

Christophe Buyle

Rise of Regional Logistics Hubs in Global Trade

Role of Arctic Corridor in Finland

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Author	Christophe Buyle
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<p>The proposed research concerns the engagement of the Finnish transport network into national, regional, European and global supply chains. The author was interested in studying the role of new transport corridors in trade reactivity and changes in market trends.</p> <p>The main target of the thesis is to understand the role of the Arctic Corridor on the implementation of Finnish development strategies. The mineral industry in Finnish Lapland and the extraction of natural resources in the Barents region will support the development of a new cross-border economic area in Finland. The corridor will connect the Baltic and the Barents Sea Regions from Kemi in Finland to Kirkenes in Norway with the aim to create new economic opportunities to Finland, Norway and the European Union.</p> <p>The paper identifies the strategic transport priorities of Finland through exploratory research and a cross-case synthesis of seven development strategies. As a result, the author finds five competitive advantages for Finland that arise from the Arctic Corridor.</p> <p>As the use of regulatory measures in management of global trade is becoming more common than using tariff barriers, regional trade agreements are progressively supplanting multilateral ones. Based on this phenomenon the thesis introduces a discussion on the rise of regional logistics hubs in global trade as a response to guarded globalization.</p>	
Keywords	Supply Chain, Arctic Corridor, Regional Logistics Hubs, Global Trade, Guarded Globalization, Arctic, Barents.

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Appendix 1. Action plans and themes of the Finnish development strategies.

Appendix 2. Thematic priorities for Finnish companies: Assessment carried out by Finpro, Tekes and Team Finland network.

Appendix 3. Transport Infrastructures connected to the Arctic Railway by geographical location.

Definition of Key Concepts

Guarded Globalization: Describes economic interactions between state capitalism countries and free market economies. The term was introduced by the president of Eurasia Group Ian Bremmer after the global financial crisis of 2008.

Trade Investment Services Nexus: Efficient interaction between trade in goods, international investment, use of infrastructure and cross border flows. In the 21st century, global demand shifted from clusters-based industrial development to global interconnected supply chains.

Intermodal Freight Transport: Transportation of freight by different modes of transport such as sea, air and land. The goods are handled in a standardized loading unit within an integrated transport chain.

Intermodal Hub: Terminal where freight is transferred from one mode of transport to another. As transshipment areas this type of hub serve neighbouring markets.

Hub and Spoke Management: Model used in multi-location distribution. The spokes connect the hub at the centre to form a transport network. All deliveries go from a centralised location and serve local distribution points.

1 Introduction

“The Arctic Corridor is a new cross-border economic area as well as a transport and development corridor”. The corridor connects Lapland to the Barents Arc, as can be seen in figure 1 (Arctic Corridor 2014c). The municipalities of Inari, Sodankylä and Utsjoki in Northern Lapland are promoting Arctic Corridor with the collaboration of the city of Rovaniemi and the Regional Council of Lapland (Cryopolitics 2014).



Figure 1. Arctic Corridor, (Arctic Corridor 2014c).

The promotional brochure of the project describes Arctic Corridor as an alternative factor of growth for Finnish companies. The natural resources in Lapland and in the Arctic draw the attention of both Finnish companies and Asian countries. Business opportunities in mining, tourism, transport and reindeer industries support the development of Arctic corridor. The project is currently active in marketing, networking and prospecting (Arctic Corridor, 2014).

The Finnish Confederation of Finnish Industries will release a report on business opportunities and railway development by mid-2015. Industrial joint initiatives are expected between Finland and Norway on the transportation of Finnish ores and Norwegian Liquefied Natural Gas (LNG) to European markets (Barents Observer 2015b).

The major investment of Arctic Corridor is the construction of the Arctic Railway that will connect Rovaniemi in Finland to Kirkenes in Norway. This section will be 507 km long and will connect the Barents, Murmansk, Bothnian and Narvik links together, as showed in figure 1.

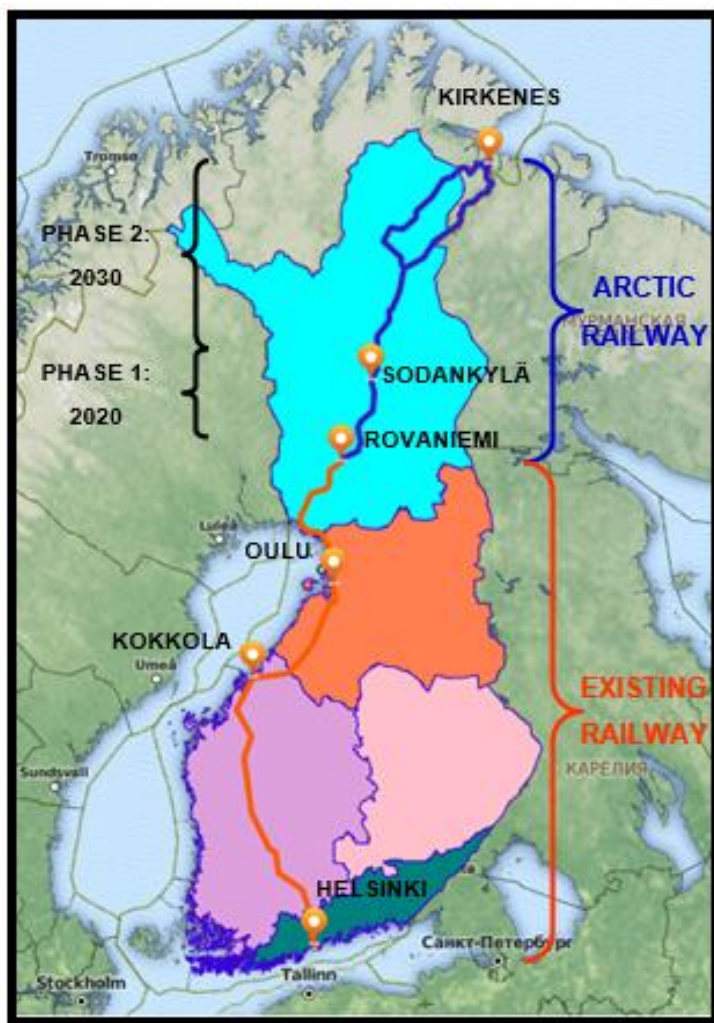


Figure 2. Arctic Railway, adapted from (Arctic Corridor, 2014b).

The first implementation of the railway is expected in 2020. The first section between Rovaniemi and Sodankylä is now in the preparatory and planning phase while the second section between Sodankylä and Kirkenes should start by 2030, as showed in figure 2 (Arctic Corridor 2014b:4).

1.1 Objectives

The Organisation for Economic Co-operation and Development (OECD) (2014a: 10) argues that “the challenge for Finland is to continue to benefit from integration in global value chains”. The fragmentation of international operations and trading relationships has changed the way companies manage their activities. Production sites and strategic activities are spread out all over the world causing deep transformation in the organization of global trade. Changes in regulatory environment and corporate strategy combined with innovation in transport, information and technologies have reinforced the role of global value chains (Europa 2013: 13).

Team Finland is an international Finnish network of government institutions that promotes and protects the interests of Finland abroad. The aim of the organization is to develop the external economic relations of Finland, help at the internationalization of Finnish companies and manage the Finnish branding (Team Finland 2014). The institution has listed industrial sectors which could become major assets in the Finnish economy. Adapting to product contractions and geographical changes in supply chains are the upcoming challenges of Finland. The new strategy for 2015 (Team Finland 2014: 14-15) recommends that Team Finland network “must be highly agile and actively seeking to promote the heterogeneous mix of companies and clusters that shows the greatest potential”.

This thesis aims to find the outcomes of the relationships between Arctic Corridor and its environment based on Arctic Railway project. The paper analyses the foreign trade and logistics state of Finland with the purpose to identify the current challenges of the Finnish economy. A cross-case synthesis of seven development strategies presents the strategic priorities of Finland in order to achieve sustainable growth. The objective of the study is to find competitive advantages of the Arctic Corridor for Finland and provide some implications for further research about the effect of regionalism in global trade on transport networks.

1.2 Research Problems

The aim of the research is to find out the interactions between Arctic Corridor and other transport routes as well as the impacts they could have on the Finnish economy. The main reasons for supporting a rail connection between Rovaniemi in Finland and Kirkenes in Norway are drawn from the main research question: **How could the Arctic Corridor support the development strategy of Finland?** The research will provide clear basis for understanding how the Arctic Corridor is connecting the Baltic and the Barents Seas. In this thesis the development strategy of Finland will be derived from reviews of seven development strategies. The use of paving technique help to identify actions plans and themes from qualitative data, as explained in figure 29 on page 49. While attempting to answer to this main research question, the following series of sub-questions will function as a guideline for the investigation:

- **What is the current situation of the Finnish economy?**

This question tries to identify the challenges of the Finnish economy by analyzing the foreign trade and the logistics state of Finland. The author identifies the growing industries and new logistics challenges that emerged from the collapse of the electronic sector.

- **What new corridors will integrate into the global transport network?**

Global warming is responsible for the melting down of the ice cap and the permafrost. This phenomenon creates new opportunities for Arctic countries. The extraction of natural resources in Northern Regions and the opening of transport routes in the Arctic Seas will develop new economical interactions in the Barents regions.

- **What industries will support the Arctic Railway?**

The question tries to answer how the Arctic Railway can be viable. The paper identifies which industries raise interest from both Finnish and international companies. The author analyzes the impacts of the mining industry on the development of new transport connectors in the Barents Region and lists growing economic activities.

- **What are the strategic priorities of Finland?**

The author selected a set of seven development strategies which cover national, regional, European and international matters. The paper conducts a cross-case-synthesis with the purpose of identifying strategic priorities for the growth of Finland related to transport infrastructure. The reasons why the seven development strategies have been selected are explained in chapter five.

1.3 Methodology

Since the Arctic Railway is still at its very early stage, this research tries to shed light on potential opportunities for the development of it. The author conducts an exploratory study based only on secondary research. Data are interpreted from non-statistical sources in order to gain knowledge on the topic and explain a new phenomenon. Systematic reviews are derived from government reports, international institution archives, thematic books, published literature and articles. An online mapping tool (Mapline) is used to illustrate the reviews with maps. The maps are adapted to thesis topic and format in order to improve reading and clarity as well as to get a unique template and view of all maps. Sources of maps are book and website, their primary origins are cited as references.

The paper is organized around an inductive method and a bottom-up approach which moves from specific observations to generalizations, as can be seen in figure 3 on page 6. Firstly the author collects information using qualitative secondary sources in order to contextualize the ground for thoughts. Secondly an analysis and cross-case-synthesis is carried out in order to identify recurring patterns in the observation phase. Theme identification is based on observation, rigorous reading and analysis of text using pawing technique, as explained on page 49. Over a third phase, tentative hypothesis are formulated and discussed. An idea of theory is introduced in the last section of the research for further development on the topic.

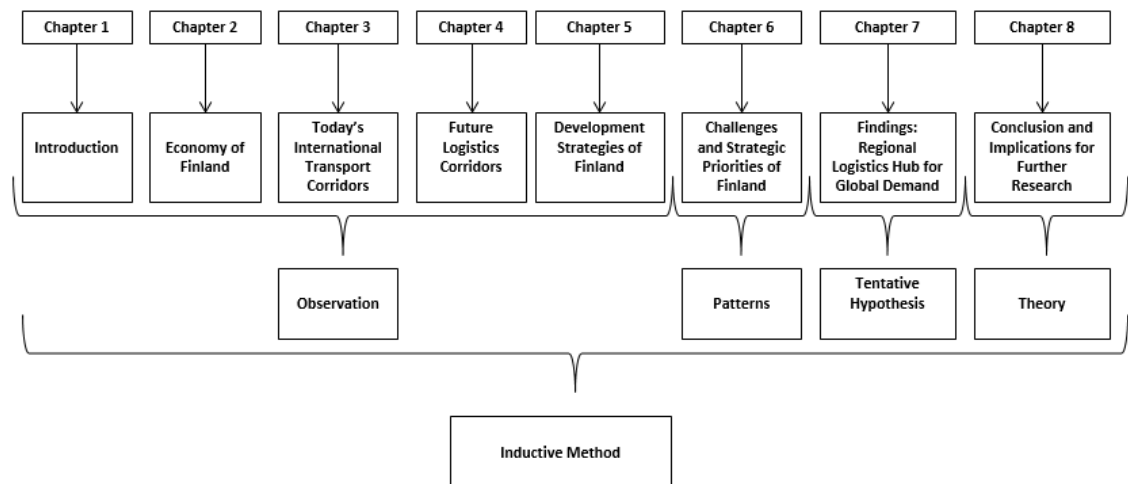


Figure 3. Methodology of the Thesis.

The paper is divided into eight chapters. First and foremost the reader is introduced to the objectives and methodology of the research as well as the background of the topic. Chapter two presents the current state of foreign trade and logistics in Finland. In the third and fourth chapters the paper makes an assessment of today and future international transport corridors. A presentation of a set of seven development strategies is made in chapter five while chapter six identifies the current challenges and strategic priorities of Finland. Five competitive advantages of the Arctic Corridor are discussed in chapter seven as the main findings of the thesis. Finally the author summarizes the paper in a conclusion and introduces an idea for a theory related to transportation of goods in an era of guarded globalization.

1.4 Background

The industries which were supporting the growth of Finland after the collapse of the Soviet Union in the early 90's kept declining in 2013. Since the crisis of 2009 the development of the Finnish economy has been sluggish with a gradual downfall of the two main growth drivers of Finland. The recession contributed to a serious slump in the production of telecommunication equipment and in the output of the forestry sector. The change in the structure of Finnish exportation affected the Finnish foreign trade. The growing sectors are not keeping up with the erosion of the weak ones (Bank of Finland 2014: 9-23).

In the last ten years the layout of export groups changed to become more varied with no prevailing sectors. Despite lagging behind, telecommunication and the forest sectors still represent an important proportion in the Finnish exports with 31.4% of the total share market (Finnish Customs Statistics 2014: 2-16). However this percentage differs greatly from the competing countries, Germany and Sweden, where these two sectors are less central than in Finland (Bank of Finland 2014: 10). According to the Ministry of Finance the Finnish economy will grow by 0,2 % in 2014 and then will stabilize around 1,5 % for the next two years. Exports will show signs of recovery by increasing slightly by 0,5 % in 2014 and will make substantial progress in 2015 and 2016 with a rise of 4,7 % (Ministry of Finance 2014: 6). These estimations do not take into consideration the impact of the Ukrainian crisis.

Finland has missed out on appropriating the new growing industries and seems not capable of taking advantage of the global trade growth in the coming years. In order to overcome the challenges ahead and identify upcoming opportunities Finland has created a network that promotes its interest abroad (Team Finland). The institution listed Russia, China, India, Brazil, USA and in Europe Germany and Sweden as priority markets for Finnish companies for 2015. The industries of clean technology and social services have great potential of growth in these countries. However, the politicisation of international economic relations is encouraging countries to have nationalistic and protectionist behaviour. Strategic industries offering services depending on regulatory framework and state investments are increasingly competitive (Team Finland 2014: 10-11).

Team Finland (2014: 11) contends that “added value generated in the global production chains should be back into Finland’s national economy”. The beginning of the second unbundling in the mid-1980 changed the way international trade used to be organized with the Trade Investment Services Nexus. The requirements for international trade changed from local clusters to a global and complex supply chains that connect factories and offices in order to do business abroad. The success of a nation relies on its ability to integrate strategic value chains. A successful integration depends on efficient interactions between trade in goods, international investment, use of infrastructure and cross border flows (WTO 2013: 55). OECD (2014: 10) mentions that “Finland is already well integrated into chemical and metals’ global value chains and has encouraging development in new areas such as electronic games, bio-technologies, biomedicine and green technologies”.

1.5 Limitations

The first limitation of this study concerns the effects of the conflict in Ukraine on East-West relations and the development of the Barents region. Trading and market restrictions between the two blocks impacted their economies and weakened their relations. The tensions between Russia and Europe, the falling ruble, the crisis of the mining industry in Finland (Talvivaara Sotkamo) and the decrease of oil price are announcing a period of stagnation instead of development. Project development in Lapland and the Barents as well as economic forecasts for Russia, Europe and Finland will be put to the test in the coming years. These elements should slow down or postpone international cooperation.

Conducting an exploratory research can limit the generalizability of the findings. This type of study aims at familiarizing the author with the possibilities of the Arctic Corridor by analyzing the Arctic Railway project. Using only secondary research and qualitative information as sources of evidence is susceptible to the effects of bias.

Finally the findings of the paper are not provided for decision making but intended for guidance for more rigorous investigation in the future. The selection of the data that describes the project and its surrounding is subjective. Therefore each competitive advantage of the Arctic Corridor should be tested further by conducting additional research. The early stage of development in Northern Finland limits the relevance of the answer to the main research question.

However, the research gives detailed explanation on the relationships between the Arctic Corridor and its environment. Five competitive advantages are identified and an attempt to apply the results beyond the study is developed in the conclusion.

1.6 Recommendations

The paper will provide a comprehensible starting point for institutions interested in conducting further research on the topic. The Arctic Corridor could be a case study for governments interested in developing transport networks that are capable of supporting the challenges related to guarded globalization and regional trade agreements. Companies could also take Arctic Corridor as an example for adapting their logistics strategy to regionalism and changes in the global supply chain.

2 Economy of Finland

The following chapters look into the current economic and logistics situation in Finland. First it reviews the characteristics of the Finnish foreign trade in 2013. In a second phase it examines the state of logistics in Finland in 2012.

2.1 Foreign Trade

The trade balance of Finland has been negative for three years in row. Main exports are from industries of electro-technical, metal, transport equipment, chemicals, woods and paper. Raw material, investment, energy and consumer goods are the most important imports (Invest Finland 2014: 6). Despite a drop of 2% in exports and imports in 2013 deficit was slightly lower compared to 2012 (Finnish Customs 2014a: 1).

Finland classifies its exports in five main categories: Metal, machinery and transport, chemical industry, forest industry, electrics and electronics and other products. In 2013 the structure of Finnish exports changed with an increase in the export of chemical products and forest industry. Export of machinery, transport equipment and electronics products went down, as shown in figure 4.

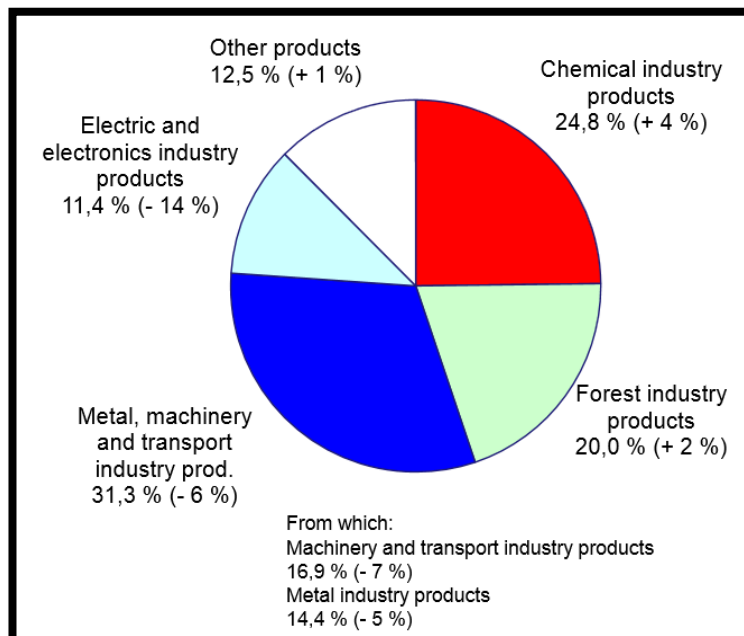


Figure 4. Export by products by activity 2013. Share and change from previous year (%), (Finnish Customs 2014: 16).

The volume of chemical products went up in 2013 but the decline in the price of oil products affected the growth in export of pharmaceutical and plastics products. Export of forest industry increased thanks to pulp and mechanical products. Paper and paperboard products saw a slump for the second year in row confirming the decline of its category. Machinery and transport equipment went down with the poor performance of special machinery and passengers vehicles. The fall in metal industry products was caused by the bad outcome of exports of iron, steel and non-ferrous-metal such as copper, nickel and zinc (Finnish Customs 2014a: 2).

Finland classifies its imports in five categories: Non-durable consumer, intermediate, energy, capital and durable consumer goods. In 2013, imports of capital and intermediate goods decreased significantly. However, non-durable and durable goods remained stable when imports of energy rose significantly, as can be seen in figure 5. The volume of imported crude petroleum went up while the volume of metal, machinery equipment and motor vehicles stopped declining (Finnish Customs 2014a: 3).

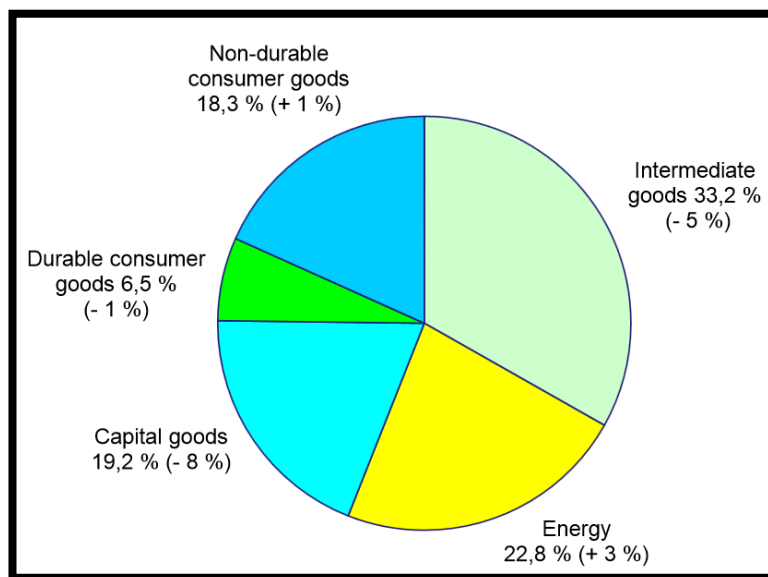


Figure 5. Imports by use of goods 2013. Share and change from previous year, (Finnish Customs 2014: 18).

The pattern of merchandise export to EU and non-EU countries changed from 2012. In 2013, Sweden had the largest share of exports following by Germany. Russia dropped to the third place in terms of volume.

In EU the share of Belgium and France went up whereas Netherlands and the United Kingdom decreased, as can be seen in figure 6. Exports to non-EU countries like to Japan and Norway declined but saw an increase in trade to China, Canada and South Korea (Finnish Customs 2014a: 4).

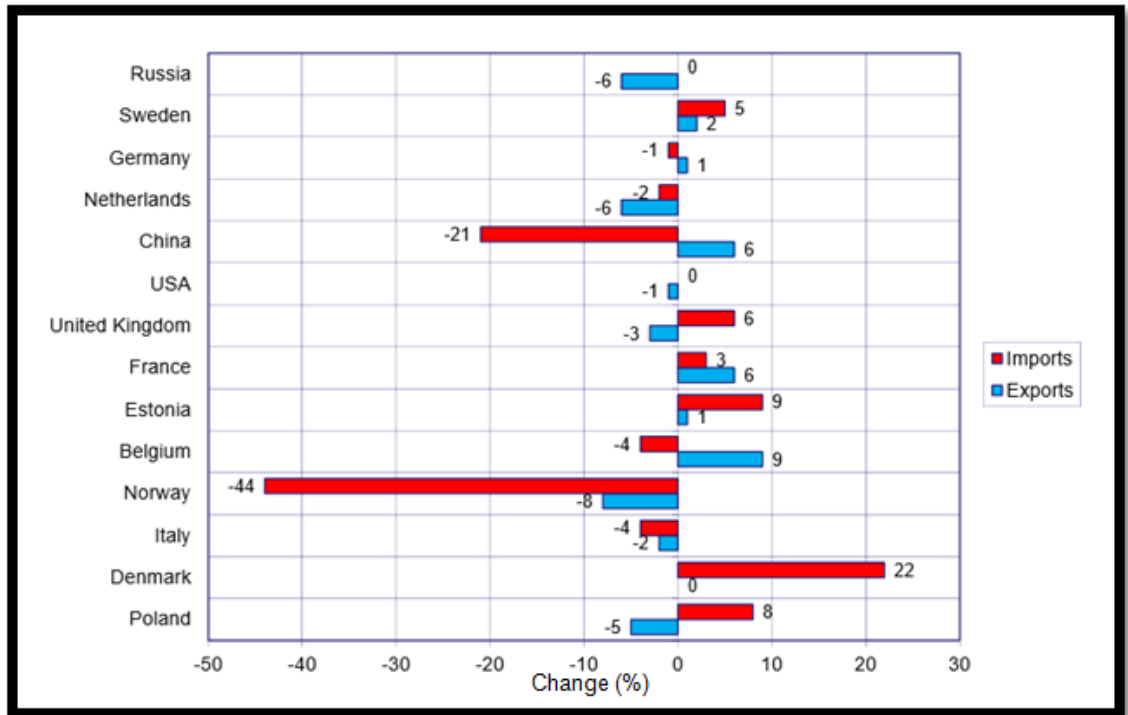


Figure 6. Change of exports and imports with main trading partners 2013. Share and Change from previous year, (Finnish Customs 2014: 37).

The import structure from EU and non-EU countries also evolved in comparison to 2012. Contrary to exports, in imports Russia has the largest market share supported by the energy sector. Germany comes second and Sweden has the third place. Imports from Denmark and Estonia intensified while the share of Norway and China went down, as showed in figure 7 on page 12 (Finnish Customs 2014a: 4).

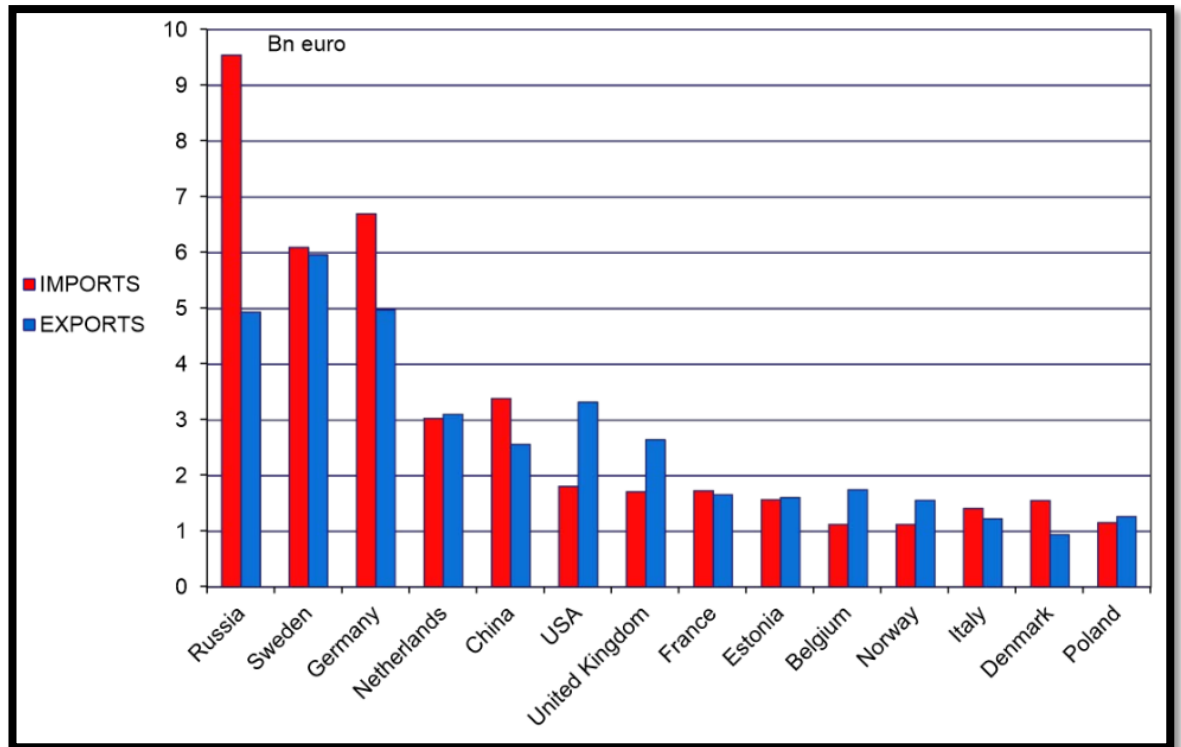


Figure 7. Foreign trade by countries 2013, (Finnish Customs 2014: 36).

Organisation for Economic Co-operation and Development (OECD) defines Re-exports as “foreign goods exported in the same state as previously imported” (OECDa 2014). In Finland re-exports account for 13% of the total export and represent a value of 6,5 billion euros. Russia is still the first re-export country with a value of 1,6 billion euros. The share of Sweden and Germany went slightly down whereas re-exports to China and Estonia went up (Finnish Customs 2014a: 4-5).

In 2013 the drop of 19% in the volume of transit goods came from the forest and the motor vehicles industries. Both exports and transit transport to Russia went down progressively from 2007 to 2013. Imports from Russia have kept increasing since 2009. The total share of Finland in export and transit has not stopped declining between 2007 and 2013 (Finnish Customs 2014a: 5).

2.2 Logistics

The increasing complexity of supply chains encourages companies to strengthen their position from their competitors. A solution is to relocate production according to markets, labour costs and raw-material location. Flexibility and adaptability are now the key elements of supply chain management in order to maintain a competitive edge in global trade. The rise of costs and risks in supply chains increases the role of the government in transport infrastructures and logistics policy (Ministry of Transport and Communications 2012: 10).

By 2015 Finnish companies will mostly increase their production capacity in low cost countries while only slightly in Finland. In 2012 the largest costs along the supply chain were still the costs of transportation. Compared to the rest of Europe, the costs of logistics in Finland are higher. This difference is a consequence of long winters, remote location and demographic disparities of Finland. The Finnish export and import are supported at 80% by sea transport. The sparse population density in Northern Finland explains why road transport is mainly used in this part of the country. However, rail transport is more used in freight in Finland than in other European countries. Configuration of the production sites and railway connections favours this type of transport (Ministry of Transport and Communications 2012: 26).

The Ministry of Transport and Communications (2012: 27) explains that “a key challenge for Finland’s infrastructure and logistics policy is to make sure there is access to reliable and moderately priced international routes to and from Finland’s major export and import markets”. If the location of Finland increases the costs of transport and the time of travel from central markets, it is also an asset in the trade between Europe, Russia and Asia. Harmonising the stages of the Finnish supply chain and enabling faster transfer of goods between different modes of transport is recognized to be a way to compensate for long distance routes and lower logistics cost in Finland. The growing competition in the Baltic Sea region will challenge Finland to remain the European gateway to Russia and Asia. In order to offset the position of the Baltic states and Poland, Finland must have a long-term strategy with Russia and an active role in the EU-Russian partnership development (Ministry of Transport and Communications 2012: 27).

The Logistics Performance Index (LPI) established by The World Bank and with the collaboration of the Turku School of Economics ranks countries in the way they facilitate foreign trade. The LPI measures the reliability and progress of border crossing, transport infrastructures, international shipment, logistics competences, and tracking and delivery performance (World Bank 2014).

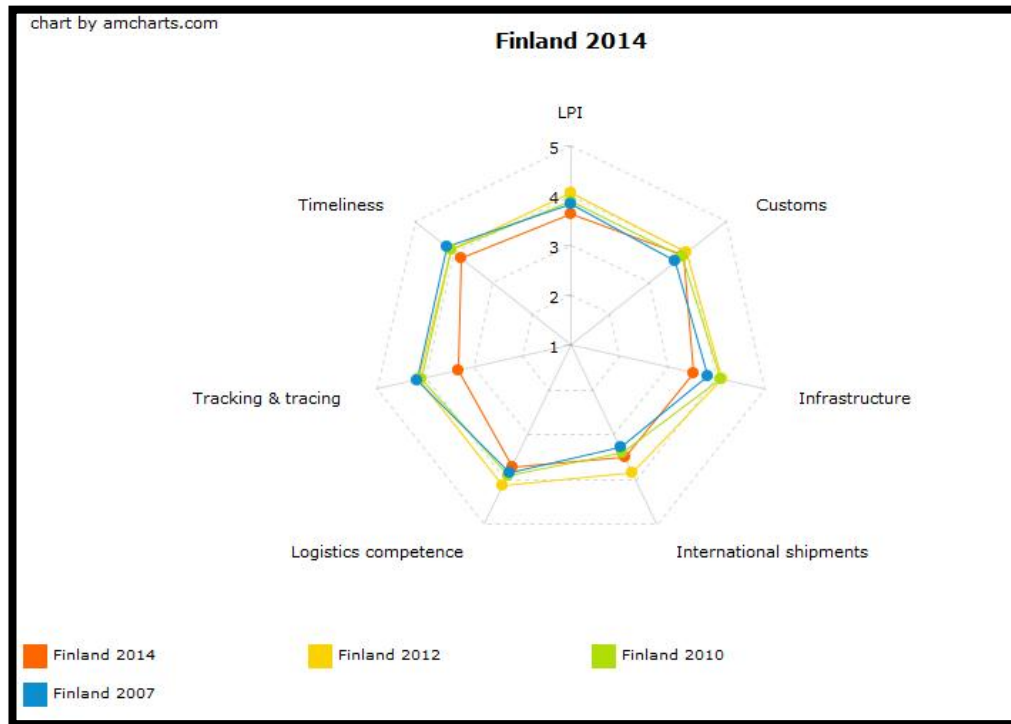


Figure 8. Logistics Performance Index. Country Score Card: Finland 2014, 2012, 2010, 2007, (World Bank 2014).

The score card of Finland 2014 illustrates the below-average performance of the country in logistics, as shown in figure 8. Continuous rise of Finland in the LPI index from 2007 to 2012 ended in 2014 with an important drop in the infrastructure and tracking and tracing criteria. One key finding in the report of 2014 is a decrease of gap between top and lower performing countries. Report also shows a relationship between services delivery and infrastructure network. The quality of infrastructure networks operated by logistics providers is less well perceived if the quality of delivery services is poor (World Bank 2014). The difference of performance between services and infrastructure might indicate a need to develop better benefits for end-users in logistics operations. Increasing competition and the need for better delivery services could explain the significant drop of Finland in the Logistics Performance Index ranking between 2012 and 2014.

3 Today's International Freight Corridors

In this chapter today's international freight corridors are categorized by mode of transport and illustrated with maps. There are three main ways to perform transport on a global scale which involve sea, land and air transportation. The following sub-chapters describe maritime, rail and air corridors used in global trade.

3.1 Maritime Routes

Four transportation axes that need to be considered when talking about maritime routes: circum-equatorial route, transoceanic, North-South pendulum connectors and transshipment markets. Each of these will be introduced in the following paragraphs.

Circum-Equatorial Route: It connects the three most important economies in the world: North America, Europe and Asia. Replaced by pendulum services, the recent expansion of the Panama Canal will make the circum-Equatorial route competitive again. Five strategic points determine the flow of the maritime shipping industry, as shown in figure 9. The dynamics of the global trade depends on these primary passages but they also have an influence on the commodities and infrastructure of regional markets (Rodrigue, Comptois and Slack 2013: 99-100).



Figure 9. Circum-Equatorial Route, adapted from (Rodrigue, Comptois and Slack 2013: 100).

Transoceanic Pendulum Connectors: Trans-Pacific route serves markets between the American Pacific façade and Asia while the section Asia-Europe is the bridge between the region of Asia Pacific and the Mediterranean façade. Finally the Trans-Atlantic corridor is used to transport freight between the European Atlantic and the North American Façades, as can be seen in figure 10 (Rodrigue, Comptois and Slack 2013: 100).

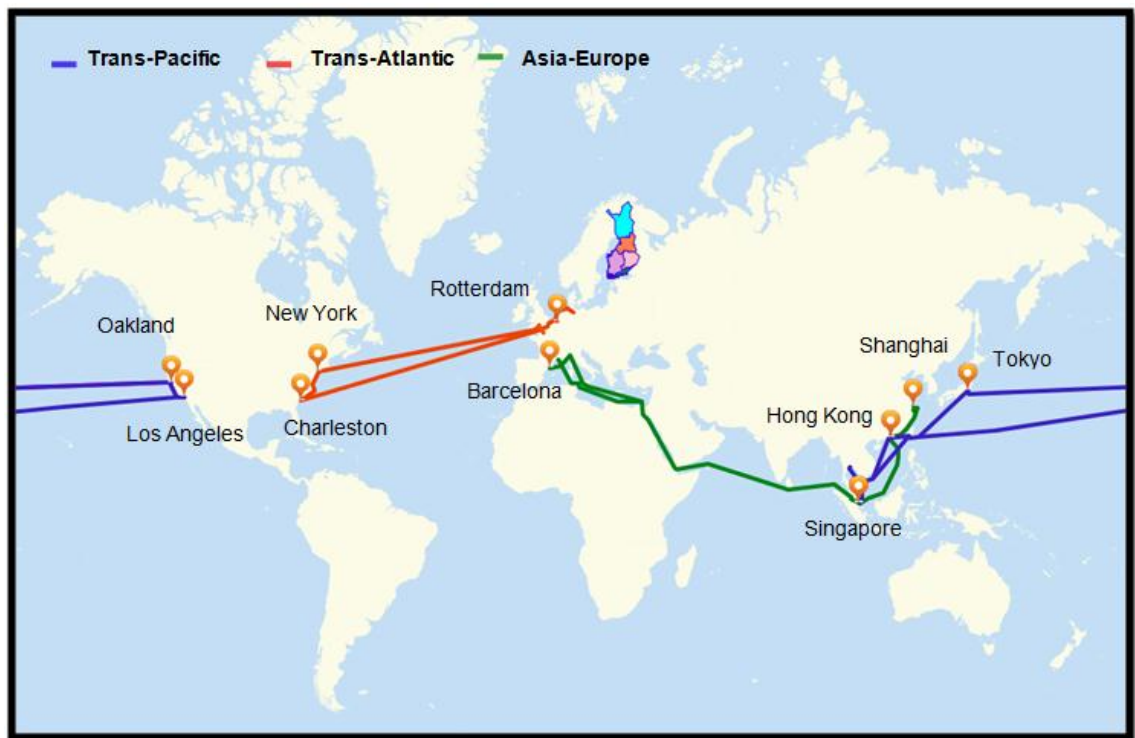


Figure 10. Transoceanic Pendulum Connectors, adapted from (Orient Overseas Container Line 2014).

North-South Pendulum Connectors: Latitudinal routes are an alternative to transoceanic itineraries to support commercial movement between North and South. These connectors meet the needs of three groups of regions: Australia/Asia, Africa/Europe and South America/North America, as can be seen in figure 11. Coordination between the circum-equatorial and transoceanic routes takes place in transshipment markets (Rodrigue, Comptois and Slack 2013: 100).

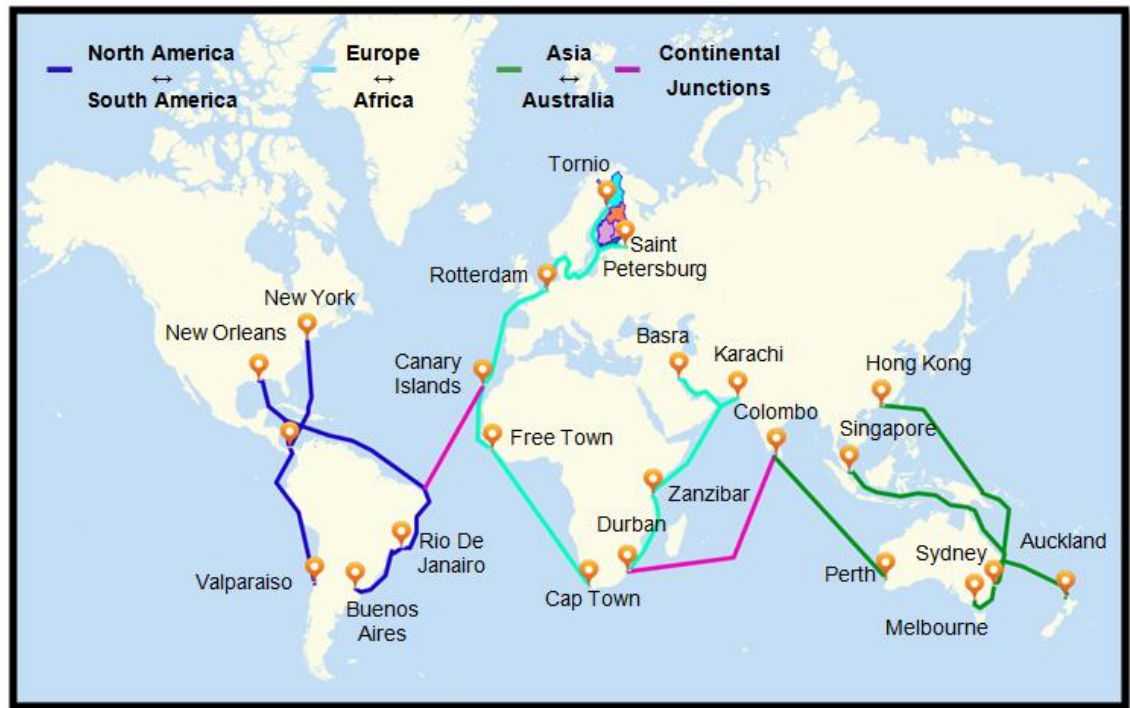


Figure 11. North-South Pendulum Connectors, adapted from (Rodrigue, Comptois and Slack 2013: 100).

Transshipment Markets: Goods are transhipped from regional ports offshore or inland to serve neighbouring markets. The most important transshipment markets along the circum-equatorial route are the Southeast Asia, Mediterranean and Caribbean zones, as showed in figure 12 (Rodrigue, Comptois and Slack 2013: 100-101).

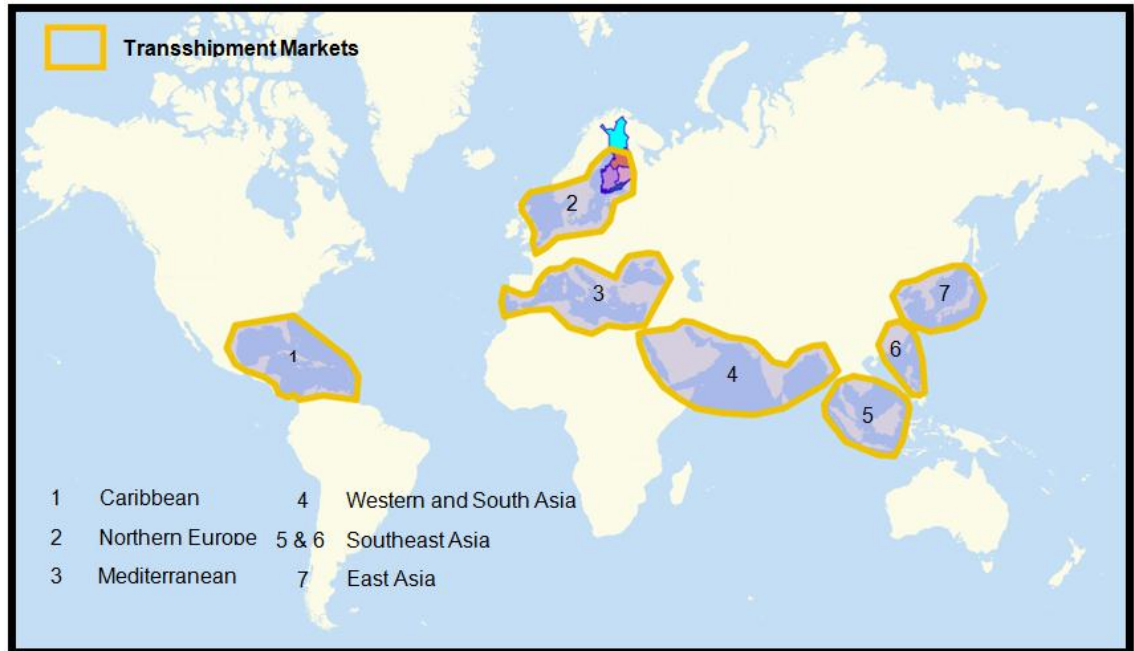


Figure 12. Transshipment markets, adapted from (Rodrigue, Comptois and Slack 2013: 100).

3.2 Rail Freight Corridors

There are three rail freight corridors that need to be considered when talking about long distance transportation by train: the Trans-Siberian, the North American Land Bridge and the Mid-Continent Trade corridor. Each of these will be presented in the following paragraphs.

The Trans-Siberian Corridor: This transnational bridge transports freight by rail between Europe and Asia. The Trans-Siberian Railway is a key transport artery for containers across Eurasia connecting the most important European cities to Russia, Kazakhstan, Mongolia, China and the two Koreas, as can be seen in figure 13. The 10000 km of track between Moscow and Vladivostok are connected to neighbouring railway networks and provide inland services to the Commonwealth of Independent States (CIS) (Russian Railways 2014).

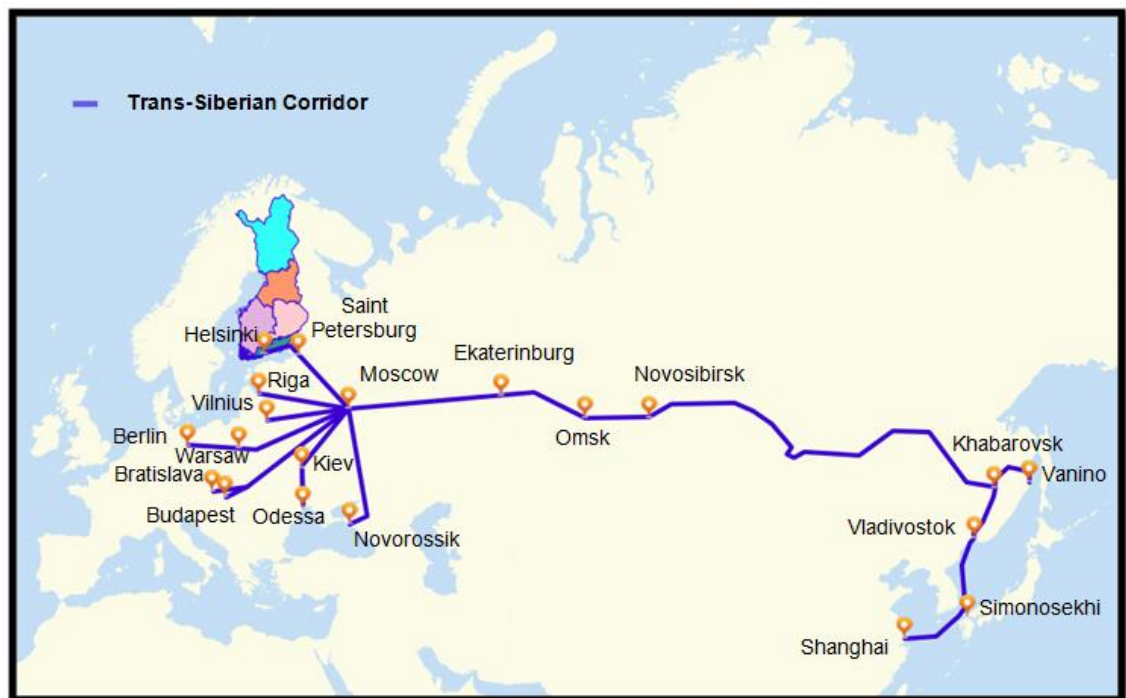


Figure 13. The Trans-Siberian Corridor, adapted from (Russian Railways 2014).

North American Land bridge: This corridor serves the two most important North American hubs of South California and New Jersey, as showed in figure 14. The land bridge supports transatlantic and transpacific trade competing with the Panama Canal. This transcontinental connector provides different options to deliver containers in North America from Asia and Europe. However, its future could be compromised due to labour issues in the West Coast and the expansion of the Panama Canal (Rodrigue, Comptois and Slack 2013: 29).



Figure 14. The North American Land bridge, adapted from (Rodrigue, Comptois and Slack 2013: 29).

Mid-Continent Trade Corridor: This intermodal transport network connects Canada to the Central North American economy, as showed in figure 15. A combination of highways and rail tracks facilitates the transport of freight between the Canadian and the American Midwest and Southwest markets. The infrastructures continue to Mexico through intermodal hubs (The Geography of Transport Systems 2015).



Figure 15. The Mid-Continent Trade Corridor, adapted from (The Geography of Transport Systems 2015).

3.3 Air Freight

Air freight transport is organized around the most active economic zones in the world. The main hubs are located in Pacific Asia, Western Europe and Eastern North America. The traffic of air freight is located in areas connected to transshipment markets, enabling hub-and-spoke management of logistics networks. Cargo traffic is high in large consumption markets and in important technological centres of production. The most important freight integrators are established in the same transshipment markets but have different regional location as they favour small airports to get a privileged access to the infrastructures. The growth of air freight traffic in tons of cargo in the last decade is attributed to Dubai and Shanghai. Dubai became a major hub in the flow of goods between Europe-Asia while Shanghai developed an attractive hub in the global market place (The Geography of Transport Systems 2014).

4 Future Logistics Corridors

There are four new routes that need to be taken into consideration when talking about future logistics corridors: Northern East-West Freight Corridor, Northern Sea Route, Arctic Bridge and Northwest Passage. Each of these will be introduced in the following chapters and illustrated with maps.

4.1 Northern East-West Freight Corridor

The Northern East-West Freight corridor is a new intermodal transport route connecting Asia, Europe and North America, as showed in figure 16.



Figure 16. The Northern East-West Freight Corridor, adapted and combined from (Futurum 2010) and (ESCAP 2014).

The Trans-Siberian railway covers the section between Asia Pacific and the Barents Region while the Trans-Atlantic segment links Norway to the ports of Eastern North America. The transcontinental corridor spreads out over North-West Russia, Finland, Sweden and Norway (The Geography of Transport Systems 2014).

4.2 Northern Sea Route

The Northern Sea Route is a bridge between Western Europe and the region of Asia Pacific. The itinerary spreads out in the water of the Arctic Sea off the Northern Coast of Russia, as can be seen in figure 17.

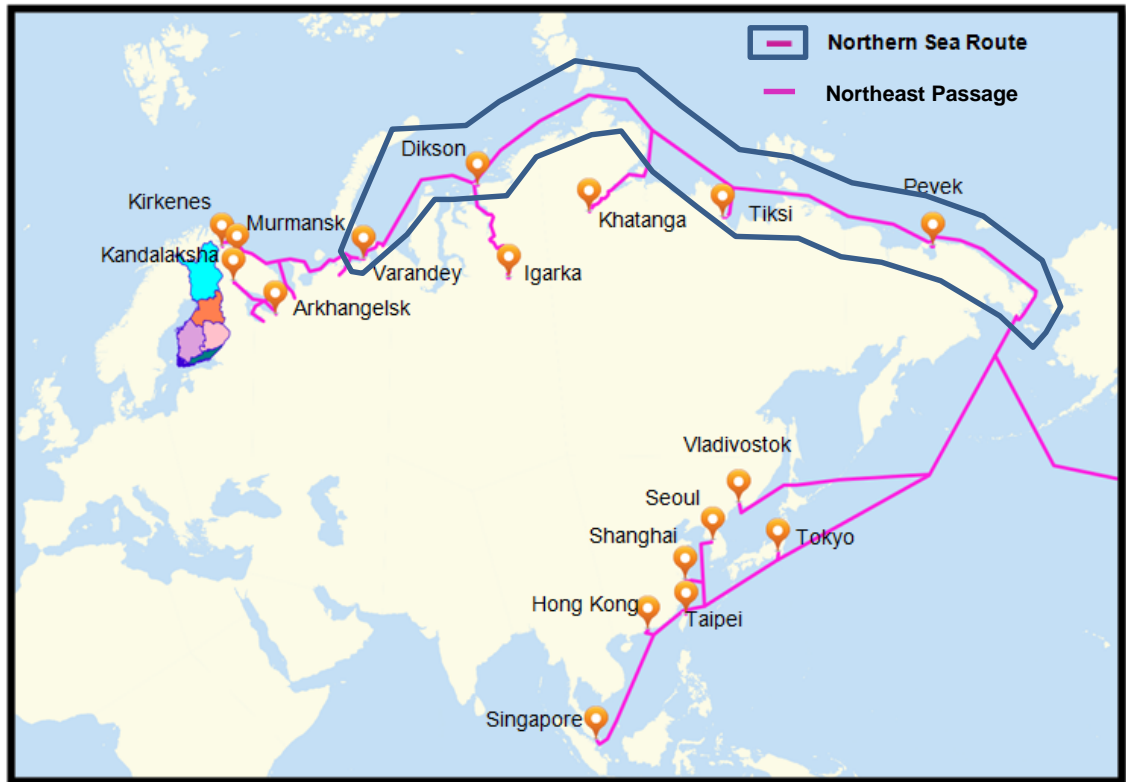


Figure 17. The Northern Sea Route, adapted and combined from (NSR Information Office 2014) and (AMSA 2009).

Originally the route was used to explore the High-North and as a logistic corridor to reach remote locations. The Northern Sea Route is now supporting fossil industries in Russia (NSR Information Office 2014).

4.3 Arctic Bridge

The Arctic Bridge connects the Canadian town of Churchill to Murmansk in Russia through the Arctic Sea, as showed in figure 18.



Figure 18. The Arctic Bridge, adapted from (Arctic Bridge 2014).

The Arctic route aims at supporting the development of a foreign trade zone in Northern Canada. Located in Winnipeg, the export processing zone has the purpose of attracting foreign investment and encouraging the creation of added value inside the borders of Canada (Foreign Trade Zone 2014).

4.4 Northwest Passage

The Canadian Northwest Passage connects the Pacific to the Atlantic Ocean. It starts from the Davis Strait through the Canadian Arctic Archipelago and finishes to the Bering Strait, as can be seen in figure 19.



Figure 19. The Northwest Passage, adapted from (AMSA 2009).

Due to climate change the passage is considered as a valuable future shipping route. The Arctic Ocean should be ice-free during the summer season between 2050 and 2100 (Parliament of Canada 2006).

5 Development Strategies of Finland

This chapter presents the major development strategies of Finland from different authority levels relating to Arctic Corridor. The author took into consideration economic, geographical and transport dimensions when selecting the strategies. In order to identify the challenges and future strategic priorities of Finland seven development strategies are presented in the following chapters. The name, origin and date of publication of the seven strategies are gathered in table 1.

Table 1. Origin of the major development strategies of Finland involved in Arctic Corridor.

Major development strategies	Title	Dates of publication	Origin
Team Finland Priorities	Team Finland: Strategy Update 2015	2014	Joint effort between: Ministry of Employment and the Economy The Ministry for Foreign Affairs The Ministry of Education and Culture
Regional Policy	Finland's Regional Development Strategy 2020	2010	Ministry of Employment and the Economy
Baltic Region	European Union Strategy for the Baltic Sea Region	2013	European Commission
	Finland	2014	European Commission
	Programme of the Finnish Government	2009/2011	Prime Minister's Office
Barents Region	The Barents Programme 2014-2018	2013	Barents Regional Council
	Finnish Chairmanship of the Barents Euro-Arctic Council 2013-2015	2013	Barents Euro-Arctic
Northern Dimension Partnership on Transport and Logistics policy	The Northern Dimension	2006	Ministry for Foreign Affairs of Finland
	Network for Peace and Development	2005	European Commission
	The Northern Transport Axis	2007	European Commission
Arctic Region	Finland's Strategy for the Arctic Region	2013	Prime Minister's Office
The Transport Needs of the Mining Industry	The Transport Needs of the Mining Industry in Finland	2013	Finnish Transport Agency

The Arctic Corridor project has transnational ramifications and international implications. By connecting the Baltic and the Barents Regions the project involves many stakeholders and stimulates exchanges between different economic areas. Selection of the seven strategies is based on these interactions and is put in perspective with regional, national and European authorities.

The Baltic and the Barents Regions being the main beneficiary of the project it is essential to analyse their development strategies. The Arctic Corridor claims to be the quickest connection to the Arctic of the European Union which implies the cooperation of Finland on Arctic matters. As a result, the Finland's Strategy for the Arctic Region and the Northern Dimension Strategy are considered as major development strategies for the corridor. The Team Finland Priorities shows national recommendations while the Regional Policy presents the orientations of Finland on a local scale. Finally the extraction of minerals in the development of Northern Finland drew the attention of the author on the needs for transport of the Mining Industry.

5.1 Team Finland Priorities

The Team Finland Strategy Update 2015 listed Russia, China, United States, Sweden, Germany, India, and Brazil as priority markets for Finland. In addition Korea, Japan, Southeast Asia and Africa are also strong markets where Finland should concentrate its efforts outside the European Union. Identifying added value on global supply chains in order to develop key industries is also a priority for Finland. Team Finland argues that the risk of adjustment costs related to the relocation of production capacities along the global supply chain should be compensated by strong social services and flexible labour market policies. The development of this societal structure will protect Finland from the volatility of the global marketplace.

Table 2. Thematic priorities, (The Team Finland Strategy 2014: 15).

Thematic Priorities	Cleantech	Bio economy	ICT and digitalisation	Life sciences, healthcare and foods	Arctic competence	Creative industries and design	Education and learning
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Being flexible the Finnish economy will be able to repatriate more money, generated on the global value chain, to Finland. Finnish expertise should be focused rather than dispersed on broad markets. This is why Team Finland has listed thematic priorities for 2015, as shown in table 2 on page 27 (The Team Finland Strategy Update 2015: 11-27).

5.2 Regional Policy

The Regional Development Strategy 2020 of Finland published by the Ministry of Employment sets strategic measures to face the challenges of regional disparities. The aim of the regional policy is to improve the coordination of decision-making structure between the central government, regional councils and metropolitan areas. The strategy follows the regional and structural policies of the European Union and the OECD. In order to harmonize and coordinate important policies into one efficient system the strategies of energies, natural resources and urban hubs will be included in the Finnish regional policy. This will prepare Finland to react and adapt faster from financial crisis, volatility on the global market place, climate change, energy scarcity, population decline or transportation (Regional Development Strategy 2010).

By 2020 regional development will rely on an interconnected innovative society. Regions will make strategic decisions for the national economy and changes will be managed locally. Urban centres in Finland will have responsibilities to develop regional innovation activities by building international networks. New sources of energy and decentralized energy production will bring new business opportunities across the country. The education system will be able to adapt to changes quicker regardless of regional location and type of industry. The labour market will be more flexible with the development of adult education. The structure of regional economy will encourage creativity and variety in all processes of regional development. Sustainable development is in the centre of the regional strategy. Urban interconnection and development corridor will be done with attention to resources. Northern and Eastern regions will have developed a strong co-operation with Russia, Sweden and Norway and will have an economy based on the development on the Barents region. The Southern and Western regions will strengthen their economics relations in the Baltic region. Finally new centres of activities will be created and transport connections for freight and passengers in the Baltic and the Barents region will be improved (Regional Development Strategy 2010: 8-19).

5.3 Baltic Region

The Baltic strategy for Finland is presented from the point of view of European priorities, the Trans-European transport network and the Finnish Government report.

The European Union Strategy for the Baltic Sea Region has three key objectives:

1. The European Union strategy focuses on fighting marine pollution in the Baltic Sea. The EU promotes more cooperation between countries surrounding the Baltic Sea in order to synchronize their efforts in clearing the sea water, preserving the wildlife and encouraging green and safe shipping (Commission of the European Communities 2013: 24-31).
2. The second priority aims at improving the territorial cohesion of the Baltic Sea Region. The region favours urbanized coastal areas over remote communities inland. Eastern European and Northern countries have concentrated their main transport corridors on the axis East-West. Connecting isolated Baltic regions with European Megapolis requires the development of communication routes oriented North-South. Regional cooperation will put the strategy into action. A better transport network in the Baltic Sea region will improve its connections with Russia, Asia, the Black Sea and the Mediterranean Sea (Commission of the European Communities 2013: 32-36).
3. The Baltic Sea Region should be seen as one single market in order to improve its competitiveness in the global marketplace. The European policy fosters market integration for small and medium enterprise inside the Baltic market. To succeed, the EU plans will reduce trade barriers and customs procedures. It will increase the flow of goods between EU and Russia and secure the European supply chain towards the East (Commission of the European Communities 2013: 37-48).

The Trans-European Transport Network (TEN-T) has an objective of connecting national networks together and ensuring that the European market is accessible equally within the territory. In the new Trans European transport Networks policy released in January 2014, the European Union focuses on nine core corridor networks (Europa 2014a).

Four of the nine core corridors serve the Baltic Sea and two connect Helsinki to the Southern and Western Europe (Europa 2014a):

1. The Scandinavian-Mediterranean Corridor links the ports of Nordic countries through Northern Germany to the Southern Italian ports.
2. The North Sea-Baltic Corridor goes to the ports of the North Sea through the Baltic States, Poland and Germany.

The Northern Axis and the Motorway of the Baltic Sea are two corridors under development which will be integrated to the Trans-European Transport Network in the future, as showed in figure 20.

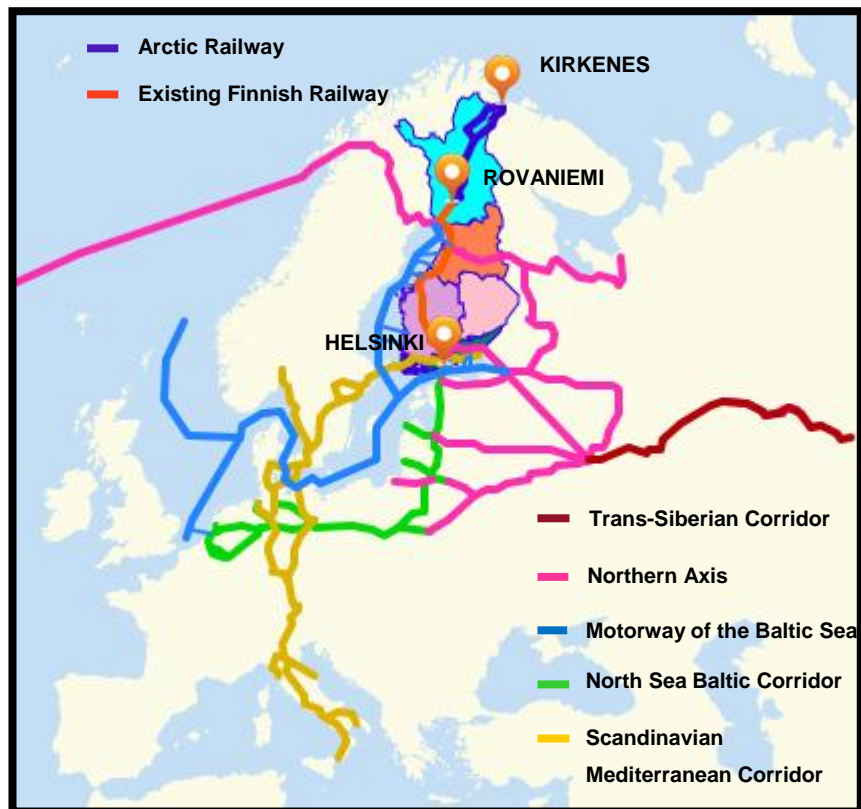


Figure 20. Current and future Trans-European Transport Network, adapted from (WSP 2007).

The Finnish government report on The Baltic Sea considers the region as a domestic and strategic market for Finnish companies, as the most important commercial partners of Finland are Germany, Sweden and Russia. The integration of the Baltic States and Poland in the European Union increased the opportunities of business for Finland. The Russian membership to The World Trade Organization (WTO) and the EU-Russia agreement consolidated the strategic regional position of Finland. The Baltic Sea is the main transport corridor of Finland as 80% of the foreign trade transit is shipped. It takes two or three days to reach the central European markets from Finland. The cost of logistics for Finnish companies is higher than average in the European Union. For these reasons Finland aims to strengthen its logistics network through new technology and more specifically smart transport solutions. Another priority for Finland is to support the TEN-T transport policy. This network will connect Finland to the Nordic triangle, central European markets and Russia (Ministry for Foreign Affairs of Finland 2014: 59-66).

5.4 Barents Region

The Barents Strategy for Finland is introduced from the point of view of The Barents Euro-Arctic Council (BEAC) and The Barents Regional Council (BRC). The European Union and non-European countries show a growing interest in the Barents Region and its strategic access to the Arctic and natural resources. The exploitation of oil, gas and minerals will generate economic interactions and finance new transport connectors in the region.

1. **BEAC:** Launched in 1993 in Kirkenes, The Barents Euro-Arctic Council is an intergovernmental collaboration between Norway, Finland, Sweden and Russia. The principal objective of the BEAC is to promote sustainable development and stability in the Barents region. Through economic cooperation Finland focuses on transport and logistics, sustainable exploitation of natural resources and the integration of young people into regional development. The Barents Euro-Arctic Council cooperates with regional institutions in order to increase cross-border efficiency (Finnish chairmanship of the BEAC 2013: 1-7).

2. **BRC:** The Barents Regional Council is a group of 13 counties currently under the supervision of the Russian county of Arkhangelsk, as shown in table 3. This regional institution supports the growth of the Barents region. The Barents Program 2014-2018 focus on developing the forestry, mining, mineral, oil, gas, tourism, logistics and higher education sectors. The stated goal of the council is to create regional agreements on bilateral or multilateral forms in each sector (BEAC 2014a).

Table 3. The counties of The Barents Region by country, (BEAC 2014a).

Country	County
Finland	Kainuu, Lapland and Oulu Region (North Karelia was granted an observer status in 2008)
Norway	Finnmark, Nordland and Troms
Russia	Arkhangelsk, Karelia, Komi, Murmansk and Nenets.
Sweden	Norrbotten and Västerbotten

In the upcoming years the Barents Regional Council will have to face important challenges such as sustainable environmental development, young generation of the North moving to southern cities and the ageing population (Barents program 2014-2018 2014b: 2).

The 13 counties of The Barents Regional Council are joining their efforts on a common theme that could boost the economy of the area. In order to stop the demographic decline and retain skilled and young people, education and living standards have to get more attention. Stimulating innovation and industrial initiatives will add value to the natural resources. The Barents Regional Council will also encourage joint management, increase cross border cooperation and make up for cultural differences. Clean and smart technology development will cover all the previous priorities in order to address climate change and environmental challenges. As stated in the latest Barents program (2014b: 3) “to achieve desired developments there is a need for good transportation and logistics systems with railways, aviation, roads and sea ports to facilitate business investments and passenger traffic”. The flow of services, people and goods inside the Barents Region has up to this point been developed on a North-South axis. New East-West transport connectors will remove obstacles to globalization and connect traditional and new international routes together.

The ports of the Barents region will form a new transshipment market in the global supply chain. As a result the interactions between the Barents Sea, the Gulf of Bothnia, the Northern Sea Route and the Northern East-West Freight corridor will increase. The integration of Intelligent Transport Systems (ITS) will increase competitiveness and coordination between all types of transports. The creation of a Barents Region Transport Strategy will stimulate multilateral cooperation between all stakeholders in the region (Barents program 2014-2018 2014b: 4-11).

5.5 Northern Dimension Strategy

The Northern Dimension is a multilateral collaboration between the European Union, Russia, Norway and Iceland based on environmental, public health, social development, transport, and cultural partnership. The goal of the strategy is to stimulate sustainable development in the regions of the Baltic, the Barents, the Arctic and North West of Russia. These countries tend to design a joint policy that will foster economic growth, stability and well-being in the Northern regions (Europa 2014c).

The Northern Dimension Strategy is divided into four policy groups such as (Ministry for Foreign Affairs of Finland, 2014):

- The Northern Dimension Environmental Partnership
- The Northern Dimension Partnership in Public Health and Social Well-being
- The Northern Dimension Partnership on Transport and Logistics (NDPTL)
- The Northern Dimension Partnership on Culture

The paper focuses on the Northern Dimension Partnership on Transport and Logistics policy in order to understand the development of the transport network in the region. The purpose of the NDPTL is to increase the integration of the Northern regions with central markets in Europe, Russia and further. In order to achieve these goals and anticipate global development, the Northern regions have to invest in new transport infrastructures. The new connectors supported by the NDPTL will connect the Trans-European transport Network defined earlier in the paper with the networks of the non-EU countries such as Belarus, Russia and Norway. New regional logistics hubs and cross-border sites will increase the integration on the Northern regions into the global supply chain (NDPTL 2014).

The High Level Group of the European Union (Europa 2005) listed “the five major axes to connect the EU with its neighbours as the Motorway of The Seas, the Northern Axis, the Central Axis, the South Eastern Axis and the South Western Axis”. The first two are relevant in the development of the paper and will be detailed briefly as follows:

1. In 2001 the European Commission introduced the concept of “Motorway of The Seas” to serve the different regions of the European Union by sea, as shown in figure 20 on page 30. The project aims at relieving other types of transport, creating new intermodal maritime hubs and developing a sustainable supply chain in Europe. **The Motorway of the Baltic Sea** connects the Northern part of the Nordic countries to the central European markets (Europa 2007).
2. **The Northern Axis** is a regional transport route under development which connects the North of Europe with Norway and Russia, as can be seen in figure 20 on page 30. The corridor will link St Petersburg in Russia to Narvik in Norway through Finland and Sweden. The Northern Axis will be a major connector between the Barents region and Europe in the future (NDPTL 2014d).

5.6 Arctic Region

The Arctic Strategy for Finland is introduced from the point of view of European priorities and the Finnish Strategy for the Arctic Region 2013.

The priority of the European Union is to protect the Arctic. Climate change and environmental policies are integrated in the European law to limit negative impacts on the Northern regions. The EU is investing in research projects and in sustainable development of natural resources. About 90 % of the European foreign trade activities are done by sea. For that reason European Union is interested in expanding the traffic of freight in the Arctic Ocean. The industries of ship-building, satellite navigation search and rescue and port infrastructure will support the development of maritime transportation in the Arctic. In addition to Finland, Sweden and Denmark the European Union tightens its cooperation with the five non-EU Arctic Council Member States (Canada, Iceland, Norway, Russia, and USA). The Arctic Council is an inter-governmental institution created in 1996 and intended to maintain the stability and to protect the environment in the Arctic regions. The chairmanship is currently assumed by Canada and will rotate to Finland for a two-year-term in 2017 (Arctic Council 2014).

In order to have a privileged access to the Arctic, the European Union will finance new transport infrastructures in the Barents Region. The Trans-European Transport Network will gradually integrate new corridors into its network. The transport needs in the Barents region will be met by the Northern Dimension Partnership on Transport and Logistics policy (Europa 2012: 2-17).

The Finnish government released its programme for the Arctic Region 2013 which aims at meeting three objectives. Firstly Finland has the aim to become a leader in environmentally friendly technologies. The country will specialize in water and hazardous management and provide top services in oil spill prevention and in energy efficiency. Secondly the policy focuses on joint projects and regional cooperation in the Arctic. Finland will have to establish strategic alliances with neighbouring countries and other Arctic States. Finally the strategy for the Arctic Region is to increase the profile of Europe in the Arctic. The Arctic Strategy informs us that Finnish industries have significant chance of economic success in focusing their efforts on Arctic expertise, as showed in figure 21. Lapland will be a research and testing ground for Arctic technologies development. The need for design expertise will also grow as new products will emerge from the Arctic development (Prime Minister's Office Publications 2013: 26-37).

Areas of Finnish Arctic expertise	
- Offshore industry	- Construction and infrastructure
- Maritime industry	- Environmental technology
- Shipping	- Management of environmental impacts
- Carriage by sea	- Sustainable social concepts
- Weather and ice information services	- Arctic environmental expertise
- Forestry	- Health and well-being in the Arctic
- Mining and minerals	- Waste management technology
- Metals	- Information technology
- Tourism	- Public e-services
- Traditional livelihoods	- Innovation-driven development
- Low-temperature expertise	- Cold climate research
- Winter testing	- Bio- and nano-sciences
- Metrology	- Risk analyses
- Generation and distribution of electricity and thermal energy	- Oil spill prevention technologies
- Energy saving and energy efficiency	- Materials technology
- Wind power technology	- Water management

Figure 21. Area of Finnish Arctic expertise, (Prime Minister's Office Publications 2013).

The Northern Dimension Partnership on Transport and Logistics will define the transport strategy in the Arctic. The growth of multimodal cross-border traffic in a fragile ecosystem will imply a sustainable development of inland and off-shore transport infrastructures. (Prime Minister's Office Publications 2013: 36-37). In January 2015 Norway, Sweden and Finland released a common master plan for sustainable growth in the Scandinavian Arctic (Prime Minister's Office Publications 2015).

5.7 The Transport Needs of the Mining Industry

In 2050 "being a global leader in the sustainable utilization of mineral resources and the minerals sector is one of the key foundations of the Finnish national economy." (Minerals Strategy 2010a). In 2012, the release of toxic waste water from a gypsum pond at the Talvivaara mine in Northern Finland led to the creation of a national plan for sustainable mining. The master plan released in 2013 contains 35 recommendations that take into consideration environmental, social and cultural factors. These actions are planned to be implemented in the Finland's Mineral Strategy (Ministry of Employment 2013). This chapter introduces the transport needs for the development of the mineral industry in Finland.

The extraction of natural resources in Finland will rely on environmentally friendly technologies, better productivity, new competencies, deeper expertise, strong minerals policy and reliable supply chains (Invest Finland 2010). The three mines of Kemi, Pyhäsalmi and Sotkamo represent 90 % of the Finnish minerals transport in 2011. Despite the recent bankruptcy of Talvivaara Sotkamo Ltd there might be an opportunity to restart mining operations in Sotkamo from a new basis that takes environmental challenges into account (Finnish Government 2014).

The road and railway networks are used for the transportation of minerals while air transport focuses on the transport of high added value items from industries of forestry, metal and energy. Despite a small share in the total volume of transport in Northern Finland (road: 5% and rail: 10%), the mineral industry has important impacts on transport infrastructures. New mining projects in Savukoski, Kolari, Ranua, Taivalkoski and Middle Lapland will increase the production of mineral and the demand for transport in Finland in the future. The extension of mines in Kemi, Sodankylä and possibly Sotkamo will create bottlenecks on existing transport corridors, as shown in figure 22 on page 38.

Sweden and Russia will also contribute to the growth of the mining industry in the Barents while the mineral production in Norway will stay quite low. The regions of Västerbotten, Norrbotten and the Kola Peninsula have the most important potential outside Finland.

The Finnish Transport Agency predicts that the Finnish freight transport industry will have to carry 7 million tons of mineral in 2017 while 2011 the figure was 2,5 million tons. The needs will grow up to 13 million tons in 2030 based on moderate estimation and could reach 24 million tons in case of high growth (The Finnish Transport agency 2013: 11-14). In 2013 the report for sustainable mining stated that 45 mining companies have made an investment in a dozen important projects. These projects will be implemented in the coming decade in Northern and Eastern Finland and will require more than 5000 new jobs (Ministry of Employment 2013).

Apart from the mining industry, the demand for transport infrastructure in Finland will come from the forest industry. The consumption of wood as a source of energy will double in Finland by 2020 and will be supplied by the North West of Russia. Secondly, the production of oil and gas in the Barents Sea will foster the development of ports and shipping activities in the Arctic. The transportation of Liquefied Natural Gas from Norway to European markets will contribute to make the Arctic Railway viable (Barents Observer 2015b). Finally imports of Norwegian fish to Russia and Eastern European countries in transit through Finland will increase the need of new cross-border points in Northern Finland (The Finnish Transport agency 2013: 11-14).

The Finnish Transport Agency (2013: 16) argues that “two main development options emerged from the report; transport via the harbours of the Bothnian Bay (Tornio, Kemi, Oulu, Raahe, Kalajoki and Kokkola) and the Arctic Ocean (Narvik, Skibotn, Kirkenes and Murmansk).”

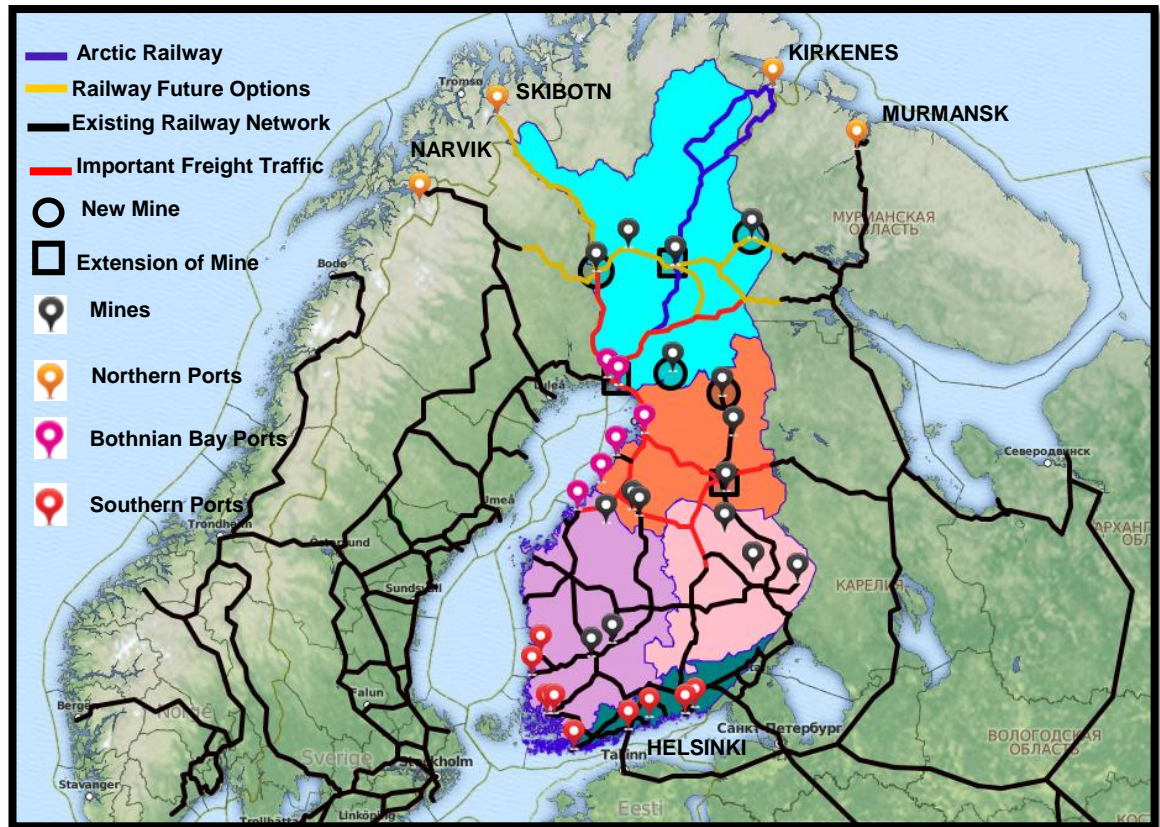


Figure 22. Mining Industry in Finland and Railway Transport in Neighbouring, adapted from (Finnish Transport Agency 2013).

The connection from mines to the ports of the Bothnian Bay and the Barents Sea will design the railway network in Northern Finland, as can be seen in figure 22. The new railway network in Northern Finland will serve the Finnish, European and non-EU markets.

There are six options of transport corridors (two for the Bothnian Bay) which could support the mining industry and growing industry in Northern Finland.

- The Bothnian Bay and its 6 harbours (Tornio, Kemi, Oulu, Raahe, Kalajoki and Kokkola)
- Narvik harbour
- Skibotn harbour
- Kirkenes harbour
- Murmansk harbour

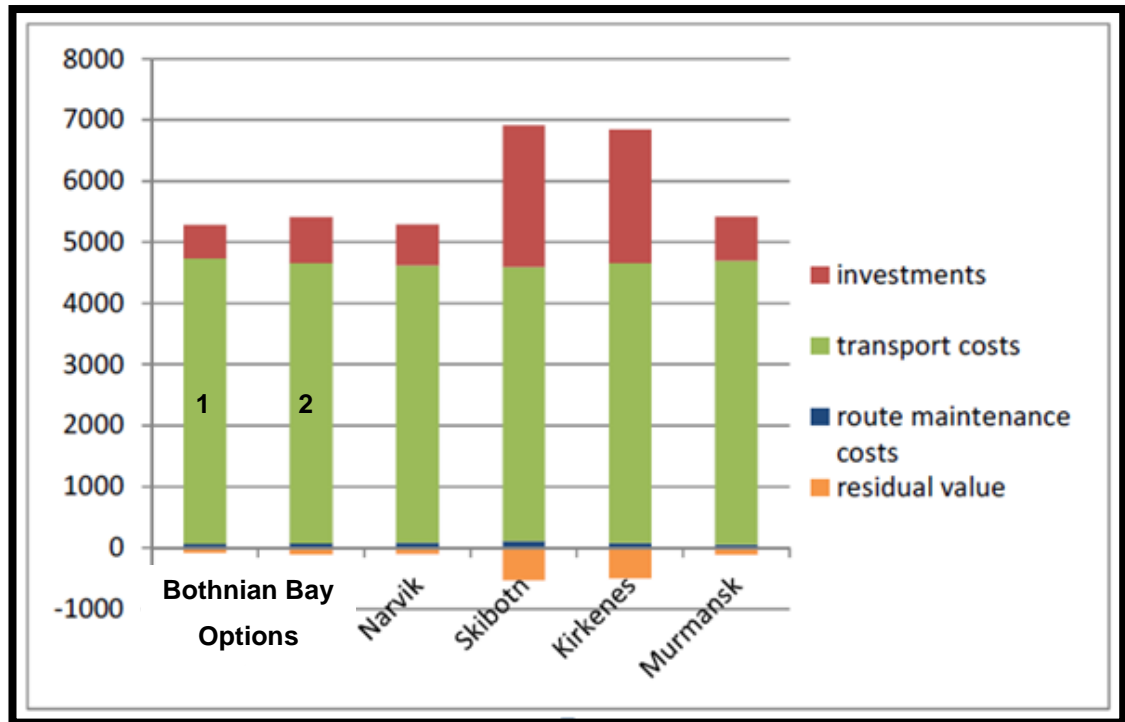


Figure 23. The present values (Million euros) of the route options' total costs for the 30 year period in the moderate growth Europe weighting case (most competitive option of each route), adapted from (The Finnish Transport agency 2013: 22).

The total cost of each option for a 30 year period and under a moderate growth case shows that the Narvik and Murmansk projects are as competitive as the Bothnian Bay, as can be seen in figure 23 (The Finnish Transport agency 2013: 21). However, these indicators should be used carefully as some investments in Norway, Sweden and Russia were not included in the calculation. The Narvik option could face traffic congestion due to the expansion of LKAB mining site in Kiruna while the Skibotn option requires new investment for the railway and the harbour. However the Finnish National Emergency Supply Agency states that "the Kirkenes alternative is the commercially most viable route" (Barents Observer 2015b).

6 Challenges and Strategic Priorities of Finland

In this chapter the author tries to identify the relationship between the current economic situation of Finland, the international transport network, the seven development strategies and the Arctic Corridor. The first two sections of the chapter explain the challenges of the Finnish foreign trade and logistics described previously in chapter two. The third section introduces the major problem of the European supply chain and the role of new transport corridors that it is facing. By conducting a cross-case synthesis of the seven development strategies the last section identifies similarities in order to determine the main strategic priorities of Finland.

6.1 Slow Industrial Diversification

Trade between Finland and non-EU countries went down in 2013 while commercial exchange with EU countries increased in both exports and imports, as shown in table 4. The top three trading partners of Finland remain Sweden, Germany and Russia. In 2013 Russia slipped from the second largest export country to the third place. The change can be attributed to the improved ports of the Baltic Sea in terms of capacity and network (Finnish Customs 2013: 4-36). As mentioned in the limitations section the current global political and economic crisis where Russia plays an important role affects Finland greatly.

Table 4. Non-EU countries and EU countries' share of Finland's foreign trade in 2012 and 2013 (Finnish Customs 2013: 3).

	non-EU countries		EU countries	
	Exports (%)	Imports (%)	Exports (%)	Imports (%)
2012	46,3	46,7	53,7	53,3
2013	44,8	43,4	55,2	56,6

Integrating (OECD 2013) a global value chain that will generate growth and increase exports requires "taking into account flows of intermediate goods and services and identifying in which countries and industries value is added along the chain".

The share of Finnish intermediate goods for future exports represents 55 % of its total gross export, as shown in figure 24. Finnish companies produce added value abroad as their sourcing network is mainly developed outside Finnish borders. The domestic market does not provide enough opportunities as a provider of intermediate goods (OECD 2009: 2).

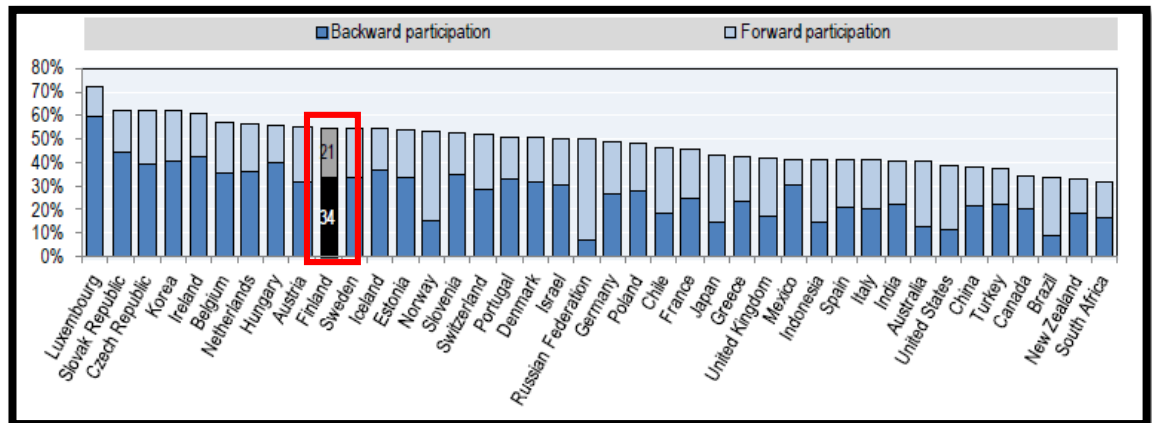


Figure 24. Participation in Global Value Chain per country: Total %of Gross Export, (OECD 2009).

The growing industries have not replaced yet the lost market share of the electronic sector but the exports configuration is more diversified than before, as can be seen in figure 25 on page 42. Even though the export shares of chemical and metal products are growing, these two industries have not made up for the decline of the electronic sector and the crumbling of the wood and paper production yet. The industries of wood, paper, chemical, mineral, basic metal and machinery form a group of similar sized industries that will take over the gap from electrical sector in the future (OECD 2009: 1).

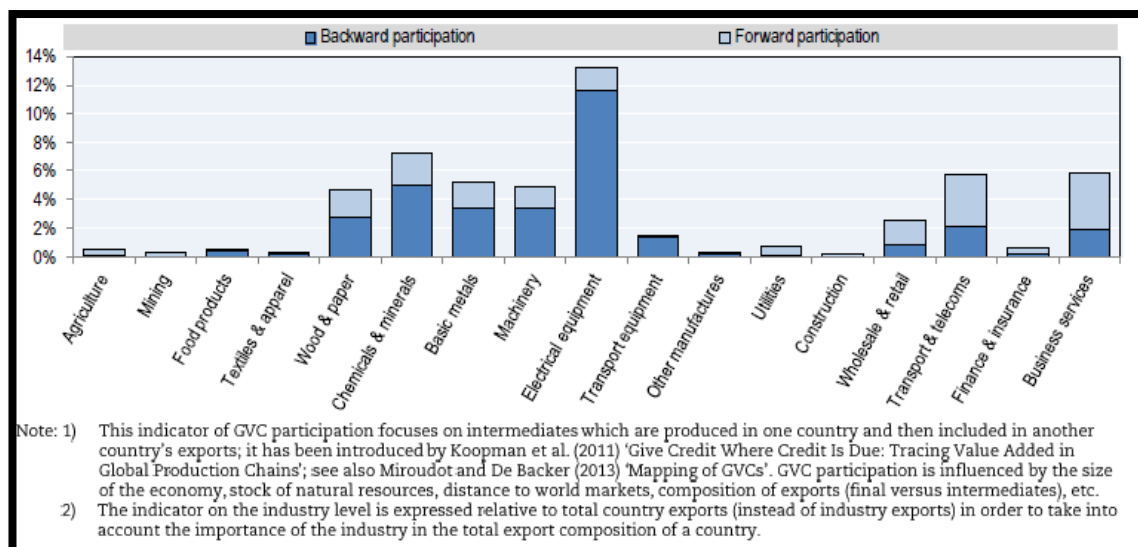


Figure 25. Participation in Global Value Chain by industry in Finland, (OECD 2009).

The configuration of Finnish exports has changed in the last ten years to become more polyvalent and flexible. There is no obviously prevailing industry in the export classification as groups have become more balanced. The shares of electrics and electronics industry products have dropped considerably from 30 % of the total Finnish export in 2009 to 11 % in 2013. Finland must find new opportunities to increase its participation in new global value chains to renew growth and jump-start exports. The list of thematic priorities that Team Finland released in its strategy for 2015 supports the idea of industrial diversification, as shown in table 2 on page 27.

6.2 Decrease in Logistics Reliability

The World Economic Forum ranks the competitiveness of 144 countries providing a glimpse into productivity of national economies. In the report of 2014-2015 Finland has been ranked at the fourth position. Despite this good result Finland occupies only the 15th position in the category of transport infrastructure (World Economic Forum.) The Logistics Performance Index confirms this low performance in its 2014 issue.

As mentioned in chapter two the latest LPI ranked Finland at the 24th position, far behind the leader Germany. This is a significant drop as Finland had the 3rd in 2012. The result of the last LPI also diverges from the 15th and 12th places reached in 2010 and 2007.

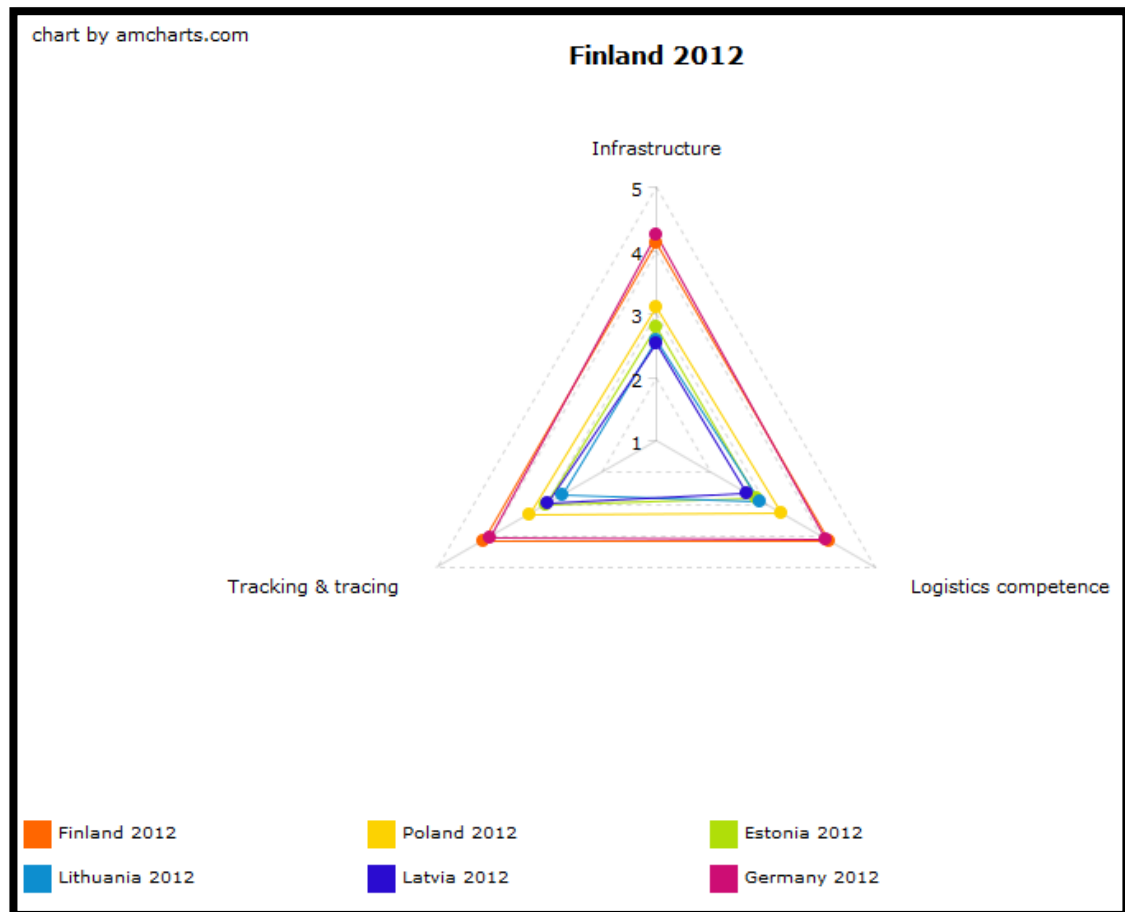


Figure 26. Logistics Performance Index. Country Score Card: Finland 2012, Lithuania 2012, Poland 2012, Latvia 2012, Estonia 2012, Germany 2012, (World Bank 2014).

A difference of more than 0.5 points between 2012 and 2014 shows the important deterioration of transport infrastructures, tracking and tracing indicators. The neighboring countries of Finland have improved their indicators significantly comparing with 2012, as can be seen in figure 26 and 27. Latvia, Lithuania, Estonia and Poland are now direct competitors for Finland in the transportation of freight in the region. The Logistics Performance Index 2014 confirms that Finland suffers from the competitiveness of adjacent countries in being the European gateway to Russia and Asia (World Bank 2014).

The LPI report states that “if service delivery is poor, good physical connectivity is not enough” highlighting the high appreciation for the quality of services and that a good infrastructure cannot alone compensate for that. Logistics infrastructures are considered as established operational networks and cannot support their own customers’ satisfaction (World Bank 2014).

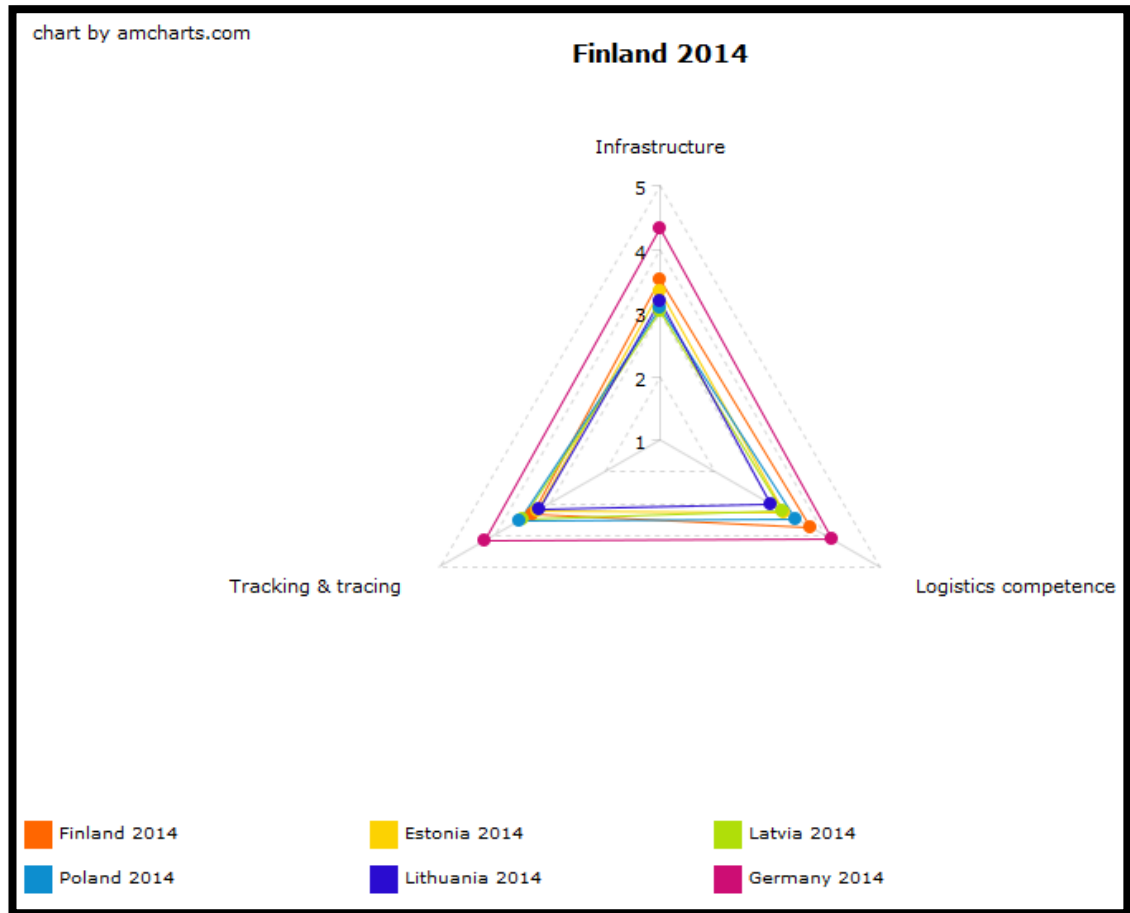


Figure 27. Logistics Performance Index. Country Score Card: Finland 2014, Lithuania 2014, Poland 2014, Latvia 2014, Estonia 2014, Germany 2014, (World Bank 2014).

The poor performance of Finland in the 2014 LPI index might be caused by the lack in quality services such as logistics competence and tracking & tracing. Between 2012 and 2014 Latvia, Lithuania and Estonia improved the quality of trade and transport related to infrastructure while Poland maintained its position. On the other hand all these countries have improved significantly the competence and quality of logistics services and their ability to track and trace consignments, as shown in table 5 on page 45. The Baltic States and Poland might have invested earlier than Finland in services and smart technologies for logistics purposes which could explain the increase in perceived infrastructure quality.

Table 5. Change in % of Infrastructure, Logistics Competences and Tracking & Tracing area of evaluation (World Bank 2014).

Countries	Infrastructures			Logistics Competence			Tracking & Tracing		
	2012	2014	Change (%)	2012	2014	Change (%)	2012	2014	Change (%)
Germany	4,26	4,32	1,4	4,09	4,12	0,7	4,14	4,17	0,7
Finland	4,12	3,52	-14,6	4,14	3,72	-10,1	4,05	3,31	-18,3
Poland	3,10	3,08	-0,6	3,30	3,47	5,2	3,32	3,54	6,6
Lithuania	2,58	3,18	23,3	2,91	2,99	2,7	2,73	3,20	17,2
Estonia	2,79	3,34	19,7	2,82	3,27	16,0	3,00	3,20	6,7
Latvia	2,52	3,03	20,2	2,64	3,21	21,6	2,97	3,50	17,8

Finnish companies tend to select their location according to business and logistics viability. It appears that the region with the best logistical position is South Finland. West Finland is second while North Finland and finally East Finland complete the ranking. The most important differences among the regions, for Finnish businesses, fall on the transport infrastructure. Put in perspective with other sources there might be a distortion in the way the infrastructure indicator is perceived by companies. The differences could be on the infrastructure themselves or in the absence of factor of development (Ministry of Transport and Communications 2012: 65).

The report of Finland State of Logistics (2012: 49) explains that “International elements in the supply chains of Finnish companies in manufacturing and trading are more often than not located in Europe and developing Asia”. By 2015 the majority of increased production capacity and procurement of Finnish manufacturing companies will occur in low-cost countries. Finland remains an attractive location for sites of production but in the long term offshoring activities in low cost countries will be more attractive. The phenomenon is not resulting from logistical factors but from the need to benefit from low production costs as close as possible from the resources (Ministry of Transport and Communications 2012: 65). Reaching these locations is a strategic stake for Finland which will be made possible with a competitive transport network, reliable services related to logistics and an extensive connection to supply chains.

6.3 Economic Competitiveness under Threat

The slow recovery of economy in Europe will continue in 2015 and 2016. Exports and imports of goods and services are forecasted to grow by 4% in 2015 and 5% in 2016 (Europa 2014e: 17). This growth will increase trade and freight transport between the main partners of the European Union and should not affect the competitiveness of European transport infrastructures. The 2001 White Paper of the European transport policy (Europa 2001: 11) emphasized that “congestion is threatening European economic competitiveness”. Despite improvements in territorial cohesion and international collaboration the Trans-European Transport Network does not yet meet the target set in terms of environmental performances and territorial coverage. The 2011 White Paper argues that the lack of connections between isolated regions and dynamic economic centres in Europe will increase bottlenecks of the supply chains. At term the European Union could suffer from a dysfunction of its transport network in the central markets and an insufficient economic activity in the peripheries (Europa 2011: 5).

In order to overcome the problem of congestion, new European transport corridors such as Arctic Corridor, Northern Axis and Motorway of the Sea of The Baltics are planned to be integrated into the Trans-European Transport Network, as can be seen in figure 20 on page 30. The external dimension is covered by the development of new international routes. Northern East-West Freight Corridor, Northern Sea Route and Arctic Bridge are the most relevant transport corridors to connect the Arctic Corridor to new global supply chains. The decentralization of global freight transport corridors from the circum-equatorial axis will also support the decongestion of central European transport infrastructures.

Northern East-West Freight Corridor: The Northern East-West Corridor will provide alternatives to existing global routes described previously in this thesis. This new corridor uses mostly existing transport infrastructures and does not depend on weather conditions in the Arctic. The railway section will be developed with new segments and new cross-border points. New regional corridors, like the Arctic Railway, will connect the Barents section to the rest of Europe and increase the reliability of the traffic. The combination of maritime and sea segments will reduce the distance between Asia and North American by 50 % (Futurum 2010).

Northern Sea Route: The Northern Sea Route reduces shipping time between Asia and Europe by 40 % compared to the Suez Canal route (Arctic Corridor 2014). The development of this shipping route is lucrative as a result of the transport of natural resources discovered in the Arctic shelf in Russia. Short ice-free season, weather conditions and use of ice breakers affect the reliability of the Northern Sea Route. The passage is open approximately four months per year from July to Mid-November. After years of stagnancy the traffic increased from 41 vessels in 2011 to 71 in 2013 while number of vessels dropped to 31 in 2014 (Northern Sea Route Information Office 2014). The decrease of traffic in 2014 could be connected to political tension between East and West blocks. However a container line between Murmansk and Petropavlovsk-Kamchatsky is considered as a serious option for the transport of fish to supply the Kamchatka and Magadan regions. This initiative will serve the Russia market and will test the viability of the maritime route (Barents Observer 2015a).

Arctic Bridge: The Arctic Bridge connects the deep sea port of Churchill in the Province of Manitoba to the port of Murmansk. The sea segment is part of an intermodal route which continues by train to China and India. The Bay of Hudson being frozen the majority of the year the Arctic Bridge is only open four months a year. The travel time to Murmansk is 16 days while reaching Beijing from Russia takes 8 days (Centre Port Canada 2012). The province is also a strategic gateway to the Mid-Continental Trade Corridor. This North-South connector serves the central markets in North America up to Mexico (Arctic 2014). The Airport of Winnipeg, the deep-sea port of Churchill and the Mid-Continent Trade Corridor will transform the province of Manitoba in an attractive international hub (Winnipeg inlandport 2014).

Northwest Passage: Shipping activities between the Davis and Bering Straits will increase with the melting of ice cap. However, need for ice-strengthened vessels during the majority of the summer season will limit its growth. Currently the passage is open to non-ice-strengthened vessels one month per year.

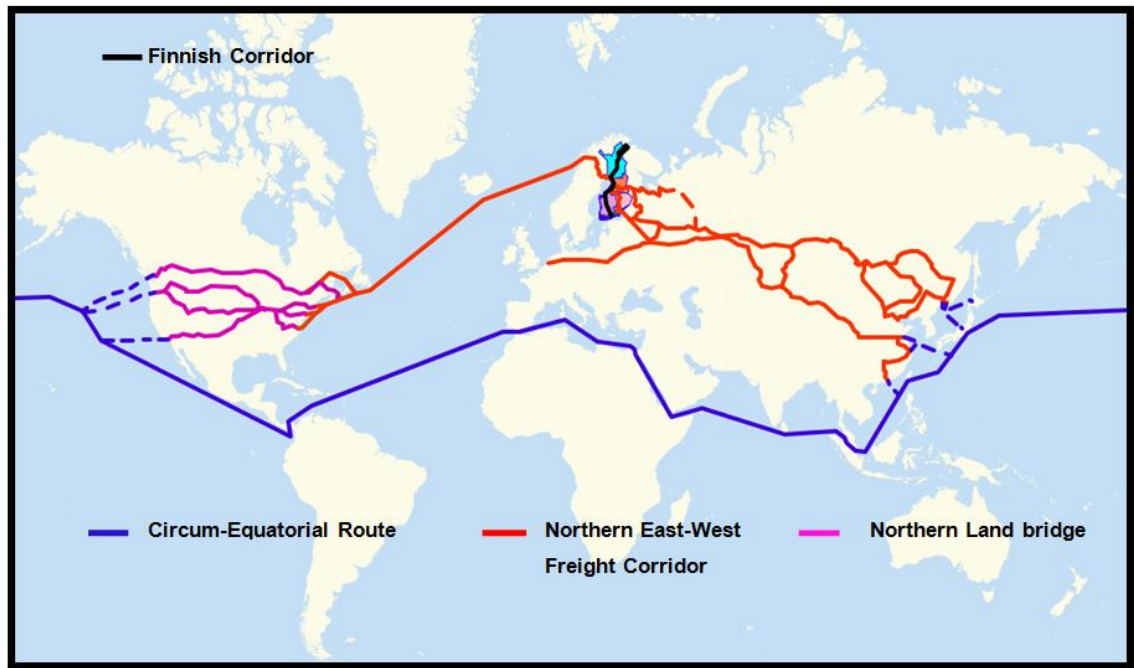


Figure 28. Northern Corridors vs. Circum-Equatorial Route, adapted and combined from (Rodrigue, Comptois and Slack 2013) (Futurum 2010) and (ESCAP 2014).

Connecting Northern Europe to the Trans-Siberian, Trans-Atlantic connectors and Arctic routes instead of the central European markets will improve transport fluidity in Europe and increase the logistics competitiveness of Finland. Developing new transport connectors in the Barents Region on an East-West axis will remove the bottlenecks in the European backbone from North-West England to Northern Italy. Extraction of natural resources in Northern Europe will foster the growth of heavy freight railway connectors, improve security and lower the costs of transport. As Arctic shipping routes depend on ice-free periods and on global warming the Northern East West Corridor has an advantage on the other international routes. Therefore it seems to be the most reliable option as a new global transport corridor for regular traffic in the Northern hemisphere and as an alternative to the circum-equatorial route, as showed in figure 28.

6.4 Strategic Priorities in Transport

The author derives connectivities between the seven development strategies in order to identify transport priorities and initiatives that will drive the development of transport infrastructures in Finland. Firstly, reviews of each strategy are conducted in chapter 5 based on which the most important action plans are categorised into different thematic areas. In order to enable a cross-case synthesis of the seven development strategies, the general themes are funnelled into what the author considers as strategic priorities for Finland, as listed in table 6 on page 50.

Strategic priorities for Finland were chosen by using the pawing technique which consists in rigorous reading and highlighting of the data (Ryan 2003), as illustrated in figure 29. A thorough reading of each strategy is done and key phrases are highlighted and sorted into action plans, as showed in appendix 1. The identification of themes is based on ocular scanning, repetition of key phrases and identified patterns in the seven strategies.

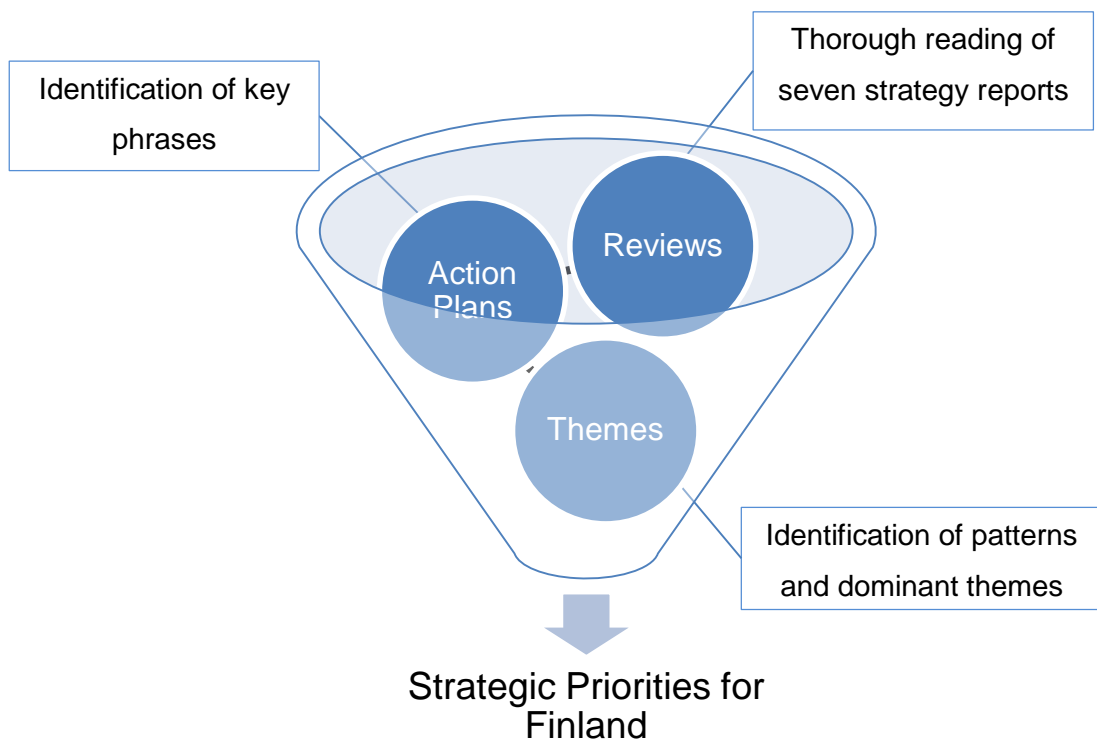


Figure 29. Pawing Technique: Identification Process of Strategic Priorities for Finland.

The author focuses on transport infrastructures and does not take into consideration other Finnish strategic priorities when answering the main research question in chapter seven. Finally a cross-case synthesis is made in order to visualize the common priorities of the seven development strategies, as can be seen in table 7 on page 51.

Table 6. Themes and strategic priorities of Finland.

Theme	Strategic priorities of Finland
Economic development	Economic development and trade facilitation
Regional autonomy	Decentralization and regional development
Decision making	Decision-making based on reliability and flexibility
International transportation	Integration to new global supply chains
European transportation	Improvement of Trans-European Transport Network
Regional transportation	Development of regional transshipments markets
Domestic transportation	Improvement of territorial connectivity
Management of institutions	Coordination of institutions
Protection of the environment	Sustainable development

Strategic priorities for the development of transport infrastructures in Finland are:

- **Integration to new global supply chains**
- **Improvement of Trans-European Transport Network**
- **Development of regional transshipments markets**
- **Improvement of territorial connectivity**

Table 7. Cross-case synthesis of seven development strategies for Finland.

Strategies Strategic priorities	Strategies		Strategies				
	International	Regional	Baltic	Barents	Northern Dimension	Arctic	Transport needs of mining industry
Economic development and trade facilitation	●	●	●	●	●	●	●
Decentralization and regional development		●					
Decision-making based on reliability and flexibility		●	●	●	●	●	
Integration to new global supply chains			●	●	●	●	●
Improvement of Trans-European Transport Network			●	●	●	●	
Development of regional transshipment markets			●	●	●	●	●
Improvement of territorial connectivity			●	●			●
Coordination of Institutions		●	●	●	●	●	
Sustainable development			●	●	●	●	

Cross-case-synthesis emphasizes the importance of the Northern strategies in the development of Finland. The Arctic and the Northern Dimension strategies support the implementation of the Barents strategy by offering great economic and transport opportunities to the Barents regional councils of Finland. The Northern Dimension Partnership on Transport and Logistics will support the transport strategy in the Barents Region. Initiatives in Barents and Arctic regions will launch activities and construction of new transport infrastructures in Lapland. The Baltic strategy still stimulates economic development and trade exchange in the Southern and Western Finland.

The Barents strategy plays a twofold role in the development of Finland by supporting economic activities happening both in North-East and South-West of Finland. Transport needs of the mining industry are a keystone for the expansion of the Finnish railway infrastructure in Lapland. The final design of the network will depend on the reliability of ongoing mining projects. Based on the existing plans, as shown in figure 22 on page 38, Sodankylä will be the central hub for the mining industries in Lapland and the Arctic Corridor the backbone of Northern economic activities connecting North to South.

On a bigger scale the Arctic Railway will unify Northern, Central and Southern transshipment markets that are important to Finland. The extension of Finnish North-South axis to the Arctic will create a sophisticated new regional logistics hub for global demand and put Finland at the heart of global transportation network, as showed in figure 32 on page 59.

7 Findings: Regional Logistics Hub for Global Demand

The corridor will be of great support in developing territory connectivity in Finland and regional transshipment markets. On a domestic level the new transport corridor will remove regional disparities by unifying economic activities between the Finnish Barents and the Baltics Regions. The Arctic Corridor has a strategic location at the crossroads of traditional and new transport infrastructures. Finnish, Nordic, European, Asian and North American markets will be accessible regardless of regional location in Finland. The project will connect Trans-European Transport Networks to the Arctic and better integrate Finland to new global supply chains. Arctic Railway will improve the reactivity of the Finnish supply network and will optimize the competitiveness of Finland into global value chains. Arctic Corridor will offer appropriate transport routes to key industries. The new corridor will strengthen the position of Finland as a connector between free-market and state capitalism countries. In an era of regionalism increasing flexibility and adaptability of Finnish transport networks will provide for contingencies in order to respond to trade reactivity and face changes in market trends.

7.1 Facilitator of Regional Development

Population growth, urbanisation and better standard of living are increasing the production of minerals. The global demand and free trading will accelerate this trend in the next decades. Finland has already several mining sites in Lapland but the discovery of new reserves in Northern Finland will add new mines on the map and increase the attractiveness of the region (Projects gtk 2010). The transport needs of the mining industry will connect several cities in Lapland to the Finnish railway network.

The expansion of the Northern railway network could help in transforming an inhospitable and remote region into a dynamic and viable economic environment. Perpetuating economic activities and providing a reliable flow of goods across the region could attract more people and companies. The boost for mining sector and in a lesser extent for oil, gas, forestry and fishing industries could also remove disparities between Southern and Northern Finland. Needs for clean technologies in the sustainable development of the Barents region will put Finnish expertise such as mining, maritime, shipping and energy industries into action.

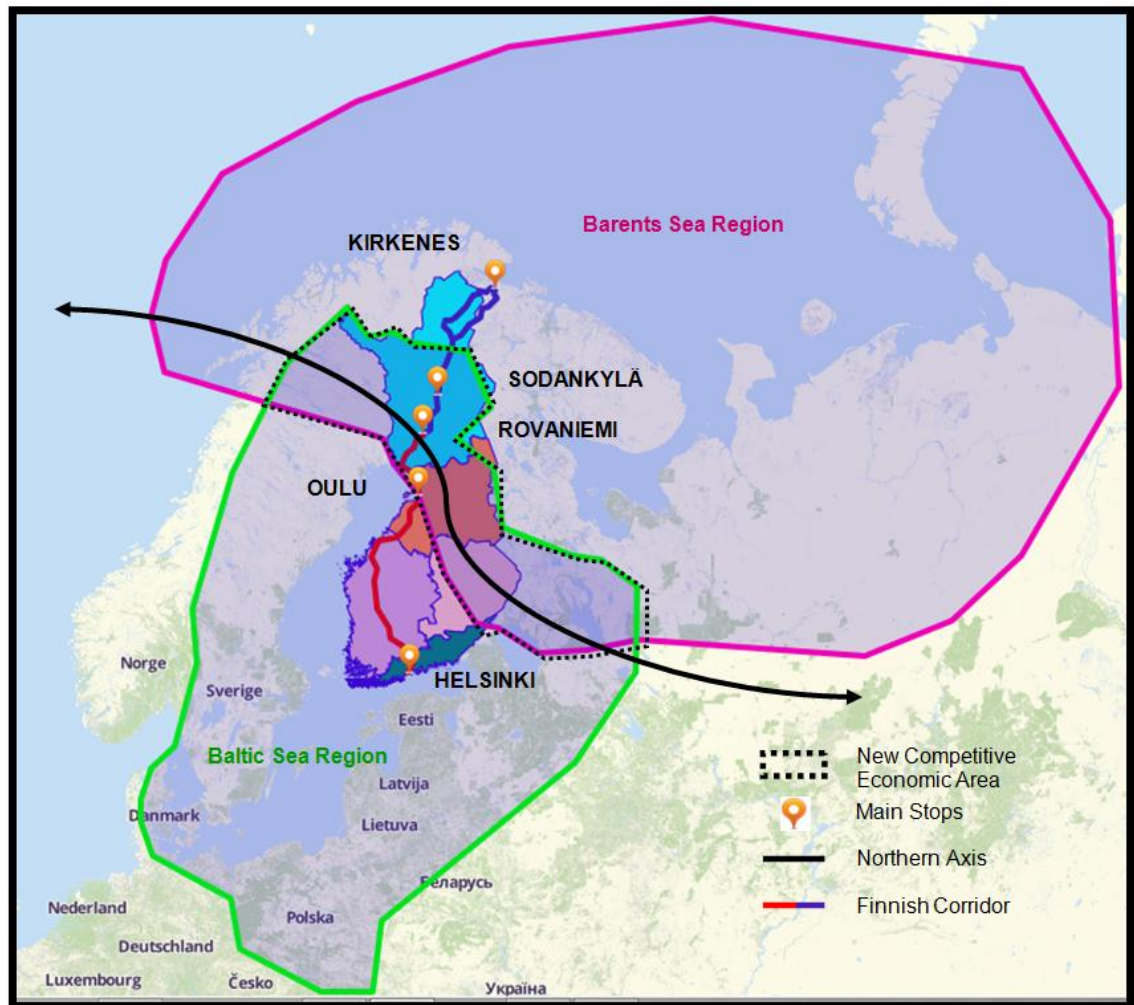


Figure 30. New competitive economic area driven by the Barents strategy, adapted and combined from (Helcom 2013), (Arctic Centre 2013) and (Arctic Corridor 2014b).

New connections to international maritime and land bridge corridors could make Lapland a more independent region and an active contributor to the Finnish economy. Arctic Railway will be the central unifying infrastructure of the Baltic and the Barents Sea regions. The project will coordinate Finnish industries activities by facilitating business collaboration, securing investments and strengthening logistics route between South and North. As an outcome a new competitive Economic Area will emerge, as shown in figure 30.

7.2 Gateway to the BRICs and Other Strategic Markets

Finland is mainly promoted to international companies as a privileged access to the Baltic Sea Region, the Nordic countries and Russia. Finland has a competitive logistics network, a reliable expertise in doing business with Russians and an innovative environment (Team Finland 2013: 3-4). Despite the Ukraine conflict and the tensions between Russia and the European Union, Finland is still discussing Arctic cooperation with neighbouring countries. Collaboration of Finland on Arctic matters with Russia should continue as the Finnish Prime Minister Alexander Stubb distinguishes European Sanction from Arctic collaboration:

“The Arctic cooperation is a quite a good example of the pragmatic and practical cooperation with Russia now despite the tension taking place in Ukraine right now. Having said that, Norway and the European Union countries have a set of sanctions that still prevail, but that is on the EU track, not on the Arctic” (Barents Observer 2015).

As the center of the Northern railway network, Sodankylä will be connected to three important transshipment markets in the Barents Region, the Bothnian Bay and the Gulf of Finland, as shown in figure 31 on page 57. The new railway network will increase the connections of Finland to new transcontinental and maritime corridors in the Atlantic and Arctic Ocean as well as China and Russia. Northern East-West Freight Corridor, Northern Sea Route, Arctic Bridge, Trans-Siberian railway, Motorway of the Baltic Sea and Trans-European Network all converge to the Arctic Corridor.

Options for route planning heading to Brazil, Russia, India and China will increase. Other Non-European destinations such as USA, Japan, Korean and Southeast Asia will also benefit from the new connections of Arctic Corridor. Northern East-West Freight Corridor seems to be the best option for new opportunities of regular traffic between strategic markets and Finland. The Trans-Siberian section heading westbound serves the fast growing markets in Asia and Russia. Transatlantic segments between the Barents transshipment market (Narvik, Skibotn, and Kirkenes) and North American transshipment market (Halifax, Montreal, New York) will shorten shipping transit time between Finland, North America and Brazil.

Despite the limitations for container traffic flow all year around, the Northern Sea Route and the Arctic Bridge could be used for summery activities. Brazil could be reached from logistics hubs in North America by using North-South pendulum connectors while Eurasian routes connected to the Trans-Siberian corridor will serve India. The integration of Arctic Corridor, Northern Axis and the Motorway of the Baltic Sea to the Trans European Transport Network will increase the supply capacity of Finland to strategic central markets in Europe such as Sweden and Germany. With this project Finland could regain lost market shares in logistics expertise to Russia and Asia but also play a bigger role in freight transport to North America.

7.3 Supply and Value Chains Optimizer

Meeting consumer expectations and relocating production capacities across different geographical locations leads to adjustment costs and reorganization of supply chains. Currently Finland does not reply fast enough to economic changes. Identifying future locations of development for new industries and supporting the flow of goods with flexible transport infrastructures will accelerate industrial transitions for Finland. By providing a new set of connections to global supply chains Arctic Corridor will support the needs of Finland to have a better integration into new value chains. The project will be a significant tool to optimize supply chain strategy. Finnish companies will have more options to develop priority industries presented by Team Finland. The connection of Arctic Railway with Kemi and Kirkenes will contribute to compensate the economic effect of decreasing industries by homogenizing the structure of the Finnish economy.

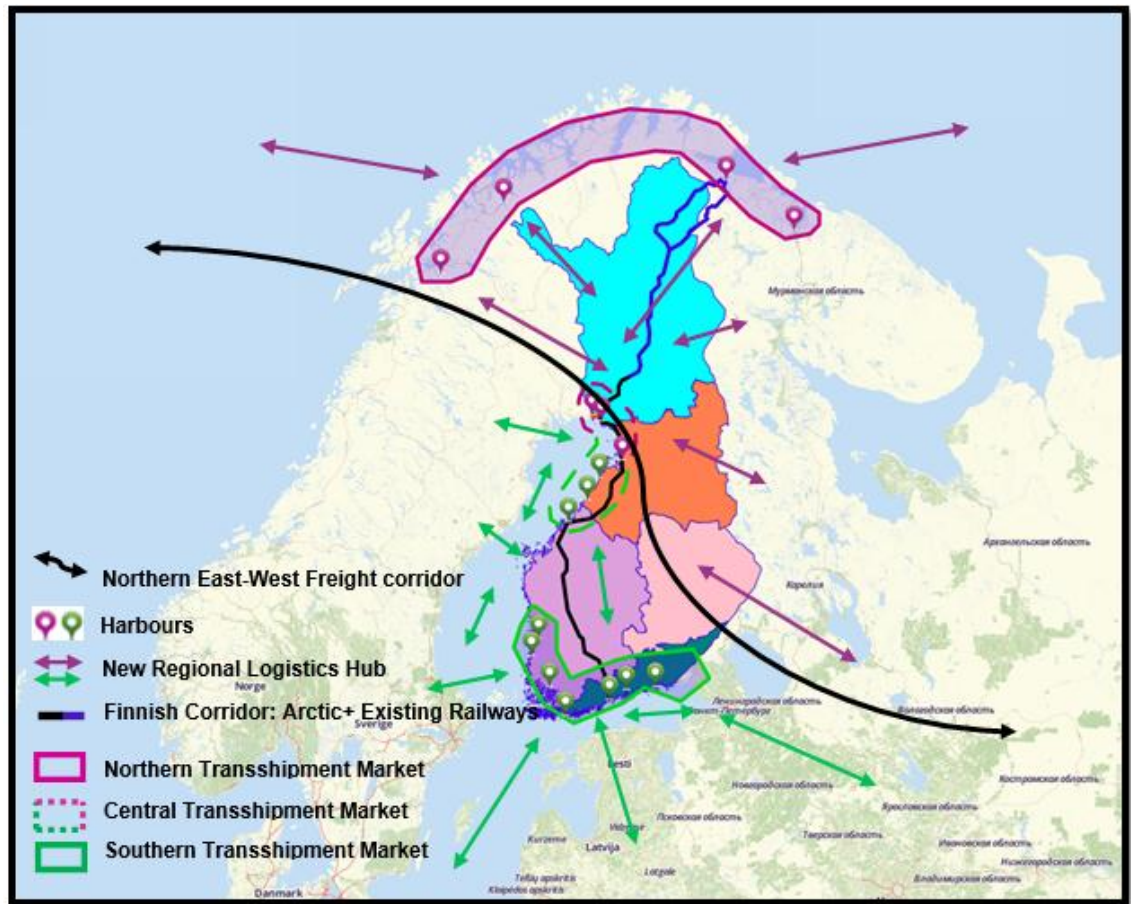


Figure 31. International Freight Corridors and Transshipment Markets in Finland and neighbouring countries, adapted and combined from (Finnish Port Association 2015), (Vectura 2012) and (Finnish Transport Agency 2013).

Arctic Corridor will also improve the supply chain of energy between Russia and Finland. Russia was still the first importing country to Finland in 2013 with 56,95 % of crude petroleum, 11,2 % of refined petroleum products and 9,3 % of natural gas. The railway will be connected to new cross-border check points between Finland and Russia. The emergence of a transnational railway network between the two countries will allow Finland to deploy its expertise in clean technologies, bio-economy and Arctic competencies in the energy sector in Russia.

7.4 Connector between Free-Market and State Capitalism

Economic ties with Brazil, Russia, China and India raise questions on trading strategy. The governments of the BRIC countries use state capitalism to embrace markets. By controlling state-owned companies these countries have a steady grip on national natural resources and specific industries. They also invest in sovereign wealth funds in strategic sectors to protect their own interests. Ian Bremmer states (2010: 5) that “the ultimate motive of state capitalism is not economic (maximizing growth) but political (maximizing the state’s power and the leadership’s chances of survival)”. China and Russia are considered as the leaders of state capitalism. Despite greater influences from free market economy India and Brazil have powerful state-owned companies that impact national strategies (Bremmer 2010: 4-124). Ian Bremmer also mentions (2010: 190) that “countries that use free market capitalism will need state capitalist governments to depend on their trade and investment”.

In response to the global financial crisis of 2008 developing countries have established strategies to reduce their dependence on Western economies. Governments of developing nations rethink their priorities and select trading partners carefully. World economy entered into a new phase called “guarded globalization”. Companies dealing with state capitalist countries must identify the strategic industries that influence the geopolitical dynamics of the nation. Added value is intended to serve the needs of governments, not of countries. Finland has four priority markets that use state capitalism for economic development. Finnish companies entering these markets need the financial and political support of Finland (Harvard Business Review 2014: 2-3). Team Finland network is an important platform to promote Finnish expertise in the BRICs countries. By enhancing the position of Finland on the global supply chain, Arctic Corridor will participate to the development of Finnish thematic priorities, listed by Team Finland, in state capitalist countries.

7.5 Regionalism: Key Factor for Global Development in Post-Financial Crisis

Despite their differences free market and state capitalism countries find a common ground in the exchange of strategic competencies. The future of Western countries will depend on their abilities to convince state capitalist governments to invest in their economy and set up agreements for trade activities. By identifying thematic industries and strategic markets Team Finland has set up a framework for economic cooperation with state capitalist countries.

Since 1947 international trade has been regulated by multilateral trade agreements and governed by the Agreement on Tariffs and Trade (GATT). Objectives of the treaty were to reduce tariff barriers between the members of the OECD. At the beginning of the 21st century trade and rules become more complex. Richard Baldwin (2011: 8) states that “when it comes to governance, the critical difference between 20th and 21st century is the Trade-Investment-service nexus”. As explained in chapter two international trade created new demands and shifted from local cluster-based industrial development to global interconnected supply chains. In terms of policy, countries are shifting from tariff barrier towards management of regulatory measures. Regional trade agreements are now more important than multilateral ones. As regional cross-border flows are more intricate, negotiating agreement in the GATT will be too onerous and slow (WTO 2013: 40-41). Ian Bremmer also argued that (2012: 3) “we have entered the G-Zero era” in contradiction with the G-7 and G-20 summits. The G-Zero era is “a world without leadership” (2012: 3). This phenomenon appeared with the rise of emerging nations such as Brazil, Russia, India and China. Their actions have different motivation than Western countries and rely on state capitalism.

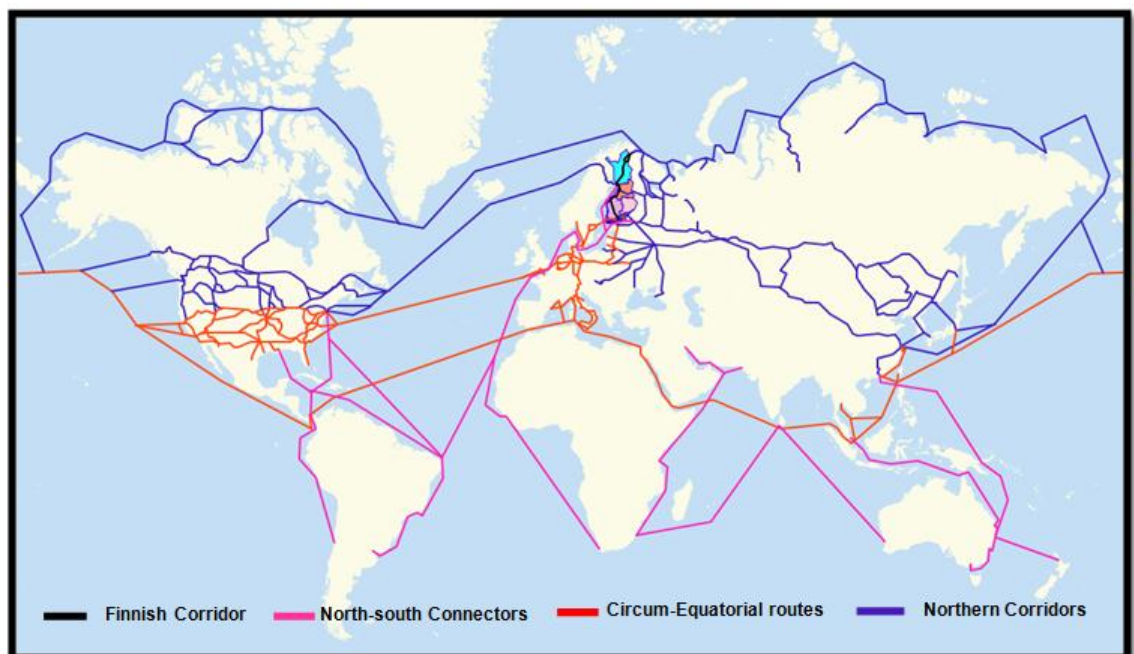


Figure 32. Future Finnish Railway and Global Connections, adapted and combined from (Arctic Corridor, 2014c), (Rodrigue, Comptois and Slack 2013), (Russian Railways 2014), (The Geography of Transport Systems 2015), (Futurum 2010), (ESCAP 2014), (NSR Information Office 2014), (Arctic Bridge 2014), (AMSA 2009) and (WSP 2007).

The leaders of the BRIC are focused on supplying jobs and higher standard of living to their population and refuse to take more responsibilities in international leadership. The financial crisis of 2008 reinforced state economic management to drive the growth of the BRIC (Bremmer 1 2012: 22-145). State capitalist countries are not anymore (2012: 55) “driven by alliance with superpower or by ambitions to join established power’s club” but have desires to make new rules in the global market place. Besides international political institutions many regional groups of countries have created free trade blocs. Regional trade agreements could define regional powers and institutions in Asia and Latin America in the future. Interaction between these regional champions will lay the foundation for a new global trading order.

The section between Rovaniemi and Kirkenes will create a new railway corridor from Helsinki to the Arctic Ocean. This new “Finnish Corridor” on a North-South axis will empower Finland to improve trade reactivity to changes in market trends and in the supply chain. By increasing the integration of Finland into new national, regional, European and global logistics hubs the “Finnish Corridor” could become the backbone of Finnish economic activities. The creation of a new regional logistics hub which stretches from the Gulf of Finland to the Arctic Ocean will able Finland to respond to global demand from specific markets, as can be seen in figure 32 on page 59.

8 Conclusion

The linkage of transshipment markets in Northern, Central and Southern Finland will create a sophisticated new regional logistics hub for global demand and put Finland at the heart of global transportation networks. As a result a new competitive economic area will emerge at the crossroad of the Baltic and Barents regions. The role of Arctic Corridor on the implementation of Finnish development strategies was examined and five competitive advantages were found as an answer to the main question.

As a guideline for the investigation the thesis has successfully answered four sub-questions. First, the paper pointed out two negative factors affecting the economy of Finland. First of all the incapacity of growing industries to compensate for the collapse of electronic sector explains the slow industrial diversification of the country. On the other hand, the high appreciation for the quality of services over good infrastructures account for the decrease in logistics reliability in Finland.

In a second phase the thesis showed the implication of transport infrastructure congestion as a threat to economic competitiveness in Finland and Europe. A new economic area in Finland has been identified from the interactions between Arctic Railway, new and existing global transport networks.

The third contribution of the research was the identification of strategic priorities in transport for Finland. Integrating new global supply chains, improving Trans-European Transport Network, developing regional transshipment markets and increasing territorial connectivity are the four key elements in terms of transportation strategy in Finland.

Finally the last sub-question listed industries that will support the Arctic Corridor. Mining industry in Northern Finland combined with the transport of Norwegian Liquefied Natural Gas (LNG) to European markets will support the Arctic Corridor viability. Forest, fishing and tourism industries will contribute to a lesser extent to the development of the new route.

Based on findings in preceding chapters and analysis derived from the sub-questions the author concluded that the Arctic Corridor will support the implementation of the development strategy of Finland in five ways.

First of all by reducing regional disparities and increasing the autonomy of regions in the national economy. Secondly the combination of traditional and new international transport corridors will optimize the connections between Finnish companies and strategic markets. Moreover the Arctic Corridor will also facilitate the integration of strategic industries into new value and supply chains. Fourthly as an area of convergence between free-market and state capitalist countries the project will also reinforce the role of Finland as an Eurasian specialist. Finally by enabling the creation of a new regional logistic hub the Arctic Corridor will be a key element for global development of Finland in a post-financial crisis era. Since countries are shifting from tariff barrier towards management of regulatory measures the world tends to be divided into trade blocks which favour the rise of regionalism in global trade.

The interconnectivity of the Arctic Corridor with domestic, regional and international freight routes on both North-South and East-West axes will decrease the level of dependence of Finland from the circum-equatorial axis in the transportation of freight.

Derived from the findings developed in chapter seven, the thesis introduces a discussion for further research on upcoming changes in global transportation for freight. The decentralization of global freight transport from the circum-equatorial axis is a result of the development of new intercontinental and transcontinental corridors. Greater interconnectivity of regional and transnational intermodal transshipment areas with these new routes increases routing options and transport reliability. The rise of regional logistics hubs in global trade could be a response to the increase of regional trade agreements that emerge from the guarded globalization era.

References

Arctic Bridge, 2014. *Trade Corridor*. [online] Available at: <<http://arcticbridge.com/>> [Accessed 27 August 2014].

Arctic Corridor, 2014. *Arctic Corridor*. [online] Available at: <<http://www.arcticcorridor.fi/arctic-corridor-2/>> [Accessed 19 August 2014].

Arctic Corridor, 2014a. *Growth Through Arctic Resources*. [online] Available at: <<http://www.arcticcorridor.fi/assets/Esitteit/JKYLEISESITEENGSCR2-2.pdf>> [Accessed 19 August 2014].

Arctic Corridor, 2014b. *Arctic Railway Rovaniemi-Kirkenes*. [online] Available at: <<http://www.arcticcorridor.fi/assets/Esitteit/JKRautatieSCR9ENG.pdf>> [Accessed 19 August 2014].

Arctic Corridor, 2014c. *Arctic Corridor*. [online] Available at: <<http://www.arcticcorridor.fi/>> [Accessed 19 August 2014].

Arctic Council, 2014. *About the Arctic Council*. [online] Available at: <<http://www.arctic-council.org/index.php/en/>> [Accessed 16 September 2014].

Arctic Centre, 2013. *Arctic Calls*. [pdf] Available at: <<http://www.arcticcentre.org/EN/SCIENCE-COMMUNICATIONS/Arctic-region/Maps/Barents>> [Accessed 19 September 2014].

Bank of Finland, 2014. *Economic Outlook*. [pdf] Helsinki: Edina Prima Oy. Available at: <http://www.suomenpankki.fi/en/julkaisut/bulletin/economic_outlook/Documents/B314.pdf> [Accessed 30 July 2014].

Barents Observer, 2015. *Discussed Arctic cooperation without mentioning Russia*. [online] Available at: <<http://barentsobserver.com/en/politics/2015/01/discussed-arctic-cooperation-without-mentioning-russia-20-01>> [Accessed 17 February 2015].

Barents Observer, 2015a. *Planning container line between Murmansk and Petropavlovsk-Kamchatsky*. [online] Available at: <<http://barentsobserver.com/en/arctic/2015/02/planning-container-line-between-murmansk-and-petropavlovsk-kamchatsky-26-02>> [Accessed 03 March 2015].

Barents Observer, 2015b. *Nordic train moves towards Arctic coast*. [online] Available at: <<http://barentsobserver.com/en/arctic/2015/02/nordic-train-moves-towards-arctic-coast-19-02>> [Accessed 03 March 2015].

Beac, 2014. *Finnish Chairmanship of the Barents Euro-Arctic Council 2103-2015*. [Online] Available at: <http://www.kopijyva.fi/ejulkaisut/ulkoasiainministerio/UM_BEAC/> [Accessed 18 September 2014].

Beac, 2014a. *Barents Euro-Arctic Council Home Page*. [pdf] Available at: <<http://www.beac.st/in-English/Barents-Euro-Arctic-Council/Barents-Regional-Council>> [Accessed 18 September 2014].

Beac, 2014b. *The Barents Programme 2014-2018*. [pdf] Available at: <http://www.barentsinfo.fi/beac/docs/Barents_Programme_2014_2018_adopted_2_June_2013.pdf> [Accessed 18 September 2014].

Bremmer, I., 2010. *The End of the Free Market: Who Wins the War Between States and Corporations?*. New York: Penguin Group.

Bremmer, I., 2012. *Every Nation for Itself: Winners and Losers in a G-Zero World*. New York: Penguin Group.

Centre Port Canada, 2014. *About Centre Port Canada*. [online] Available at: <<http://www.centreportcanada.ca/>> [Accessed 27 August 2014].

Commission of the European Communities, 2013. *European Union Strategy for the Baltic Sea Region*. [pdf] Available at: <<http://www.cbss.org/wp-content/uploads/2012/12/Action-Plan-2013.pdf>> [Accessed 18 September 2014].

Cryopolitics, 2014. *Interview with Arctic Corridor Spokesman Timo Lohi*. [online] Available at: <<http://cryopolitics.com/2014/03/27/interview-with-arctic-corridor-spokesman-timo-lohi/>> [Accessed 20 August 2014].

DPTL, 2014. *Regional Transport Network*. [online] Available at: <<http://www.ndptl.org/ndptl-regional-transport-network>> [Accessed 19 September 2014].

ESCAP, 2014. *Trans-Railway Network Map*. [online] Available at: <<http://www.unescap.org/our-work/transport/trans-asian-railway>> [Accessed 16 December 2014].

Europa, 2001. *White Paper: European transport policy for 2010*. [pdf] Available at: <http://ec.europa.eu/transport/themes/strategies/doc/2001_white_paper/lb_texte_complet_en.pdf> [Accessed 17 September 2014].

Europa, 2005. *Network for Peace and Development*. [pdf] Available at: <http://ec.europa.eu/ten/transport/external_dimension/doc/2005_12_07_ten_t_final_report_en.pdf> [Accessed 19 September 2014].

Europa, 2007. *The Northern Transport Axis*. [pdf] Available at: <http://www.nordim.fi/ten-naxis/ten_naxis_final_report.pdf> [Accessed 19 September 2014].

Europa, 2011. *White Paper on Transport: Roadmap to a single European Transport Area*. [pdf] Available at: <http://ec.europa.eu/transport/themes/strategies/doc/2011_white_paper/white-paper-illustrated-brochure_en.pdf> [Accessed 20 November 2014].

Europa, 2012. *Developing a European Union Policy towards the Arctic Region: progress since 2008 and next steps*. [pdf] Available at: <http://eeas.europa.eu/arctic_region/docs/join_2012_19.pdf> [Accessed 16 September 2014].

Europa, 2013. *Interconnected Economies: Benefiting from global value chains*. [pdf]

Available at:

<http://s3platform.jrc.ec.europa.eu/documents/10157/46174/Interconnected_economies.pdf> [Accessed 31 July 2014].

Europa, 2014. *Infrastructure - TEN-T - Connecting Europe*. [online] Available at:

<http://ec.europa.eu/transport/themes/infrastructure/ten-t-guidelines/corridors/index_en.htm> [Accessed 18 September 2014].

Europa, 2014a. *Finland*. [pdf] Available at:

<<http://ec.europa.eu/transport/themes/infrastructure/ten-t-guidelines/doc/ten-t-country-fiches/merged-files/fi.pdf>> [Accessed 18 September 2014].

Europa, 2014b. *TEN-T Network Corridor*. [pdf] Available at:

<<http://ec.europa.eu/transport/themes/infrastructure/doc/ten-t-country-fiches/ten-t-corridor-map-2013.pdf>> [Accessed 19 September 2014].

Europa, 2014c. *Northern Dimension*. [online] Available at:

<http://eeas.europa.eu/north_dim/index_en.htm> [Accessed 16 September 2014].

Europa, 2014d. *Mobility and Transport*. [online] Available at:

<http://ec.europa.eu/transport/modes/maritime/motorways_sea/index_en.htm> [Accessed 19 September 2014].

Europa, 2014e. *European Economic Forecast Autumn 2014*. [pdf] Available at:

<http://ec.europa.eu/economy_finance/publications/european_economy/2014/pdf/ee7_en.pdf> [Accessed 19 November 2014].

Finnish Customs, 2013. *Finnish foreign trade 2013 Figures and diagrams*. [pdf]

Available at:

<<http://www.tulli.fi/en/releases/ulkomaankauppatilastot/tiedotteet/kuluvavuosi/summary07022014/liitteet/figurs13.pdf>> [Accessed 30 July 2014].

Finnish Customs, 2013a. *Customs Information*. [pdf] Available at:

<http://www.tulli.fi/en/releases/ulkomaankauppatilastot/tiedotteet/kuluvavuosi/summary07022014/liitteet/Tullitiedottaa_EN.pdf> [Accessed 30 July 2014].

Finnish Port Association, 2015. *Member Ports*. [online] Available at: <http://www.finnports.com/eng/member_ports/> [Accessed 30 July 2014].

Finnish transport agency, 2013. *The Transport Needs of the Mining Industry*. [pdf] Available at: <http://www.google.fi/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0CCAQFjAA&url=http%3A%2F%2Fwww2.liikennevirasto.fi%2Fjulkaisut%2Fpdf%2FIs_2013-02_transport_needs_web.pdf&ei=sLtxVcXelsqhsAGZjYC4CA&usg=AFQjCNGjfbwHx4Td2-8o5kdjJum3CxZNeg&bvm=bv.95039771,d.bGg> [Accessed 19 September 2014].

Foreign Trade Zone, 2014. *Foreign Trade Zone-Free Trade Zone Winnipeg*. [online] Available at <<http://foreigntradezone.ca/>> [Accessed 27 August 2014].

Futurum, 2010. *New Corridor*. [online] Available at: <<http://www.futurum.no/publikasjoner/oest-vesttransport-paa-jernbane-via-narvik.aspx>> [Accessed 27 August 2014].

Geological Survey of Finland, 2012. *Mineral deposits and metallogeny of Fennoscandia*. [pdf] Available at: <<http://arkisto.gtk.fi/sp/sp53/sp53.pdf>> [Accessed 30 August 2014].

Government of Canada, 2012. *Canada's Northern Strategy*. [online] Available at <<http://www.northernstrategy.gc.ca/index-eng.asp>> [Accessed 27 August 2014].

Harvard Business Review, 2014. *The New Rules of Globalization*. [pdf] Available at: <<http://www.homeworkmarket.com/sites/default/files/q4/02/06/week20120article.pdf>> [Accessed 30 August 2014].

HELCOM, 2013. *Baltic Sea Catchment Area*. [online] Available at: <<http://maps.helcom.fi/website/mapservice/index.html>> [Accessed 19 January 2014].

Invest Finland, 2010. *Mining News*. [online] Available at: <<http://www.investinfinland.fi/articles/news/mining/finland-publishes-new-minerals-strategy/49-539>> [Accessed 19 September 2014].

Invest Finland, 2014., *Facts of Finland*. [online] Available at: <<http://portfolio-web.ess.fi/www/ContactFinland/2014/#/1/>> [Accessed 27 August 2014].

Ministry for Foreign Affairs of Finland, 2014. *The Northern Dimension*. [online] Available at:
<<http://formin.finland.fi/public/default.aspx?nodeid=15579&contentlan=2&culture=en-US> > [Accessed 16 September 2014].

Ministry of Employment , 2014. *Making Finland a Leader in the Sustainable Extractive Industry- Action Plan*. [pdf] Available at:
<https://www.tem.fi/files/37130/TEMjul_22_2013_web_04072013.pdf> [Accessed 17 February 2015].

Ministry of Employment and the Economy, 2010. *Finland's Regional Development Strategy 2020*. [pdf] Available at:
<http://www.tem.fi/files/27807/TEM_53_2010_netti.pdf> [Accessed 27 August 2014].

Ministry of Employment and the Economy, 2010a. *Finland's Mineral Strategy*. [pdf] Available at
<http://projects.gtk.fi/export/sites/projects/minerals_strategy/documents/FinlandsMineralsStrategy_2.pdf> [Accessed 19 September 2014].

Ministry of Finance, 2014. *Economic Bulletin*. [online] Available at:
<<http://verkkojulkaisut.vm.fi/zine/37/article-4528>> [Accessed 30 July 2014].

Ministry of Transport and Communications, 2012. *Finnish State of Logistics*. [pdf] Available at:
<http://www.lvm.fi/c/document_library/get_file?folderId=1986562&name=DLFE-18617.pdf&title=Julkaisu%2025-2012> [Accessed 21 August 2014].

NDPHS Data Base, 2005. *The Northern Dimension*. [pdf] Available at:
<<http://www.ndphs.org/?database,view,paper,24>> [Accessed 17 February 2015].

Northern Sea Route Information Office, 2014. *Arctic Ports*. [online] Available at:
<<http://www.arctic-lio.com/arcticports>> [Accessed 27 August 2014].

OECD, 2009. *Global Value Chain (GVCs): Finland*. [pdf] Available at: <<http://www.oecd.org/sti/ind/GVCs%20-%20FINLAND.pdf>> [Accessed 29 September 2014].

OECD, 2013. *Implications of Global Value Chains For Trade, Investment, Development and Jobs*. [pdf] Available at: <<http://www.oecd.org/sti/ind/G20-Global-Value-Chains-2013.pdf>> [Accessed 31 July 2014].

OECD, 2014. *Economic Surveys Finland*. [pdf] Available at: <http://www.oecd.org/eco/surveys/Overview_Finland_2014.pdf> [Accessed 30 July 2014].

OECD, 2014a. *Glossary of Statistical Terms*. [online] Available at: <<http://stats.oecd.org/glossary/search.asp>> [Accessed 20 November 2014].

Orient Overseas Container Line, 2014. *Our Services, Service Routes*. [online] Available at: <<http://www.oocl.com/eng/ourservices/serviceroutes/tpt/Pages/default.aspx>> [Accessed 21 August 2014].

Orient Overseas Container Line, 2014. *Our Services, Service Routes*. [online] Available at: <<http://www.oocl.com/eng/ourservices/serviceroutes/aet/Pages/default.aspx>> [Accessed 21 August 2014].

Orient Overseas Container Line, 2014. *Our Services, Service Routes*. [online] Available at: <<http://www.oocl.com/eng/ourservices/serviceroutes/tat/Pages/default.aspx>> [Accessed 21 August 2014].

PAME, 2009. *Arctic Marine Shipping Assessment*. [online] Available at: <<http://pame.is/index.php/projects/arctic-marine-shipping/amsa/amsa-2009-report>> [Accessed 27 November 2014].

Parliament of Canada, 2006. *Canadian Arctic Sovereignty*. [online] Available at <<http://www.parl.gc.ca/Content/LOP/ResearchPublications/prb0561-e.htm>> [Accessed 27 August 2014].

Prime Minister's Office Publications, 2009. *Challenges of the Baltic Sea and on Baltic Sea Policy*. [pdf] Available at: <<http://vnk.fi/julkaisukansio/2009/j23-itameri-selonteko-24-ostersjon-redogorelse-25-challenges/pdf/en.pdf>> [Accessed 18 September 2014].

Prime Minister's Office Publications, 2013. *Finland's Strategy for the Arctic Region 2013*. [pdf] Available at: <<http://vnk.fi/julkaisukansio/2013/j-14-arFktingen-15-arktiska-16-arctic-17-saame/PDF/en.pdf>> [Accessed 16 September 2014].

Prime Minister's Office Publications, 2015. *Growth from the North*. [online] Available at: <<http://site.uit.no/growthfromthenorth/files/2015/01/Growth-from-the-North-lowres-EN.pdf>> [Accessed 17 February 2015].

Rodrigue, J.P., Comptois, C. and Slack, B., 2013. *The Geography of Transport Systems*. New York: Routledge.

Russian Railways, 2014. *Trans-Siberian Railway*. [online] Available at: <http://eng.rzd.ru/statice/public/en?STRUCTURE_ID=87> [Accessed 21 August 2014].

Sage Journal, 2003. *Field Methods*. [pdf] Sage Publication. Available at: <<http://fm.sagepub.com/content/15/1/85.abstract>> [Accessed 05 August 2014].

Team Finland, 2014. *Team Finland: Strategy Update 2015*. [pdf] Prime Minister's Office Publications. Available at: <<http://vnk.fi/julkaisukansio/2014/j05-tf-strategia2015-06-tf-strategi-07-tf-strategy/pdf/en.pdf>> [Accessed 30 July 2014].

The Geography of Transport Systems, 2014. *Home*. [online] Available at: <<https://people.hofstra.edu/geotrans/index.html>> [Accessed 21 August 2014].

The World Bank, 2014. *Logistics Performance Index*. [online] Available at: <<http://lpi.worldbank.org/international/scorecard/radar/254/C/FIN/2014/C/FIN/2012/C/FIN/2010/C/FIN/2007#chartarea>> [Accessed 27 Aug. 2014].

The World Bank, 2014a. *Connecting to Compete: Trade Logistics in the Global Economy*. [pdf] Available at:
<<http://www.worldbank.org/content/dam/Worldbank/document/Trade/LPI2014.pdf>>
[Accessed 17 February 2015].

Valtioneuvosto, 2014. *Government to initiate special measures following bankruptcy of Talvivaara Sotkamo Ltd.* [online] Available at: <http://valtioneuvosto.fi/en/article/-/asset_publisher/valtio-kaynnistaa-erikoistoimet-talvivaara-sotkamo-oy-n-konkurssin-seurauksena?_101_INSTANCE_3qmUeJgIxZEK_redirect=%2Fen%2Fminister-of-economic-affairs> [Accessed 17 February 2015].

Winnipeg Inland Port, 2014. *CentrePort Canada Initiative*. [online] Available at:
<<http://www.winnipeginlandport.ca/>> [Accessed 27 August 2014].

Vectura, 2012. *Bothnian Green Logistic Corridor Report Task 3:1 Deliverable 1*. [online] Available at: <<http://www.bothniangreen.se/reports/>> [Accessed 27 Oct. 2014].

World Economic Forum, 2014. *Global Competitiveness Report 2014-2015 Index*. [online] Available at: <<http://reports.weforum.org/global-competitiveness-report-2014-2015/economies/#indexId=GCI&economy=FIN>> [Accessed 27 Oct. 2014].

WSP, 2007. *The Northern Transport Axis*. [pdf] Available at:
<<http://www.ndptl.org/northern-axis> > [Accessed 10 February 2015].

WTO, 2011. *21st Century Regionalism: Filing the gap between 21st century trade and 20th century trade rules*. [pdf] Geneva: Graduate Institute. Available at:
<http://www.wto.org/english/res_e/reser_e/ersd201108_e.pdf> [Accessed 10 August 2014].

WTO, 2013. *Global Value Chains In a Changing World*. [pdf] Geneva: WTO Publications. Available at:
<http://www.wto.org/english/res_e/booksp_e/aid4tradeglobalvalue13_e.pdf> [Accessed 05 August 2014].

Action Plans and themes of the Finnish development strategies

Action plans and themes for the Team Finland Strategy.

International Strategy	
Action Plans	Themes
Focusing effort on Brazil, Russia, India, China and USA markets	Economic development
Locating added value on the global value chain	Economic development
Promoting key industries	Economic development
Integrating key industries in the global value chain	Economic development

Action plans and themes for the Regional Strategy of Finland.

Regional Strategy	
Action Plans	Themes
Rebalancing regional disparity	Regional autonomy
Integrating energy, natural resources and urban hubs in the regional policy	Regional autonomy
Increasing the role of municipalities in regional economy	Decision-making and Economic development
Increasing the role of regions in national economy	Decision-making
Delegating the development of Barents region to Eastern and Northern regions	Regional autonomy
Delegating the development of Baltic region to Southern and Western regions	Regional autonomy
Strengthening cooperation between central government, regional council and metropolitan area.	Management of institutions and Decision-making

Action plans and themes for the Baltic Strategy of Finland.

Baltic Strategy	
Action Plans	Themes
Increasing cooperation between countries surrounding the Baltic Sea	Management of institutions and Decision-making
Developing communication routes oriented North South	Regional transportation
Fostering clean and smart transport development	Regional transports and Protection of the environment
Connecting the Baltic regions together	Regional transportation
Connecting the Baltic Region to the global supply chain	International transportation
Developing the Baltic Region as one market	Management of institutions, Decision-making and Economic development
Improving the connectivity of the Baltic Region to the TEN-T network	European transportation
Connecting the Baltic Region to the Barents Region	Domestic transportation

Action plans and themes for the Barents Strategy of Finland.

Barents Strategy	
Action Plans	Themes
Promoting Clean and smart technologies	Protection of the environment
Developing natural resources and tourism	Economic development and Domestic transportation
Reinforcing regional agreements	Management of institutions and Decision-making
Fostering the growth of the Northern Sea Routes	Economic development
Connecting the Barents Region to the global supply chain	International transportation
Supporting ingenious people's initiatives	Protection of the environment
Creating new East-West Transport connectors	Regional transportation
Integrating the Barents transport network to the TEN-T network	European transportation
Fostering innovation and industrial initiative	Economic development

Action plans and themes for the Northern Dimension Strategy.

Northern Dimension Strategy	
Action Plans	Themes
Stimulating durable development in the regions of the Baltic Sea, the Barents, the Arctic and North West Russia	Protection of the environment
Designing joint policy in the Northern Regions in term of environment, public health, transport and culture	Management of institutions and Decision-making
Integrating the transport network of Northern regions to their neighbouring and central markets in Europe but also to the global supply chain.	Regional, European and International transportation
Linking urban centres of the Northern countries together but also to their remote areas and their natural resources	Regional transportation and Economic development
Developing and connecting the Motorway of the Baltic Sea and the Northern Axis to the TEN-T network	European Connectivity
Supporting ingenious people's initiatives	Protection of the environment

Action plans and themes for the Transport Routes of Finland.

The Transport needs for the mining strategy	
Action Plans	Themes
Supporting the development of mineral industry	Economic development
Connecting mines together	Domestic transportation
Developing the Bothnian and the Northern Corridors	Regional transportation
Supporting other growing industries such as forestry, gas, oil, and fish.	Economic development
Creating new cross-border points with Norway, Sweden and the North West of Russia.	Regional transportation
Developing a transport network to serve the Finnish, European and Non-EU markets.	International transportation
Developing transport routes towards the Bothnian Bay and its 6 harbours as well as the 5 harbours of Narvik, Skibotn, and Kirkenes in Norway and Murmansk in Russia.	Regional transportation

Action plans and themes for the Arctic Strategy of Finland.

Arctic Strategy	
Action Plans	Themes
Promoting durable development	Protection of the environment
Protecting the environment in the Arctic	Protection of the environment
Fostering economic opportunities	Economic development
Promoting Lapland as a research and testing ground for Arctic technologies.	Economic development
Becoming a leader in design competencies in energy, arctic maritime, arctic shipping, renewable natural resources, mining, clean technology, tourism and digital industries	Economic development
Using the Northern Dimension Partnership on Transport and Logistics as leverage to plan transport development in the Arctic.	Regional, European and International transportation
Developing new transport infrastructure	Regional, European and International transportation
Developing joint project and regional cooperation	Management of institutions and Decision-making
Supporting ingenious people's initiatives	Protection of the environment
Cooperating with the Arctic Council countries members	Management of institutions and Decision-making
Expanding traffic in the Arctic Ocean in both the North East and the North West Passage	International transportation

**Thematic priorities for Finnish companies: Assessment carried out by
Finpro and Tekes and Team Finland network**

Themes	Examples
Cleantech	<ul style="list-style-type: none"> • Energy and material efficiency • Renewable energy • Intelligent systems and services in urban environments • Industrial water treatment and purification • Sustainable mineral extraction industry • Intelligent energy systems, green ICT • Waste management and waste-to-energy • Air quality
Bio economy	<ul style="list-style-type: none"> • Chemical forest industry • Mechanical forest industry and wood construction • Bio refining, including bioenergy, biomaterials, biochemical and biofuels • Bio economy equipment • Bio economy services, including ecosystem services
ICT and digitalisation	<ul style="list-style-type: none"> • Games and gamification • Cyber security • Mobile/Wireless solutions and enabling technologies • Online trading • The Internet of Things
Life sciences, health care and foods	<ul style="list-style-type: none"> • Medical technology • Health care and care service concepts • Healthy food, functional food, high quality foods and raw materials • Food technology and food safety
Arctic competence	<ul style="list-style-type: none"> • Marine industry and logistics • Building, infrastructure and ICT • Energy and environmental technology • Mining and minerals
Creative industries and design	<ul style="list-style-type: none"> • Industrial design • Audio-visual production • Creative digital concepts • Design brands and fashion • Architecture
Education and learning	<ul style="list-style-type: none"> • Digital learning solutions, serious games • Vocational education • Teacher training • Consultation related to educational systems

Transport Infrastructures connected to the Arctic Railway by geographical location.

Connections of the Arctic Railway	
Geographical Area	Transport Infrastructures
South-East Finland	<ul style="list-style-type: none"> • National transport network
Baltic	<ul style="list-style-type: none"> • Motorway of the Baltic Sea • North East West Freight Corridor • Trans-Siberian Corridor • TEN-T
Barents	<ul style="list-style-type: none"> • Northern Axis • North East West Freight Corridor
Arctic	<ul style="list-style-type: none"> • Northern Sea Route • Arctic Bridge
Russia	<ul style="list-style-type: none"> • Northern Sea Route • Trans-Siberian Corridor • North East West Freight Corridor • Arctic Bridge • Northern Axis
Europe	<ul style="list-style-type: none"> • Motorway of the Baltic Sea • Northern Axis • TEN-T network
Asia	<ul style="list-style-type: none"> • Northern Sea Route • Trans-Siberian Corridor • North East West Corridor
North-America	<ul style="list-style-type: none"> • Arctic Bridge • North East West Freight Corridor