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Transport connections between the EU and Russia

Current status and outlook for the future

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Transport connections between the EU and Russia, current status and outlook for the future

Abstract

This study examines the development of trade between the EU and Russia as well as between the EU and Asia, main transport connections and their development outlook, current and future transport volumes and the position of Finland. Transport volumes are affected by the growth of trade between the EU and Russia, which depends on the political development and economic growth of these areas as well as the development of other economic areas in the world. The position of the route through Finland is strengthened by, for example, the growth of trade in valuable goods and increase of unit load transport. These types of goods demand good level of logistics services and they are not sensitive to cost differences between routes. In the long run, the possible WTO-membership of Russia and the strong growth of Russian trade can maintain the significant position of Russian transit traffic volumes. In addition to Finland, primarily the Baltic countries also compete on these volumes. The important factors of competition in Finland in the future will include the level of logistics and infrastructure, value added services and environmental aspects. The Germany–Poland-route has a great potential as a direct ground transport connection between Russia and the central areas of the EU. Investments on the infrastructure of the route will promote its competitiveness. Belorussia will remain the bottleneck of the route also in the long run.

The subject of study in freight transport between the EU and Asia was the Trans-Siberian railway, which has a connection to routes between the EU and Russia. The considerable growth of population, economy and production in Asia during the next 20 years will promote trade between the EU and Asia. The share of valuable unitized cargo will grow which will increase the demand for rapid container transport. In Europe, the capacity and operability of the Trans-Siberian railway is at its best on the rail section north of Moscow. Thus, the route through Finland has good possibilities of acting as the logistics centre of the extension of this railway.

Keywords

international transport, transit traffic, logistics, traffic policy, economic prospects

Miscellaneous

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FOREWORD

After the enlargement of the EU, most of the Pan-European Transport Corridors remained inside the enlarged European Union and they will be developed as part of the TEN-network in the future. Therefore, the European Commission has started the re-appraisal of transport connections to the Third countries ("Wider Europe for Transport"). This study is partly linked to this re-appraisal and transport connections between the EU and Russia are examined from the Finnish viewpoint. The work also serves the ongoing national development programme of logistics.

This study was conducted by a consultant group. The coordinator was WSP LT Consultants Ltd. The experts of WSP LT Consultants Ltd. were Licentiate of Technology Kari Lautso, M.Sc.(Economics) Pirjo Venäläinen and Analyst Hannu Lehto. The experts of subconsultants were Doctor of Technology Wladimir Segercrantz of ANSERI - Consultants Ltd., Licentiate of Political Sciences Kari Hietala of Kari Hietala Ltd., M.Sc.(Tech.) Erkki Jaakkola of Matrex Ltd. and M.Sc.(Tech.) Martti Miettinen of Transys Ltd.

I wish to thank all persons who have contributed to and provided comments for this study!

Helsinki, January 14, 2005

Juha Parantainen
Senior Engineer

SUMMARY

Due to globalisation, production will move to the growing economic areas of Asia. The simultaneous growth of population and production in the area will create an economic agglomeration in Asia, which will surpass the growth of the economic areas in Europe and the United States. The economies of India and China will grow by a factor of 10 during the next 30 years. This phenomenon will have a dramatic impact on the freight flows of world trade. Also, the Russian economy will grow significantly. However, this growth is mitigated by declining population development.

Trade and economic dependency between the EU and Russia will grow and these areas will constitute a nearly integrated economic area. Russia should be clearly more self-sufficient regarding the production of consumer and investment products. The CIS will be the only area in the northern hemisphere in the future, which will have a significant amount of raw materials also for export. A significant share of export from Russia to the EU consists of energy products. The share of energy will not, however, increase much in the trade between the EU and Russia.

The above mentioned development is reflected in freight transport as follows:

- Export of the EU 25 (excluding energy products) to rapidly developing economic areas (the CIS, China, India, the DAE-countries) and Russia will triple by the year 2030.
- Import to the EU 25 (excluding energy products) from rapidly developing economic areas (the CIS, China, India, the DAE-countries) will grow by a factor of 2–3 by the year 2030. Import from Russia will triple.
- Import to Finland from Russia and export to Russia will approximately triple by the year 2030.

The more rapid development of Russia than expected would reduce the transport volumes in foreign trade, as the self-sufficiency of Russia grows. Also, slower development than expected would reduce transport volumes as a result of decreasing demand for export and import products.

The planning of Russian transport policy has become more efficient in recent years. Protectionism, which is included in the objectives of the transport policy, will cause conflicts with the EU-countries. Stricter EU-regulations will cause problems to Russia and Russian transport companies. However, the anticipated WTO-membership of Russia will probably solve the conflicts in the Russian tariff policy especially regarding railway and air transport.

Taking the above mentioned background into consideration, the position and development of freight transport routes can be described as follows:

- Main freight transport volumes between Europe and Asia will still remain in sea transport, but the significance of air transport and the Trans-Siberian railway will be emphasised.

- Russia will direct large investments to the development of its main transport corridors. These include Corridors 1, 2, 9A and the Northern Arctic route as well as the ports, which serve them in the Baltic Sea and the Barents Sea.
- Increase of the port capacity in Russia is slower than the growth in the demand for capacity. Transit traffic through the ports of other countries will be necessary also in the future.
- The Berlin–Moscow-connection will develop slowly due to barriers of through-transport in Belorussia. Infrastructure investments and the improvement of logistics services will increase transport volumes on the route and shift transport volumes from competing routes. The impacts of the improved level of service in this connection on the route through Finland will be small.
- The favourable location of the Baltic ports, efficient operations and good ground transport connections will maintain the significance of these ports for the freight transport of Russian foreign trade in the future.
- The Trans-Siberian railway has limited capacity and the growth of Russian domestic transport may use the available supply of capacity. Transport between the EU and the Far East must be mainly directed through traditional sea transport connections.
- The Northern Arctic route will not probably be significant in the early part of this century, but it may have great significance at the end of this century.

The following factors mainly affect the position of the route through the Finnish ports both in freight transport between the EU and Russia and between the EU and Asia:

- Increasing shares of unit loads and intermodality in transport as well as a growing demand in the level of service (speed, security, reliability, valued-added logistics, line services) are all sectors in which the route through Finland is competitive. Also, the transport costs of valuable goods are competitive on the route through Finland.
- The competitiveness of the route through Finland is affected by:
    - The development of logistics in the Baltic countries and Russia
    - Russia's policy for favouring domestic ports
    - Port projects in other countries and
    - The development of ground transport connections in Russia and continental Europe.
- Transit traffic volumes of Russia will not necessarily grow in Finland, but by providing value added logistics services, the economic significance of transit traffic will increase despite slower growth of volumes.
- The competitiveness of the route through Finland is ideal for the transport of valuable goods when compared to other routes, since both transport times and costs are equal or more favourable than via competing routes.

The position of the route through Finnish ports can be strengthened by developing value added logistics services as well as relations to authorities and private operators of logistics chains in Europe, Russia and Asia. Initiating and supporting development projects in Finland, Russia and Asia will also be beneficial for the EU and Finland for eliminating the bottlenecks in the infrastructure on the route through Finland. Price competitiveness should also be maintained by appropriate tariff and fee policy.

TABLE OF CONTENTS

1 INTRODUCTION

The following factors have the greatest impact on the development of international freight transport as well as transport between the EU and Russia:

- Globalisation development of trade and production
- Rapid growth of the new economies in Asia
- Economic growth of, political development and trade relations of the EU and Russia
- Structural changes in trade and growing transport of unitized cargo

The amount, structure and direction of international transport are directly dependent on the economic development of different countries and the supply of transport infrastructure. Globalisation development and the rapid growth of new economies, such as China and India, will dramatically change the direction of trade flows in the world in forthcoming decades. Despite long distances, the share of the Asian economies in trade with both the EU and Russia will grow.

The economic development of Russia and other eastern European countries, the enlargement of the European Union, development of commercial relations between Russia and the EU and the probable membership of Russia in the WTO are main examples of changes in the operating environment. This development will promote trade between the EU and Russia, and thus also lead to growth in transport volumes.

Cost and service level will, in turn, affect the route choice of freight transport: speed of transport modes and the level of infrastructure, supply of logistics services, frequency of transport connections, safety as well as the functionality of border crossing operations and other public authority activities. Demands for level of service on different routes vary between types of goods. As the demand for logistics services increases, the performance of international transport routes will be emphasised. Exports to Russia, which mainly consist of raw materials and energy, operate quite well at the moment, but import consisting of unitized cargo has problems.

The development of the EU's internal main transport network and the EU's external connections have been invested in the past decade for promoting transport operations in Europe. The most important transport connections between Central Europe and Russia are still directed through the Gulf of Finland and the Baltic countries. After the enlargement of the EU in May 2004, the most significant external connections of the EU are being identified again.

The objective of this work is to examine the eastbound traffic and transport connections of the EU in the changing economic, political and logistics environment, and the position of Finland in this development. More detailed goals include:

1. Evaluate the most significant changes in the operating environment and economy which will affect international freight transport
2. Examine the current status and development views of the most important freight transport connections between the EU and Russia as well as the EU and the Far East and
3. Evaluate the position of Finland as a transport route between the EU and Russia.

In obtaining an overall view and support for conclusions, this report examines the future development of the agglomerations of world economy and related trade and cargo flows. From this point of view, the development of the economies of the EU and Russia, as well as trade and cargo flows between them, have been evaluated in more detail. The transport policy of the EU and Russia has will have an impact, for example, on the future supply of infrastructure and the level of service of transport routes, which again will affect the route choice of freight transport. Also, the impacts of the development trends in logistics on route choice have been analysed. The current status and development views of the most important transport routes between the EU and Russia have also been described in the report for evaluating the competitiveness of alternative transport routes.

Evaluations on the role of different routes and especially on the position of Finland are based on all of the above mentioned studies as well as on theoretical impact area and sensitivity analyses performed by a freight transport model.

2 TRANSPORT IN THE WORLD ECONOMY

2.1 The world economy and competing economic areas

- Transport volumes follow roughly the development of economic growth.
- Competitiveness of nations and economic areas is reflected in the rate of growth. Leading economic agglomerations include North America, Europe and the Far East.
- Annual economic growth in the United States is about three percent. Growth is about two percent in the old EU-countries and about four percent in the new EU-countries. Growth is about 10 percent in the Far East and the focus of the world economy is shifting there. Rapid growth, about seven percent, also occurs in Russia.

Economic growth is currently the key to the success of nations. Transport volumes follow roughly long-term economic development. As the gross national product (GNP) reaches a certain level, foreign transport will especially increase. The production of a high gross national product demands increasing procurement of foreign raw materials and components.

North America, Europe and the Far East constitute three of the most significant competing economic areas. The development of the gross national products in these areas is presented in Figure 2.1. If the new EU-countries of Eastern Europe are included in the figures of Western Europe, the gross national product of the EU will almost reach the level of the United States.

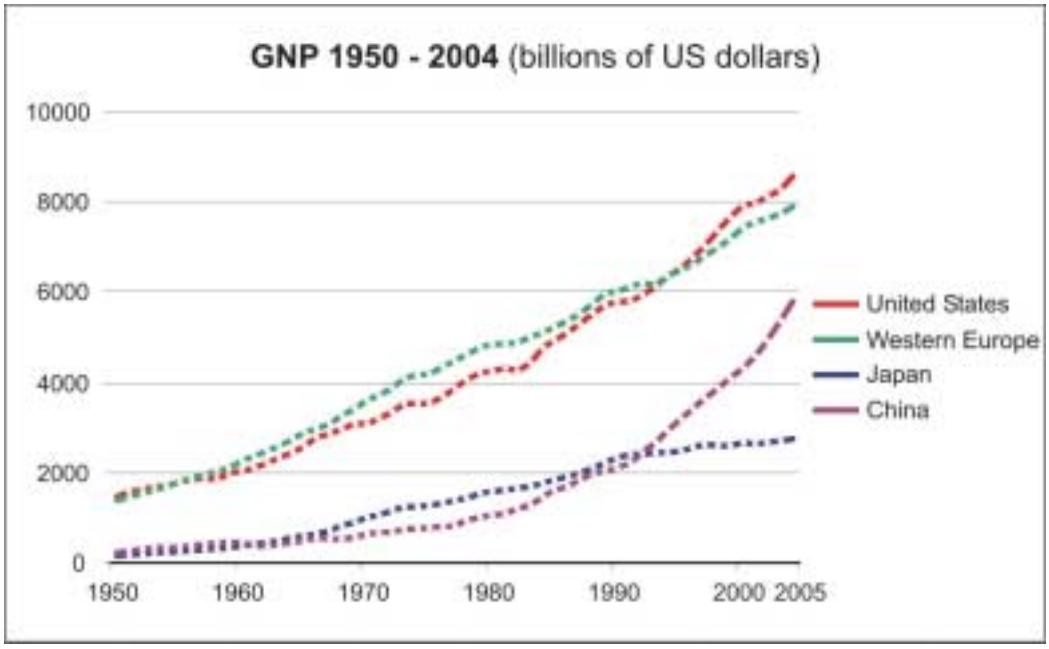


Figure 2.1. Gross national product in the United States, Western Europe, China and Japan during 1950–2004 at fixed cost for the year 1990 (billions of US dollars). Source: Maddison, 2003.

Economic growth in Europe has been slower than in competing economic agglomerations (Figure 2.2). The growth of the gross national product of Europe is experiencing almost a linear decrease or the growth is decelerating. After the Second World War, Japan has experienced the most rapid growth but it has slowed down to about one percent/year. In the United States the growth has stabilised to about three percent and in Europe to about two percent. China has taken the role of Japan as the growth engine of the Far East. The rate of economic growth in China is now about 10 % or at the same level as in Japan in the 1950s and 1960s.

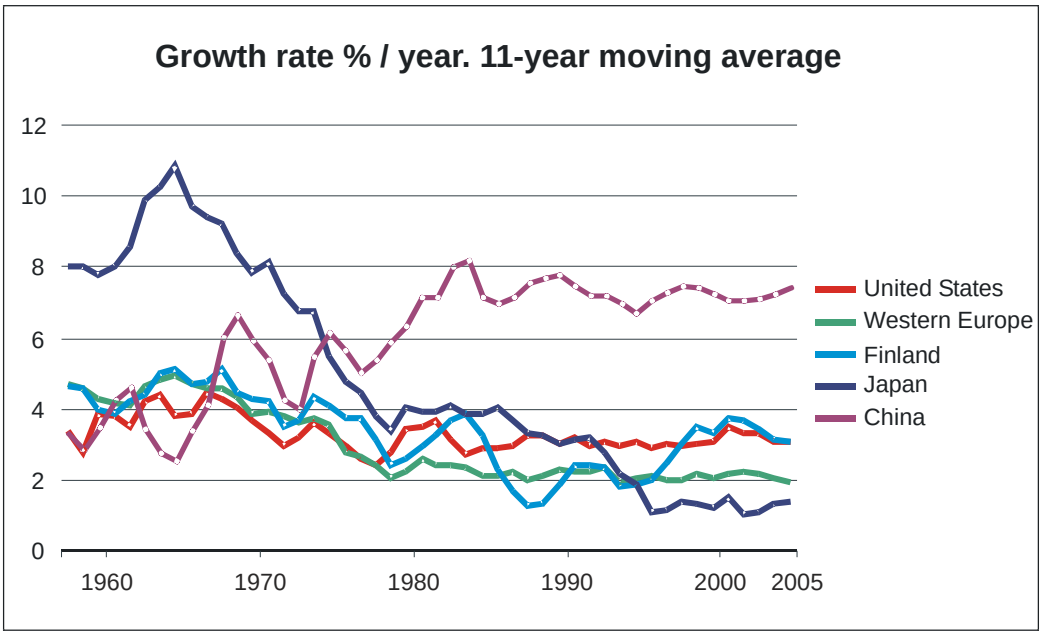


Figure 2.2. Rate of growth of the gross national products (% / year) in the United States, Western Europe, Finland and Japan during 1957–2004. 11-year moving average. Source: Maddison, 2003.

Gross national product per capita (GNP per capita) can be used for estimating the economic development and prosperity of different nations. So-called valuable goods (for example electronics and equipment) are produced, consumed and thus transported more in countries with high GNP per capita.

In the area of the former Soviet Union, GNP per capita is 22 % of the GNP in Finland. Between the years 1950–2000 GNP per capita in Finland increased by a factor of 5, almost by a factor of 11 in Japan, but only by a factor of 1,5 in the area of the former Soviet Union (Figure 2.3). Thus, there is a lot of growth potential in Russia.

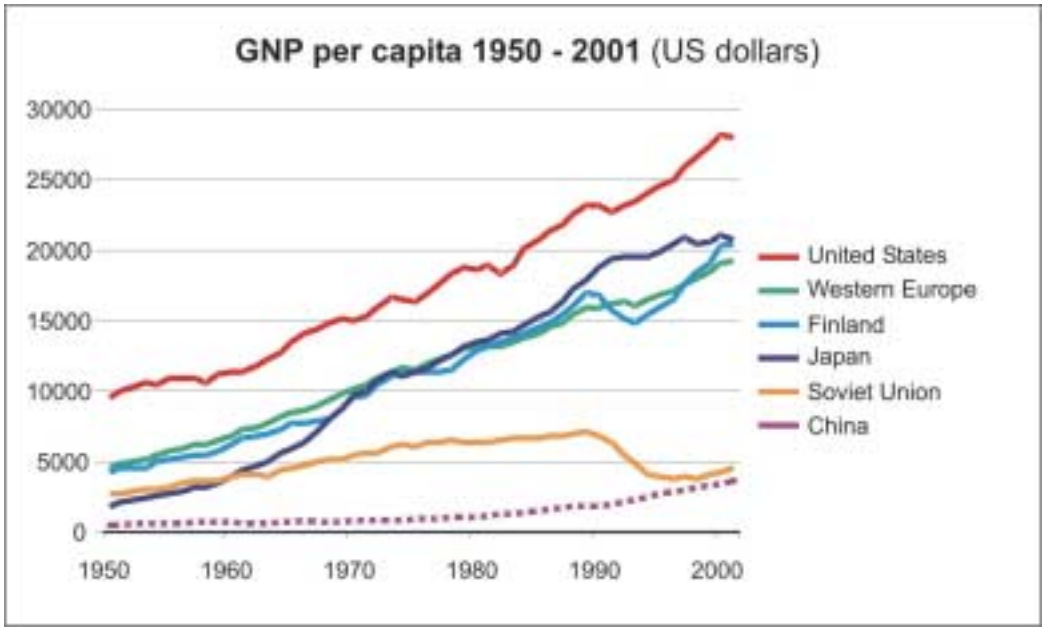


Figure 2.3. Development of gross national product per capita in selected countries during 1950–2001 (US dollars/year). Source: Maddison, 2003.

The competitiveness of the United States is now constrained by current account and budget deficits. The country is acquiring more debt. On the other hand, the country is so wealthy that it can afford these constraints. Long-term competitiveness is, however, good. Innovations can be both produced and applied efficiently. Age structure is favourable due to strong immigration. On the other hand, the age structure in Europe and especially in Finland is unfavourable with regard to economy. The same situation also prevails in Japan and Russia.

The economic systems in the new EU-countries are closer to the Anglo-Saxon English and American model than to the Nordic welfare model. Social security and the rate of taxation are at low levels. Estonia has flat (non-progressive) income taxation and no import tax. Therefore, the new member countries are very business-friendly and have already attracted plenty of direct investments. The greatest amount of foreign investments in relation to population has been directed to the Czech Republic.

By the year 2030, China (including Hong Kong) will experience the most significant growth of all economic areas in the world (Figure 2.4). Another significant growth area is Southeast Asia. North America, the EU-25 and Japan will experience more moderate growth.

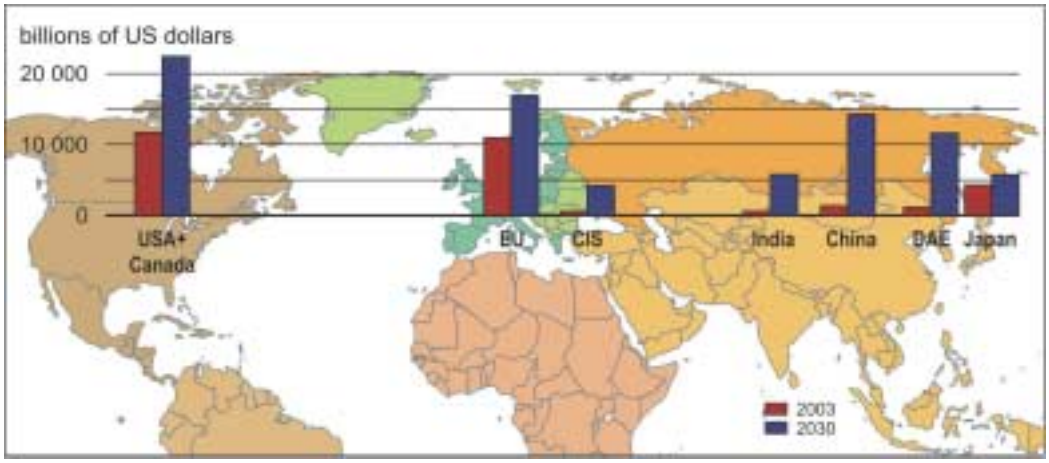


Figure 2.4. Development of gross national product in the great economic powers (billions of US dollars). Source: World Bank, Goldman&Sachs. DAE= Developing Asian Economies.

2.2 Trade flows

- The old EU-countries (EU-15) export one-third of their production. The new EU-countries export 50 % and Finland exports 39 %.
- The production export rate will grow due to globalisation. There is potential for growth especially in Finland.
- The most important trade partners of the old EU-countries include North America, other European countries and the Far East. The balance of trade shows clear deficits with the Far East and Russia.
- Over half of Finnish foreign trade is directed to the EU-15. Trade to the Far East and Russia is more balanced than in the old EU-countries. Access to growing markets has been gained.

With regard to foreign trade, the new EU-countries are more open economies than the old EU-countries. About half of the production of the new EU-countries is exported. The share of foreign trade of production is only about one-third in the old EU-countries. This difference can partly be explained by the fact that the old EU-countries have larger population and the domestic demand is significant. The production export rate is 39 % in Finland. This share could, however, be clearly higher, since the share of foreign trade is higher in the old EU-countries of similar size.

Three of the most important and equally strong trade partners of the **old EU** include NAFTA (primarily the United States), other European countries (primarily the new EU-countries) and the Far East (Figure 2.5). The balance of trade in the old EU-countries shows a surplus with NAFTA, other European countries and the Near East. The balance of trade shows significant deficit with the Far East. Imports from the Far East exceed exports by 60 %. Imports from Russia to the EU-15 exceed exports by 71 %. It is estimated that the Far East and Russia will act as engines of the world economy in the future. Even today trade from the EU shows significant deficit with both of them, which is not a very good signal for the future.

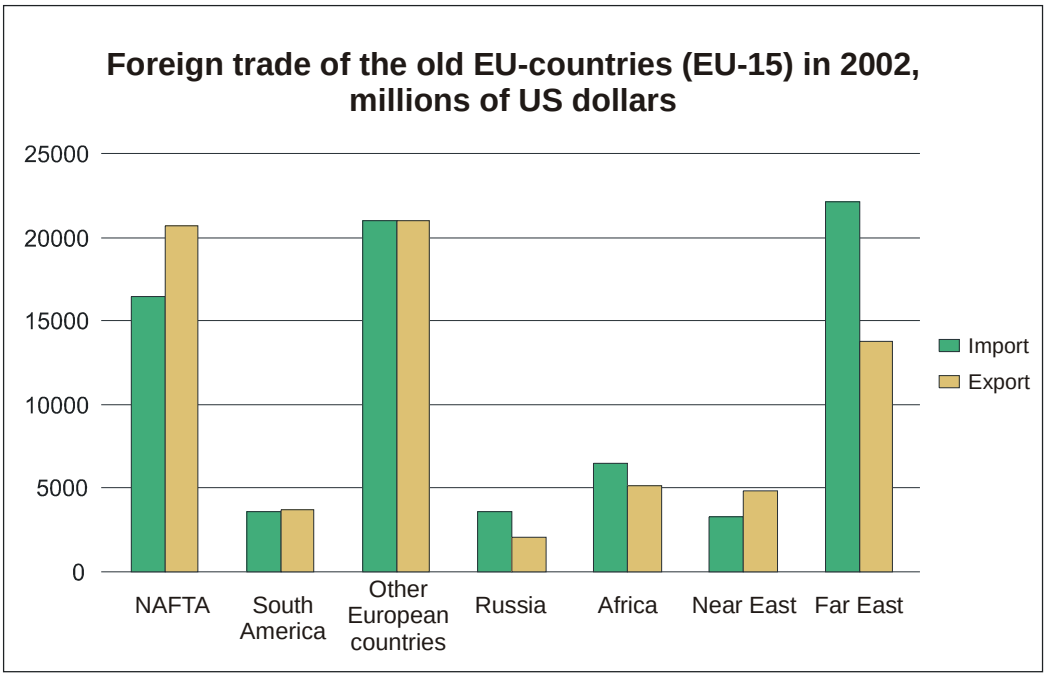


Figure 2.5. Foreign trade of the old EU-countries (EU-15) in the year 2002 (millions of US dollars). Source: OECD, 2004.

Over half of the foreign trade of **Finland** is directed to the old EU-countries (Figure 2.6). On the other hand, the share of other European countries, NAFTA, Russia and the Far East is only about 10 %. The balance of trade in Finland shows less relative deficit with Russia and the Far East than with the EU-15, which is a positive indicator for Finland. The growing markets have been entered.

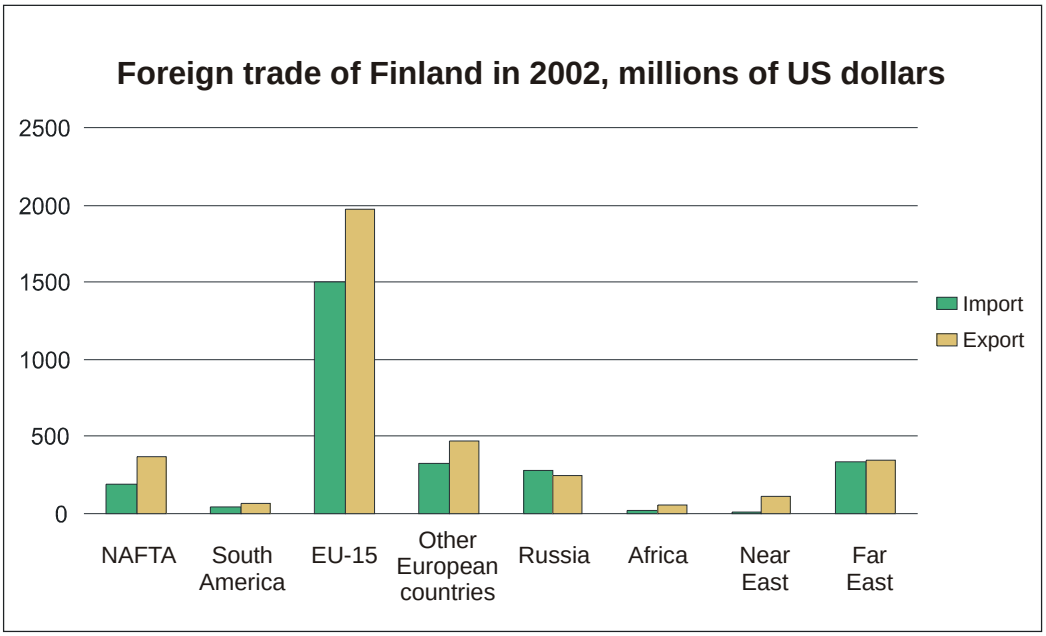


Figure 2.6. Foreign trade of Finland in the year 2002 (millions of US dollars). Source: OECD, 2004.

2.3 Roles of transport modes and development of logistics

- Sea transport is the most significant mode in global transport due to the high share of bulk products in world trade.
- The share of air cargo transport will grow with increasing trade of valuable goods.
- International railway transport has significant potential, but technical and administrative barriers reduce the attractiveness of railway transport.
- Logistics will globalise and kilometres transported will grow, the role of international logistics companies will increase and main transport flows will be concentrated on hubs.
- Intermodal transport chains will develop and bring new transport alternatives.

Roles of transport modes

Sea transport is the most important **mode of transport** in world trade due to the high share of bulk products in total worldwide transport. The significance of air cargo transport has increased in recent decades, as the international trade of valuable goods has grown. The share of air cargo of transport flows calculated by the value of goods is already significant. The share of railway freight transport in long-distance international transport is modest, but it has significant potential in certain connections. Railway freight transport has many infrastructure-related problems in internal transport within Europe, which reduce the competitiveness of this transport mode. The share of pipeline transport of total transport is also significant, as it is an economic mode for long-distance transport of oil and gas.

A total of 6,1 billion tonnes of *sea freight* was transported in the year 2002. One-third of this consisted of the transport of oil and oil products. It is estimated that worldwide sea transport volumes will triple by the year 2020. Although bulk cargo transport is emphasised in sea transport, the growth of worldwide sea transport has closely followed the increase in the value of international trade. An average of 1 tonne of goods is transported by sea for every 1000 USD of export worth. The development of Asian economies has increased the share of Asia in worldwide sea transport. (UNCTAD).

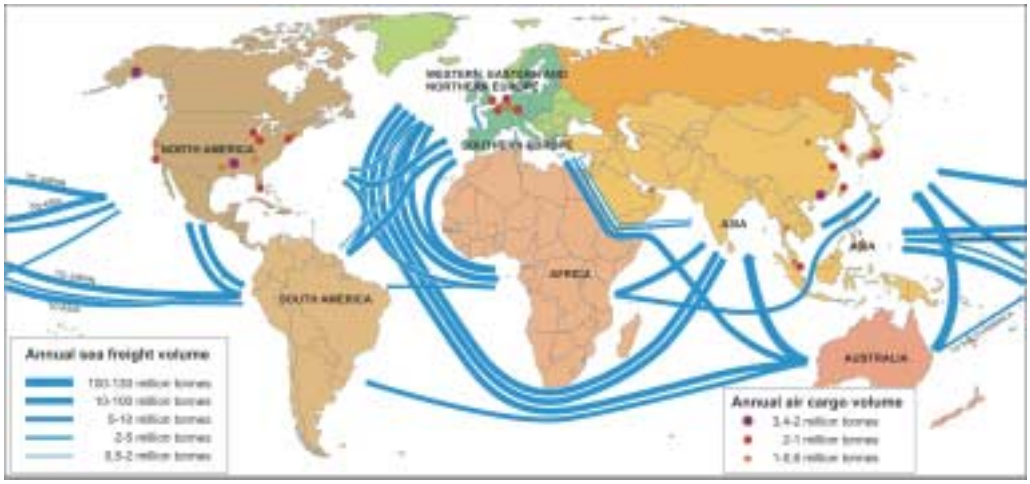


Figure 2.7. Sea transport flows in the world and the most important cargo airports (million tonnes / year). Source: GAIA – Great World Atlas, 2004 and ACI, 2004.

Since the year 1970, the annual growth in worldwide *air cargo* and airmail transport has been over two-times higher than the rate of GNP growth. It is estimated that air cargo and airmail transport volumes will be 2,5-times higher (480 million tonne kilometres) by the year 2021. The growth of air cargo transport is promoted by e.g. the rapid economic growth of the developing countries, large air transport infrastructure investments, liberation of air cargo transport, development of air traffic services and growth of express cargo services. The fastest growing air cargo markets include Asian internal freight transport as well as freight transport between Asia and North America and between Asia and Europe. The annual growth of air cargo is over 7 % in each market. (Boeing, 2004).

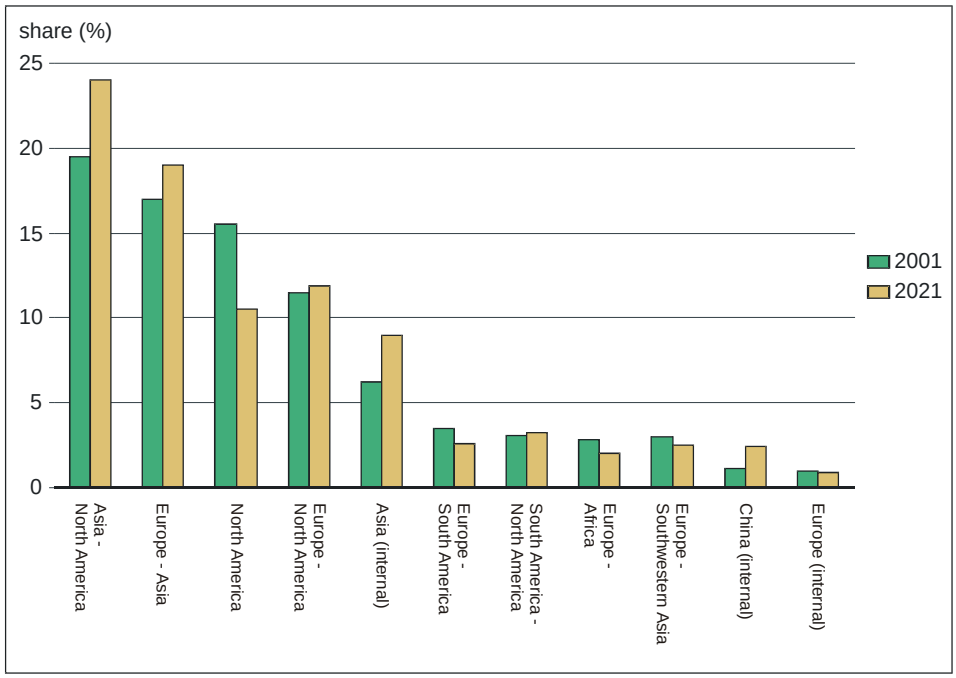


Figure 2.8. Share of different connections (%) of worldwide air cargo in 2001 and forecast for the year 2021. Source: Boeing, 2004.

In countries of large geographic size (China, India, Australia and the United States) *railway freight transport* has a share of even 40 % of the internal transport in the country. The goal is to increase the share of railway freight transport in international transport by e.g. developing intermodal transport chains. One example of this is the N.E.W-corridor project (Northern East West Freight Corridor), in which a multimodal corridor will be developed connecting North America, Northern Europe and the Far East. The most important railway connection that connects continents is the Trans-Siberian railway, which is described in more detail in Chapter 3.6. The development of railways in Mexico will promote the use of railway freight transport in North America. (UIC, 2004).

A significant share of long-distance oil and gas deliveries is transported through *pipelines.* The most extensive pipeline network has been constructed between Russia and other European countries (see Chapter 3.1). Other significant pipelines exist, for example, between North Africa and Southern Europe, in North America and in southern parts of South America.

Development of logistics

As production, procurement and markets globalise, delivery chains and logistics solutions will also globalise. Overall, development of logistics will:

- make average distances transported longer
- make the number of deliveries more frequent
- increase the share of air cargo transport in total transport volumes
- make sea transport and intermodal transport chains more efficient and
- concentrate main transport flows into international hubs.

Similar levels of service (reliability, speed, flexibility, punctuality) are expected from **global logistics** as, for example, from domestic logistics. On the other hand, the suppliers of logistics services are more often global enterprises or networks of companies.

International logistics companies can operate cost-efficiently through a developed **hub-system** and a network of subcontractors. A hub-system in freight transport is described as a central freight terminal, which has frequent connections from other terminals within the system. A hub-system concentrates transport flows to certain, often scheduled routes which smaller transport flows are linked to, thereby benefiting from economies of scale. As a result of the hub-system, freight flows do not use the most direct route, but they will be optimised according to the cost and schedules of the hub-system of every logistics network. New significant terminals or the combining of old terminals can significantly change the route choice of international freight transport.

The increasing use of containers and other unit loads in transport has increased the share of **intermodal** transport chains, which contain several modes of transport. Cost-efficient railway or sea transport is used on the main routes of intermodal transport, while flexible road transport is used in collection and distribution activities. The EU transport policy favours intermodal transport instead of

direct road transport for environmental reasons. The functionality and efficiency of intermodal transport chains are developed in many ways for promoting transport. Global transport chains, which are often intermodal by nature, will also benefit from this.

The most valuable goods are transported in containers and other **unit loads**, and efficient container transport demands developed infrastructure and level of service. The share of container goods in international transport has significantly increased and this growth is estimated to continue at an annual rate of 9 % (Ryan, 1998). The handling of containers is fast which shortens the expensive mooring time of vessels at port. In addition, the speed of container ships has increased. In addition to small container ships, very large container ships (transporting over 5 000 TEUs) have become more common in overseas transport routes.

The utilization of **data and communications technology** enables cost-efficient logistics of an even greater number of products as well as for longer transport distances and more and more market areas. Thus, the significance of distance decreases in logistics solutions. With the help of information technology, different alternatives for transport and logistics can be quickly compared. The predictability of logistics will shorten response times, which will increase the demand for frequent deliveries, while tracking possibilities will improve the security of transport. Technological development has been one of the most important preconditions for the globalisation of production, markets and logistics. The utilization of data and communications technology will increase the demand for the level of service in logistics and quickly reveal the bottlenecks of a delivery chain. Consequently, information technology concentrates transport flows to logistically feasible, not geographically shortest, transport routes.

2.4 Estimates on the long-term development of freight transport

- Globalisation will separate the production and consumption of goods. Kilometres transported will also grow as a result of growing population.
- Transport volumes between Europe and Asia will be tripled. The significance of the Trans-Siberian railway will be emphasised. Transport volumes between the EU and the CIS will be doubled.
- The share of consumer and investment goods will grow.

Development trends in transport and factors affecting the trends

The following factors have the most significant effect on the **growth** of global freight transport:

- Due to globalisation, the production and consumption of goods will geographically separate from each other even more which will add to the total kilometres transported. The reason for separation is no longer the varying locations of population and raw materials, but more commonly the location of cheap employment.

- Growth in the demand for consumption due to population growth in the world
- Rapidly growing demand for consumption and investments in developing economic areas
- Growth in domestic production and export of developing economic areas.

The development outlook for international transport flows between and within different **continents** is as follows:

- Internal transport flows in Asia will increase, as both production and consumption grow in the area
- Freight transport flows between Europe and Asia as well as between North America and Asia will increase, as the economy and demand grows in Asia
- The slow growth in the demand for consumption in North America and Europe as well as satisfying the demand by domestic production will keep the increase in import transport at quite low levels in these areas
- The cost level in Asia will increase in the long run which will result in shifting of procurement and production of western companies to South America and Africa
- Transport flows between the developing areas will grow slowly.

The development outlook for particular **transport routes** is as follows:

- Transport on the so-called Iron Silk Road and especially on the Trans-Siberian railway and its branches will grow significantly
- The Arctic Sea route will not yet be internationally significant during the early years of this century, but will possibly be important later when the performance of icebreakers will grow
- Transport flows to Europe from South America and Africa will grow, as the cost level in Asia increases.

The following trends can be estimated in the development of the **structure of transport**:

- The share of air cargo transport in the value of total transport will grow further
- The amount of sea freight transport will continue to grow due to advantages brought by technological development
- Railway freight transport has a growing role in transport flows between the northern continents
- The share of consumption and investments goods in total freight transport will grow
- The share of energy products in total freight transport will decrease
- Kilometres transported will grow with longer transport distances.

Development outlook for international freight transport of the EU-25

The export of goods from the current **EU-25** increased to almost 2 000 million tonnes and the import of goods to almost 3 000 million tonnes during the past five years (Figure 2.9). The reason for the deficit in the balance of trade is mainly the dependence of the EU-25 on the energy production of countries outside of this area. The terms of foreign trade will show deficit also in the future.

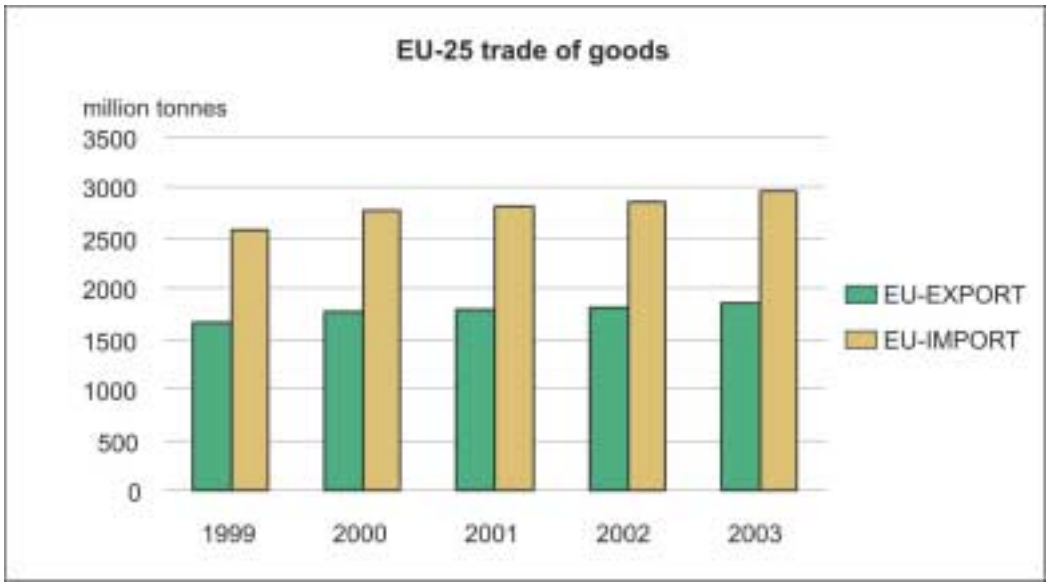


Figure 2.9. Development of export and import of the EU-25 during 1999–2003 (million tonnes / year). Source: Eurostat ESDS.

Freight flows (excluding energy) between the EU-25 and **the CIS** will double from the existing level by the year 2030 (Figures 2.10 and 2.11). The majority of the flows will still consist of the transport of raw materials, since the CIS is permanently the only net exporter of the primary raw materials of the economic areas shown in the figures, even though the domestic consumption of the CIS also grows significantly.

Freight flows between the countries in the **Far East** (excluding Japan) and the EU-25 will be doubled or tripled and become more versatile. Trade flows will normalize in quality or also include products other than “cheap imports” in the future. The domestic consumption of the countries in the Far East will increase with GNP growth, which will reduce the share of exports in total production.

Trade flows between **North America** and the EU will decrease, as the Asian economies take over a more significant share of international trade due to stronger growth in the Far East.

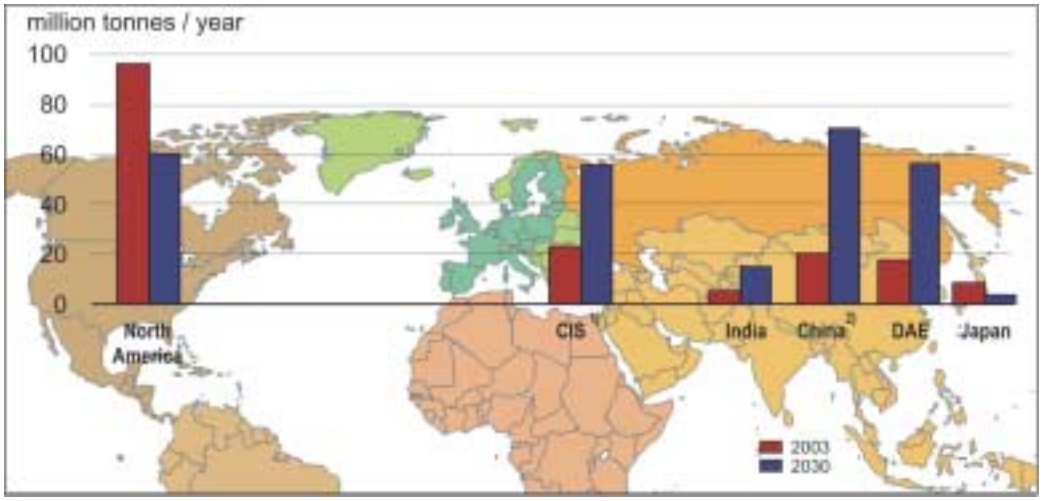


Figure 2.10. Export of the EU-25 by region in the year 2003 and forecast for the year 2030 (million tonnes / year). Source: Eurostat ESDS, World Bank, Goldman&Sachs, own calculations

1: excluding energy transport,
2: including Hong Kong, but not Taiwan, DAE = Dynamic Asian Economies excluding Hong Kong or Thailand, Malaysia, South Korea, Singapore, Taiwan.

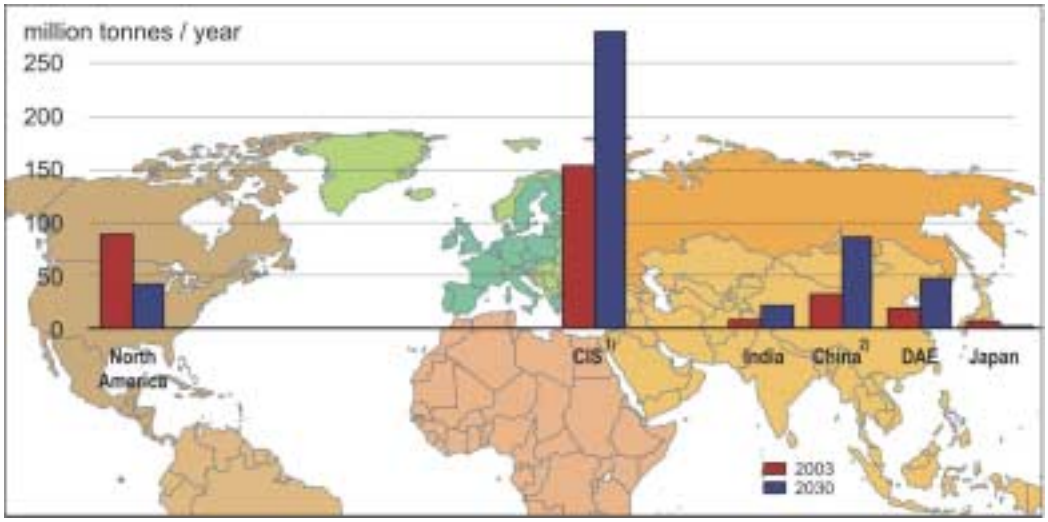


Figure 2.11. Import of the EU-25 by region in the year 2003 and forecast for the year 2030 (million tonnes / year). Source: Eurostat ESDS, World bank, Goldman&Sachs, own calculations

1: excluding energy transport,
2: including Hong Kong, but not Taiwan, DAE = Dynamic Asian Economies excluding Hong Kong or Thailand, Malaysia, South Korea, Singapore, Taiwan.

3 TRANSPORT FLOWS AND CONNECTIONS BETWEEN THE EU, RUSSIA AND THE FAR EAST

3.1 Viewpoint of regional geography

- Natural resources of Eurasia have concentrated in the central parts of the area. Population and production have, in turn, concentrated on the eastern and western coasts of the area.
- A significant part of international transport flows occurs between the areas of natural resources and production.
- Transport of consumption and investment products between the east and west coast of Eurasia constitutes another significant flow, which is mainly based on the differences in costs and standard of living between these areas. The globalisation of the operations of European companies will accelerate growth in freight transport.
- The development of economies in Eastern Asia will increase the production and domestic demand for consumption in these areas.
- Economic development in Eastern Asia will increase the cost level of the area in the long run. Concentration of production and logistics in the congested coastal zone will also reduce international competitiveness.

The most significant factors for international **freight flows** in Eurasia include the location of:

- energy resources (especially oil)
- other natural resources
- production and
- large population concentrations.

Most of the natural resources in Eurasia are located in the middle of the area, whereas population concentrations are located on eastern and western parts by the coast. Differences in economic and industrial development between countries also increase the transport demand of the area. Population concentrations and industry in Europe consume plenty of energy and the domestic energy production in Europe is not sufficient to meet the demand for energy. Oil and gas pipelines as well as sea transport have a significant role in energy transport throughout Eurasia.

Cost difference between Europe and Asia, especially in labour costs, creates a significant import flow of consumer products into Europe. The most important modes for transporting consumer products include sea container transport, air cargo transport and increasingly railway freight transport. The most significant population growth centres of Eurasia are located in the Far East and the economy of many countries in Southeast Asia has experienced significant development during the past decade. This has led to an increase in domestic demand for energy, raw materials and consumer products, and thus to the growth of transport flows. Economic development in Asia will increase the cost level of the

area in the long run, which will shift production to countries with even cheaper labour (for example South America). The competitiveness of Asia will also be reduced by the concentration of production in the most populated areas. The strong growth of these areas will cause growing traffic congestion, and thus lead to deteriorated performance of logistics.

The most significant **population concentrations** of Eurasia are located in Central Europe, Eastern Asia (Japan, eastern and southwestern China) and the Indian Peninsula (Figure 3.1). Over half of the world's population lives in Asia and the population is estimated to grow to almost 5 billion people by the year 2030. The population of Europe is estimated to decrease slowly to about 685 million people by the year 2030 (Figure 3.2). (UN, 2004). According to the estimates of population development, internal and external freight transport flows of Asia will increase considerably. This development is accelerated by rapid economic growth and the increase of domestic production in Asia. International trade and freight transport in Europe will grow despite the decrease of population. This is due to e.g. the development of Eastern European economies, which will promote trade and production in the area.

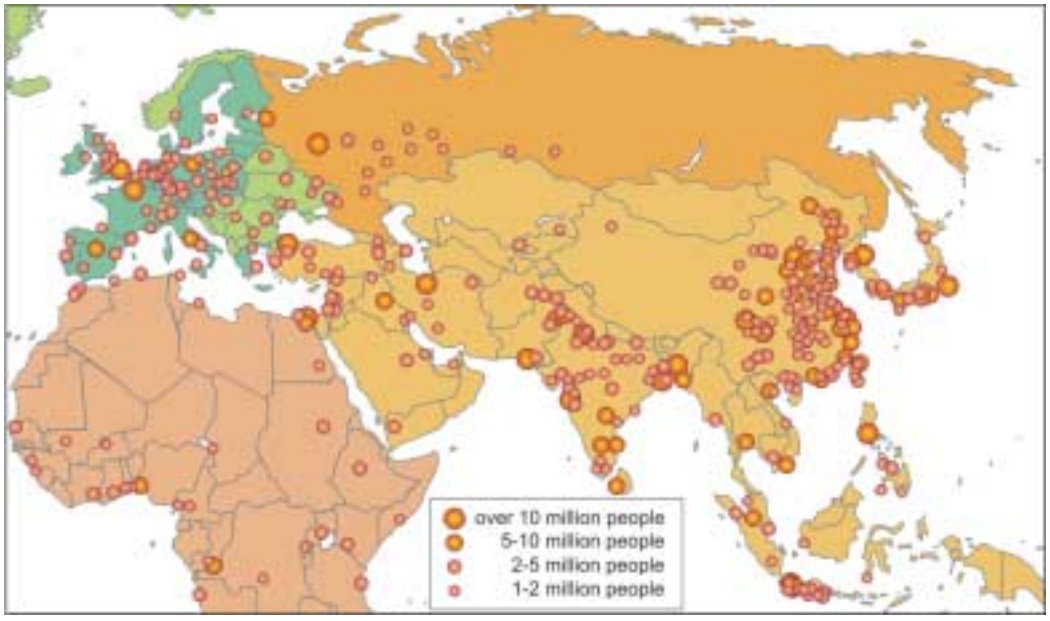


Figure 3.1. Metropolitan areas in Eurasia. Source: GAIA – Great World Atlas, 2004.

The most significant **energy and natural resources** of Eurasia are located in the middle of the area in Russia and China. Russia is the second largest oil producer after Saudi-Arabia having a share of about 10 % of total worldwide production. Oil is the most significant product category of international freight transport. Oil resources are located in sparsely populated areas, while the demand is concentrated in countries, which are at advanced levels in economic and technological development. In the year 2003, the share of the CIS-countries was 28 % of the import of crude oil to the EU-15. The share of import, for example, from Norway was 22 % in the same year (European Commission, 2003a).

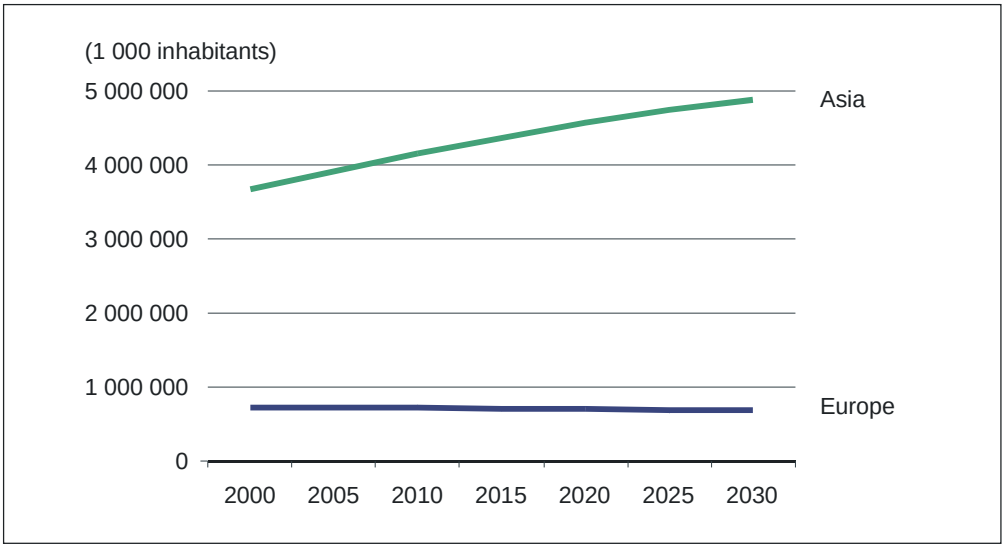


Figure 3.2. Population forecast for Europe and Asia until the year 2030 (1 000 inhabitants). Source: UN, 2004.

Russia has a share of over one-fifth of the production of natural gas in the world. Another equally significant producer is the United States. The most important producer of coal and brown coal is China, which has a share of almost 25 % of the world production. (GAIA – Great World Atlas, 2004). In addition to Russia, other significant European producers of oil and natural gas include Great Britain and Norway. Poland and Ukraine have coal production. In the year 2002, Russia had a share of almost 40 % of the import of natural gas to the EU-15 (European Commission, 2003a). Russia's share of the import of oil and natural gas to the EU has increased along with the enlargement of the EU.

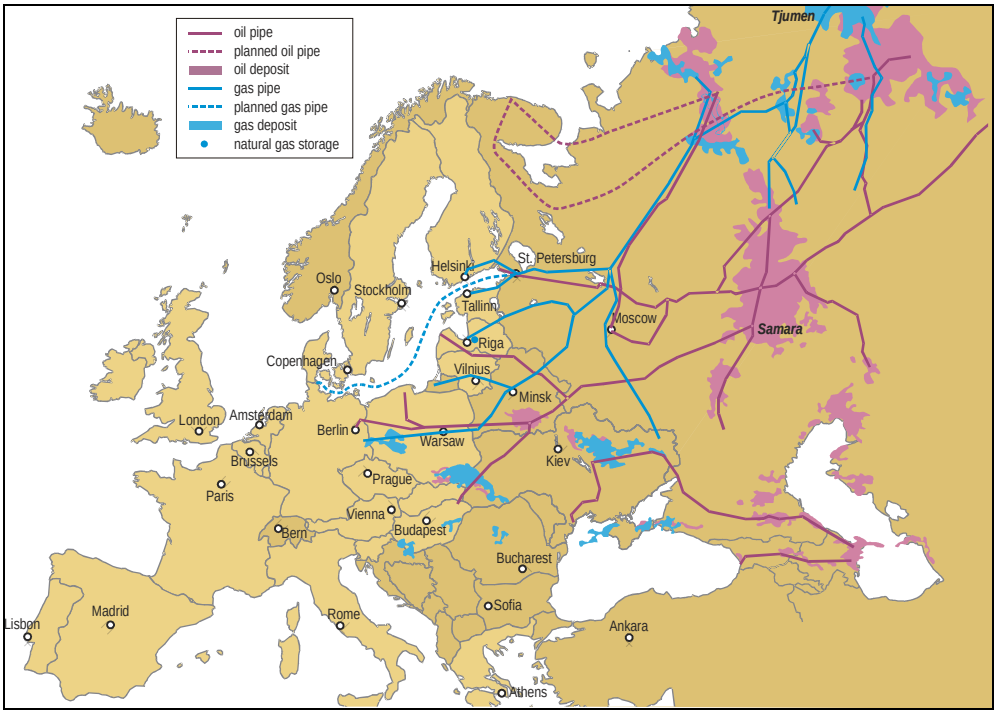


Figure 3.3. Oil and natural gas deposits and pipelines of Western Russia. Source: Maps of Petroleum Economist Ltd.

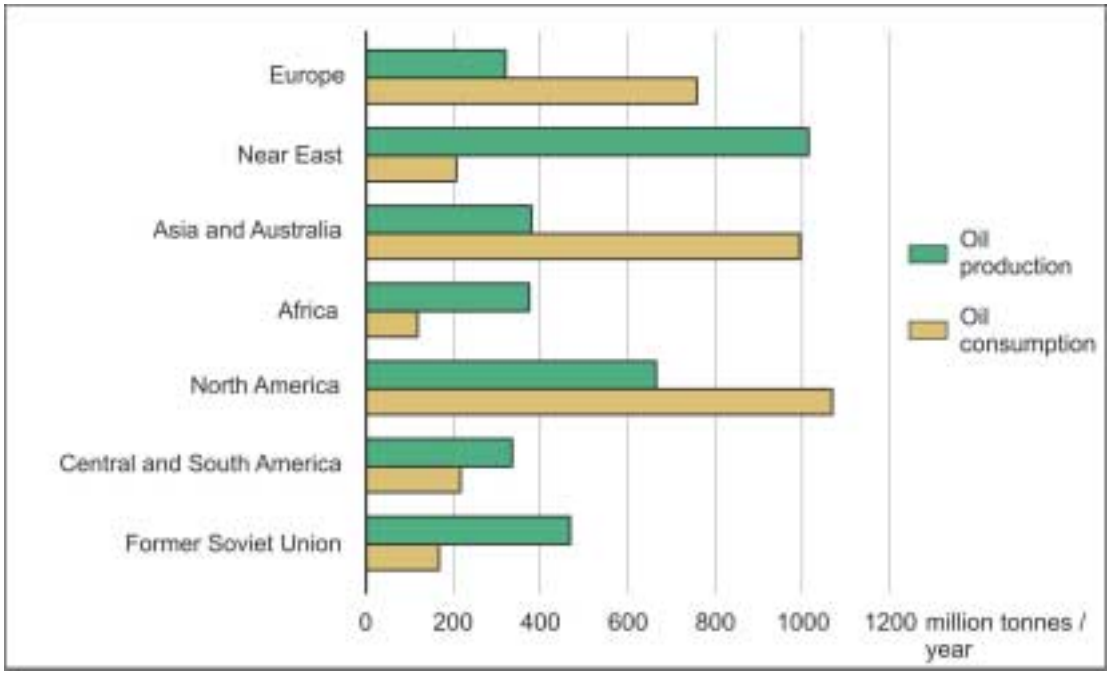


Figure 3.4. Oil production and consumption by region in 2002. Source: BP in publication: Statistics Finland (2003).

The **industrial production** of Eurasia has concentrated even more than population to the eastern and western coasts of the continent, and thus next to good sea transport connections. Sea transport connection is important for the transport of imported raw materials and energy. Industry promotes population development of areas, and also leads to growing production of consumer goods, which is independent of traditional raw materials, and the import of energy. Consequently, the development of production feeds itself. For example, missing transport links and mountain barriers have slowed down industrial development in inland areas.

3.2 Viewpoint of transport economy

- Transport systems in Russia and the EU have developed to be very different. Differences of opinion also exist in executed transport policy.
- Russia has tightened its hold of its transport policy. Protectionism related to politics causes conflicts with the EU. The forthcoming WTO-membership of Russia may help in solving such conflicts in the future.
- The PCA-agreement has been the basic document for cooperation, but it has had minor significance. The EU has made new initiatives for developing dialogue, such as ”Wider Europe” and ”Common Economic Space”.
- Russia directs large investments to the development of main transport corridors. The most important common transport corridors and their development have been agreed upon.

Introduction

The essential questions with regard to the transport policy of the EU and Russia are the following:

- The EU-countries and Russia have very different historical backgrounds for developing transport infrastructure. This is also the reason for great differences in current transport policy and its objectives.
- The EU has been active, but not often very successful in making initiatives for the dialogue between the EU and Russia regarding transport. Russia is willing to be treated as a special case among the neighbouring countries of the EU. As Russia also aims at bilateral discussions, the EU Commission has had difficulties in finding the appropriate form of communication.
- The significance of the EU transport policy has grown from the Russian perspective, as Russia is willing to provide transport services to the European countries, and also otherwise integrate into the EU networks. Tighter EU regulations will cause constant problems for Russia and Russian transport companies.
- Execution of Russian transport policy has become more efficient in recent years, but just lately has been overruled by an administrative reform, which was initiated in the winter of 2004. The main goals of Russian transport policy are still probably quite well outlined. Due to emphasised protectionism in goals, it can, however, be expected that they will cause conflicts both with the EU and compliance with the conditions of the WTO.
- Russia aims at continuously directing large investments to the development of main transport corridors. These include Corridor 1 through Kaliningrad, Corridor 2, Corridor 9A and the Trans-Siberian railway as an extension of it, the Northern Sea Route as well as ports in the Baltic Sea and the Barents Sea, which serve the corridors. The North-South corridor, which is less significant for the EU, is also one of the priorities. Due to the improvement of transport infrastructure, transport flows will also most likely be directed to these routes.

Historical background

European-wide ground transport infrastructure started to develop in the latter part of the 19th century when, for example, railways were constructed between the capital cities of Central and Eastern Europe including railways between Helsinki and St. Petersburg, Berlin and St. Petersburg as well as Berlin and Moscow. Even the Trans-Siberian railway in Russia was entirely completed in the year 1916. However, the Russian revolution and the World Wars almost completely severed transport connections between Europe and Russia until the latter part of the century.

After the wars, automobile traffic and related road network investments started to grow quickly and have continued until today. On the other hand, railways maintained their dominant role in the ground transport of the Soviet Union and its allied countries. Automobile traffic had only local significance and the na-

tional development of a road network was ignored. An extensive pipeline transport system was constructed alongside railways.

In the early 21st century, a significant difference in transport systems existed between Russia and the EU-countries. Road transport had become the main mode of transport in the EU-countries. The share of road transport in kilometres travelled in these countries had reached an average level of 80 %. The characteristics of Russia included a vast geographic area with sparse population, a production system inherited from the Soviet era and a recently strengthened exporter role of raw materials and energy. These characteristics have contributed to the fact that pipelines and railways have maintained their status as main transport infrastructure. In the early part of the 21st century, pipelines had a share of 55 % and railways a share of 40 % of all kilometres transported in Russia. If pipelines are excluded, the share of railways is almost 90 % of all internal kilometres transported within Russia. In addition, the share of kilometres transported in relation to the gross national product in Russia has been 10-times higher than in the EU-countries.

Due to different historical backgrounds, there are some practical problems between the EU-countries and Russia, which disrupt seamless transport operations. These problems exist particularly in railway transport, for example, the question of rail gauge and different power, safety, communication and brake systems.

Road transport problems have been caused by different standards of road infrastructure and transport equipment, which are reflected in different vehicle regulations, such as maximum weight and dimensions of vehicles, and constantly stricter safety and environmental regulations outside of the EU. Also, the administrative procedures regarding shipping documents have been a constant problem at border crossing stations.

Dialogue between the EU and Russia with regard to transport

The following instruments control the dialogue:

- PCA-agreement (1997)
- Pan-European Transport Corridors and Areas
- Eurasian Transport Conferences in St. Petersburg
- Wider Europe and New Neighbourhood -initiatives and
- Common Economic Space -forum and related action programme.

The PCA-agreement (Partnership and Cooperation Agreement) has been the basic document for the communication between the European Union and Russia. It includes an agreement on continuous dialogue between both sides primarily regarding economic questions. In this context, the concept of economy also includes transport. The agreement became valid in December 1997 and its articles also include separate items for transport and border crossings.

Since the 1990s, the Pan-European Transport Corridors and Areas have also had a central role in transport infrastructure cooperation between the EU and Russia.

The Pan-European Transport Corridors and Areas were decided on at three Pan-European Transport Conferences:

- Prague 1991
- Crete 1994
- Helsinki 1997.

Corridors 1 (for Kaliningrad), 2 and 9 of the Pan-European Transport Corridors as well as the Barents Euro-Arctic Transport Area of the Pan-European Transport Areas are located in Russia. A letter of intent between the Ministries of Transport in corridor countries has been signed for every transport corridor and area. One contracting organization is also the EU Directorate General for Energy and Transport (DG TREN).

With the support from the EU, Russia has also organized Eurasian Transport Conferences in St. Petersburg in the years 1999, 2001 and 2003. They have mainly concerned the development of international and external transport connections of Russia.

The latest phase in the transport relations between the EU and Russia started when the enlargement of the EU to the east was decided. As simultaneously the PCA-agreement was considered to be of minor significance at least from the Russian viewpoint, new initiatives were needed. These include e.g. the concept of a ”Wider Europe” which intended to strengthen the cooperation with the new neighbouring countries as a result of the enlargement. The most important document of the initiative was ”Paving the Way for a New Neighbourhood Instrument”. The concept of a ”New Neighbourhood” has since mostly replaced the ”Wider Europe” concept. Russia has, however, had a suspicious attitude towards the initiative, since it is willing to be always treated as a special case.

The concept of a ”Wider Europe for Transport”, which was introduced in the Eurasian Transport Conference in St. Petersburg in the autumn of 2003, is still used in the transport sector. The process continued in a seminar held in June 2004 in Santiago de Compostela, Spain, where it was decided that transport corridors between the EU and its new neighbouring countries will be re-examined. A so-called “High Level Working Group” was appointed for this purpose, which aims at completing its work by the summer of 2005. Regional working groups have also been appointed for supporting the High Level Working Group and they act, as designated, as forums of cooperation in respective countries.

The concept of a “Common Economic Space” (CES) was introduced in the EU-Russia Summit in St. Petersburg in the year 2003. The common goal of the CES is to create open and integrated markets between the EU and Russia by opening up new opportunities for economic actors. Although energy cooperation is the original starting point of the CES, it now also covers transport cooperation, however, primarily promoting the harmonisation of legislation and regulations between the EU and Russia.

The CES may ultimately be the forum through which the relations between the EU and Russia can best be managed in the future. Further implementation of the

CES was discussed in detail in a summit between the EU and Russia in late November 2004.

In practice, the implementation of the CES requires a functional framework for cooperation, which, in addition to the Commission, the member countries can also participate in. The goal of the EU has been the preparation of the ”Joint EU-Russia Action Plan on the Common Spaces”.

The EU transport policy

The White Paper ”European Transport Policy 2010: Time to Decide” is the most important document of the EU transport policy. It outlines the main objectives of EU transport policy for this decade. The recommendations of the White Paper concern only indirectly the transport questions between the EU and Russia.

The scope for making EU transport policy clearly changed with the enlargement of the EU in the year 2004. As a result, two-thirds of the previous Pan-European Transport Corridors remained inside the enlarged EU. Partly due to this, the Commission started the above mentioned re-appraisal of the TEN-network. Based on this appraisal, the new Trans-European Network Transport Guidelines (TEN-T Guidelines) were adopted in June 2004.

The new guidelines propose 30 large projects, which include the most important infrastructure with regard to international transport. The Motorways of the Sea is a new concept included in the guidelines. The cost estimate of these 30 projects is 225 billion Euros.

Russian transport policy

Since the end of the 1990s, the role of Russian government in transport policy has gradually strengthened and at the same time clarified. Main goals and operating principles have been recorded in a few documents. The most important of them is the Transport Strategy of the Russian Federation.

Although the Transport Strategy of the Russian Federation for the years 2004–2010 was completed and initially approved in December 2003, it has not been finally confirmed yet. One reason for this is the administrative reform and change of government during the winter and spring of 2004. Among other things, the previously separate Russian Ministry of Railways and the Ministry of Transport were combined. The new Transport Strategy was yet to be finally confirmed in December 2004.

The Transport Strategy is supplemented by more detailed programmes for different modes of transport, such as the modernization programme of Russian roads and the renewal programme of railways, which are prepared based on the Strategy. Furthermore, regional programmes have been prepared such as the transport strategy of Northwestern Russia.

From the viewpoint of internal reforms of Russia, the Transport Strategy has many modern goals:

- A main transport network will be developed in Russia which will support the economic integration of the country
- The transport infrastructure for foreign trade throughout the country will be made more versatile for securing international competitiveness
- Growing export of logistics services, improving the competitiveness of Russian operators and the utilisation of the transit potential of the country are considered very important
- The gap between increasing car ownership and the development of a transport network will be narrowed by quick improvements in the road network
- This will simultaneously promote the growth of road transport, mobility of people and the extension of good transport connections throughout the country
- Furthermore, the principle of sustainable development should be considered in transport.

In the first phase (2004–2010) of the Transport Strategy of the Russian Federation, development is directed to the quick diversification of the transport sector. The second phase (2011–2020) includes further actions for the development of the transport system, which are required for the promotion of sustainable development, creation of reliable transport connections between different parts of the country and the implementation of a geopolitical transport strategy.

In the first phase, the estimated annual financing need for the development of the transport system is about 4 % of the gross national product or almost 20 billion dollars. In the second phase, the share of financing can be reduced to 3 % of the gross national product and the share of public financing can be cut down.

Other cooperative bodies of transport between Europe and Russia and the WTO

There are several international official and semi-official organizations, which are either responsible, coordinate or at least comment on how international freight transport should be managed and developed. For example, all modes of transport have their own European or international organizations. A typical example is the TIR-system under the United Nations, which is managed by the International Road Transport Union and under which a major share of the road transport between the EU and Russia still operates.

Another example is the Economic Commission for Europe of the United Nations (UN/ECE), which decides on the numbering of the so-called European Roads.

Transport corridors in the perspective of the transport strategies of the EU and Russia

The EU and Russia share common transport goals in some essential respects, as they agree especially on the most important transport corridors and their development needs. The jointly approved corridors primarily include Corridor 2 (Ber-

lin–Moscow), Corridor 9 (Helsinki–St. Petersburg–Moscow) and their extension along the Trans-Siberian railway to the Pacific Ocean. The western part of the Northern Sea Route is also jointly approved as an important part of the transport network. This consensus and large investments in infrastructure improvements in these transport corridors will most probably support the growth of transport along them in the near future.

This is where the consensus ends, as several measures are listed in the Transport Strategy of the Russian Federation through which the domestic transport markets of Russia will be protected from international competition by the government. This protection includes both Russian internal and external transport. State subsidy policy is, in part, very aggressive. It is carried on, for example, through tax concessions and administrative procedures and regulations, which are tailored to the Russians. This is based on the clear objective to continuously shift an increasing share of the transport of Russian foreign trade to domestic ports and for the use of their own transport equipment (vessels and lorries).

In practice, the protection of domestic markets and transport companies, which has already now been carried on in Russia, will be continued. The already adopted methods include double pricing of railway freight transport, which means multiple tariffs for shipments that are transported across the borders of Russia. Another example of a complex problem is the high charges for trans-Siberian flights, which are collected from international air traffic.

The goal of making bilateral transport agreements (especially air transport) can also be included in protectionism, which will reduce the possibilities of the EU as one negotiating party.

Impact of Asian countries on the transport between the EU and Russia

The Trans-Siberian railway provides an opportunity for some Asian countries, such as China, Japan and South Korea, to transport consumer goods quickly and efficiently to European markets. At the moment, mainly South Korea has used the Siberian connection, and today a major share of the incoming container transport from Asia to Finland has its origin in South Korea. Furthermore, South Korea has together with Russia started the upgrading of a connecting railway through North Korea, which will support the Siberian connection, but was taken out of service a long time ago.

Japan would have the same benefits from the Trans-Siberian railway as South Korea, but it has not been as active. Also, freight transport from China to Europe through the Trans-Siberian railway is not very well developed at the moment.

In the early part of the 21st century, the so-called Asian Highway Project was started with the support from the United Nations Economic and Social Commission for Asia. One of the main goals of the project is to define the international and regional road network of Asia and the routes included in it or the so-called A-Roads. The Asian road network will, however, only have local and regional significance for a long time.

3.3 Viewpoint of logistics

- The development of logistics in Russia and especially in Eastern Asia cannot completely meet the needs of strong growth in trade and transport.
- The preparedness and level of service in logistics vary significantly in different countries and areas. The problem in logistically developed areas is congestion, which will contribute to the relocation of logistics operations outside of central areas and ports.
- The development of transport connections outside the nodes of logistics is the key question for the competitiveness of Asia.
- The development of logistics services in Russia and Asia requires the promotion of entrepreneurship. Cultural differences and the importance of relations in business activities reduce the possibilities of foreign logistics companies to operate alone in these markets.

The knowledge and know-how of logistics of Russian and Asian companies have significantly increased in recent years. An even better level of service is expected from logistics, which is emphasised by the growing share of valuable goods in foreign trade of these countries. Authorities will also pay even more attention to the operability of logistics and its impacts on economy and competitiveness.

Accelerated by globalisation, the strong growth of the economy and production in Russia and especially in Asia together with rapid population growth will increase transport volumes in core areas to the point of congestion. The bottlenecks of logistics will create a barrier to the development of the competitiveness of these areas.

Russia and Asia have e.g. the following special characteristics of logistics:

- Economic and logistics development has concentrated in the Moscow and St. Petersburg areas in Russia as well as in Japan, Hong Kong, Singapore and Taiwan in Eastern Asia. Strong growth creates congestion in these areas, while efficiency in logistics demands the relocation of activities and the development of new logistics centres. The poor condition of infrastructure is a problem outside of the centre areas.
- The growth of container transport volumes and the growing size of container ships require the development of new container ports, since the geographical confines of existing container ports (in the middle of dense populations or along rivers) make it impossible to extend these ports.
- The logistics service sector demands further development and there are few services that efficiently combine different modes of transport. This will reduce the choice of transport modes.
- Recognized, large international companies and local companies, which are familiar with the national culture and have personal relations with different actors (especially with authorities), are successful in the markets of logistics services.

- Air transport has the most developed level of service and the fastest customs clearance of goods of all modes of transport.
- Border crossings, customs clearance and other public authority activities still constitute a significant barrier to international transport (see Figure 3.5).
- Poor levels of cooperation and communication between different authorities slow down transport flows and lead to additional costs.
- The use of data and communications technology is common only in large and often international companies. This will reduce e.g. the systematics and monitoring of the operation of logistics chains. Lack of data promotes e.g. the need for reserve stock, which will increase the total costs of logistics.
- Removing the barriers of logistics enables significant growth potential of international trade.

(LT-Consultants Ltd. et al., 2004; Manunen et al., 1999; Carruthers et al., 2003).

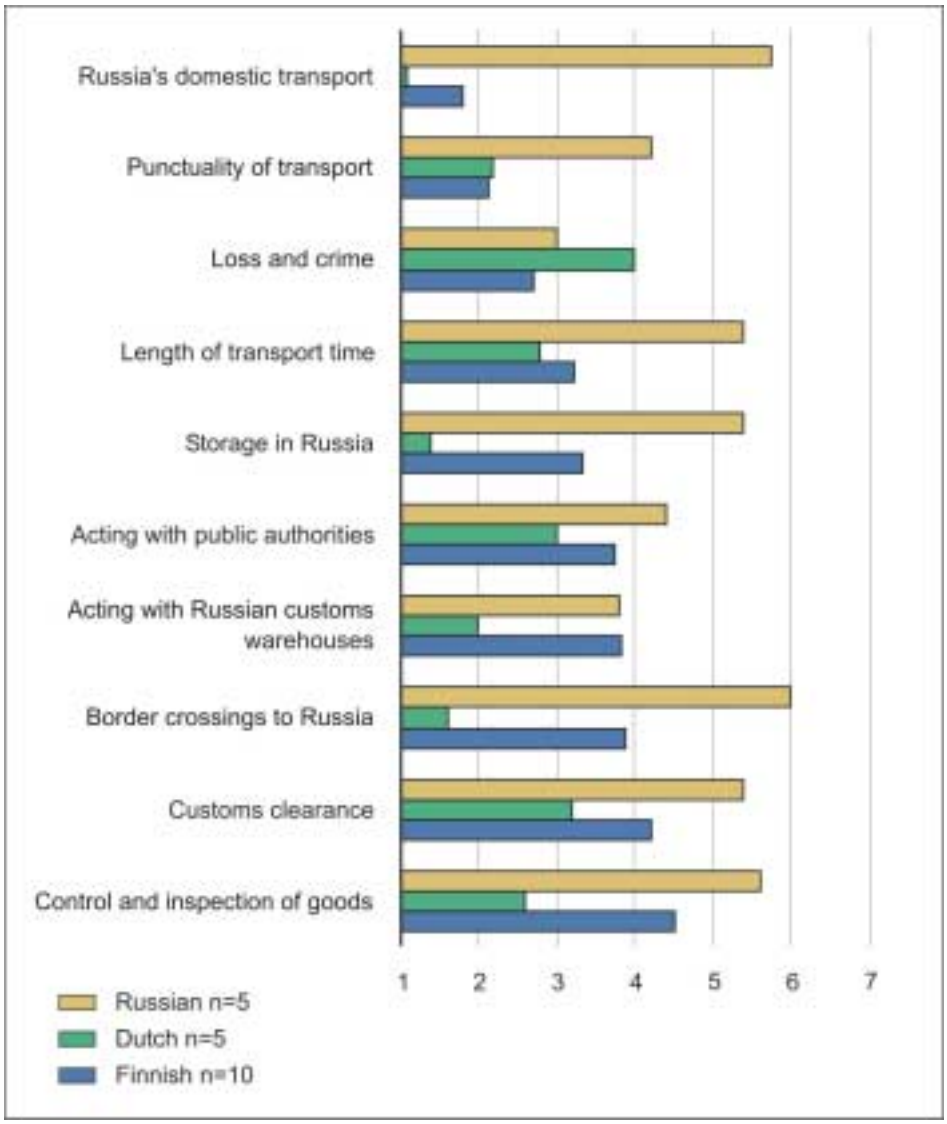


Figure 3.5. The level of problems (1 = no problem – 7 = very big problem) in the logistics and trade with Russia according to export and import companies. Source: LT-Consultants Ltd. et al., 2004.

The stabilisation of the economy and operating environment in **Russia** will increase interest in Russian markets and investments (including logistics systems). In Russian trade (also in exports to Russia) the Russian trade partner is often responsible of the transport of goods. The operating environment in Russia is considered unfamiliar and challenging in Western Europe with the respect to the above mentioned problems. Consequently, the responsibility of logistics is willingly passed on to a local partner who can operate better in possible problem situations. Western European companies also use Russian subsidiary companies as recipients of goods for making control of the delivery chain easier. On the other hand, the Russians are willing to control their own logistics and operate based on Russian agreements. (LT-Consultants et al., 2004; Laaksonen et al., 2004).

The location of customs terminals for particular products in Russia can affect the route choice of freight transport in Russia. For example, goods that have their destination in St. Petersburg may be transported through Moscow due to inexpensive customs clearance in Moscow.

Asia and especially Eastern Asia have e.g. the following special characteristics of logistics:

- Japan is clearly the forerunner in logistics and the supply of logistics services (warehousing, multimodal services) in Eastern Asia, which can also be seen in the cost level of services. Also, public authority activities are more distinct and predictable in Japan than in other Asian countries. Furthermore, telecommunications are highly developed. Japanese set very high quality requirements on logistics.
- Other clearly developed countries and areas in logistics include Hong Kong, South Korea, Taiwan and Singapore. There is tough mutual competition between these countries and they constantly develop their logistics for maintaining competitiveness.
- Of the great Asian economic areas, India and China have problems in logistics
- The production and international freight transport of Eastern Asia have concentrated on coasts and coastal ports, as international trade with North America and Europe is more significant than domestic trade. Consequently, internal ground transport connections and services are poorly developed. The cost of ground transport of deliveries can be very high in relation to total costs. The coastal area becomes congested with growing economy and production as well as rapid growth of coastal population.
- Air cargo transport has an important role in Eastern Asia, since its main trade partners are located far away. Thus, air cargo logistics is very well developed in South Korea, Hong Kong, Japan and Singapore. Growth of transport and congestion has contributed to the implementation of new cargo airports next to large hubs.
- The largest ports in Eastern Asia, Hong Kong and Singapore, have capacity problems which have promoted the development of other ports in the area and direct international connections from them
- Inland waterways provide important potential transport routes and inland waterway transport volumes have already increased in China

- Advanced regional economic cooperation of the type that prevails in the EU and NAFTA is missing in Asia. This is needed not only for overall development of infrastructure, but also for the harmonisation projects of logistics systems and business operations.
- The cost structure of logistics in Asia favours transport of full containers, and thus transport of small shipments is not yet as profitable as in Europe
- The use of containers is still small in inland freight transport of Asia.

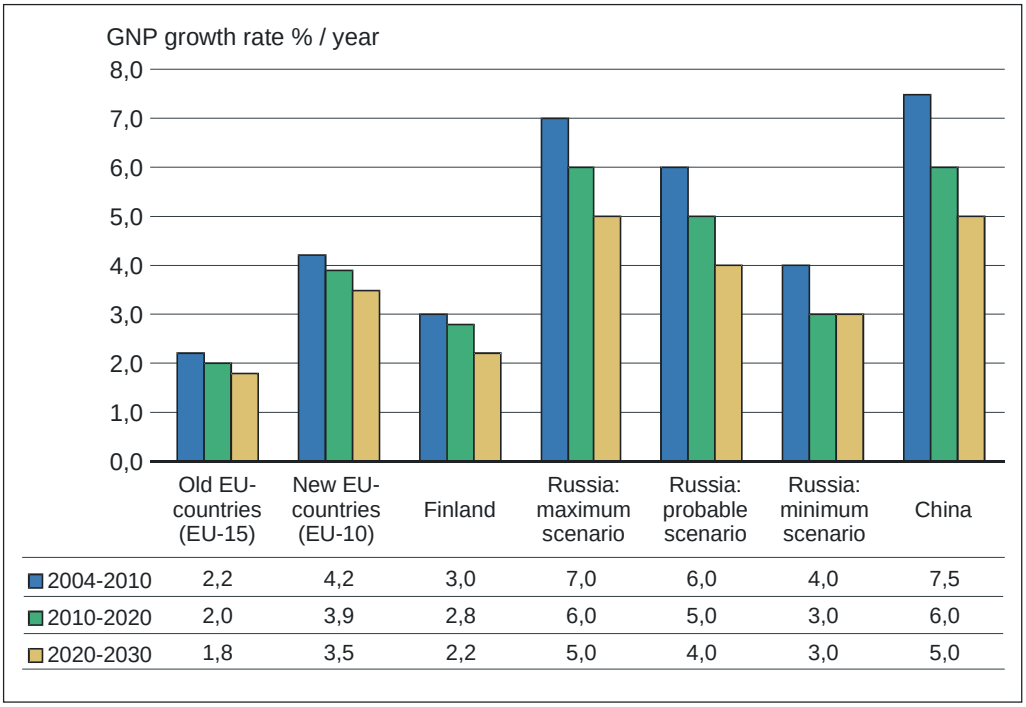
(United Nations, 2001 and 2003; Carruthers et al., 2003).

3.4 Outlook for economic development and trade flows

- Rates of growth will slow down in the future.
- The GNP of China will surpass the GNP level of the United States in the early 2020s.
- A wide forecast range is included in the estimated growth of Russia due to factors of uncertainty.
- The value of export is estimated to almost double from the current level in the old EU-countries, almost triple in the new EU-countries and grow by a factor of four in Russia by the year 2030.

The growth rates of economy will clearly slow down both in the EU and Russia due to an ageing population (Figure 3.6). Another reason for this is the fact that the growth rate's strong compounding effect cannot continue endlessly due to e.g. limited amount of non-renewable natural resources. Raw materials will not run out during the 30-year study period, but growth in demand will increase their cost. Thirdly, an even higher share of labour input will be in the service sector, especially in developed countries, in which the growth possibilities of profitability are more limited than in industry. The share of employment in primary production and industry is decreasing. In developing countries, strong rates of growth are gradually returning to a normal level of slower growth, when salary levels and other costs increase. Thus, these countries will not be so advantageous investment areas as they were previously.

China has the strongest outlook for growth. It is presumed in the forecast presented above, that China will reach a period of independent growth and not remain an economy of subsidiary companies. China acknowledges this risk and aims at attracting know-how through all available means. Furthermore, it is presumed in the forecast that the growing tension and difference in standard of living between the declining western and central parts or the so-called rural/chimney China and strongly export-oriented Eastern China can be solved peacefully. The minimum scenario for economic development in China includes the fact that these differences cannot be balanced enough which will lead to significantly slower growth than now during the 2020s and especially 2030s.



	Old EU-countries (EU-15)	New EU-countries (EU-10)	Finland	Russia: maximum scenario	Russia: probable scenario	Russia: minimum scenario	China
2004-2010	2,2	4,2	3,0	7,0	6,0	4,0	7,5
2010-2020	2,0	3,9	2,8	6,0	5,0	3,0	6,0
2020-2030	1,8	3,5	2,2	5,0	4,0	3,0	5,0

Figure 3.6. Estimated growth rates of the gross national product (% / year) in the old and new EU-countries, Finland, Russia and China.

The maximum scenario of **Russia** is close to the above mentioned probable scenario of China. In the maximum scenario, Russia will open up markets for competition and join the WTO, which will lead to a growth peak in the 2010s. The structure of export will become more versatile. Profitability along with the GNP per capita will grow throughout the national economy, which will lead close to the goal presented by president Putin, namely doubling of the GNP in 10 years.

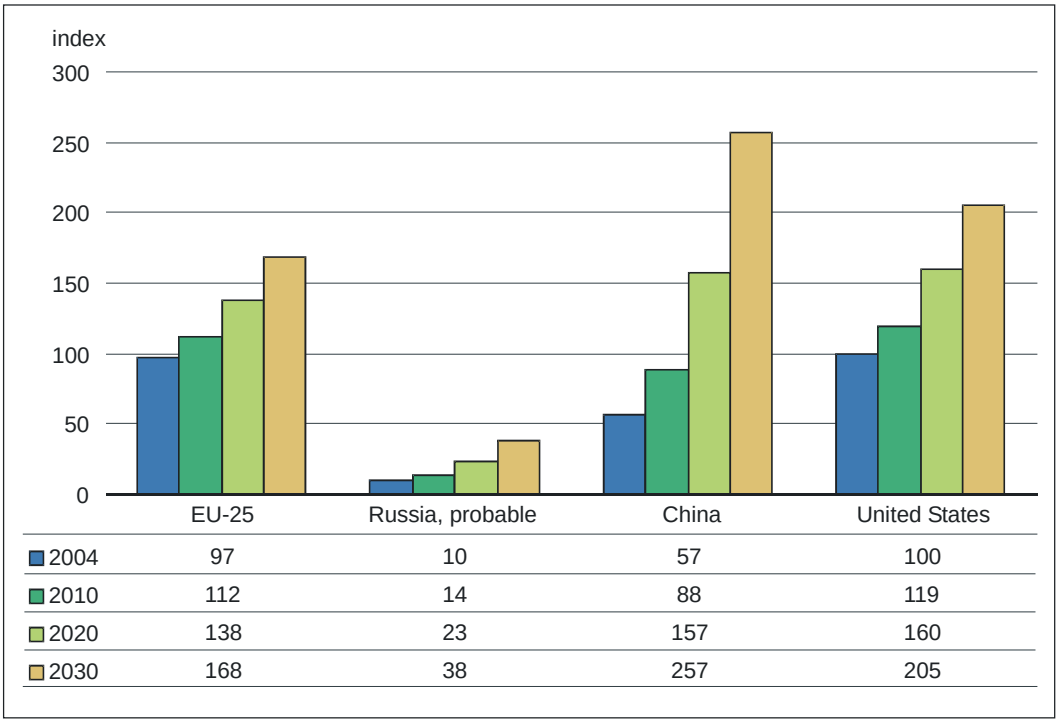
In the probable scenario of Russia, reforms will not proceed as fast as in the maximum scenario. The membership of the WTO will, however, be reached in the 2020s. This will lead to a growth peak. The production and export of Russia will be renewed and become more versatile similar to the maximum scenario, but at a considerably slower rate.

In the minimum scenario, Russia will not reach an independent growth phase. Russia will remain as a typical oil exporting country. Pressure groups guarding their own short-term interests will succeed in preventing the WTO agreement – the existing situation with protectionism will continue. Devaluations will be common in this scenario and trade will fluctuate. Foreign companies will not practically be allowed, for example, in many services.

In the **old EU-countries** (EU-15), growth will continue in the future following the same or slightly more modest phase (about 2 % / year), which it has already followed for the past 25 years. Most of the old European countries will be forced to endure structural reforms in the 2010s. Pressure will come from two directions: developing countries and multinational companies, which select a country that will provide the greatest benefits as a location for production.

In the new EU-countries price competitiveness will be better, salaries lower and the flexibility in economy and labour markets greater than in the old EU-countries. Correspondingly, their growth may be about 2 % faster than in the old EU-countries, which is also partly explained by a lower starting level of economy. The difference in the standard of living between the new and old countries will narrow. This will also occur between the new EU-countries themselves. Capital will flow as direct investments to countries with the lowest salary levels, where economic growth will accelerate. This model based on the capital movements and economies of subsidiary companies will, however, stop the development of a country when the standard of living of other countries is approached. Only those countries, which have entrepreneurship committed to their own country supported by domestic development input, will be capable of economic take-off.

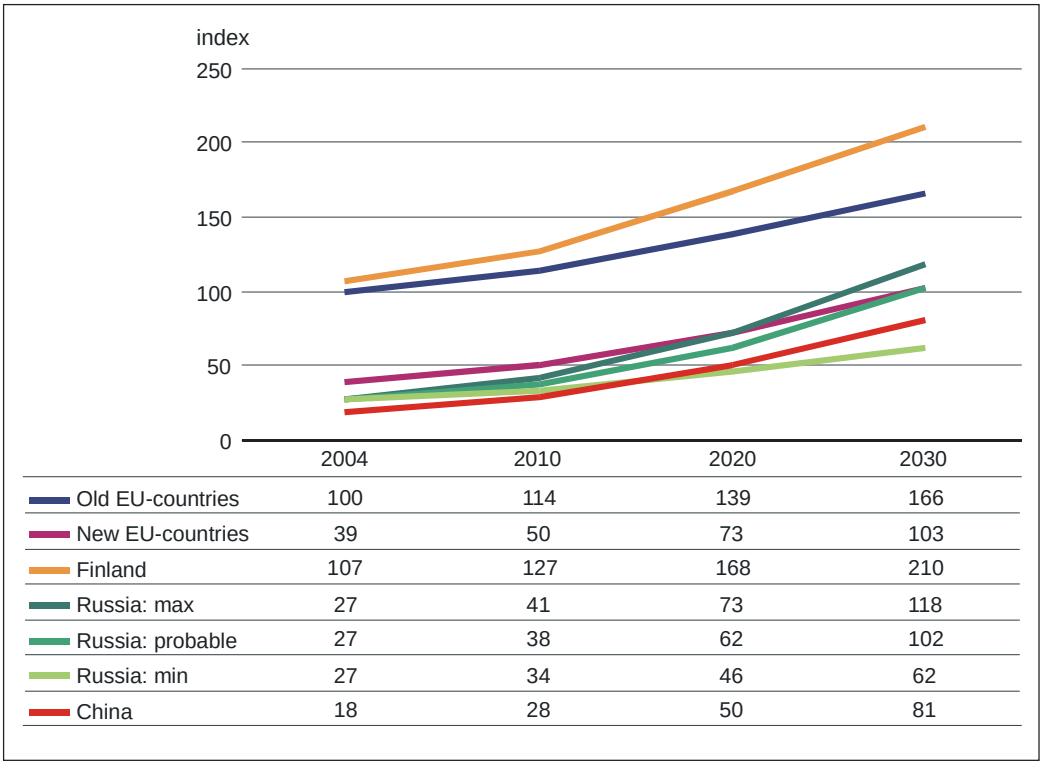
According to international estimates, the potential competitiveness of Finland has been at a high level for several years. A small share of this potential will be realised in growth. The better Finland succeeds, the better it can specialise in tasks requiring high knowledge, such as product development tasks.



	EU-25	Russia, probable	China	United States
2004	97	10	57	100
2010	112	14	88	119
2020	138	23	157	160
2030	168	38	257	205

Figure 3.7. The index of the gross national product in the year 2004 when the index of the United States is 100.

The focus of the world economy is shifting to the Far East. According to presented growth rates, the GNP of China will surpass the level of the GNP in the United States in the early 2020s. In the year 2030, the GNP of China will be 25 % higher than the GNP of the United States and 1,5-times higher than the GNP of the EU-25. In practice, the change will be even more dramatic, as there are many other countries in the Far East, in addition to China, which have reached the rapid growth phase or will reach it during the forecast period.



	2004	2010	2020	2030
Old EU-countries	100	114	139	166
New EU-countries	39	50	73	103
Finland	107	127	168	210
Russia: max	27	41	73	118
Russia: probable	27	38	62	102
Russia: min	27	34	46	62
China	18	28	50	81

Figure 3.8. The index of gross national product per capita in the year 2004 when the index of the old EU-countries is 100.

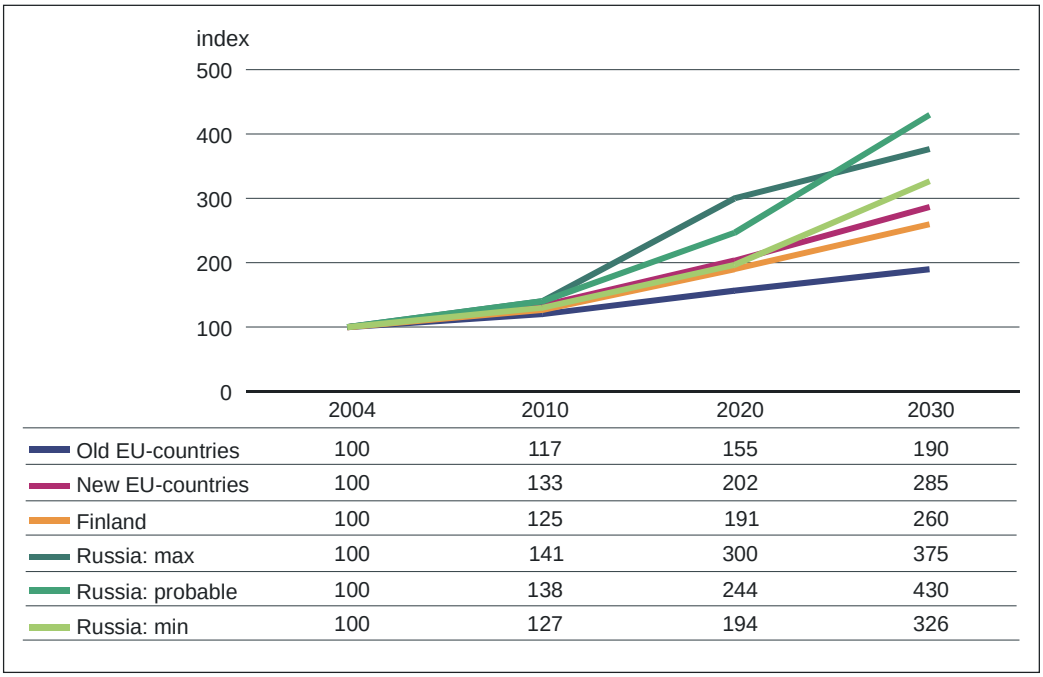
Gross national product per capita describes the degree of development, average standard of living and average productivity of a country. According to the prepared forecast, the GNP and GNP per capita in the maximum scenario of Russia in the year 2030 will be almost twice as high as in the minimum scenario. Thus, the range of forecast is wide and significant for the standard of living. If Russia develops according to the minimum scenario, China will pass the average standard of living in Russia at the end of the 2010s. If Russia develops according to the maximum scenario, it will pass the standard of living in the new EU-countries in the year 2020.

For the purpose of determining the value of export transport (and later export volume) the **rate of export** should also be determined. The existing rates of export and forecast for the year 2030 are presented in the following table.

Table 3.1 Rates of export (%) in the year 2004 and forecast for the year 2030.

	2004	**2030**
Old EU-countries	35	40
New EU-countries	53	57
Finland	37	49
Russia min/max/probable scenario	35	50/30/40

Rates of export will increase with globalisation. It is presumed that foreign trade will be balanced in the long run and so the rates of import will grow similarly. The minimum scenario for Russia includes the greatest growth in the rate of export, according to which Russia will become a typical oil exporting country, which cannot reach the phase of independent growth. In the maximum scenario, Russia will become a typical superpower, which has a relatively low rate of export due to enormous domestic markets, although absolute export volumes are greater than in the minimum scenario (Figure 3.9). The growth of the rate of export will be high also in Finland, which was considered to have growth potential in relation to the size of the country. In the year 2030, the rate of export will be lower only in the maximum scenario of Russia as compared to the year 2004.



	2004	2010	2020	2030
Old EU-countries	100	117	155	190
New EU-countries	100	133	202	285
Finland	100	125	191	260
Russia: max	100	141	300	375
Russia: probable	100	138	244	430
Russia: min	100	127	194	326

Figure 3.9. Export index during 2004–2030, when 2004 = 100.

In the minimum scenario of Russia, export will mainly consist of raw materials and energy similar to the development so far. In the probable and especially in the maximum scenarios, the structure of export will be very different. Refined products will have a considerable share. As the value of export in the maximum scenario is only 15 % higher than in the minimum scenario, this indicates that raw materials and energy will be exported far less in the maximum scenario. They will even be saved for future generations, whereas this will not happen in the minimum scenario. In the maximum scenario, more valuable goods will be transported to a greater extent in containers as compared to bulk cargo in the minimum scenario.

The China-phenomenon also means that capital movements will replace the traditional movements of goods. European companies go to China and manufacture products for selling a portion of them there and maybe importing a smaller portion to Europe. Planning, know-how and some valuable components are exported from Europe. This also applies to the investments of the old EU-countries

in the new EU-countries. When a developing country advances to the phase of growth, it will start to export more products and more developed products. Trade flows and freight transport from China and other countries of the Far East, and on the other hand from the new EU-countries, to the old EU-countries will thus significantly increase later.

3.5 Current freight transport flows and development outlook

- A share of 70 % of the Russian export is directed to Europe and it mainly consists of dry bulk and liquid bulk. The mutual trade between the CIS-countries is emphasised in import.
- During the boom of oil prices Russia has aimed at fully utilizing growing export possibilities, but the total production of oil has not yet reached the level of the Soviet era despite an annual growth rate of 10 %.
- The import and export of Russia excluding energy products are expected to triple and become more versatile in the probable scenario by the year 2030.

Current freight transport

The total import volume of Russia was 120 million tonnes and export volume was 530 million tonnes in the year 2003. A share of 70 % of the Russian export is directed to Europe and mainly consists of liquid bulk (oil and oil products) and dry bulk (Figure 3.10). The most important areas of import for Russia include the CIS and Southeastern Asia, where mainly dry bulk is imported from. Import from Europe mainly consists of unitized cargo.

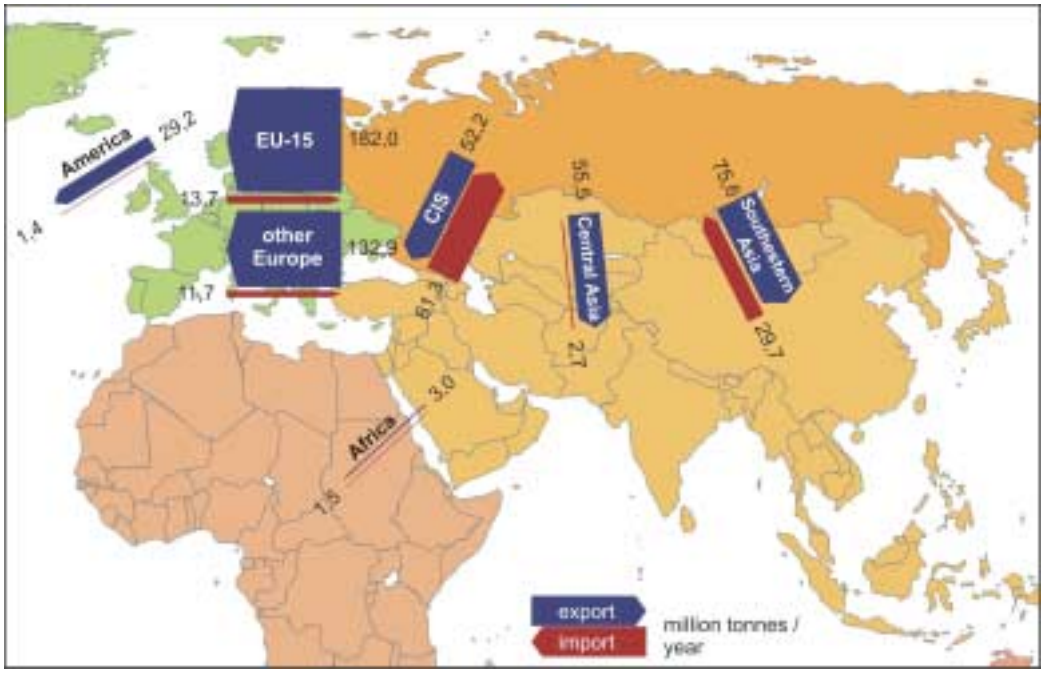


Figure 3.10. Import and export of Russia in 2003 (million tonnes/year). Source: Mahlin, 2004.

Outlook for freight transport

According to the freight transport scenario (TEN-STAC, 2003), freight transport between the EU15+2-region[1] and "other European countries" [2] as well as between the CEEC-countries[3] and "other European countries" will grow by a factor of almost three during the years 2000–2020. The estimated growth of freight transport will be very close to the growth of the GNP in Russia in the maximum scenario, as described in Chapter 3.4.

It is expected that the greatest growth will occur in the transport of metals and chemicals. Transport of liquid fuel will increase especially between EU15+2 and other European countries (growth by a factor of almost four).

In freight transport between the EU15+2-region and other European countries, the volumes of all modes of transport will double or triple by the year 2020. It is expected that the most significant growth will occur in inland waterway transport (growth by a factor of over three). This is enabled by the investments of the EU and Russia in the operability of inland waterway networks. Road transport between the former CEEC-countries and other European countries will grow by a factor of almost seven by the year 2020 (Figure 3.11).

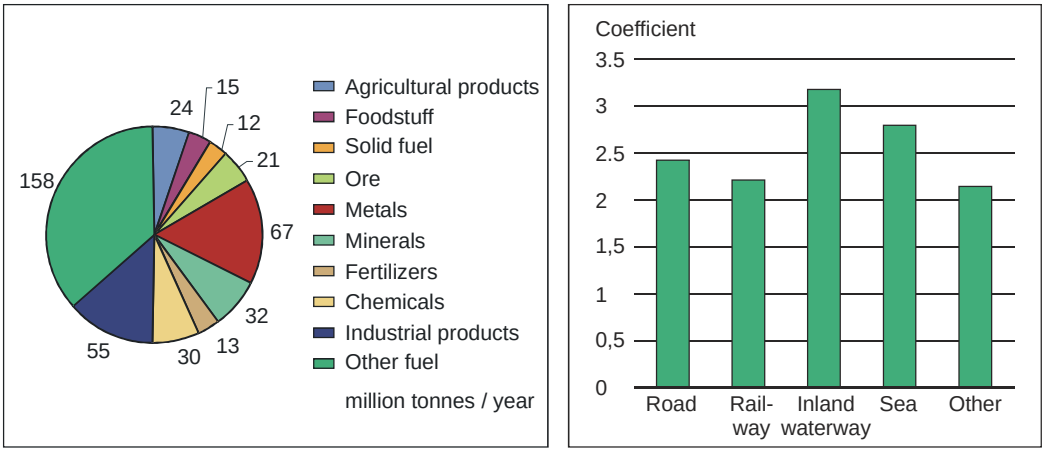


Figure 3.11. Freight transport scenario by types of goods in the year 2020 (million of tonnes/year) between the EU15+2 and "other European countries"[1] as well as the coefficient of development by mode of transport, TREND+ -scenario. Source: TEN-STAC, 2003.

The share of Finland is not indicated in the above calculations. Due to this, an estimate was prepared which describes freight transport between the EU and Russia as well as between the EU and the CIS in a way that the share of Finland is indicated. The forecast year is 2030. The examination is based on the growth scenarios of Russia and other countries, which are presented in Chapter 3.1. The current situation is based on the statistics of Eurostat. The export index indicates

[1] EU15+2 –region: The Netherlands, Belgium, Spain, Ireland, Great Britain, Italy, Austria, Greece, Luxemburg, Norway, Portugal, France, Sweden, Germany, Finland, Switzerland, Denmark
[2] Other European countries: Albania, Bosnia and Herzegovina, Island, Yugoslavia, Croatia, Macedonia, Moldova, Ukraine, Belorussia, Russia
[3] CEEC-countries: Bulgaria, Latvia, Lithuania, Poland, Romania, Slovakia, Slovenia, Czech Republic, Hungary, Estonia

the growth of export ability and the GNP index indicates the willingness to import. It is estimated that the growth of trade between countries is described by the geometric average of the export index of an exporting country and the GNP index of an importing country. The estimate of freight transport volumes is presented in Figure 3.15 in which oil and oil products are included from energy products. The CIS is expected to satisfy about half of the additional need for oil of the EU. The transport routes of energy products are difficult to predict. The annual capacity of one crude oil pipe is about 55 million tonnes. If the pipe is international, the construction of it is even more difficult than an oil port of similar volume. However, there is significant pressure on transport investments for energy products between Russia and the CIS as well as Russia and the EU despite the type of investments (oil or gas pipe, electric line or oil port).

The growth rates between this forecast for the year 2030 and the TEN-STAC forecast for the year 2020 correspond quite well with each other. According to the forecast, both import to and export from Russia and the CIS-countries will almost triple by the year 2030 (Figure 3.12). Geographically, it is essential that freight transport of the so-called old EU (EU-15) is the type that will use the Baltic Sea as a realistic alternative, whereas the new member countries mainly use ground transport.

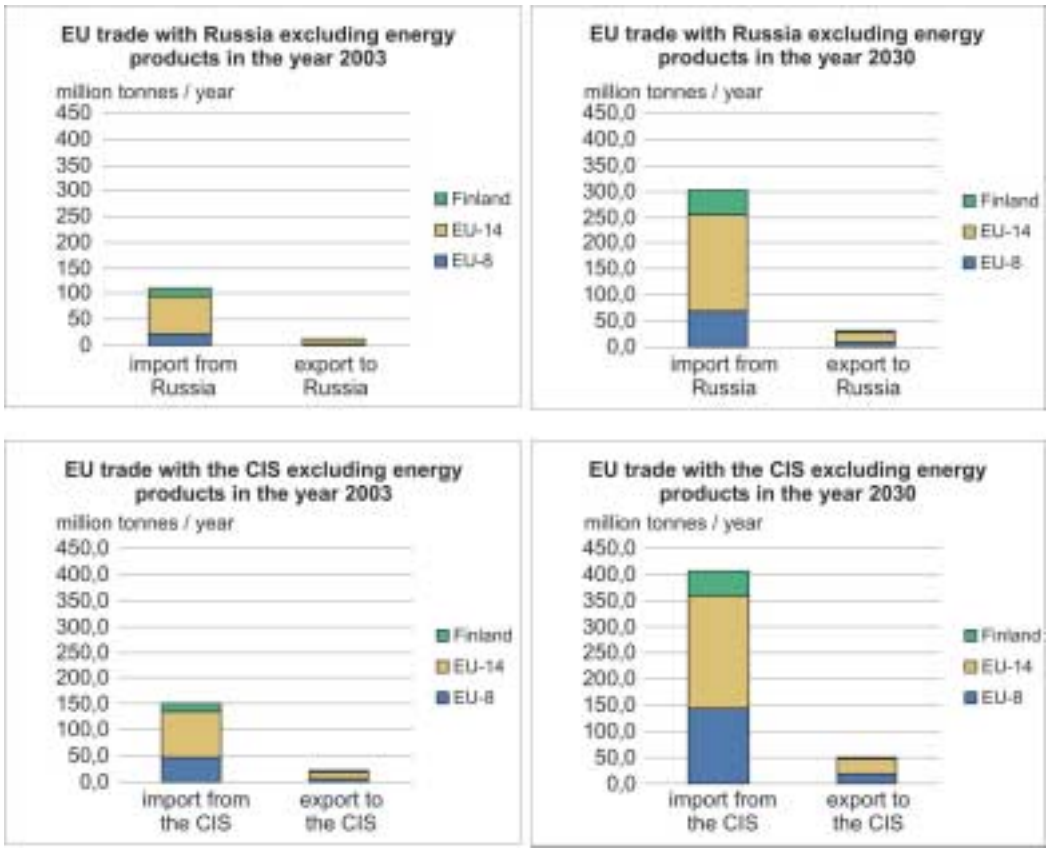


Figure 3.12. Trade between the EU and Russia as well as the EU and the CIS excluding energy products in 2003 and forecast for the year 2030. EU-14 = EU-15 excluding Finland, EU-8 = new member countries excluding Malta and Cyprus.

The most significant transport flows between Russia and the EU are directed through the central ports of the Baltic Sea (the Gulf of Finland and the Baltic countries). The ground transport route through Belorussia, Poland and Germany has a very modest role. The significance of this route will not be great in the future either due to barriers caused by the infrastructure and public authority activities in Belorussia. Transport flows between Russia and the west are presented in the following figures (Figures 3.13–3.16). The significance of the route through Finland is emphasised when the flows of valuable goods (for example machines and consumer goods) are examined only. The most significant growth in freight transport other than energy transport will occur in the Russian ports of the Gulf of Finland and on the Germany–Poland-route in which transport volumes will more than triple during the study period. The route through the Baltic ports will maintain its position.

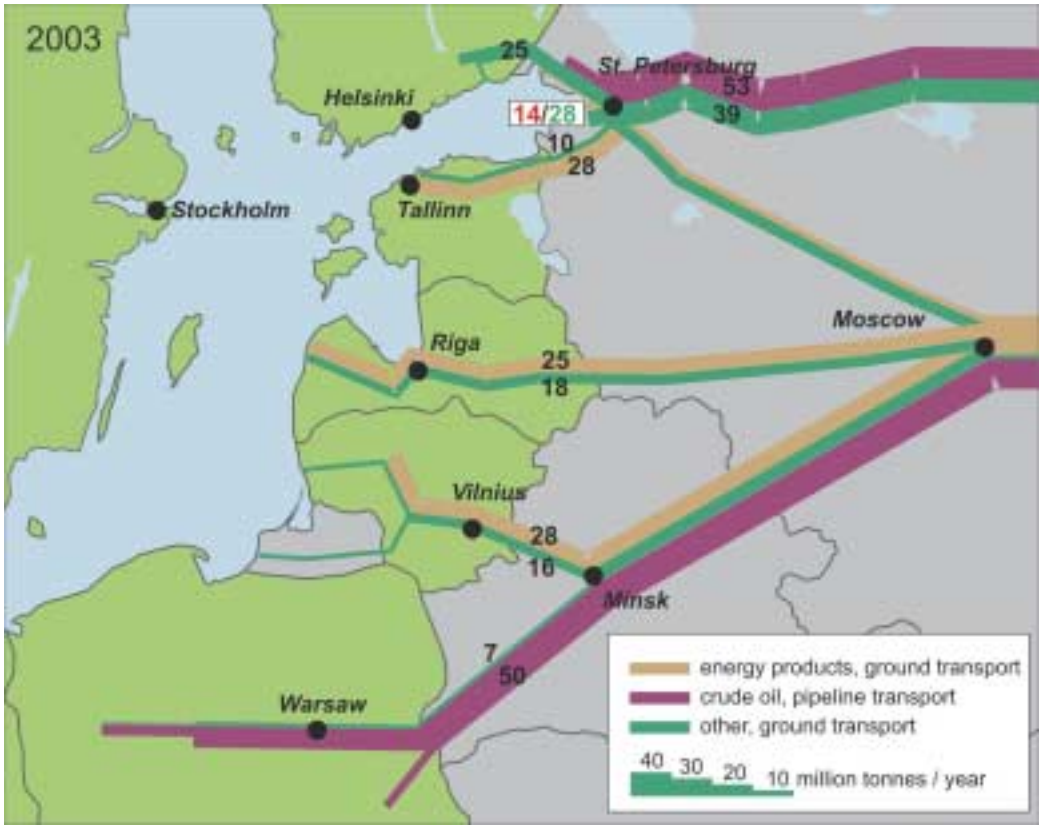


Figure 3.13. Russia's main transport routes to the west; import, export and transit traffic in 2003, million tonnes/year. Source: Mahlin, 2004.

Ground transport flows to Finland across the eastern border were over 25 million tonnes in the year 2003 including transit traffic. In addition, over 10 million tonnes of energy products came from Russia directly by sea. Russia had a "self-sufficiency" of about 50 % in export transport in the year 2003 if the direct crude oil pipeline to Central Europe is included. Even though Russia will significantly increase its port capacity, the market share of ports will only significantly increase for energy products. Part of the growth of total volumes of import and export will be directed to existing countries with transit traffic.

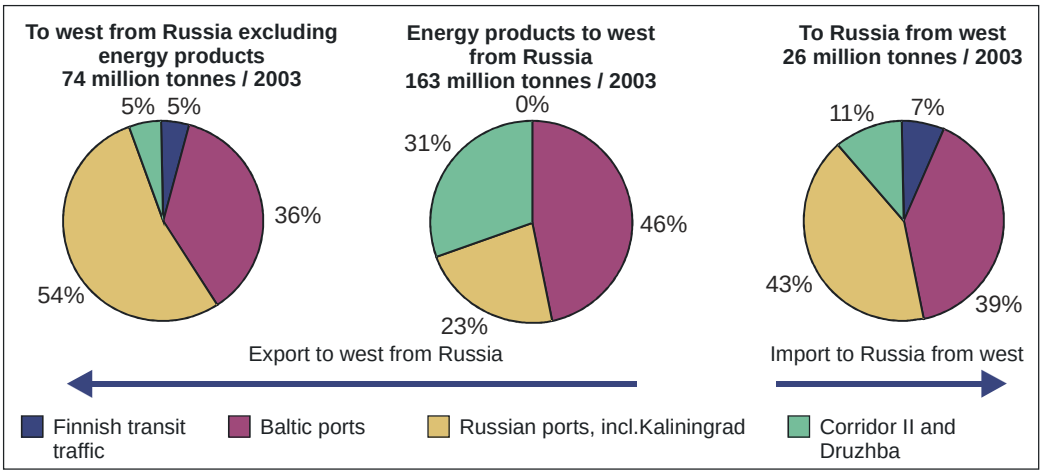


Figure 3.14. The share of the examined Russian domestic ports and routes of transit traffic in the year 2003.

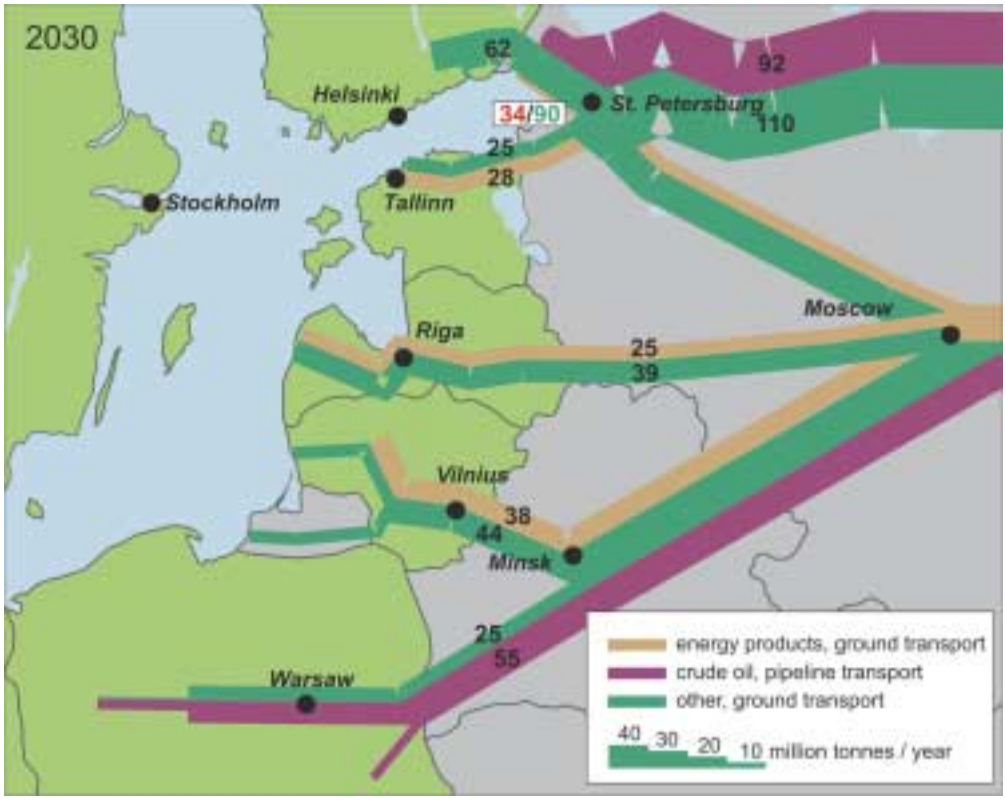


Figure 3.15. Scenario of Russia's main transport route to the west; import, export and transit traffic in the year 2030, million tonnes/year.

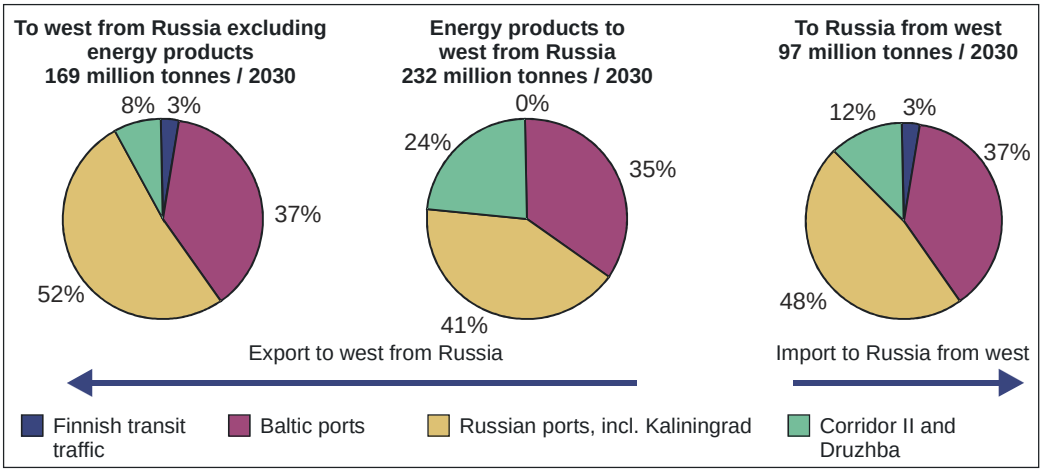


Figure 3.16. The development of the share of the examined Russian domestic ports and routes of transit traffic by the year 2030.

3.6 Transport connections of Eurasia

- The most important freight transport routes between the European Union and Russia are the routes through the ports of Finland, Russia and the Baltic countries which use the ”Motorway of the Baltic Sea” and which deliver about 40 % of Russian foreign trade.
- The most significant ground transport route is the route through Germany, Poland and Belorussia.
- The Trans-Siberian railway is a natural extension to the above mentioned routes, which enables fast container transport from the Far East to Europe (about 11 days on a special train).
- The ocean route through the Suez Canal is the most important freight transport connection between Europe and Asia. The problem is the duration of transport. Total delivery time from the supplier to the customer can be more than 45 days.
- The western part of the Arctic Sea route has a great significance to Russian foreign trade. The eastern parts of the route are difficult to navigate and they are mainly used for service transport of local settlements and industry.
- Many countries on the TRACECA-route are politically unstable. The use of the route is disrupted by the Caucasus Mountains and crossing of the Caspian Sea.

The study includes the most important freight transport routes between the European Union and Russia (Figure 3.17). Especially the Motorways of the Baltic Sea -route (or transport through the Baltic ports of Finland, the Baltic countries and Russia) with extensions to the main centres in Russia and to the Eurasian transport network are studied in more detail. About 40 % of the transport in Russian foreign trade is directed through these routes. With regard to ground transport routes, mainly the route through Germany, Poland and Belorussia is studied, of which the Pan-European Corridor 2 constitutes a significant part. The

characteristics and development outlook of these routes are described in more detail in Chapter 4.

The Trans-Siberian railway reaching out to the Far East, which serves as an extension to all examined main transport routes between Europe and Russia, is described in this chapter and the route card in the appendix. The ocean route is the most important freight transport connection between Europe and Asia, as a significant share of total freight flows are transported by sea. The significance of the Arctic Sea connection to the ports of Northwestern Russia (mainly to Murmansk) is increasing. The North-South Corridor in Russia serves as an extension of Corridor 9 to the Black Sea and the Caucasus. The TRACECA-route consists of several railway and road connections between Eastern Europe and Northern China. The significance of this route is small due to political reasons.

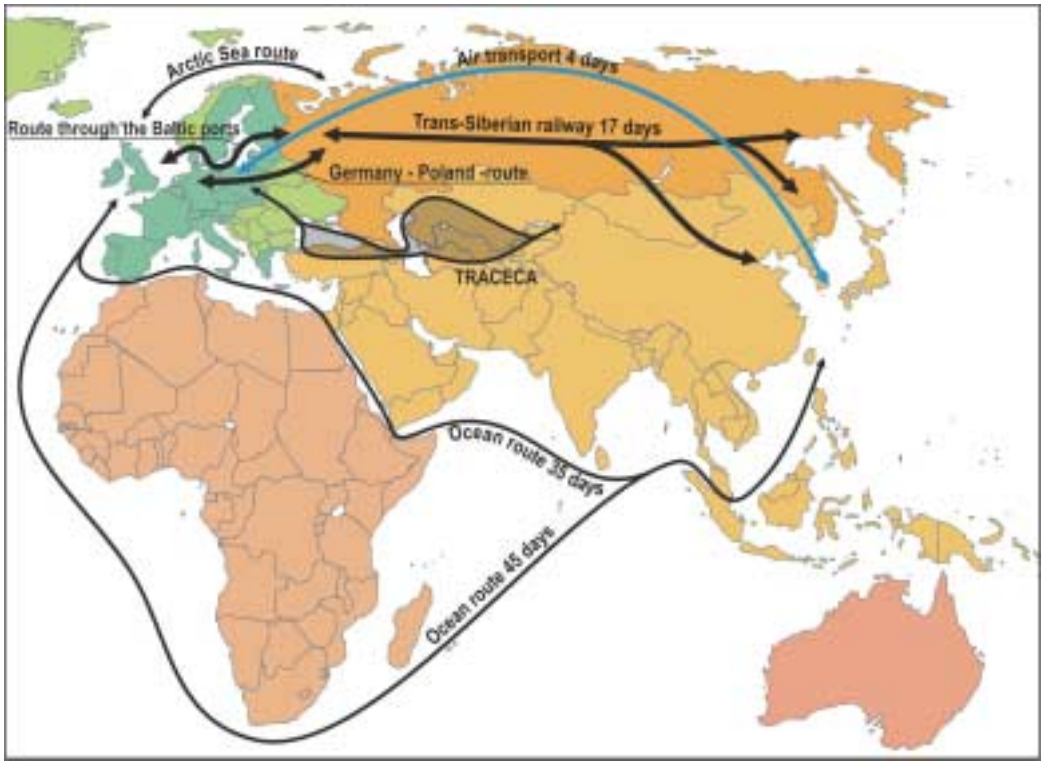


Figure 3.17. The examined transport routes.

Significance of different modes of transport

Sea transport has the most significant share of freight transport between Europe and Asia. Important ocean ports are located in the Benelux-countries in Europe and the Southeastern coast of Asia. There are frequent transport connections between these ports and even larger vessels are used for transport. Extensive feeder transport connections serve further connections in Europe. River transport has a significant share in inland transport in Asia.

Air cargo transport is very frequent between the opposite ends of Eurasia. The share of air cargo transport between Europe and Asia (excluding Southwestern Asia) is about one-fifth of the worldwide air cargo. It is expected that the share

of air cargo transport between Asia and Europe will grow annually about 7 %. (Boeing, 2004).

The most important and only significant connection in railway transport is the Trans-Siberian railway with its branches. The railway provides a competitive alternative to air and sea transport for some products. The construction of additional branches to, for example, Korea has been delayed due to the political situation in North Korea.

Road connections are the bottlenecks of transport chains both in Europe and Asia. Congestion creates a problem especially in Central Europe. The road network is quite incomplete and of poor technical standard in Asia.

The Trans-Siberian railway

The Trans-Siberian railway together with the Moscow–St. Petersburg and Moscow–Brest-railways constitute the backbone of the Russian transport system. The railway connects the western border and major centres of Russia to the Urals, Western and Eastern Siberia and the Far East. There are frequent sea transport connections from the Far East ports of Russia (Vanino, Vostochny, Nahodka, Vladivostok) to Japan, South Korea, South China, Taiwan and the countries of Southeastern Asia. The railway constitutes a part of the planned multimodal N.E.W-corridor (Northern East West Freight Corridor), which connects North America, Europe and Asia.

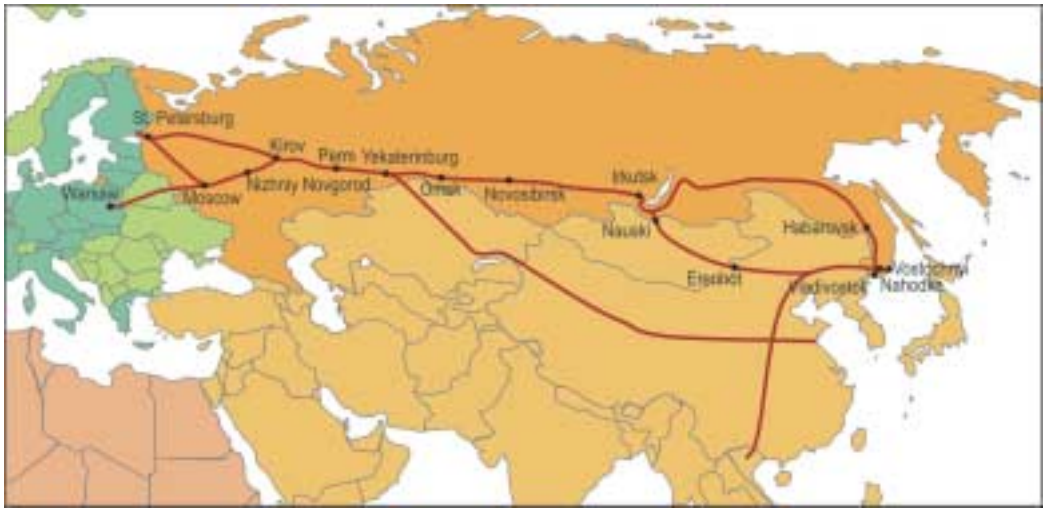


Figure 3.18. The Trans-Siberian railway.

The Trans-Siberian railway serves transport within and between the regions of Russia as well as the transport of foreign trade. Technically, the railway is one of the most developed routes in Russia. Annual transport volumes are 80–90 million tonnes on the most loaded sections. The capacity of the railway is sufficient at the present, as 46–60 million tonnes of the capacity of about 100 million tonnes is annually in use. In recent years, container transport has increased in fast special trains from the ports of the Far East to Finland, Central Asia and Brest. Transport flow to Finland has the highest volume of all these. The devel-

opment of container transport on the Trans-Siberian railway during 1998–2003 is presented in Figure 3.19. International transport volumes almost doubled between the years 2002 and 2003 to almost 100 000 TEUs per year.

Examples of transport times on the Trans-Siberian railway are presented in Table 3.2. Sea transport times from the ports of Japan, the Republic of Korea and China as well as transport times at the western end should be added, if needed, to the transport times from Nahodka. For example, Berlin can be reached from Nahodka in 14,5 days. Railway transport between Shanghai and Europe is clearly slower than railway transport on the Trans-Siberian railway. This is due to operational and infrastructure problems in railway transport in China. Sea transport from the ports of Japan, China or South Korea to European ports takes 30–45 days of which the transport time between ports is 28–32 days. (TIS, VR Cargo, CCTST).

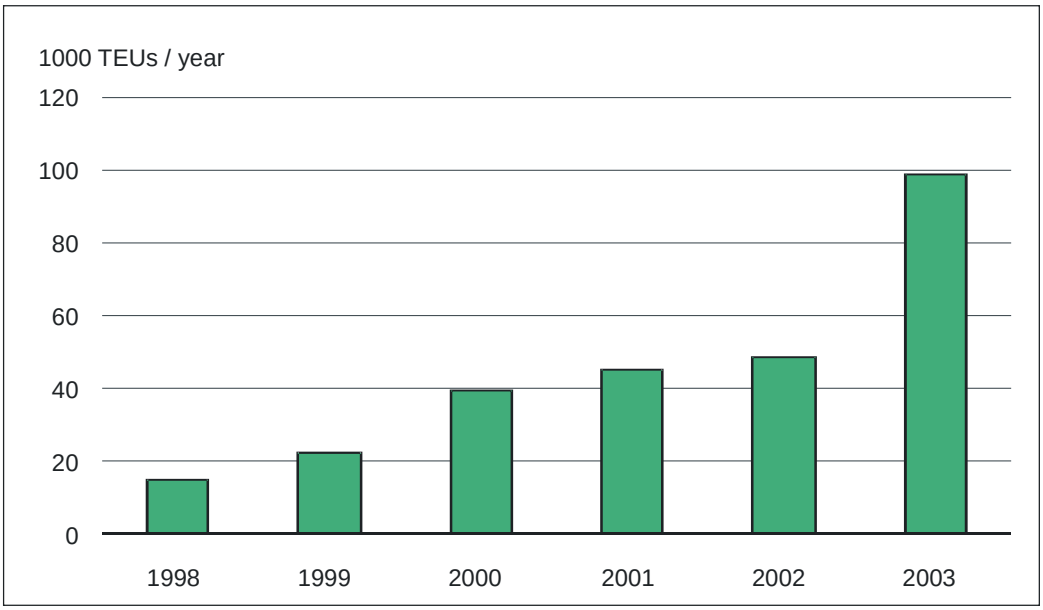


Figure 3.19. Development of international container transport on the Trans-Siberian railway during 1998–2003 (1 000 TEUs / year). Source: Mahlin, 2004.

Table 3.2. Examples of transport times on the Trans-Siberian railway. Source: TIS, VR Cargo, CCTST.

Route	Transport times, days
Nahodka–Buslovskaja / Vainikkala	11–13
Nahodka–Krasnoye (Belorussian border)	12
Nahodka–Zemova (Ukrainian border)	12
Shanghai–Kotka	18–22
Shanghai–Moscow	20
Shanghai–Central Europe	25

The **problems** of the Trans-Siberian railway include:

- Need for new investments, if load on the railway grows significantly from the current situation
- Rail yards of ports, sorting yards and terminals of nodal points are in need of extension
- Another bridge across the Amur River is needed (only 1 pair of tracks on the existing bridge)
- Insufficient number of container freight wagons, especially for 40-foot containers
- Lack of confidence in railway services, especially in Japan, due to constantly changing legislation and interpretation of customs regulations in Russia. Also, the organizational reform of the RZD is still incomplete.
- Ready-made logistics systems of large companies based on ocean transport and unwillingness to change them.

Development projects related to the Trans-Siberian railway include:

- Stabilisation of the common economic situation of the RZD
- Development of quality in services
- Integration with the Eurasian transport system
- Partial upgrading of the railway: reinforcement of the rail bed at locations where its weakness or deterioration affect the longevity of superstructure and maintenance costs
- Construction of another bridge across the Amur River
- Electrification of the connecting railways to the Trans-Siberian railway, development of rail yards and terminals of ports and other nodal points. Increasing the number of handling points for 40-foot containers.
- Development of the nodal points in St. Petersburg and Moscow: rail yards, terminals. Better connections to airports.
- Moving freight traffic away from the Moscow–St. Petersburg-railway to the Moscow–Velikije Luk–Mga–St. Petersburg and Moscow–Jaroslavl–Vologda–St. Petersburg-railways. The Velikije Luk – St. Petersburg -railway requires upgrade investments.

Eurasian ocean route

The ocean route around Africa or shortcut through the Suez Canal is the most important trade route between the Far East, Southeastern Asia and Europe. Large, global companies have developed an efficient logistics system which consists of a collection and delivery network at both ends, terminals and large vessels for which the Postpanamax-type of vessels can transport 5 000 TEUs at a time. Eastern ports of departure include Yokohama, Pusan, Hong Kong, Singapore, Munbay and Shanghai. Transport time from the Far East to a European delivery port is 28–32 days through the Suez Canal. Mooring time at ports and duration of further deliveries should be added to transport time. Thus, the delivery time of a product or a container from the supplier to the customer can be over 45 days on the transport route through the Suez Canal (Far East Transport Group).

Arctic Sea route

The western part of the Arctic Sea route, the Barents area, is very significant for the foreign trade of Russia. In the year 2003, about 22 million tonnes of cargo were transported through the port of Murmansk and about 3 million tonnes of cargo through the port of Archangelsk. Navigation conditions in Murmansk are good all-year round, while the ice conditions at the port of Archangelsk are difficult. The problem with both ports is their distant location away from the main centres of Russia. The Barents area, including the Komi, is rich in natural resources. Due to the policy of favouring domestic ports in Russia, the development of the port of Murmansk is supported.

The eastern parts of the Arctic Ocean are sometimes hard to navigate even in the summer. Navigation conditions are easy from the west to the Kara Gate. Pack ice can still remain in the Kara Sea in the summer. Icebreaker assistance is always needed in the Laptev and East Siberian Seas and high ice classification is required from ships. Due to these circumstances, transport in the eastern parts of the Arctic Sea mainly consists of service transport to arctic residential and industrial areas primarily during the summer months. Also, transport related to the construction projects of arctic oil and gas fields occur on the route. Transport volumes of the ports located east of the Kara Gate were modest in the year 2003 (Transito, 2004):

- Nanjan-Mar 28 000 tonnes
- Tiksi 12 000 tonnes
- Amderma 4 000 tonnes

Transport to the eastern areas is carried out both from western and eastern direction through the Bering Strait all the way to Tiksi. It is considered in Russia that the use of the Northeastern Passage as a Eurasian corridor for transit traffic is not profitable in current circumstances. (Mahlin, 2004).

The North-South corridor of Russia

The west-east Corridor 2 together with the Trans-Siberian railway and the North-South corridor, which serves as a Eurasian extension of the Pan-European Transport Corridor 9, are defined as the main routes of transport in the Transport Strategy of the Russian Federation.

The purpose of the North-South corridor is to extend the impact area of the Transport Corridor 9 and develop connections to:

- the coastal area and ports of the Black Sea in Russia (e.g. Novorossiisk, Tuapse)
- the Caucasus (Georgia, Azerbaijan, Armenia)
- the Caspian Sea area:
  - the Central Asian countries of the CIS
  - Iran and to the ocean through it
  - the developing TRACECA-corridor.

The northern part of the route from the Finnish border to Moscow consists of the Pan-European Transport Corridor 9A. The route to the south of Moscow has two branches: in the direction of the Black Sea and the Caspian Sea. Railway connections on both branches of the corridor meet the technical standards required from the main railway network of Russia (maximum axle loads, length and speed of trains). The level of road connections on the route in the Caucasus and Central Asia is lower than the existing level in Russia.

The Black Sea route

Considerable freight flows of Russian foreign trade are directed through the large ports of the Black Sea. In the year 2003, 88,4 million tonnes of freight were transported through Novorossiisk and 17,7 million tonnes of freight through Tuapse. The hinterland of these ports is, however, different than that of the Baltic ports. A considerable increase in the use of the Black Sea is disrupted by the unfavourable location of ports in relation to new deposits of natural resources in Russia and to foreign trade partners as well as problems in the use of the Bospor Strait.

TRACECA

The TRACECA (Transport Corridor Europe–Caucasus–Asia) is a transport corridor from Europe to Asia through the Caucasus. The following countries have expressed their interest in developing the corridor:

- European countries: Bulgaria, Romania, Turkey, Ukraine, Moldova
- Caucasian countries: Georgia, Armenia, Azerbaijan
- Central Asian republics: Kazakhstan, Uzbekistan, Turkmenistan, Kyrgyzstan, Tajikistan.

A conference was held in the year 1993 to start development work and basic agreement on international transport in the corridor was signed in 1998. The TRACECA is technically and politically a difficult transport corridor. Many TRACECA-countries are politically unstable and some countries have regional conflicts (Moldova, Georgia, Central Asia). The route has two ferry transport connections (across the Black Sea and the Caspian Sea) and the Caucasus Mountains. These disrupt freight transport and thus international transport has concentrated on ocean routes. The development of the TRACECA to an international corridor will require the stabilisation of circumstances in the Caucasus and Central Asia as well as large investments for the upgrading of the railway network and modernisation of ferry stock for these connections. (GIPRO-TRANSTEI; International Railway Journal 06/2004).

4 MAIN TRANSPORT ROUTES BETWEEN THE EU AND RUSSIA

After the disintegration of the Soviet Union, the Baltic ports at the bottom of the Gulf of Finland and Kaliningrad remained in the use of Russia. Severe ice conditions constitute a problem in the eastern part of the Gulf of Finland. Port capacity in the area has significantly increased in the past few years. Direct ground transport connection to the central parts of Russia through Lithuania and Belorussia complicates the use of the ports of Kaliningrad.

The Baltic and Finnish ports have a significant share of the freight transport of Russian foreign trade. In addition to insufficient capacity of Russian domestic ports, also the growth of Russian economy and foreign trade together with oil pipelines leading to the Baltic ports have contributed to large transit traffic volumes.

The development of ground transport connections between Russia and Central Europe has been slowed down by:

- a high share of liquid bulk in Russian transport, which promotes the demand for sea and pipeline transport
- fewer resources for the development of ground transport connections
- difficulties in international development cooperation for the route.

Transit traffic volumes of Russia have a significant socioeconomic impact, especially in the Baltic countries. There is strong competition in growing volumes, which is promoted by Russia's own port investments and policy of favouring domestic ports.

The share of unitized cargo in Russian transport to Europe will increase in the future. Then the speed and quality of logistics services, handling speed of unit loads and seamless border crossing operations will be more and more emphasised on transport routes.

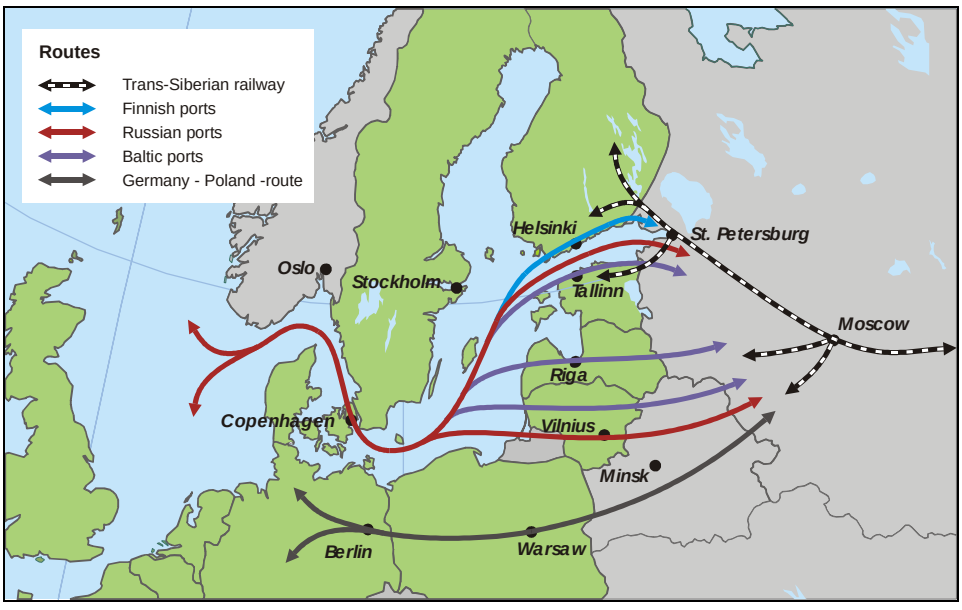


Figure 4.1. Main transport routes between the EU and Russia in comparison.

A summary of the description of the above mentioned transport routes is presented in Table 4.1. Each route is described in more detail in Chapters 4.1–4.4. The competitiveness and market position of routes is examined in Chapter 5.

Table 4.1 Summary of the studied routes.

Route	Significance for transport	Modes of transport	Greatest problems and development projects
Germany–Poland	- Connects TEN-network to the Eurasian corridors of Russia (Trans-Siberian railway and North-South corridor of Russia). - Great national significance in Russia and Belorussia.	- Multimodal Eurasian corridor (railway, road, waterway, connection to the inland waterway network of Russia).	*Railway:* - Transhipment in Brest. Automatic rail gauge transfer system of wagons is being developed. - Upgrading work for higher speeds on entire route. *Road:* - The Polish segment is very congested. Long waiting times at the Belorussian–Polish-border. Upgrading of the Polish segment.
Route through the Russian ports	- The most important foreign trade route of Russia together with the ports of Finland and the Baltic countries.	- Multimodal corridor, which provides a connection to the main centres of Russia, deposits of natural resources, the Eurasian network (Siberian railway and national corridors) as well as inland waterway network. - Connection to main pipelines.	- Location of the great port of St. Petersburg within the metropolitan area, difficult navigating conditions in the winter. - Environmental risks. - Extension of the Primorsk oil port, construction of the Vysotsk port of the Lukoil, development of Ust Luga port. - Ground transport connections to ports.
Route through the Baltic ports	- Competent ports with regard to geographical location and navigation. - Good ground transport connections to Russia.	- Multimodal corridor, which is mainly oriented to serving transit traffic to Russia and other CIS-countries. - Dry and liquid bulk is the largest product group - Ro-Ro-transport is important.	- Efficient ports in transport of bulk cargo. - Container transport is less developed. - Deficiencies in environmental protection and prevention of accidents. - Construction of a deep-water port at Sillamäe.
Route through the Finnish ports	- The best line service to the core areas of Europe. - Efficient ports. - High environmental and safety standards. - Developed ground transport connections to Russia and its Eurasian connections.	- Multimodal corridor, which is oriented to demanding transport operations (handling of containers, handling of hazardous chemicals, Ro-Ro-transport). - Empty containers from Russia are used in own export transport of Finland.	- E18-motoway in Finland. - Upgrading of Moscow–St. Petersburg–Finnish border-road connection. - Rail capacity is almost at maximum. - Increase of axle load to 25 tonnes on the Finnish rail section. - In addition to Kerava–Lahti direct rail line, investments are needed in high-speed railway traffic to the east of Lahti. - Investments in the St. Petersburg–Vyborg-railway and increasing speed between Moscow–St. Petersburg.

4.1 Germany–Poland-route

- Route provides a direct road and railway connection between the capital cities of Germany, Poland, Belorussia and Russia.
- There is a further connection from the eastern end point of the route, Nizni Novgorod, to the important industrial centres and energy deposits of Russia as well as to the Caucasus, Central Asia and the Far East.
- Road transport flows between Russia and Germany are growing.
- Problems include border crossings between Belorussia and Poland as well as traffic congestion in Poland.
- Railway transport is disrupted by transshipment at the Brest–Terespol border station due to different rail gauge.

Germany–Poland-route is a multimodal link, which connects the European TEN-networks through the capital cities of four countries to the Eurasian transport networks of Russia. The route constitutes a natural extension to the Trans-Siberian railway (TSR) through Russia.

The Pan-European Transport Corridor 2 constitutes a significant part of the Germany–Poland-route. In addition to the intermediating role of international passenger and freight transport, the route has an important political and economic role in every country along the route. There is a connection from the eastern end point of the route, Nizni Novgorod, to the Urals and along the Trans-Siberian railway to Siberia, Central Asia, the Caucasus and the Far East. Nizni Novgorod is also an intermodal crossing point with the Volga River, which is the most important inland waterway of Russia.

Figure 4.2. Germany–Poland-route.

The adoption of an automatic rail gauge transfer station in Brest, Belorussia and the development of logistics services may shift container transport to the Germany–Poland-route from other routes between the EU and Russia.

Transport flows

Road transport between Germany and Poland has experienced a strong growth in recent years (Figure 4.3). The growth is accelerated by the EU-membership of Poland. The annual Russian transit traffic volume on this route is 5,2 million tonnes, a quarter of which is transported by rail. Transit traffic has a growing development trend. A major share of transit traffic volumes is dry bulk.

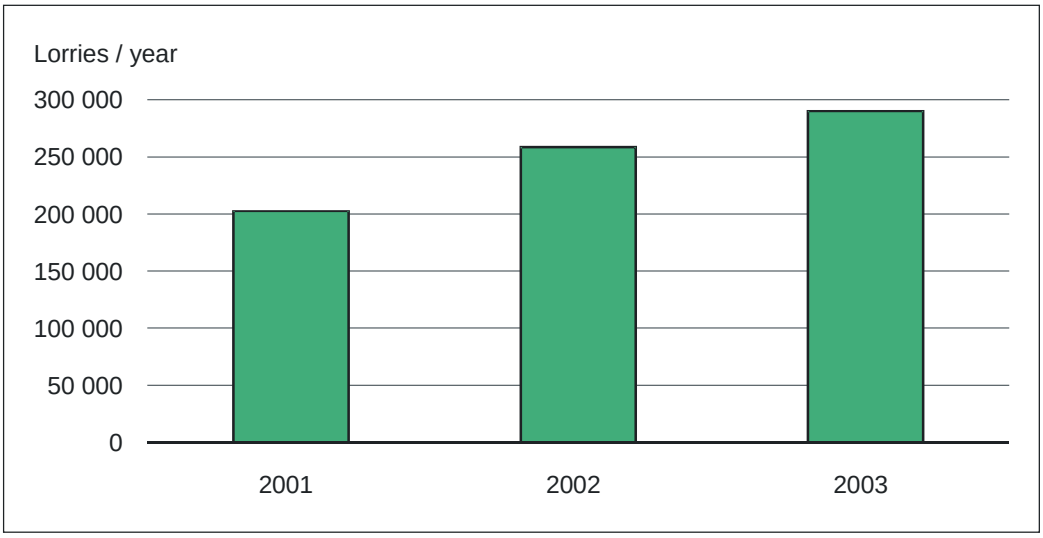


Figure 4.3. Russian transit traffic across the border between Germany and Poland (lorries/year). Source: ASMAP, 2004; Mahlin, 2004.

Attraction factors of freight transport

The attraction factors of the Germany–Poland-route include:

- The route connects the capital cities of four countries and other core areas of these countries
- There is a connection from the western end point of the route, Berlin, to the core areas of Europe. In turn, there is a connection from the eastern end point of the route, Nizni Novgorod, along the Trans-Siberian railway to the Far East and Central Asia.
- The route constitutes the shortest connection by distance between Russia and the core areas of the EU
- The technical condition of road and railway infrastructure on the route has been improved through international and national programmes. Furthermore, development projects are currently being implemented (see route card in the Appendix).
- Railway track on the route is electrified and has heavy rails. Special freight trains can have a maximum speed of 100 km/h in Russia and Belorussia and 80 km/h in Poland.

- An automatic rail gauge transfer station is under construction at the Brest border station in Belorussia, which is estimated to be completed in the year 2005.

Problems

Problems in the railway network include:

- Poland and the CIS-countries have different rail gauge and therefore cargo transhipment must be made in Brest. Therefore, the volume of container transport is quite modest on the route (only 8 000 TEUs, while, for example, the international transport volume on the Trans-Siberian railway is 99 000 TEUs) (RZD statistics, 2003).
- The marketing of the route is insufficient
- Reforms of the railway organizations in Russia and Poland are incomplete
- Change of cargo manifest type at the border between Poland and Belorussia slows down transport operations.

Problems in the road network of the Germany–Poland-route include:

- Crossing the border between Belorussia and Poland at Brest is time-consuming, waiting times can vary from 12 hours to even 48 hours
- Road is quite congested along the Polish segment. Road segment in the city of Warsaw is very congested.

Development projects

The ongoing railway network projects include:

- Upgrading of the railway network is underway on the entire rail section. The goal of upgrading is to increase the speed of container freight trains and special freight trains to 100–120 km/h.
- An automatic rail gauge transfer station is under construction in Brest, which is estimated to be completed in the year 2005.

The ongoing or planned road network development projects on the Germany–Poland-route include e.g.:

- Road segment in Germany is currently being upgraded to a multi-lane motorway. The work will be completed by the year 2006.
- Upgrading of the Polish road segment will be implemented in two phases. Road segment from the German border to Warsaw will be upgraded to a motorway by the year 2011. This project will be implemented together with the upgrading of the Warsaw ring road. Upgrading of the road segment from Warsaw to the Belorussian border will be started after the year 2011.
- Road segment in Belorussia has recently been upgraded to a four-lane highway. The condition of the road will be improved later.
- Initialisation of upgrading work on the Russian road segment is being discussed in Russia.

Development projects will not solve the problems at the Brest border station. Automatic rail gauge transfer only concerns special wagons. The use of ordinary wagons requires a transhipment or a change of bogie also in the future. The speed of freight trains on the track can be increased to a good level and development projects in different countries on the route will already alleviate road congestion in the near future. The future development of border crossing operations is difficult to estimate. The possible adoption of limitations on transit traffic in Poland, which are common in Austria and Switzerland, will, to some extent, disrupt the development possibilities of the route.

4.2 Route through the Finnish ports

- There is a frequent and efficient line service network from Finnish ports to the main ports of the Nordic countries, Poland and Western Europe.
- The route is an extension to the Trans-Siberian railway and the nationally important North–South corridor of Russia.
- The characteristics of the route include efficient logistics services, high environmental and safety standards and good ground transport connections to Russia. An efficient icebreaker fleet ensures the reliability of sea transport even in severe conditions.
- Less than one-day delivery-type transport operations are possible to the economic areas of St. Petersburg and Moscow.
- Container transport on special trains from the ports in the Far East to Finland grows rapidly. Over 90 % of international container transport on the Trans-Siberian railway is directed to Finland.
- Development projects are under planning both in Finland and Russia for improving the operability of the route. The goal is to upgrade the entire route to a motorway standard and improve railway connections to meet the requirements of high-speed traffic.

A frequent and efficient line service network connects the Finnish ports to the main ports of the Nordic countries, Poland and Western Europe, which have connections to Southern Europe and other continents. There are several ship connections to Scandinavia from Finland (for example the Nordic Triangle connections from Southern Finland) as well as ground transport connections from Northern Finland. There are operational and developing road and railway connections from Finland to Russia through different border crossing stations. The most important of these connections is the Pan-European Transport Corridor 9.

Corridor 9 is divided into three branches. The northern branch of the corridor consists of road and railway connections between Helsinki, St. Petersburg and Moscow. There are extensions from Helsinki and other ports through the Baltic Sea Motorways to the core areas of Europe. Connections continue from St. Petersburg and Moscow along the Trans-Siberian railway to the Far East. There is a connection from Corridor 9 to the Nordic Triangle, the Pan-European Transport Corridors 1 and 2 and the ports of the Baltic countries.

The road segment of Corridor 9 in Finland consists of Road E18 between Helsinki–Vaalimaa. A share of 67 % of this road segment is of motorway or semi-motorway standard. Congested road segments can be found in the Helsinki Metropolitan Area (Ring Road III), between Loviisa and Kotka as well as in Hamina. There are good connections through Helsinki to Turku and other ports on the southern coast.

The railway section of Corridor 9 in Finland consists of the Helsinki–St. Petersburg–Moscow railway connection. The Corridor is connected to the Nordic Triangle through Turku, which has connections to Scandinavia and Central Europe. The northern link from the Corridor consists of the Vainikkala–Tornio–Narvik -connection (the N.E.W.-corridor). Another northern railway route to Finland leads from Archangelsk through Kostamus and Vartius.

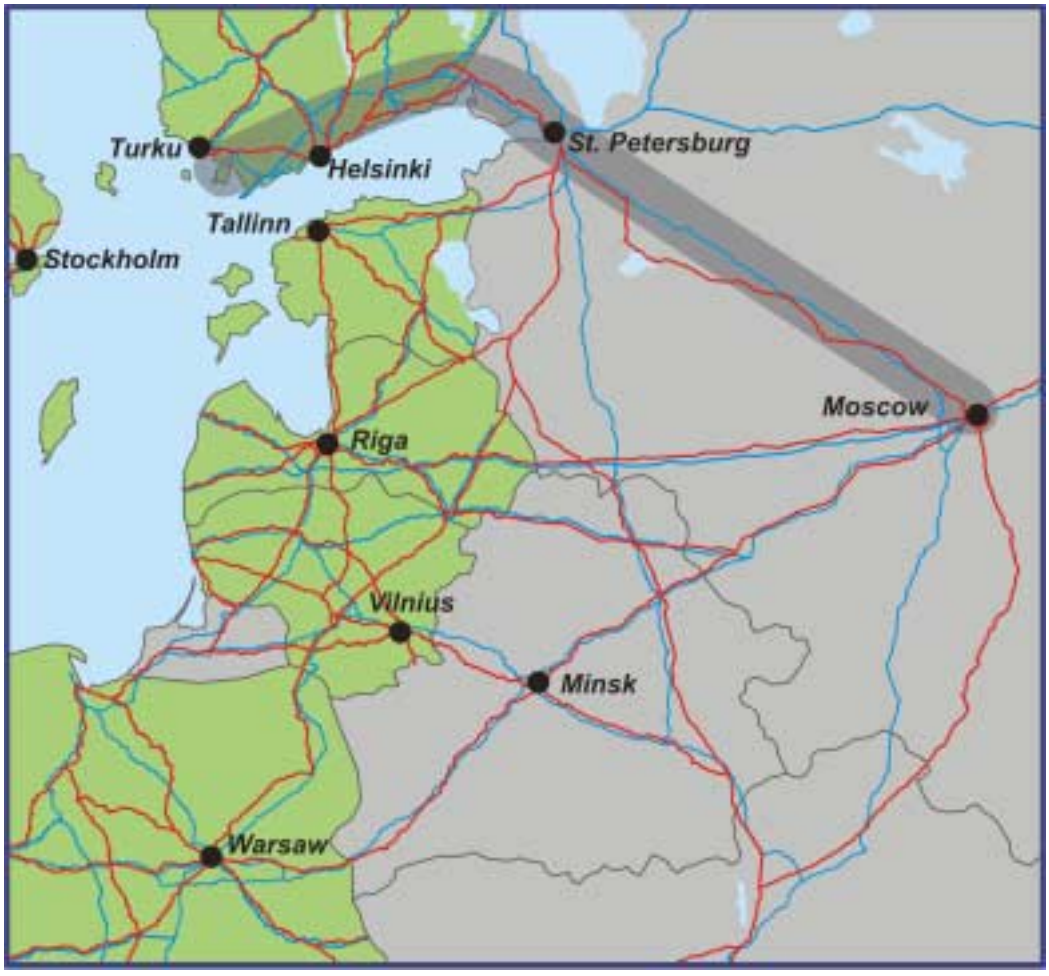


Figure 4.4. Route through the Finnish ports.

Transport flows

Road traffic volumes through the most important border stations of Finland, Vaalimaa and Nuijamaa, have experienced rapid growth. The average daily traffic (ADT) volume on the road segment between Helsinki and Vaalimaa was 14 100 vehicles in the year 2003. The share of heavy traffic of this volume

was 14 %. Lorry traffic volumes have increased annually by 10–20 % in the past couple of years. The route through Finland is the main transport route for valuable goods from the EU to Russia. Valuable goods are mainly transported in containers or lorry loads. (GIPROTRANSTEI; Mahlin, 2004). Transport operations to the St. Petersburg and Moscow areas can be of delivery-type especially from the Kotka and Hamina regions.

The volume of **railway freight transport** between Finland and Russia was about 9,7 million tonnes in the year 2003. Most of this freight flow (68 %) consists of foreign trade between Finland and the CIS-countries and one-third of it consists of transit traffic through Finnish ports. Finland imports energy products, products for the chemical industry, raw materials, raw wood and timber as well as raw materials for the steel industry from Russia. Various liquid chemicals constitute the largest product group in transit traffic. In practice, Finnish ports and routes do not compete with the Baltic ports on the Russian transit traffic.

The strong growth in the number of containers transported through the Trans-Siberian railway has been a new phenomenon in railway transport between Finland and Russia. About 100 000 TEUs of containers was transported by rail through Finland in the year 2003 (VR Cargo). Simultaneously, international container transport at the Brest border station was only 8 000 TEUs (Statistics of the RZD). Transport flow from the Vostochny port to Finland, which has experienced strong growth, has required a minimum of two daily special container trains. The average transport time from the ports in the Far East to Finland is 11 days. Containers are transported from South Korea, Japan and China. The share of South Korea is about 75 % (VR Cargo). Transport flows from China are estimated to grow significantly. Russia is preparing for upgrading projects which will enable the increase of speed of special freight trains to 100–120 km/h. Bringing the North Korean railway into service will also speed up the Trans-Siberian connection for transit traffic which originates from South Korea. Then this route can provide a real alternative to the ocean routes between Europe and Asia.

The estimated total value of imports to Russia from Finland and other imports to Russia through Finland is 21,2 billion Euros. This is about 32–42 % of the total value of Russian imports. (SVULO, 2004).

Attraction factors of freight transport

Attraction factors of the route through Finnish ports include:

- Frequent line services to the ports of Scandinavia, Poland and Western Europe
- Developed port terminals, road and railway connections between Finland and Russia which enable the fastest intermodal delivery chain between the core areas of Europe, Russia and the Far East
- Efficient logistics services as well as high environmental and safety standards
- Efficient icebreaker fleet ensures reliable sea transport even in severe ice conditions

- The route is an extension to the Trans-Siberian railway and the North–South corridor of Russia
- Rapid special container train service has been started between the ports in the Far East and Finland. The Russian railway company RZD has increased the speed of container freight trains so that a trip for a special train from Vostochny port to Finland takes an average of 11 days.
- The possibility to bypass the overloaded St. Petersburg–Moscow rail section by using the northern link (Perm–Kirov–Vologda) of the Trans-Siberian railway
- If the border between North and South Korea is opened for railway transport, an even faster connection will be created between South Korea and Finland. Then the Trans-Siberian railway and the route through Finland will be the fastest and most inexpensive transport connection between Europe and Asia.
- The joint projects between Finland and Russia have speeded up border crossings and improved information exchange with regard to freight transport
- The possibility for delivery-type transport taking less than one day to the economic areas of St. Petersburg and Moscow.

The liberation of port operations and development of competition can improve the competitiveness of the route in the future as compared to the Baltic countries.

Problems

The most significant problems of the route include:

- The development and favouring of Russia's own Baltic ports may reduce the use of Finnish ports
- The road connection between Moscow and St. Petersburg is congested along almost the entire length, especially the entrance roads of Moscow and St. Petersburg are congested. The road segment in the city of Vyborg is also congested.
- The Moscow–St. Petersburg-railway is heavily loaded
- The development of logistics environment in the Baltic countries may shift part of the transport of valuable goods through Finland to routes south of the Gulf of Finland. A lower level of environmental and safety requirements, low business tax and salary levels together with operational infrastructure may accelerate this phenomenon.
- Non-logistical factors, such as customs tariffs on electronics in Russia, which favour transport flows through Finland instead of direct deliveries to Russia, partly affect the existing competitiveness of the route through Finland.

Development projects

The most important railway projects in Finland include:

- The Kerava–Lahti direct rail line, which will be opened in the year 2006. The budget of the project is 335 million Euros.
- Development of the Lahti–Luumäki rail section to meet the demands of high-speed operations and 25 tonne axle load. The cost of the project is about 150 million Euros and it will be completed around the year 2010. Construction of an additional track all the way to Vainikkala may become of particular interest in the future.
- Construction of a so-called Y track in Riihimäki
- Securing rail capacity on Turku–Toijala and Riihimäki–Lahti rail sections

The most important railway projects in Russia include:

- Removing freight transport from the Moscow–St. Petersburg -railway to routes Moscow–Velikije Luk–Mga–St. Petersburg and Moscow–Jaroslavl–Vologda–St. Petersburg. The Velikije Luk–St. Petersburg-railway demands upgrade investments.
- Construction of double track between Vainikkala and Buslovskaja
- Upgrading of the Buslovskaja–St. Petersburg rail section or construction of a parallel track. There is no decision about the project at this point. The parallel rail line would be aligned through St. Petersburg Ladozhski–Rutshji–Petäjäjärvi–Kamennogorsk–Vyborg. The connection requires the construction of a 64-kilometre railway between Losevo–Kamennogorsk.

The most important projects for the development of the Corridor 9 railway connection are the high-speed rail development projects between Helsinki–St. Petersburg and St. Petersburg–Moscow. The implementation of high-speed railway connections demands new rolling stock compatible in both countries as well as several technical improvements of rail infrastructure.

Road development projects in Finland include:

- Completion of the Ring Road III development projects (estimated to be completed in the year 2005, budget of 205 million Euros)
- Upgrading of the Koskenkylä–Vaalimaa road segment to a motorway is estimated to be completed by the year 2015. The estimated investment is 283 million Euros.

Road development projects in Russia include:

- Completion of the Vyborg by-pass road through the construction of the third phase in the year 2005
- Construction of the St. Petersburg ring roads. The first phase of the eastern ring road is estimated to be completed in 2005. The construction of the western ring road is estimated to be started in the year 2005.
- Upgrading the road segment between the Finnish border and St. Petersburg to a four-lane motorway. The estimated cost of the project is

250 million Euros. Implementation may start after the completion of the St. Petersburg ring roads.
- Motorway through St. Petersburg is in the planning phase. The implementation schedule of the project is still open.
- Preparation of a project for developing the Moscow–St. Petersburg-road into a high-quality motorway. It will be a toll road and will be implemented through public and private financing. Preliminary preparation of the project has started in the Ministry of Transport as well as in the Ministry of Economic Development and Trade of Russia.

4.3 Route through the Baltic ports

- Transport of Russian transit traffic is very important to the Baltic countries.
- The Baltic ports have a favourable location and good ground transport connections to Russia.
- Several infrastructure development projects are underway in these countries: upgrading of road and railway connections, construction of border stations, extension of ports.
- Although the goal of Russian transport policy is to shift as much freight flows as possible to domestic ports, the growth of Russian foreign trade has been considerably greater than the increase of capacity in domestic ports.
- The Baltic ports and ground transport connections are efficient, but the route has weaknesses e.g. in technical equipment of railway border stations and equipment for preventing environmental accidents.

Transit traffic to Russia and the CIS-countries is one of the most important and most profitable sources of income for the Baltic countries, especially to Latvia and Estonia. Also, transit traffic has a significant employment effect. The Transport Strategy of the Russian Federation is directed to the growing use of domestic ports, which foresees a tough competition on the freight flows of Russian foreign trade in the future.

The Baltic ports have a favourable location and good ground transport connections, and the ports are efficient. Due to the growth of the freight flows of Russian foreign trade, the use of the Baltic ports will be necessary in Russian international transport also in the future. The significant investments of the Russians themselves to the infrastructure and terminal operations of the Baltic ports contribute to further use of these ports.

The most important destinations of the freight flows through the Baltic ports are the northwestern and central parts of Russia as well as the Urals. The Baltic ports have served foreign trade and military interests of Russia and its predecessors.

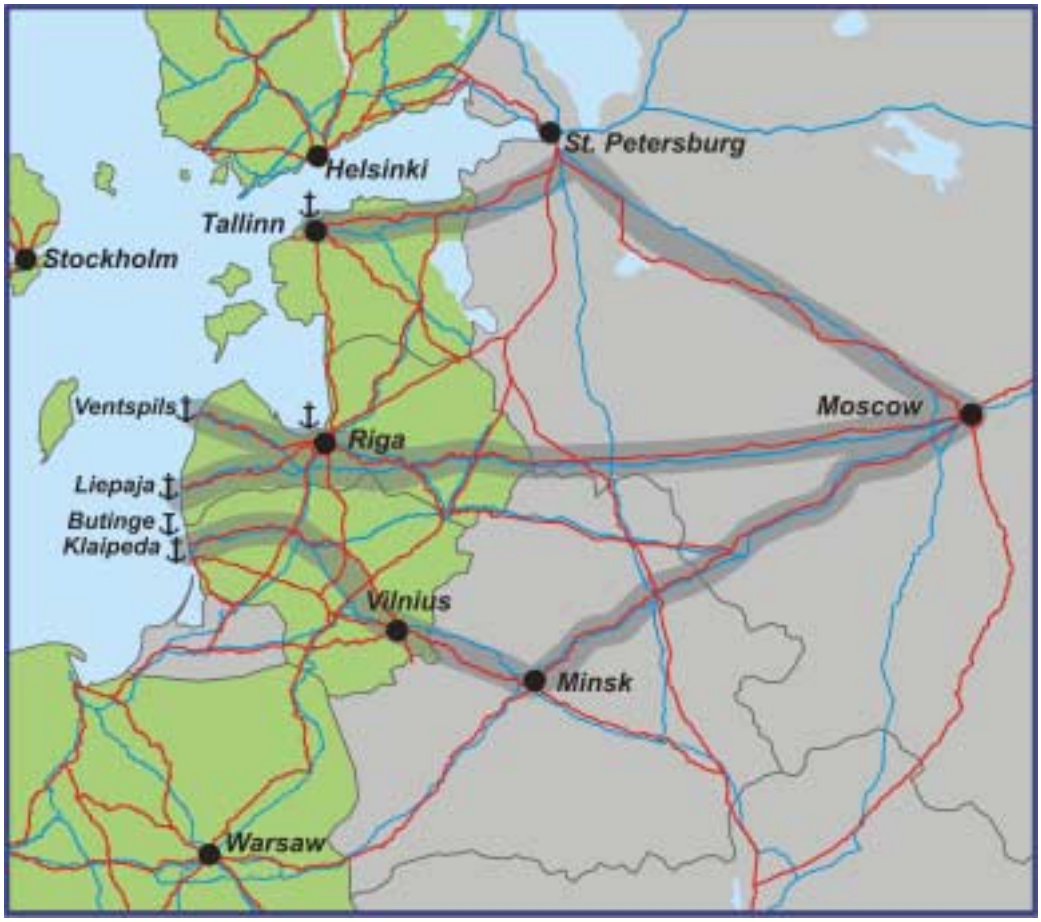


Figure 4.5. Route through the Baltic ports.

Transport flows

The Baltic ports handled a total of 133 million tonnes of freight in the year 2003. The share of Russian transit traffic was about 92 million tonnes. A share of 53 % of the freight flows of Russian foreign trade through the Baltic Sea was transported through the great Baltic ports. Oil, liquid fuel and other liquid chemicals had the largest share (65,9 million tonnes) of all product groups. The share of dry bulk was 11,7 million tonnes and the share of metals was 3,8 million tonnes. Container freight transport has been growing. The volume of transit traffic of Russia and the CIS-countries varies in the Baltic ports. The greatest volumes are in Tallinn and the lowest volumes are in Klaipeda. (Transit, 2004; Mahlin, 2004).

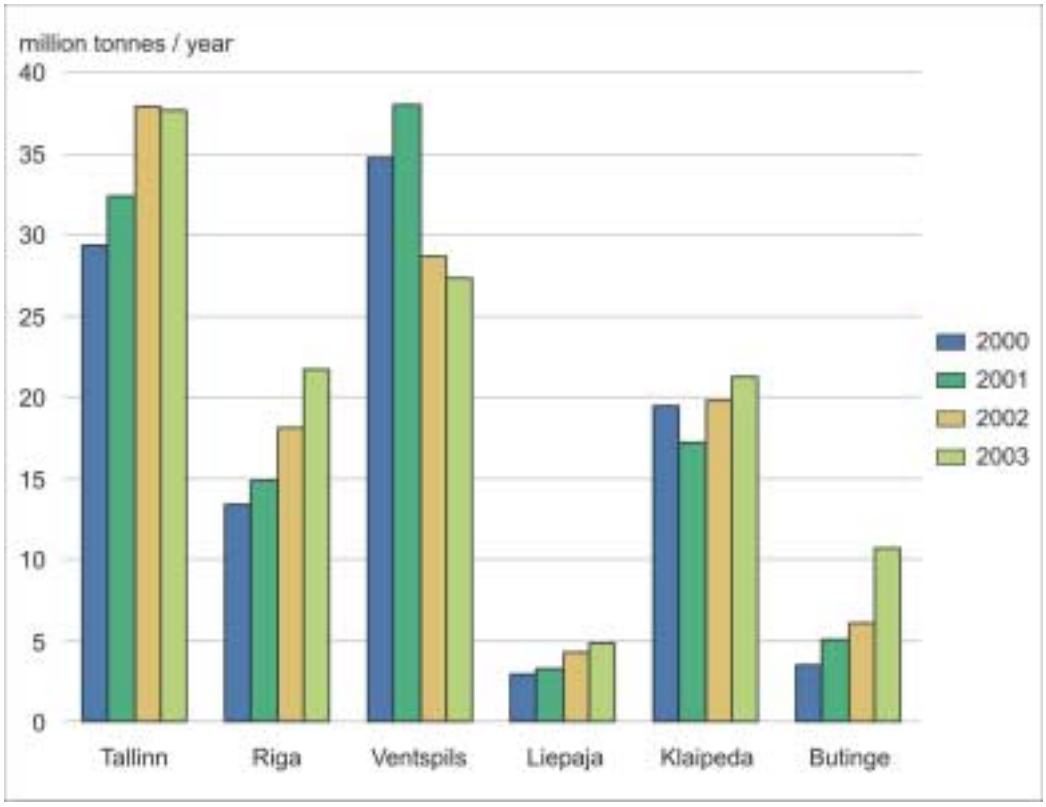


Figure 4.6. Development of freight volumes in the Baltic ports (million tonnes / year). Source: Mahlin, 2004.

Attraction factors of freight transport

Attraction factors of the route through the Baltic ports include:

- The geographical location of the Baltic ports is favourable to the centres of Russia and the entrance fairways of ports are good. The ports of Ventspils and Klaipeda are not ice-covered in normal winters and ice conditions in the ports of Tallinn are not usually severe.
- After the disintegration of the Soviet Union, most of the Russian foreign trade through the Baltic Sea still use these ports
- The Baltic ports have developed road and railway connections as well as port infrastructure, depth in docks is sufficient, the ports of Muuga, Riga, Ventspils and Klaipeda have efficient warehouses and terminals. Ports have skilled port operators and personnel with command of the Russian language. Russian companies (for example Severstal and Lukoil) have ownership in several ports. Ports have flexible working hours and competitive salary levels.
- Developed security and public authority activities.

Problems

Problems in the Baltic ports include:

- Transport volumes in the port of Ventspils have slightly declined, as oil pipelines have not been in use any more

- Technical equipment of border stations, for example, for the inspection of tank wagons is insufficient, which causes delays in border crossings
- Great environmental risks. For example, hazardous goods must be transported through the metropolitan area of Riga and Tallinn. Equipment for preventing environmental accidents is insufficient or old-fashioned.
- Insufficient icebreaker fleet has caused problems in severe winters
- Railways are heavily used and traffic safety risks exist particularly at grade crossings.

Development projects

Development projects of the infrastructure of Estonia include:

- Completion of the upgrading work of Via Baltica, Tallinn–Narva-road and Tallinn–Tarto-road. A by-pass road and another bridge across the river to Russia are needed in Narva in the future. So far, Russia has not expressed interest in the bridge project.
- Upgrading of main railways and completion of the construction of the Koidula border station in Southeastern Estonia
- The aim is to construct a rail line by-passing Tallinn in the future
- Extension work will be started in the ports of Muuga and Paldiski
- A co-financed project is underway in the Sillamäe port, the first phase will be completed in the year 2005.

Development projects of Latvia include:

- Completion of the upgrading work on the east-west Ventspils–Riga–Liepaja-railway. The work also includes the improvement of the technical level of border stations.
- The aim is to improve the condition of the main road network and promote the level of traffic safety.

Development projects of Lithuania include:

- Completion of the upgrading of the Lithuanian road segment of Via Baltica
- Development of Klaipeda port terminals
- Completion of the construction work at Kena and other border stations
- Construction of 1 430 mm gauge railway all the way to Kaunas. The railway may also be continued to the directions of Riga and Tallinn in the future. The project has political support.

The development projects in the Baltic countries will remove technical problems of ports. Mitigation of environmental risks will still demand considerable additional investments and resources for preventing accidents.

4.4 Route through the Russian ports

- According to the Transport Strategy of the Russian Federation, as high of a share as possible of the sea transport of foreign trade should be directed through domestic ports. Existing ports have been extended and new ports have been constructed for implementing the Strategy.
- Annual freight volumes at Russian ports have grown to almost 80 million tonnes.
- Oil transport and container transport have experienced the most rapid growth.
- The largest development projects include: extension of the Primorsk port, construction of the Ust Luga dry cargo port and the Vysotsk oil port, ferry connection between St. Petersburg–Kaliningrad–Germany.
- The greatest problems include the entrance fairways of the ports in the eastern part of the Gulf of Finland and environmental risks of oil transport in the Gulf of Finland.

According to the Transport Strategy of the Russian Federation, a maximum share of the sea transport of foreign trade should be directed through domestic ports, which would reduce transit traffic through the Baltic countries and Finland. This goal is supported by, for example, the differentiation of railway tariffs.

The freight volumes of Russian foreign trade through the Baltic Sea routes have significantly grown. So far, the increase in the capacity of Russian domestic ports has been slower than the growth of trade. Therefore, a significant share of Russian foreign trade will be directed through the Baltic ports of neighbouring countries also in the future.

Transport flows

Freight flows through the Baltic ports of Russia have constantly increased. The total volume of the ports has grown from 40 million tonnes to 76 million tonnes during the years 2000–2003 (Figure 4.8). At the same time, there was an increase in the share of Russian domestic ports of Russian foreign trade through the Baltic Sea. Currently this share is 44 %. The share of all Baltic ports (Russia, the Baltic countries, Finland) is about 40 % of the freight transport of Russian foreign trade (GIPROTRANSTEI; Transit, 2004).

Rapid growth of freight volumes has occurred in the great port of St. Petersburg. A total of 60 million tonnes of freight was handled in the great port of St. Petersburg and oil terminal of Primorsk in the year 2003. Also, freight volumes in the port of Kaliningrad have increased. There is a connection from St. Petersburg to the extensive inland waterway network of Russia, which expands to Moscow and further south.

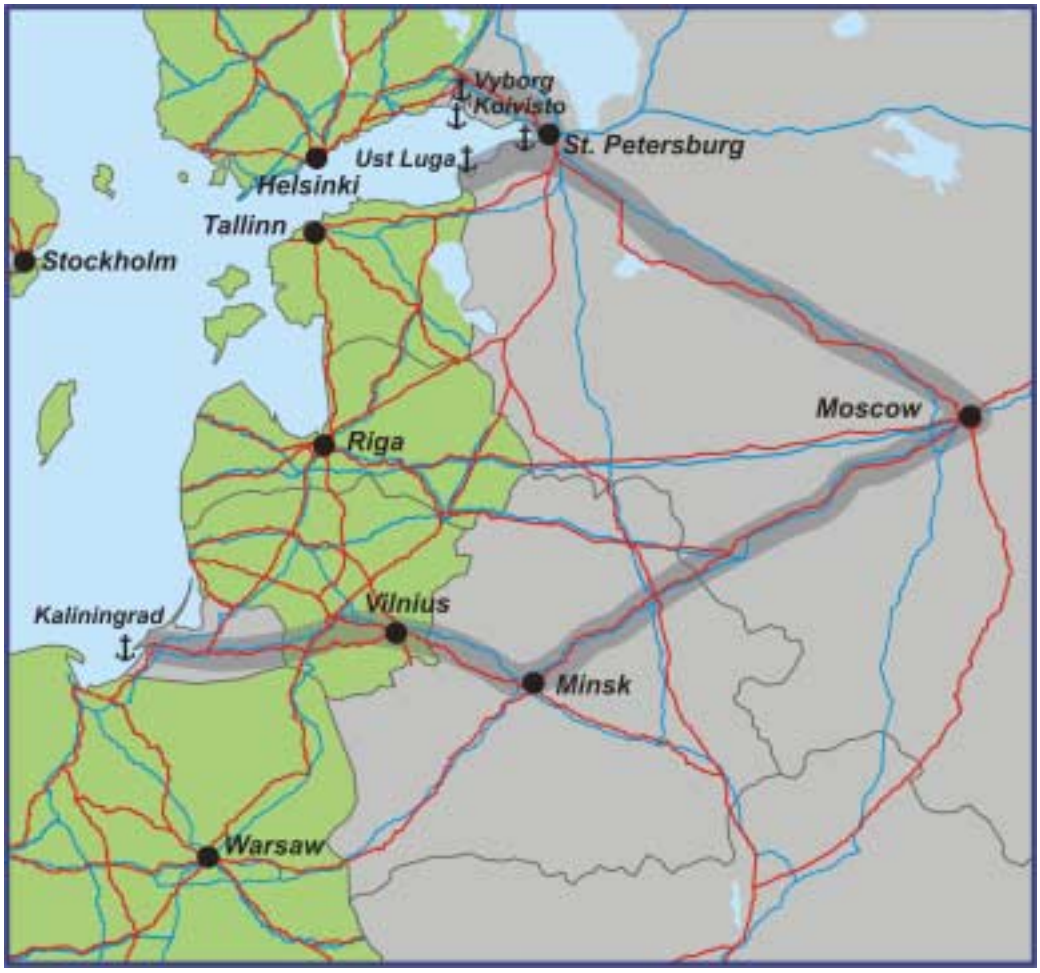


Figure 4.7. Route through the Russian ports.

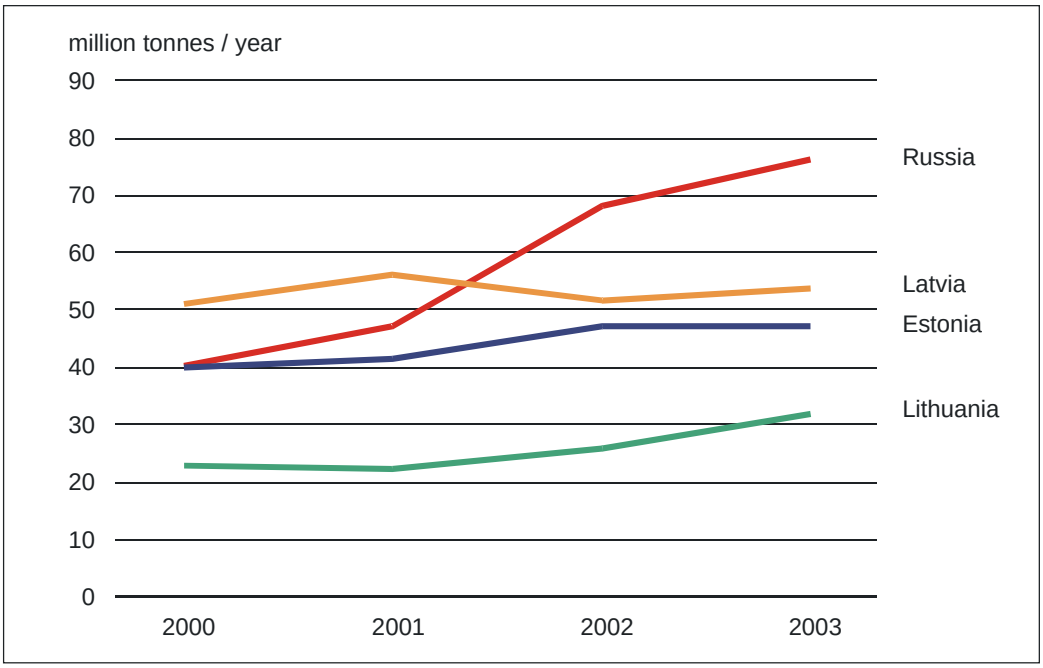


Figure 4.8. Growth of freight volumes in the Baltic ports of Russia and the ports of the Baltic countries (million tonnes / year). Source: Mahlin, 2004.

The annual freight transport volumes of the Volga-Balt Canal between St. Petersburg and Moscow are 30 million tonnes and the volumes are expected to grow significantly in the next few years (Ringborg, 2004). The WTO-membership of Russia will open inland waterway transport also to international operators.

Attraction factors of freight transport

The development of domestic ports is one of the goals of the transport policy in the national strategy of Russia. This development has been supported by the world market situation having demand for Russian export products and favourable cost development. With regard to port development, this has implied the participation of companies (e.g. Lukoil, Yukos and Severstal) in the financing of projects.

In current circumstances, there are no alternative routes for the freight flows of Russian foreign trade through the Baltic ports. The reasons for this are:

- The favourable geographical location of ports in relation to the main centres of Russia, raw material deposits and foreign trade partners in Europe
- Existing and planned port capacity and ground transport connections of ports
- Connection from ports to Russian main pipeline network.

Problems

The problems of Russia with regard to the ports in the Gulf of Finland include:

- There are over six million annual passengers between Tallinn and Helsinki. Crossing vessel traffic creates a safety risk in the Gulf of Finland which can partly be controlled by the Vessel Traffic Service Center of the Gulf of Finland, but not totally removed.
- The location of the port of St. Petersburg in the metropolitan area disrupts the development of the port (improvement of entrance fairways, rail yards and related warehouse areas, container fields and waiting areas for lorries)
- Ice conditions are quite severe in the eastern part of the Gulf of Finland, duration of ice conditions is about 2–3 months in normal winters and longer in severe winters. The icebreaker fleet has not been sufficient in severe winters.
- The entrance channel to St. Petersburg needs continuous dredging which limits the vessel size to 14 000–16 000 tonnes. The ports of Ust Luga, Primorsk and the Vysotsk new oil port in the Gulf of Finland as well as the Baltijski port area in Kaliningrad can receive vessels of 60 000–80 000 tonnes in size.
- Dangerous entrance fairways to the ports of Primorsk and Vysotsk as well as severe ice conditions constitute an environmental risk.

Problems of the ports in the Kaliningrad area include:

- Ground transport connections from Kaliningrad to other parts of Russia are directed through Lithuania and Belorussia. This has prevented suffi-

cient investments for port development. The lack of ground transport connections is mitigated by the so-called 2K (Kaliningrad–Klaipeda) -agreement with Lithuania, according to which reasonable railway tariffs are granted to freight flows through both of these ports. These tariffs have made the operations of both ports easier.

- There are a lot of military areas in the Kaliningrad area
- The depth of the entrance fairway to ports in the city area is 9,75 metres and therefore the maximum vessel size is limited to 10 000–12 000 tonnes.

Development projects

The Baltic ports of Russia have the following development projects:

- Starting of the second and third phase of the development of Primorsk oil port
- The first phase of the Vysotsk oil port by Lukoil started in the summer of 2004
- Construction of the port of Ust Luga and improvement of ground transport connections of the port
- Ferry connection through Kaliningrad to Germany and other parts of Europe
- Deep-water port project in Baltijski
- Preliminary plans have been prepared for the ports of Batareinaja, Vistino and Lomonossov
- Moving freight transport from the Moscow–St. Petersburg rail section to parallel routes and moving freight transport between Vyborg and St. Petersburg to the route St. Petersburg–Ladozhski–Rutshji–Petäjäjärvi–Kamennogorsk–Vyborg.

After the development projects, the problems in the port of St. Petersburg will still create a bottleneck (shallow entrance fairway and location of port in the metropolitan area). Transport can, however, be directed to other Russian ports in the Gulf of Finland. Severe ice conditions in the eastern part of the Gulf of Finland and insufficient icebreaker capacity will slow down freight transport in the winter.

5 ASSESSMENT OF THE ROLE OF THE ROUTES

In this chapter comparisons are made by:

- the weaknesses and strengths of the routes as well as
- the impacts of the changes in the operating environment and measures (development of infrastructure) on the position and market share of the routes.

Furthermore, the impacts of the changes in some essential parameters (cost, level of service, speed) on the competitiveness of the routes are examined.

5.1 Comparison of routes and outlook for the route through Finland

- The development of logistics in the Baltic countries and Russia will have the greatest impact on the position of the route through Finland.
- The route through the Baltic ports will benefit from the growth of trade, if the capacity of the Russian ports will not increase enough and the logistics sector of the Baltic countries becomes competitive.
- The development of the Germany–Poland-route will be most dependent on changes in the political operating environment, such as the improvement of transport connections and border crossings on the route.
- The share of the Baltic ports in Russia will increase in the short-run, but in the long-run insufficient capacity of these ports, good operability of other routes and free competition between ports may decrease the share of the route.
- Several changes in the operating environment will support an increase in the share of the Trans-Siberian railway in freight transport between the EU and Asia.
- Air cargo transport will grow rapidly, but is the most sensitive to changes in operating environment.

The current strengths and weaknesses of the studied transport routes are presented in Table 5.1. Only the Baltic ports of all the Russian ports are examined. The assessment has mainly been conducted from the viewpoint of growing transport of unitized cargo. The route through Finland is only competitive for the transport of products other than bulk. The primary task of the route is, however, to always directly serve the trade between Finland and Russia. The routes through the Baltic and Russian ports are quite similar with regard to the level of service. Insufficient capacity in Russian ports will shift freight transport to the Baltic countries. The competitiveness of the Germany–Poland-route is poor, which is also reflected in a small amount of unitized cargo transport on the route.

The Trans-Siberian railway competes with air cargo for the transport of valuable goods. However, the most significant share of freight flows will always be transported by sea.

Table 5.1. Current strengths and weaknesses of transport routes.

	Freight transport between the EU and Russia				**Freight transport between the EU and Asia**		
	Route through the Finnish ports	Route through the Baltic ports	Route through the Russian ports	Germany-Poland	Trans-Siberian railway	Ocean route	Air cargo transport
Road connections	++			--			
Railway connections	+	+		--	++		
Port capacity	++	++	-				
Handling of containers	++			-	+	+	
Value-added services	++		-	--		+	++
Border crossing and customs	+	+	++	--	--	+	++
Speed	+		+	-	+	--	++
Security	+			-	-		++
Reliability	++	+		-			++
Cost/bulk	-	+	+	-	-	++	--
Cost/valuable goods				-	++	++	

+ / ++ Factor is a strength / significant strength of the route
- / -- Factor is a weakness / significant weakness of the route
Evaluation not available in grey boxes

Changes in the *relative* shares between different routes as a result of changes in the operating environment are examined in Tables 5.2 and 5.3. Some changes in the operating environment can increase or decrease the absolute freight volumes of all routes. Thus, the relative change will not necessarily indicate the direction of absolute change. It is estimated that the Russian economy will develop according to the so-called probable scenario or the economy will grow by a factor of almost four by the year 2030. The time period of the assessment extends to the year 2030.

Table 5.2. Impacts of changes in the operating environment on the relative share of freight volumes on the routes between the EU and Russia as well as between the EU and Asia by the year 2030.

	Freight transport between the EU and Russia				**Freight transport between the EU and Asia**		
	Route through the Finnish ports	Route through the Baltic ports	Route through the Russian ports	Germany–Poland	Trans-Siberian railway	Ocean route	Air cargo transport
Changes in the operating environment							
Liberation of world trade		+	-		-		+
Globalisation of production		-	+		+	-	+
Development of the EU-Russia relations	-	+	-	++	++	-	
Growth of trade between the EU and Russia	+	+	--	+			
Russia's policy of favouring domestic ports	-	-	++	-			
Development of logistics in Russia and the Baltic countries	--	+	+		+		
Increasing share of unit loads		-	+	+	+		-
Energy crisis			+	-	+		--
Emphasis on environmental aspects	+	-	--	+		+	--
Stabilisation of cost differences in Europe						+	+

+ / ++ Share of route in total freight transport increases / increases significantly
- / -- Share of route in total freight transport decreases / decreases significantly
Evaluation not available in grey boxes

Table 5.3. Impacts of different measures on the relative share of freight volumes on the routes between the EU and Russia as well as between the EU and Asia by the year 2030.

	Freight transport between the EU and Russia				**Freight transport between the EU and Asia**		
	Route through the Finnish ports	Route through the Baltic ports	Route through the Russian ports	Germany–Poland	Trans-Siberian railway	Ocean route	Air cargo transport
Impacts of measures on relative position							
Financing possibilities of investments	+	-	+	-			
Increase of port capacity in Russia	-	-	++				
Development of Brest border station	-	-		+			
Development of Corridor 2				++			
Increase of speed on the Trans-Siberian railway	+				++		
Development of railway connection in Southeastern China	+	-		+	++	-	
Railway connection in South Korea	+				++	-	
Development of Corridor 9A	+						

+ / ++ Share of route in total freight transport increases / increases significantly
- / -- Share of route in total freight transport decreases / decreases significantly
Evaluation not available in grey boxes

The **liberation of world trade** will increase global trade flows and the number of kilometres transported. Liberation concerns especially consumer products, when the share of air cargo transport in freight transport between the EU and Asia will grow. The capacity of the Trans-Siberian railway will not increase sufficiently with regard to the growth in transport demand. In freight transport between the EU and Russia, the liberation of world trade (which also means WTO-membership of Russia) will lead to a decreasing share of the Russian ports in total freight transport, as Russia cannot continue a transport policy of favouring domestic ports. Growing demand for freight transport of products will make the existing, quite one-sided transport structure of the Baltic ports more versatile.

Globalisation of production will increase freight flows between different countries due to international subcontracting chains. The globalisation of production

will increase the share of the Russian ports as a transport route between the EU and Russia, as globalisation will move production to Russia and the share of goods other than raw materials in Russian transport will grow. The Germany–Poland-route is not competitive with regard to global production flows due to e.g. congestion on the route. The share of the Trans-Siberian railway and air cargo transport between the EU and Asia will grow, as the globalisation of production especially concerns consumer and investment products, the cost level of which allows for the use of more expensive transport modes than sea transport.

The development of EU–Russia relations will promote trade, remove administrative barriers of trade and logistics as well as increase investments to transport infrastructure between these countries. The Germany–Poland-route is the shortest route between the EU and the core areas of Russia. Investments in the development and operability of this route will significantly improve the speed of the route from the existing level. Freight transport based on political reasons through the Russian ports will decrease.

As relations improve, the structure of trade between these countries will stabilise and the share of transport and investment products of total trade will grow. This will reduce the competitiveness of sea transport routes. The volumes of export and import transport will stabilise which will promote the development of profitable ground transport services. The Baltic countries will benefit most from the improved relations due to former Russia-relations.

The Trans-Siberian railway will act as one of the significant transport routes between the EU and Russia. The development of this route will also improve its competitiveness in freight transport between the EU and Asia. The improvement of relations between the EU and Russia will reduce the Far East -dependency of the EU. Consequently, the share of sea freight transport, which is suitable for large volumes, will decrease.

Growth of trade between Russia and the EU will promote the relative significance of other transport flows than those through the Russian domestic ports. This is due to the fact that the growth of capacity in Russian domestic ports will not be sufficient with regard to the growth in transport volumes. The EU is dependent on energy imports from Russia, and thus the interest of the EU is also to have exports to Russia in order to maintain relations and a trade balance. As the structure of trade becomes more versatile, the significance of the shortest transport route will increase which will promote the significance of the Germany–Poland-route.

The strengthening **Russian policy for favouring domestic ports** will evidently promote the significance of Russian ports instead of other ports. This policy is possible in circumstances where the relations and cooperation between the EU and Russia have not developed in the best possible way. This will result in slower growth of absolute freight volumes of all ports as compared to other scenarios.

The development of logistics in Russia and the Baltic countries (the creation of central warehouses, development of logistics infrastructure of companies, improvement of speed and security of logistics etc.) will clearly reduce the competitiveness of the route through Finland. The development of logistics in the Baltic countries and Russia will promote the role of the Trans-Siberian railway in freight transport between the EU and Asia, as soon as speed and reliability as well as logistics services of the railway improve and become commonly known. Logistics serving Russian air cargo transport is not expected to significantly develop from the current situation.

Increasing share of unit loads in freight transport will improve the opportunities for the Germany–Poland-route, as growing volumes encourage the development of a direct ground transport connection and particularly an operational railway connection. The share of the Russian ports in domestic flows will increase when planned container port investments are in use. There will be no significant change in the position of Finland, as the Germany–Poland-route will not significantly compete with the route through Finland.

An increasing share of unit loads in freight transport between Asia and the EU will especially increase the share of the Trans-Siberian railway, as the competitiveness based on the speed of the railway can be utilised better than before. The Trans-Siberian railway will even compete with air cargo transport for some products.

Increasing fuel prices due to an **energy crisis** will considerably decrease the share of air cargo transport (impact on freight transport between the EU and Asia) and ground transport (in freight transport between the EU and Russia). The share of the Russian ports in freight transport to Europe will increase when the ground transport section in the transport chain is kept as short as possible.

An energy crisis will have a decelerating effect on globalisation and the absolute growth of freight transport.

A growing emphasis on environmental values will decrease the share of oil transport in the total sea transport of the Baltic Sea. Oil transport will be shifted from the Baltic ports of Russia and the Baltic countries to the port of Murmansk and to pipeline transport and then, for example, major accident risks caused by frequent passenger traffic in the Gulf of Finland can be avoided. The development of the railway connection on the Germany–Poland-route will improve the environmental competitiveness of the route.

Growing emphasis on environmental values in freight transport between the EU and Asia will particularly reduce air cargo transport and promote ocean transport. Public awareness of environmental values will promote antiglobalisation or the aim is to reduce the overall number of kilometres transported.

Stabilisation of differences in production and transport costs between Russia and other European countries will shift the focus of globalisation outside of Europe (for example to the Far East or South America). The low cost level of

Russia will attract manufacturing companies only during the next decade and after that the economic growth of Russia will lift the cost level near the level of Western Europe. The price competitiveness of the Trans-Siberian railway will decline and the share of ocean and air cargo transport in Asian freight transport will increase.

The impact of **measures** or mainly the effect of infrastructure investments on the share of different transport routes is more certain than changes in the operating environment. Growing port capacity in Russia will have the most evident impact on the shares of routes and decrease the share of the ports in the Baltic countries and Finland. Technical and operational development of Corridor 2 and particularly Brest can promote the position of the Germany–Poland-route as clearly the fastest transport connection between the EU and Russia. Development projects of the Trans-Siberian railway will not only increase the share of the railway in Asian freight transport, but also the share of the route through Finland in freight transport between the EU and Russia. Finland has actively participated in the development of Trans-Siberian transport so it will have an advantage in utilising the railway.

Financing possibilities of investments are decisive factors of competition. Infrastructure can even develop quickly when preconditions for financing exist. As far as Russia is concerned, it is also a question of obtaining international financing for projects. The routes differ from each other with regard to financing possibilities. The Germany–Poland-route including four countries is problematic when compared to the route through the Finnish ports. It has already been proved in practice that Russia can develop its port capacity very quickly through international financing.

Significant projects for the EU in the Far East include the development of the **railway connection in Southeastern China** and in the longer run the possible construction of the **South Korean railway connection**. Both projects will significantly extend the impact area of the Trans-Siberian railway. As already mentioned earlier, Finland will benefit from both projects also in freight transport between the EU and Russia.

All development projects related to **Corridor 9A**, which will increase the speed on the route, will be significant for the route through Finland. The most important projects for the competitiveness include e.g. Lahti–Kerava direct rail line, the development of Lahti–Luumäki–Vainikkala rail section and Road E18 as well as seamless border crossing operations.

The table of comparison presented above has been examined by rows. It can also be examined by columns or by **routes.** At the same time, it should be noted that part of the presented changes in the operating environment will probably occur simultaneously.

A growth scenario can easily be created, according to which world trade will be liberated and globalisation will strengthen. Furthermore, the relations between the EU and Russia will experience a positive development, while promoting

trade between the EU and Russia as well as setting all transport routes in equal position in which they compete by their own strengths. Growing emphasis on environmental values and an energy crisis are part of this scenario, which can develop during the study period. These factors will control the implementation of this scenario. Another extreme alternative is the opposite of the previous scenario.

The overall relative changes between the routes are small in both of the above mentioned scenarios, although the absolute differences in volumes will be considerable. The competitiveness of the route through Finland will be strengthened by a growing emphasis on environmental aspects (this will occur in both scenarios) and extremely rapid growth of Russian trade which, due to insufficient capacity, will lead to cargo flows through Finland. The threat is a quick development of logistics in Russia and the Baltic countries as well as the Russian policy for favouring domestic ports. The Germany–Poland-route and the Trans-Siberian railway would be the winners in this growth scenario, both of which have unused natural qualifications for increasing their share. In addition, all examined transport connections between the EU and Russia seek the benefits of the Trans-Siberian railway.

5.2 Examples of impact assessment of different factors on the competitiveness of the routes

- Unit costs and transport times in freight transport between Central Europe and Moscow on the route through Finland and St. Petersburg are almost the same as on other routes. The competitiveness of the route through Finland is based on the speed and flexibility of freight transport. The route through Finland serves well the transport of valuable or perishable goods all the way to Moscow.
- Total transport time of the route through the Baltic ports is slightly longer than on the above mentioned routes due to waiting times at ports. The unit cost for the transport of valuable goods is higher than on the above mentioned routes, but is lower for the transport of raw materials and metal products.
- If the level of service on the Germany–Poland-route improved considerably, the transport of valuable goods would mainly shift from the route through the Baltic ports to the Germany–Poland-route. When improved, this route would be a very competitive transport connection for valuable goods between the EU and Moscow. Total freight volumes on the route could grow by a factor of 2,0–2,5 when compared to existing volumes.
- The impact area of the Germany–Poland-route would extend to the central and southern parts of Poland, eastern and southern parts of Germany and South European countries. Freight transport from Moscow to other parts of Western Europe would still be worth directing through the Baltic ports, as the profitability of sea transport is more obvious in long transport distances.

The comparison of the competitiveness of the routes was specified by example studies, which included the following questions:

- what would be the effect of a more efficient level of service on the Germany–Poland-route on total transport volumes of different routes
- how will the unit costs of routes differ from each other
- how will the transport times of routes differ from each other
- what would be the effect of a more efficient level of service on the Germany–Poland-route on the impact areas of different routes

These studies were conducted by using the Frisbee-model, which is described in more detail in the Appendix of the report.

Effects of improved level of service on the transport volumes of routes

The effects of a more efficient level of service on the Germany–Poland-route on the transport volumes of other routes (relative changes) are presented in Figure 5.1.

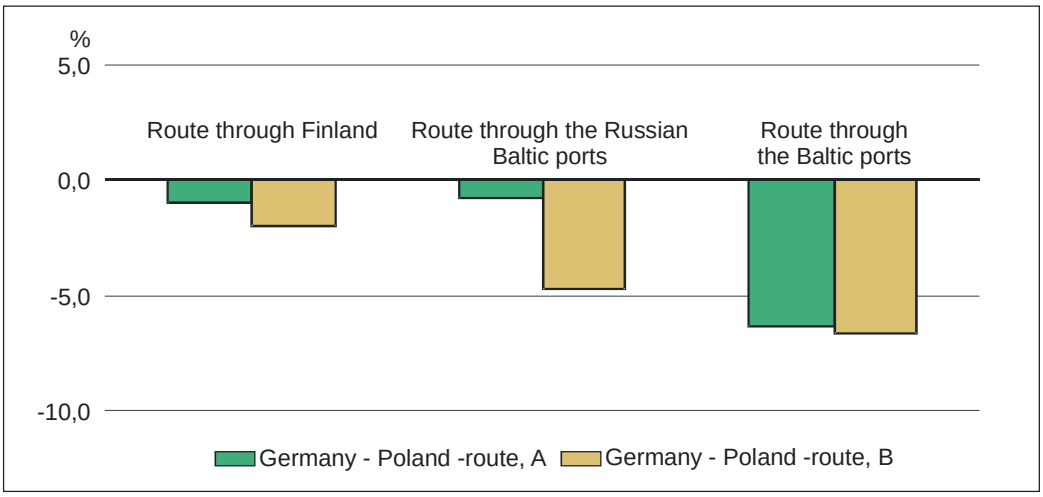


Figure 5.1. Decrease of transport volumes on other routes as a result of a more efficient level of service on the Germany–Poland-route. (Unit costs on the Germany–Poland-route between Moscow–the Polish border A: at the EU-level B: at the Russian level).

Changes on the route through Finland would be relatively small, total freight volumes would decrease by a share of 1–2 % from the current level at the border between Finland and Russia. This would indicate a decrease of about 0,2–0,4 million tonnes in the transit traffic through Finland. Freight volumes through the Baltic ports would decrease by an average share of 6–8 % and the transport volumes at the Baltic ports of Russia would decrease by a share of 1–5 %.

Freight transport volumes on the Germany–Poland-route would more than double as a result of a more efficient level of service. Other than so-called bulk cargo would consist of the potential freight transport flows, which could shift to this route. A total of about 210 million tonnes of freight was transported through the Baltic ports of Russia and the Baltic countries in the year 2003. About 55 million tonnes of this volume was other than bulk cargo.

Comparison of the unit costs of routes

The unit cost index of routes for three different product groups is presented in Figure 5.2. The unit cost of the route through Finland (existing situation) is 100 for all product groups.

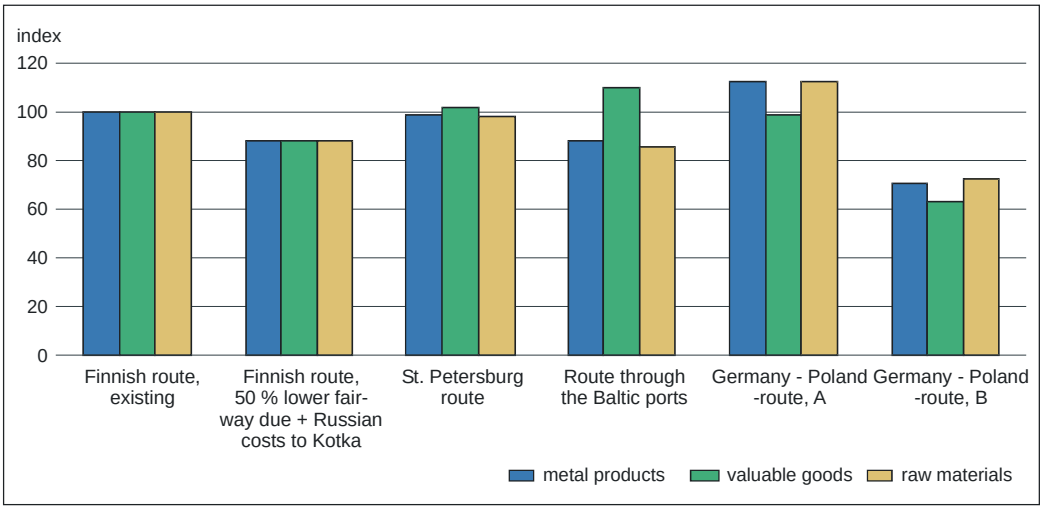


Figure 5.2. Unit cost index of transport routes for three different product groups between Central Germany–Moscow. Unit cost of the Finnish route (existing situation) is 100 for all product groups. (Unit costs on the Germany–Poland-route between Moscow–the Polish border A: at the EU-level B: at the Russian level).

The unit costs for the route through Finland (existing) are equal to the unit costs for the St. Petersburg route for all three product groups. The route through the Baltic ports is less expensive in the transport of metal products and raw materials, but clearly more expensive for valuable goods. The ”more effective” route through Finland (50 % lower fairway due and Russian costs on railways all the way to the port of Kotka) would be very competitive with routes other than ”Germany–Poland-route, B” in freight transport between Central Germany and Moscow.

The competitiveness of the route through Finland is based on the speed and flexibility of freight transport. The route through Finland also serves well the transport of valuable or perishable goods all the way to Moscow.

The competitiveness of the Germany–Poland-route is very dependent on the unit costs applied on the route:

- If the EU costs are used in freight transport, the route is more expensive than other routes for metal products and raw materials. For valuable goods, the route is about as expensive as, for example, the route through Finland.
- If the so-called Russian costs can be used in freight transport from Moscow to the Polish border, the route is clearly less expensive for all product groups.

It should be noted that the unit costs of valuable goods are 6–10 times higher than the unit costs of raw materials or metal products on the same transport routes.

Comparison of the transport times of routes

The total transport times of routes between Central Germany and Moscow are presented in Figure 5.3. Total transport time consists of the speed of transport for different modes and handling times at terminals (ports and border crossings).

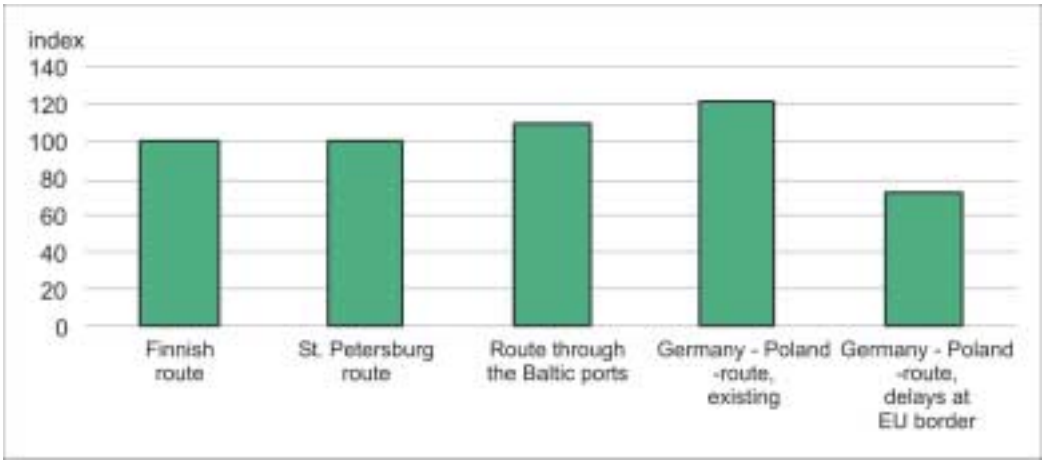


Figure 5.3. Transport times of routes in freight transport between Central Germany and Moscow. Transport time for the Finnish route is 100.

Transport times are about the same on the route through Finland and on the St. Petersburg route. Total transport times are currently an average of 10 % longer on the route through the Baltic ports as compared to the route through Finland and the St. Petersburg route. This is due to the fact that, on the average, e.g. the Baltic ports have more infrequent line services (longer waiting times) than, for example, the ports of Finland.

Current transport times on the Germany–Poland-route are longer than on the other routes. If border crossing operations and speed of transport on this route were at the average EU-level, this would be clearly the fastest route in freight transport between Germany and Moscow. Unlike the other routes, there are no port operations, but only ground transport operations on this route.

Impact areas of routes

In this part, the model was used for examining how the impact areas would change, if the level of service on the Germany–Poland-route improved significantly (Figures 5.4 and 5.5). The Moscow region in Russia was selected as the origin/destination of goods. More detailed figures are presented in the Appendix.

- Currently, freight transport between Moscow and the EU is almost entirely directed through the Baltic ports of Russia, the Baltic countries and Finland

- After a more efficient level of service, the impact area of the Germany–Poland-route would extend from the existing area (red line in figures) to the central and southern parts of Poland, eastern parts of Germany and Southern European countries (green line in figures)
- Freight transport to/from Moscow to other parts of Western Europe would still be worth directing through the Baltic Sea. The profitability of sea transport is more obvious in long transport distances.
- Goods to/from Moscow would be transported through the Finnish route also in the future, even if the level of service on the Germany–Poland-route improved considerably. The strengths of the Finnish route include good line services and quick port operations, the significance of which is emphasised in the transport of valuable goods.

Figure 5.4. Transport routes of metal products between Moscow and the EU: change of impact areas as a result of the improved level of service on the Germany–Poland-route. A road connection of motorway standard and direct block train connections from Moscow to Berlin were assumed to be constructed. Delays at border stations were assumed to be the same as the average in the EU area or 2–5 hours.

- The role of the Baltic ports will remain strong in the transport of metal products, as the time savings on a more direct ground transport route are not so significant as in the transport of valuable goods. However, part of the transport of valuable goods will shift from the route through the Baltic ports to the Germany–Poland-route.
- The improved Germany–Poland-route would be a very competitive connection for valuable goods (such as office apparatus as well as data processing, telephone, radio and TV equipment) between the EU and Moscow.

Figure 5.5. Transport routes of valuable products between Moscow and the EU: change of impact areas as a result of the improved level of service on the Germany–Poland-route. A road connection of motorway standard and direct block train connections from Moscow to Berlin were assumed to be constructed. Delays at border stations were assumed to be the same as the average in the EU area or 2–5 hours.

BIBLIOGRAPHY

ACI (2004). *ACI cargo traffic reports–Cargo Traffic 2003 Final*. Available in Internet: http://www.airports.org/traffic/traf_cargo.htm. Referred 30.9.2004.

Boeing (2004). *World Overview and Forecast*. Available in Internet: www.boeing.com/commercial/cargo/pdf/W_O_F.pdf. Referred 16.11.2004.

Cargo Turnover in the Baltic Ports January–December, 2003. *International Journal "Transit"*. 1/2004. Tallinn. Available in Internet: www.bi-info.ee/transit.

Carruthers, R. et al. (2003). *Trade and Logistics: An East Asian Perspective*. In World Bank (ed.): East Asia Integrates. Available in Internet: http://lnweb18.worldbank.org/eap/eap.nsf/Attachments/Chapter+5/$File/chapter+5.pdf. Referred 1.12.2004.

CCTST (2004). *The International Coordinating Council on Transsiberian Transportation.* Brochure. Moscow.

Community guidelines for the development of the trans-European transport network, proposal for a decision of the European Parliament and the Council, Brussels. 2003.

De Palacio. L. (2003). *EU Transport Policy: towards global growth and sustainable mobility.* Speech by transport commissioner Loyola de Palacio in St. Petersburg, September 11, 2003.

Directorate General Energy and Transport (2004). *Wider Europe for Transport*. Reflection note of Directorate General Energy and Transport, Santiago de Compostela, June 8, 2004.

Estonian Ministry of Economic Affairs and Communications and the World Bank (2004). *Transport Sector Restructuring in the Baltic States Toward EU Accession.* Proceedings of the 2nd Seminar held in Parnu on November 24–25, 2003.

EUROPA–Enlargement: Weekly Newsletters.

European Commission (2001). *White paper on Transport: "European Transport Policy for 2010: Time to decide"*.

European Commission (2003a). *EU Energy and Transport in Figures–Statistical Yearbook 2003.* Luxembourg: Office for Official Publications of the European Communities.

European Commission (2003b). *European Energy and Transport Trends to 2030.* Available in Internet: http://europa.eu.int/comm/dgs/energy_transport/-figures/trends_2030/index_en.htm. Referred 25.10.2004.

European Commission (2003c). *EU Crude oil imports, volumes & prices.*

European Commission (2003d). *Wider Europe–Neighbourhood: A New Framework for Relations with our Eastern and Southern Neighbours*", Communication from the Commission, Brussels, 11.3.2003.

European Commission (2003e). *Enlargement of the trans-European transport network.* Commission Press release, October 1, 2003.

European Commission. *Wider Europe: Commission to strengthen cross-border cooperation with new neighbours*. Press Release.

European Parliament–Directorate-General for Research. (2001). *Meeting Demand for Sustainable Transport and Transport Infrastructure in the Enlarged European Union*. Working paper for the STOA Unit. Brussels.

Eurostat. European Statistical Data Support (ESDS)–information service. Available in Internet: http://epp.eurostat.cec.eu.int/portal/page?_pageid=-1090,1137397&_dad=portal&_schema=PORTAL.

Foundation of Federal and Regional Programs (2003). *MTK North - South. International Transport Corridor North–South.* Brochure. Available in Internet: www.1080058.spb.ru/MTK.

GAIA–Great World Atlas (2004). Helsinki: Weiling+Göös.

Goldman&Sachs (2003). *Dreaming with BRICs: The Path to 2050*. Global Economics Paper No: 99.

High Level Group (2004). *Extension of the Major Transport Axes to the Neighbouring Countries and Regions*. EU working document, 18–19 October 2004.

International Railway Journal. 06/2004.

Klaipeda State Seaport (1998). *Klaipeda Container Terminal*. Brochure.

Laaksonen, P. et al. (2004). *Logistiikan tulevaisuus Itämeren alueella (Future of Logistics in the Baltic Sea Area).* Summary of the writings and discussions of specialists 16.8.2004. TEDIM-secretariat.

Latvian Road Administration (2004). *Yearbook of the Latvian Road Administration 2003.* Riga.

LT-Consultants et al. (2004). *ELOG EU–RUS–Logistisen informaation kehitystarpeet Venäjän ja Euroopan unionin jäsenvaltioiden välisessä tavaraliikenteessä (ELOG EU–RUS–Development needs of logistics information in freight transport between Russia and the European Union).* TEDIM Publications: Helsinki.

Maddison, A. (2003). *The World Economy: Historical Statistics. Development Centre Studies.* OECD, Paris.

Manunen, O. et al. (1999). *Aasian viennin logistiikka (Logistics of export to Asia).* Research report 516/1999. VTT Communities and Infrastructure.

MAP Kaliningrad. *Information Brochure Kaliningrad*.

Maritime business of Latvia (1996). Brochure. Riga.

Ministry of Transport of Lithuania. *Lithuania: A Transit Country.* Brochure. Vilnius.

MPS (1998). *Russian Railways–Inclusive Transportation Corridors*. Brochure. Moscow.

OECD (2004). *Monthly Statistics of International Trade*. Volume 2004/7 July.

PCA-agreement between the EU and Russia.

Port Authority. *Port of Tallinn*. Brochure. Tallinn.

Port of Tallinn. *Port Rules.* Valid from 31.12.2002. Tallinn.

Research and Design Institute of Regional Development and Transportation (2003). *Pan-European Transport Corridor IXA. Modeling Freight Transport. Phase II.* Sankt-Petersburg.

Ringborg, W. (2004). *Trade and transport in Northern Europe–Renaissance for River Sea Shipping? Baltic Shipping Days–Effects of the European Extension. Sundsvall 20.–21.10.2004.*

Ryan, N. K. (1998). *The future of maritime facility designs and operations.* Proceedings of the 1998 Winter Simulation Conference.

RZD. *Presentation Russian Railways AO*. Moscow.

State Customs Committee of the Russian Federation (2004). *Customs statistics 2004*. Part I and II. Publication of the Customs Committee. Moscow.

Statistics Finland (2003). *Statistical Yearbook of Finland 2003*. Gummerus: Jyväskylä.

SVULO (2004). *Suomen ja Venäjän logistinen kumppanuus (Partnership in logistics between Finland and Russia).* Unpublished draft report.

TEN-STAC (2003). *Scenarios, Traffic Forecasts and Analysis of Corridors on the Trans-European Network. Description of the Base Year 2000 and Interim Forecasts 2020.* D1+ Deliverable Corrigendum. Available in Internet: http://www.nea.nl/ten-stac/. Referred 15.9.2004.

TINA (2002). *Transport Strategies. Status of the Pan-European Transport Corridors and Transport Areas. Development and Activities in 2000 and 2001*. Final report. Vienna 2002.

TIS. *Trans-Siberian Intermodal Service.* Brochure. Moscow. Available in Internet: www.oootis.ru.

Transit Business Information. Transit business of Latvia `98. Riga. Available in Internet: www.transport.lv

Transport Infrastructure Development for a Wider Europe. Seminar, Paris, 27–28 November 2003.

Transport Strategy of the Russian Federation, draft (draft versions of winter 2003 and spring 2004).

Tähismaa, I (2004). *Information concerning construction of Port of Sillamäe.* Äripäev. 25/10/2004.

UN (2004). *World Population Prospects*: The 2002 Revision and World Urbanization. Available in Internet: http://esa.un.org/unpp. Referred 30.9.2004.

UNCTAD (2003). *Review of Maritime Transport, 2003. Annexes*.

UNESCAP (2001). *Report on the policy-level expert group meeting of the road networks connecting China, Kazakhstan, Mongolia, the Russian Federation and the Korean Peninsula.* UN Economic and Social Commission for Asia and the Pacific, Bangkok.

United Nations (2001). *Review of Developments in Transport and Communications in the ESCAP Region 1996–2001*. Available in Internet: http://www.unescap.org/tctd/pubs/review2001toc.htm. Referred 21.10.2004.

United Nations (2003). *Review of Developments in Transport in the ESCAP Region 2003*. Available in internet: http://www.unescap.org/publications/-detail.asp?id=972. Referred 22.10.2004.

VR Cargo. Transport statistics.

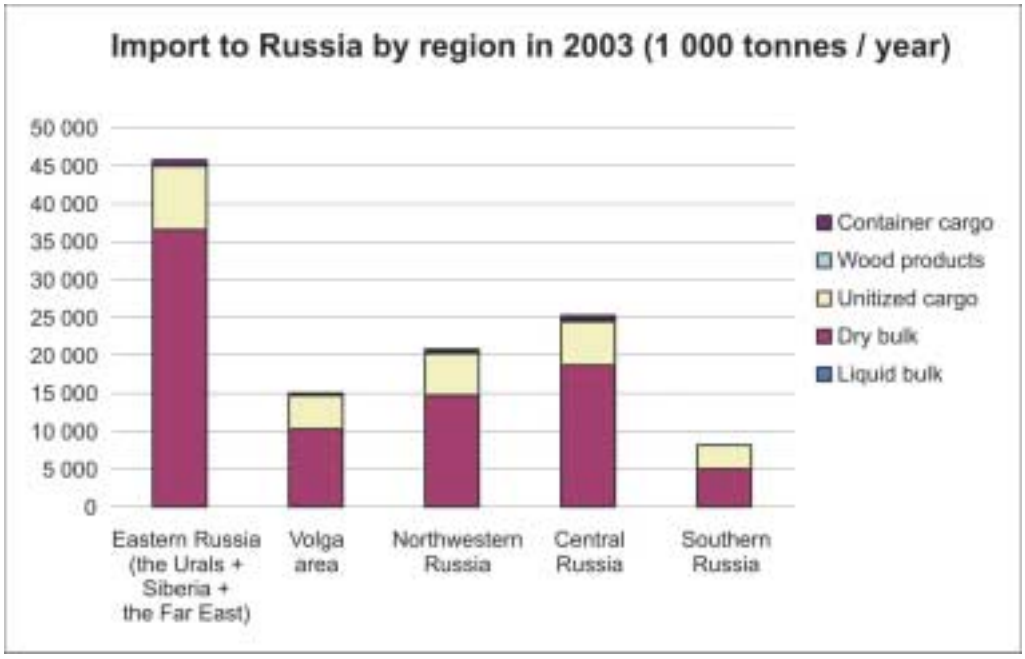
World Bank (2004). *World Development Indicators Database*. September 2004.

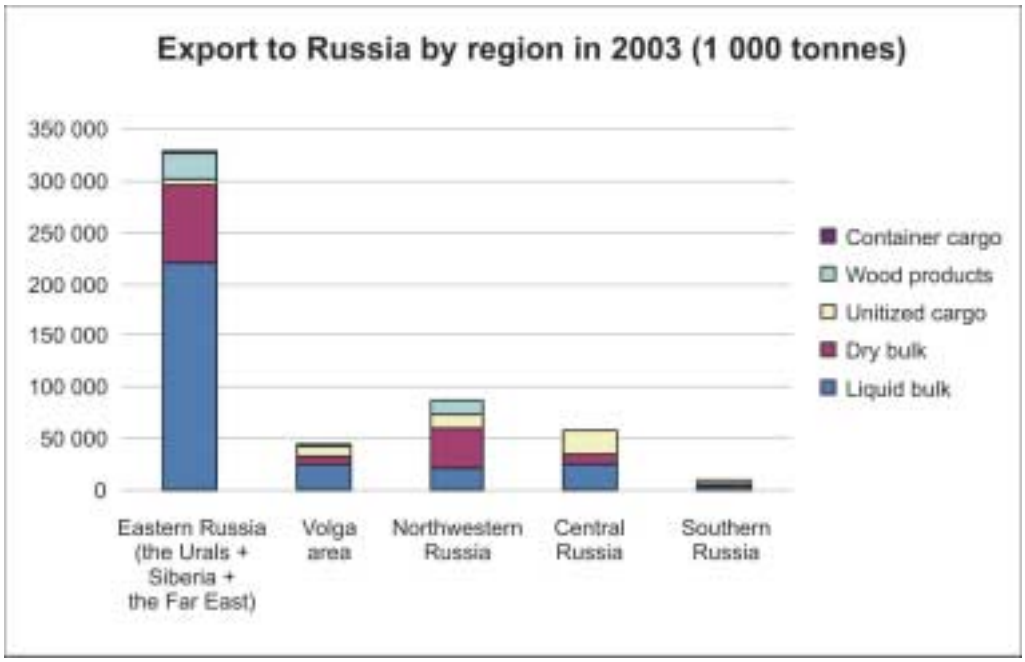
Interviews

Mahlin, E., Giprotranstein. Moscow.

APPENDICES

Appendix 1 Import and export of Russia by region





Appendix 2 Freight transport scenarios

Freight transport scenario by types of products in the year 2020 (1000 tonnes / year), TREND+ -scenario. Source: TEN-STAC, 2003.

	Agricultural products	Foodstuff	Solid fuel	Ore	Metals	Minerals	Fertilizers	Chemicals	Industrial products	Liquid fuel	Total
EU15+2 - other Europe	24 000	15 000	12 000	21 000	67 000	32 000	13 000	30 000	55 000	158 000	**427 000**
CEEC-countries - other Europe	9 000	8 000	8 000	94 000	15 000	17 000	8 000	25 000	17 000	65 000	**266 000**
Total	**33 000**	**23 000**	**20 000**	**115 000**	**82 000**	**49 000**	**21 000**	**55 000**	**72 000**	**223 000**	**693 000**
Freight transport scenario by types of products, TREND+ -scenario rate of change 2000-2020											
EU15+2 - other Europe	1,11	1,77	0,99	2,33	4,11	1,65	2,03	3,21	2,80	3,85	**2,62**
CEEC-countries - other Europe	1,76	1,60	1,04	3,35	3,79	2,51	2,41	4,98	3,33	1,97	**2,58**

Freight transport rate of development 2000–2020, TREND+ -scenario. Source: TEN-STAC, 2003.

	Road	Railway	Inland waterway	Sea	Other	Total
EU15+2 - other Europe	2,41	2,21	3,16	2,77	2,13	2,62
CEEC-countries - other Europe	6,96	1,85	1,90	2,53	1,80	2,58

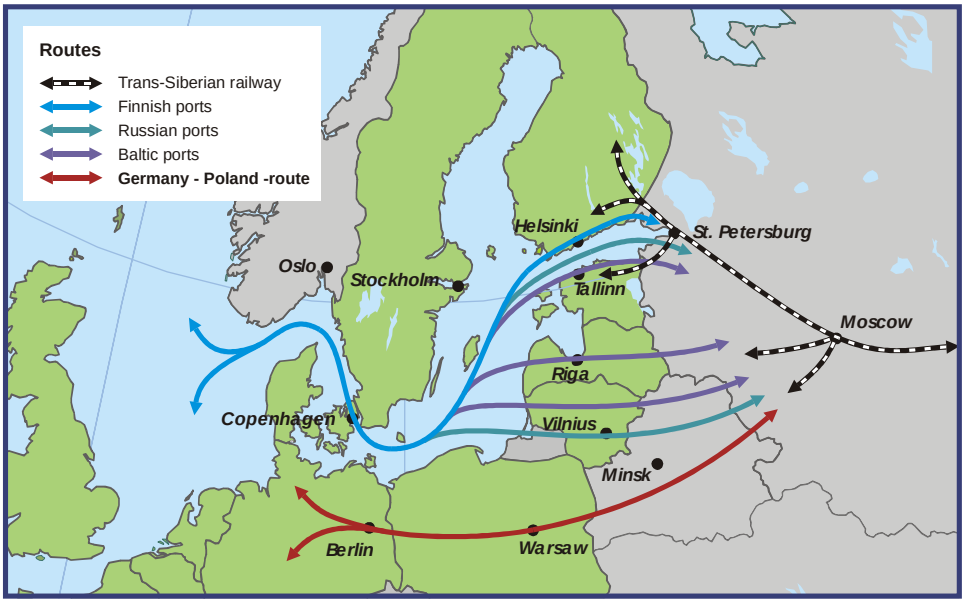
Exchange of goods between the EU, Russia and the CIS excluding energy products based on customs information as well as different scenarios for the year 2030 (million tonnes / year).

	2003 import from Russia	2003 export to Russia	2030 import from Russia (MinSce)	2030 import from Russia (ProbSce)	2030 import from Russia (MaxSce)	2030 export to Russia (MinSce)	2030 export to Russia (ProbSce)	2030 export to Russia (MaxSce)
EU-8	21,4	3,3	64,7	74,3	69,3	8,6	10,6	12,1
EU-14	72,9	8,7	171,6	197,1	184,1	18,8	23,0	26,3
Finland	18	1,7	46,0	52,8	49,3	4,2	5,2	5,9
Total	**112,3**	**13,7**	**282,2**	**324,1**	**302,7**	**31,7**	**38,8**	**44,3**

	2003 import from the CIS	2003 export to the CIS	2030 import from the CIS (MinSce)	2030 import from the CIS (ProbSce)	2030 import from the CIS (MaxSce)	2030 export to the CIS (MinSce)	2030 export to the CIS (ProbSce)	2030 export to the CIS (MaxSce)
EU-8	47,3	7,4	137,9	147,5	142,6	20,2	22,1	23,6
EU-14	87,2	12,0	203,2	228,6	215,6	26,2	30,4	33,7
Finland	18,0	1,9	46,1	52,9	49,4	4,7	5,7	6,4
Total	**152,6**	**21,3**	**387,1**	**429,1**	**407,6**	**51,1**	**58,2**	**63,7**

Appendix 3 Germany–Poland -route card

Germany - Poland -route



General description of route

Germany - Poland -route serves as a multimodal link, which connects European-wide networks (TEN-networks) through capital cities of four countries to the Eurasian transport networks of Russia. The route constitutes a natural extension to the Trans-Siberian railway (TSR) through Russia. The PAN-Corridor 2 constitutes a significant part of the route. Route is also included in the TINA -network.

Alignment

Route alignment:
Berlin - Warsaw - Minsk - Moscow - Niznij Novgorod, continuing to the Urals

Countries in the corridor:
Germany, Poland, Belorussia, the Russian Federation

Modes of transport:
Railway, road, (air transport)

Length of corridor
- railway 2 313 km
- road 2 200 km

Significance for transport

Railways and roads are included in the main transport network of countries along the route. In addition to intermediating role of international passenger and freight traffic, route has internally important political and economic role. There is a connection from Niznij Novgorod at the end of route to the Urals and along TSR to Siberia and the Far East. Niznij Novgorod is also an intermodal node to the important Volga inland waterway.

Technical description

ROAD:

Germany: 118 km of 4-6 lane motorway

Poland: 682 km (537 km of 2-lane highway 145 km of 4-lane motorway, 48 km in urban area)

Belorussia: 604 km of 4-lane highway

RAILWAY:

Germany, Poland: Rail gauge 1430 mm. Max. speed in the future 160 km/h (estimate).

Russia, Belorussia: Rail gauge 1 520 mm, heavy rails, electrified (25 kV) track. Max. axle load 22 500 kN. Max. speed for freight trains 80 km/h, passenger trains 120 - 140 km/h.

Germany–Poland -route card (2/3)

Transport volumes

ROAD TRANSPORT

Germany:
- ADT of 24 000 vehicles (year 1998), one-third of heavy traffic
- Estimated ADT 40 000 - 50 000 vehicles in the year 2010

Poland:
- ADT of 14 000 vehicles (year 2000)
- Maximum of about 41 000 vehicles (year 2000)
- Average freight volume in the Polish section is 22 100 000 tonnes/year, of which 3 600 000 tonnes of transit traffic

Russia:
- Transit traffic on the route is 5,2 million tonnes per year

RAILWAY TRANSPORT

Poland:
- 61 daily trains

Russia:
- Transit traffic of about 1,3 million tonnes
- About 8 000 TEUs of containers through Brest

Existing problems

ROAD TRANSPORT

Poland:
59 km of severely congested road segments (Warsaw and its entrance roads).

Belorussia:
Road upgraded, no extensive technical problems. Border crossing between Belorussia and Poland.

Russia:
Pavement condition partly poor. Congestion on the Moscow ring road (delay of about 1 hour for trucks). Some bridges need upgrading.

RAILWAY TRANSPORT

Transshipment in Brest is a problem, due to which container transport is modest on the route.

Also, the marketing of the route is considered insufficient.

Change of cargo manifest type at the border of Russia and Belorussia slows down transport.

Germany–Poland -route card (3/3)

Development projects and administration

ROAD NETWORK DEVELOPMENT PROJECTS

Germany: Upgrading works on the entire German segment from the centre of Berlin to the Polish border (118 km). Number of motorway lanes varies between 4-6. Completion by the year 2006.

Poland: Upgrading work on the entire segment, includes new road connections and upgrading. Road from the German border to Warsaw will be upgraded to motorway standard for the entire length, completion in 2011 (implementation with the Warsaw ring road construction). Reinforcement of pavement from Warsaw to the Belorussian border, completion in 2007.

Belorussia: Upgrading completed for the entire segment (604 km), no new development projects.

Russia: Number of lanes varies between 2 - 6 on the entire segment (860 km). Pavement condition is partly very poor, upgrading is needed.

RAILWAY NETWORK DEVELOPMENT PROJECTS

Germany: Upgrading of section between Berlin and the Polish border to a speed of 160 km/h. Estimated completion in 2005. Development of border stations in the future.

Poland: Modernisation of existing railway for the entire length. The southern ring railway of Warsaw for freight transport is in preliminary planning phase (182 km). Modernisation of Terespol border station.

Belorussia: Length of section 610 km. Ongoing upgrading of connection, estimated completion in 2005.

Russia: Section from the Belorussian border to Moscow (489 km) and from Moscow to Niznij Novgorod (439 km).

INTERNATIONAL ADMINISTRATION

An international administrative committee (AC) has been established for the development of the Pan-Corridor 2. Representatives from the European Commission, Germany, Poland, Belorussia and Russia participate in the work of the AC. German representative manages the tasks of international secretariat. A Memorandum of Understanding was signed on 23.1.1995. In 2000, Corridor was decided to be extended to Volga in Russia. Working groups of railway organizations and Customs have actively participated in the work of the AC.

Financing outlook

According to the TINA-report, the development of the route (until the year 2015) requires:

Railway network

- Germany: 316 million Euros
- Poland: 1,839 million Euros
- Russia: 1,481 million Euros

Road network

- Germany: 69 million Euros
- Poland: 3,709 million Euros
- Russia: 1,059 million Euros

SOURCES OF FINANCING

Poland: The EU programmes, national financing and loans

Belorussia, Russia: National sources (RZD annual investment programmes), state budget and loans

Implementation schedule and goals

ROAD NETWORK

Poland: Investments until 2015

- 2004 segment Poznan - Nowy Tomysl
- 2004 - 2005 Konin - Strykov (103 km)
- 2005 - 2007 Nowy Tomysl - Swiecko (110 km)
- 2006 - 2008 Strykov - Warsaw (102 km)
- 2009 - 2011 Warsaw ring road
- after 2011 Warsaw - Kukuryki (190 km)
- Minor upgrading on the segments Konin - Poznan and Warsaw - Terespol

Russia: 5 - 8 years

RAILWAY NETWORK

Russia: railway projects 2010

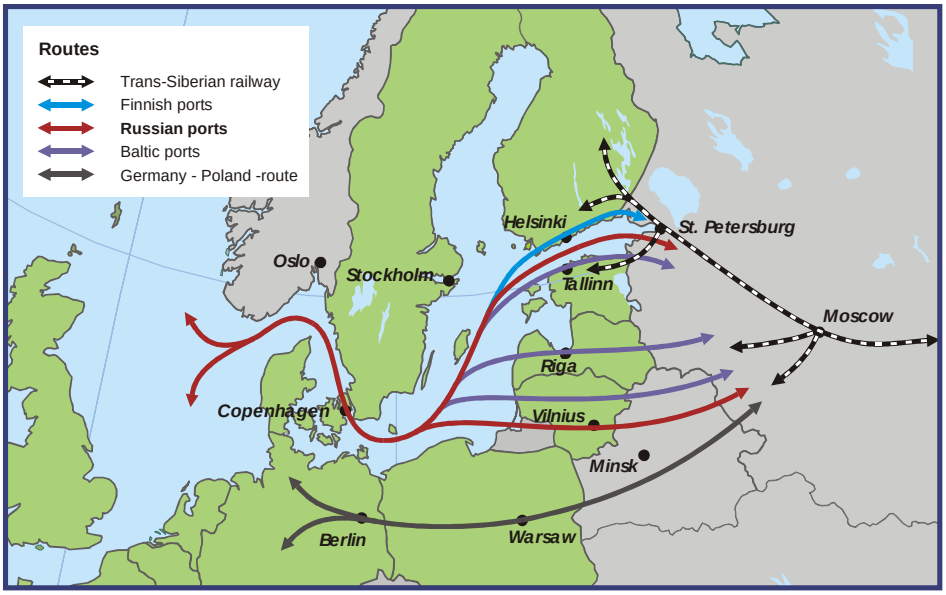
Belorussia: Brest station 2005

GOALS

Goal is the international level: efficient, safe and competitive Pan-European route in accordance with the best standard.

Appendix 4 Route through the Russian ports -route card

Route through the Russian ports



General description of route

The most important Baltic ports of Russia include:

- MAP (Morskaja Administracia Porta) Kaliningrad: Commercial port of Kaliningrad, fishing port of Kaliningrad and oil terminal, river port of Kaliningrad, Baltiiski port area
- MAP St. Petersburg: Commercial port of St. Petersburg, Primorsk oil port
- MAP Vyborg ja Uuras

Alignment

There are sea connections from the Baltic ports of Russia to ports of Western Europe, extending from the Nordic countries all the way to the Mediterranean Sea. Through overseas transport, ports have connections to North and South American ports, the Near East and Western Africa.

The Trans-Siberian railway (TSR) and the east-west routes of Russia provide good connections to the Far East, Central Asia and the Caucasus. Ground transport connections of ports act as branches of the PAN-Corridor 9, and thus provide connection to the PAN-Corridors 1 and 2.

Significance for transport

Total of 76,4 million tonnes of cargo were transported through the Baltic ports of Russia in 2003. The share of the Baltic ports (Russia, the Baltic countries, Finland) is about 40 % of freight transport in Russian foreign trade. The share of the Russian ports of this is about 56 %.

The ports of St. Petersburg and Kaliningrad act as nodal points of the international PAN-corridors and Russian domestic routes, which connect inland waterway, railway and road networks in addition to sea transport networks.

Technical description

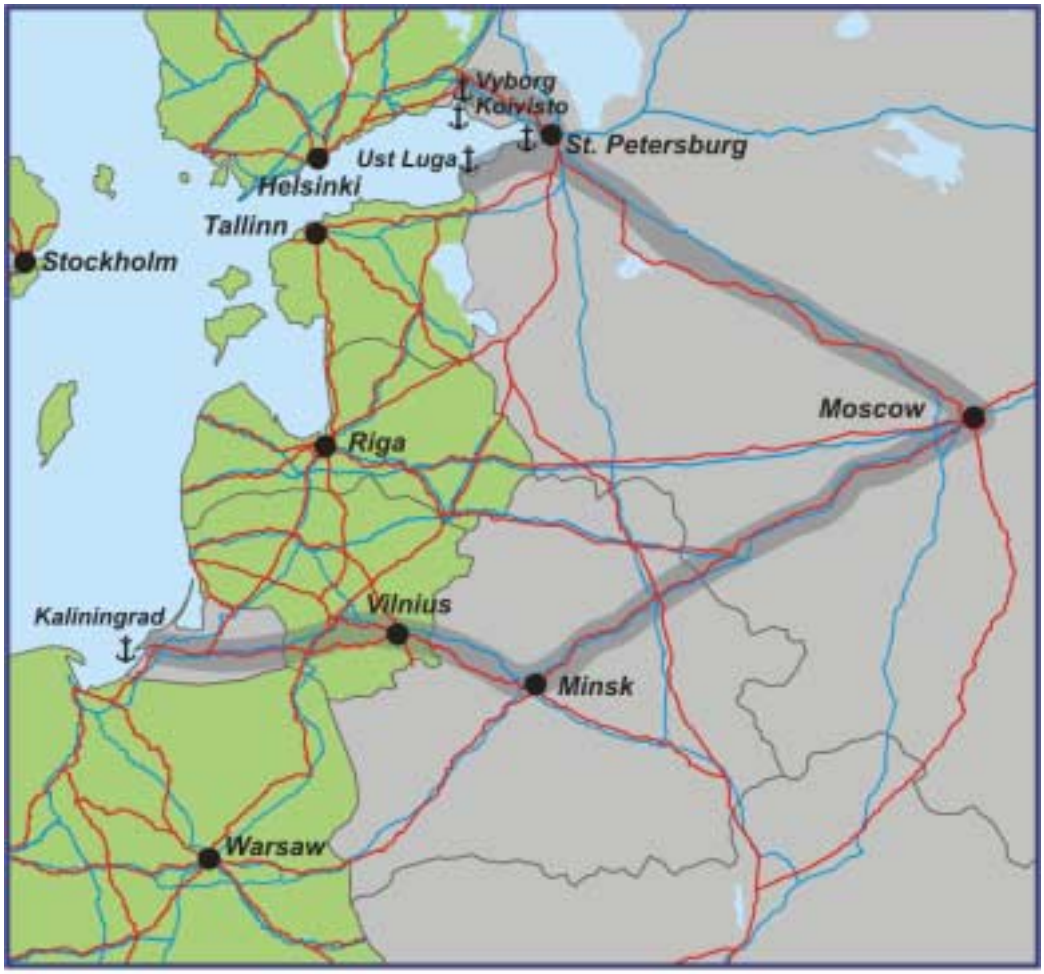
Ports in Kaliningrad area: Depth of commercial port is 9,75 m, fishing port is 8,2 m and river port is 4,8 - 5,25 m. Max. vessel size is 10 - 16 000 tonnes.

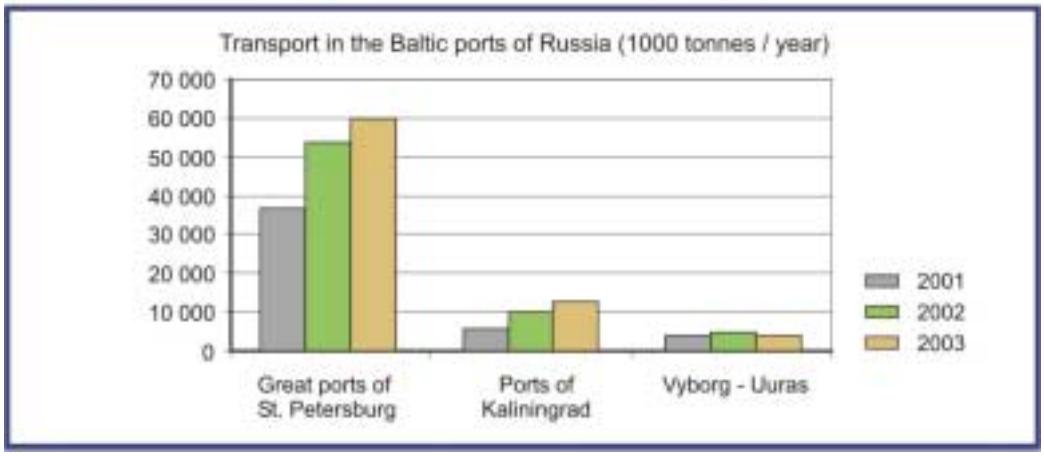
Port in the city of St. Petersburg: Depth of port is 11 m and max. vessel size is 14 - 16 000 tonnes. Capacity of port is 18 million tonnes.

Primorsk oil port: Depth of port is 13 - 15 m and max. tanker size is 60 - 80 000 tonnes. Current capacity is 20 million tonnes.

Vyborg and Uuras: Depth of port 8 - 9 m in Vyborg,10 - 11 m in Uuras. Max. vessel size 9 - 10 000 tonnes in Vyborg, 14 - 16 000 tonnes in Uuras. Total capacity is 4 - 5 million tonnes.

Route through the Russian ports -route card (2/3)





Route through the Russian ports -route card (3/3)

Transport volumes

Transport volumes in all Russian ports are increasing excluding Vyborg.

The greatest growth has occurred in crude oil transport (42,6 % during the year 2003).

Container transport is concentrating on St. Petersburg. 653 183 TEUs was handled in 2003.

Also, freight flows in Kaliningrad have been growing.

Freight flows in ports in the year 2003:

- Great port of St. Petersburg:
  Total of 42 042 thousand of tonnes
- Primorsk oil port:
  17 685 thousand of tonnes of crude oil
- Vyborg, Vysotsk:
  3 942 thousand of tonnes
- Ports in Kaliningrad:
  12 725 thousand of tonnes

Development projects

- Development of the Lomonossov port in the city of St. Petersburg
- Entrance roads to the city ports of St. Petersburg
- Second phase of the development of the Primorsk oil port is nearly completed. This will increase port capacity from 18 million tonnes to 30 million tonnes. Third phase is under planning, which can increase port capacity to 50 - 60 million tonnes.
- Preliminary plans of the Vistino, Batareinaja and Lomonossov ports
- Ust Luga port and ground transport connections to port
- Development projects in the ports of Kaliningrad
- Ferry connection to Germany and other parts of Europe through Kaliningrad

Existing problems

Common problems in the Russian ports include e.g. environmental risks of massive oil transport and crossing transport flows in the Gulf of Finland.

Problems in the port of St. Petersburg

- Location in the metropolitan area makes upgrading of entrance roads complicated and development of warehouse areas, container fields, rail yards and parking areas difficult
- Hazardous environmental impacts of port transport
- Entrance fairway needs dredging, vessel size of 14 000 - 16 000 tonnes
- Severe winter conditions, 2 - 3 months in normal winters, longer in severe winters

Problems in the Primorsk port

- Dangerous entrance fairway

Problems in the ports of Kaliningrad

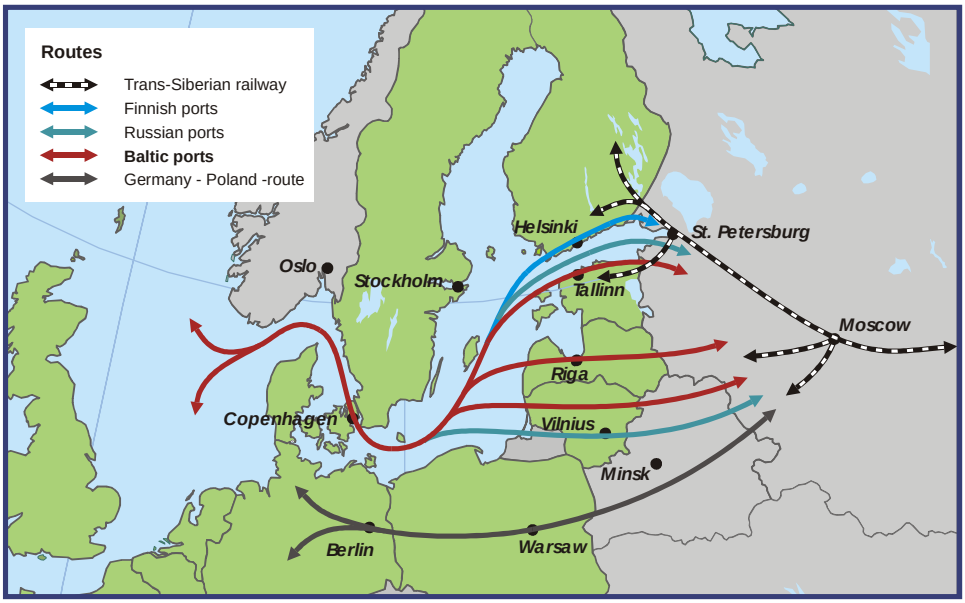
- Ground transport connections through Lithuania
- Many military areas
- Reluctance of companies to locate in Kaliningrad area

Financing outlook

- National funding from the program “Modernization of transport systems in Russia”
- Company financing (Lukoil) for Primorsk and Vysotsk
- Annual investment programmes of the RZD (Ust Luga railway connection)
- Loans from international financing institutions

Appendix 5 Route through the Baltic ports -route card

Route through the Baltic ports



General description of route

The main ports of the three Baltic countries (Estonia, Latvia, Lithuania) are Tallinn, Riga, Ventspils, Liepaja and Klaipeda. These ports are connected to the main ports of the Nordic countries, Poland, Germany, the Netherlands, Belgium and England through line service network. In addition, other destinations include Southern Europe, Africa, Asia and America. The most important destinations in Russia include Northwestern and Central Russia and the Urals. Also, connections to Belorussia and Kazakstan are important.

Alignment

Railway connections:

From the **port of Tallinn** to Russia,
from the **ports of Riga, Ventspils** and **Liepaja** to Russia and Belorussia and
from the **port of Klaipeda** to Belorussia and Kaliningrad area.

Road connections:

From the **port of Tallinn** south to Via Baltica and east towards St. Petersburg,
from **the ports of Riga, Ventspils** and **Liepaja** to Russia in the direction of St. Petersburg, Moscow and Kaliningrad,
from **the port of Klaipeda** to Belorussia and Kaliningrad area.

Significance for transport

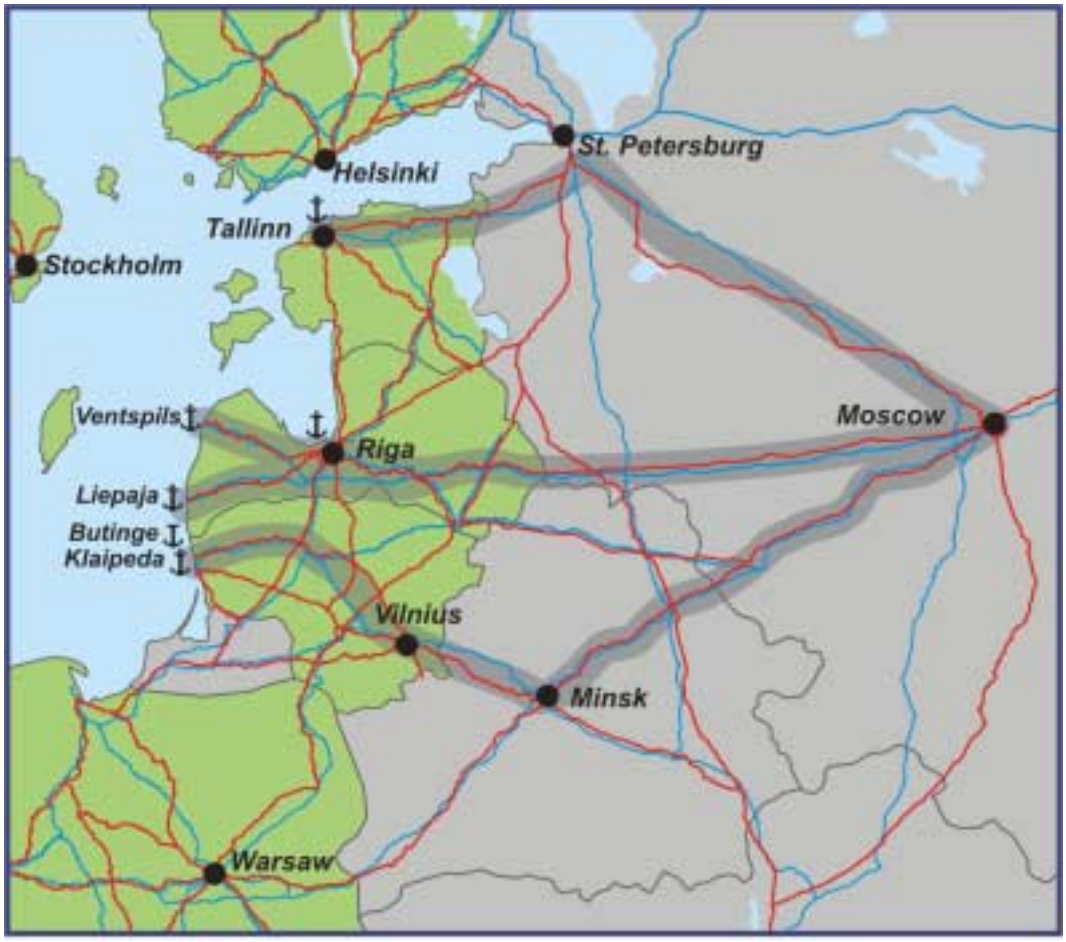
Ports in the Baltic countries serve the freight transport of foreign trade of Russia and the other CIS-countries. Total volume of ports was about 112 million tonnes in 2003. Most of this consisted of transit traffic to Russia and the other CIS-countries.

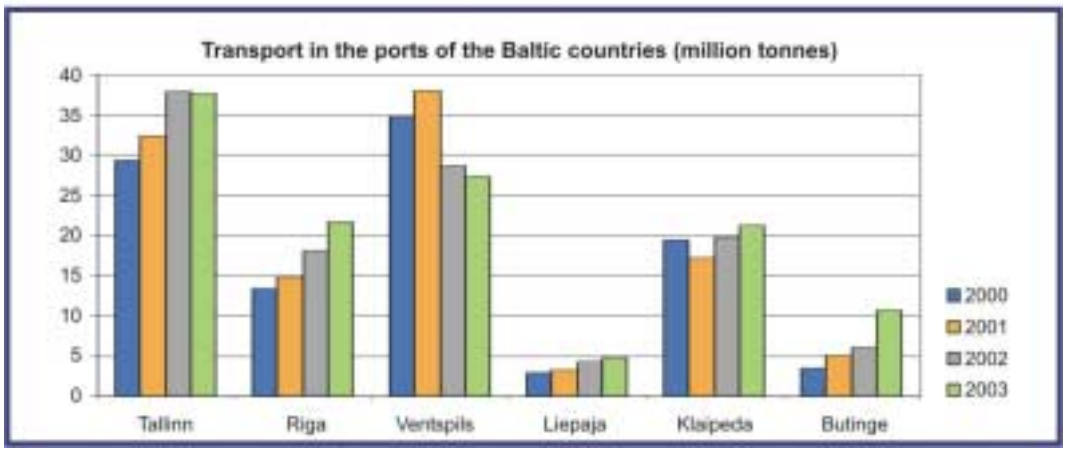
Good logistics and operating environment in the Baltic ports have so far kept the most significant freight flows in the ports of Muuga and Ventspils.

Technical description

Port of Klaipeda: Depth of port is 10,5 m, max. length of vessel is 200 m. The capacity of port is 21 million tonnes per year.
Port of Ventspils: Port area is 1 728 hectares, length of quay is 5 767 m. Depth of dock is 17,5 m, max. length of vessel is 230 - 250 m.
Port of Riga: Port area is 2 532 hectares, length of quay is 12 662 m. Max. depth is 10,6 m. Max. length of vessel is 240 m.
Port of Liepaja: Depth of dock is 4,5 - 10,5 m. Max. length of vessel is 200 m. Length of quay is 7 000 m. Capacity of port is about 7 million tonnes per year.
Ports of Tallinn: Port area is 562 hectares, length of quay is 10 201 m.

Route through the Baltic ports -route card (2/3)





Route through the Baltic ports -route card (3/3)

Transport volumes

Transport volumes in 2003 (1000 tonnes)

Port of Klaipeda:

Volume 21 192, in which east-west direction 15 947 and west-east direction 5 245. Annual growth of volume 11,5 %.

Port of Liepaja:

Volume 4 858, in which east-west direction 4 223 and west-east direction 635. Growth of 12,5 %.

Port of Ventspils:

Volume 27 351. Decrease of 4,7 %.

Port of Riga:

Volume 21 722. Growth of 20,0%.

Port of Tallinn:

Volume 37 855, in which east-west direction 33 129 and west-east direction 3 932. Total transit traffic 29 317. Decrease of volume 0,6 %.

Existing problems

Road transport: Border crossings (also depend on Russia), educational level of operators, travel behaviour and safety. Capacity and poor condition of Narva bridge. Estonia is willing to build another bridge at Narva.

Railway transport: Technical development of border stations, environmental protection, prevention of environmental accidents, technical level of railway network compared to other EU-countries.

Ports: Work and environmental safety, prevention of environmental accidents in ports. Icebreaking during severe winters.

Other: : Uncertainty due to the development of Russian own ports and discriminating tariff policy of Russia towards neighbouring countries.

Financing outlook

Ports:

Own investment programmes, private financing and loans from international financing institutions.

Roads and railways:

EU financing, national sources.

Development projects

Investments of the Baltic countries to the TEN-network during 1996 - 2010 (Actual data 1996-2001)

million Euros

	Roads:	Railways:	Ports:
Estonia:	386	76	290
Latvia:	274	-	66
Lithuania:	315	758	360

Transport sector has the greatest need for investments. Road investments are directed to partial upgrading of the main road network and improvement of pavement quality.

Rail investments in Lithuania are used to the construction of 1 430 mm track all the way to Kaunas and building of border stations; in Estonia for upgrading of the railway network and building of the Kliima border station.

In Estonia, port terminals of Muuga and Paldiski, new ports, Sillamäe freight port and Saarenmaa harbour for cruise ships are further developed. Sillanmäe port is under construction. The cost estimate of the construction of the port and its infrastructure is over € 50 million. The first phase of the port includes an oil terminal, 7 berths and a rail yard. The first phase is estimated to be completed in the spring of 2005. Construction of the Saarenmaa harbour is complicated, as it is located near important environmental protection areas.

Port terminals of Klaipeda are further developed in Lithuania.

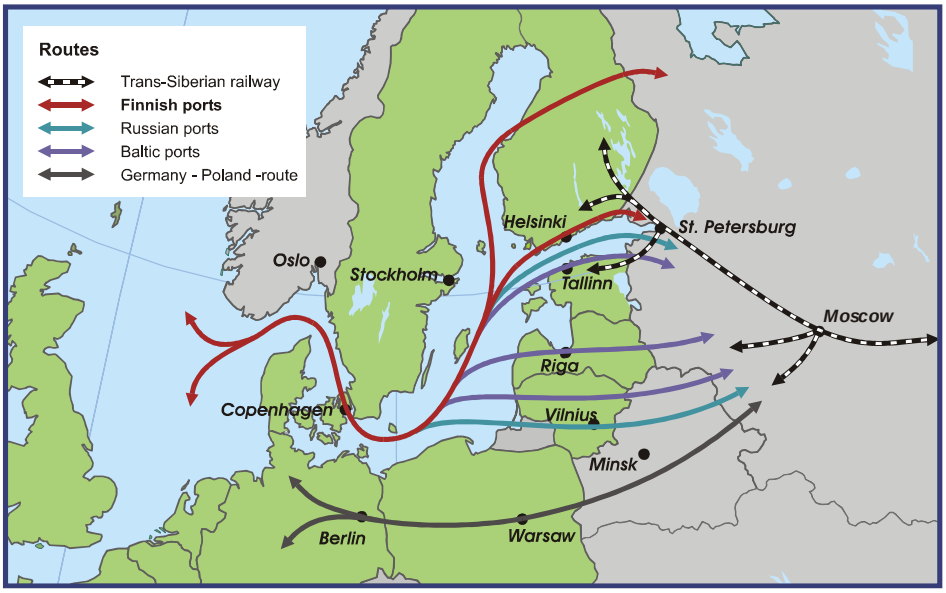
Summary

Transit traffic to Russia and the CIS-countries is one of the most important and profitable sources of income for the Baltic countries, especially for Latvia and Estonia. It has also an important employment effect. Russian strategy is directed to increasing use of domestic ports which anticipates stronger competition for the freight flows of Russian foreign trade.

The favourable location of the Baltic ports, efficient operations, good ground transport connections and growth of the freight flows in Russian foreign trade will make it necessary for Russia to use the Baltic ports also in the future. The volume of use remains to be seen.

Appendix 6 Route through the Finnish ports -route card

Route through the Finnish ports



General description of route

The route through the Finnish ports has the best line service of the Baltic Sea to the ports of Scandinavia and Western Europe. The route has efficient services and high environmental and safety standards. The route is an intermodal PAN-Corridor consisting of sea and inland waterway transport, railways and roads. Helsinki, St. Petersburg and Moscow are nodes of international air transport. A share of about 32 - 42 % of the value of the imports of Russia comes from Finland and through Finland.

Alignment

The alignment of the main branch of the route:
Turku/Hanko/Helsinki/Kotka/Hamina - St. Petersburg - Moscow.
Connection along Corridor 9 all the way to Greece and along the Trans-Siberian railway to the Far East.

Countries on the route:
Finland, Russia

Modes of transport:
Railway, road

Length of route:
- railway 1 120 km
- road 110 km

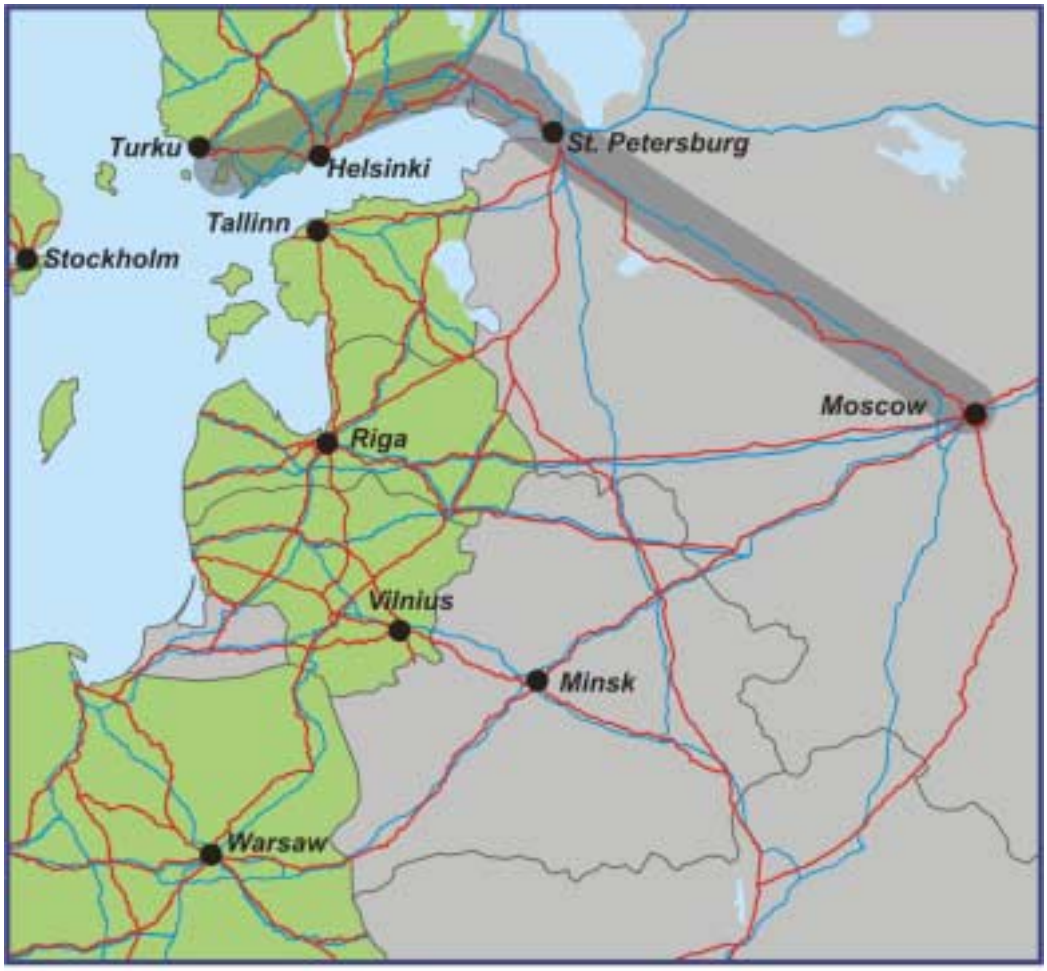
Significance for transport

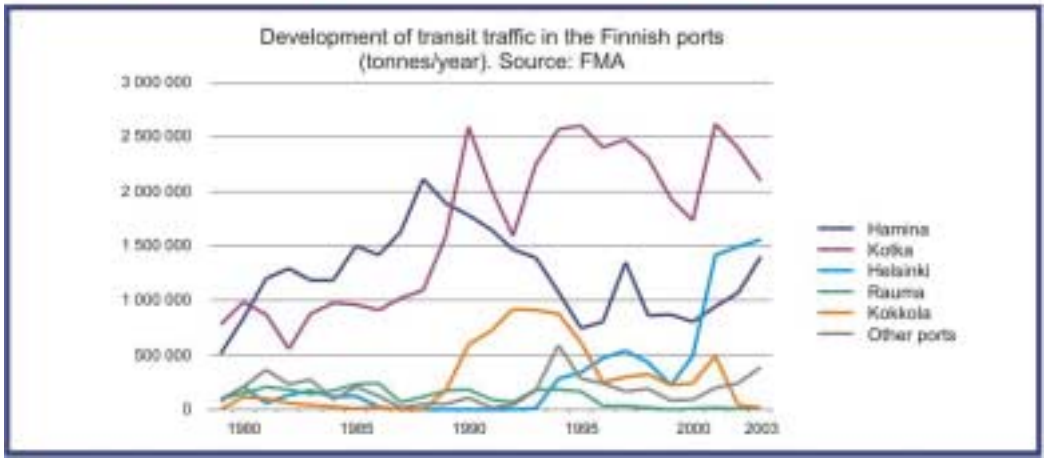
The route connects the Nordic countries and the ports of Western Europe to the core areas of Russia. The efficient line service in the Baltic Sea replaces long-distance lorry transport. There is a road and railway connection from the ports of Finland to St. Petersburg, Moscow and along the Trans-Siberian railway to other parts of Russia, the CIS and the Far East. There is a connection from St. Petersburg to the inland waterway network of Russia. The route has great significance as a supplier of bilateral foreign trade between Finland and Russia. Nationally, the route is included in the main corridors of Russia.

Technical description

Road connection from Moscow to St. Petersburg has 2-3 lanes (entrance roads to cities have 4-6 lanes). Driving directions are partly divided in the vicinity of cities. Traffic volume is near the capacity along the entire road.
Road connection from St. Petersburg to Kiev is of poor condition. Bridges and pavement need improvement. In addition, some bridges have weight limitations.
Maximum axle load on the track **between Moscow and St. Petersburg** is 22 500 - 23 000 kN. Track is electrified. Maximum speed of special freight trains is 100 km/h.
Track from St. Petersburg to Belorussia and Ukraine is not electrified and has one pair of rails.

Route through the Finnish ports -route card 2(3)





Route through the Finnish ports -route card (3/3)

Transport volumes

Transport volumes on the Russian section:

- Road connection:
  6 million tonnes / year
- Railway connection:
  30 - 35 million tonnes / year

Branch through Belorussia to Ukraine:

- Road connection:
  1,5 million tonnes / year
- Railway connection:
  7 million tonnes / year

Existing problems

- Road between Moscow and St. Petersburg is considered a barrier to the development of Russia due to congestion and poor condition
- Pavement and bridges on the road between St.Petersburg and Kiev are in need of repair
- Railway volumes between Moscow and St. Petersburg are almost at maximum capacity which disrupts the use of high-speed trains
- Rail section from St. Petersburg through Mga to Velikie Luk needs upgrading so that part of freight transport could be shifted to it from the railway between Moscow and St. Petersburg
- Insufficient financing
- Insufficient use of available financing
- Limited use of PPP and other modern financing mechanisms in railway and road projects

Financing outlook

Current financing from the programme ”Modernization of the Russian transport system”.

Annual investments by the RZD and the road sector of Russia.

These instruments are considered insufficient. The participation of companies similar to the PPP are welcomed. Furthermore, toll roads and special measures are planned.

A more efficient mechanism for using State appropriations is under planning.

Development projects

Russia

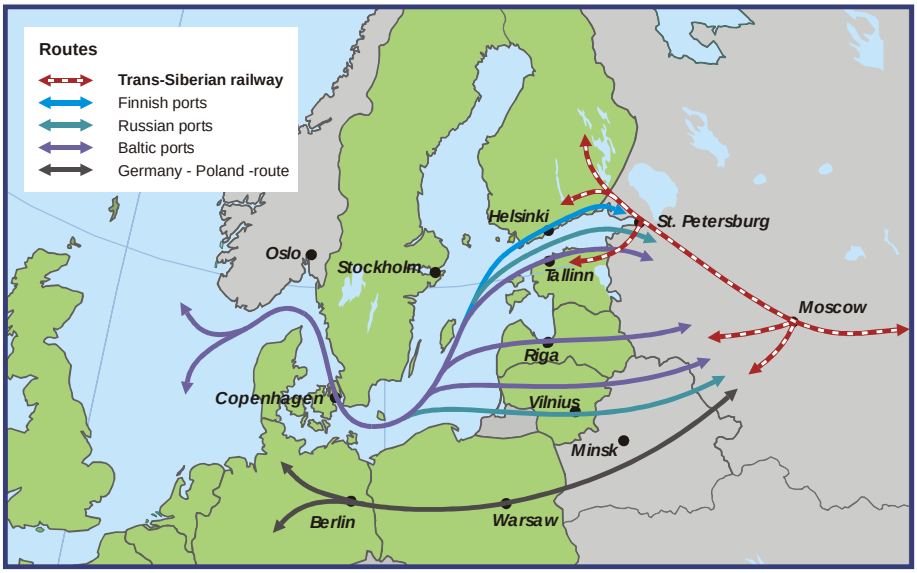
- Construction of a motorway on the route Moscow - St. Petersburg - the Finnish border (Helsinki): the aim is to develop the largest and nationally most significant project in this sector. It is considered in Russia that the project will provide a strong boost to the Moscow, Tver, Novgorod and Leningrad regions. The project will promote the mobility of people and the transport opportunities of the international North-South corridor of Russia as well as the port of St. Petersburg. Simultaneously, the project will also promote the competitiveness of the Finnish logistics system in Russia.
- Moving part of the freight transport away from the Moscow - St. Petersburg railway and increasing the speed of trains.
- Improving the condition of parallel railways to meet the demand of freight transport.
- Use of the modern financing mechanisms through long-span budget financing and introduction of private financing through the PPP-principle. Good examples are the construction of the ports of Koivisto and Uuras and the participation of Lukoil and other companies.

Finland

- Improvement of Road E18
- Kerava - Lahti direct rail line
- Additional track between Luumäki - Vainikkala
- Construction of double track between Vainikkala - Buslovskaja

Appendix 7 Trans-Siberian railway -route card

Trans-Siberian railway



General description of route

Trans-Siberian railway (TSR) together with Moscow - St. Petersburg and Moscow - Brest railways constitute the backbone of the Russian transport system. TSR connects the main centres on the western border to the Urals, Western and Eastern Siberia as well as the Far East and its ocean routes. The railway serves both internal transport of regions in Russian and freight transport of foreign trade. Technically, TSR is one of the most developed routes in Russia. Annual freight transport volumes on the most loaded sections are 80 - 90 million tonnes.

Alignment

Route of the main branch of the alignment: Moscow - Nizhniy Novgorod - Perm - Yekaterinburg - Omsk - Novosibirsk - Irkutsk - Habarovsk - Vladivostok / Nahodka / Vostochnyi

Extensions from Moscow:

- to the PAN-Corridor 9: St. Petersburg - Finnish border - Finnish ports
- to Klaipeda, Kaliningrad (so-called 2K-transport)
- connection to Ukraine, ports of the Black Sea and Caspian Sea, the Caucasus, Hungary and Slovakia
- connection to Estonia and Latvia

Extensions from nodal points to Central Asia, Mongolia and China.

Significance for transport

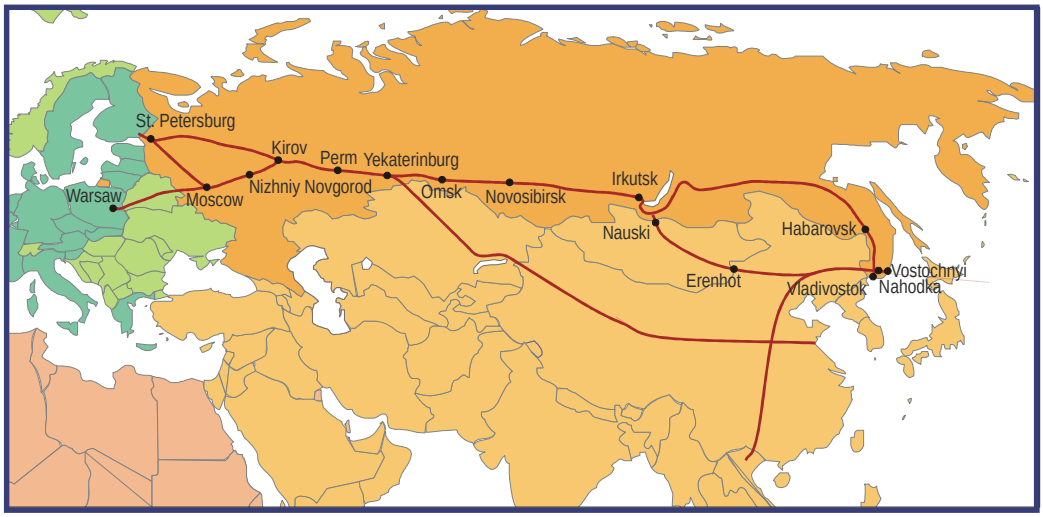
National: connects politically and economically important areas of Russia. Very important for the internal freight transport of the country.

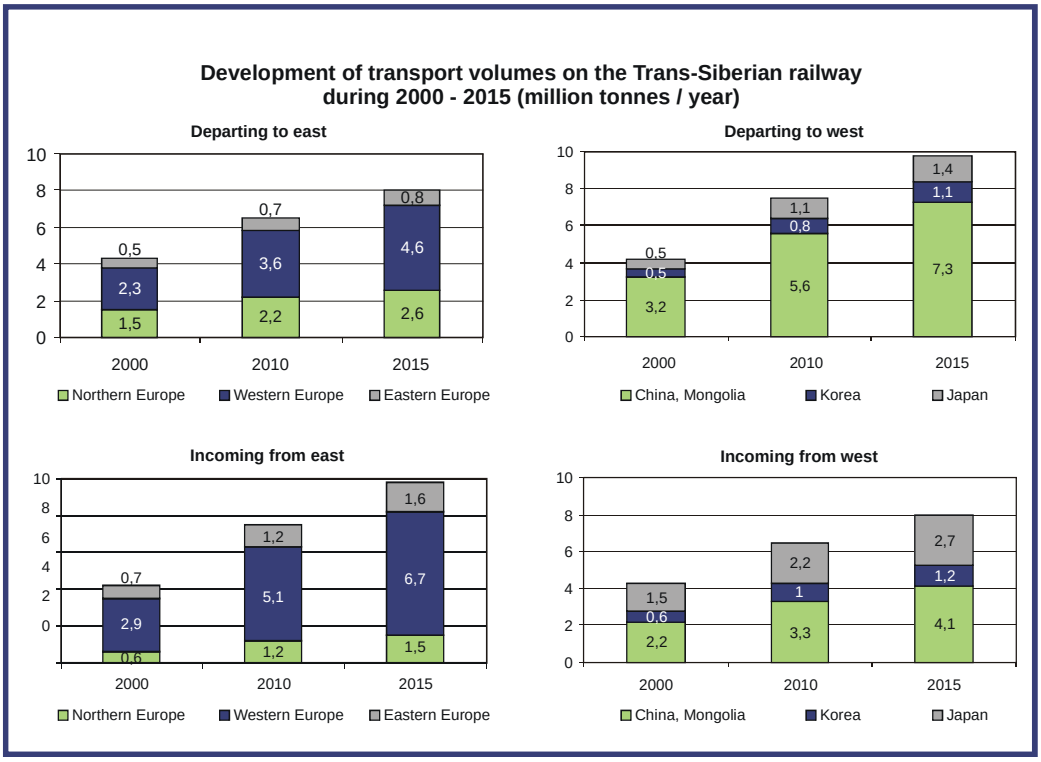
International: connects the railway networks of Western and Eastern Europe as well as the Far East. Branches from the main route to the ports of the Baltic countries, Black Sea, Caspian Sea and Chop in Ukraine as well as to Southeastern and Central Asian countries. The Russian ports in the Far East have frequent sea transport connections to e.g. Japan, South Korea and China.

Technical description

- Two pairs of rails on the entire length, heavy rails
- Electrified 25 kV track
- Maximum axle load 22 500 - 23 000 kN
- Maximum length of freight train is 59 - 71 wagons, maximum speed of 80 km/h
- Optical cable along the entire TSR for telecommunications
- Speed of special container freight trains is 100 km/h, daily journey of 1 200 km along the TSR

Trans-Siberian railway -route card (2/3)





Trans-Siberian railway -route card (3/3)

Transport volumes and times

The current capacity of container transport is about 250 000 TEUs.

Examples of transport times:

- Shanghai - Kotka 22 days
- Shanghai - Moscow 20 days
- Shanghai - Central Europe 25 days
- Nahodka - Buslovskaja / Vainikkala 10,5 days (on a special train)
- Nahodka - Belorussian / Ukrainian border 12 days

Sea transport times from the ports of Japan, Republic of Korea and China to Nahodka as well as transport times in western ports should be added to the total transport time. For example, Berlin can be reached in 14,5 days from Nahodka.

Sea transport from the ports of Japan, China or South Korea to European ports takes 30-45 days.

Summary: TSR provides a quick alternative between Eastern Asia and Western Europe when compared to sea route through the Suez Canal or around Africa.

Existing problems

Problematic locations:

- Container terminals of the Russian ports in the Far East
- Bridge over the Amur River has only one pair of rails
- Border stations of Brest and Chop: change of bogie or cargo transshipment to 1 430 mm rail gauge
- Missing ground transport connection through North Korea to South Korea

Other problems:

- Lack of delivery terminals at nodal points
- Shortage of container wagons (particularly for 40-foot containers)
- Logistics systems of large companies based on ocean transport and an unwillingness to change them
- Constantly changing public authority activities in Russia and partially inconsistent legislation, which reduces the confidence in services especially in Japan
- Organizational reforms of the RZD and the Ministry of Transport in Russia are not yet totally completed

Development projects

- Stabilization of the common economic situation of the Russian Railways (RZD).
- Development of the quality of services.
- Integration into the Eurasian transport system
- Partial upgrading of railway: reinforcement of rail bed in locations where its weakness or deterioration affect the longevity of superstructure and maintenance costs.
- Construction of another bridge across the Amur River.
- Electrification of the connecting railways to the TSR, development of rail yards and terminals of ports and other nodal points. Increasing the number of handling points for 40-foot containers.
- Development of the nodal points in St. Petersburg and Moscow: rail yards, terminals. Better connections to airports.
- Moving freight traffic away from the Moscow - St. Petersburg -railway to Moscow - Velikije Luk Mga - St. Petersburg and Moscow - Jaroslavl - Vologda - St. Petersburg -railways. The Velikije Luk - St. Petersburg -railway requires upgrade investments.

Administration and financial outlook

Administration

The operation of the TSR is controlled by the RZD. Also, private operators participate in the production of transport services (for example Far East Transport Company, Sungate and Locotrans).

National financing:

- through the investment programmes of the RZD
- from companies
- loans from investment banks

Implementation schedule and goals

Goals

- Stabilization of the common economic situation of the RZD
- Development of quality in services
- Integration into the Eurasian transport system

Appendix 8 FRISBEE-modelling

General

The goal of the Frisbee-project was to produce an information system for freight transport and logistics at the strategic level by using and updating existing data. This system can be used in decision-making of the Ministry of Transport and Communications and can also be utilised by private companies. Geographically, the system centres in Northeastern Europe and Northwestern Russia covering especially the Baltic Sea and the Barents Sea area. The system also roughly covers other European countries and other continents.

The freight transport system demonstrating the existing situation includes a description of the transport networks and terminals as well as the supply of transport services; unit costs at market price for modes of transport and type of goods, freight flows classified into 12 product categories and information about mitigating factors that affect transport flows. The freight flows of the system primarily consist of the export and import transport of Finland and main transport flows with regard to the transit traffic potential of Finland.

With regard to Russian transport flows, the model includes those export and import transport flows that have their origin or destination in St. Petersburg and the Leningrad region or are transported through these areas. This information was compiled in the Corridor 9 project. The total export and import volumes of Russia were compiled in this work.

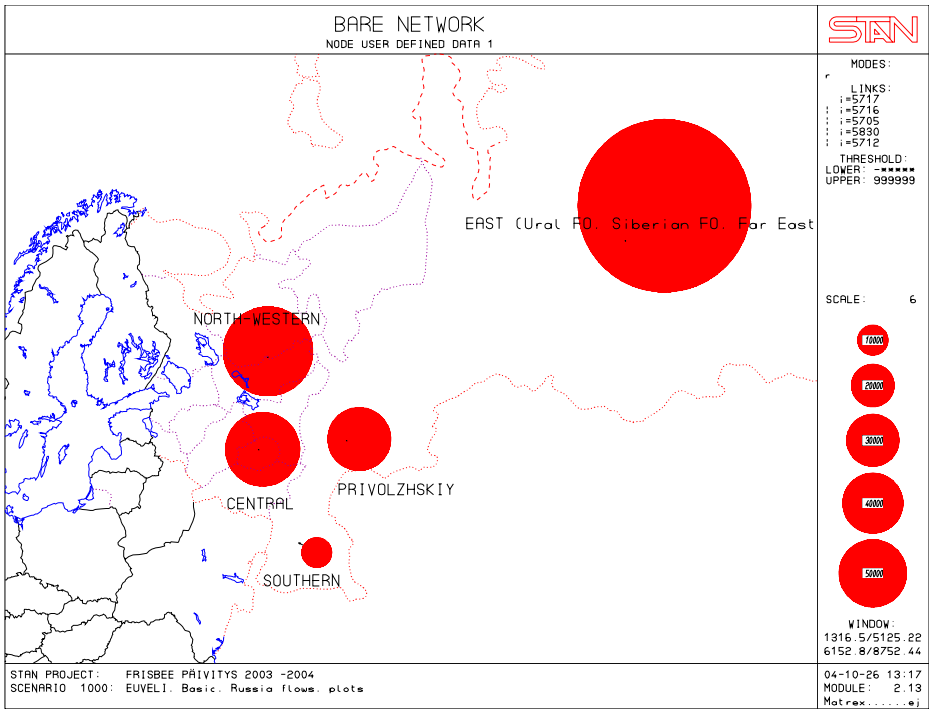
The Frisbee-model can be used for examining strategic development alternatives of an impact area in different transport situations. The model can be well applied, for example, to the mutual comparison and impact assessment of transport network alternatives. All product categories and modes of transport defined in the model can be examined simultaneously. Factors affecting the route choice of transport flows can also be weighted to each other in different ways. Factors affecting route choice defined in the model include operating costs (at market price), risk of damage, reliability, value of goods, transport time and frequency of sea transport services.

The main transport routes between the EU and Russia defined in the model include the Germany–Poland-route, the route through the Baltic ports, the route through the Baltic ports of Russia and the route through the Finnish ports. Total transport volumes, unit costs, transport times and impact areas were studied for these routes. Other routes of Russian foreign trade were not included in the model, and thus it was not possible to examine these routes in this work.

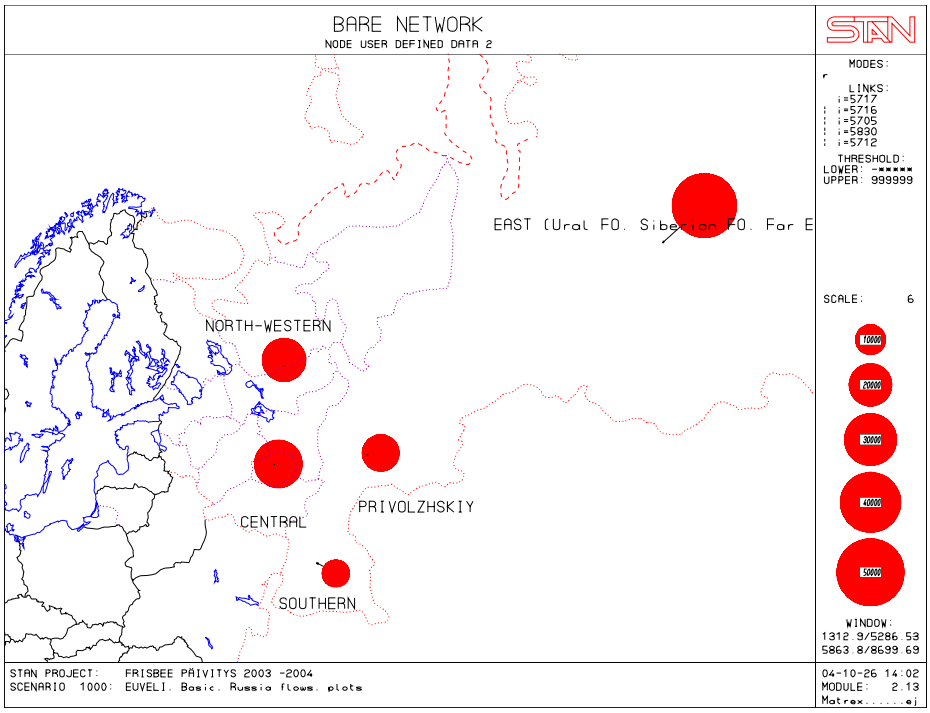
Updating of background information

Transport volumes between the EU and Russia were verified and updated by a freight flow questionnaire (ANSERI - Consultants Ltd./Matrex Ltd.). Information was obtained from Eugeny Mahlin in Moscow. The questionnaire was used for checking the export and import volumes of Russia for the year 2003 classi-

fied into five product categories and to container freight transport. There were five regions of origin/destination in Russia in the questionnaire. There were a total of 12 groups of regions in the EU and other countries as well as other continents.



Export transport flows of Russia by region in 2003, 1000 tonnes/year, total of 530,3 million tonnes.

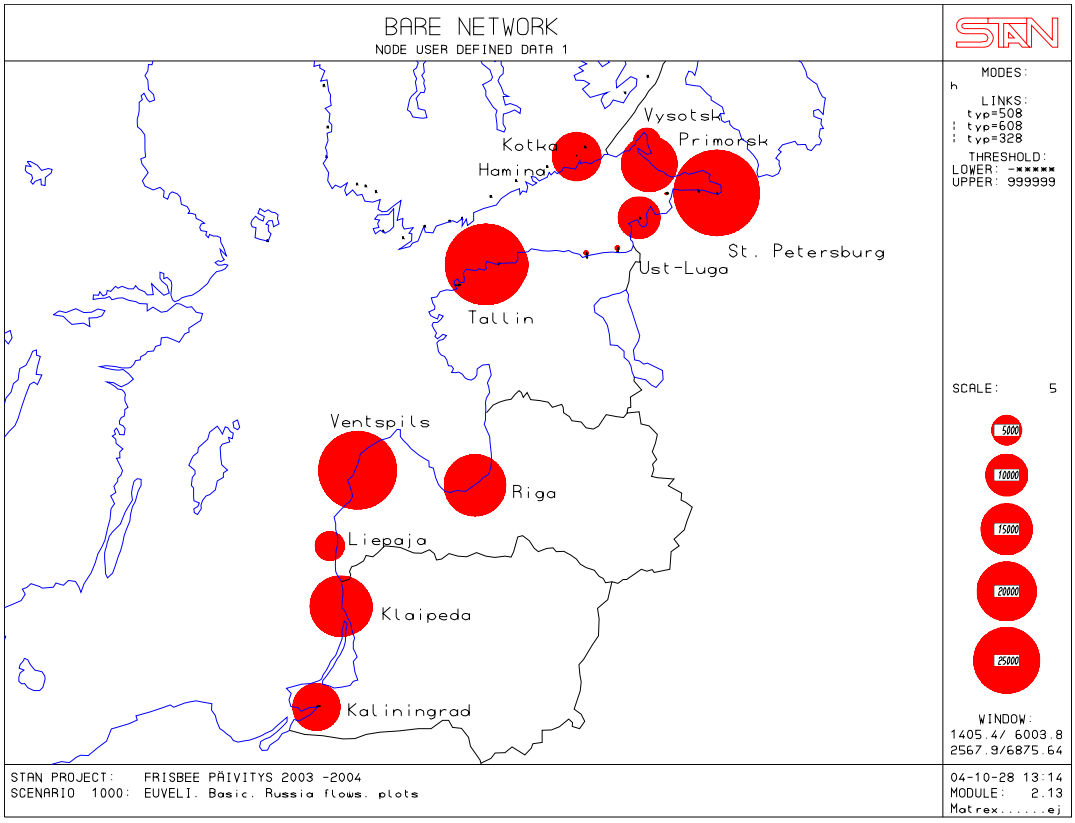


Import transport flows of Russia by region in 2003, 1000 tonnes/year, total of 115,0 million tonnes.

Based on the questionnaire, the model was updated by freight flow data, which concerned the export, and import transport of Russia to/from the EU-area (existing) and to those non-EU countries for which transport networks were ready in the Frisbee-model. The allocation between countries and regions within countries was done by using the proportional shares which were defined in the study "Pan-European Transport Corridor IX A; Modelling Freight Transport".

The model does not include unit costs for container freight transport at the moment, and thus they were not included in this study.

Freight transport volumes of the Baltic ports of Russia and the Baltic countries in the year 2003 were obtained from ANSERI - Consultants Ltd. These volumes are presented in the following figure.



Actual transport volumes in the Baltic ports of Russia and the Baltic countries as well as in the ports of Kotka and Hamina in 2003 (1000 tonnes).

Zonal division

Transport flows are examined as flows between different sub-regions in the model. Currently, there are 206 sub-regions. The zonal division is as follows:

Finland	Regional level (19)	NUTS 3
Other Scandinavian countries		NUTS 3
Other EU-countries (15)		NUTS 2
The Baltic countries	One zone/country	NUTS 1

Poland	16 zones	NUTS 3
Other CEEC countries	Country	
Russia	St. Petersburg and the Leningrad region	13
Russia, other parts		5
Belorussia	Country	
Ukraine	Country	
North and South America	”Transhipment terminals”	

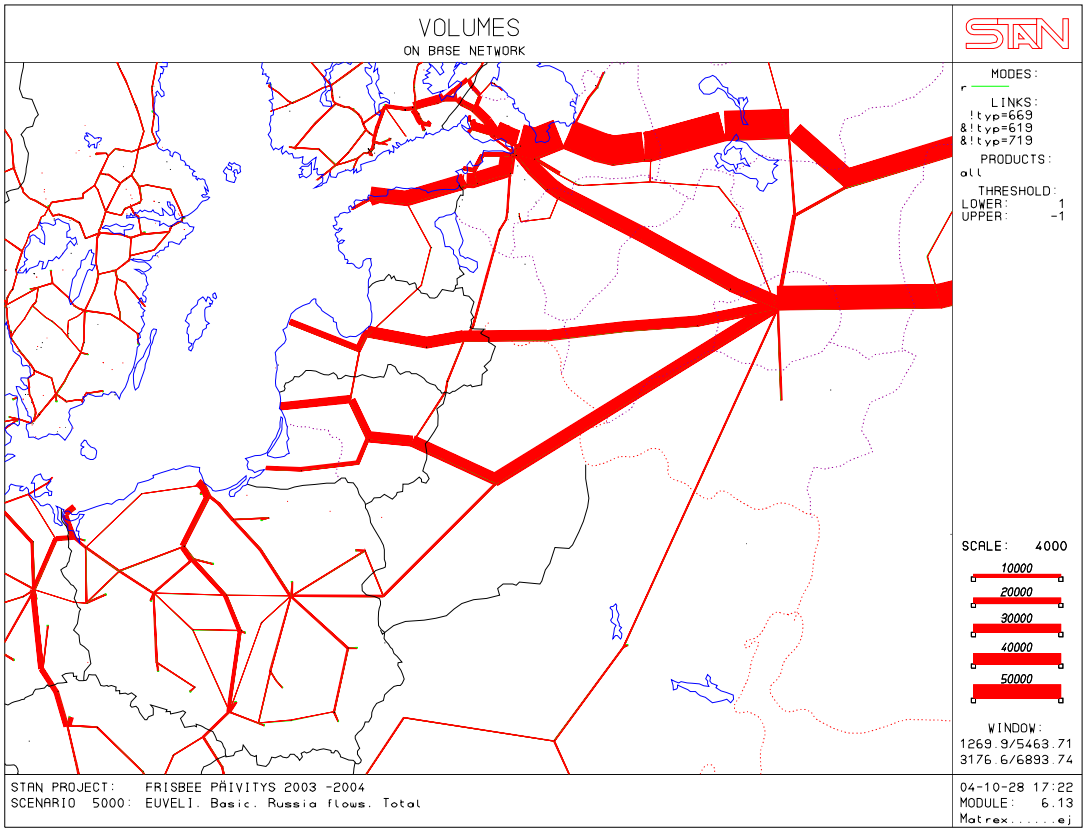
Product categories

The classification of product categories used in the questionnaire did not correspond to the classification in the Frisbee-model. The unit costs of the model are based on the classification into 12 product categories, and thus the classification used in the questionnaire could not be directly used in the model. Furthermore, it was not possible to adapt the classification used in the questionnaire to the classification in the model. The classification of product categories is presented further below.

For this reason, with regard to the assignment of transport flows into the freight transport networks, the model can only be used for examining the total transport flows of Russian freight transport, not flows by product categories. On the other hand, when examining the unit costs, transport times or impact areas of routes, studies can be conducted by product categories (12).

Model calibration

Based on the export and import volumes of Russia (updated for the model) and the freight transport volumes of the Baltic ports of Russia and the Baltic countries, the model was calibrated to equal the actual freight transport volumes between Russia and the EU at the level of the year 2003. As a result of the calibration, the total transport volumes assigned to the transport networks by the model are roughly equal to the existing transport situation. The existing main routes of ground transport between Russia and the EU are presented in the following figure.



Main routes of ground transport between Russia and the EU.

Unit costs

Unit costs in the model denote all factors affecting transport volumes and particularly the route choice of freight transport, which can be described as commensurable. All unit costs are defined at market price. Cost information has not been updated in this work.

Operating costs are not the only factors affecting the mode and route of transport in long-distance freight flows. Route choice is not only dependent on actual delivery and handling costs and but also on the level of service and interest costs associated with capital invested in cargo. The unit costs in the Frisbee-model include *operating costs at market price, risk of damage, reliability, value of goods, transport time and frequency of sea transport services.*

Unit costs by product group have been defined in the model separately for the transport phase (Euros/tonne km) and the terminal phase (Euros/tonne). Unit costs can be changed/varied by region (partly by country). The unit costs used in Russia differ significantly from the corresponding costs in other regions. For example, the costs of railway freight transport in Russia constitute a share of only 10–15 % of the corresponding costs in Germany.

Starting points for the comparison of routes

Comparison of transport volumes

The model was used for studying the impact of a more efficient level of service on the Germany–Poland-route on transport volumes of other routes. A road connection of motorway standard and direct block train connections from Moscow through Warsaw to Berlin were assumed to be constructed on this route. Delays at borders were assumed to be the same as the average in the EU area (2–5 hours). The calculations included total transport volumes between the EU and Russia.

The unit costs for the Germany–Poland-route were calculated for two transport alternatives; A) unit costs for the route between Moscow and the Polish border are at the average EU-level and B) unit costs for the route between Moscow and the Polish border are at the average Russian level. When presenting the results, each of the Baltic ports of Russia and the Baltic countries were treated as one entity.

Comparison of unit costs

The comparison above included all freight transport volumes between the EU and Russia (all pairs of sub-regions). This comparison was conducted for transport flows between two pairs of sub-regions; transport volumes between Central Germany and Moscow. The model was used to calculate unit costs along different routes between these regions separately for metal products, so-called valuable goods (such as office apparatus as well as data processing, telephone, radio and TV equipment) and raw materials. The unit costs included operating costs, risk of damage, reliability, value of goods, transport time and frequency of sea transport services. It was presumed in this study that the unit costs for the routes were the same in both directions.

In this study, the unit costs for the route through Finland were calculated in two alternative transport situations: A) existing situation and B) situation in which the attraction of the route was improved by a 50 % reduction of fairway dues as well as using the Russian railway tariffs all the way to Kotka. The route through the port of St. Petersburg was selected as the route through the Baltic ports of Russia. The routes through the Baltic ports were examined as one average route. The Germany–Poland-route was examined in two transport situations; A) unit costs for the route between Moscow and the Polish border are at the average EU-level and B) unit costs for the route between Moscow and the Polish border are at the average Russian level. For example, the costs of railway freight transport in Russia constitute a share of only 10–15 % of the corresponding costs in Germany.

It should be noted that the unit costs of transport routes for valuable goods are 6–10 times higher than the unit costs for raw materials and metal products for the same routes.

Comparison of transport times

In this section, studies on the transport flows between Central Germany and Moscow were conducted in the same way as in the previous section. The model was used for comparing transport routes based only on transport times. When calculating transport times, the speed of transport by different modes and handling times at terminals (ports and border crossings) were considered. Operating costs and other factors contributing to the level of service were not considered at all in this context.

When calculating the speed of transport, it was assumed that lorries, trains and vessels have a uniform speed despite the type of goods. Furthermore, average handling times independent of product category were used in ports. Due to this, transport times of routes were only presented for one ”average” product category.

When calculating the unit costs for the routes, the effect of transport time is dependent on the product category. The value of time for valuable goods has a multiple effect as compared, for example, to raw materials.

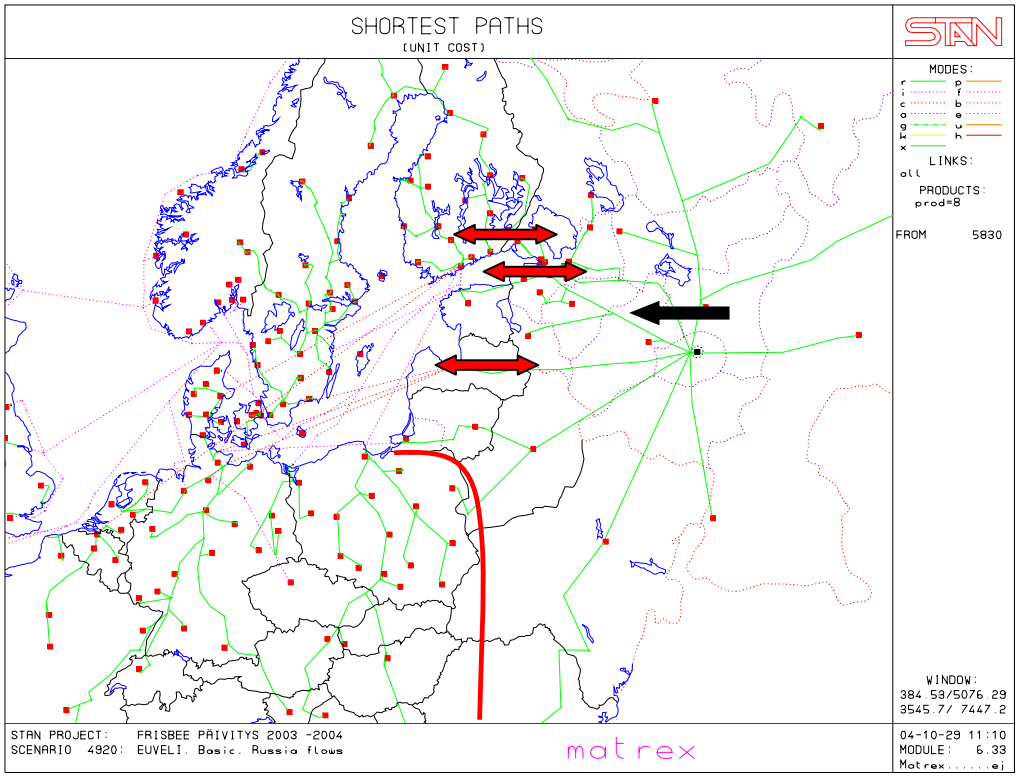
Impact area studies

In this section, changes in the impact areas of routes were examined in export and import transport of Russia assuming that the level of service on the Germany–Poland-route would improve.

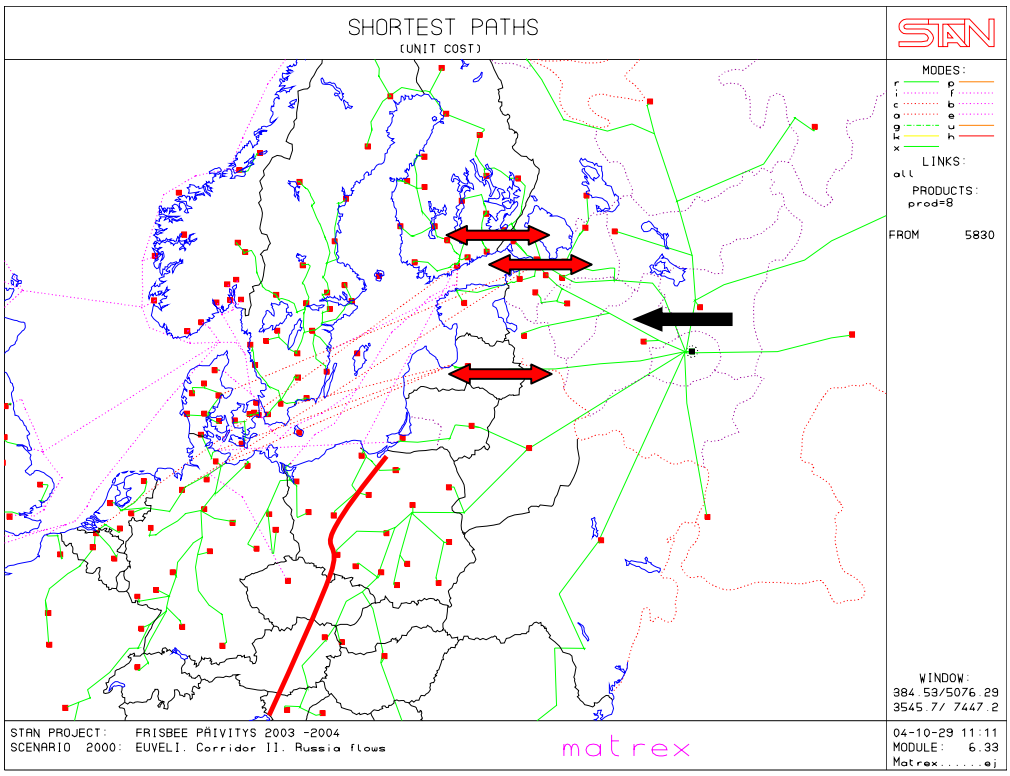
It must be noted that in this section all the routes through ports are observed as individual routes. In the previous section “comparison of unit costs of routes”, for example, the routes through the Baltic ports were examined as one average route.

The study was conducted separately for metal products and so-called valuable goods. Moscow was assumed to be the area of origin/destination in Russia.

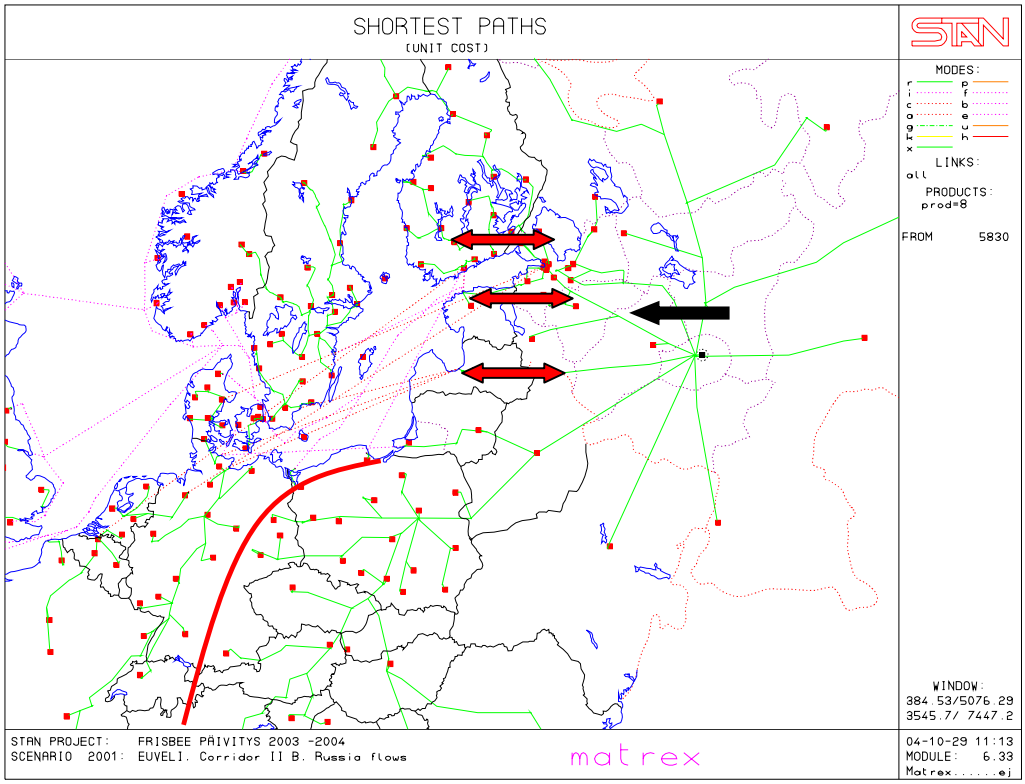
The results are presented in the following figures. The red line denotes the border, east of which transport flows to/from Moscow would be directed through the Germany–Poland-route, and west of which through other routes (also the Nordic countries). Red arrows denote these other routes or routes through the ports of Finland, St. Petersburg and the Baltic countries.



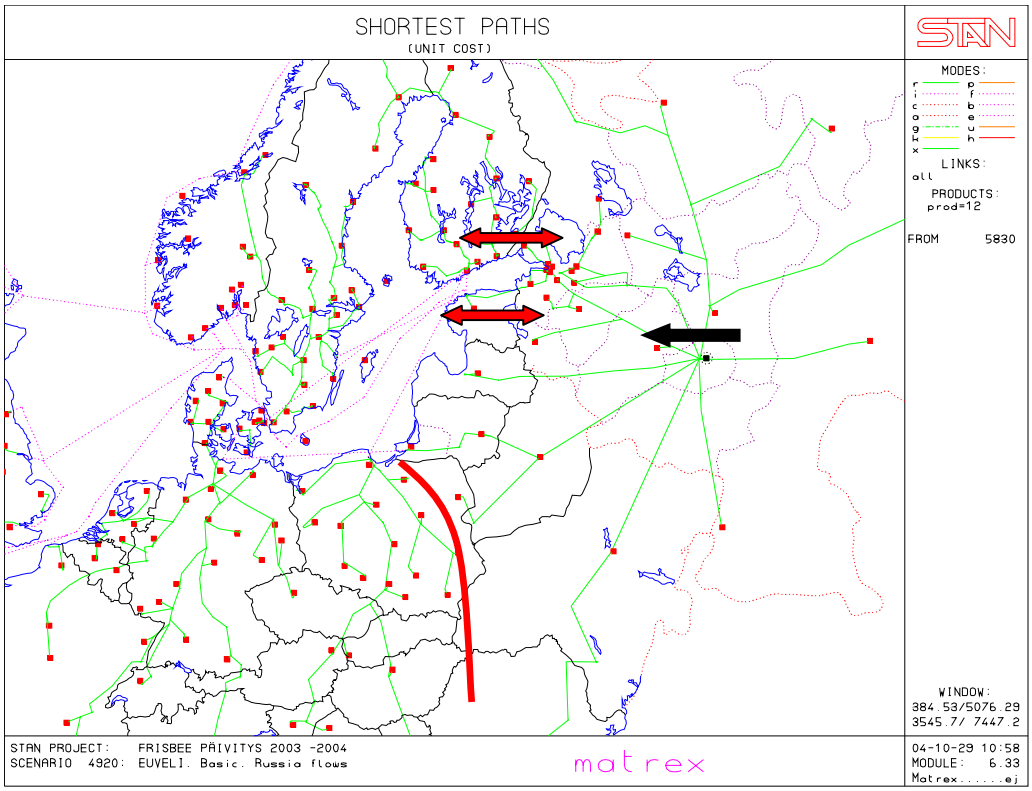
Metal products. Existing transport situation. Transport flows to/from Moscow from/to western side of the red line along the routes through Finland, St. Petersburg, the Baltic countries.



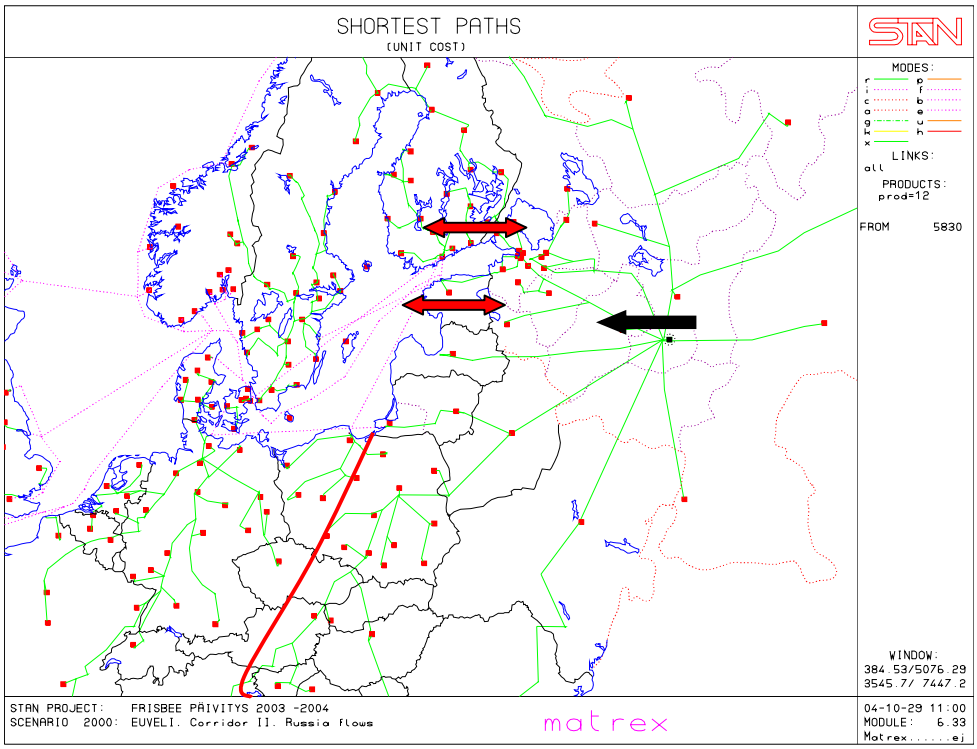
Metal products. Unit costs on the Germany–Poland-route between Moscow–the Polish border A: at the EU-level). Transport flows to/from Moscow from/to western side of the red line along the routes through Finland, St. Petersburg, the Baltic countries.



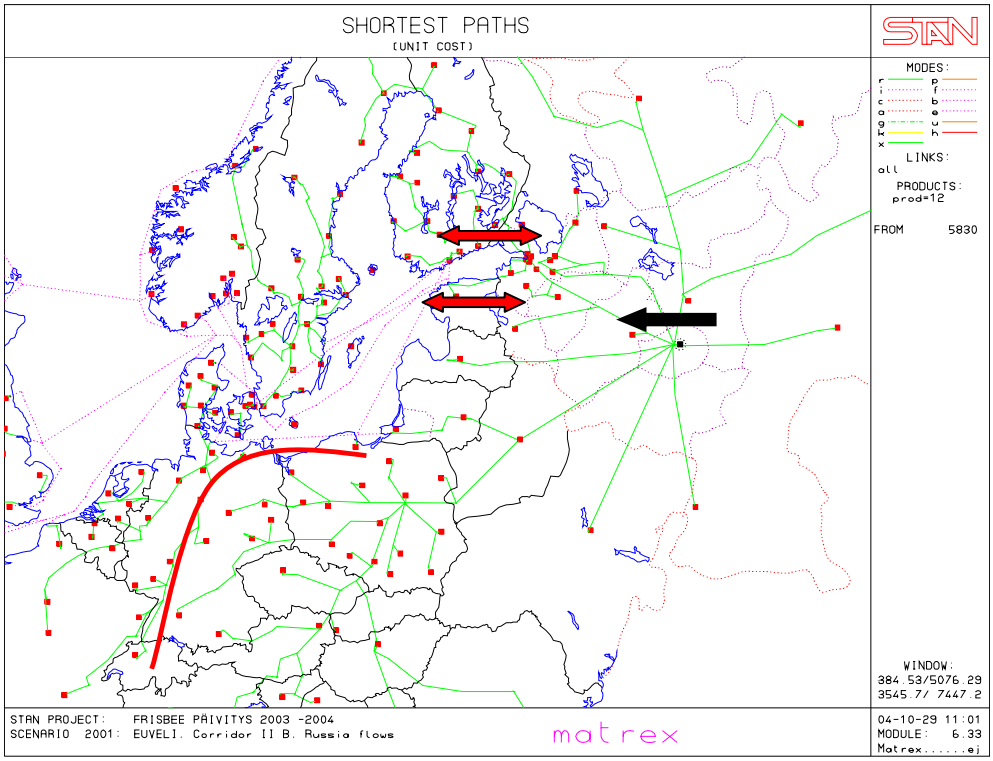
Metal products. Unit costs on the Germany–Poland-route between Moscow–the Polish border B: at the Russian level). Transport flows to/from Moscow from/to western side of the red line along the routes through Finland, St. Petersburg, the Baltic countries.



Valuable goods. Existing transport situation. Transport flows to/from Moscow from/to western side of the red line along the routes through Finland and the Baltic countries.



Valuable goods. Unit costs on the German–Poland-route between Moscow–the Polish border A: at the EU-level). Transport flows to/from Moscow from/to western side of the red line along the routes through Finland and the Baltic countries.



Valuable goods. Unit costs on the Germany–Poland-route between Moscow–the Polish border B: at the Russian level). Transport flows to/from Moscow from/to western side of the red line along the routes through Finland and the Baltic countries.

Appendix 9 FRISBEE classification of product categories

(1.) **A**
- Live animals
- Meat and meat preparations
- Dairy products and birds' eggs
- Fish (not marine mammals) and preparations thereof
- Cereals and cereal preparations
- Vegetables and fruit
- Sugars, sugar preparations and honey
- Coffee, tea, cocoa, spices, and manufactures thereof
- Feeding stuff for animals (not including unmilled cereals)
- Miscellaneous edible products and preparations

(2.) **B**
- Beverages
- Tobacco and tobacco manufactures

(3.) **C**
- Hides, skins and fur skins, raw
- Oil-seeds and oleaginous fruit
- Crude rubber (including synthetic and reclaimed)
- Cork and wood
- Pulp and waste paper
- Textile fibres and their waste
- Crude fertilizers and crude minerals
- Metalferous ore and metal scrap
- Crude animal and vegetable materials

(4.) **D**
- Coal, coke and briquettes
- Petroleum, petroleum products and related materials

(5.) **E**
- Animal oils and fats
- Fixed vegetable oils and fats, refined or fractionated
- Animal or vegetable oils and fats, processed

(6.) **F**
- Organic chemicals
- Inorganic chemicals
- Dyeing, tanning and colouring materials
- Medicinal and pharmaceutical products
- Essential oils, resinoids and perfume materials
- Fertilizers
- Plastics in primary forms
- Plastics in non-primary forms
- Chemical materials and products

(7.) **G**
- Paper and paperboard and articles thereof

(8.) **H**
- Iron and steel
- Non-ferrous metals
- Manufactures of metals

(9.) **I**
- Leather, leather manufactures and dressed fur skins
- Rubber manufactures
- Cork and wood manufactures (excluding furniture)
- Textile yarn, fabrics, made-up articles
- Non-metallic mineral manufactures

(10.) **J**
- Power-generating machinery and equipment
- Machinery specialized for particular industries
- Metalworking machinery
- General industrial machinery and equipment
- Road vehicles
- Other transport equipment

(11.) **K**
- Prefabricated buildings; sanitary, plumbing, heating and lighting fixtures and fittings
- Furniture and parts thereof
- Travel goods, handbags and similar containers
- Articles of apparel and clothing accessories
- Footwear
- Miscellaneous manufactured articles

(12.) **L**
- Office machines and automatic data-processing machines
- Telecommunications and sound-recording and reproducing apparatus and equipment
- Electrical machinery, apparatus and appliances
- Professional, scientific and controlling instruments and apparatus
- Photographic apparatus, equipment and supplies and optical goods

Appendix 10 Export and import volumes of Russia in 2003

Export and import of Russia by product category in 2003. Source: Mahlin, 2004.

Product category	Export (1 000 tonnes)	Import (1 000 tonnes)
Liquid bulk	295 156	203
Dry bulk	134 935	24 879
Unitized cargo	56 599	27 538
Wood products	39 820	328
Container cargo, tonnes	39 820	2 002
Total	530 303	114 950
Containers, 1 000 TEUs	474,1	250,3

Russian export transport by origin in 2003. Source: Mahlin, 2004.

Product category	Eastern Russia (the Urals, Siberia and the Far East)	Privolzhskiy	Northwest	Central	South
Liquid bulk	220 648	25 272	21 821	24 243	3 172
Dry bulk	74 663	7 894	39 034	10 776	3 168
Unitized cargo	6 792	9 056	13 584	23 772	3 395
Wood products	25 465	796	12 762	177	20
Container cargo, tonnes	1 585	688	710		76
Total	328 653	43 706	87 911	60 302	9 831
Containers, 1 000 TEUs	176,8	93,2	96,9	97,3	9,9

Russian import transport by destination in 2003. Source: Mahlin, 2004.

Product category	Eastern Russia (the Urals, Siberia and the Far East)	Privolzhskiy	Northwest	Central	South
Liquid bulk	62	22	48	54	17
Dry bulk	36 489	10 185	14 580	18 524	5 101
Unitized cargo	8 320	4 402	5 712	5 996	3 108
Wood products	64	61	72	101	30
Container cargo, tonnes	841	287	315	527	32
Total	45 776	14 957	20 727	25 202	8 288
Containers, 1 000 TEUs	103,6	35,9	38,9	66,9	5