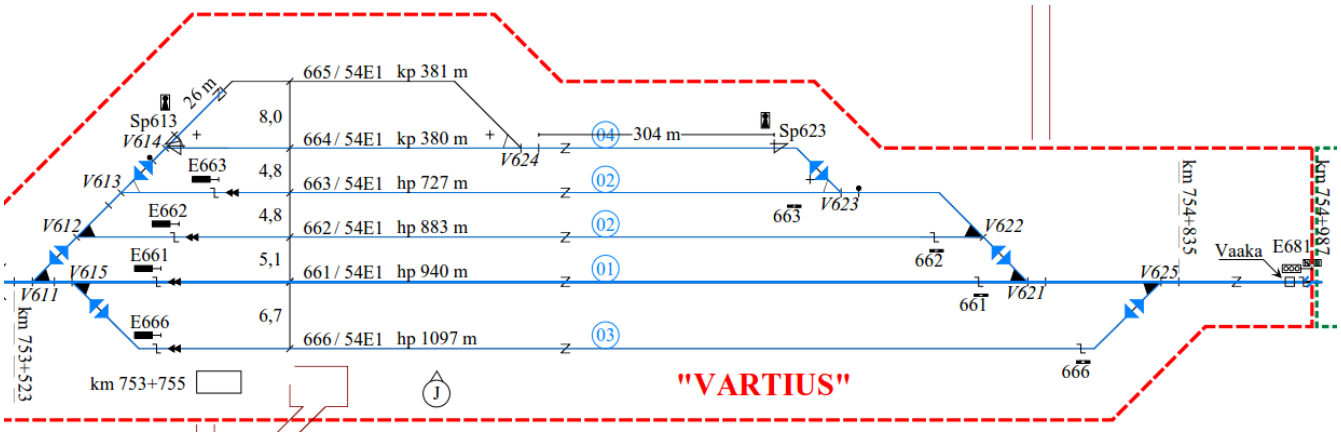


Figure 29: Vartius railyard diagram (Source: liikennevirasto ohje Dnro 5543/1000/2013)

661	980 m
662	923 m
663	757 m
666	1137 m

Operational lengths by rails at Vartius yard.

The following map shows how Arola – Kontiomäki interval with long safety point distance creates a bottleneck for increase of rail traffic frequence.

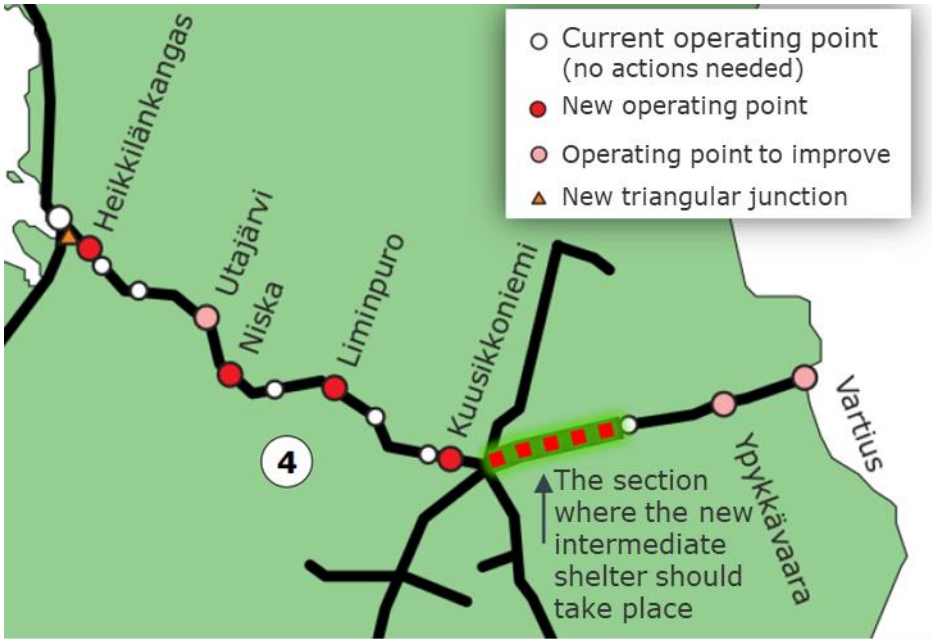


Figure 30: Distance between safety points Arola-Kontiomäki interval is really long (+40 km). It is the largest infrastructural bottleneck in Vartius traffic. (Source: VR Group)

There are two alternative transport routes between Kokkola and Vartius border station: one through Oulu and the other via Iisalmi. The length of the route through Oulu is approximately 460 km and the route through Iisalmi is approximately 440 km. For the rest, the lines are part of the TEN-T network and the main railway routes with a freight transport profile. These different routes form a networked entity in freight transport and the development of routes is interrelated.

The Kokkola-Oulu section of the main line is a very busy passenger and freight section.

Transit trains, other freight trains and also passenger transport operate between Oulu and Kontiomäki. There is transit traffic between Kontiomäki and Vartius. Approximately 6,6 million tons of freight is moving yearly on the railway section Oulu – Kontiomäki - Vartius (e.g. industrial raw material transport and transit) and it is one of the busiest sections of freight transport measured by tons.

The route through Iisalmi is important from the point of view of different industrial sectors. There is also passenger traffic between Iisalmi-Kontiomäki-Oulu and Ylivieska-Iisalmi. In freight transport, growth is forecast on all routes, most on the route through Oulu. A significant increase in passenger transport is also forecast on the main line section.

The Kokkola-Ylivieska interval is already two-track in the current situation, especially due to the busy freight traffic. Kokkola railway yard is under improvement project. The renewal of the safety equipment in the Kokkola railway yard will be ready 2022.

Between Ylivieska and Oulu, high-speed passenger traffic and heavy freight traffic with long trains create challenges for the capacity of the railway section. The interval has been improved as part of the Seinäjoki-Oulu project, but there are still development needs. Increasing the number of passenger trains, together with the growth in freight transport, will require the construction of a double track between Ylivieska and Oulu. In particular, the operating conditions for freight transport can also be improved in the first phase through smaller measures.

The long distances between long meeting places are causing problems between the single-track Oulu-Kontiomäki-Vartius. In the connection interval, it is necessary to increase capacity by building new meeting places. The connecting capacity would also be improved by the Oulu Triangle Rail and Heikkilänkangas traffic location. The route from Ylivieska to Iisalmi and Kontiomäki is single track. The electrification of the railway section Iisalmi–Ylivieska is underway, as is the construction of the Iisalmi triangular railway. There are still needs for improvement in the development of transport points. In addition, the connection Ylivieska-Iisalmi-Kontiomäki-Vartius has renovation needs.

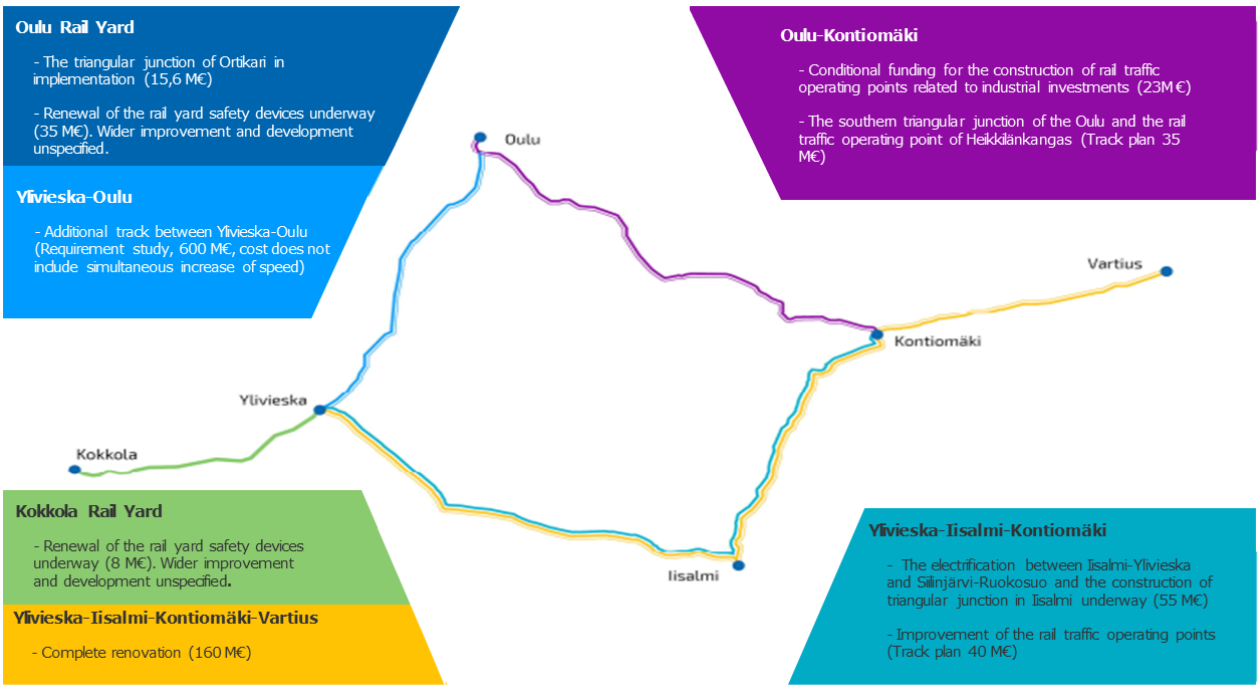


Figure 31: Alternative routes and planned improvements. Source: Väylävirasto

The Oulu Triangular Railway enables traffic in the direction of Ylivieska without the necessary train turn in Oulu's railway yards. Oritkari's triangular art in Oulu is coming true. The renewal of the safety equipment in the Oulu railway yard is also underway. Oulu railway yards also have other needs from renovation to development.

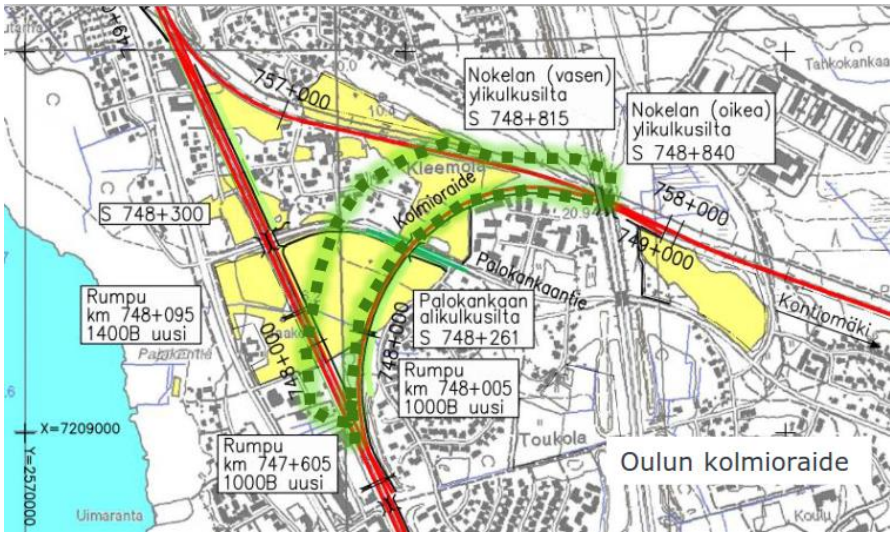


Figure 32: The Oulu Triangular Railway project (Source: VR Group)

3.5 Estimates of potential additional volumes

The purpose of this chapter is to estimate how much of the goods in question (relevant goods) could be exported / imported in addition of current transit traffic via border crossing point by road and/or rail. The estimation is based on theoretical passby capacity of border crossing process and infrastructure as well as estimations done in previous studies.

3.5.1 Potential additional volumes in road traffic

All 27 EU Member States committed to turning the EU into the first climate neutral continent by 2050. To get there, they pledged to reduce emissions by at least 55% by 2030, compared to 1990 levels

From 2026, road transport will be covered by emissions trading, putting a price on pollution, stimulating cleaner fuel use, and re-investing in clean technologies.

By 2035, the EU should aim to reach climate neutrality in the land use, forestry and agriculture sectors, including also agricultural non-CO2 emissions, such as those from fertilizer use and livestock. The EU Forest Strategy aims to improve the quality, quantity and resilience of EU forests. It supports foresters and the forest-based bioeconomy while keeping harvesting and biomass use sustainable, preserving biodiversity, and setting out a plan to plant three billion trees across Europe by 2030.

The main goal is to harness the significant potential in global markets for low-emission technologies, sustainable products and services in order to achieve climate neutrality by 2050. However, achieving a climate neutral and circular economy requires the full mobilization of industry. All industrial value chains, including energy-intensive sectors, will have a key role to play.

The Commission is also proposing a new climate policy tool, the so-called climate policy tool. carbon limit mechanism, to prevent carbon leakage from the EU to countries with looser climate policies. The carbon limit mechanism would apply to certain products entering the EU from third countries, such as steel and electricity. The size of the carbon limit mechanism would be determined by the price of eu allowances.

When looking at transport chains for Vartius' transport, the key is the ability to react locally to any changes brought about by the EU Green Deal program, such as production methods and the renewed demands of industries. These may include, for example, differences in emissions trading pricing in the Regions of Russia and the EU and changes in raw material flows. To succeed in changing environment, partnership model or ecosystem is needed with commercial operators, authorities and other stakeholders.

3.5.2 Potential additional volumes in rail traffic

The previous studies have identified significant additional potentials for rail traffic via VLBC. These estimates are referred in this chapter. Additionally, potentials from linkages to EU TEN-T network and New Silk Road concept are evaluated.

Estimates from the study ”Vartiuksen kansainvälisen raja-aseman kehittämissuunnitelma 2008”

At the maximum forecast, shipments through Vartius could increase by as much as 2–4 million tonnes by 2015. Of the growth, about 0.5–1.0 million tonnes would be transported to the east and about 1.5–3.0 million tonnes to the west.

In particular, the volume of transit traffic is likely to increase rapidly after the opening of the Vartius–Kostomuksha–Ledmozero–Kochkoma line. The growth would mainly consist of the transportation of products and raw materials for the metal, forest and mining industries in Northwest Russia. Products would be transported via Vartius to the west, but industrial raw materials would also be transported via Vartius to the east.

A significant part of the growth in rail transport would be container transport. Part of the increase in the volume of transport would result from the increasing transport between Finland and Russia via Vartius, which would be directed both to the west (imports) and to the east (exports). In addition, transport between Asia and Europe / North America also offers significant growth potential in the longer term.

Estimates from the study ”Barents Link. Kansainvälisen raideliikenteen markkinointi- ja kehittämiskonsepti Vartius-Kochkoma 2009”

Industry	Product	Estimated potential (year)	Direction
Mine	Ores and concentrate	Millions of tons	FI → RUS → FI
Metal	Recycled metal Metal products	Hundreds of thousands of tons Thousands of tons	RUS → FI FI → RUS
Construction and Construction industry	Settlement infrastructure Industry infrastructure	Hundreds of thousands of tons Hundreds of thousands of tons	FI → RUS FI → RUS
Chemical Forest Industry	Chemical pulp (paper, cardboard)	Hundreds of thousands of tons	RUS → FI
Mechanical Forest Industry	Lumber, chips, sawdust, plywood, wood products	Weekly shipments	RUS → FI FI → RUS → FI
Machinery and Equipment	Industrial equipment and machinery	Tens of thousands of tons	FI → RUS
Chemistry	Mining and industrial raw materials Fertilizers Other chemicals	Hundreds of thousands of tons Hundreds of thousands of tons Hundreds of thousands of tons	FI → RUS → FI FI → RUS → FI FI → RUS → FI
Coal and Coke	Coal	Hundreds of thousands of tons	RUS → FI
Bioenergy	Energy tree, pellets, brickets, peat	Hundreds of thousands of tons	RUS → FI
OVERALL		0,6-1,0 million tons 2,0-2,4 million tons	FI → RUS RUS → FI
CONTAINER TRANSPORT SHARE	Of the above: Machinery and equipment, construction products, industrial products, and raw materials	Hundreds of thousands of tons	FI → RUS

Figure 33: The potential transport of the railroad between Vartius-Kochkoma. The most likely and significant potentials in the short time period are shown first. (Source: Barents Link. Kansainvälisen raideliikenteen markkinointi- ja kehittämiskonsepti Vartius-Kochkoma 2009)

Potential from the connection to TEN-T network

The Trans-European Transport Network (TEN-T) policy addresses the implementation and development of a Europe-wide network of railway lines, roads, inland waterways, maritime shipping routes, ports, airports and railroad terminals. The ultimate objective is to close gaps, remove bottlenecks and technical barriers, as well as to strengthen social, economic and territorial cohesion in the EU. The current TEN-T policy is based on Regulation (EU) No 1315/2013.

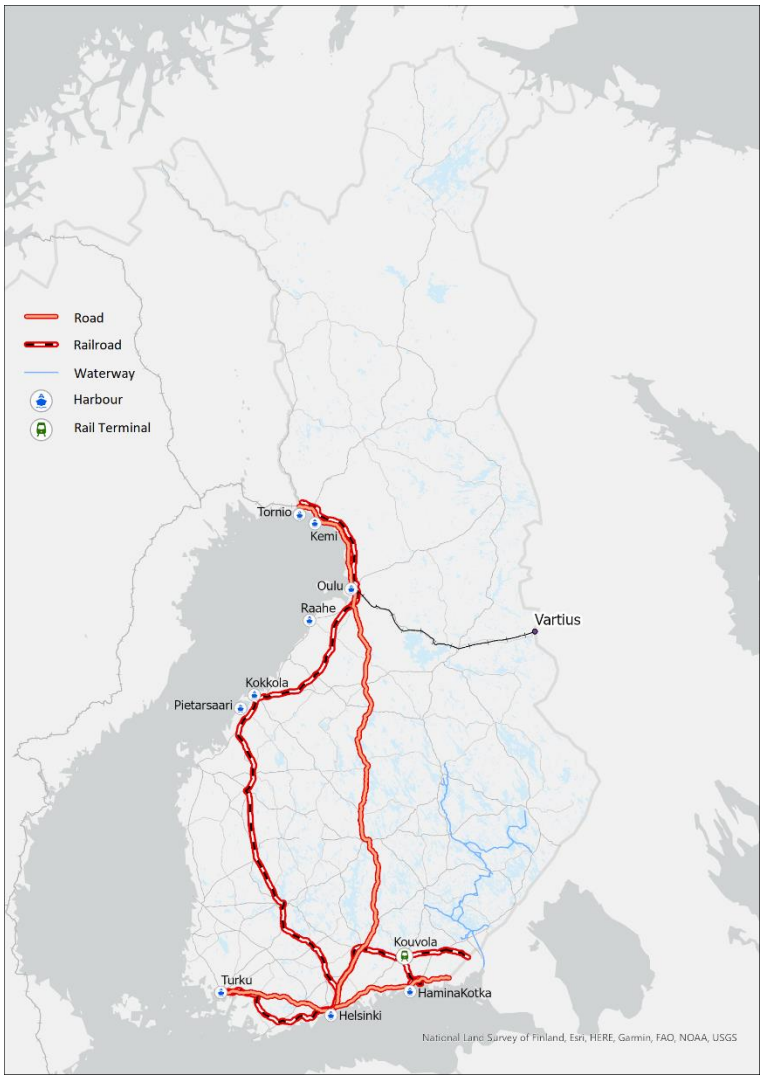


Figure 34: TEN-T corridors in Finland (Source: Ramboll 2021)

Besides the construction of new physical infrastructure, the TEN-T policy supports the application of innovation, new technologies and digital solutions to all modes of transport. The objective is improved use of infrastructure, reduced environmental impact of transport, enhanced energy efficiency and increased safety.

TEN-T comprises two network layers:

- The **Core Network** includes the most important connections, linking the most important nodes, and is to be completed by 2030.

- The **Comprehensive Network** covers all European regions and is to be completed by 2050.

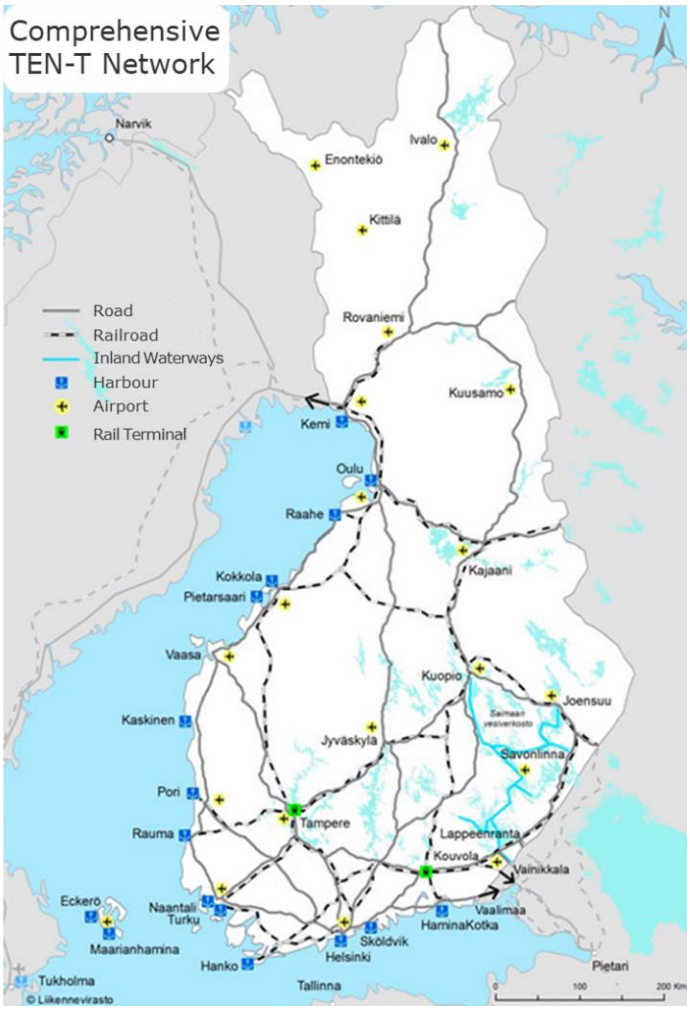


Figure 35: Comprehensive TEN-T Network (Source: Finnish Transport Infrastructure Agency)

The backbone of the Core Network is represented by nine Core Network Corridors, which were identified to streamline and facilitate the coordinated development of the Core Network.

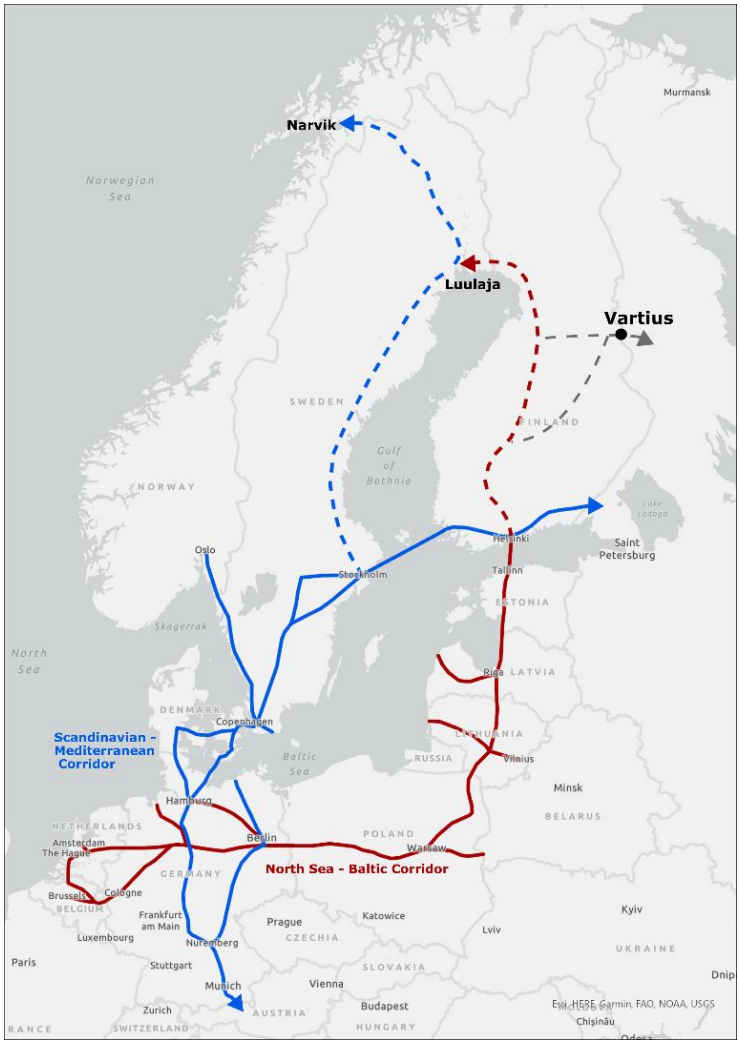


Figure 36: TEN-T corridors: Scandinavian - Mediterranean Corridor and North Sea – Baltic Corridor (Source: Ramboll 2021)

Potential from the connection to New Silk Road

The new Silk Road is the concept of a new pan-European transport system, supported by China, together with Russia, Kazakhstan, Belarus and other countries, to transfer goods and passengers from China to European countries.

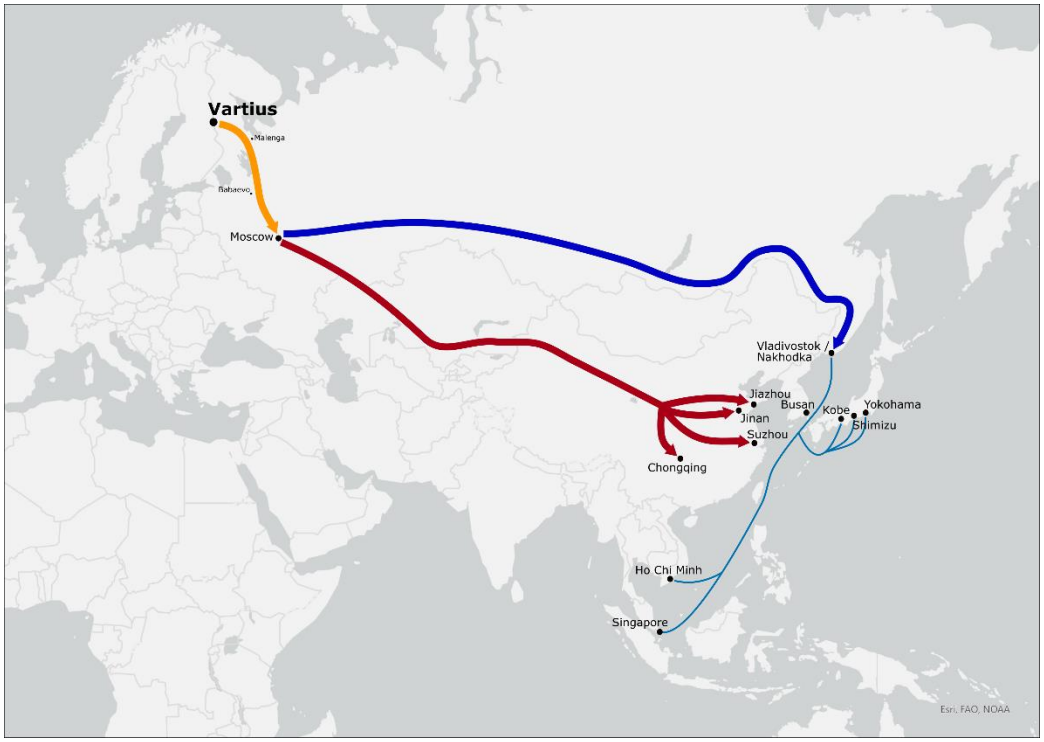


Figure 37: Potential connection from Vartius to New Silk Road and to the port of Vladivostok (Source: Ramboll 2021)

The main advantage of the route is the speed of transport. Trains on this world's longest freight railway route from China to Germany run in 13 days, twice as fast as the sea route via the Suez Canal. At present, the number of China-Europe freight trains has exceeded 12 thousand and the average annual growth rate is 108%. Between 2013 and 2019, trade between China and partners in its Belt and Road project increased from $1.04 trillion to $1.34 trillion.

Eurasian Railway Alliance JSC (UTLC ERA JSC) is a joint project between Belarusian, Russian and Kazakh railways to arrange high-tech comprehensive freight traffic on the China-Europe-China route.

Railway corridor Europe-China has rising volumes in groups of goods such as wood and wood products, textiles, rubber and rubber products, paper and cardboard products, pharmaceutical products. The volume of pharmaceutical products from Europe to China via the Russian Mamonovo/ Poland Branievo border crossing has almost quadrupled. The number of parfume, cosmetics and toilet products increased more than five times in the same direction.

Basic component of multimodal transport is the use of a single document. The corridor shall support a single CIM/SMGS consignment book (Convention on the International Transport of Goods by Rail/Agreement on the International Transport of Goods by Rail). One CIM/SMGS transport document is valid in the legal transport systems of China, Kazakhstan, Russia, Belarus and Europe. In this case, the consignment bond need not be re-issued on the train journey, which avoids the possibility of errors in the re-issue of documents and can also optimise the cost of transporting goods, technology and delivery time.

In 2019 the total freight traffic volume for the rail Eurasian route was 333 thousand TEU, in 2020, it hit 546.9 thousand TEU, with an increase of 64 %. The development drivers were, on the one hand, the constant improvement of the transportation technology on the route itself, and on the other hand, the restrictions imposed due to the spread of COVID-19, which incited consignors along the China-Europe-China route to opt for the railroad.

In 2020, the Eurasian railway transit route showed record growth rates in terms of traffic volumes.

This modal shift was triggered by disruptions in air transport operations and the crisis of sea cargo traffic, that dramatically increased the demand for the services of railways, and transport and logistics operators working in Eurasia. As a result, the Drewry WCI, which reflects the price of sea container shipping, exceeded for the first time that of the ERAI Index, the main quotation for the Eurasian rail transit. In April 2020, WCI was $ 1,495, in October it was $ 2,590, almost equaling the ERAI ($ 2,676). In November 2020, the transportation price for one TEU reached $ 2,902, for the first time overtaking the price of transit by rail.

Transportation of agricultural products provides great opportunities. The increasing consumer demand in China, the natural scarcity of arable agricultural lands, and the developing agriculture & food in the countries of this region impose the need for development in this direction.

The main problem for diversifying the agriculture and food product range is the sanctions imposed on Russia and the sanctions initiated by the Russian Federation. Such a situation around Russia, as one of the main transit countries and agriculture and food goods producers in the Eurasian area, resulted in a virtual freezing of this activity.

Decree of the Russian President in summer 2019, allows the transit of sanctioned cargoes through the territory of the Russian Federation subject to special requirements. The use of seals to protect containers from opening is a prerequisite for transportation of sanctioned products from Europe to China. In 2020, several pilot shipments were made in a close cooperation between the Eurasian route operator, the Russian Railways company, and Russian government agencies.

Originally, the main groups of goods transported along the Eurasian route were electronics and computers (CN FEA codes 85, 84), which are still holding the main positions with a total volume of 149,838 TEU for January-November 2020 with a share of 34%. At the same time, with the route development, the product range is diversified.

Cargo traffic of meat and meat products to the PRC faces not only non-tariff, but also transport and logistics limitations imposed by China. Currently, the possibility of such traffic is significantly limited due to the lack of special warehouses (approved and certified by a veterinary service) in the PRC territory to accept the controlled goods. Transportation of meat from Europe to China is possible so far only to consignees in Chengdu and Chongqing. Otherwise, it is presumed that the customs clearance of such goods should be carried out at the border when they are imported into the Chinese territory, where the required infrastructure is also lacking.

The following diagrams show the main agricultural product categories and categories of imports from China transported on the new Silk Road. This indicates potential for new products and volumes in border-crossing trade between Finland and Russia.

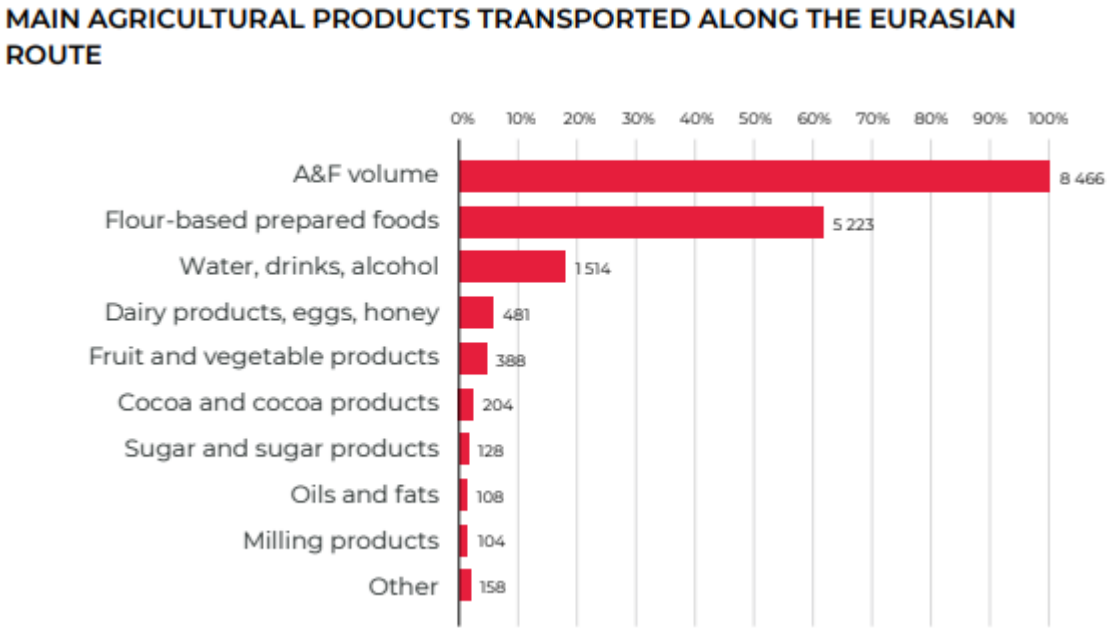


Figure 38: Product categories at Eurasian route (Source: Eurasian Rail Alliance)

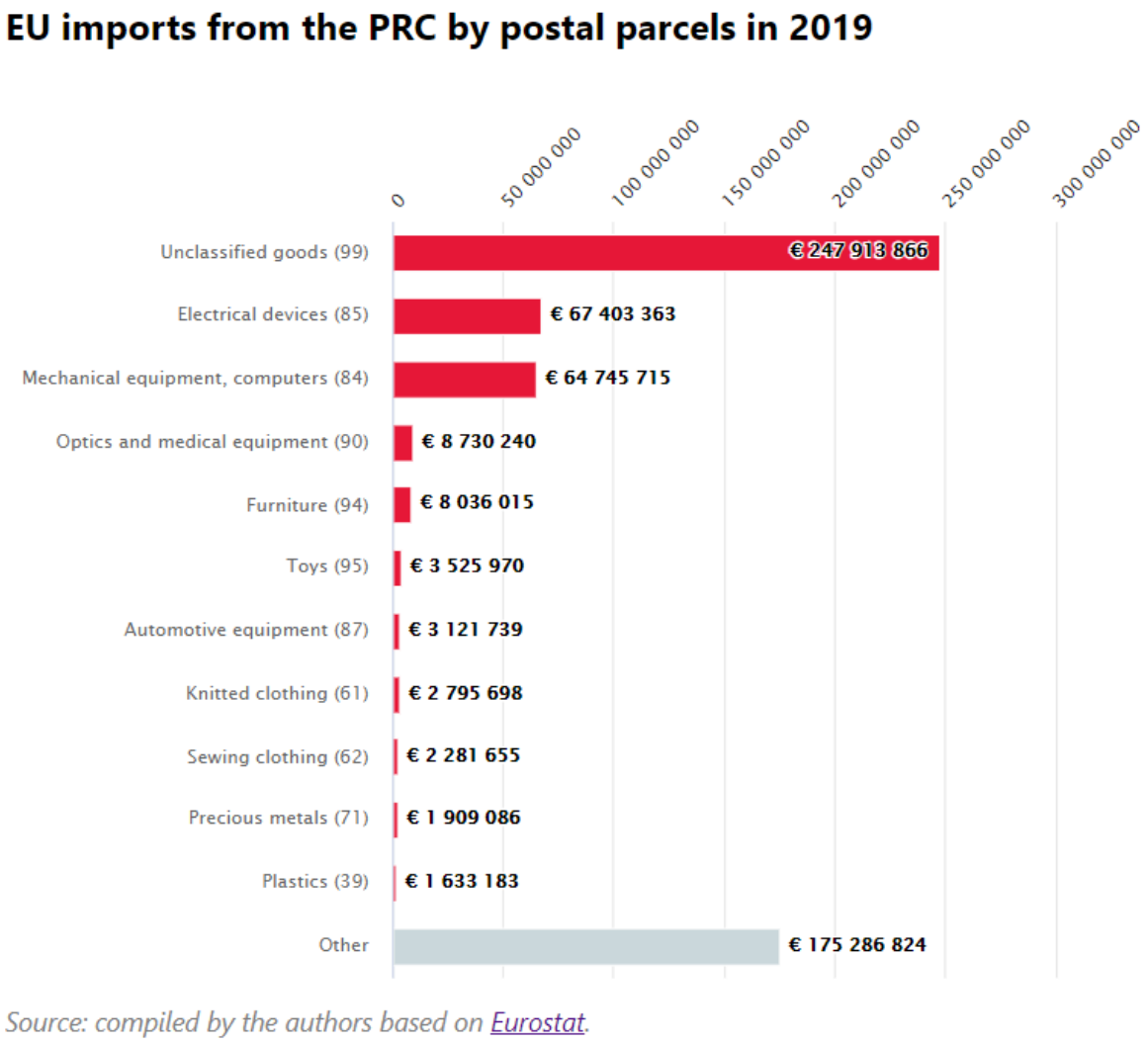


Figure 39: Eu import total value from China by categories in Eur (Source: Eurasian Rail Alliance)

3.6 Assesment of economic benefits

The purpose of this chapter is to assess of the economic benefits for the related regions if freight transport at the VLBC border crossing point can be developed for those products that are not currently exported/imported across the border.

3.6.1 An overview to economic benefits in freight transport

(Sources: Vartiuksen kansainvälisen raja-aseman kehittämissuunnitelma 2008, Barents Link Kansainvälisen raideliikenteen markkinointi- ja kehittämiskonsepti Vartius-Kochkoma 2009)

In the Barents region in the northwestern Russia, i.e. in the reach of Vartius's transport connections, there are production sites of mining, metal, forest and chemical industries. Gas and oil industries have also a strong position. This industry transports its raw materials and products for export mainly through Russian ports (including St. Petersburg, Murmansk and Arkhangels). The growing economy of Russia has caused continuous increases in freight traffic. This has congested traffic in many of the above-mentioned ports and the associated rail network. The

interest of the industry in ports of the Gulf of Bothnia, and the reliable connections they provide, has increased.

The most important industrial sectors in Northern Finland are forestry, paper, metal, mining, chemical and electronics industries. Two-thirds of industrial jobs are located close to Gulf of Bothnia. Product exports of the industry in Northern Finland to Russia and imports of raw materials from Russia are transported mainly through the border crossing points in Southern Finland or by sea through Russian ports. Exports to Russia include products from the metal and paper industries, and imports from Russia consist mainly of recycled metal products and coke. The Vartius transport route could shift a part of these transports through Vartius.

The area of impacts of the Vartius connection can develop considerably wider than at present, extending to west towards Sweden and Norway and to east towards further east of Russia and to the Far East until.

Northern Sweden has a strong position in mining, metallurgy, mechanical, wood, paper and pulp industries There is a fishing industry as well as oil and gas industry in northern Norway.

The economic benefits of increasing freight transport via Vartius – Lytta can be summarized as

- shorter routes for industry
- less congestion in Russia railways
- increased economical activity in the vicinity of the border-crossing station

3.6.2 Economical comparison with other routes and corridors

The volume of transit traffic in rail transport has increased almost continuously since mid-1990s. There has been growth especially in iron pellet traffic between Kostomuksha and the port of Kokkola.

New service concepts have been outlined to better serve the needs of freight logistics transport. Container train services to China, for example, have started. The containers have exported to China, for example, sawn timber, machinery industry products, workwear, and ship parts.

Recently, however, the growth in transit traffic is stagnating-now, with the exception of traffic between Kostomuksha and Kokkola. The future development of transit traffic will be influenced by, for example, the development of ports in Russia and the development of east-west railway lines in Finland. Since the financial crisis in 2008, transit traffic by sea towards Russia has decreased markedly. Russia's investments in the development of its own port network (e.g. Ust-Luga and Bronka ports) also contributed to this. Source: NATIONAL TRANSPORT SYSTEM PLAN 2021-2032

The following diagram shows how significantly exceptional circumstances and incidents have affected the development of sea container price,

Figure 40: container price surge (source: railfreight.com)

4. CONTAINER TRANSPORT STUDY

In the container transport study, the circumstances of the border crossing container transport in Vartius-Lytta will be analyzed, including

- overview of the container traffic from/to Finland
- administrative hindrances for container traffic, and possibilities to decrease and overcome them
- restrictions created by the existing infrastructure and facilities for container traffic, and related possibilities for improvements
- market-related factors affecting potential for container traffic
- other relevant factors.

As container transport is one specific part of freight transport, the most parts of the overall analysis made in chapter 3 are relevant and will not be duplicated in this chapter.

In the study an assessment of potential new container traffic will be made. Based on that, an assessment of the economic benefits for the related regions will be made for estimated additional container traffic.

4.1 An overview to current container traffic between Finland and Russia

The purpose of this chapter is to summarize previous studies and to analyze in general terms the current situation related to container transport, container volumes by traffic modes, by product categories, etc.

Container volumes and their development in general

The following diagram shows the development of container traffic from/to Finland using sea freight (via ports).

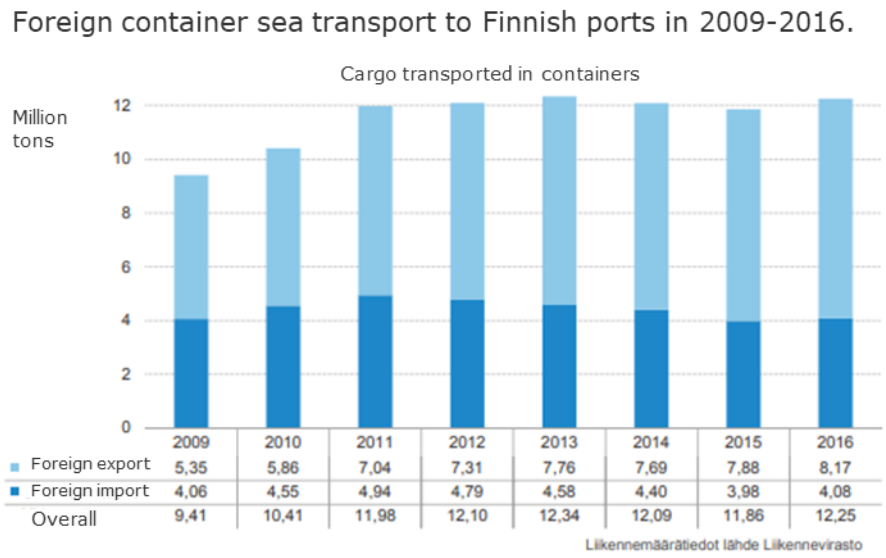


Figure 41: Container volumes in export / import via sea ports in Finland

As for rail traffic, in the 2000's the container transports crossing the border by rail have mainly been transit transports using Finnish ports. Between 2005 and 2012 the volumes of rail traffic have varied from around 1.2 million tonnes to around two million tonnes per year. Since 2010 some volumes of the transit transport have moved to Russia's own ports. Container transit routes are located almost exclusively in the ports and border crossing points of Southern Finland. Only individual containers are transported to or from Russia through the ports and border crossing points of Northern Finland.

Containers crossing the eastern border via rail are transported mostly through Vainikkala. In 2013, the total traffic in Vainikkala was about 20 000 containers.

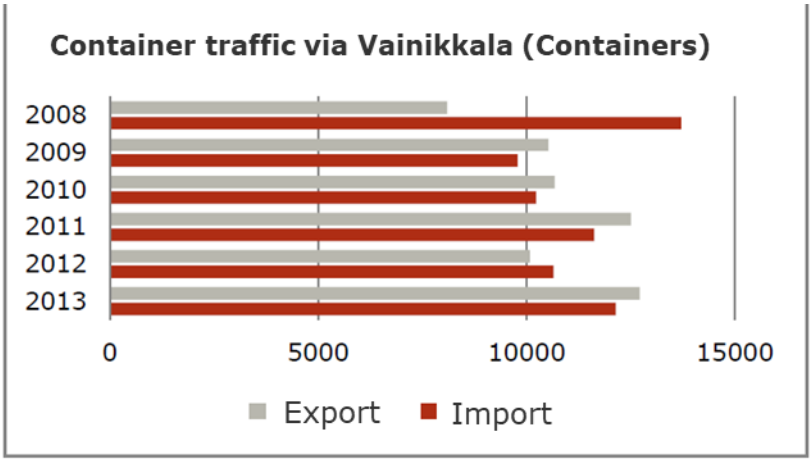


Figure 42: Container traffic via Vainikkala border station

The following diagrams illustrate total import and export volumes (tons) between Finland and Russia in Q1 / 2021 by product category. The diagrams give indication for potential for containerized transports.

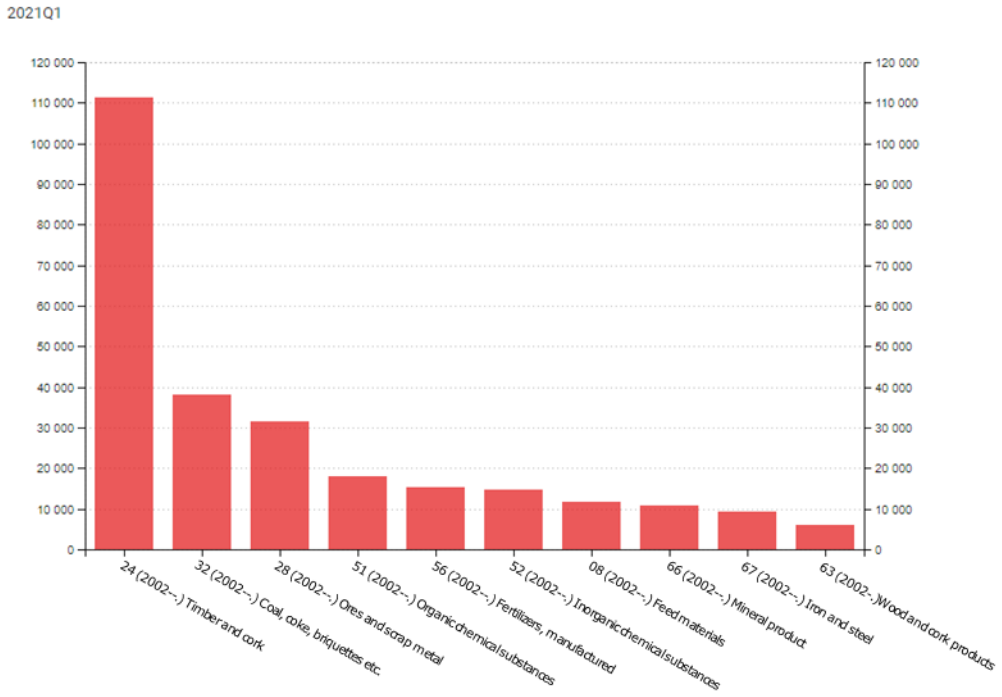


Figure 43: Q1/2021 Export from Finland to Russia by products in tons. (Source: Finnish Customs)

In export from Finland to Russia, paper, paper board and related products is the largest product category in tons, followed by chemicals, plastics and mineral products.

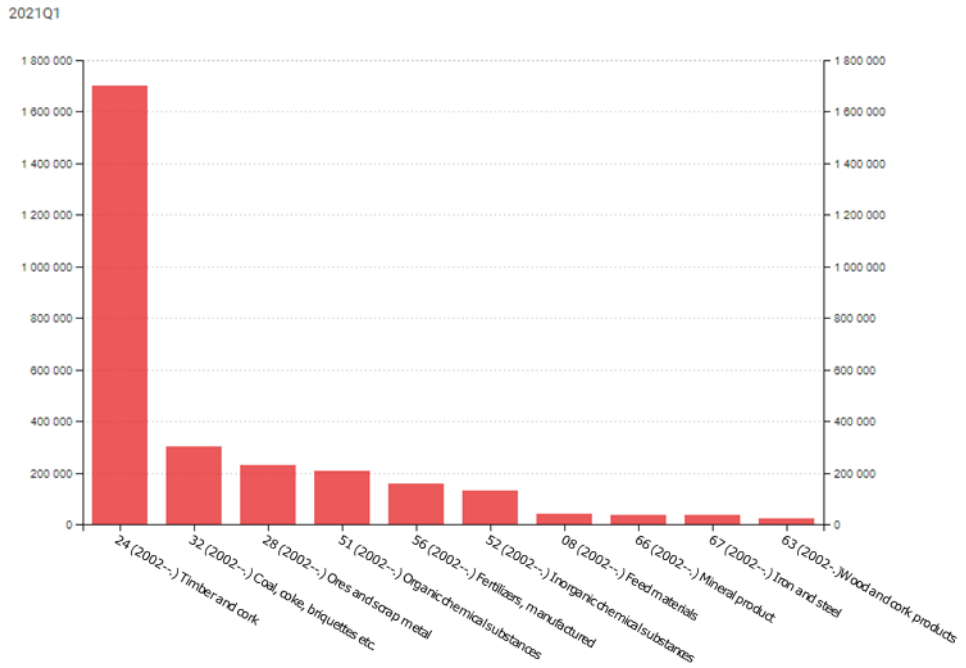


Figure 44: Q1 /2021 import from Russia to Finland by product category in tons. (Source: Finnish Customs)

In import volumes (tons) from Russia to Finland the wood materials dominate, followed by coal and various ores and metals.

Products listed

24 (2002--.) Timber and cork	1 701 098 t
32 (2002--.) Coal, coke, briquettes etc.	302 282 t
28 (2002--.) Ores and scrap metal	231 657 t
51 (2002--.) Organic chemical substances	207 592 t
56 (2002--.) Fertilizers, manufactured	157 737 t
52 (2002--.) Inorganic chemical substances	131 212 t
08 (2002--.) Feed materials	38 990 t
66 (2002--.) Mineral product	35 452 t
67 (2002--.) Iron and steel	34 503 t
63 (2002--.) Wood and cork products	22 466 t
59 (2002--.) Various chemical products	19 947 t
64 (2002--.) Paper and cardboard, and products from them	8 735 t
68 (2002--.) Other metals	7 284 t
69 (2002--.) Products from base metals	7 018 t
27 (2002--.) Mineral, unmanufactured	6 641 t

62 (2002--.) Rubber products	5 759 t
25 (2002--.) Pulp	3 494 t
57 (2002--.) Plastics, unmanufactured	2 202 t
04 (2002--.) Cereal and cereal products	2 038 t
23 (2002--.) Natural rubber, synthetic and regenerated rubber	1 651 t
77 (2002--.) Other electrical machinery and equipment	937 t
58 (2002--.) Plastics, manufactured	616 t
05 (2002--.) Fruits and vegetables	598 t
65 (2002--.) Textile products, excluding clothing	418 t
29 (2002--.) Other animal and plant raw materials	394 t
81 (2002--.) Prefabricated houses; HPAC and lighting fixtures	298 t
71 (2002--.) Prime movers and motors	241 t
11 (2002--.) Drinks	233 t
53 (2002--.) Dyes and tanning agents	155 t
01 (2002--.) Meat and meat products	130 t
72 (2002--.) Special machinery of different industries	110 t
78 (2002--.) Vehicles	91 t
74 (2002--.) General purpose industrial machinery and equipment	62 t

The modes of transport in imports and exports and their expected development are shown in the next diagrams. The share of containerized transports (blue color) has been steadily increasing.

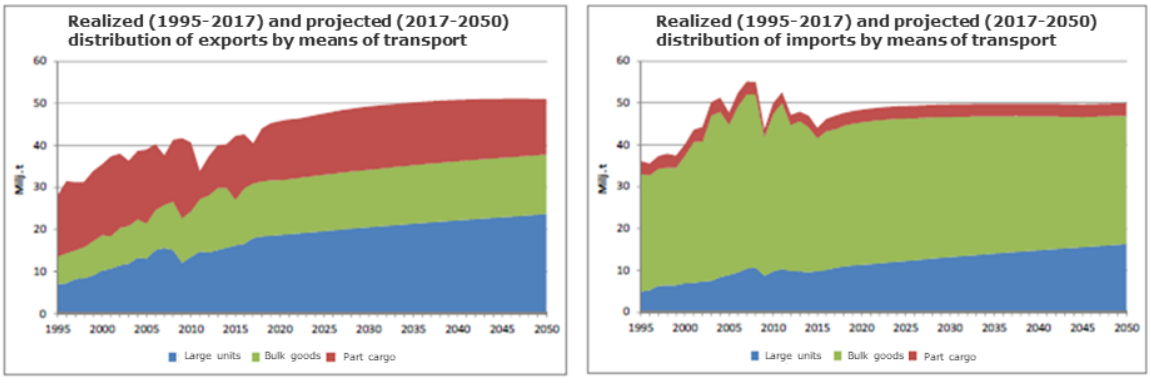


Figure 45: Development of transport modes in export and import. (Source: Liikennevirasto, valtakunnalliset liikenne-ennusteet, 2018)

Large units (in blue) include trucks, trailers and containers. Their share of the export traffic is approximately 35 %, and the share is expected to increase steadily in the future. In import traffic,

the share of unitized cargo in large units is approximately 20 % and the share is expected to increase steadily.

An overview of products imported to Finland in containers

In general, imports in containers from China, Japan, South Korea, Mongolia, Kazakhstan and Russia to Finland consist of

- Wholesale and retail trade consumer goods (consumer goods), including seasonal products
- Textiles, shoes, bags
- Garden accessories and furniture
- Furnishings
- Sports goods
- Electronics, toys
- Commodities for industry and construction
- Cars, mopeds, motorcycles
- Products of the on-line stores that are temporarily stored locally
- Pre-worked and processed stone materials

Some examples of importers are Rusta, Tokmanni, Puuilo, JYSK; Motonet, Biltema; H&M, Cubus, XXL; Zalando, Alibaba.

An overview to products exported from Finland in containers

In general, exports in containers from Finland to Russia, China, Kazakhstan, as well as to other countries within distribution distance, consist mainly of

- Paper and paper board products
- Containerized pulp
- Sawmill, building board and wood products
- Containerized chemicals
- Stone materials sent for processing in Asia
- Metal and engineering products
- Vehicles, work machines
- Special steel
- Food
- Beverages (Exporters like Olvi, Finspring, Polarspring)
- Meat products, berries (Exporters like Atria, HKScan,)
- Salmon from Norway
- Cleantech products
- Measuring equipment (Vaisala)
- Seasonal and event products: Products for olympics, international fairs etc.

4.2 Administrative hindrances in container imports / exports

In general, container traffic is subject to similar administrative hindrances as freight traffic (see chapter 3.3).

Administrative challenges and hindrances related specifically to the container traffic relate to the cost structure of container traffic. In the manufacturing industry, freight costs are usually 1-2% of turnover. oOn a company basis it is most affected by transport mode, the delivery clause between buyer and seller, and the volume purchased. Container costs react quite rapidly to changes in global demand of containers and cost levels of ship fuels (energy). The problem areas are the

availability of containers, the capacity of the transport chain in some areas, energy (fuel) prices and impacts of exceptional events such as natural disaster, the pandemic, geopolitical crises, etc.

Locally available means of easing the short-term changes in market situation are limited, the choice of route or choice of mode of transport are in practice the means which companies can react.

The following diagram shows the development of transport price of forty-foot equivalent unit (FEU, approximately two TEUs) during recent 24 months.

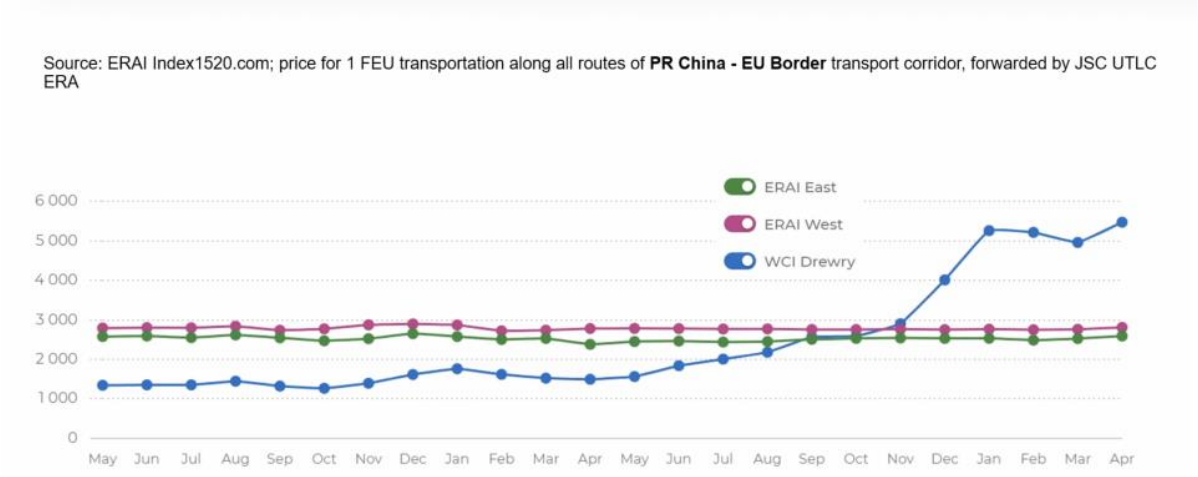


Figure 46: Price for forty-foot equivalent unit (FEU) (Source: ERAI Index1520.com)

During periods of crises like Covid-19 pandemic, container prices are also subject to significant shifts. Until the beginning of 2020, container prices were relatively low and stable for a long time. The pandemic's outbreak resulted in a continuous price increase that reached unprecedented high levels (figure 42). The same applied during the Suez blockade at March 2021.

In the following diagram shows the changes in availability of containers, port of Antwerp used as an example.

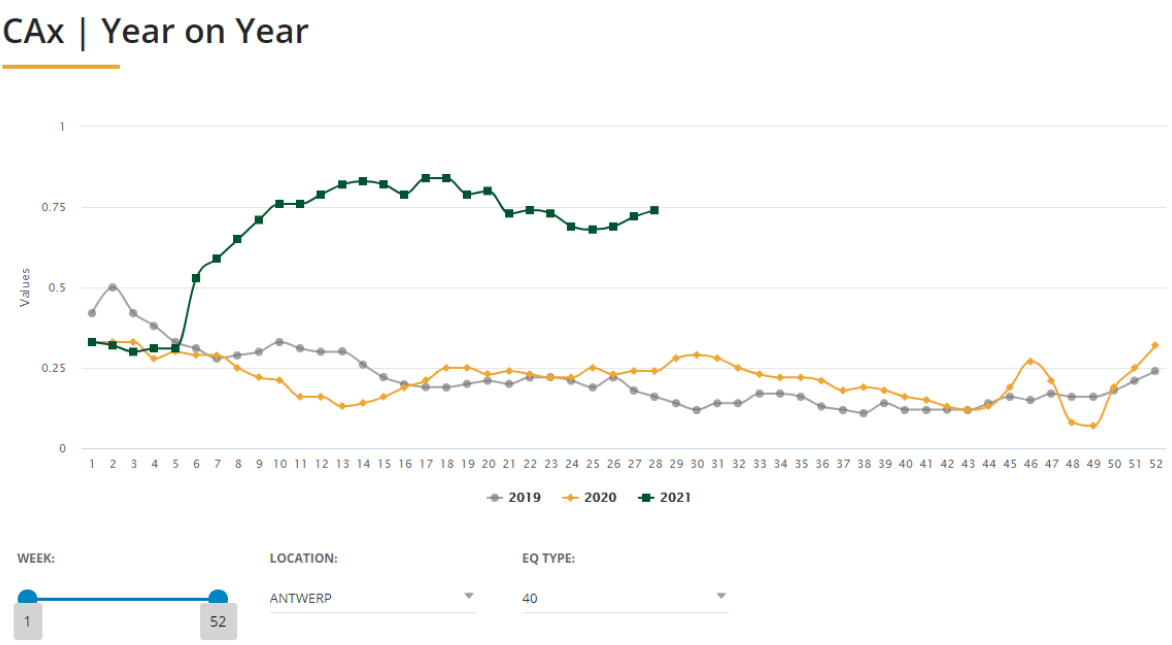


Figure 47: Container availability index regarding 40 feet containers in the port of Antwerp (source: container-xchange.com)

A CAx value of 0.5 means that the same amount of containers leave and enter a port in the same week. CAx values of > 0.5 means that more containers enter and CAx values of < 0.5 means more containers leave a specific port.

At very low CAx values the safety stock at a specific port is nearly empty. As a result, the CAx values turn positive again as only the containers that enter a port can leave again. At very high equipment levels, CAx values are likely to decrease again as a port has to reduce its safety stock first before they can accept new incoming containers.

4.3 Container logistics infrastructure in Vartius

Intermodal transport refers to moving freight by two or more modes of transportation. By loading cargo into intermodal containers, shipments can move seamlessly between trucks, trains and cargo ships.

In northern Finland Oritkari in Oulu, Ajos in Kemi, Lapaluoto in Raahe and Yxpihlaja in Kokkola are railway yards having capability for container intermodal operations like load and unload railway wagons. All these railway yard locations are in a seaport and it creates possibility to build up container train already in harbor. It is practically removing need to change transport mode in a border crossing point if wagons used are Russian wagons.

There can be many reasons that make handling containers in border crossing point less reasonable.

In transit traffic, target is to move container from border of entry to border of exit. Mode of transport is usually selected by price, speed and availability. Every movement and operation with container add more costs into products in container. That is why operators avoid changing

transport mode during transit. The national interest of Finland is to have stress caused by transit traffic to traffic network in a minimum and simultaneously to maximize revenue from transportation for example by offering local services and labor.

If feeder traffic to outbound trains would be produced by trucks, the trucks would need to drive empty to the next place of loading after they have delivered the container. This would bereflected in the cost of truck transport. If the inbound train would have a full container load, there is no reason to change transport mode because train can be driven to the destination port directly.

As described earlier, the Vainikkala border crossing station is handling most container volume by rail to Russia. In Vainikkala they had a container crane for loading/unloading, but it was abandoned years ago because of minor usage.

Vartius border crossing station does have proper equipment to serve modern logistic chain.

4.4 Market related factors in border crossing container traffic

4.4.1 Competitive landscape

Choosing the mode of transport is influenced by the availability of services, operating models, costs, service level and actions of public steering (subsidies, restrictions etc). Each transport mode has its own strengths and weaknesses and an optimal operating environment.

When choosing a mode of transportation, the customers consider transport time, delivery reliability and punctuality of the entire logistics chain. Also, the characteristics of cargo affects the transport mode, e.g. sensitivity to temperature, value of goods and sensitivity to damage.

The following diagram shows examples of transport time and cost between Europe and China in 2017 for relevant transport modes.

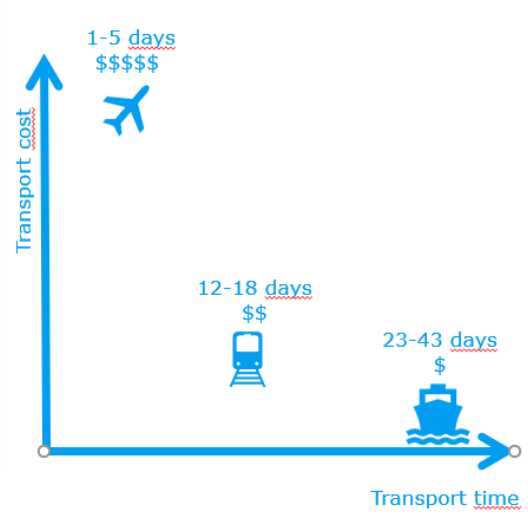


Figure 48: Costs and lead time on principal level by transport mode at Europe – China route

It is estimated that the level of transportation costs is more significant in exports from Finland and the transportation time in imports to Finland. Certain export goods, such as food, vehicles and other commodities also benefit from speed.

The strengths of rail freight are faster transport time compared to sea freight and lower transportation costs compared to air freight. The challenges are congestion of routes and border stations. Rail transports are a good alternative between air and sea transports both in terms of cost and delivery time.

4.4.2 Containers depots / availability of empty containers

A container depot or yard is a place where several containers are stored or held in transit, once they are unloaded. This depot provides a single place where shipping and logistics companies can keep their containers until it is time for reloading. In general, the depot is located inside a port or terminal or in the surrounding area. This enables for a quick and immediate transfer of containers between different locations.

During covid-19 pandemic the situation has been different than in any other time.. In a normal situation shipping companies and container owners can keep a balance quite well by pricing and rotating container flow.
Following six reasons collected by Onno De Jong, describes very well how sensitive and unpredictable is the balance of container availability.
The container market is going through some extraordinary conditions that affect it heavily.
There are six reasons to explain the current situation:

1. Supply chains are still under stress due to the scaled-down production following the pandemic's outbreak in 2020.
2. The faster than expected recovery of the market following the pandemic led to shortages in many supply chains.
3. The container schedules adjusted to the scaled-down production. When production stepped up, it resulted in constraints.
4. Imbalances because of empty containers worsen the situation.
5. The Suez-canal was blocked when the 400m-long Ever Given became wedged across it after running aground amid high winds. It was an extra aggravating disruption.
6. Finally, forwarders chartering their own smaller container ships do not prove beneficial for the market.

Rail freight also plays a role in the situation. Specifically, the fact that China Railways decided to ban the export of its containers worsened the equipment scarcity

4.5 Evaluation of economic impacts and benefits

The purpose of this chapter is to evaluate economic impact and other benefits of increasing container traffic via Vartius -Lytta, including business opportunities of the Northern Norway, Northern Sweden, Northern Finland, Russia and Barents region

4.5.1 Qualitative evaluation of economic impacts and benefits

<u>Impacts and benefits to industry/customers</u>

Companies choose their logistical solutions from their own financial and production-based criteria. Using a container instead of a fixed bodywork for short distances and non-intermodal transports is rarely justified, especially in the Finland territory, with the advantage of vehicle dimensions of existing HCT combinations. The increase of a container traffic at Vartius – Lytta border crossing

point, the way it benefits the area from an economic point of view, requires that consignor or consignee benefits from the routing of the container through Vartius. Factors affecting the choice may include the value of the goods in relation to the freight cost, the quantity of goods, the location of the target market area, the extent of the related corridors, the inter-combination of modes of transport chain, the regional market shares of logistics operators. Transport costs are a significant factor for companies, so support services and non-core business activities, such as transport, are outsourced to service providers. The buyer's motivation to influence route selection in the outsourced solution is minimal in the absence of a cost impact.

Benefits of modal shift from road to rail

Source: Barents Region Transport and Logistics Case Studies

The logistical benefits from the optimal modal shift are
- Each mode is used in their optimal operational environment respective to time and cost
- Reduced total transport costs
- Higher load factors and better utilization of existing capacity
- Less empty backhauls due to modal shift and cargo consolidation
- Added value for transport customers
- Reduced environmental footprint and less congestion on the road network

4.5.2 Calculations confirming the economic benefits

Benefits are more company spesific. Company can set a different priority for things. Decisions made on based company’s internal values or by product features are difficult to synchronize to fit all.

4.6 Potential for cross-border container traffic via rail

The purpose of this chapter is to make an assessment of potential industries that could benefit from the development of container traffic through the Vartius / Lytta border crossing point. The focus is in rail traffic, and the assessment covers exports, imports and transit traffic. The current situation will be analyzed briefly. A list of potential business sectors will be made. The main pre-requisites of commencing container traffic / increasing existing volumes will be indicated.

4.6.1 Current situation in export/import in brief

The following diagram shows the annual development of import and export value (M€) between Finland and Russia.

Source: Finnish Customs

Figure 49: Value of foreign trade between Finland and Russia, 2002-2020. Value of imports is twice the value of exports.

The main fluctuations derive from

- Financial crisis in 2008.
- European Union introduced economic sanctions against Russia in 2014.
- In March 2020 the Covid-19 pandemic hit the global economy.

The imports to Finland from Russia are heavily based on mineral fuels, approx. 70% of total import value in 2019. The exports from Finland to Russia show greater versatility; in 2019, machinery and transport equipment accounted for approx. 40% and basic manufactures approx. 25% of total export value.

The breakdown of imports to Finland from Russia in 2005-2019 is shown in the next diagram

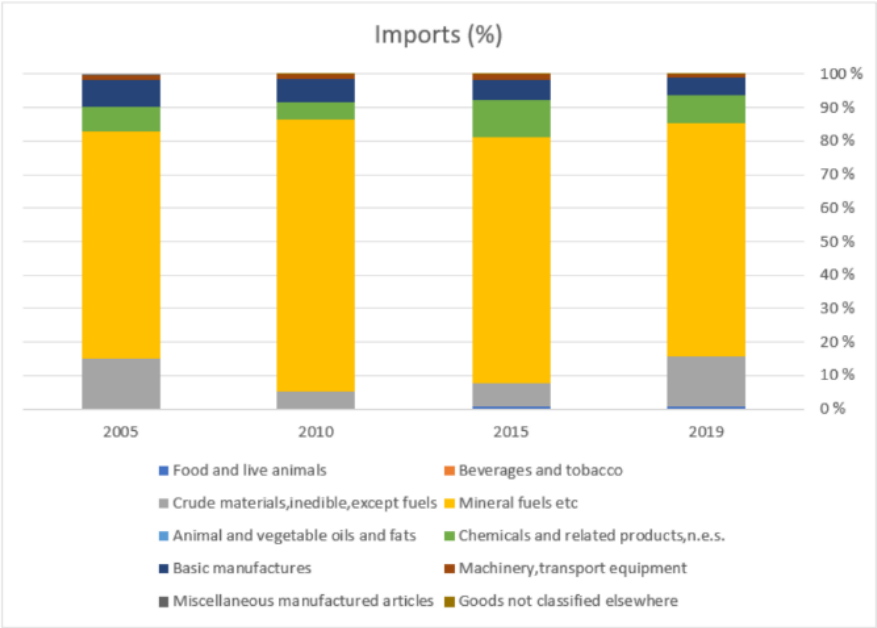


Figure 50: The breakdown of imports to Finland from Russia in 2005-2019

The main volumes in import traffic come from mineral fuels, crude materials. chemicals and related products and basic manufactures.

The breakdown of exports from Finland to Russia, 2005-2019, is shown in the next diagram.

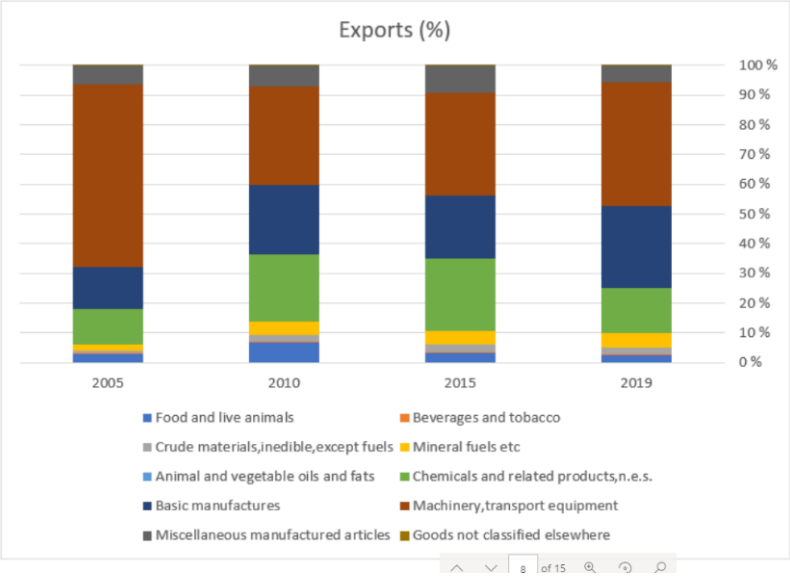


Figure 51: The breakdown of exports from Finland to Russia, 2005-2019

The main volumes in export consist of machinery and transport equipment, basic manufactures, as well as chemicals and related products.

4.6.2 General trends affecting potentials in industrial cargo

The general trends affecting potential for industrial export/import via Russian border can be summarized as :

- Increasing transportation volumes between Asia and the EU: Asia's growing role as a supplier to the EU, Growth of international e-commerce, growing demand in Asia for high quality European building materials and investment commodities, stricter environmental requirements increasing costs of marine transportation
- Changing customer needs – smaller volumes, but faster and with more accurate schedules
- Increasing requirements for transparent and sustainable operations: open access principles, shipment tracking. Increasing significance of cooperation.
- Growing intelligence and increasing automation of transportation chain
- International transportation corridors: TEN-T in the EU, Belt and Road Initiative (New Silk Road) in China

4.6.3 Experiences from rail freight cases in container transport

Recently there have been a few business initiatives to develop cross-border container traffic via rail. In general, all initiatives have taken time, and there are successes as well as failures.

Case Nurminen Logistics

Nurminen Logistics arranged the first block train shipment from Finland to China in 2017. As an example of export traffic, Nurminen Logistics has mentioned forest industry products. As an example of import traffic, Nurminen logistics has mentioned seasonal products, as sea transport is too slow an alternative for them.

Nurminen Logistics transports cargo by rail between Europe and China in both directions. The service runs from Helsinki and Narvik to Chongqing and Jiaozhou. From Suzhou, Chongqing, and Jinan tere are westbound trains. Via Trans-Siberian route the cargo can be transported to Japan, Vietnam, Singapore, Korea and back. The train transports all kinds of goods, both full containers and general cargo.

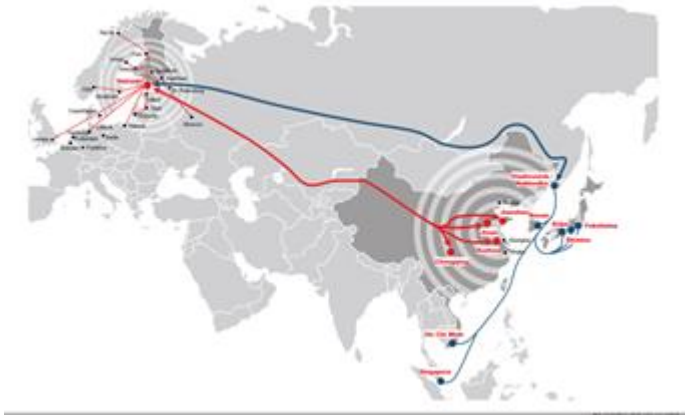


Figure 52: Transport routes of Nurminen Logistics. Source: Nurminen Logistics.

In June 2021 Nurminen Logistics started service from Far-East to Nordic countries via the Trans-Siberian route. The rail cargo is transported every week from China, Japan, and Korea via Vladivostok to Helsinki and other Nordic countries.

Nurminen Logistics is the only northern European company offering regular traffic to Asia. Competitors are Chinese companies offering charter trains to targeted customers.

The operation is based on cooperation agreements with VR Group and RZD (Russian Railways) and other local railway operators. The wagons come from RZD, on the Indian route from the Azerbaijan Railway Company.

Terminals and loading treatments are situated in Vuosaari harbour, somewhat in Kotka and Vainikkala. 30% of the volume comes from the Baltic states and Europe on ships in containers or in bulk by trucks. The feeding traffic in Finland is carried mainly by trucks, somewhat in cooperation with VR. Container loading takes place in Vuosaari.

The new connection of Nurminen Logistics to Sweden will operate via VR via the port of Vaskiluoto in Vaasa, from there the ship to Sweden and then on board by the Swedish railway operator to southern Sweden.

The o loading stations are Vainikkala, Kotka and Vuosaari, wagons or containers won’t be added to train during the journey.

RailGate connection Kouvola-China and Kouvola RRT

The City of Kouvola and development company Kouvola Innovation have been the active parties in developing RailGate container train service and Kouvola RRT intermodal terminal. Also the local terminal operator Kouvola Cargo Handling has been actively involved.

Terminal operators in Kouvola, Moscow / Kaluga, Khorgos and Zhengzhou signed a cooperation agreement at the end of 2016 (Zhengzhou later changed to Xi'an).

Figure 53: Train connection from Kouvola to Xian may also also connect the Northern Sea and the Pacific Ocean.

The rail connection from Kouvola to Xian is about 8,000 kilometers long and the journey takes about 12 days. According to Kouvola Innovation, the route is about 2,000 km shorter than the Central European route, thus significantly speeding up freight traffic between Europe and China compared to shipping and lowering costs compared to air freight. The rail connection also has the advantage of larger container weight classes. Traffic volumes are mainly based on exports to China and imports from China to Europe

According to the future vision, operators would have daily, two-way trains between China and Europe.

Kouvola RRT (Rail-Road Terminal) is the only intermodal terminal in Finland in the European TEN-T core network. The current terminal can handle at least one full train per day or about 30,000 to 50,000 TEU per year. A new intermodal terminal combining different modes of transport is currently being built in the Kullasvaara area. With the completion of the new terminal, hundreds of thousands of TEUs and 4 to 5 container trains per day can be handled. The maximum length of container trains can be 1 100 m.

Figure 54:

The RRT project has received EU and state funding. The total amount of the investment is EUR 45 million.

So far, a total of approximately 20 container trains were transported in this route in 2018-2019, after which the traffic has stopped entirely. The reasons for this can be estimated to be the increase in transport prices after the end of Chinese subsidies and the lack of interest of commercial logistics operators. The private operators prefer port terminals for direct loading and unloading to/from ship, to avoid extra costs. Location in seaport or airport is practically mandatory if it is matter of multimodal and long-distance transport production.

4.6.4 Potential industries in export of containerized goods

The potential export industries that could benefit from the development of container traffic via rail through the Vartius - Lytta border crossing station are summarized from two viewpoints: A. potential created by general trends and B. potential created by specific circumstances related to Vartius/Lytta route.

A. Export potential created by general market and industry development trends

- Growth in pulp exports from Finland to Asia is expected to continue
  - ➔ pulp industry, examples like UPM, StoraEnso
- Export volumes of sawmill products, plywood and building boards vary according to the international competitive situation, their demand in China is growing
  - ➔ timber, plywood and building board manufacturers
- There is growth potential in the chemical industry's exports
  - ➔ chemical industry products
- In food transportation, it is anticipated that the permitting procedures for transportation to / through Russia will be easier, which would enable and facilitate the transportation of Finnish food and, for example, Norwegian salmon through Russia to the Asian market
  - ➔ food industry
- The circular economy is a rising business trend in all countries
  - ➔ Materials, recycled raw materials

B. Export potential created by specific circumstances related to Vartius/Lytta route (from interviews)

- Organic and healthy food, like berries and mushrooms from Finnish forests
  - ➔

As a conclusion, taking into account the restrictions described earlier in this study, some short-term potential can be seen in export of pulp, sawmill products, plywood and building boards as well as in export of containerized chemical products.

In the longer run, export potential can be seen in new technology, energy solutions and battery value chain.

<u>Salmon transport from Norway to Russia</u>

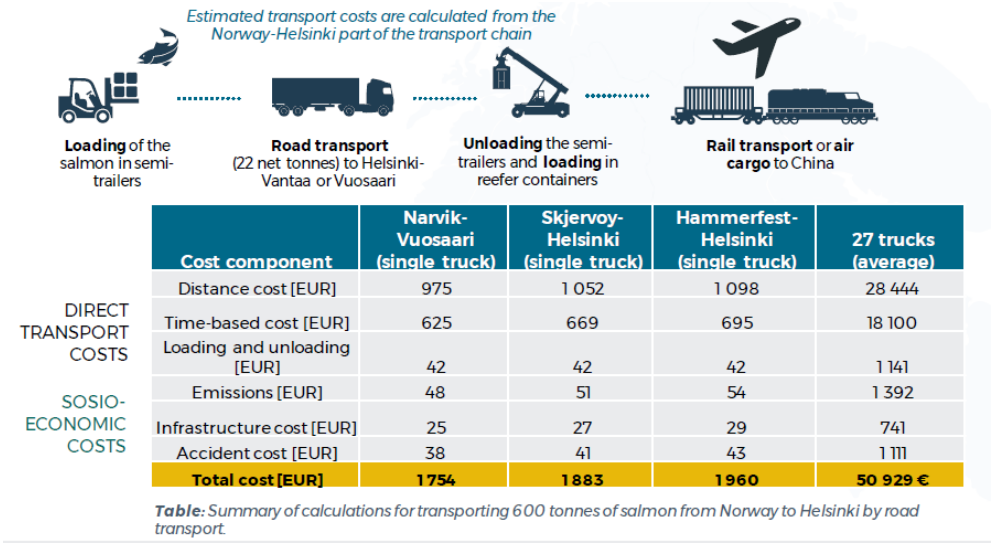
(Source: Barents Region Transport and Logistics, Case Studies)

Figure 55: Salmon route in road network (Source:)

Total volume of salmon and other seafood transports from Norwegian High North area are approx. 0,4 million tonnes per year. This volume is estimated to grow to 1,6 million tonnes by 2050. In this case study three transport routes are evaluated as potential border-crossing freight transport flows for modal shift. Transport volumes on E8 main road are 160 000-200 000 tonnes per year from two origins, Skjervoy and Hammerfest. About 2/3 is transported from Skjervoy and 1/3 from Hammerfest. These are operated by trucks to Helsinki-Vantaa airport and further to diverse destinations in Asia. Part of the transport volume is transported to Finland, Sweden and Russia.

The third transport chain is the latest, called container rail transport Narvik-Tornio-Helsinki-China. At the moment this transport system is operated by road transport between Narvik and Helsinki and further to Asia by rail container transport. This route has a lot of potential in the future for diverse cargo types and forms a transport corridor between Asia-Helsinki-Narvik and further to Iceland, USA and Canada.

There are also direct air transports of salmon from Narvik (Evernes) to Asia. Qatar Airways is operating transport route Narvik-Doha-Asia to diverse destinations.



	Cost component	Narvik-Vuosaari (single truck)	Skjervoy-Helsinki (single truck)	Hammerfest-Helsinki (single truck)	27 trucks (average)
DIRECT TRANSPORT COSTS	Distance cost [EUR]	975	1 052	1 098	28 444
	Time-based cost [EUR]	625	669	695	18 100
	Loading and unloading [EUR]	42	42	42	1 141
SOSIO-ECONOMIC COSTS	Emissions [EUR]	48	51	54	1 392
	Infrastructure cost [EUR]	25	27	29	741
	Accident cost [EUR]	38	41	43	1 111
	Total cost [EUR]	**1754**	**1883**	**1960**	**50 929 €**

Table: *Summary of calculations for transporting 600 tonnes of salmon from Norway to Helsinki by road transport.*

Figure 56: Calculations feeding traffic costs Norway – Helsinki (Source:)

Exporting sawmill products

(Source: Barents Region Transport and Logistics, Case Studies)

Figure 57: Regions of North Karelia and Kainuu have many sawmills in diverse dimension and product supply. (Source:)

	Cost	Road	Road+rail	Road+ship
DIRECT TRANSPORT COSTS	Distance cost [EUR]	29 510	19 805	13 133
	Time-based cost [EUR]	20 015	24 828	13 046
	Loading and unloading [EUR]	6 080	14 400	38 080
	Fairway dues [EUR]	0	2 287	5 500
SOSIO-ECONOMIC COSTS	Emissions [EUR]	1 576	238	1 292
	Infrastructure cost [EUR]	678	102	262
	Accident cost [EUR]	1 018	154	394
	Total cost [EUR]	**58 878 €**	**61 814 €**	**71 707 €**

Figure 58: Summary of calculations for transporting 3200 tonnes of Saw products from Kuhmo to HaminaKotka. (Source:)

4.6.5 Potential industries in import

The potential import industries that could benefit from the development of container traffic via the Vartius / Lytta border crossing station are summarized from two viewpoints: A. potential created by general trends and B. potential created by specific circumstances related to Vartius/Lytta route.

A. Import potential created by general market and industry development trends:

- import and distribution of consumer goods

B: Import potential created by specific circumstances related to Vartius/Lytta route (from interviews)

History of city of Kostomuksha. City was established for mining industry. Raw materials are available, if portfolio of production in the area, expands to products of a higher added value, it can diversify categories of import. Another possible factor is a special status as one of the territories of advanced socio-economic development in the Republic of Karelia. It can speed up added value industrial development in Kostomuksha.

4.6.6 The pre-requisites for increasing container traffic in Vartius/Lytta

<u>General pre-requisites and challenges</u>

The development of container traffic must be seen as a holistic transport system development work that improves logistical competitivity and brings added value to the transport customers. Therefore the development of container traffic needs a clear vision and target setting to form a competitive and sustainable transport system. This transport system must be cost

efficient with high service level and increasingly sustainable. Thus, a combination of looking at the big picture and local development is needed.

General challenges to be solved in container traffic by rail are listed below. Most of them are relevant from the viewpoint of Vartius-Lytta border crossing traffic:

- Loading and unloading costs are a much larger share of the total cost by rail than by road. Much larger freight volumes are required over longer distances to generate economies of scale for rail transport.
- The intermodal market consists of several modes of transport (road, rail, sea, air) with varying market terms and business models. Transport modes are in competition with each other.
- The lack of access to loading terminals, as well as capacity limitations in the rail network, could reduce business opportunities.
- The freight forwarder market is relatively poorly developed, and there is a significant lack of 3PL/4PL companies able to coordinate and market transport solutions, which are attractive to customers in the intermodal transport market.
- Public actions (e.g. export/import restrictions) and public incentives (e.g. China financing the new Silk Road approach) can change the competitive landscape and business potential over night

Pre-requisites and challenges related to commercial interest

The commercial interest of significant logistics operators (3PL, 4PL operators) is a major pre-requisite for commencing and increasing container traffic. The interest of operators and their customers (exporters, importers) will be derived from sufficiently competitive costs and other terms of transportation solution. This competitiveness of costs and other terms is a major pre-requisite for commercial interest.

There are companies offering transport and forwarding services for cross-border traffic with Russia, like

- Nurminen Logistics
- Steveco Logistics
- Kuehne-Nagel
- DB Schenker
- DFDS
- DSV
- DHL
- Varova
- Hacklin

There are also sea container carriers who could take advantage of a new route for some of their customers, like

- 2M Alliance: Maersk, MSC, Hyundai
- Ocean Alliance: CMA, CGM, COSCO, Evergreen ja OOCL
- THE Alliance: Hapag-Lloyd, UASC, Yang Ming, Hanjin, K Line, NYK ja MOL .
- Seago Line
- Backman-Trummer
- Beweship DSV Air & Sea
- TNT

The interest of one - or rather several - logistics operators is a crucial factor in developing container traffic via Vartius-Lytta.

Specific challenges and pre-requisities of container traffic in Vartius-Lytta

The biggest challenges for increasing container traffic in Vartius border crossing are the small volumes to Republic of Karelia in Russia, distance from the Oulu railway yard, which is the nearest traffic point for the construction of a container train and the lack of a clear competitive advantage over other transports and operators. Active operator, who would have interest to create connection to

4.7 Forecast for future container traffic volumes

Wrap-up of previous studies

The potential for container transport via Vartius has been estimated by former studies to be several hundreds of tons.

"One million tons of goods could be transported from Finland via Vartius to northwestern Russia, of which several hundred tons in containers. The containers would carry machinery and equipment, construction and industrial products and raw materials"

Based on the freight flow modeling of the Barents Freeway project, significant transport potentials between northern Finland and northwestern Russia include e.g. chemicals, metal products, paper products and various equipment and machinery and parts thereof. The transport potential of these as a whole on the Salla route was estimated at several hundred thousand tons. There are demand indications for logistics companies for container transport of the above-mentioned types of goods on the Vartius route, so with the implementation of a reliable and cost-effective container train service on the Vartius route, there is a potential container transport potential of hundreds of thousands of tonnes. The potential consists mainly of transport from east to west - on the contrary, the potential would appear to be significantly lower.

Based on the interviews made in the study "Vartiuksen konttiliikenneselvitys (2014)", the following minimum potentials for container transport of different types of goods were identified

- Transit transport of metal products: potential container shipments of at least tens of thousands of tonnes
- Transit transport of concentrates: container transport potential of at least 50,000-100,000 tonnes
- Imports of chemicals to Finland and exports from Finland: at least 60,000 -100,000 tonnes
- Other products: export and transit of general cargo, industrial products and machinery and equipment in containers: potential at least thousands of tonnes

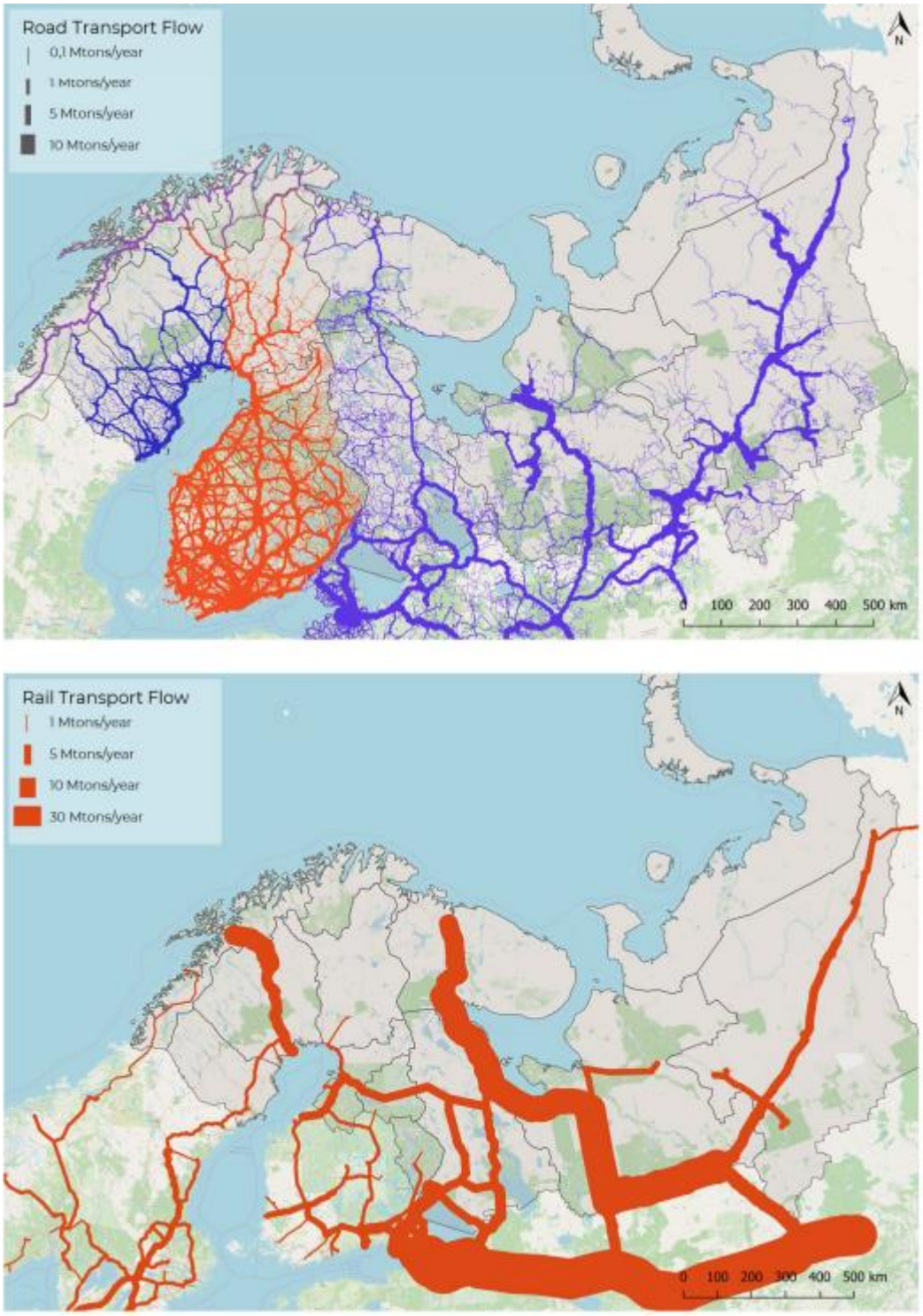


Figure 59: Road and Rail Transport flows and corridors. (Source: Barents Region Transport and Logistics)

4.8 Challenges and solutions related to container traffic potential

The realization of the transport potential depends on the actual cost and service level of the route.

From the point of view of cost competitiveness, the opening of the Ledmozero-Kochkoma connection to international traffic and the normalization of the tariff level of the connection are key factors.

Rail freight needs boosting through increased capacity, strengthened cross-border coordination and cooperation between rail infrastructure managers, better overall management of the rail network, and the deployment of new technologies such as digital coupling and automation.

Example: Terrafame logistics ecosystem (Source: Terrafame website)

Terrafame, together with its partners Oy M. Rauanheimo Ab and VR Transpoint, has developed a comprehensive logistics solution covering the entire supply chain from the production facility to the customer's port.

The logistics solution innovatively interconnects the location of Terrafame's production facilities with Finland's comprehensive rail and port network.
Battery chemicals are packed in sealed shipping containers and loaded into railway wagons in the Terrafame industrial area. VR Transpoint's fleet of locomotives and wagons optimized for transporting Terrafame products enables uninterrupted deliveries flexibly to different domestic ports. There are always a number of containers in the industrial area corresponding to production. Battery chemicals are delivered to the destination designated by the customer without factory or other intermediate storage, and containers are not opened during transport. The solution, in which rail transport can be flexibly translated into different ports, will make effective use of both the transport equipment and the capacity of the rail and port network, as well as a wider maritime transport offering. The electrified rail network promotes the climate resentability of transport. When operating at full capacity, the export traffic of the battery chemical plant means loading and shipping 25-30 shipping containers 6-7 days a week all year round. In connection with this, Terrafame has signed a cooperation agreement with HaminaKotka Satama Oy to develop container traffic.

Summary
Building a logistics chain for big volumes needs large co-operation between all actors in the chain. When the client is planning logistics solutions, the operator is in crucial role when modes of transport, used techniques of material handling, connected corridors and route selection are evaluated and selected.
As can be seen from case Terrafame, the logistics chain is nowadays rather a jointly created ecosystem than an individual solution for certain need.
In the absence of an active commercial operator, the means to develop services are limited. Public sector actors must adhere to given limits, but the private actor is able to operate more flexibly and responsively.

5. ROUTES OF FREIGHT FLOWS

5.1 Current east traffic transport routes

In June 2021 published Barents Region Transport and Logistics -case studies. The publication is a comprehensive review of transport chains in the Barents area.

Figure 60: Prioritized rail network by the EU and the Russian Federation (Source: Joint Barents Transport Plan 2016)

From Narvik to EU border

The Ofotbanen railway is 43 kilometres long from Narvik harbour to the national border with Sweden. The railway has a connection to the Swedish rail network. The Ofotbanen line follows from Narvik the fjord inwards and eastwards towards the mountains at The Swedish Border.

The Ofotbanen line is also an important freight corridor for the entire Nordic region and 90% of the grocery supply to Nord-Norway goes by train via Narvik.

The Ofotbanen has too little capacity. Therefore, in the short term, longer sidetracks are developed on the track. In a few years, the track will need a double track.

When you look at possible routes from Narvik to Russia and further on to Asia, the logical transit point is Oulu. From Narvik to Oulu, routing, and therefore costs, are the same. From Oulu onwards, possible alternative routes and modes of transport include maritime transport, train and road transport.

Figure 61: Oulu is the TEN-T network hub in Northern Finland

The infrastructure in the Port of Oulu enables the change of mode of transport, intermodality. The Finnish Mainline is a part of the Trans-European Transport Core Network (TEN-T). Highway 4 is part of the TEN-T core network also. The Helsinki-Tornio interval is part of the core network to be built by 2030. Oulu is practically a TEN-T network hub in Northern Finland.

By rail, the route runs either along the main line to Helsinki and through Vainikkala on the Russian network to Vologda, where the flows of goods from the Murmansk line are combined with the flow of goods from the Trans-Siberian line. In other words, the flow of goods that have been disconnected in Oulu will be reunited in Vologda, Russia, from where the connections will be the same. The differences in rail transport costs and transport times therefore incur between Oulu and Vologda.

Figure 62: Connection to Trans-Siberian railway in Yaroslavl

Nurminen Logistics started regular container train services from Finland to China in 2018, when the Hefei route was opened. In autumn 2020, they started co-operation with the Port of Narvik. Traffic from Narvik to Helsinki is done by trucks in a beginning.

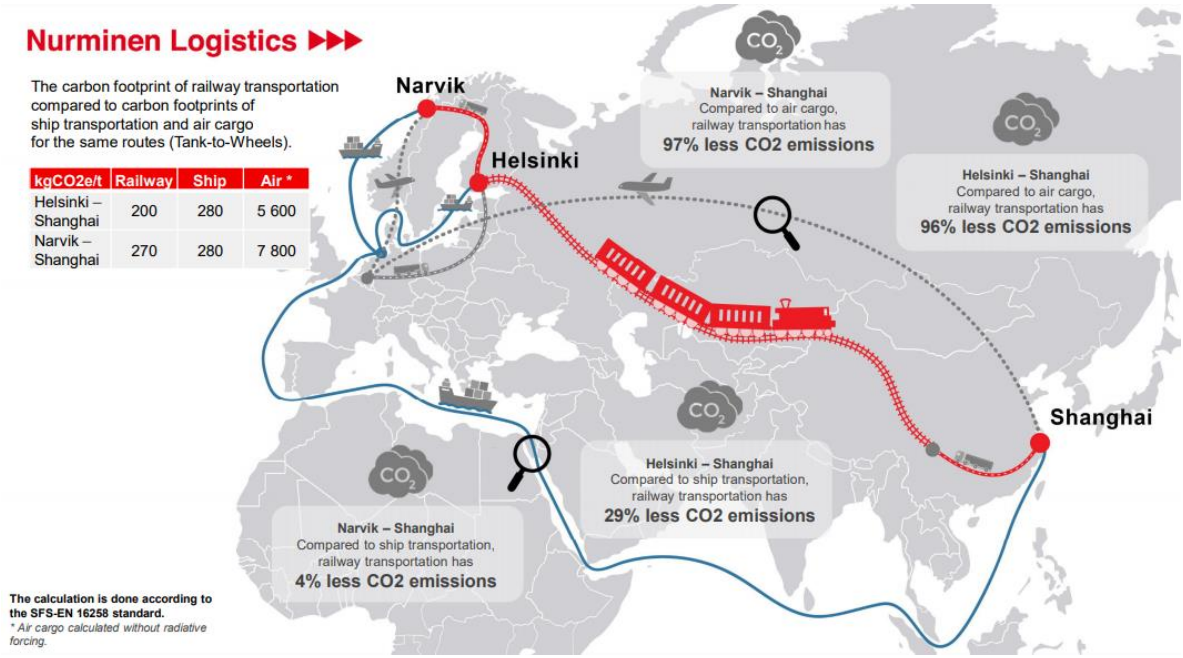


Figure 63:Nurminen Logistics carbon footprint comparison of the routes. (Source: Nurminen Logistics)

Many other routes, including routes focused on different modes of transport, compete for existing and potential new transports through Vartius. The competitive position between routes is influenced by a number of factors:

- Transport departure and destination areas for export, import and transit: route length and suitable modes of transport. Unloading and loading areas.
- Amount and value of goods.
- The speed, service, safety and cost level requirements.
- Special needs of the transport batch (e.g. temperature and additional service needs related to increasing the value of goods during the transport chain, such as pricing of goods, (re-)packaging, washing and repair)
- Regularity of transport needs and contractual carriers used by transport customers and their freight forwarders.

The competitiveness of the route can be influenced by a good level of transport infrastructure, the smoothness of border crossings, the provision of logistics services that fit the needs of companies and, above all, an affordable cost level.

Consequently, the new route and its services must offer significant advantages over the existing solutions of companies. The new routes should be therefore more competitive in meeting transport needs.

Current development in logistics is based on logistic corridors. Logistics corridors have standard processes and alternative and mutually supportive corridors. The prerequisites for a good regional logistics environment are, in addition to the active service providers, a functional local distribution network and connections to logistics corridors.

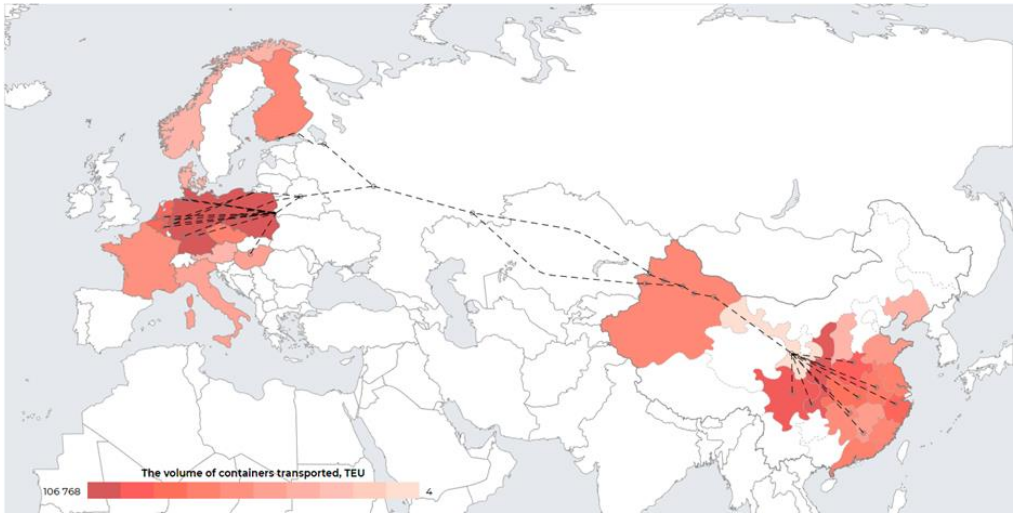


Figure 64: Container flow in rail between Europe and PRC at Q1 2021 (Source ERAI)

Comparing alternative routes from Oulu shows differences between routes. Estimated time from Oulu to Vologda via Vartius is 10-12 hours more than alternative routes.

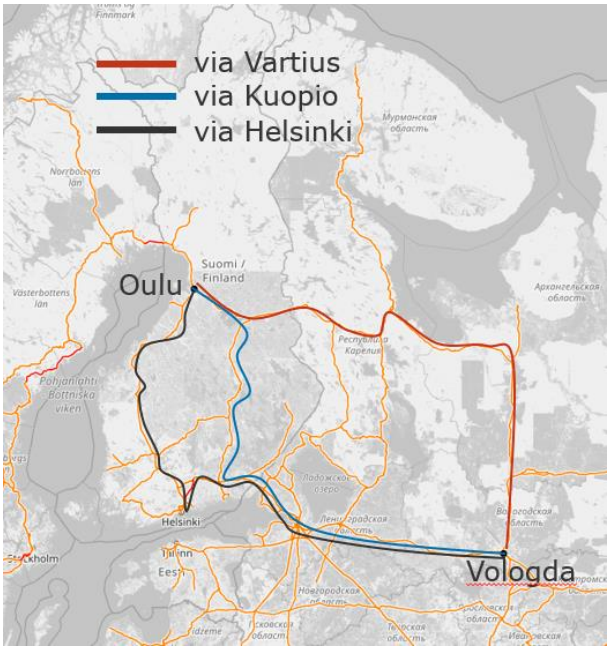


Figure 65: Alternative routes from Oulu to Vologda. (Source: Ramboll 2021)

An example of transport times in Helsinki – Chongqing –route of Nurminen Logistics

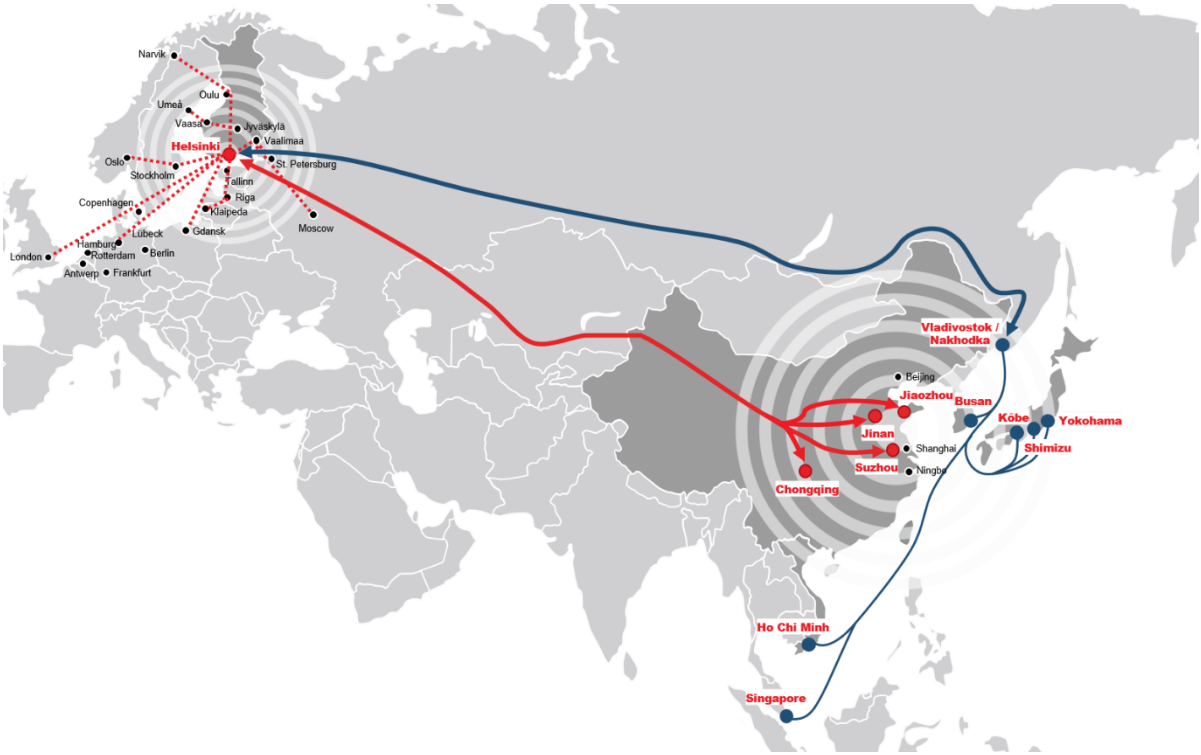


Figure 66: Nurminen Logistics east traffic lines (Source: Nurminen Logistics)

Nurminen Logistics Helsinki – Chongqing –route
Transport unit 40HC or 45RF (reefer) -container

Start point Helsinki, FI
Border crossing Vainikkala, FI / Buslovskaya, RU GPS sealing
Border crossings Iletsk, RU, Dostyk, KZ / Alashankou, CN
ending point Chongqing, CN

Transit-time 14 days.

From Narvik, by truck via Tornio and Helsinki, transit-time is 17 days.

6. SUMMARY AND CONCLUSIONS

General development trends

Local production, on both the Finnish and Russian sides of the border, has based on making use of natural resources. In the globally ambitious efforts to achieve carbon-neutral production and sustainable development, the mining and forest industries and their related industries are under particular interest. The use of natural resources and their value chains may be redefined even on a fast schedule by political decisions.

A transition to a resource-green and carbon-neutral circular economy is essential. On the current path, forecast for the use of global material resources (fossil fuels, biomass, metals, minerals) is to be more than double from around 90 billion tonnes to 190 billion tonnes by 2060. This would mean a massive increase in CO2 emissions associated with the management of materials and, on the other hand, a reduction in raw materials for high technology, for example. The production and processing of materials, fuels and food accounts for approximately half of global CO2 emissions and more than 90% of biodiversity loss (Source: Global Recourses Outlook, International Recourse Panel (2019)

The circular economy is about to replace the linear economic system that is based on consuming materials and discarding them after use. The circular economy involves a reduction in the consumption of virgin raw-materials and environmental impacts.

Finland is one of the most material-intensive countries in Europe. A transition to a circular economy would be spurred by measures such as factoring environmental harm into prices, making investments that support a circular economy, and re-evaluating regulations critical raw materials such as rare metals, which are needed for the batteries of electric cars and for other solutions for a low-carbon society.

The development of the international metal and minerals market follows a cycle based on demand and supply. The prospects for the mining sector are difficult to predict due to tensions between the US and China and the strong price fluctuations in battery minerals needed for electric cars.

Creating a Finnish battery value chain will be a significant investment and a significant source of employment both on its own and through multiplier effects in other industries. The potential for the battery value chain extends to all sectors of society, enabling new research and development activities in Finland. All this also supports the mineral cluster, circular economy and carbon-neutral mobility in the future. (Source: Ramboll 2019)

Measures to diversify freight traffic at the Vartius border station

From the viewpoint of developing and increasing activities in VLBC, good contacts with the business community and a rapid response to their needs in the quickly changing business environment are important.

Connectivity to international traffic corridors via Vartius is facing a challenge because of distance to existing connection points of corridors. Alternative north-south direction routes and their distance to intermodal shifting- and connection points is not supporting use of Vartius horizontal connection.

As a measure, it would be necessary to inform logistics operators about Vartius' possibilities and to market Vartius as an alternative route when the main routes are congested, or when malfunctions interfere processes on the main logistics corridors.

Cross-border road traffic is mainly operated by Russian carriers, so the target for marketing and information should be Russian road carriers and rail freight broker operators who are offering railway charter services. Chinese and other global operators are already offering charter trains to companies with large freight volumes.

Infrastructure and administrative functions in Vartius are on the level that makes possible to develop charter- and feeder traffic. Lack of free capacity in rail is a limiting factor in quantum of possible new traffic.

The most important task is to find international commercial operator who is committed to exploiting northern horizontal link.

APPENDIX 1
[APPENDIX OTSIKKO]

Reference Sheet

B2B (Business to Barents) 2019. Barents liiketoiminta alueena. https://pohjoiskarjalankauppakamari.fi/files/b2b%20markkinointiselvitys.pdf

Barents Euro-Arctic Council (BEAC) 2016. Joint Barents Transport Plan. Proposals for development of transport routes. https://www.barentsinfo.fi/beac/docs/JointBarentsTransport_Plan_15_06_2016_eng.pdf

Barent Link 2009. Kansainvälisen raideliikenteen markkinointi- ja kehittämiskonsepti Vartius-Kotshkoma 2009. https://kainuunliitto.fi/assets/uploads/2020/09/B15-Barents-Link.-Kansainvalisen-raideliikenteen-markkinointi-ja-kehittamiskonsepri-Vartius-Kotshoma-2009.pdf

Davydenko I., Landa Maxta I., Martens R., Nesterova N., Wark T 2012. Potential for Eurasia land bridge corridors & logistics developments along the corridors. https://www.tno.nl/media/2825/report_potential_eurasia_land_bridge_rail-corridors_final_25042012.pdf

EPI CBC Kolarctic 2014. Barents Freeway and it’s outputs in a nutshell.

EU List of products restricted in regulation (EU) 2020/1158. https://www.legislation.gov.uk/eur/2020/1158/contents/england

Finnish Customs, 2021. https://uljas.tulli.fi/v3rti/

Finnish Customs. Approved border control posts (BCP). https://tulli.fi/documents/2912305/3741829/Hyv%C3%A4ksytyt+rajatarkastusasemat+BCP+Godk%C3%A4nda+gr%C3%A4nskontrollstationen+BCP+Approved+border+control+posts.pdf/269a511e-7cdf-de1a-995a-8d0287e8ac45/Hyv%C3%A4ksytyt+rajatarkastusasemat+BCP+Godk%C3%A4nda+gr%C3%A4nskontrollstationen+BCP+Approved+border+control+posts.pdf?t=1603961519398

Iikkanen P. & Lapp. T 2016. Ratayhteyden Ylivieska–Kontiomäki–Vartius kehittäminen – Iisalmen ja Oulun kautta kulkevien reittien kehittämisen arviointi ja vertailu. https://www.doria.fi/bitstream/handle/10024/125290/ls_2016-03_ratayhteyden_ylivieska_web.pdf?sequence=4&isAllowed=y

Iikkanen P. & Lapp. T 2019. Kontiomäki – Pesiökylä – Ämmänsaari/Taivalkoski – radan peruskorjaus. Väyläviraston julkaisuja 26/2019. https://julkaisut.vayla.fi/pdf12/vj_2019-26_kontiomaki-pesiokyla_web.pdf

Korkia & WSP 2020. World Transport Market and Logistics Project - KO1029 Barents Region Transport and Logistics Report 15.5.2020. https://kainuunliitto.fi/assets/uploads/2020/11/World-Transport-Market-and-Logistics_ENG.pdf

Lapp, T., Iikkanen P., Ristikartano J., Niinikoski M., Rinta-Piirto J., Moilanen P. 2018. Valtakunnalliset liikenne-ennusteet. Liikenneviraston tutkimuksia ja selvityksiä 57/20187. https://julkaisut.vayla.fi/pdf8/lts_2018-57_valtakunnalliset_liikenne-ennusteet_web.pdf

Liikennevirasto 2013. Vartius railyard diagram, Dnro 5543/1000/2013. https://docplayer.fi/13820557-Ohje-2-15-2-11-2013-dnro-5543-1000-2013.html

Logoka 2021. Statistical overview of transport & economy in the project region. (Logistics for Business Karelia-Oulu Region). https://drive.google.com/file/d/1sMjwNQpNv0Fun5Z7NeV-F5wLwYDslPEw/view

Mäkelä, T. 2008. Perussolmuratapihojen merkitys ja näkymät osana kuljetusjärjestelmää. Ratahallintokeskuksen julkaisuja A 5/2008. https://julkaisut.vayla.fi/pdf4/rhk_2008-a5_perussolmuratapihojen_merkitys_web.pdf

Nikola-Määttä, S. 2021. Kainuun liikennejärjestelmä ja liikennejärjestelmään liittyvät selvitykset.

Nurminen Logistics 2020. (Gaia Consulting). Carbon footprint of rail transportation. https://www.nurminenlogistics.com/wp-content/uploads/nurminen_co2_report.pdf

Pitkänen J-P., Musto M., Rinta-Piirto J., Mankki A., Salminen A. 2020. Rataverkon välityskyvyn kokonaiskuva. Väyläviraston julkaisuja 30/2020. https://julkaisut.vayla.fi/pdf12/vj_2020-30_rataverkon_valityskyvyn_web.pdf

PWC 2014. Guide to Investment – Republic of Karelia. https://www.pwc.ru/en/doing-business-in-russia/assets/pwc_invest_karelia-eng.pdf

Pöyskö T. 2014. Vartiuksen konttiliikenneselvitys – Konttiliikenteen edellytykset Vartiuksen reitillä. https://docplayer.fi/3893320-Vartiuksen-konttiliiken-neselvitys.html

Pöyskö, T. & Kunnas J. 2008. Vartiuksen kansainvälisen raja-aseman kehittämissuunnitelma 2008. Barents Link Forum. https://kainuunliitto.fi/assets/uploads/2020/09/B13-Vartiuksen-kansainvalisen-raja-aseman-kehittamissuunnitelma_2008.pdf

Railfreight.com 2020. ‘Rail should not become as congested and unreliable as deep-sea shipping ’. https://www.railfreight.com/business/2021/06/15/rail-should-not-become-as-congested-and-unreliable-as-deep-sea-shipping/

Ramboll 2018. Jäämeren ratayhteyden kysyntäpotentiaalin ja vaikutusten arviointi. https://julkaisut.vayla.fi/pdf8/ramboll_jaameren_ratayhteyden_web.pdf

Ramboll 2012. Vartiuksen rajanylityspaikan liikennejärjestelyt. Pohjois-Pohjanmaan elinkeino-, liikenne- ja ympäristökeskuksen julkaisuja 2012.

Ruokavirasto. List of veterinary border Control Posts in Finland. https://www.ruokavirasto.fi/globalassets/yritykset/tuonti-ja-vienti/tuonti-eun-ulkopuolelta/elaimet-ja-elainperaiset-tuotteet/bcp-listaus5.pdf

Salanne I., Jaakkola E., Tikkanen M. 2017. Suomen satamien takamaatutkimus. Liikenneviraston tutkimuksia ja selvityksiä 55/2017. https://julkaisut.vayla.fi/pdf8/lts_2017-55_suomen_satamien_web.pdf

Sitra 2021. EU Biomass Use in a Net-Zero Economy. https://media.sitra.fi/2021/06/28151630/material-economics-eu-biomass-use-in-a-net-zero-economy.pdf

Strafica Oy 2006. Rautatieliikenne 2030 -suunnitelman lähtökohdat ja vaikutustarkastelut. Ratahallintokeskuksen julkaisuja A 7/2006. https://julkaisut.vayla.fi/pdf4/rhk_2006-a7_rautatieliikenne_2030_web.pdf

SYKE 2019. A circular economy allows a significant reduction in the consumption of natural resources. SYKE POLICY BRIEF 2019. (Finnish Environment Institute). https://helda.helsinki.fi/bitstream/handle/10138/305605/SYKEPolicyBrief_Kiertotalous_ENG_20190930_screen.pdf?sequence=1&isAllowed=y

Traficon Oy & Domer PK 2021. Project Report: Study of Vartius/Lytta - Arkhangelsk Road 2021.Northern Axis - Barents Link (KO4159).

Traficon Oy & Domer PK 2021. Report Annex: Study of Vartius/Lytta - Arkhangelsk Road 2021 ANNEX 1. Northern Axis - Barents Link Project (KO4159).

Traficon Oy & Domer PK 2021. Report Annex: Study of Vartius/Lytta - Arkhangelsk Road 2021 ANNEX 2. Northern Axis - Barents Link Project (KO4159).

YLE 2018. VR valvoo jatkossa paremmin kemikaalivaunuja – tilapäisiä säilytyspaikkoja ei enää ole. https://yle.fi/uutiset/3-10414622

Vilponen, J. 2013. Rautatiekuljetuksien merkitys huolitsijan näkökulmasta. Thesis. VAMK liiketalous ja matkailu. https://www.theseus.fi/bitstream/handle/10024/54174/Vilponen_Jaana.pdf?sequence=1&isAllowed=y

WSP & Korkia 2021. Barents Region Transport and Logistics Case Studies. https://kainuunliitto.fi/assets/uploads/2021/06/Barents_case_studies_report_tiny.pdf


Kolarctic
CBC | CROSS-BORDER COOPERATION


REGIONAL COUNCIL
OF KAINUU


Northern Axis
Barents Link