CBC 2014-2020
South-East Finland - Russia

Green InterTraffic

THE GREEN ROADMAP AND THE ROADMAP FOR THE CREATION OF AN INTELLIGENT TRANSPORT SYSTEM FOR UNMANNED VEHICLES OF THE E18 (SPb-HELSINKI)

The Project funded by the European Union, the Russian Federation and the Republic of Finland

This Green Roadmap and ITS Roadmap is developed within the framework of the project “Enhancing environmental safety of road Intertraffic in the border areas of Russia and Finland applying innovation solutions» (Green InterTraffic) of the South-East Finland-Russia CBC Programme 2014-2020.

In the Road Maps are included the proposed measures to develop the infrastructure of the road E18, as well as measures to reduce the load on vehicles proposed for implementation by the participants of the Green Intertraffic project. The Green Road Map gives the main directions of the implementation of events, including improving the energy efficiency of the existing fleet of vehicles; development of the use of alternative fuels; development of transport infrastructure and mobility management. The Green Road Map also describes measures for the reconstruction of those Russian sections of the road E18 that do not yet satisfied to the parameters of the high-speed road. The measures for the development of the intellectual transport system of the road E18 and related digital services are described in the framework of the ITS Development Roadmap. For widely using all interested stakeholders.

The materials of the Road Maps were developed by the group of experts of the Green InterTraffic project: Svetlana Vorontsova, Yuriy Popov, Vladislav Pavlov, Oskari Lähdeaho, Emmi Laukkanen

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TERMS OF DEFINITIONS

The following terms in this document will have definitions as set forth below.

Terms	Definitions
Air pollution	adding or generating harmful substances (pollutants) to/in the atmospheric air in concentrations that exceed the hygiene and environmental air quality standards established by the state.
Border-crossing points on the national border of the Russian Federation	are designed to handle individuals, vehicles, goods and animals crossing the state border of the Russian Federation. Border-crossing points are established on the basis of international agreements of the Russian Federation or legal acts of the Government of the Russian Federation in especially designated areas in immediate proximity to the national border of the Russian Federation. There are two types of BCPs: international BCPs and simplified (temporary) BCPs. International border-crossing point is an especially equipped location that is open for international traffic and provides border control, customs control and, where necessary, other checking procedures and processes individuals, vehicles and goods crossing the national border.
Damage to the environment	Negative change in the environment resulting from its pollution which led degradation of natural ecological systems and exhaustion of natural resources.
Environmental impact minimization	reduction or complete cessation of negative impact on the environment from facilities used in economic activities, including through the use of best available technologies (technical methods) and introduction of low-waste and/or zero-waste technologies.
Federal public roads:	1) roads connecting the capital of the Russian Federation – Moscow – to capitals of neighbor countries and to administrative centers (capitals) of regions of the Russian Federation; 2) roads that are on the list of international roads in accordance with international agreements that the Russian Federation is a party to. Roads that may be deemed federal public roads in Russia are: 1) roads connecting administrative centers (capitals) of regions of the Russian Federation; 2) approach roads that connect federal public roads, international interchanges (seaports, river ports, airports, railway stations), and special purpose federal facilities; 3) approach roads connecting administrative centers of regions of the Russian Federation that lack public roads to connect their administrative centers to Moscow, and the nearest seaports, river ports, airports, and railway stations.
Forecast of Socio-Economic Development of the Russian Federation	a strategic planning document which contains descriptions of external and internal conditions, goals, objectives, basic areas and expected results of socio-economic development of the Russian Federation in the medium or long term.
Greenhouse gas emissions	the total mass of greenhouse gases released into the atmosphere over a certain period of time.
Greenhouse gases (GHG)	Gases of high transparency within the visible range and with high absorption in the far-infrared range (FIR). The presence of such gases in the atmosphere of the plant causes the greenhouse effect. The main

	anthropogenic GHGs are deemed to be: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O).
Harmful substance (pollutant)	Any chemical element and (or) a compound with it, which when present in the environment can be a threat to life and health of the public, ecosystems, flora and fauna, and therefore are subject to control in compliance with international agreements.
Intelligent transport system (ITS)	a comprehensive system for information support and traffic control on a road, which is based on application of information and telecommunication technologies, global navigation satellite systems and modern traffic control methods and operates to ensure safe, reliable and effective transport of cargo and passengers. Introduction of ITS on roads provides all road users with updated information on road and weather conditions, increases throughput capacity of the road network, lowers time loss associated with travel/transportation, provides a significant reduction in the number and severity of road traffic accidents ДТП, and lowers pollution.
International transport	movement of passengers and cargo (goods) using various transport modes, when the origin point and/or the destination point is outside the Russian Federation.
International transport corridors (ITCs)	a set of arterial transport connections with appropriate infrastructure, which support international passenger and freight transport on the busiest routes connecting various countries.
Reconstruction of a road	a set of operations aimed at changing the parameters of a road and/or parts thereof in order to change the class and (or) category of the road or the boundaries of the right-of-way of the road.
Regional and intermunicipal public roads	roads that are located within a region (subject) of the Russian Federation. The list of such roads is approved by the supreme government body of the region.
Road	A piece of transport infrastructure designed as a thoroughfare for transport vehicles and consisting of land within the right-of-way of the road, the structural elements located on and in the land (roadbed, road pavement, etc.), and road structures that are part of the road such as protective road structures, bridges, tunnels, pipes, technical facilities, and road furniture and equipment.
Road furniture	structures such as road signs, road barriers, traffic signal heads and other devices used to regulate road traffic; rest areas, stops and road light equipment; walkways, vehicle weight and dimensions control stations; toll plazas; vehicle parking lots/facilities; road/bridge security structures; sidewalks and other structures designed to enable or support road traffic and its safety, with the exception of road service facilities.
Road owners	executive government bodies, the local administration (the executive and administrative body of a municipality), individuals and legal entities that own roads based on property right as provided by applicable legislation of the Russian Federation. Where and as provided by applicable federal law, the Russian Highways State Company may exercise the powers of the road owner in respect of roads that were handed in trust to it.
Road service facilities	Buildings, structures and other objects designed to service road users as they travel (petrol stations, bus stations, bus terminals, hotels, camping sites, motels, catering outlets, service stations, similar facilities and vehicle parking and rest areas that are necessary for such facilities to function).

Road users	individuals and legal entities using roads for travel and transport .
Throughput capacity of a road	the maximum number of vehicles that can use a given road section or a given road over a particular time.
Traffic level	the number of road vehicles crossing a certain cross-section of a road within a given time unit (per day/hour).
Vehicle	a device designed for transportation of people, goods or equipment.
Road	A piece of transport infrastructure designed as a thoroughfare for transport vehicles and consisting of land within the right-of-way of the road, the structural elements located on and in the land (roadbed, road pavement, etc.), and road structures that are part of the road such as protective road structures, bridges, tunnels, pipes, technical facilities, and road furniture and equipment.

ABBREVIATIONS

Abbreviations used in this document are as follows:

DF – diesel fuel

EU – the European Union

FCS of Russia – the Federal Customs Service of the Russian Federation

FSB of Russia – the Federal Security Service of the Russian Federation

GDP – gross domestic product

GHG – greenhouse gas

GRP – gross regional product

IPCC – Intergovernmental Panel on Climate Change

ITC – international transport corridor

ITS – intelligent transport systems

LCV – light commercial vehicles

MRdBCP – multilateral road border-crossing point

NGVF – natural gas vehicle fuel

PS – petrol station

RES – renewable energy sources

RF – Russian Federation

RosStat – Federal Government Statistics Service

RTA – road traffic accident

RV – road vehicle

RwBCP – railway border-crossing point

UNFCCC – UN Framework Climate Change Convention

UNO – United Nations Organizations

WHO – the World Health Organization

Introduction

The goal of the Green Roadmap and the Roadmap for Development of the ITS of the Road Route *Saint Petersburg – Helsinki* is to create the environment necessary for safe and comfortable traffic, higher efficiency and better quality of freight and passenger transport, and lower environmental impact of road transport.

The focus of this study is the road route *Saint Petersburg – Helsinki* which includes the federal road A-181 *Scandinavia*. The road route *Saint Petersburg – Helsinki* is used for international transport and travel between the Russian Federation and EU countries.

The subject matter of this study is the development of the Green Roadmap and the Roadmap for Development of ITS of the Road Route *Saint Petersburg – Helsinki* for unmanned vehicles.

The work completed to form this report was as follows:

- the significance of the road route *Saint Petersburg – Helsinki* for cooperation between the Russian Federation and Finland has been determined;
- analysis of the dynamics of international freight and passenger transport between the Russian Federation and Finland has been performed;
- the description of the road A181 "*Scandinavia"* has been prepared;
- the future trends in socio-economic development of Saint Petersburg and Leningrad Region which have an impact on the amount of traffic on the *Scandinavia* road have been analyzed;
- a forecast of volumes of international transport and travel via the MRdBCP "Torfyanovka" has been developed;
- plans for the reconstruction of the road A181 "*Scandinavia"* have been presented;
- factors that have a negative impact on the environment in the influence zone of the road route *Saint Petersburg – Helsinki* have been determined;
- new areas for improvement of environmental safety of the road route *Saint Petersburg – Helsinki* have been developed;
- the Green Roadmap of the road route *Saint Petersburg – Saint Petersburg* has been developed;
- the Roadmap for development of the ITS of the road route *Saint Petersburg – Saint Petersburg* has been developed;
- results expected from implementation of the set of measures within the Green Roadmap and the Roadmap for Development of ITS of the Road Route *Saint Petersburg – Helsinki* for unmanned vehicles have been determined.

The research methods used to complete the tasks are as follows: marketing research methods; methods of statistical processing of data and analysis of time series; factor analysis methods; methods of consolidation of information from socio-economic monitoring; system analysis and synthesis methods; polling and interviews; socio-economic forecasting methods; transport planning methods; geospatial analysis methods using GIS-technologies; etc.

Implementation of the measures within the Green Roadmap and the Roadmap for Development of the ITS of the Road Route *Saint Petersburg – Helsinki* will foster efficiency and quality of transport, creation of safe and comfortable environment for traffic flows, lower negative impact of road traffic on the environment, and higher attractiveness of Saint Petersburg and Leningrad Region as tourist destinations.

This Green Roadmap is developed within the framework of the project “Enhancing environmental safety of road Intertraffic in the border areas of Russia and Finland applying innovation solutions» (Green InterTraffic) of the South-East Finland-Russia CBC Programme 2014-2020. The Project funded by the European Union, the Russian Federation and the Republic of Finland.

1. Significance of the road route *Saint Petersburg – Helsinki* for cooperation between the Russian Federation and Finland

The 380 km road route *Saint Petersburg – Helsinki* is playing a significant role in supporting international, interregional and local transport and travel in North-West Russia and South-East Finland.

The route consists of two roads:

- the federal public road A-181 “Scandinavia”: *Saint Petersburg – Vyborg – the border with the Republic of Finland in the Russian Federation*;

- State Road 7 (Valtatie 7) *Helsinki – Vantaa – Porvoo – Loviisa – Kotka – Hamina – Vaalimaa* (Russia's border) – in Finland.

The federal public road A181 “Scandinavia” is a part of the intermodal Pan-European Corridor IX and the international transport corridor “North – South” which connects India, Pakistan, Iran, reaching the Caspian Sea and then going via the Russian Federation towards Central and Northern Europe.

Figure 1.1.1 shows the map of the international transport corridor “North – South” which the road A 181 “Scandinavia” is a part of, within the Russian Federation.

By virtue of its importance as a transport link, the Scandinavia road was included in the international networks of European and Asian highways (Table 1.1.1).

The E-road network route which includes E-18 goes from Northern Ireland via the United Kingdom, Norway, Sweden and Finland, to the administrative capital of the North-West Federal District of the Russian Federation – Saint Petersburg.

The Asian route which includes AH-8 goes from the Finnish – Russian border across the Russian Federation to Caspian ports and then to Iran, Pakistan and India.

Figure 1.1.1 - International transport corridor “North – South” within the Russian Federation

Table 1.1.1 - List of international routes including the federal road “Scandinavia”

Road index	Road title	Name of international road route
Roads within the International E-road network		
E-18	A-181 “Scandinavia” from Saint Petersburg via Vyborg to the Russian – Finnish border	Northern Ireland – United Kingdom – Norway – Sweden – Finland (Turku – Helsinki – Finnish-Russian border) – Russia (Vyborg – Saint Petersburg)
Roads within the Asian Highway Network (AH)		
AH-8	1. A-181 “Scandinavia” from Saint Petersburg via Vyborg to the Russian – Finnish border; 2. M-10 “Russia” from Moscow via Tver and Velikiy Novgorod to Saint Petersburg	Finnish-Russian border – Torfyanovka – Vyborg – Saint Petersburg – Moscow – Tambov – Borisoglebsk – Volgograd – Astrakhan – Makhachkala – Kazmalyarsky – Baku – Tehran – Emam

Figure 1.1.2 shows the international transport corridors in Leningrad Region including the ITC “North – South” which the federal road A-181 “Scandinavia” is a part of.

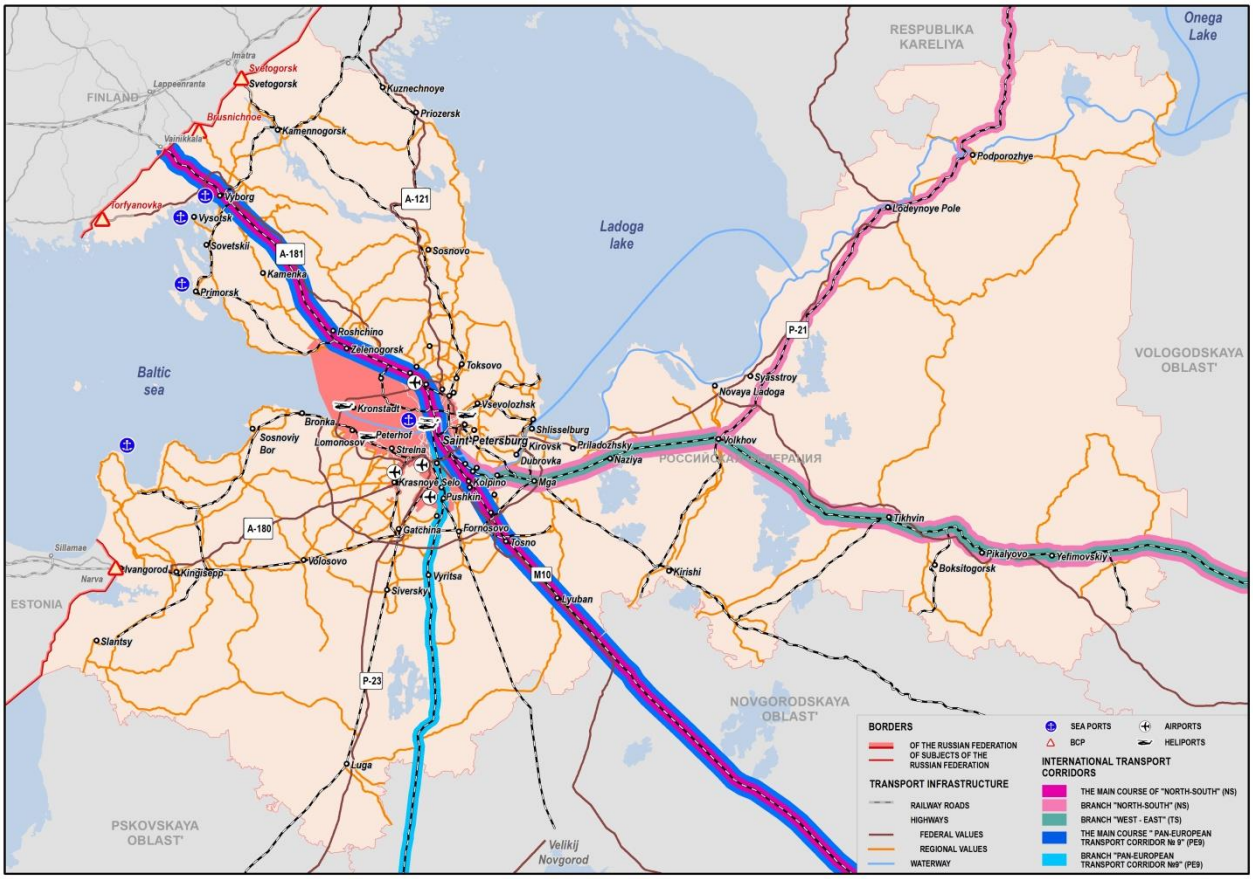


Figure 1.1.2 – International transport corridors in Leningrad Region including ITC “North – South” with the federal road A-181 “Scandinavia” as a part of it

The road route *Moscow – Saint Petersburg – Helsinki* which is approximately 1100 km long is the busiest part of the international transport corridor (ITC) “North – South”. The two largest cities of Russia – Moscow and Saint Petersburg – and the capital of Finland – Helsinki – are responsible for most of the traffic on the route *Moscow – Saint Petersburg – Helsinki*. Saint Petersburg being located 700 km from Moscow and 400 km from Helsinki, there is a large amount of interaction between the cities which are major centers of business, important industrial, commercial, cultural and administrative centers and the home of about 10% of the Russian and 12% of the Finnish population, with the residents of the cities having the highest income levels and purchasing power in their respective countries. There being active economic and cultural connections between the Russian Federation and Finland, the traffic on the road route *Moscow – Saint Petersburg – Helsinki* is massive.

The international road route *Moscow – Saint Petersburg – Helsinki* is being used to deliver export/import goods to regions where the route is located as well as to multiple EU countries and regions of the Russian Federation in Central, Privolzhsky, Uralsky and Sibirsky federal districts of Russia. This is due to the fact that almost the entire European part of Russia, with the population of 95 million people (about 66% of the country’s population), tends to import and export goods

via the Baltic ports of Saint Petersburg, Leningrad Region and Southern Finland. There are major manufacturing facilities of the basic industries in European Russia, many of which use imported raw materials and equipment and export natural resources, materials and finished products.

The *Scandinavia* road runs in the north-western part of the Karelian Isthmus from Saint Petersburg via Vyborg to Helsinki. This road is a major link between Russia and Northern and Central Europe via Scandinavian countries, and the shortest link between Russia's second city – Saint Petersburg – and the capital Finland – Helsinki. The road is used for international travel and freight transport including deliveries of goods to and from the Baltic seaports. In addition to international transport operations, the *Scandinavia* road supports regional freight and travel, connections with Vyborg, a major industrial center in Leningrad Region, and regional and local travel to multiple recreation locations, health resorts and hotels, gardening and cottage communities on the northern coast of the Gulf of Finland and in the Karelian Isthmus.

At present, about 9 million people live in the influence zone of the road route *Saint Petersburg – Helsinki* (Table 1.1.2), including 7.2 million people in the Russian Federation (80,8%) and 1.7 million people in Finland (19.2%).

The *Scandinavia* road plays an important role in supporting freight transport related to the seaports of Leningrad Region.

There are three seaports on the coast of the Gulf of Finland north of Saint Petersburg – Primorsk, Vyborg and Vysotsk (Figure 1.1.3). In 2018, the total cargo turnover of those ports was 74.2 million tons, the port of Primorsk being responsible for 53.5 million tons, Vysotsk for 18.8 million tons and Vyborg for 1.9 million tons.

New terminals are to be built at the seaports on the northern coast of the Gulf of Finland. OOO Primorsk Universal Loading Complex is the investor for the project of building new maritime terminals to handle coal, grain, mineral fertilizers and containers at the port of Primorsk by 2025, with the first stage to be commissioned in 2022. The multifunctional port complex at the port of Primorsk will be able to handle up to 70 million tons of cargo a year including 20 to 25 million tons of coal, 5 to 7 million tons of mineral fertilizers, 2 to 3 million 20-feet containers, 1.2 to 2 million tons of general cargo and 5 to 7 million tons of grain.

Table 1.1.2 – Population of the influence zone of the road route *Saint Petersburg – Helsinki* *

	RF region, Region of Finland	Population as of 01.01.2019, thousand people	Percentage of the total population living in the influence zone of the road E-18, section from Saint Petersburg to Helsinki (%)
1.	Saint Petersburg	5381.7	60.2
2.	Leningrad Region	1846.9	20.7
	Total in RF	7228.6	80.8
3.	Southern Finland	1066.1	11.9
4.	Helsinki	648.0	7.2
	Total in Southern Finland:	1714.1	19.2
	TOTAL	8942.7	100.0

* *According to the government statistics of the Russian Federation and Finland*

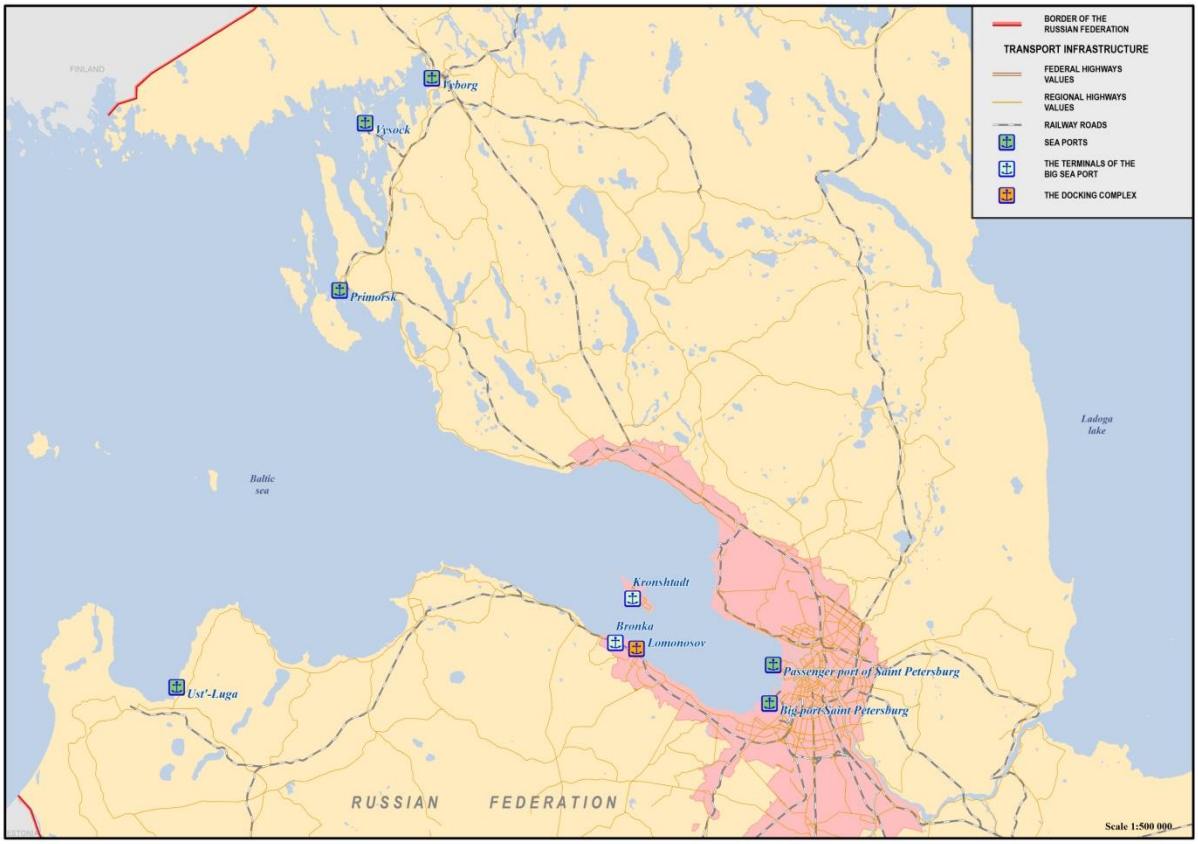


Figure 1.1.3 – Locations of seaports in Saint Petersburg and Leningrad Region

A new maritime terminal is under construction near the compressor station “Portovaya” at the port of Vysotsk which will produce, store and ship liquefied natural gas, with the capacity of 1.8 million tons of LNG per annum.

There is a plan to build a terminal for handling timber and general cargo at the port of Vysotsk, with the capacity of 2.6 million tons. Moreover, the coal terminal handling coal for export is to be further developed.

The seaports located in the influence zone of the road route *Saint Petersburg – Helsinki* in Finland are the ports of Helsinki and Kotka-Hamina.

The port of Helsinki is one of the largest Finnish ports. Its cargo turnover reached 14.71 million tons in 2018, with the container turnover going up to 509.53 thousand TEUs, and the amount of equipment transported via the port reaching 603.13 thousand units.

The seaport of Hamina is the easternmost port of Finland situated 35 km from the Russian border. The seaport of Kotka is about 50 km away from the Russian border and 280 km from Saint Petersburg. In 2018, the cargo turnover of the Hamina-Kotka port was 16.17 million tons.

As the influence zone of the federal road E-18, section from Saint Petersburg to Helsinki, has a significant population and includes major cities and multiple populated centers, high concentration of manufacturing, carrier companies, commercial enterprises and links to Russian and Finnish Baltic ports, the road is heavily used for international, interregional and local transport.

Figure 1.1.4 shows the existing vehicular traffic on the road route *Saint Petersburg – Helsinki*.

The highest traffic (up to 20 000 vehicles / day) is observed on the road sections from Saint Petersburg to the Vyborg Bypass, from Porvoo to Helsinki (up to 30 000 vehicles / day) and around the town of Kotka – the area where the Hamina-Kotka port is located.

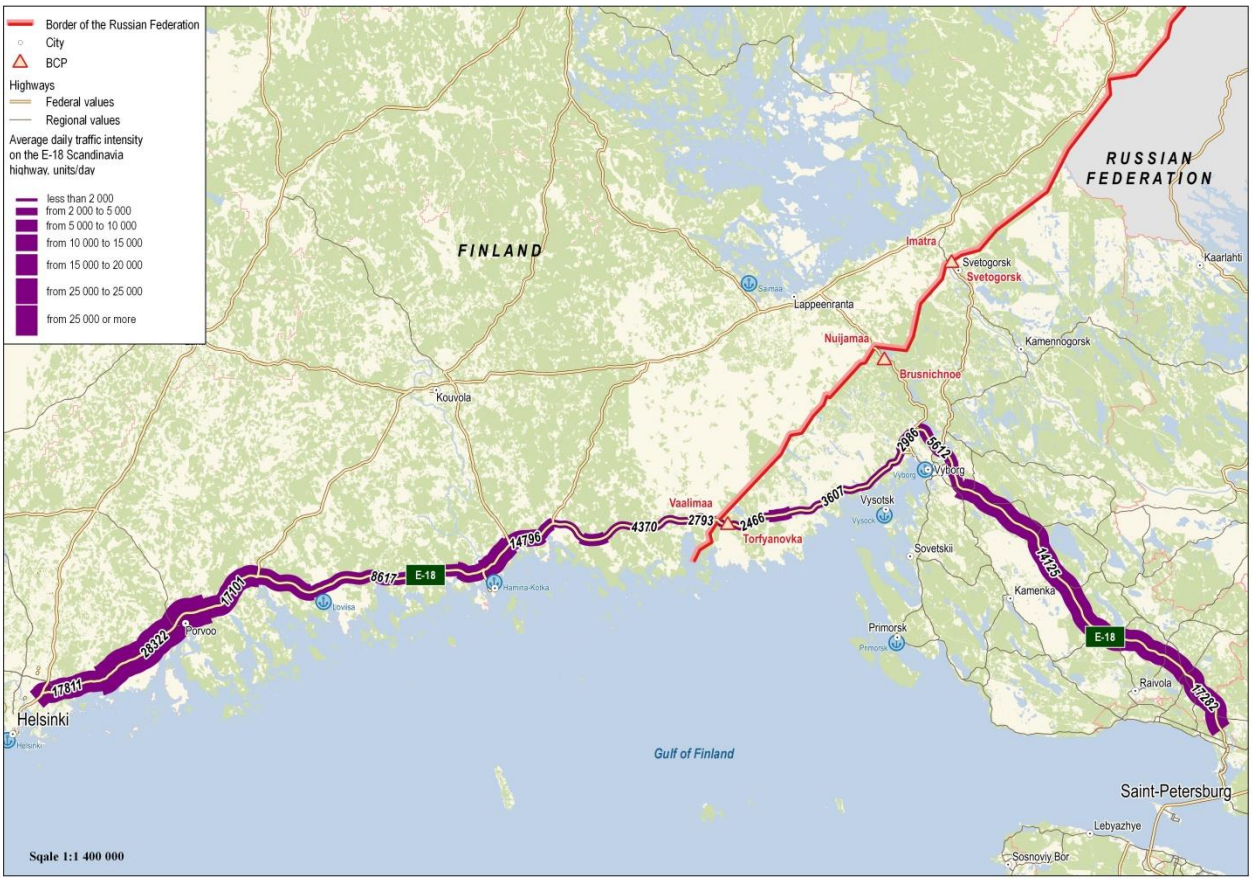


Figure 1.1.4 – Average annual daily traffic on the road route *Saint Petersburg – Helsinki*

The heavy traffic is due to the large volumes of freight and passenger flows on the route *Saint Petersburg – Helsinki*, which are discussed in the next chapter.

2. Analysis of the dynamics of international freight and passenger transport between the Russian Federation and Finland

Freight transport between the Russian Federation and Finland

The road route *Saint Petersburg – Helsinki* is used for transporting a significant proportion of international cargo on the link "Russia – EU" including export and import cargo flows between the Russian Federation and Finland.

There was a significant change in the foreign trade turnover between Russia and Finland during the period 2010 – 2018. The trade turnover peaked in 2011 – 2013 (~ 17 to US$ 19 billion) and then declined considerably in 2014 – 2016 (to US$ 9-12 billion) due to mutual economic sanctions imposed by Russia and Finland. The foreign trade turnover between Russia and Finland has been showing positive growth since 2017. According to the Federal Customs Service of Russia, the foreign trade turnover between Russia and Finland was 14 US$ 752 million in 2018 (a 19.6% increase vs. 2017, in current prices) (Table 2.1).

Table 2.1. – Trade dynamics between Russia and Finland in 2010 – 2018, according to the Federal Customs Service of Russia, in US$ million

	2010	2011	2012	2013	2014	2015	2016	2017	2018
Cargo turnover	**16754**	**18869**	**17013**	**18704**	**15952**	**9762**	**9013**	**12338**	**14752**
Export from Russia to Finland	12170	13197	12009	13308	11381	7092	6535	8642	11373
Import from Finland to Russia	4584	5672	5004	5396	4571	2670	2478	3696	3379
Balance	7586	7525	7005	7912	6810	4423	4057	4946	7994

Source: FCS of Russia

Russian exports to Finland amounted to US$ 11 372 million in 2018, showing a 31.6% increase compared to 2017. Russian imports from Finland in 2018 amounted to US$ 3 379 million, an 8.6% decline compared to 2017.

Russia had a positive trade balance of US$ 7 993 million with Finland in 2018. Compared to 2017, the trade balance increased by 61.6%.

The significance of Finland in Russia's foreign trade is determined by its position and share in the foreign trade turnover of Russia. In 2018, Finland was in the 14th place among Russia's trade partners. The share of Finland in the external goods turnover of Russia in 2018 was 2.14%, the share in exports and imports being 2.53% and 1.42% respectively (Table 2.2).

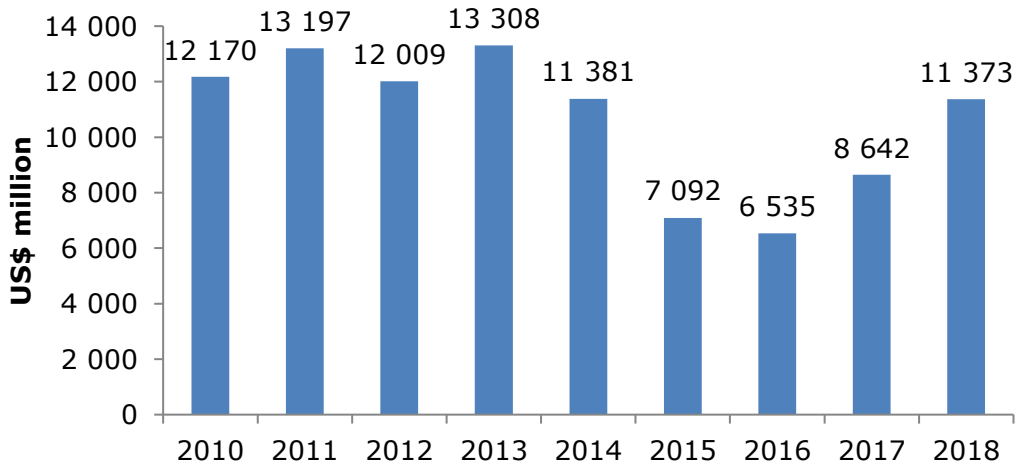
Table 2.2 – Significance of Finland in Russia's foreign trade in 2010 – 2018

	2010	2011	2012	2013	2014	2015	2016	2017	2018
Finland's position in Russia's goods turnover	13	15	15	15	15	15	15	15	14
Finland's share in Russia's goods turnover, in %	2.68	2.29	2.02	2.22	2.04	1.85	1.93	2.11	2.14
Finland's position in Russia's exports	12	15	14	13	14	14	13	13	12
Finland's share in Russia's exports, in %	3.06	2.55	2.29	2.52	2.29	2.06	2.29	2.42	2.53
Finland's position in Russia's imports	12	15	16	15	16	18	16	14	18
Finland's share in Russia's imports, in %	2.00	1.86	1.58	1.71	1.60	1.46	1.36	1.63	1.42

Source: Federal Customs Service of Russia

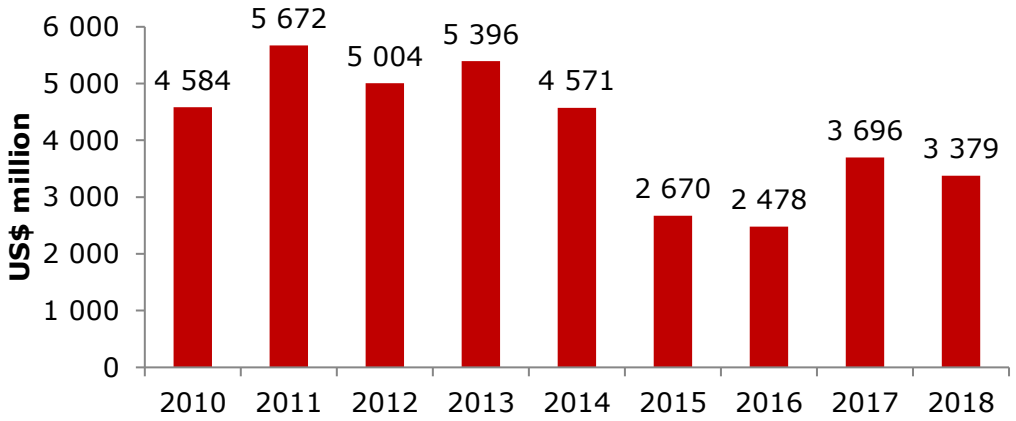
Russian exports accounted for 77% of trade between Russia and Finland in 2018. Exports from Russia to Finland in 2018 amounted to US$ 11 373 million, which was 1.3 times the level of 2017 (Figure 2.1).

Russian imports accounted for 23% of trade between Russia and Finland in 2018. Import of goods to Russia from Finland in 2018 declined by 8.6% compared to 2017 and amounted to US$ 3 379 million (Figure 2.2).



Source: FCS of Russia

Figure 2.1 – Dynamics of exports from Russia to Finland, in US$ million



Source: FCS of Russia

Figure 2.2 – Dynamics of imports to Russia from Finland, in US$ million

Table 2.3 reflects the dynamic of Russian exports to Finland and Table 2.4 shows how imports to Russia from Finland changed during the period 2010 – 2018, by key commodity group (with the volumes exceeding US$ 100 million).

Table 2.3. – Dynamic of Russian exports to Finland between 2010 and 2018, by key commodity group (with the volumes exceeding US$ 100 million), in US$ million

Code TNVED	Commodity group	2010	2011	2012	2013	2014	2015	2016	2017	2018
27	Mineral fuel, oil and oil products; bituminous substances; mineral wax	9348	9990	9300	10587	8786	5144	4242	5048	7146
28	Non-organic chemical products; non-organic and organic compounds of precious metals, rare-earth metals, radioactive elements or isotopes	115	172	155	138	114	116	75	82	85
29	Organic chemical compounds	1076	1413	1254	1112	1047	671	547	648	945
40	Caoutchouc, rubber and products	100	104	105	114	109	89	93	79	82
44	Wood and products; charcoal	520	519	460	569	556	415	409	453	536
72	Ferrous metals	108	151	125	57	50	55	57	69	92
73	Ferrous metal products	180	191	25	30	15	18	229	812	625
75	Nickel and products	111	65	0	1	21	12	265	626	795

Source: FCS of Russia

Table 2.4 – Dynamic of imports from Finland to Russia between 2010 and 2018, by key commodity group (with the volumes exceeding US$ 100 million), in US$ million

Code TNVED	Commodity group	2010	2011	2012	2013	2014	2015	2016	2017	2018
04	Dairy products; eggs; natural honey; food products of animal origin not mentioned or included elsewhere	254	288	293	318	214	1	0	1	1.6
27	Mineral fuel, oil and oil products; bituminous substances; mineral wax	239	288	326	316	272	151	131	169	196
32	Tanning or dyewood extracts; tannins and derivatives; dye, pigments and other colorants; paint and varnish; putty and other mastics; printing ink, writing ink, Indian ink	199	197	163	150	139	85	74	61	61
34	Soap, surface-active organic substances, lubricants, artificial and finished wax, cleaning and polishing products, candles and similar products, molding paste, plasticine, dental wax and gypsum-based dental compounds	149	169	176	179	150	76	73	75	73
39	Plastic and plastic products	325	375	343	383	343	227	207	263	242
48	Paper and cardboard; pulp, paper or cardboard products	574	621	656	674	597	407	412	427	475
72	Ferrous metals	101	181	152	156	112	64	58	77	63
73	Ferrous metal products	374	365	119	111	85	69	46	53	75
84	Nuclear reactors, boilers, equipment and mechanical devices; parts thereof	776	968	884	895	723	376	441	632	744
85	Electrical machines and equipment and parts thereof; audio recorders and audio players, TV audio and video recorders and players, parts and accessories	463	624	316	352	560	312	280	356	297
87	Land-based vehicles excluding trains or	103	189	215	180	196	104	114	256	290

Code TNVED	Commodity group	2010	2011	2012	2013	2014	2015	2016	2017	2018
	trams, parts and accessories									
89	Vessels, boats and floating structures	110	126	22	293	99	165	17	660	168

Source: FCS of Russia

In 2018, Russian exports to Finland were lower than in 2010 in most commodity groups amounting to more than US$ 100 million, with the exception of the following commodity groups: “Wood and products; charcoal”, “Ferrous metal products”, and “Nickel and products”

The cash value of imports to Russia from Finland in was lower in 2018 compared to 2010 for most key commodity groups (amounting to more than US$ 100 million), with the exception of the following commodity groups: “Land-based vehicles excluding trains or trams, parts and accessories” (2.8 times growth in current prices), “Vessels, boats and floating structures” (1.5 times growth in current prices).

The sharpest decline in import to Russia from Finland between 2014 and 2018 was in the commodity group “Dairy products; eggs; natural honey; food products of animal origin”.

The leading types of goods exported from Russia to Finland in 2018 were as follows:

- mineral products (TNVED codes 25-27) – 63.8% of the total amount of exports from Russia to Finland (in 2017 – 59.8%);
- metals and products (TNVED codes 72-83) – 14.1% of the total amount of exports from Russia to Finland (in 2017 – 18.2%);
- chemical products (TNVED codes 28-40) – 13.4% of the total amount of exports from Russia to Finland (in 2017 – 12.5%);
- wood and pulp-and-paper products (TNVED codes 44-49) – 5.1% of the total amount of exports from Russia to Finland (in 2017 – 5.6%);
- machines, equipment and vehicles (TNVED codes 84-90) – 2.0% of the total amount of exports from Russia to Finland (in 2017 – 2.4%).

The highest growth in exports from Russia to Finland in 2018 compared to 2017 was recorded for the following commodity groups:

- mineral fuel, oil and oil products; bituminous substances; mineral wax (TNVED code 27);
- organic chemical compounds (TNVED code 29);
- nickel and products (TNVED code 75);
- fertilizers (TNVED code 31);
- wood and products; charcoal (TNVED code 44);
- vessels, boats and floating structures.

The leading types of goods imported by Russia from Finland in 2018 were as follows:

- machines, equipment and vehicles (TNVED codes 84-90) – 46.4% of the total amount of imports to Russia from Finland (in 2017 – 53.0%);
- chemical products (TNVED codes 28-40) – 18.9% of the total amount of imports to Russia from Finland (in 2017 – 17.2%);
- wood and pulp-and-paper products (TNVED codes 44-49) – 15.1% of the total amount of imports to Russia from Finland (in 2017 – 12.7%);
- metals and products (TNVED codes 72-83) – 6.5% of the total amount of imports to Russia from Finland (in 2017 – 5.7%);
- mineral products (TNVED codes 25-27) – 6.0% of the total amount of imports to Russia from Finland (in 2017 – 4.8%);
- food and agricultural raw materials (TNVED codes 01-24) – 3.3% of the total amount of imports to Russia from Finland (in 2017 – 3.3%).

The highest growth in imports from Russia to Finland in 2018 compared to 2017 was recorded in the following commodity groups:

- nuclear reactors, boilers, equipment and mechanical devices; parts thereof (TNVED code 84);
- paper and cardboard; pulp, paper or cardboard products (TNVED code 48);
- land-based vehicles excluding trains or trams, parts thereof and accessories (TNVED code 87).

With the unfavorable situation in the economy which started developing in 2014, trade between the Russian Federation and the Republic of Finland declined leading to a decrease in volumes of rail and road freight transport during the period 2014 – 2017 compared to 2013 (Figure 2.3).

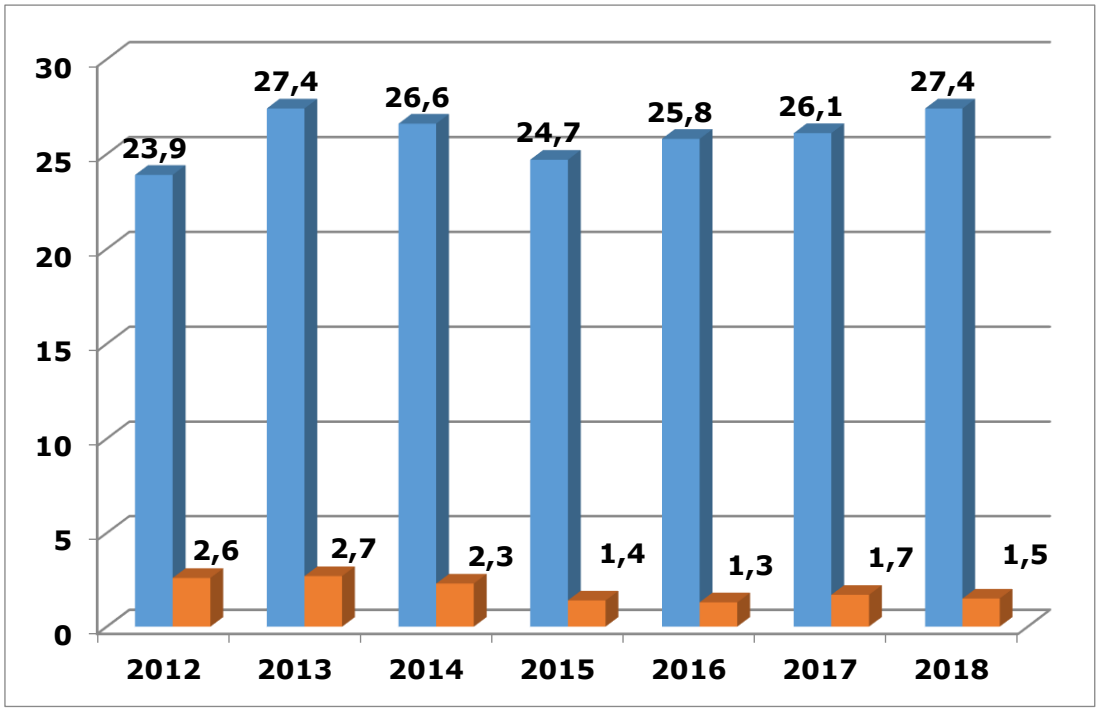
In 2018, the amount of export-related freight from Russia to Finland went back to the level of 2013 (27.4 million tons), while import-related freight from Finland to Russia decreased to 1.5 million tons (a 50% reduction compared to 2013).

From 2015 to 2018, export cargo flows from Russia to Finland were 17 to 20 times the amount of import cargo flows from Finland to Russia.

The largest volume of goods is carried between Russia and Finland by rail – about 57%, while trucks are used to carry 16% of such goods, with the remaining 27% carried by other transport modes (Figure 2.4).

The largest volume of goods exported from Russia to Finland is transported by rail – about 59.4%, while trucks are used to carry 12.3% of such goods, with the remaining 28.4% carried by other transport modes (Figure 2.5).

The largest volume of goods imported by Russia from Russia is transported by road – about 76%, while trains are used to carry 18% of such goods, with the remaining 6% carried by other transport modes (Figure 2.6).

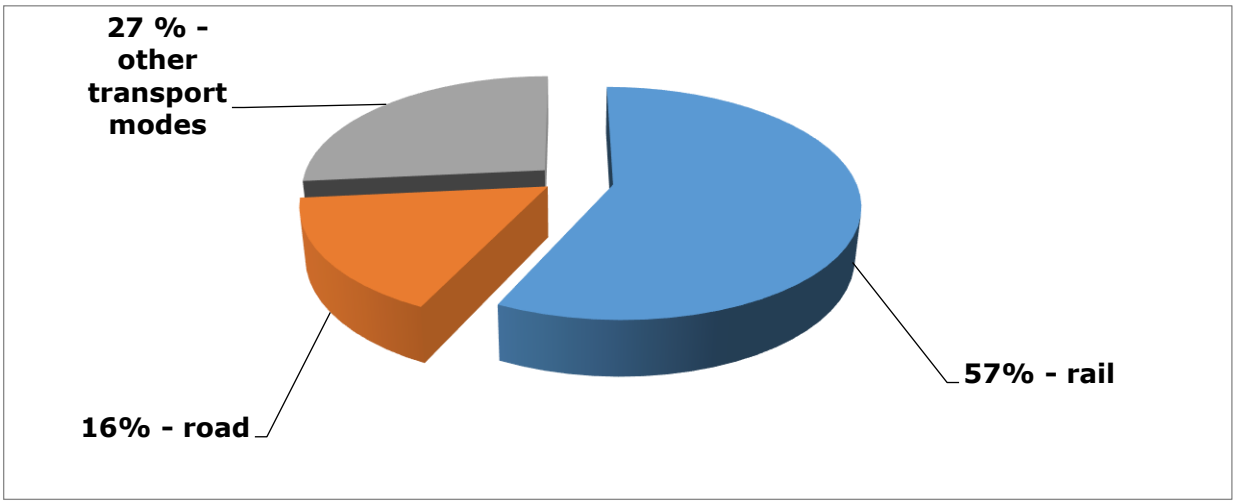


Source: FCS of Russia

- export freight from Russia to Finland
- import freight to Russia from Finland

Figure 2.3 - Dynamics of export and import cargo flows between Russia and Finland in 2010-2018, in million tons

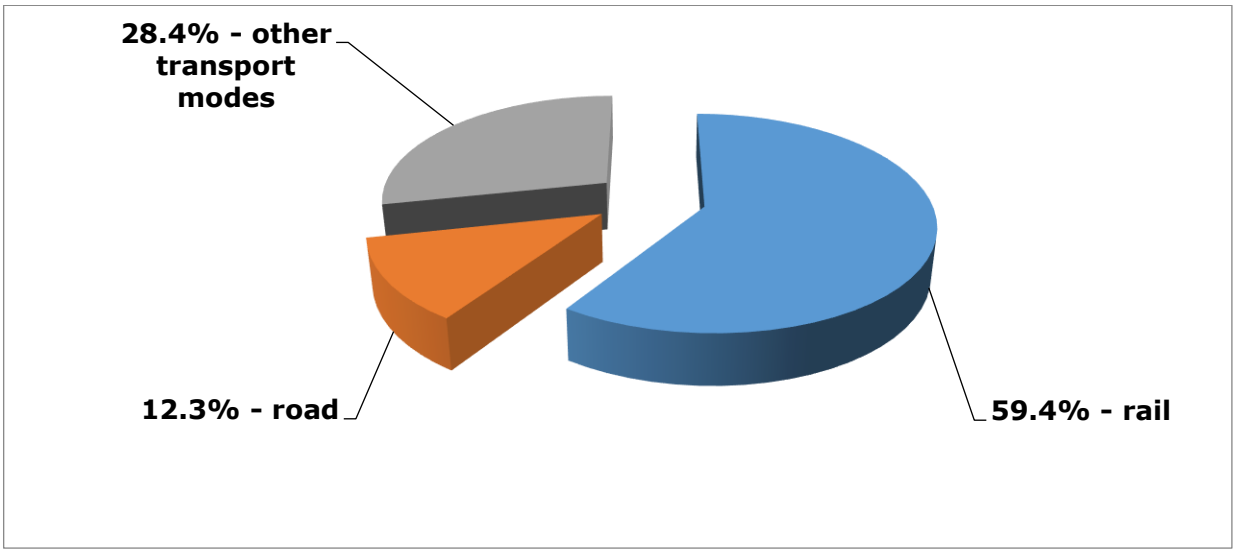
Total – 27.8 million tons in 2017.



Source: FCS of Russia

Figure 2.4 - Modal split in freight transport between Russia and Finland in 2017, %

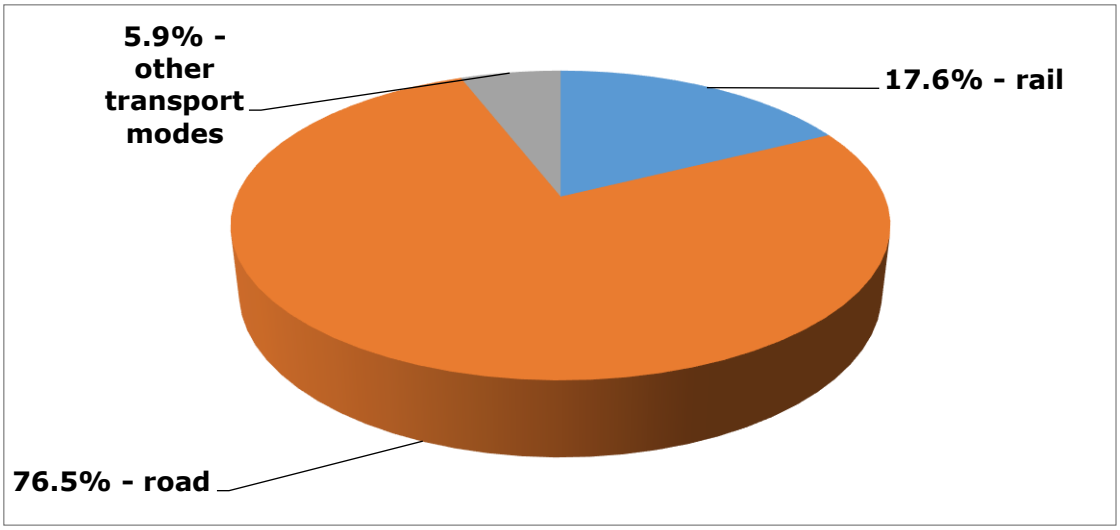
Total – 26.1 million tons in 2017.



Source: FCS of Russia

Figure 2.5 - Modal split in export freight transport from Russia to Finland in 2017, %

Total – 1.7 million tons in 2017.



Source: FCS of Russia

Figure 2.6 - Modal split in import freight transport from Finland to Russia in 2017, %

About a half of all freight transport between Russia and Finland is carried out via the border-crossing points located in Leningrad Regions. Table 2.4 shows the volumes of freight transport between Russia and Finland via MRdBCPs and RwBCPs of Leningrad Region in 2017 and 2018.

Table 2.4 – Dynamic of freight transport between Russia and Finland via MRdBCPs and RwBCPs of Leningrad Region in 2017 and 2018, in tons

	2017, tons	2018, tons	2018 vs. 2017, %
Road border-crossing points			
MRdBCP "Torfyanovka"	1 635 685.0	1 763 641.0	107.8
MRdBCP "Brusnichnoye"	998 064.9	1 382 029.0	138.5
MRdBCP "Svetogorsk"	943 202.0	886 278.0	94.0
Total	3 576 951.9	4 031 948.0	112.7
Railway border-crossing points			
RwBCP "Buslovskaya"	7 233 573.0	8 023 449.0	110.9
RwBCP "Svetogorsk"	2 351 361.0	2 461 692.0	104.7
Total	9 584 934.0	10 485 141.0	109.4
TOTAL traffic via road and railway border-crossing points	13 161 885.9	14 517 089.0	110.3

Source: FCS of Russia

An increase in volumes of international trade led to growth in freight transport between Russia and Finland via the border-crossing points in Leningrad Region: the total cargo flows went up from 13.2 million tons to 14.5 million tons (by 10.3%) in 2017 – 2018, including:

- the cargo traffic via the road border-crossing points increased from 3.6 million tons in 2017 to 4.0 million tons in 2018 (by 12.7%);
- the cargo traffic via the railway border-crossing points increased from 9.6 million tons in 2017 to 10.5 million tons in 2018 (by 9.4%).

At present, nearly all road vehicles moving within the Russian Federation towards the national border with Finland and going through the multilateral road border-crossing points "Torfyanovka", "Brusnichnoye" or "Svetogorsk" use the Scandinavia road on the leg from Saint Petersburg to Vyborg.

The road border-crossing points "Torfyanovka", "Brusnichnoye" and "Svetogorsk" are used to transport:

- wood and wood products, ferrous metals, caoutchouc, rubber and products, glass and products, and other goods *from Russia to Finland*;
- paper and cardboard, machines, oil products and other goods *from Finland to Russia*.

The railway border-crossing point "Buslovskaya" is used to transport:

- chemical fertilizers, oil, timber, coal, ferrous metals, ore, grain and bitumen *from Russia to Finland*;
- paper and cardboard, machines, oil products, machines and equipment *from Finland to Russia*.

Passenger transport between the Russian Federation and Finland

Russia and Finland being neighbors, there is a significant amount of cross-border travel by citizens of both countries.

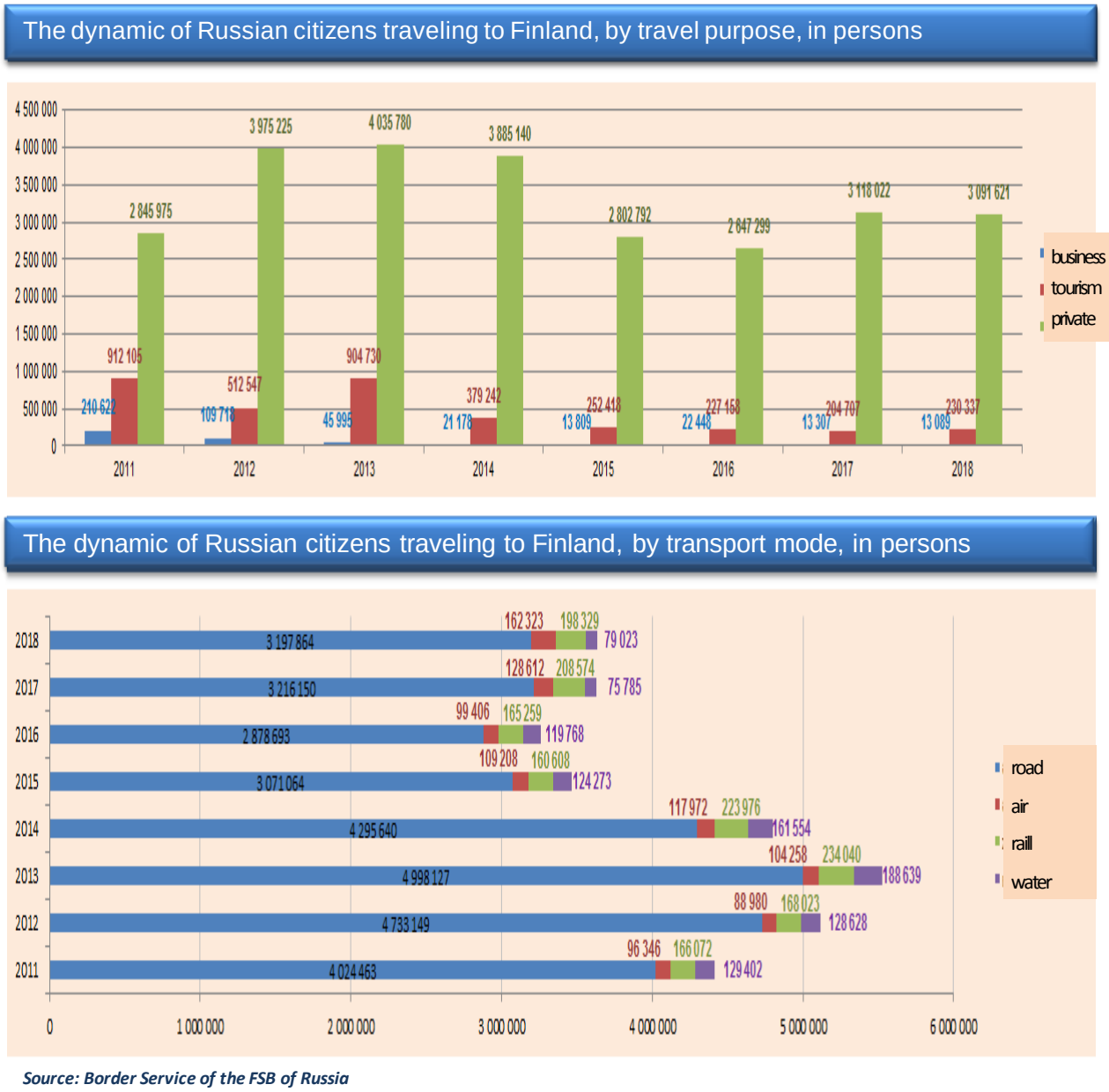
Residents of Russia and Finland account for the largest proportion of trips between the two countries (while residents of other countries also travel between Russia and Finland when visiting Russia and/or Finland for various purposes or traveling via Russia and/or Finland).

Figure 2.7 shows the dynamic of visits to Finland by Russian citizens during the period 2011 – 2018, with the travel purposes and the transport modes indicated.

According to the Border Service of the FSB of Russia, the number of Russian citizens visiting Finland peaked in 2013 reaching 4 986.5 thousand people. During the period 2014 – 2016, the number of Russians visiting Finland declined by 26% due to worsening economic situation and the crush of the Ruble in relation to the Euro. However, the number of visits to Finland by Russian citizens started growing again in 2017. In 2018, this indicator reached 3 335.0 thousand people, with 92.7% of the visitors traveling for private purposes, 6.9% – as tourists, and 0.4% – on business.

Figure 2.8 shows the dynamic of visits to Russia by Finnish citizens during the period 2011 – 2018, with the travel purposes and the transport modes used to get to Russia indicated.

According to the Border Service of the FSB of Russia, the number of Finnish citizens who visited Russia peaked in 2015 reaching 1 416.0 thousand people. The number of such visits then declined between 2016 and 2018 going down to 950.1 thousand people (a 33% decrease vs. 2015). In 2018, 58.4% of all Finnish visitors to Russia came on business, while 35.2% traveled for private purposes and 6.4% came as tourists.



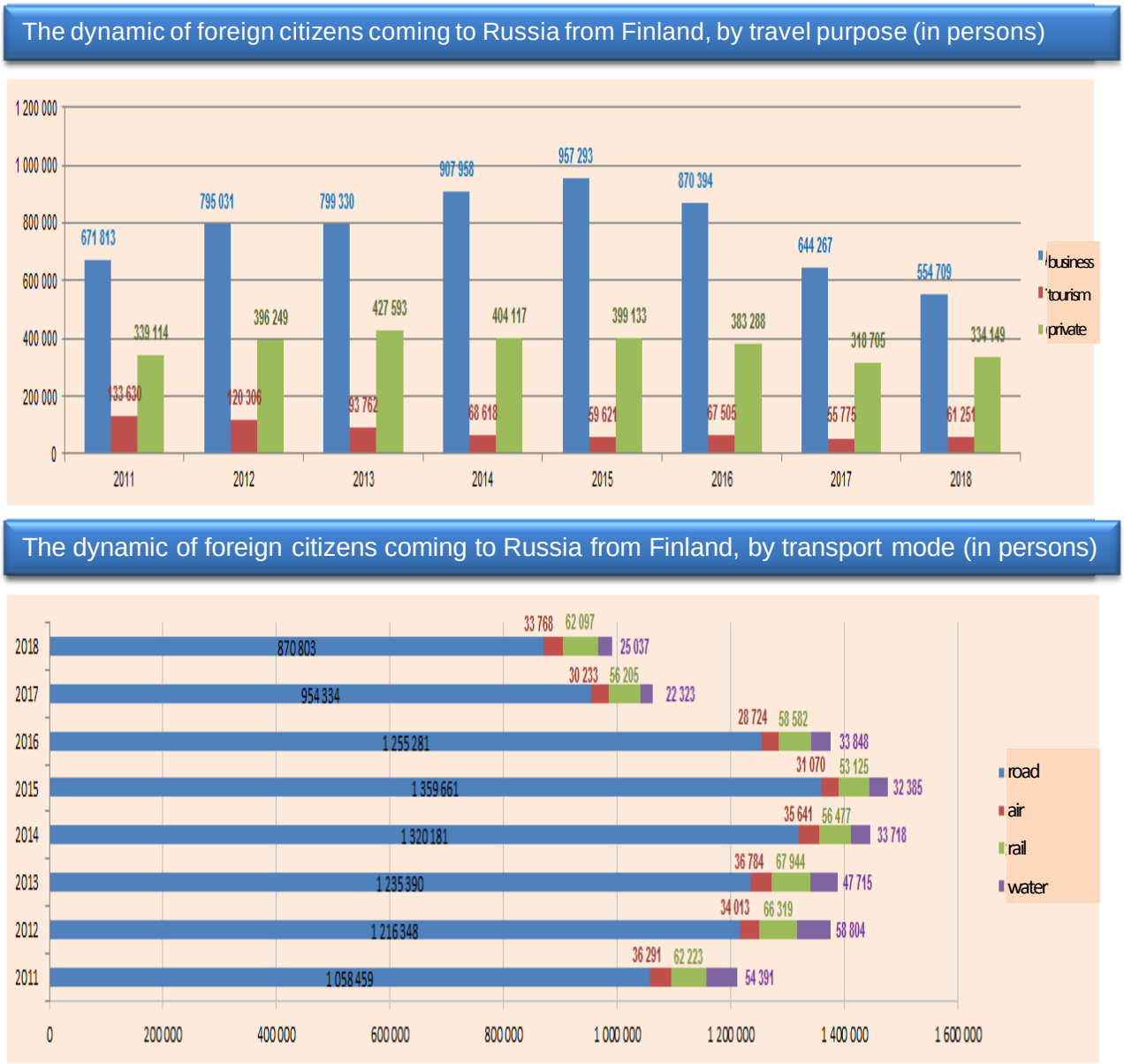
Source: Border Service of the FSB of Russia

Figure 2.7 – The dynamic of the number of Russian citizens visiting Finland, with a breakdown by travel purpose and transport mode

People travel between Russia and Finland by all transport modes: by rail, road, air and sea.

The analysis of the dynamic of the number of Russian citizens visiting Finland and Finnish citizens visiting Russia shows that in 2018:

- 4 285 thousand Russian and Finnish citizens traveled between Finland and Russia;
- most (88%) Russian and Finnish citizens traveled between the two countries by road, while 6% took a train, 4% flew and 2% used ferries.



Source: the Border Service of the FSB of Russia

Figure 2.8 – The dynamic of the number of Finnish citizens visiting Russia, with a breakdown by travel purpose and transport mode

A total of 8849.8 thousand people traveled between Russia and Finland by land in 2017, including:

- by road – 8 237.9 thousand people (93%);
- by rail – 611.9 thousand people (7%).

About 82% of the total passenger traffic between Russia and Finland by land goes through the border-crossing points located in Leningrad Region. Table 2.5 shows the volumes of international passenger transport between Russia and Finland via MRdBCPs and RwBCPs of Leningrad Region in 2017 and 2018.

Table 2.5 – Dynamic of international passenger transport between Russia and Finland via MRdBCPs and RwBCPs of Leningrad Region in 2017 and 2018, in thousand people

	2017, thousand people	2018, thousand people	2018 vs. 2017, %
Road border-crossing points			
MRdBCP “Torfyanovka”	2469.7	2403.6	97.3
MRdBCP “Brusnichnoye”	2677.0	2719.6	101.6
MRdBCP “Svetogorsk”	1558.5	1543.0	99.0
Total	6705.2	6666.2	99.4
Railway border-crossing point			
RwBCP “Buslovskaya”	547.7	551.3	100.7
TOTAL traffic via road and railway border-crossing points	7252.9	7217.5	99.5

Source: the Border Service of the FSB of Russia

In 2018, 6 666.2 thousand (92.4% of the total) out of 7 217.5 thousand passenger trips between Russia and Finland via the MRdBCPs and RwBCPs of Leningrad Region were made by road and only 551.3 thousand trips (7.6%) – by rail.

The busiest road border-crossing points in 2018 were the MRdBCP “Brusnichnoye” – 2 719.6 thousand trips (41% of the total) – and the MRdBCP “Torfyanovka” – 2 403.6 thousand trips (36%). 1 543 thousand people (23%) traveled via the MRdBCP “Svetogorsk” in 2018.

Figure 2.9 shows the main passenger travel routes between Saint Petersburg, Leningrad Region and Southern Finland for various transport modes.

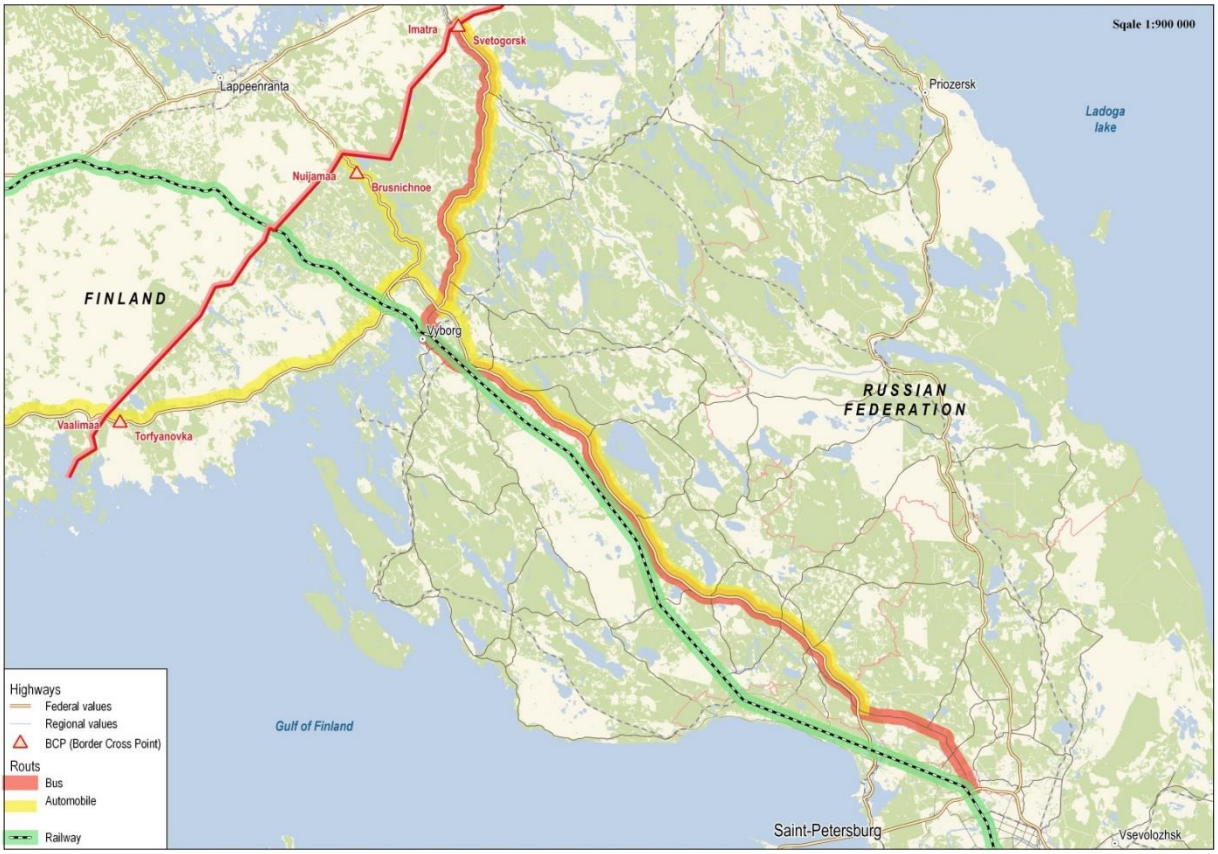


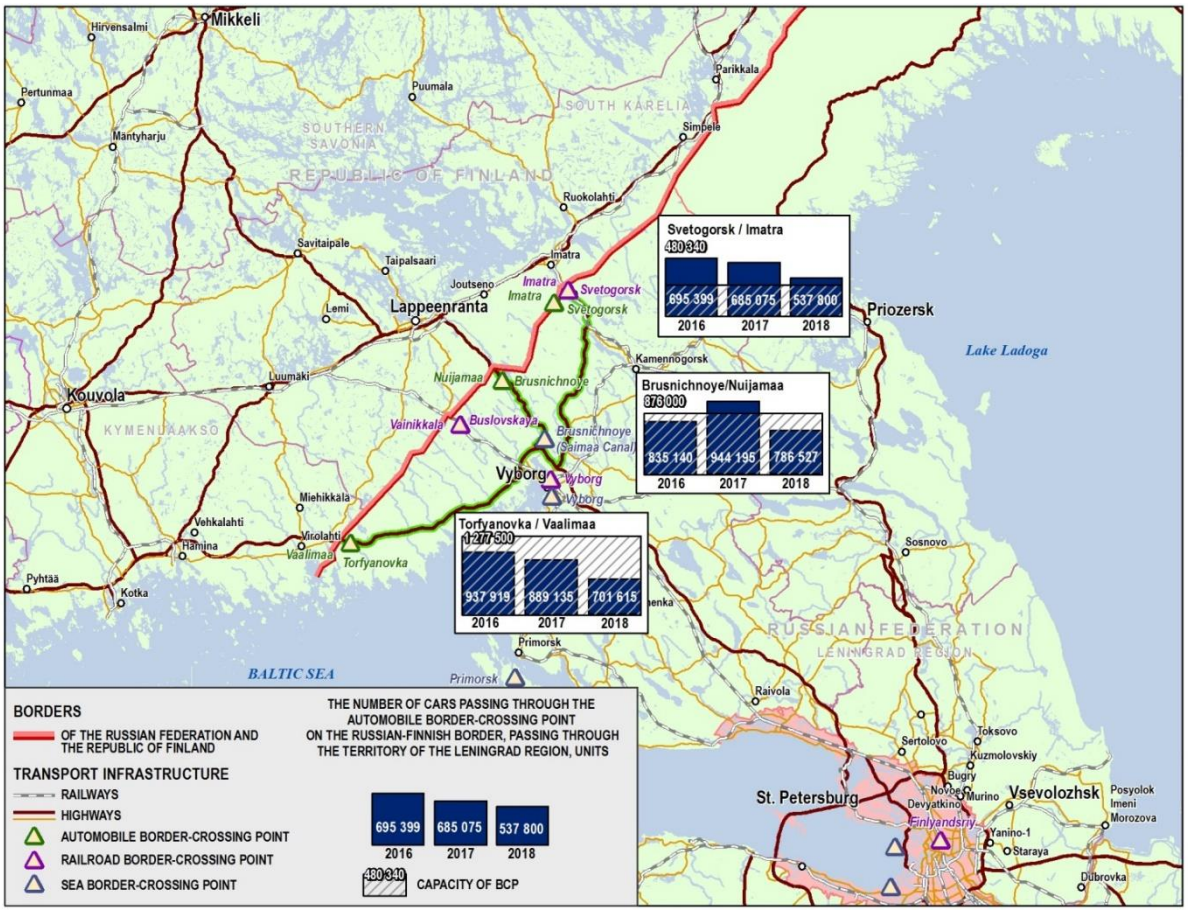
Figure 2.9 – Main passenger travel routes between Saint Petersburg, Leningrad Region and Southern Eastern Finland for various transport modes

At present, passenger traffic between Russia and Finland by road through the multilateral road border-crossing points (MRdBCPs) in Leningrad Region is 12 times the passenger traffic on trains (6,666.2 thous. pax and 551.3 thousand pax respectively in 2018).

The demand for road travel is high since:

- the per passenger cost of travel by rail between Saint Petersburg and Helsinki is much higher when that of travel by road;
- there is no passenger train service from Saint Petersburg to Lappeenranta and Imatra (while 4 262.6 thousand people traveled to those destinations by road in 2018).

Figure 2.10 shows the dynamic of car traffic between the Russian Federation and Finland via the multilateral road border-crossing points in Leningrad Region over the period 2016 – 2018.



Source: the Border Service of the FSB of Russia

Figure 2.10 – Dynamic of car traffic between the Russian Federation and Finland via multilateral road border-crossing points in Leningrad Region, over the period 2016 – 2018.

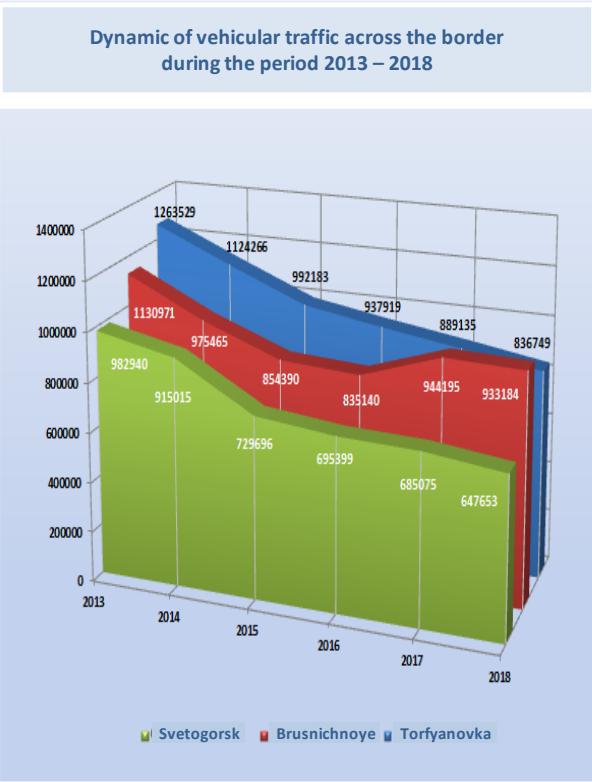
Figure 2.11 shows the dynamic of car and passenger flows between Russia and Finland at the multilateral road border-crossing points in Leningrad Region over the period 2013 – 2018.

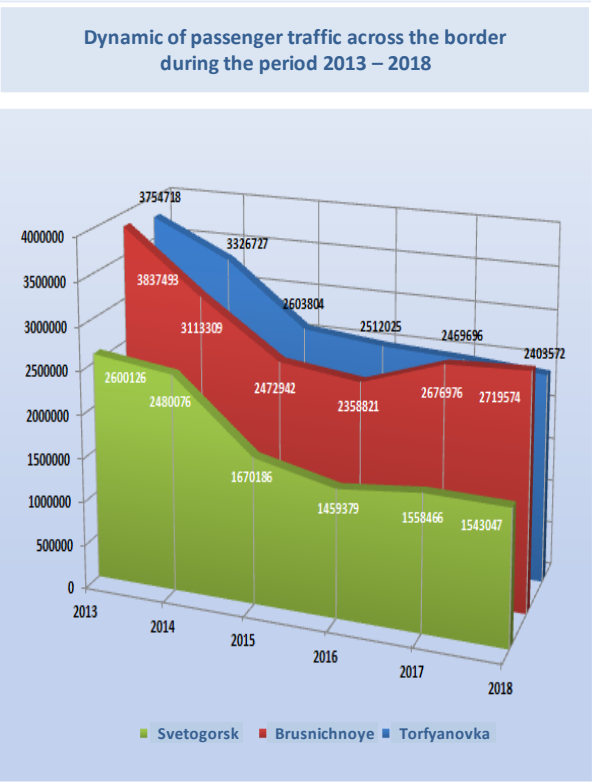
In 2018, 2.8 million vehicles (including 2.4 cars) and 6.7 million people went through the road border-crossing points in Leningrad Region, including:

- vehicle traffic via the MRdBCP “Torfyanovka” – 1.0 million vehicles, including 0.8 million cars and 2.4 million people;
- vehicle traffic via the MRdBCP “Brusnichnoye” – 1.1 million vehicles, including 0.9 million cars and 2.7 million people;
- vehicle traffic via MRdBCP “Svetogorsk” – 0.7 million vehicles, including 0.7 million passenger cars and 1.5 million people.

MRdBCP “Brusnichnoye” handled the largest volume of traffic in 2018 in terms of both vehicles (39% of the total) and people (40.8% of the total).

The MRdBCP “Torfyanovka” is in the second place in terms of vehicular and passenger traffic (35.7% and 35.8% respectively).





Source: the Border Service of the FSB of Russia

Figure 2.11 – The dynamic of the number of cars and passengers that crossed the border between Russia and Finland at the multilateral road border-crossing points in Leningrad Region

According to the Border Service of the FSB of Russia, 24.4 thousand cross-border bicycle trips were made via the MRdBCPs “Torfyanovka”, “Brusnichnoye” and “Svetogorsk” in 2017, the cycling traffic in 2018 being 29.8 thousand trips, and in the first 8 months of 2019 – 26.5 thousand trips.

At present, there are no organized cycle routes in the border districts of Leningrad Region, i.e. cycle routes that are marked, provided with appropriate infrastructure and lead to the road border-crossing points at the Russian – Finnish border. All cycling in Leningrad Region towards the Russian-Finnish border occurs either along federal and regional roads (along the road shoulders) or on local roads that lack equipment or infrastructure for cycling.

The largest amount of cycling between the border areas of Russia and Finland takes place:

- between border towns of the Russian Federation (Vyborg and Svetogorsk) and the border towns of Finland (Imatra, Lappeenranta, etc.;

- between Saint Petersburg (or from other Russian towns via Saint Petersburg) and border towns and more remote towns of Finland (Imatra, Lappeenranta, Hamina, Kotka, Helsinki, etc.);

- between populated centers of Central Europe (via the Baltic States), Leningrad Region (via Saint Petersburg) and Finnish towns, from which cyclists can go to Northern Europe (including on the cycle routes EuroVelo 10 and EuroVelo 13).

The map of the most important routes used by cyclists traveling in the border areas of Leningrad Region is provided in Figure 2.12.

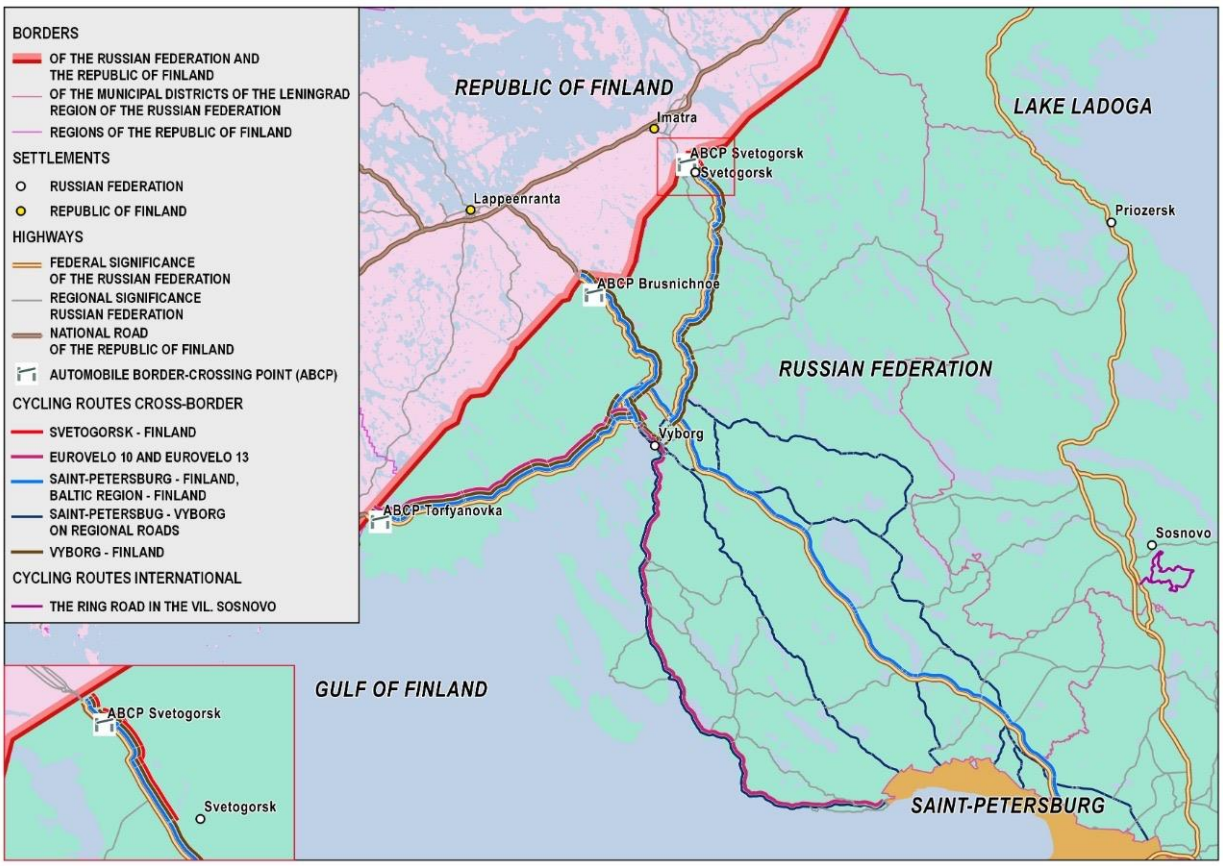


Figure 2.12 – Cycle routes in border areas of Leningrad Region

Figure 2.13 shows the heatmap (according to Strava Global Heatmaps) of the most popular cycle routes located in the border areas of Leningrad Region and the town of Svetogorsk. The busiest routes look thicker on the heatmaps. They are highlighted in yellow and white.

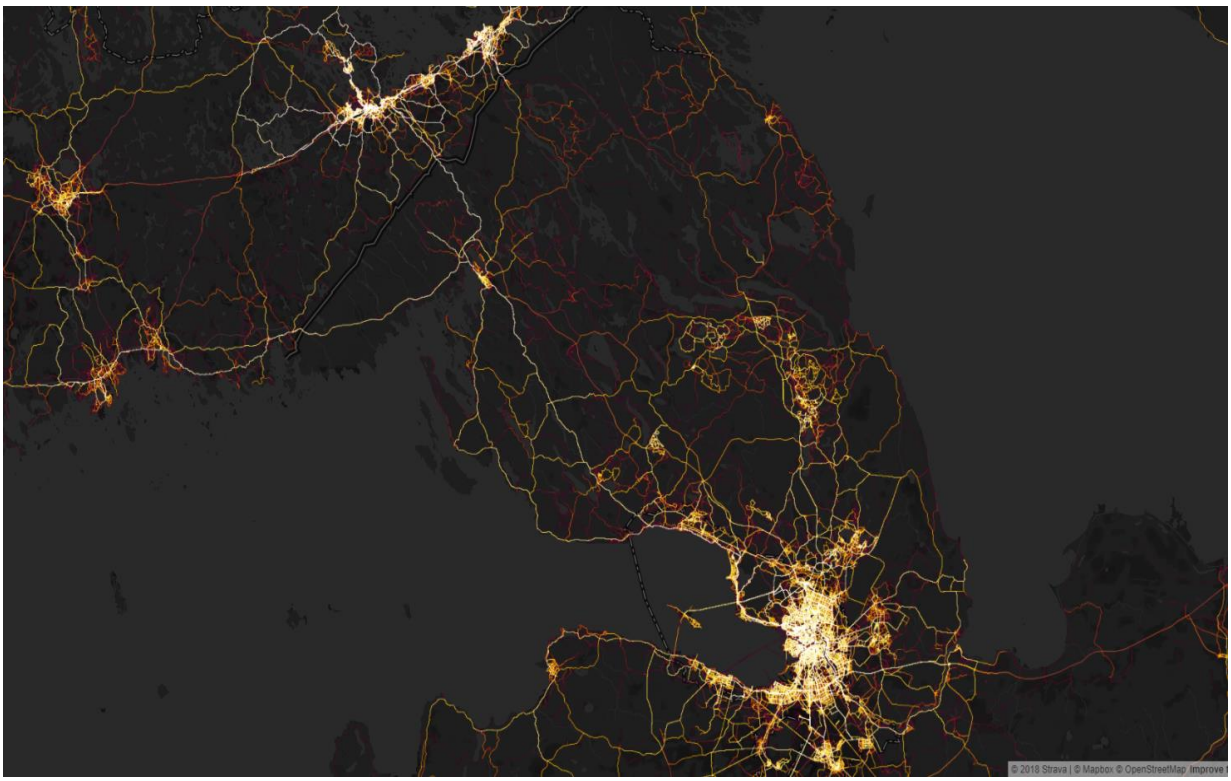


Figure 2.13 – Heatmap of the most popular cycle routes in border areas of the Leningrad Region (according to Strava Global Heatmap)

The cross-border cycle routes in the border areas of Leningrad Region almost entirely lack cycling infrastructure. The only type of infrastructure available on such routes is roadside infrastructure designed primarily for drivers and passengers of motorized vehicles – petrol stations with catering outlets and shops, motels and roadside cafés built along roads leading to the border. Cyclists on such routes can use those facilities.

According to data on the first 8 months of 2019, MRdBCP “Svetogorsk” accounts for most (84.1%) border crossings by cyclists, which is due to close proximity of the towns of Imatra (Finland) and Svetogorsk (Russia) to the border, the distance between the towns being about 10 km. The border-crossing points “Brusnichnoye” and “Torfyanovka” account for 8.3% and 7.6% of all border-crossings by cyclists respectively (Figure 2.14).

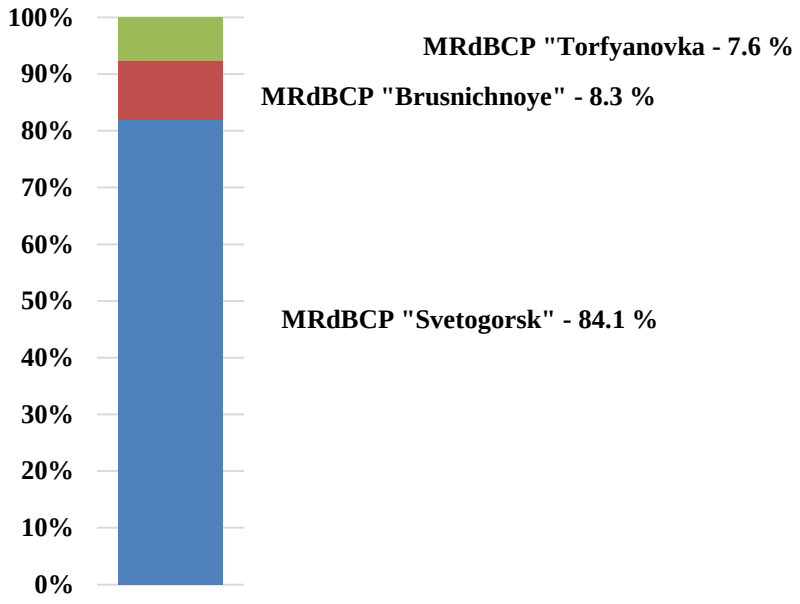


Figure 2.14 – The distribution of cyclists crossing the Russian-Finnish border at the MRdBCPs “Torfyanovka”, “Brusnichnoye” and “Svetogorsk” during the first 8 months of 2019

Most cyclists who cross the Russian - Finnish border (68% to 93% depending on the year) are citizens of the Russian Federation, the Finnish citizens being in the second place (5% to 30%). Citizens of other countries make 0.5% to 2.1% (Figure 2.15) and mostly come from Ukraine, Germany, Estonia and Belarus (in descending order). The respective share of any one of the four countries does not exceed 0.3% of the total flow of cyclists at the three border-crossing points.

The demand at the three MRdBCPs in terms of passenger traffic surpassed their design capacities in 2018 (Table 2.16).

The workload at the MRdBCP “Torfyanovka” and the MRdBCP “Brusnichnoye” in terms of passengers in 2018 was about 125%, the workload at the MRdBCP “Svetogorsk” being 169%. The workload of the MRdBCP “Svetogorsk” and the MRdBCP “Brusnichnoye” in terms of vehicular traffic in 2018 was 149% and 121% respectively.

Congestion at the multilateral road border-crossing points of Leningrad Region increases waiting times on the border.

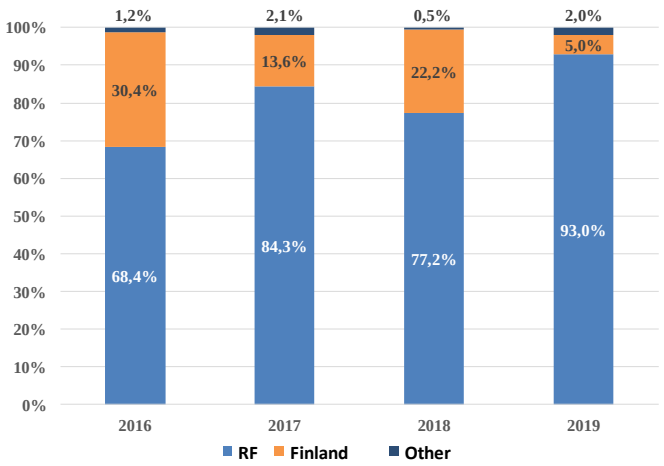


Figure 2.15 – Cycling traffic at the MRdBCPs “Torfyanovka”, “Brusnichnoye” and “Svetogorsk” between 2016 and 2019, by citizenship of cyclists

The average time costs related to border control and customs procedures at Russian and Finnish border-crossing points for cars are 1 to 2 hours on weekdays and 3 to 4 hours on weekends and during holidays. The average time costs associated with border control and customs procedures at Russian and Finnish border-crossing points for trucks may vary from hours to days.

In addition to private cars, there are over 10 daily bus services from Saint Petersburg to Finland. There are bus services to Helsinki, Lappeenranta, Kotka, Turku, Jyväskylä, Tampere, Joensuu, Kuopio and Virolahti, starting from the central bus terminal of Saint Petersburg as well as from *Rossiya Hotel*, *Pulkovskaya Hotel*, *Moscow Hotel*, etc. Moreover, many transport companies provide minibus services, picking up passengers from their homes and taking them to various towns of Finland. The average occupancy of buses going to Finland is 70%. The main advantage of bus services is that buses do not have to queue to cross the border.

As to train services between Russia and Finland, there are the high-speed trains “Allegro” (Saint Petersburg – Helsinki) and the passenger trains “Lev Tolstoy” (Moscow – Helsinki) which cross the border at the RwBCP “Buslovskaya” – “Vainikkala”.

Table 2.6 – Demand (workload) at the multilateral road border-crossing points in Leningrad Region

Indicators	Traffic in 2018, vehicles / persons	Design capacity of the BCP, vehicles a year / persons a year	Workload, in %
MRdBCP “Torfyanovka”			
Vehicles a year	1 018 404	1 277 500	79.7 %
Persons a year	2 403 572	1 916 250	125.4 %
MRdBCP “Brusnichnoye”			
Vehicles a year	1 063 846	876 000	121.4 %
Persons a year	2 719 574	2 190 000	124.2 %
MRdBCP “Svetogorsk”			
Vehicles a year	714 011	480 340	148.6 %
Persons a year	1 543 047	912 500	169.1 %

Source: the Ministry of Transport of the Russian Federation

The high-speed trains "Allegro” take passengers from Saint Petersburg to Helsinki in 3.5 hours.

The routes of the trains “Allegro” and “Lev Tolstoy” are shown in Figure 2.16.

The total passenger traffic on trains between the Russian Federation and Finland going via the RwBCP “Buslovskaya” – “Vainikkala” was 551.3 thousand pax in 2018, including 481.8 thousand people who took *Allegro* trains and 69.5 thousand passengers of *Lev Tolstoy* trains (Figure 2.17). Passenger travel between Russia and Finland by rail accounts for over 70% of the total volume of passenger traffic between Russia by Russian Railways (RZD).

Figure 2.16 – Routes of the trains “Allegro” and “Lev Tolstoy” between Saint Petersburg and Helsinki

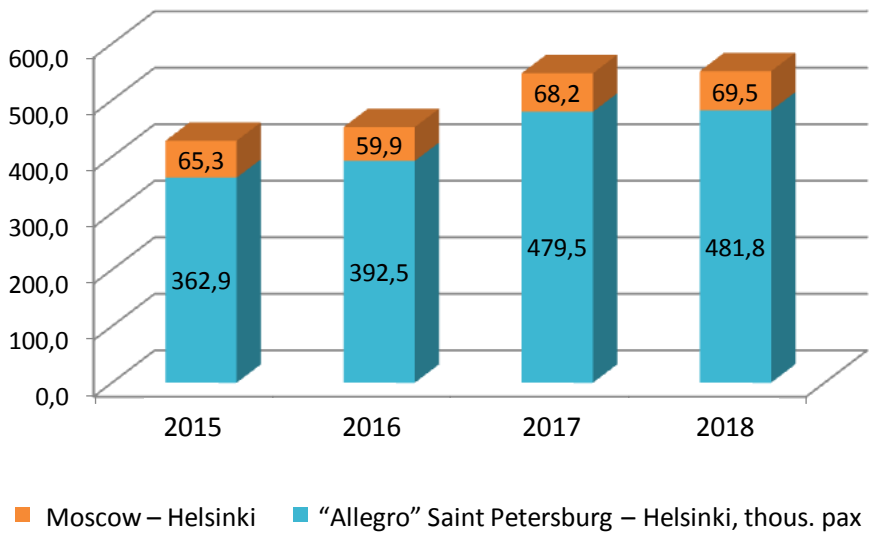


Figure 2.17 – Dynamic of passenger traffic on train services between Russia and Finland going via the RwBCP “Buslovskaya” – “Vainikkala”, in thousand pax

The fastest way to travel between Russia and Finland is by air. There are daily flights from Pulkovo Airport to Helsinki Vantaa airport which is 19 km away from Helsinki. The travel time is about an hour. The passenger traffic on flights between Russia and Finland in 2018 was about 280 thousand pax, a significant proportion being transit passengers who changed planes in Helsinki airport to fly to various cities in Europe and Asia. Flights from Finland to other European and Asian countries being cheaper, the passenger traffic from Pulkovo Airport to Finland is growing by 10% per annum on average.

People also use waterborne transport to travel between Russia and Finland. Existing waterborne transport services include:

- the *Princess Anastasia* ferry operating on the route *Saint Petersburg – Helsinki – Stockholm – Tallinn – Saint Petersburg*. There are 2 to 3 services a week. Operator: St. Peter Line. The traffic on the ferry is about 200 000 pax per annum;
- the cruise motor ship operating in summer: from Lappeenranta to Vyborg on the Saimaa Canal. Travel time: 6 hours 30 minutes. Operator: Saimaatravel.

Table 2.7 provides a comparative analysis of time and price characteristics of passenger travel by various transport modes between Russia and Finland.

The comparison of time and price characteristics shows that railway transport is the most attractive to passengers in terms of speed, comfort and safety. Bus services are the most affordable. Air transport is the fastest, but the high fares and significant waiting times at the airports makes the option less attractive. Waterborne services are mostly used for tourist trips.

Car travel takes longer and is more expensive compared to bus services. Still it can be quite efficient if there are several persons in the car. The possibility of door-to-door travel also adds to the attractiveness of car travel.

Table 2.7 – Time and price parameters of passenger travel between Russia and Finland, for various transport modes

##	Transport mode	Time costs of traveling from Saint Petersburg to Helsinki	Cost of one-way trip, in rubles
1	Air transport	50 minutes + 2 hours for passport control, customs inspection and other procedures at the airport	6 500 to 12 500 per person
2	Railway transport	3 hours 27 minutes	2 500 – 7 800 per person
3	Bus services	6 hours + 1 to 2 hours for passport control, customs inspection and other procedures at the border-crossing point	700 to 1 500 per person
4	Car travel	6 hours + 1.5 to 2.5 hours on weekdays and 3 to 4 hours on	4 000 – 6 000 per vehicle

##	Transport mode	Time costs of traveling from Saint Petersburg to Helsinki	Cost of one-way trip, in rubles
		weekends or during holidays for passport control, customs inspection and other procedures at the border-crossing point	
5	Water transport	13 hours + 1 to 2 hours for passport control, customs inspection and other procedures at the border-crossing point	14 400 – 58 600 per person

3. Description of the road A181 “Scandinavia”

The federal road A-181 “Scandinavia” *Saint Petersburg – Vyborg – border with Finland* is a part of the European route E-18 and the Asian route AH-8. Effectively it is also an extension of the federal road M-10 “Russia”. This federal road is virtually the only full-fledged connection of the North-West Russia to Europe including the Scandinavian countries – the most promising part of the Baltic region.

The route from Saint Petersburg to Helsinki is 380 km long, including the following sections:

- the section from Saint Petersburg via Vyborg to the Russian – Finnish border, km 47+571 – km 208+360 (200+062), which is 189 km long;

- the section from the Russian – Finnish border to Helsinki, which is 191 km long.

At present, the federal road A-181 “Scandinavia” is controlled by the Federal Government Agency “Administration of federal roads “North-West” named after N. V. Smirnov of the Federal Road Agency” (Figure 3.1).

Figure 3.1 – Federal road A-181 “Scandinavia” is controlled by the Federal Government Agency “Administration of federal roads “North-West” named after N. V. Smirnov of the Federal Road Agency”

The federal road A-181 “Scandinavia” starts where the road crosses the border between Saint Petersburg and Leningrad Region, which corresponds to km 47.803 km. Then the road runs on the Karelian Isthmus of Leningrad Region via the settlement Ogonki, along the lakes Nakhimovskoye and Glubokoye, past Vyborg, and ends at the national border with Finland at the MRdBCP

“Torfyanovka”. The counterpart road in Finland starting from the border on the Finnish side is Valtatie 7 which leads to Helsinki.

Near Vyborg, the traffic takes the 28.5 km bypass road which was built according to the standards for a Category II road. The Vyborg Bypass road has a bridge over the Saimaa Canal and six overpasses. The Vyborg Bypass has exits in two directions towards the Russian – Finnish border: one to the multilateral road border-crossing point (MRdBCP) “Torfyanovka” / “Vaalimaa” which is the closest BCP to Helsinki, the other – to the MRdBCP “Brusnichnoye” / “Nuijamaa” which is near Lappeenranta, Finland.

The Vyborg Bypass is also the starting point of the federal road *Vyborg – Svetogorsk* which leads to the MRdBCP “Svetogorsk” and provides a road link to Imatra, Finland.

The *Scandinavia* road was built during the period 1984 – 1994. However, it does not meet the current safety and capacity requirements given the growing traffic level. The traffic level on the road has tripled since the 2000’s, its capacity becoming insufficient for the actual amount of truck, bus and car traffic.

Most of the Scandinavia road has one lane per direction (Figure 3.2), is consistent is Technical Category II, the carriageway width being 7.5 m with the exception of the section km 47 – km 65 from the border of Saint Petersburg to the settlement of Ogonki, which after the reconstruction of 2019 has three lanes per direction (which is consistent with Technical Category I).

There being a large volume of road transport between Russia and Finland, the *Scandinavia* road has a lot of traffic. The busiest section of the road is the one from Beloostrov to Vyborg with the traffic level of 15 000 to 20 000 vehicles a day. The situation becomes worse on weekends when residents of Saint Petersburg and Vyborgsky District of Leningrad Region travel to the Karelian Isthmus or Finland for recreational purposes.

Figure 3.2 – The *Scandinavia* road mostly has one lane per direction

Figure 3.3 shows the average annual daily traffic on the road A-181 “Scandinavia” and the connecting roads, as calculated by Transport Integration Ltd. on the basis of the data provided by:

- the Federal Government Agency “Administration of federal roads “North-West” named after N. V. Smirnov of the Federal Road Agency” on the basis of automatic traffic counts;
- the Road Committee of Leningrad Region on the basis traffic data on regional and intermunicipal roads; and
- the Federal Customs Service of Russia on the basis of data on the vehicle traffic through the MRdBCP “Torfyanovka”.

The part of A-181 “Scandinavia” with the highest average annual daily traffic is the section *Saint Petersburg* – Ogonki – over 19 000 vehicles a day. The traffic on the section from Ogonki to Vyborg Bypass is 15.6 thousand vehicles a day; Vyborg Bypass has the traffic of 6.2 thousand vehicles a day, the traffic level on the section from Vyborg to the MRdBCP “Torfyanovka” being 2.7 – 5.3 thousand vehicles a day.

Figure 3.3 – Average annual daily traffic on the road A-181 “Scandinavia” and the connecting roads

With the high traffic levels, some sections of the *Scandinavia* road are congested beyond their capacity as the road mostly has only two traffic lanes (Figure 3.4), which leads to a significant number of road traffic accidents (RTAs).

Most RTAs are caused by speeding and crossing into oncoming traffic when overtaking (Figure 3.5).

Figures 3.6 – 3.8 show RTA “black spots” on the *Scandinavia* road by year, from 2016 through 2018. Figure 3.9 shows the summary for the three years. The locations where people were killed in RTAs are marked with the color red.

Figure 3.4 – The *Scandinavia* road mostly has one lane per direction, which results in RTAs and congestion

Table 3.1 shows the dynamic of RTAs on roads that provide international connections between Russia and Finland for the period 2016 – 2018

Table 3.1 – Dynamic of RTAs on roads that provide international connections between Russia and Finland between 2016 and 2018

Name of road	2016			2017			2018			Total over the period 2016-2018		
	RTAs	People killed	People injured	RTAs	People killed	People injured	RTAs	People killed	People injured	RTAs	People killed	People injured
A-181 “Scandinavia”	166	19	82	64	25	95	92	25	162	322	69	339
Vyborg – Brusnichnoye	4	-	8	6	3	22	6	3	13	16	6	43
Vyborg – Svetogorsk	9	1	14	27	3	34	8	5	8	44	9	56
Kamennogorsk – Lesogorsky	1	1	2	-	-	-	-	-	-	1	1	2
Total	180	21	106	97	31	151	106	33	183	383	85	440

Source: RF GIBDD (State Inspectorate for Traffic Safety)

Figure 3.5 – RTAs on the Scandinavia road

There were 322 RTAs on A-181 “Scandinavia” during the period 2016 – 2018, with 69 people killed and 339 injured.

The number of RTAs has declined in recent years but the severity of their consequences increased: the number of deaths went up from 21 persons in 2016 to 33 persons in 2018, and the number of people injured increased from 106 to 183 over the same period of time.

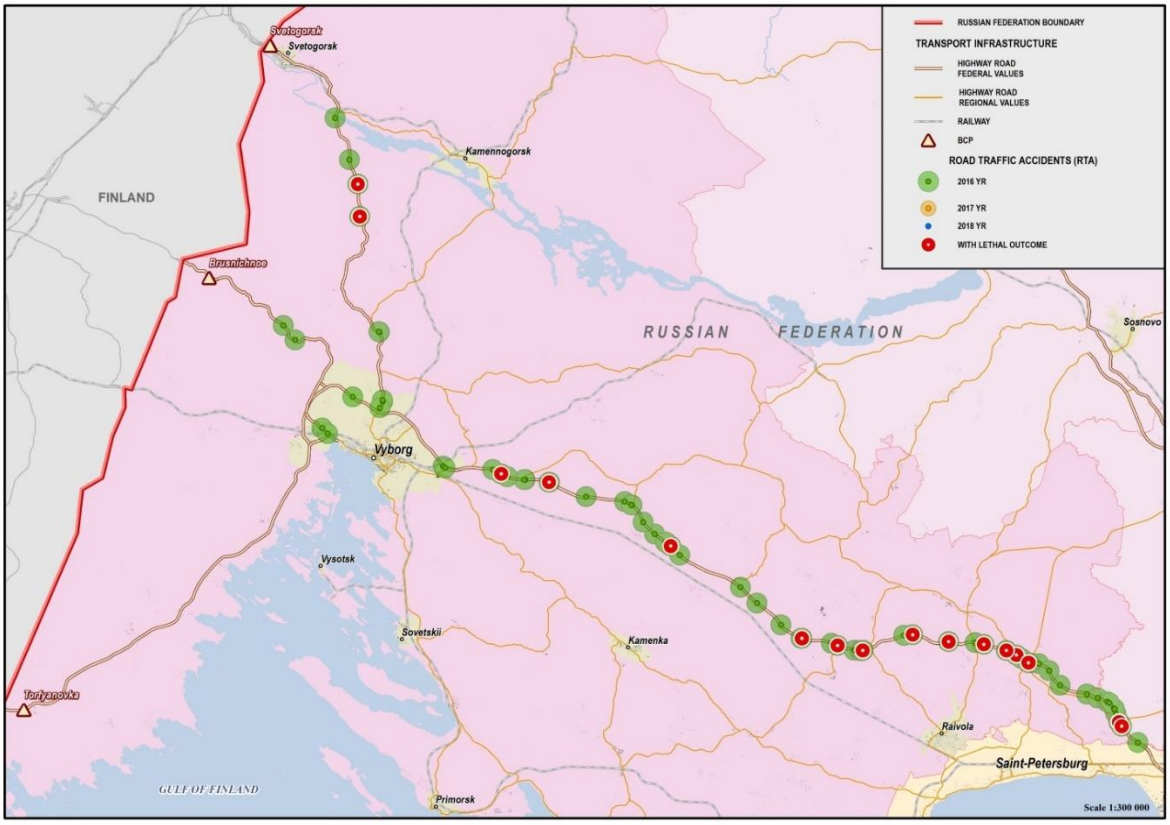


Figure 3.6 – RTA “black spots” on roads that provide international connections between Russia and Finland in 2016

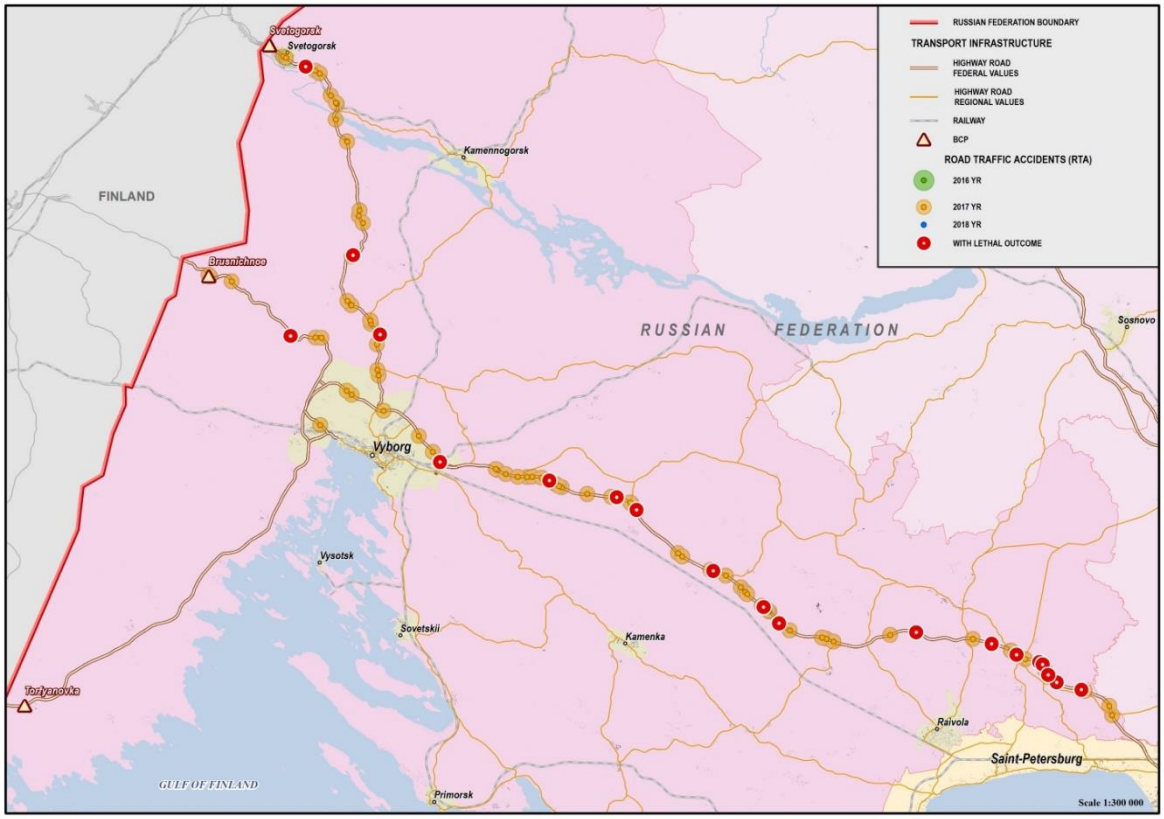


Figure 3.7 – RTA “black spots” on roads that provide international connections between Russia and Finland in 2017

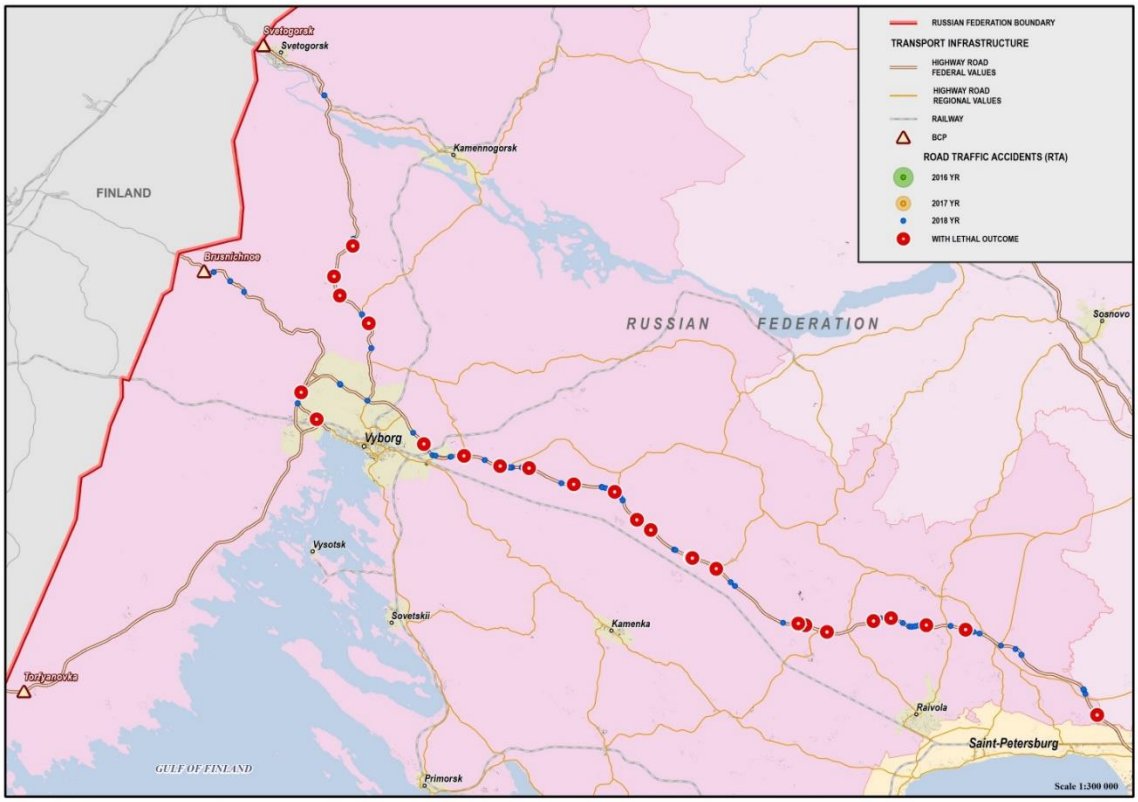


Figure 3.8 – RTA “black spots” on roads that provide international connections between Russia and Finland in 2018

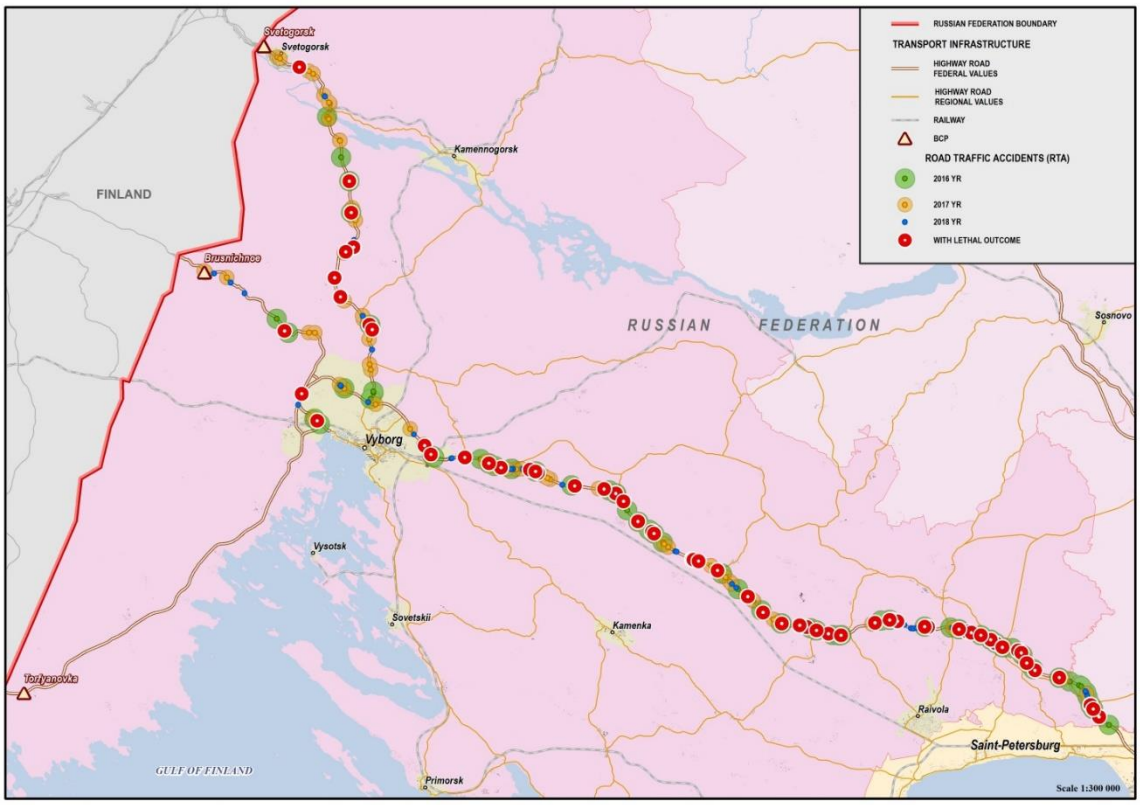


Figure 3.9 – RTA “black spots” on roads that provide international connections between Russia and Finland between 2016 and 2018

Given the importance of the *Scandinavia* road for international, regional and local transport and travel, it should be developed to meet the increasing demand, and made comfortable and safe for the benefit of the population of Russia and Finland.

4. Future trends in socio-economic development of Saint Petersburg and Leningrad Region which have an impact on the volumes of traffic on the *Scandinavia* road

The main factors that impact the traffic levels on the *Scandinavia* road are as follows:

- socio-economic development trends in the Russian Federation, Leningrad Region and Saint Petersburg, such as the expected GDP and GRP growth, investment including in transport infrastructure, population growth and growth of real disposable income of the region's residents;
- trends in trade between the Russian Federation and Finland;
- trends in tourism, tourism infrastructure and paid services;
- introduction of free electronic visas for foreign citizens;
- increasing travel of Finnish citizens to Russia and of Russian citizens to Finland.

These factors are briefly detailed below.

Population growth in Saint Petersburg and Leningrad Region

The combined population of Saint Petersburg and Leningrad Region is 7.2 million people or 4.8% of the population of the Russian Federation.

The population of Saint Petersburg and Leningrad Region has grown in recent years, including due to migration, active housing construction and the opening of new businesses. The combined population of the two regions has increased by 6% over the last 5 years.

The average monthly wages are also increasing, and economic development indices are improving (industrial production, investment in equity, the turnover in the service sector), which creates the environment needed for tourism to grow.

The *Forecast of Socio-Economic Development of Saint Petersburg 2035* features three scenarios: *the baseline* scenario, the *baseline* + scenario, and the *target* scenario. According to the baseline scenario, the population of Saint Petersburg will be 5 675.3 thousand people in 2030 and 5 818.9 thousand people in 2035, the forecast for the *baseline*+ scenario being 5 948.9 thousand and 6 079.3 thousand people respectively. The *target* scenario involves the population reaching 6 355.3 thousand people by 2035.

The *Forecast of Socio-Economic Development of Leningrad Region 2035* features two scenarios:

- *Scenario 1* that assumes that the economy will develop within the existing inertial dynamic; and

- *Scenario 2* that involves implementation of a set of measures to accelerate the economic growth and improve the demographic situation and living standards.

According to Scenario 1, the population of Leningrad Region will be 1 918.5 thousand people in 2030 and 1 952.3 thousand people in 2035, the forecast for Scenario 2 being 1 958.1 thousand people and 2 011.5 thousand people respectively.

Therefore, if the demographic situation is good:

- the population of Saint Petersburg will increase from 5 381.7 thousand people in 2019 to 5 948.9 thousand people in 2030 and up to 6 079.3 thousand people in 2035 (13% growth compared to 2019);

- the population of Leningrad Region will increase from 1 846.9 thousand people in 2019 to 1 958.1 thousand people in 2030 and up to 2 011.5 thousand people in 2035 (8.9% growth compared to 2019).

Socio-economic development trends in the Russian Federation, Leningrad Region and Saint Petersburg

The forecasts of socio-economic development of the Russian Federation, Leningrad Region and Saint Petersburg, and trends in the tourism industry which have an impact on the demand for the road route *Saint Petersburg – Helsinki* are provided in the following documents:

- The Forecast of the Socio-Economic Development of Russia For the Period 2036, approved at the session of the RF Government on 22.11.2018);

- The Strategy of Spatial Development of the Russian Federation 2025 (RF Government Directive No.207-p dated February 13, 2019);

- The Forecast of Socio-Economic Development of Leningrad Region 2035 (Decree of the Leningrad Region Government No. 100 dated 18.03.2019);

- The Forecast of Socio-Economic Development of Saint Petersburg 2035 (Decree of the Saint Petersburg Government No. 90 dated 14.02.2017).

The main provisions from these documents, which will impact the socio-economic development of Leningrad Region and Saint Petersburg are provided in Annex A-1.

The Forecasts of Socio-Economic Development of the Russian Federation, Leningrad Region and Saint Petersburg look at several scenarios that involve different dynamics of population, GDP and GRP, investment in equity, real disposable income, etc.

Demographic improvement, higher rates of economic growth, more investment including in transport infrastructure, and higher living standards would lead to greater demand for the road route *Saint Petersburg – Helsinki*.

The Strategy of Spatial Development of the Russian Federation 2025 envisages:

- stronger interregional cooperation within Russia;
- faster socio-economic development of high-potential centers of economic growth including Saint Petersburg and Leningrad Region;
- elimination of infrastructure related limitations and improving accessibility and quality of arterial transport and IT and telecommunication infrastructure;
- stronger cooperation of border regions of the Russian Federation with neighbor countries:
- reduction in border-crossing times for passengers and cargo at border-crossing points;
- fostering development of small and medium-sized businesses involved in cross-border cooperation;
- assisting interregional cooperation with border regions of neighbor countries in science, technology, on social and environmental issues, and in tourism and infrastructure development;
- assisting interregional cooperation in strategic and territorial planning in border regions of the Russian Federation and municipal areas with border regions of neighbor countries.

High potential for tourism in Saint Petersburg, Leningrad Region and border areas of Finland

Saint Petersburg and Leningrad Region have favorable geographical positions, vast recreational resources, very rich historical and cultural heritage, and good possibilities for development of inbound and domestic tourism.

Historically, Saint Petersburg has been one of the major tourist attractions in Russia and Europe. Saint Petersburg' appeal to tourists is due to its rich historical and architectural heritage, its historical center which is on the UNESCO World Heritage List, the unique palace-and-park complexes, multiple tourist attractions, museums, theaters, concert halls, sports facilities and creative spaces. Tourists mostly visit Saint Petersburg in the summer period of "White Nights" and at the time of spectacular mass events (the City Day, the Scarlet Sails high-school graduation festivities, international cultural and sports events, etc.).

In 2016-2018, Saint Petersburg was named the World's Leading Cultural City Destination by the World Travel Awards (WTA). It was the top Russian city in terms of popularity with Russian and international tourists in 2018. In 2019, Saint Petersburg won the WTA nomination as the Europe's Leading City Destination.

There are over 5 200 cultural heritage sites in Leningrad Region, including UNESCO heritage sites such as palace-and-park complexes and over 180 former manors and memorable sites. Leningrad Region is the only region in Russia that boasts six medieval fortresses. Figure 4.1 shows the locations of main tourist attractions in the border areas of Leningrad Region.

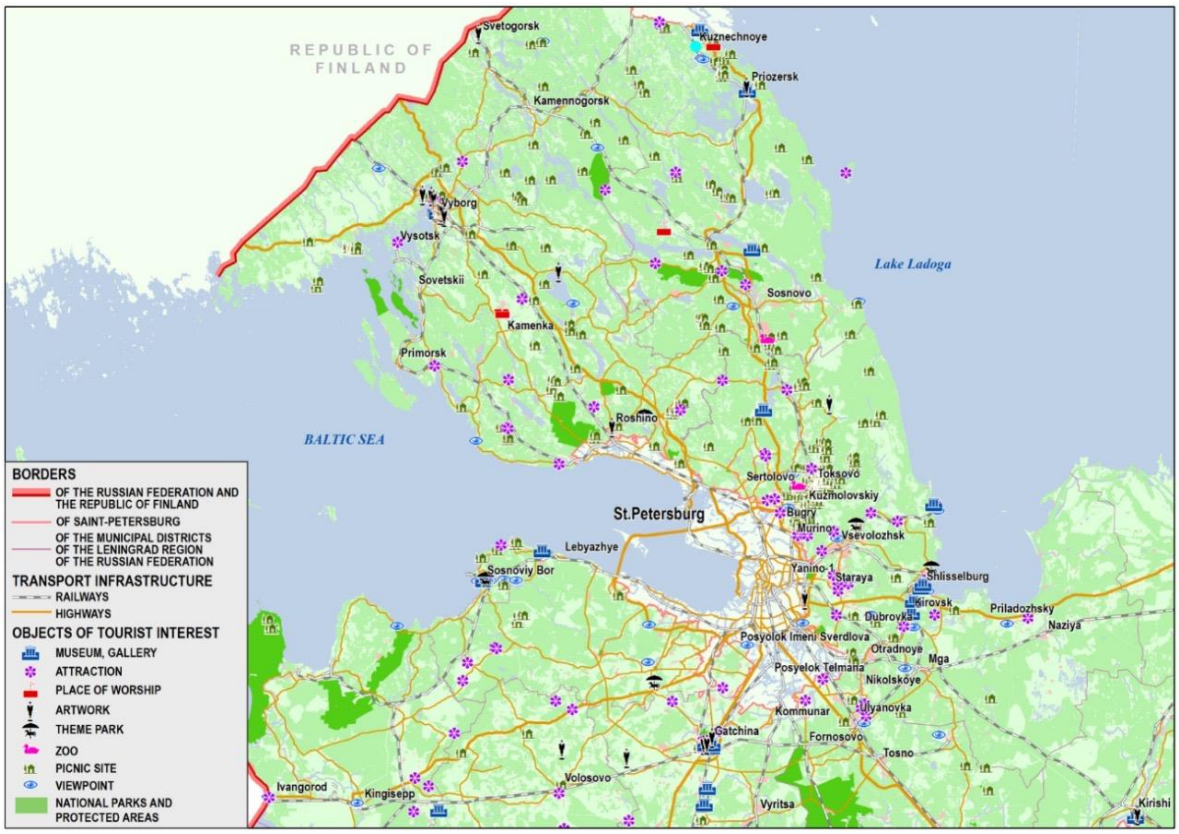


Figure 4.1 – Key tourist attractions and recreation locations in Leningrad Region

The main summer attractions are:

- the coast of the Gulf of Finland, with its sand dunes and pine trees;
- the Karelian Isthmus boasting picturesque landscapes formed by broken terrain, pine and spruce forests, multiple cliffs and beautiful lakes;
- the area around the Ladoga lake;
- the routes along rivers such as the Neva, the Svir, the Volkhov and the Vuoksi.

Two EuroVelo cycle routes run in Leningrad Region (EuroVelo 10 and EuroVelo 13).

In recent years, tourism infrastructure has been developing rapidly in Saint Petersburg and Leningrad Region, such as new hotels, hostels, recreational compounds and expanding shop chains and restaurant chains, all of which help attract more tourists from abroad and other regions of Russia.

Over the period 2013 – 2018:

- the number tourists who visited Saint Petersburg grew by 1.4 times, from 6.2 million people (including 2.7 million foreign tourists) to 8.5 million people. (including about 5 million foreign tourists);

- the number tourists who visited Leningrad Region increased from 1.1 million to 1.7 million people (a 1.5 times growth), the number of sightseers growing from 1.5 million to 3.6 million people (a 2.4 times growth).

Finnish citizens account for a significant share in the total number of international tourists coming to Saint Petersburg and Leningrad Region.

In addition, Finland is one of the most attractive tourist destinations for residents of Saint Petersburg and Leningrad Region. Southern Finland has a large number of historical and cultural monuments, interesting natural landscapes, many sites for fishing and sports, and well developed tourism infrastructure: multiple hotels, recreational compounds, cafés and shops. There are many points of interest in the border areas of Southern Finland: the famous Imatra Rapid (Imatrankoski), the ancient fortress and the Museum of South Karelia in Lappeenranta, the Sapokka Park and Sibelius Park in Kotka, the Tykkimaki Amusement Park near Kouvola, etc. Figure 4.2 shows the locations of main tourist attractions in the border areas of Southern Finland.

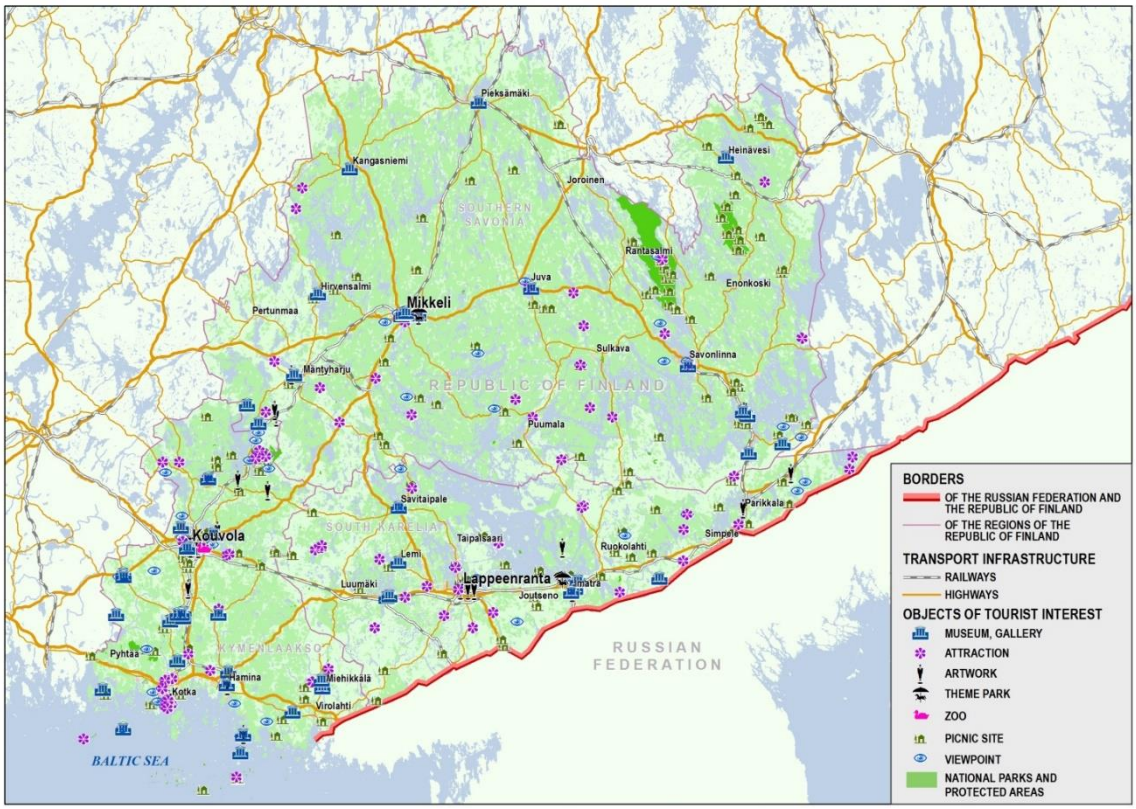


Figure 4.2 – Key tourist attractions and recreation sites in border areas of Finland

Various types of tourism are developing rapidly in Leningrad Region and Saint Petersburg, including:

- culture related and recreational tourism, where Russian and foreign citizens get to know historical and cultural values, natural monuments, customs and traditions of the region;

- active tourism;

- health tourism for relaxation and rehabilitation;

- cruise tourism – travel by water for culture-related, recreation, health, professional, business and other purposes;

- environmental tourism for relaxation and observation of nature;

- military-patriotic tourism (there are 750 war monuments in Leningrad Region);

- industrial tourism (there are over 60 major manufacturing enterprises in Leningrad Region, with organized tours to many industrial facilities);

- religious and pilgrimage tourism (Leningrad Region has 12 monasteries, Russian Orthodox monuments and Russian wooden architecture sites in Tikhvin, Staraya Ladoga, on Konevets Island, and in Lodeynopolsky District);

- event tourism, with about 300 cultural, sports and war-patriotic events being held annually, including historical reconstructions of various epochs, film and music festivals, bicycle parades, competitions, sailing races, etc.

Current trends and the main areas in development of tourism in the Russian Federation, Leningrad Region and Saint Petersburg are covered in the following documents:

- The Tourism Strategy of the Russian Federation 2020 (as approved by RF Government Decree No. 941-r dated 31.05.2014);

- The Concept for the Federal Targeted Program “Development of domestic and inbound tourism in the Russian Federation (2019 – 2025)” (as approved by RF Government Directive No. 872-r dated May 5, 2018);

- The State Program of the Russian Federation “Development of culture and tourism for the period 2013 – 2020” (as approved by RF Government Decree No. 317 dated April 15, 2014);

- The Government Program of Saint Petersburg "Development of culture and tourism sectors in Saint Petersburg" 2015 – 2020 (as approved by Decree of the Government of Saint Petersburg No. 488 dated 17.06.2014);

- The Government Program of Saint Petersburg "Development of the tourism sector in Saint Petersburg" (as approved by Decree of the Government of Saint Petersburg No. 936 dated 14.11.2017);

- The Draft Government Program of Leningrad Region “Development of domestic and inbound tourism in Leningrad Region”;

- The Strategy for Socio-Economic Development of Vyborgsky District 2025.

The main provisions from these documents, which will impact the development of the tourism sector in Saint Petersburg and Leningrad Region are presented in Annex A-2.

Introduction of free electronic visas for foreign citizens

A special visa-regime fosters development of inbound tourism in the region. In 2004, visa-free access for 72 hours was introduced for foreign citizens arriving in the Russian Federation on cruise ships, and in 2009 visa-free access was granted to foreign tourists arriving on sea ferries. The ports providing visa-free access include the Great Port of Saint Petersburg and the Seaport of Vyborg. Over 9 million tourists have taken the opportunity to come to Saint Petersburg on ferries and cruise ships in the last 15 years.

At present, electronic visas are issued to foreign tourists. A Presidential Decree authorized the issue of electronic visas to foreign citizens arriving in Saint Petersburg and Leningrad Region starting October 1, 2019. An electronic visa is issued to a foreign citizen by the decision of the Ministry of Foreign Affairs of the Russian Federation in response to a visa application that has to be filled in on the web-site of the ministry at least four days prior to entering Russia. Such visas are issued for a period of 30 calendar days during which the visitor is allowed to stay in Russia for up to 8 days. No processing fee is charged for electronic visas. There are 53 countries whose citizens are eligible for free electronic visas to visit Saint Petersburg and Leningrad Region, including all countries of the European Union. The same visa-access procedure has been available to citizens of the same countries visiting Kaliningrad Region and the Far East for some time, and from January 1, 2021 foreign tourists will be able to obtain electronic visas to visit all regions of the Russian Federation.

Saint Petersburg and Leningrad Region have already had a positive experience – with electronic passports issued to football fans (Fan IDs) coming for 2018 FIFA World Cup. The procedure has been tested and proved effective. Over 1 million football fans visited Saint Petersburg and Leningrad Region during 2018 FIFA World Cup, 60% of them being international tourists. The tourist consumption level was record high during the World Cup, with the tourists spending over 8 billion rubles.

According to the estimate by the Association of Tour Operators of Russia, electronic visas may lead to a 20% to 25% increase in the tourist flow[1].

[1] https://tourism.interfax.ru/ru/news/articles/59923/
https://www.m24.ru/news/turizm/18062019/80043
https://www.atorus.ru/news/press-centre/new/47401.html

Increasing travel of Finnish citizens to Russia and of Russian citizens to Finland

The forecast of travel of Finnish citizens to Russia and of Russian citizens to Finland for the period through 2030 was made on the basis of:

- the Forecast of Socio-Economic Development of the Russian Federation, Saint Petersburg and Leningrad Region 2035;

- analysis of passenger traffic through the MRdBCPs “Torfyanovka”, “Brusnichnoye” and “Svetogorsk” and the RwBCP “Buslovskaya”;

- tourism development prospects of the Russian Federation, Finland, Saint Petersburg and Leningrad Region.

The forecast of travel of Finnish citizens to Russia and of Russian citizens to Finland for the period through 2030 was made in accordance with the *baseline scenario* of socio-economic development of the Russian Federation, Saint Petersburg and Leningrad Region.

According to the *baseline* scenario, the combined population of Saint Petersburg and Leningrad Region will grow from 7.2 million people in 2018 to 7.9 million people in 2030 (10% growth) (Figure 4.3).

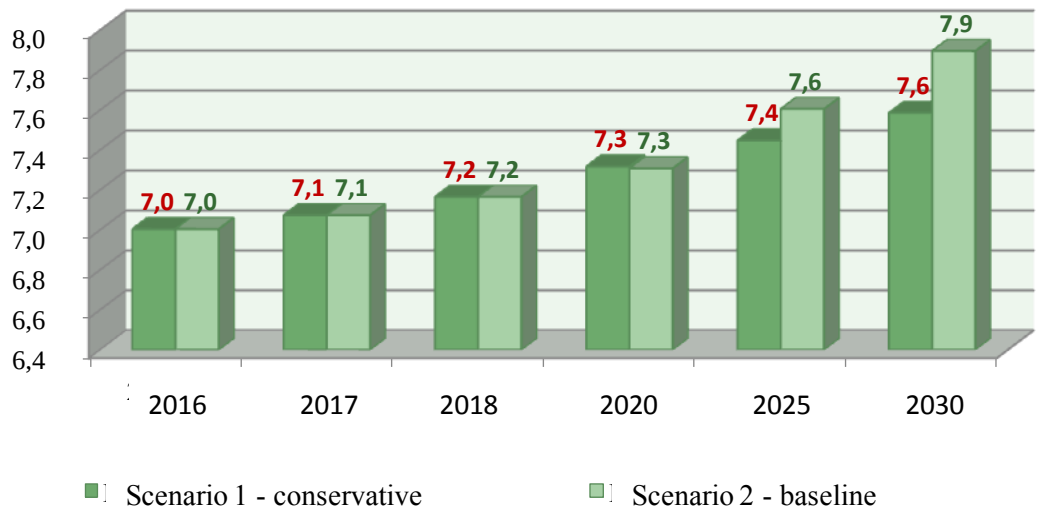


Figure 4.3 – Population forecast for Saint Petersburg and Leningrad Region for the period through 2030

Analysis of tourism sector indicators of Leningrad Region and Saint Petersburg revealed a recent increase in tourist flows as well as high potential for attracting more tourists through further development of tourism infrastructure.

According to the forecast, in 2035:

Saint Petersburg will receive 15 to 17 million visitors (depending on the scenario), half of which will be international tourists (growth by 1.8 to 2.1 times vs. 2018);

Leningrad Region will receive 9 to 11 million visitors (depending on the scenario), 40% of them being international tourists and 60% – Russian tourists (growth by 1.7 to 2 times vs. 2018).

The key measures fostering tourism in Saint Petersburg and Leningrad Region are: building and promotion of new tourist routes; implementation of tourism infrastructure; building tourism and recreation clusters and centers of cultural and tourism development; improvement of quality and competitiveness of tourist-oriented services; active promotion of Leningrad Region and Saint Petersburg as tourist destinations on the target markets in Russia and abroad.

Implementation of the program documents of the Russian Federation, Leningrad Region and Saint Petersburg as listed above would help in attracting more investment in tourism infrastructure, foster development of tourism and make the region a more attractive tourism destination.

According to the FSB of Russia, 3 637.5 thous. Russian citizens traveled to Finland in 2018 on business, as tourists or for private purposes, and 950.1 thous. foreign citizens visited Russia.

The data on passenger traffic between Russia and Finland by travel purpose allow forecasting how many Russian citizens will travel to Finland and how many foreign citizens will come to Russia depending on the main factors (forecasts of population growth, economic growth and personal income growth; development of international cooperation and tourism, etc.).

With the real personal income in Russia growing as forecast, the number of Russians visiting Finland for private purposes would grow by 1.5 times by 2035. The tourist flow from Russia to Finland during the period 2019 – 2035 is expected to grow faster (by 2.9 times).

The number of business travelers going to Finland in 2035 would be 5.2 times the level of 2018 due to expansion of the economic cooperation between the two countries.

The forecast of the number of Russian citizens visiting Finland during the period through 2035 is presented in Figure 4.4.

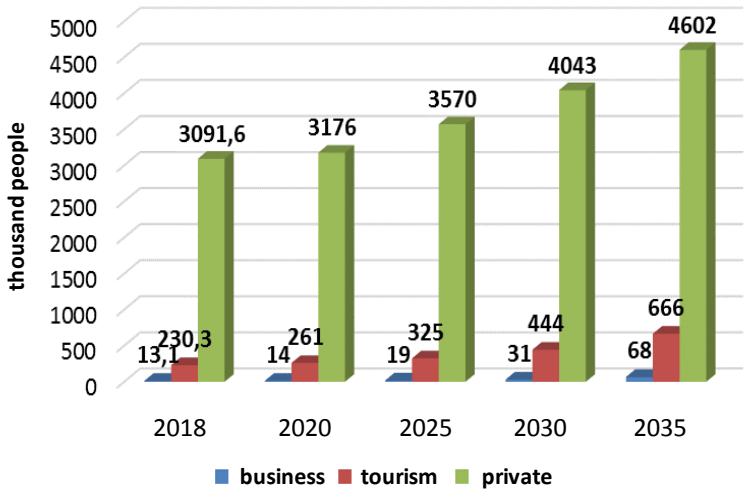


Figure 4.4 – Forecast of the number of Russian citizens visiting Finland during the period through 2035, in thousand persons

The number of foreign citizens coming from Finland to Russia on business in 2035 is forecast at 823 000 which is 1.5 times the level of 2018. The tourist flow from Finland to Russia is expected to grow faster – by 3.1 times. The number of foreign citizens traveling from Finland to Russia for private purposes in 2035 is forecast to grow by 2.3 times vs. 2018 and reach 776 000 (Figure 4.5). The forecast takes into account: the development of travel over the period 2011 – 2018; the outlook for cooperation between Finland and Russia in various sectors; introduction of electronic visas for EU citizens in October 2019 (According to the estimate by the Association of Tour Operators of Russia, electronic visas may lead to a 20% to 25% increase in the tourist flow).

Therefore, according to the forecast over 7 million foreign citizens will come to Russia from Finland in 2035 (1.7 times as many as in 2018). The travel is expected grow faster between 2031 and 2035 (Figure 4.6).

The forecast of passenger traffic between Russia and Finland was based on the forecast of foreign citizens' visits to Russia from Finland and Russian citizens' visits to Finland from Russia. The passenger traffic between Finland and Russia is forecast to grow by 1.7 times during the period 2019 – 2035.

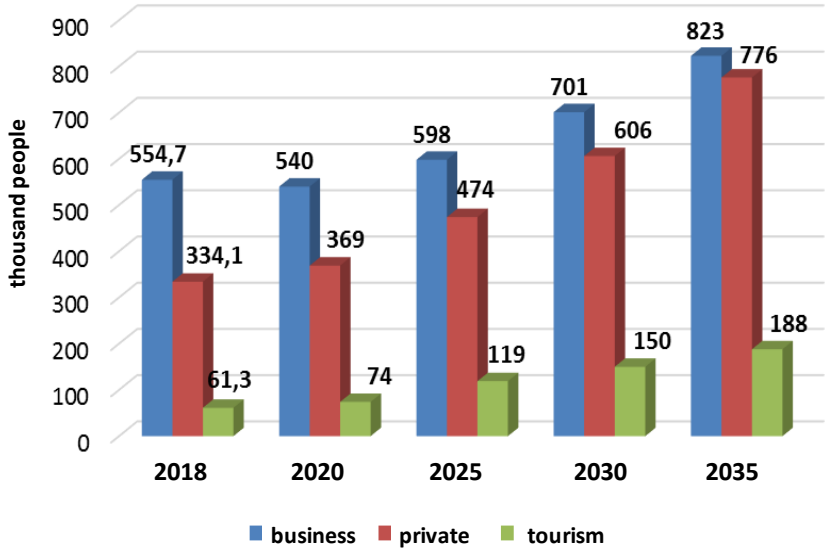


Figure 4.5 – Forecast of the number of foreign citizens traveling from Finland to Russia during the period through 2035, in thousand persons

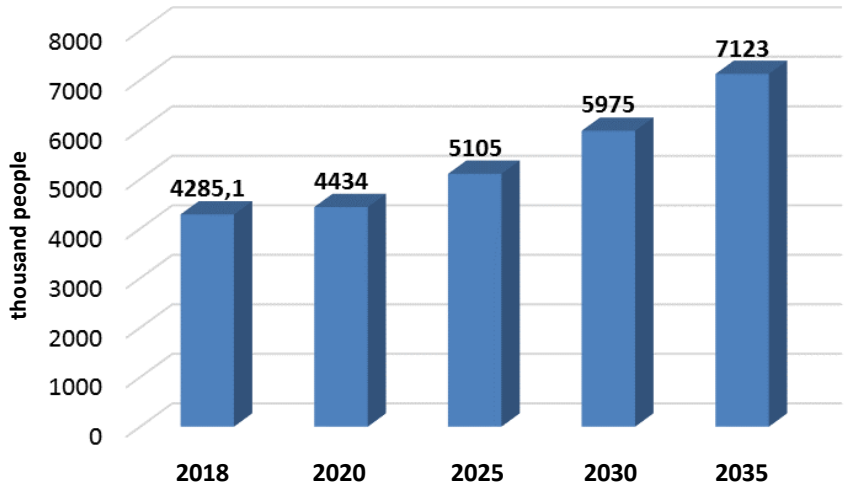


Figure 4.6 – Forecast of the number of foreign citizens traveling from Finland to Russia and Russian citizens traveling from Russia to Finland during the period through 2035, in thousand persons

According to the forecast, international passenger traffic via the border-crossing points in Leningrad Region will be 11 997.3 thousand persons in 2035 (1.7 times the level of 2018) (Figure 4.7). The growth of passenger traffic at the border-crossing points of Leningrad Region is expected to be the fastest during the period 2025 – 2035.

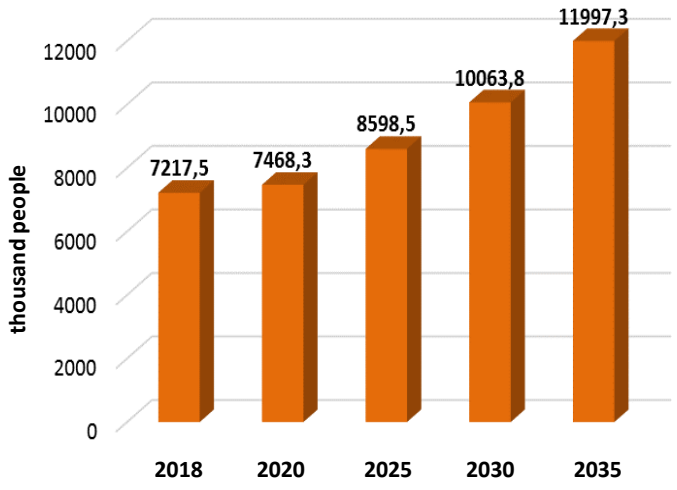


Figure 4.7 – Forecast of international passenger traffic through border-crossing points in Leningrad Region for the period through 2035, in thousand pax

5. Forecast of international transport and travel via the MRdBCP "Torfyanovka"

Forecast of trade between the Russian Federation and Finland

According to the *baseline* scenario of long-term socio-economic development of the Russian Federation, Russia will be increasingly involved in the global economic system including international trade. Russia's exports in 2036 will be 2.3 times the level of 2017 in real terms.

In 2036, the share of export of fuel and energy is expected to decline by more than a half: from 54.1% in 2017 to 26.5% in 2036, while the share of chemical products, food products and machines will increase. The physical amount of export of food products and agricultural raw materials (save for fibrous material) in 2036 is forecast to be 4.3 times the level of 2017, with chemical products increasing by 3.8 times and rawhide, pellets and finished products made of those materials, textile, textile products and footwear – 3.6 times.

According to the *conservative scenario* of the socio-economic development of the Russian Federation, Russian exports in 2036 will increase by 2.2 times compared to 2017 in real terms. The highest growth in exports is expected in the following commodity groups: food products and agricultural raw materials (save for fibrous material) – 4.1 times increase; chemical products – 3.7 times; rawhide, pellets and finished products made of those materials – 3.5 times; textile, textile products and footwear – 3.4 times.

Under the baseline scenario, Russia is going to import 1.8 times as much goods as it did in 2017 in real terms, while the conservative scenario forecasts a 1.6 times increase.

Under the baseline scenario, a significant increase in imports to Russia is forecast for the following commodity groups: metal and metal products – 7.1 times growth in 2036 vs. 2017 (in real terms); precious stones, metals and products – 6.9 times growth.

During the period 2018 – 2036, import of mineral products to Russia is expected to decline by 82.2% under the baseline scenario and by 83.8% under the conservative scenario.

The commodities that Russia is expected to import less of are primarily food products and agricultural raw materials (save for fibrous material) (a decrease from 12.1% in 2017 to 9.1% in 2036), chemical products (a decrease from 16.9% in 2017 to 13.0% in 2036), while the share of metals, precious stones and articles made of those materials is forecast to increase (from 6.8% in 2017 to 16.2% in 2036).

According to the baseline scenario of the socio-economic development of the Russian Federation, the external goods turnover between Russia and Finland will amount to 60 million

tons, including 57 million tons of exports from Russia to Finland and 3 million tons of imports from Finland to Russia (Table 5.1).

Table 5.1 – Forecast for trade between Russia and Finland through 2035, in million tons (baseline scenario)

	2018	2020	2025	2030	2035	2035 vs. 2018, times
Foreign trade turnover	28.9	32.6	41.9	51.8	60.0	2.1
Export from Russia to Finland	27.4	31.0	40.0	49.3	57.0	2.1
Import from Finland to Russia	1.5	1.6	1.9	2.5	3.0	2.0

The average annual growth in exports from Russia to Finland in 2019-2035 would be 104.2%, which is consistent with the forecast for Russia's exports.

The growth of Russian export of goods produced by wood processing and chemical industries to Finland is expected to continue. As is traditional, Russia and Finland will also continue their close cooperation in metallurgy, energy sector and food production.

The highest growth is forecast for the commodities "Organic chemical compounds" and "Fertilizers" which is consistent with the current trends.

The growth in export of chemical products would be due to development of the industrial production of ammonia and methanol in Leningrad Region, those substances being in high demand on the global market.

Export of fertilizers from Russia to Finland increased by 2.9 times over 2017 and 2018 alone, clear evidence that Finnish companies are interested in buying fertilizers from Russia.

The growth in export of the commodity "Fuel, oil and oil products; bituminous substances; mineral wax" is expected to be slower during the period 2019 – 2035 than for other major commodities exported from Russia to Finland due to the general downward trend as regards export of fuel and energy from Russia.

According to the forecast the Ministry of Economic Development of the Russian Federation, export of oil products from Russia in 2036 will decline by 2.3% compared to 2018, with crude oil exports declining by 1.5%, while export of liquefied natural gas will increase by 4.6 times and export of natural gas – by 1.5 times (baseline scenario).

The long-term forecast of Russia's export of major commodity groups to Finland is provided in Table 5.2.

Table 5.2 – Forecast of Russia's export of major commodities to Finland through 2035, in million tons (baseline scenario)

	2018	2020	2025	2030	2035	2035 vs. 2018, times
Mineral fuel, oil and oil products; bituminous substances; mineral wax	14.5	15.5	17.2	19.2	20.0	1.4
Wood and products; charcoal	6.7	7.4	10.4	12.9	15.9	2.4
Organic chemical compounds	1.8	2	2.9	4.2	6.1	3.3
Fertilizers	1.6	1.8	2.6	3.8	5.5	3.4
Ore, slag and ash	1.2	1.4	1.5	1.7	1.8	1.5
Ferrous metal products	0.5	0.7	0.9	1.1	1.3	2.7

According to the forecast, export of Russian goods to Finland will amount to US$ 27.91 million in 2035, with import of goods from Finland to Russia amounting to US$ 7.83 million (Table 5.3).

Table 5.3 – Forecast for trade between Russia and Finland through 2035, in US$ million (baseline scenario)

	2018	2020	2025	2030	2035	2035 vs. 2018, times
Foreign trade turnover	14.752	16.880	22.370	28.840	35.720	2.4
Export from Russia to Finland	11.373	13.300	17.800	22.720	27.910	2.5
Import from Finland to Russia	3.379	3.580	4.570	6.120	7.830	2.3
Balance	7.994	9.720	13.230	16.600	20.210	2.5

In money terms, export of goods from Russia to Finland in 2035 would be 2.5 times the level of 2018, while imports from Finland will increase by 2.3 times.

Forecast of international freight transport via the MRdBCP "Torfyanovka"

The forecast for freight transport via the MRdBCP "Torfyanovka" was developed using:

- the socio-economic development forecast for the influence zone of the road route *Saint Petersburg – Helsinki*; and

- the forecast of trade between the Russian Federation and Finland.

According to the forecast of trade between the Russian Federation and Finland:

- in 2035, export of Russian goods to Finland will amount to US$ 27.91 million with import of goods from Finland to Russia amounting to US$ 7.83 million;

- in money terms, export of goods from Russia to Finland in 2035 would be 2.5 times the level of 2018, while the imports from Finland will increase by 2.3 times;

- during the period through 2035, export from Russia to Finland is forecast to grow at the fastest rates for the following commodity groups: fertilizers, organic chemical compounds, ferrous metal products, wood and wood products;

- according to the *baseline scenario* of the socio-economic development of the Russian Federation, the external goods turnover between Russia and Finland would amount to 60 million tons, including 57 million tons of exports from Russia to Finland and 3 million tons of imports from Finland to Russia;

- the average annual growth of exports from Russia to Finland in 2019-2035 will be 104.2%, which is consistent with the forecast for Russia's exports.

The forecast of trade between the Russian Federation and Finland was used to predict the distribution of freight transport of export and import goods by road and rail via the MRdBCPc and RwBCPs of Leningrad Region, see Table 5.4.

Table 5.4 – Forecast of the distribution of freight transport of export and import cargo between the Russian Federation and Finland via the MRdBCPs and RwBCPs of Leningrad Region, by transport mode, in million tons

	2018	2020	2025	2030	2035	2035 vs. 2018
Export-related freight transport from Russia to Finland, total, in million tons including:	13.7	16.1	19.6	23.5	28.2	2.1
- by rail	10.3	12.4	14.8	17.8	21.4	2.1
- by road	3.4	3.7	4.8	5.7	6.8	2.0
Import-related freight transport from Finland to Russia, total, in million tons	0.8	1	1.9	2.4	2.9	3.6

	2018	2020	2025	2030	2035	2035 vs. 2018
including:						
- by rail	0.2	0.2	0.3	0.4	0.5	2.5
- by road	0.6	0.8	1.6	2	2.4	4.0
Export and import freight, total, in million tons including:	14.5	17.1	21.5	25.9	31.1	2.1
- by rail	10.5	12.6	15.1	18.2	21.9	2.1
- by road	4.0	4.5	6.4	7.7	9.2	2.3

According to the forecast provided in Table 5.4, the amount of freight transport of export goods by road would increase from 3.4 million tons in 2018 to 6.8 million tons in 2035 (doubling), with the amount of import cargo increasing from 0.6 million tons to 2.4 million tons (quadruple growth). Most of the growth in import-related freight transport by road is expected after 2020, after the economic sanctions are lifted and deliveries of machines, chemicals, pulp-and-paper and food products from Finland to Russia are resumed.

The share of road freight transport in servicing export and import is expected to grow from 27.6% in 2018 to 29.6% in 2035 while the share of rail transport would decline from 72.4% in 2018 to 70.4% in 2035.

The forecast of export- and import-related freight transport between Russia and Finland by road was used to produce a forecast of freight traffic via the MRdBCP “Torfyanovka” as provided in Table 5.5.

Table 5.5 – Forecast of freight transport of export and import cargo between the Russian Federation and Finland by road via the MRdBCPs “Torfyanovka”, in million tons

	2018	2020	2025	2030	2035	2035 vs. 2018
Transport of export cargo from Russia to Finland by road, total, in million tons including:	3.4	3.7	4.8	5.7	6.8	2.0
- via MRdBCP “Torfyanovka”	1.5	1.6	2.1	2.5	3.0	2.0
Transport of import cargo from Finland to Russia by road, total, in million tons including:	0.6	0.8	1.6	2	2.4	4.0
- via MRdBCP “Torfyanovka”	0.3	0.4	0.8	1.1	1.4	4.7

	2018	2020	2025	2030	2035	2035 vs. 2018
Total volume of export- and import-related freight transport via the MRdBCP "Torfyanovka", total, in million tons including:	4	4.5	6.4	7.7	9.2	2.3
- via MRdBCP "Torfyanovka"	1.8	2.0	2.9	3.6	4.4	2.5

According to the forecast provided in Table 7.2.2, transport of export cargo by road via the MRdBCP "Torfyanovka" will amount to 3 million tons in 2035 (doubling compared to 2018) while transport of import cargo will be 1.4 million tons (4.7 times the level of 2018), the total being 4.4 million tons (an increase by 2.5 times compared to 2018).

Forecast of international passenger travel via the MRdBCP "Torfyanovka"

The forecast of passenger travel via the MRdBCP "Torfyanovka" was developed using:

- the socio-economic development forecast for the influence zone of the road route *Saint Petersburg – Helsinki*; and

- the forecast of tourism in the Russian Federation and Finland.

According to the Border Service of the FSB of Russia, in 2018, 7 252.9 thousand people traveled between Russia and Finland by road via the MRdBCP "Torfyanovka", the MRdBCP "Brusnichnoye" and the MRdBCP "Svetogorsk" and by rail via the RwBCP "Buslovskaya", with 2 403.6 thousand people going through the MRdBCP "Torfyanovka". (33.3%).

Implementation of the projects listed below will foster travel by road and rail between the Russian Federation and Finland:

- the construction of the new road approach road from Vyborg to the MRdBCP "Brusnichnoye" by 2025;
- the opening of the railway passenger service *Saint Petersburg – Vyborg – Svetogorsk – Imatra – Lappeenranta* in 2025;

Table 5.6 presents a forecast of passenger travel between the Russian Federation and Finland via the MRdBCPs and RwBCPs in Leningrad Region for the period through 2035.

According to the forecast, the demand for travel between the Russian Federation and Finland via the MRdBCPs and RwBCPs in Leningrad Region will increase from 7 217.5 thousand people in 2018 to 11 997.3 thousand people in 2035. After the train services on the route *Saint Petersburg – Vyborg – Svetogorsk – Imatra – Lappeenranta* start operating in 2025, there will be a significant increase in

travel by rail – from 551.3 thousand people in 2018 to 2 100 thousand people in 2035. As a result, the share of passenger travel by road will decrease from 92% in 2018 to 82% in 2035.

The demand for passenger travel via the MRdBCP “Torfyanovka” is expected to increase from 2 404 thousand people in 2018 to 3 958.9 thousand people in 2035 (an increase by 1.6 times).

The cycling traffic between the Russian Federation and Finland via the MRdBCP “Torfyanovka” is expected to grow from 2.2 thousand in 2018 up to 10 thousand in 2035 with the introduction of a dedicated cycle track from Vyborg to the national border.

Table 5.6 – Forecast of passenger travel between the Russian Federation and Finland via the MRdBCPs and RwBCPs in Leningrad Region for the period through 2035, in thousand people

	2018	2020	2025	2030	2035	2035 vs. 2018
The passenger travel between the Russian Federation and Finland via the MRdBCPs and RwBCPs in Leningrad Region, total, in thousand people including:	7217.5	7468.3	8598.5	10063.8	11997.3	1.7
- by rail	551.3	606.43	1650	1900	2100	3.8
- by road, total, in thousand people, including:	6666.2	6861.87	6948.5	8163.8	9897.3	1.5
- via MRdBCP “Torfyanovka”	2404	2538.892	2640.43	2367.5	3958.9	1.6

The forecast of freight and passenger flows was used to calculate the future workload for the MRdBCP “Torfyanovka”, which is expected to surpass the design capacity of the border-crossing point in 2025.

The forecast of the growth in international freight and passenger traffic at the MRdBCP “Torfyanovka” by 2035 (freight transport – 2.5 times increase up to 4.4 million tons; passenger travel – 1.6 times increase up to 4 million people) is evidence that the border-crossing point is in need of reconstruction.

Given the anticipated growth in cargo and passenger flows, the traffic on various sections on the road route *Saint Petersburg – Helsinki* would increase by 1.5 to 2 times by 2035, leading to increased emissions of greenhouse gas and pollutants from road traffic.

6. Plans for reconstruction of the road A181 “Scandinavia”

The Federal Targeted Program (FTP) “Development of the Transport System of Russia” (2010 – 2020) includes reconstruction of five sections of the *Scandinavia* road (Figure 6.1):

- from km 47 to km 65 (from the border of Sestroretsk to the village of Ogonki);
- from km 65 to km 100 (from the village of Ogonki to the settlement of Kirpichnoye);
- from km 100 to km 134 (from the settlement of Kirpichnoye to Vyborg);
- from km 134 to km 160 (Vyborg Bypass);
- from km 160 to km 203 (from Vyborg to the road approach to the MRdBCP “Torfyanovka” on the border with Finland).

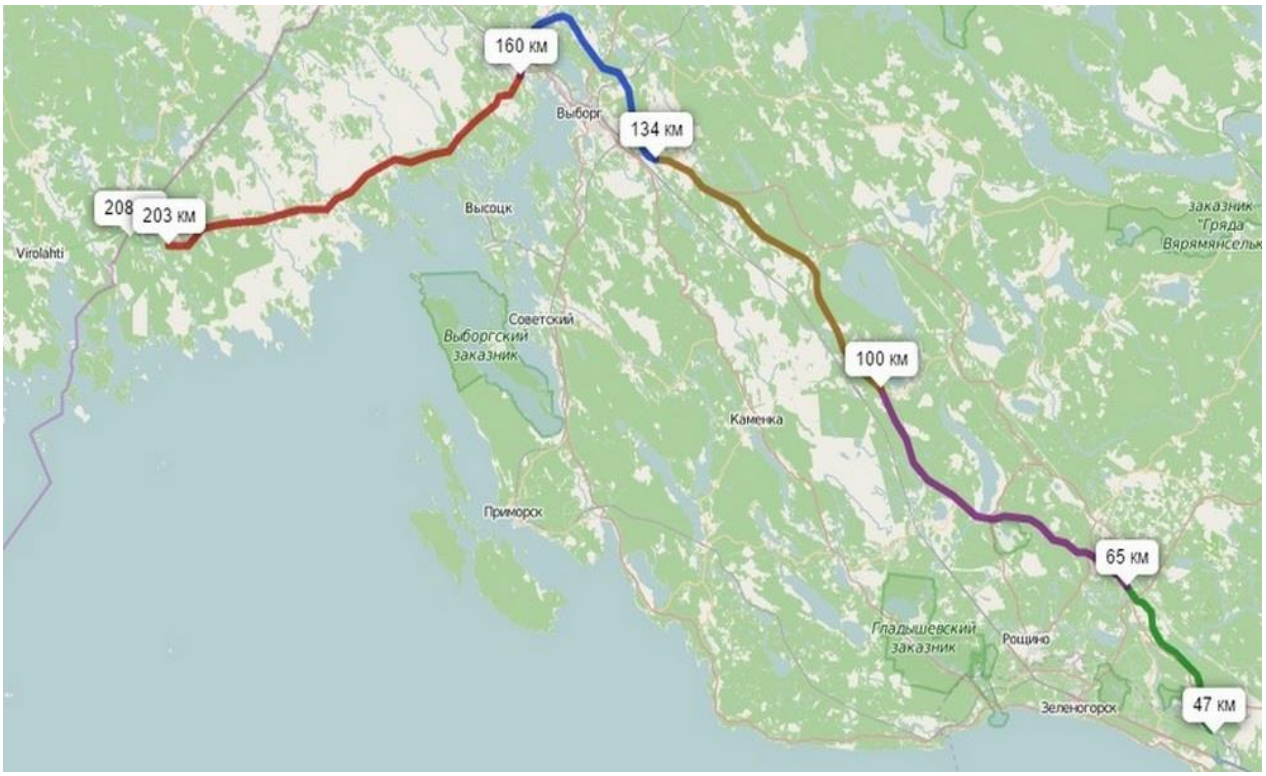


Figure 6.1 – Locations of the five road sections
the road A-181 “Scandinavia” subject to reconstruction

After the reconstruction of 156 km the *Scandinavia* road, the road from Saint Petersburg to Vyborg will have three traffic lanes in each direction, a median up to five meters wide, and grade-separated interchanges at intersections with roads and railways. There will be four lanes on the Vyborg Bypass and at the approach to the national border. The road will have ITS elements and lights. As a result, the speed limit on the road will be raised from 90 km/h to 120 km/h.

The reconstruction of the road A-181 “Scandinavia” is to be completed by 2025. The total cost of the reconstruction will be about 100 billion rubles.

The reconstruction of the road A-181 “Scandinavia” started in 2015. The first phase of the reconstruction – the section from km 47 to km 65 – was finished in 2018 (Figures 6.2, 6.3 and 6.4). The capacity of the road went up to 80 thousand vehicles a day due to the additional traffic lanes. After the reconstruction work, the road A-181 “Scandinavia” is much safer as traffic directions are now separated, with a barrier preventing vehicles from crossing into oncoming traffic. The “smart” outdoor lights have been provided throughout the reconstructed section including on exits from interchanges: the lights turn on and off by an automatic system according to a preset schedule depending on the illumination level, with the brightness of the artificial light changing smoothly. The reflective road markings also help the drivers to keep their positions on the road.

Figure 6.2 – Section km 47 – km 65 of the road A-181 “Scandinavia” during the reconstruction

Figure 6.3 – Section km 47 – km 65 of the road A-181 “Scandinavia” after the reconstruction

Figure 6.4 – Grade-separated interchanges on the road A-181 “Scandinavia” after the reconstruction

At present, land preparation work for the section km 65 – km 100 from the settlement of Ogonki up to the settlement of Kirpichnoye to be widened to provide six instead of two traffic lanes is nearing completion. The reconstruction the section km 65 – km 100 of A-181 “Scandinavia” is to be finished by the end of 2021 (the carriageway will have 6 traffic lanes, two new bridges, an interchange, a viaduct and a pedestrian overpass).

Environmental protection is a special focus in this reconstruction project. Wildlife corridors are being built in locations of animal migration. There are special barriers to prevent animals’ access to the road. Comprehensive water treatment facilities are to be provided in locations of water protection zones. Noise barriers are being installed along residential zones to reduce noise and road dust.

In future, the *Scandinavia* road will become a “smart road” when an intelligent transport corridor is created, with an automated traffic control system, traffic counting stations, weather stations, etc. Mobiles services and apps will provide drivers with information on queues on the border as well as on road and weather conditions in both Russia and Finland.

The reconstruction of A-181 “Scandinavia” will increase the capacity of the road, reduce travel times and improve traffic safety on the arterial road linking Russia with Finland and other EU countries.

After the reconstruction of the entire Scandinavia road, there will be new hotels and camping sites, supermarkets, cafés, shopping and entertainment centers, sports and rest areas along the route.

The result will be increased attractiveness of the road's influence zone for investors and tourists, new jobs and greater tax revenue to the budget system due to development of entrepreneurial activities.

7. Main factors that have a negative impact on the environment in the influence zone of the road route *Saint Petersburg - Helsinki*

The road route *Saint Petersburg – Helsinki* creates a serious load on the environment. This is due to a number of negative factors that have a significant impact on the environment in the influence zone of the route, the most important of those factors being as follows:

1. There is still a significant number of vehicles of low environmental class being used on roads within the route. According to the GIBDD MVD of Russia (State Inspectorate for Traffic Safety of the Russian Ministry of Interior), there are 1.8 million registered vehicles of class Euro-3 or lower in Saint Petersburg and Leningrad Region which is 69.7% of the total number of vehicles in operation. 78.1% of goods vehicles (255.4 thousand vehicles) and 70.1% of buses (12.8 thousand vehicles) are environmental class Euro-3 or lower.

2. The Russian part of the route has a number of sections with technical parameters which do not allow the optimal traffic conditions in terms of smoothness and speed of the traffic flow. The section *Ogonki – MRdBCP "Torfyanovka"* of A-181 "Scandinavia" in particular, only has one lane per direction, which causes difficult traffic conditions and increases the number of RTAs when the traffic level is high.

State Road 7 (Valtatie 7) Helsinki – Vantaa – Porvoo – Loviisa – Kotka – Hamina – Vaalimaa (Russian border) in Finland meets the technical parameters of a motorway on its entire length, which makes for optimization of traffic conditions.

3. The border sections of the road route *Saint Petersburg – Helsinki* are responsible for a large proportion of the total volume of emissions of greenhouse gas and pollutants. This is largely due to the long waiting times for vehicles on the national border resulting from long queues, especially on weekends and during holidays. When vehicle engines operate in the "acceleration - braking" mode and idle, emissions of greenhouse gas and pollutants increase by 30% to 35% compared to the situations when vehicles move smoothly at 90 km/hour.

4. At present, the share of alternative fuels in the fuel balance in the regions of the influence zone of the road route is still small. The retail sales of gas vehicle fuel (CNG and LPG) in Saint Petersburg and Leningrad Region is about 47 thousand tons (less than 1.9% of the total sales of vehicle engine fuel). Only 3.6 thousand vehicles registered in Saint Petersburg and Leningrad Region use alternative fuel and electricity (about 0.15% of all registered road vehicles).

5. Cars make a significant portion in the traffic flow on the road route as most road users view a car as the most acceptable means of transport. However, cross-border travel by rail still has a lot of potential in the area. For example, the demand for the high-speed trains "Allegro" was 481.8 thousand people in 2018. At the same time, 2 404 thousand people crossed the border at the MRdBCP

“Torfyanovka” in 2018, which is 5 times as many. 2.2 thousand cyclists went through the MRdBCP “Torfyanovka” in 2018.

All these factors contribute to emissions of greenhouse gas and pollutants in the area along the road route *Saint Petersburg – Helsinki*.

8. Key areas for improvement of environmental safety of the road route *Saint Petersburg - Helsinki*

The key areas for improvement of the environmental safety of the road route *Saint Petersburg - Helsinki* are as follows:

1) legal framework:

- building a system of technical regulations with compulsory requirements regarding environmental safety of road vehicles;

- building a system of government monitoring of characteristics of vehicles and quality of vehicle fuel being sold;

- defining requirements for energy efficiency of vehicles, and developing a vehicle environmental labeling system;

- decision-making towards the EU's transport decarbonization target of 2050[2];

2) vehicle manufacturing:

- transition to alternative fuel (natural gas vehicle fuel, biofuel, electricity, hydrogen, etc.);

- providing incentives for manufacturing a line of vehicles that use alternative fuel;

- introduction of a system of classification, standardization and marking of vehicles based on their levels of emission of pollutants and CO_2 (energy efficiency);

- building an information system to inform consumers about environmental characteristics of vehicles and vehicle labeling and identification methods, and development of appropriate federal statistical observation forms;

- providing incentives for replacement of vehicles that are over 10 years old with modern fleet;

- increasing energy efficiency of vehicles and improving their qualities: reducing vehicle weight, increasing engine power, reducing fuel consumption, and increasing their efficiency and sustainability;

3) transport planning:

- development of Internet services for trip planning and selecting sustainable transport modes;

- development of a user app for information exchange on air pollution level along the route *Saint Petersburg – Helsinki*;

- creation of a road vehicle environmental monitoring system;

[2] The target is to decrease greenhouse gas emissions from transportation to be 60% lower in comparison to the levels in 1990.
Source: European Commission (2016). A European Strategy for Low-Emission Mobility. https://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX:52016DC0501

- implementation of measures to foster the use of environmentally sustainable vehicles for public services and industries of the economy by regional executive and municipal authorities in Russia;

- supporting various forms of shared car use (car sharing, carpooling, etc.);

4) reconstruction of the road A-181 “Scandinavia” and the road border-crossing point “Torfyanovka”, and implementation of organizational and technical measures:

- reconstruction of the road A-181 “Scandinavia” and the road border-crossing point “Torfyanovka” to increase their capacities;

- increasing the capacity of the road through introduction of intelligent transport systems as well as telematics and navigation systems;

- introduction of energy efficient, resource saving and “green” technologies in the road sector;

- environmental monitoring of operation of vehicles and road companies;

- introduction of environmental audit systems in carrier companies and road sector organizations;

- use of voluntary environmental responsibility mechanisms by state organizations and companies with state participation;

- construction of recharging stations for electric vehicles and filling stations for vehicles using alternative fuels (LNG, CNG, etc.);

- banning the use of trucks and buses of environmental class Euro-2 or lower and vehicles with high levels of smoke of the exhaust;

5) economic regulation:

- introduction of economic mechanisms that stimulate the use of more sustainable and energy efficient vehicles;

- application of “green” financial tools to foster low-carbon based development of the transport sector;

- introduction of financial incentives for purchase of more sustainable and efficient vehicles that use alternative fuel;

6) professional training and education:

- training skilled specialists for transport companies in the area of low-carbon based development of the transport sector;

- training specialists for regional and local government bodies of Russia with expertise in low-carbon based development of the transport sector;

- building scientific potential in low-carbon based development of the transport sector;

- implementation of awareness and educational programs on low-carbon based development of the transport sector;

- inclusion of efficient driving techniques, etc, in training and advanced training programs for drivers, etc.

Measures to increase environmental safety of the road route *Saint Petersburg – Helsinki* should have a special focus on development of cooperation between the Russian Federation and Finland as regards raising the energy efficiency of automobiles, ensuring the environmental safety of roads, and creation of an environment for introduction of advanced practices and technical and organizational solutions that proved sustainable in practical activities of transport and road organizations.

9. Green Roadmap of the Road Route *Saint Petersburg – Helsinki*

The goal of the Green Roadmap of the road route *Saint Petersburg – Helsinki* is to create the environment necessary for safe and comfortable traffic, higher efficiency and better quality of freight and passenger transport, and lower environmental impact of road transport.

The set of measures recommended for inclusion in the Green Roadmap of the road route *Saint Petersburg – Helsinki* is provided in Table 9.1. All measures included in Table 9.1 are divided into 3 blocks:

1. Increasing energy efficiency of vehicles that use traditional fuel, and introduction of advanced transport technologies.
2. Increasing the number of vehicles that use alternative fuels with lower emissions of GHG and other pollutants.
3. Developing transport infrastructure and controlling mobility to reduce unsustainable travel distances, improve space and load capacity use efficiency, and reduce the load on the environment.

Recommended deadlines, responsible entities and expected outcomes have been determined for each of the measures.

Table 9.1 - Green Roadmap of the road route *Saint Petersburg – Helsinki*

##	Activity	Deadline	Responsible entities	Outcome expected
1. Increasing energy efficiency of vehicles using traditional fuel, and introduction of advanced transport technologies				
1.1	Defining requirements for energy efficiency of vehicles, and developing a vehicle environmental labeling system	2020-2022	Ministry of Industry and Trade of the Russian Federation	Promoting expanded manufacturing and use of sustainable vehicles. Reducing GHG and pollutant emissions through introduction of more sustainable vehicles.
1.2	Building an information system to inform consumers about environmental characteristics of vehicles and vehicle labeling and identification methods, and development of appropriate federal statistical observation forms	2020-2022	Ministry of Industry and Trade of the Russian Federation	Promoting expanded manufacturing and use of sustainable vehicles. Reducing GHG and pollutant emissions through introduction of more sustainable vehicles.
1.3	Expansion of manufacturing and use of sustainable vehicles through programs designed to promote purchase of new vehicles (including easy-term vehicle loan and leasing programs for new vehicles and scrappage programs for vehicles of low environmental class)	2020-2035	Ministry of Industry and Trade of the Russian Federation, regional executive authorities within the influence zone of the route	Fleet renewal in the influence zone of the road route *Saint Petersburg – Helsinki*, and increasing the fleet environmental class by promoting purchase and introduction of more sustainable vehicles; increasing traffic safety through the use of more sustainable modern vehicles. Reducing GHG and pollutant emissions through introduction of more sustainable vehicles.
1.4	Changing the transport tax calculation methodology to reflect energy efficiency, environmental performance and year of the vehicle	2020-2021	Ministry of Industry and Trade of the Russian Federation, regional executive authorities within the influence zone of the route	Fleet renewal in the influence zone of the road route *Saint Petersburg – Helsinki*, and increasing the fleet environmental class by promoting purchase and introduction of more sustainable vehicles; increasing traffic safety through the use of more sustainable modern vehicles. Reducing GHG and pollutant emissions by promoting more sustainable vehicles.
1.5	Promotion of sustainable driving rules; development of programs and organizing sustainable	2020-2035	GIBDD MVD of Russia regional executive authorities within the influence zone of the route	Increasing the level of road traffic safety in regions within the influence zone of the road route *Saint Petersburg – Helsinki*. Reducing GHG and pollutant emissions through optimization of the driving mode.

##	Activity	Deadline	Responsible entities	Outcome expected
	driving courses on the national and regional levels.			
1.6	Establishing government monitoring of the quality of oil products in relation to international standards	2020-2035	Ministry of Energy of the Russian Federation	Improvement of the quality of oil products. Reduction of emissions by improving sustainability of traditional types of engine fuel.
1.7	Introduction of environmental audit systems in carrier companies and road sector organizations	2020-2024	Ministry of Transport of the Russian Federation, Ministry of Transport and Communications of Finland, and regional executive authorities within the influence zone of the route	Reduction of GHG and pollutant emissions within the influence zone of the road route *Saint Petersburg – Helsinki* by using more sustainable vehicles and equipment of transport companies and road sector organizations.
1.8	Use of voluntary environmental responsibility mechanisms by state organizations and companies with state participation	2020-2024	Ministry of Transport of the Russian Federation, Ministry of Transport and Communications of Finland, and regional executive authorities within the influence zone of the route	Reduction of GHG and pollutant emissions within the influence zone of the road route *Saint Petersburg – Helsinki* by using more sustainable vehicles and equipment of state organizations and companies with state participation.
2. Increasing the number of vehicles that use alternative fuels with lower emissions of greenhouse gas and other pollutants				
2.1	Expanding the manufacturing and use of vehicles using alternative fuel as well as hybrid and electric vehicles through programs designed to promote purchase of new vehicles (including easy-term vehicle loan and lease programs for new vehicles using alternative fuel as	2020-2035	Ministry of Industry and Trade of the Russian Federation, Ministry of Economy of Finland, Ministry of Environment and Climate Change of Finland, and regional executive authorities within the influence zone of the route	Fleet renewal in the influence zone of the road route *Saint Petersburg – Helsinki* by purchasing and introducing of vehicles that use alternative fuel as well as hybrid and electrical vehicles. Reduction of GHG and pollutant emissions by using vehicles that use alternative fuel as well as hybrid and electrical vehicles.

##	Activity	Deadline	Responsible entities	Outcome expected
	well as hybrid and electrical vehicles)			
2.2	Motivating carrier companies operating on the road route *Saint Petersburg – Helsinki* to use vehicles (such as heavy trucks and buses) operating on alternative fuel (such as biofuel and natural gas).	2020-2035	Ministry of Industry and Trade of the Russian Federation, Ministry of Economy of Finland, Ministry of Environment and Climate Change of Finland, and regional executive authorities within the influence zone of the route	Reduction of GHG and pollutant emissions generated by vehicles on the route Saint *Petersburg – Helsinki* by expanding the use of vehicles operating on alternative fuel (such as biofuel and natural gas).
2.3	Development of infrastructure to provide alternative fuel and recharge electrical vehicles on the road route *Saint Petersburg – Helsinki;* development and implementation of regional programs for development of refueling/recharging infrastructure	2020-2024	Ministry of Energy of the Russian Federation, Rosavtodor, Ministry of Transport and Communications of Finland, regional executive authorities within the influence zone of the route, and regional operators of infrastructure for production and sale of alternative fuel/electricity	Creation of an integral network of infrastructure for production and sale of alternative fuel and electricity in regions within the influence zone of the road route *Saint Petersburg – Helsinki* Reduction of GHG and pollutant emissions from vehicles on the route Saint *Petersburg – Helsinki* by expanding the use of vehicles operating on alternative fuel as well as electrical vehicles.
2.4	Motivating owners of parking facilities, malls and other commercial facilities in regions within the influence zone of the road route *Saint Petersburg – Helsinki* to install recharging stations for electrical vehicles on their facilities	2020-2024	Regional executive authorities within the influence zone of the route	Creation of an integral network of recharging stations for electrical vehicles in regions within the influence zone of the road route *Saint Petersburg – Helsinki* Reduction of GHG and pollutant emissions generated by vehicles on the route *Saint Petersburg – Helsinki* by expanding the use of electrical vehicles.
2.5	Development of tax incentives to increase demand for gas engine vehicles and electrical vehicles (including reduced or zero tax rates for such vehicles)	2020-2021	Ministry of Industry and Trade of the Russian Federation, Ministry of Economy of Finland, Ministry of Environment and Climate Change of Finland, and regional	Reduction of GHG and pollutant emissions in regions within the influence zone of the route *Saint Petersburg – Helsinki* by expanding the use of vehicles operating on alternative fuel as well as electrical vehicles.

##	Activity	Deadline	Responsible entities	Outcome expected
			executive authorities within the influence zone of the route	
2.6	Development of organizational and management solutions to increase efficiency of vehicles using alternative fuel including by organizing high-quality maintenance and repair services	2020-2024	Manufacturers of vehicles using alternative fuel as well as hybrid and electrical vehicles	Reduction of GHG and pollutant emissions in regions within the influence zone of the route *Saint Petersburg – Helsinki* by expanding the use of vehicles operating on alternative fuel as well as hybrid and electrical vehicles.
3. Developing transport infrastructure and controlling mobility to reduce unsustainable travel distances, ensuring more efficient use of space and load capacity, and reducing pressure on the environment				
3.1	Reconstruction of the road A-181 “Scandinavia” with upgrade to Category I-B on the section *Ogonki – Vyborg*	2020-2022	Rosavtodor	Increasing average speed and providing even distribution of traffic on the road section; improving level of service on the road; improving traffic safety through spatial segregation of traffic directions. Reducing GHG and pollutant emissions through optimization of the driving mode on the road section.
3.2	Reconstruction of the road A-181 “Scandinavia” with upgrade to Category I-B on the section *Vyborg – Border with Finland*	2022-2025	Rosavtodor	Increasing average speed and providing even distribution of traffic on the road section; improving level of service on the road; improving traffic safety through which corresponds to km 47.803 km segregation of traffic directions. Reducing GHG and pollutant emissions through optimization of the driving mode on the road section.
3.3	Creation of ITS on the section *Ogonki – Vyborg* of A-181 “Scandinavia”	2020-2022	Rosavtodor	Ensuring even distribution of traffic on the road section; improving effectiveness of road maintenance; increasing traffic safety on the road section; monitoring main operation indicators of the road; creating background conditions for development of autonomous traffic; increasing information support to end users of the road. Reducing GHG and pollutant emissions through optimization of the driving mode on the road section.

##	Activity	Deadline	Responsible entities	Outcome expected
3.4	Creation of ITS on the section *Vyborg – Border with Finland* of A-181 “Scandinavia”	2022-2025	Rosavtodor	Ensuring even distribution of traffic on the road section; improving effectiveness of road maintenance; increasing traffic safety on the road section; monitoring main operation indicators of the road; creating background conditions for development of autonomous traffic; increasing information support to end users of the road. Reducing GHG and pollutant emissions through optimization of the driving mode on the road section.
3.5	Coordination of intelligent transport systems (ITS) on the Russian and Finnish parts of the route *Saint Petersburg – Helsinki* to enable autonomous traffic and reduce workload on infrastructure of border-crossing points.	2025-2035	Ministry of Transport of the Russian Federation, Rosavtodor, Ministry of Transport and Communications of Finland, Transport and Communications Agency of Finland, and Transport Infrastructure Agency of Finland	Ensuring even traffic distribution of the route *Saint Petersburg – Helsinki*; forming routes for autonomous vehicles; and increasing information support to end users of the route. Reducing GHG and pollutant emissions through optimization of the driving mode on the route.
3.6	Improvement of planning and routing of transport to increase the efficiency of the route, including promotion a modal shift of freight and passenger flows from roads to other transport modes.	2020-2035	Ministry of Transport of the Russian Federation, Ministry of Transport and Communications of Finland	Reducing traffic on the route by decreasing the number of trucks and personal cars thereon; increasing the role of public transport in the supply of transport services in regions within the influence zone of the route. Reducing GHG and pollutant emissions through reduced traffic and optimization of the driving mode on the route.
3.7	Supporting various forms of shared vehicle use (car sharing, car pooling, etc.)	2020-2024	Regional executive authorities within the influence zone of the route	Reducing traffic on the route by decreasing the number of personal cars thereon; increasing the role of shared vehicle use services in transport supply within the influence zone of the route. Reducing GHG and pollutant emissions by lowering traffic on the route.
3.8	Promoting creation of routes (including the necessary infrastructure) designed for non-motorized vehicles and personal mobility devices	2020-2035	Ministry of Transport of the Russian Federation, Rosavtodor, SevZapUprAvtoDor, LenAvtoDor, Ministry of Transport and Communications of Finland, and Transport	Improving the level of service on the route by reducing traffic (all vehicles); increasing the role of non-motorized vehicles (primarily, bicycles) and personal mobility devices in the transport supply within the influence zone of the route. Reducing GHG and pollutant emissions through reduced traffic and optimization of the driving mode on the route.

##	Activity	Deadline	Responsible entities	Outcome expected
			Infrastructure Agency of Finland	
3.9	Promotion of development of rapid and high-speed train services in the influence zone of the route *Saint Petersburg – Helsinki* to move passenger flows from roads to trains	2020-2035	Ministry of Transport of the Russian Federation, RosZhelDor, RZD, Ministry of Transport and Communications of Finland, Transport Infrastructure Agency of Finland, VR-Yhtymä Oy (VR Group)	Improving the level of service on the route by reducing the number of buses and personal cars thereon; increasing the role of railway transport in the transport supply in regions within the influence zone of the route. Reducing GHG and pollutant emissions through reduced traffic and optimization of the driving mode on the route.

10. Roadmap for development of the ITS of the road route *Saint Petersburg – Helsinki* and supporting traffic of autonomous vehicles

A road ITS is a comprehensive system for traffic control and information support to road users, which is based on application of information and telecommunication technologies, global navigation satellite systems and modern traffic control methods and operates to ensure safe, reliable and effective transport of cargo and passengers.

The main objectives in creating the ITS of the road route *Saint Petersburg – Helsinki* located on the road E-18 (A-181) "Scandinavia" are as follows:

- to ensure high quality of transport services for the users of the arterial road through reduced delays and increased average traffic speed;
- to increase the capacity of the road route by creating an automated traffic control system operating in real time;
- to ensure a high level of safety for traffic and pedestrian flows, and reduce the number and severity of RTAs;
- to provide users of the road route with updated and reliable information on road conditions, weather, locations of road service facilities, types of services being provided, queues at the approaches to the MRdBCPs, the approximate waiting times on the national border, etc.;
- to create an environment allowing comfortable rest for drivers and passengers by providing information on the locations of rest areas, tourist sites (places of interest, museums, etc.), parking facilities, motels and hotels and availability of rooms therein;
- to reduce the impact of road traffic on the environment by ensuring sustainable traffic modes and reducing "acceleration – braking" cycles.

The process of creating the ITS for the entire road route from Saint Petersburg to Helsinki should involve preparation of a coordinated action program based on coordination of all measures being implemented by the Russian and Finnish sides in terms their scope and schedules. The single ITS architecture and information exchange standards should reflect harmonization of requirements for functional and technical characteristics of ITS components in the Russian Federation and EU countries.

The intelligent transport system of the route from Saint Petersburg to Helsinki should develop on the basis of coordinated and harmonized sets of services and subsystems, and unification and standardization of communication protocols and its national segments.

To achieve the best environmental parameters and ensure a significant reduction in emissions of greenhouse gas and pollutants from automobiles, the ITS of the road route *Saint Petersburg – Helsinki* should ensure:

- limited access to the ITS coverage zone for vehicles with combustion engines that do not meet the standards for emission of sulfur oxides, nitrogen oxides and carbon oxides, as well as engines with high smoke levels;
- sustainable traffic modes by minimizing acceleration and braking cycles and maintaining traffic speeds that minimize emissions;
- minimal idling times of combustion engines at the border-crossing points “Torfyanovka” and “Vaalimaa”;
- border crossing without stopping for trucks at the border-crossing points “Torfyanovka” and “Vaalimaa” including for platoons of autonomous trucks;
- border crossing without stopping for vehicles of emergency services within the ITS coverage zone to reduce the time of unsustainable traffic through rapid response to accidents and emergencies;
- constant monitoring of environmental parameters and forecasting the same based on traffic levels and weather conditions;
- preliminary planning of travel routes for automobiles and prompt information support to road users as regards road conditions to enable timely change of route to avoid congested locations;
- timely and high quality maintenance of the road to maintain sustainable traffic parameters and clean the surrounding areas.

The current status of intelligent information systems implemented on the road E-18 (A-181) “Scandinavia” which were designed to minimize the impact of road traffic on the environment are presented in Table 10.1.

Table 10.1 – Implemented ITS services of the road A-181 “Scandinavia” designed to minimize the impact of road traffic on the environment

Group of services as per ITS standard	**Service as per ITS standard**	**Finnish segment of ITS E-18 (A-181)**	**Russian segment of ITS of E-18 (A-181)**
Information support to road users	Trip planning and providing information on traffic conditions	+	+*
	Information support to drivers	+	+*
	Navigation and routing	+	+
Road traffic control	Support to transport planning	+*	+**
	Traffic management	+	+**
	Control during traffic disruptions	+	+*
	Positive traffic control	+**	+**
	Road infrastructure maintenance and service control	+	+**
Emergency and special situation control	Recognition of emergencies and special situations, and personal safety systems	+	+*
	Control of transport of hazardous goods	+	+*
Safety management	Ensuring safety of public transport and passengers	+*	+*
	Special modes of control and information support	-	-

*) Service implemented in part
**) Service without automatic or automated modes

To reduce emissions from road traffic, the following services and subsystems should be added to the ITS of the road E-18 (A-181) “Scandinavia”:

1. To limit access to the ITS coverage zone for vehicles with combustion engines that do not meet the standards for emission of sulfur oxides, nitrogen oxides and carbon oxides, as well as engines with high smoke levels, special areas for instrument-based environmental checks should be provided at the border-crossing points; Such areas exist on the Finnish side of the border. However, the instrument-based environmental control there only involves checks for carbon dioxides in the exhaust. There are no such areas on the Russia side and no instrument-based environmental control of vehicles.

2. To ensure sustainable traffic modes, extra functions and modes should be added to the traffic control system to minimize acceleration and braking cycles and enable speeds that result in minimal emissions of sulfur oxides, nitrogen oxides and carbon oxides. Primarily, these measures are necessary in the Russian segment of the ITS of E-18 (A-181) “Scandinavia”. There should be a complete separation of traffic control for trucks, buses and cars since sustainable traffic modes differ by vehicle type. Practices around the world show that lane traffic control with variable message signs, T.4 traffic signal heads and road information panels enable optimal speeds and smooth traffic of various types of vehicles on a road with multiple lanes. Triple-technology traffic detectors should be installed all over E-18 (A-181) “Scandinavia” to collect information on traffic levels and composition of the traffic flow which is necessary for effective traffic control.

3. To minimize idling time for vehicles with combustion engines, vehicles should be able to go through both Finnish and Russian border-crossing points by appointment and with pre-declaration of cargo. This service should be based on the principle of one request for border-crossing points on both sides. Sufficient accumulation areas should be provided for vehicles to wait for their appointment time. The accumulation areas should have the signs 6.4 “Parking area” and 8.7 “No idling”.

4. To enable constant monitoring of environmental parameters and their forecasting based on traffic levels and weather, the ITS of A-181 “Scandinavia” should be equipped with traffic detectors reading the parameters of the traffic flow and its composition, and automatic road weather stations (ARWS) with environmental modules to measure the amount and composition of emissions.

5. To enable route pre-planning and prompt information for road users as regards road conditions allowing them enough time to change the route, the ITS of A-181 “Scandinavia” should include a fully-fledge information subsystem which would use the following channels:

– an information portal accessible from PCs, tablets and smartphones and providing information on road conditions, weather, estimated arrival times, options for avoiding congested locations, roadwork, unsafe parts of the road, various incidents and environmental situation on the route;

– information panels installed within the ITS coverage zone in sufficient numbers to inform road users of road conditions, weather, options for avoiding congested locations, and environmental conditions on the route;

– RDS-channels on vehicle audio units to inform drivers of road conditions, and specialized road radio stations also transmitting information on queues at border-crossing points, environmental conditions on E-18 (A-181) and weather forecasts every 30 minutes.

6. To maintain sustainable traffic parameters and reduce pollution of surrounding areas, timely and high-quality maintenance should be provided on E-18 (A-181) “Scandinavia” which would be responsive to weather forecasts.

The use of a complete modern ITS on E-18 (A-181) “Scandinavia” would have two basic aspects:

1. Environmental aspect – to ensure sustainable traffic modes by means of:
    - reducing “acceleration – braking” cycles;
    - rapid traffic control response in case of road accidents or other emergencies;
    - enforcement of the ban on non-moving vehicles with idling engines;
    - limiting access to the ITS coverage zone for vehicles that do not meet the requirements regarding emissions and smoke;
    - providing timely and reliable information on road conditions to users;
    - reducing border-crossing times.
2. Economic aspect – traffic control that takes into account presence of autonomous vehicles in the traffic flow by:
    - introducing the platooning technology (having autonomous trucks of Categories 2 and 3 move in a convoy);
    - ensuring accurate positioning of vehicles within the ITS coverage zone to enable autonomous traffic;
    - providing a high-speed environment for data transmission for implementation of Class V2X protocols;
    - creating intelligent transport infrastructure for all road users.

Autonomous vehicles are to be used on the route *Saint Petersburg – Helsinki* in future. The use of road vehicles in an autonomous mode is based on the experience in developing autonomous transport (the *Caravan* project which the Federal Road Agency has been working on since 2016) (Figure 10.1).

Figure 10.1 – Example of a platoon of autonomous trucks on a public road

The Caravan project is to use the experience of Finnish experts who are actively testing a route for autonomous trucks using the platooning technology which is the use of a convoy of autonomous trucks moving close to each other and following the controlled lead truck. The platooning technology is to be tested in Moscow Region, the Republic of Tatarstan, Leningrad Region, Samara Region and Krasnodar Region. The advantage of platooning for the environment is fuel saving (trucks moving close to each other in a convoy are less exposed to air resistance) which results in lower emissions.

Truck platooning would produce real economic effects if the following conditions are met:

1. Fuel savings are meaningful with a distance between vehicles in a caravan not exceeding 15 m and the speed of 90 km/h.
2. An automatic driving system can handle any situation on all types of roads, at any speed and in any environment. Follower vehicles do not need drivers.
3. There are at least 8 autonomous vehicles in a platoon, which leads to a significant reduction of operation costs.
4. Platoons move on arterial routes without traffic signals, outside the road networks of cities and other populated centers.
5. A platoon can include vehicles from different manufacturers.
6. Crossing the national border without stopping.
7. Daily travel distance of a platoon could be 1 000 km a day.

At present, the following factors are preventing the adoption of truck platooning on E-18 (A-181) “Scandinavia”:

1. The reconstruction E-18 (A-181) “Scandinavia” has only been done on the section km 47 – km 65.

2. Technical capabilities of the traffic control system of E-18 (A-181) “Scandinavia” as a key components of the ITS do not allow traffic control of autonomous trucks.

3. The road border-crossing points “Torfyanovka” and “Vaalimaa” on the Russian – Finnish border lack the necessary dedicated road infrastructure for truck platoons to cross the border without stopping (Figure 10.2).

Figure 10.2 – Road infrastructure of the MRdBCP “Torfyanovka” and the MRdBCP “Vaalimaa”

Pre-design stage measures for further development of the ITS of E-18 (A-181) “Scandinavia” should be implemented in the following order:

1. Producing more accurate information on the types of ITS users and participants including transport companies, road building and operation companies, passenger transport and trucking operators, emergency response services, service providers and other vehicle owners and users of E-18 (A-181) “Scandinavia” (Figure 10.3).
2. Producing more accurate information on the types and functions of ITS subsystems (Figure 10.4) and services (Figure 10.5) required to achieve the intended environmental parameters on E-18 (A-181) “Scandinavia”.
3. Deciding on the order (sequence) of providing ITS services for users and those traveling E-18 (A-181) “Scandinavia”.
4. Making the list of measures to develop the ITS in order to achieve the goals and attain relevant environmental objectives on A-181 “Scandinavia”.

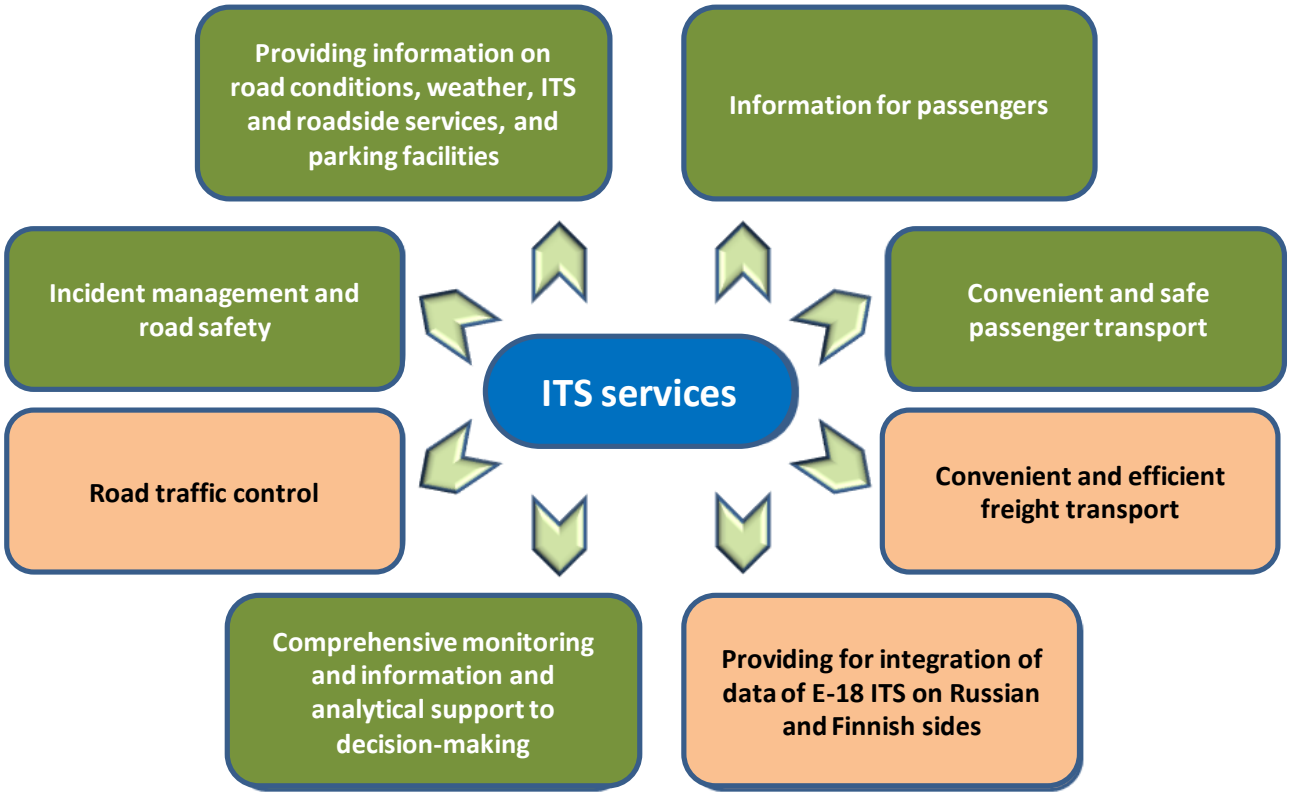


Figure 10.3 – List of essential ITS services to be finalized at the implementation stage

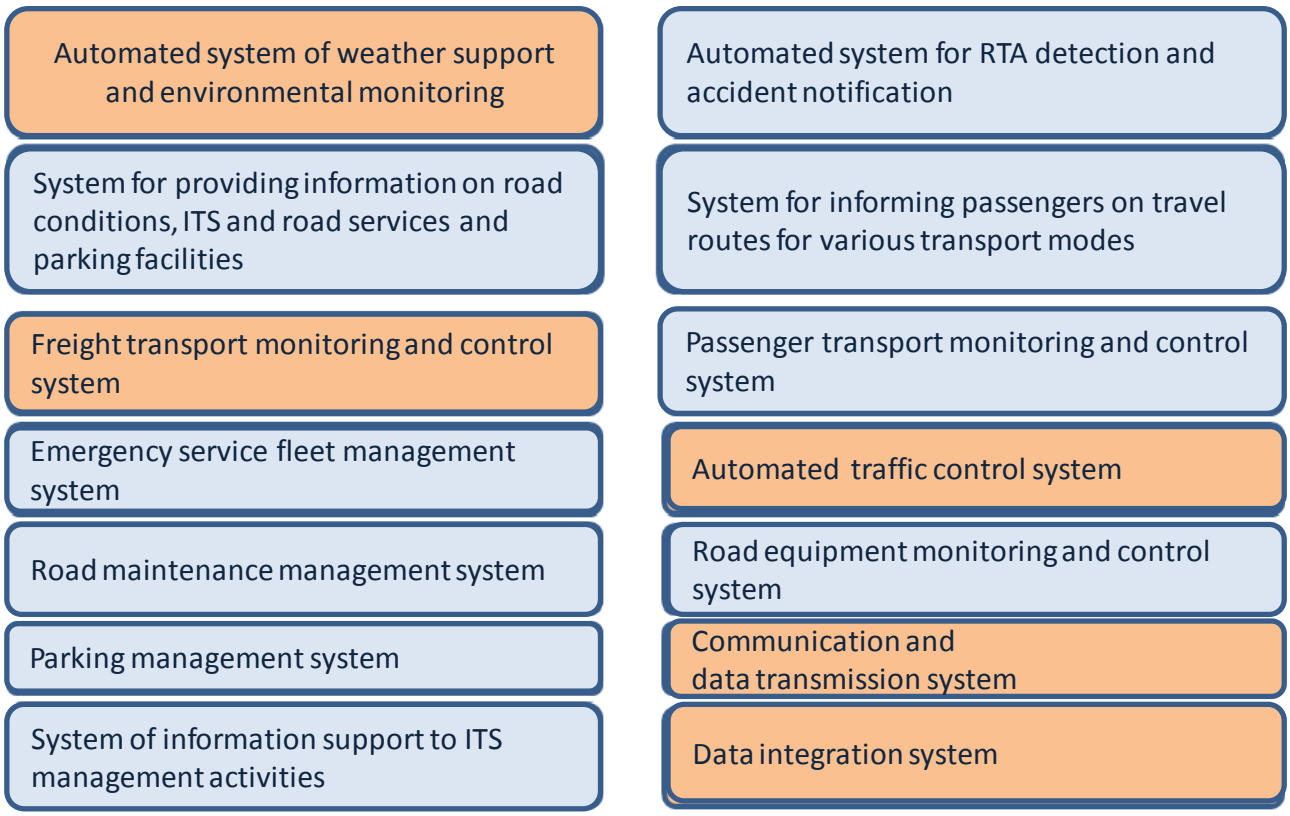


Figure 10.4 – List of ITS subsystems to be finalized at the implementation stage

The roadway has been broadened and the initial version of the automated traffic control system (ATCS) created on the section km 47 – km 65 in accordance with the reconstruction plan for E18 (A-181) “Scandinavia”. The section km 65 – km 100 is under reconstruction, and site surveys for the reconstruction of the sections km 101 – km 134, km 134 – km 159, and km 159 – km 200 are to be performed including design of the corresponding segments of the ATCS.

The Roadmap for development of the ITS reflects the set of measures for further development of the ITS of the road route *Saint Petersburg – Helsinki*, the implementation schedule, responsibilities and expected results (Table 10.2). The Roadmap was developed so as to ensure environmental monitoring on the road route *Saint Petersburg – Helsinki* and introduction of the service of truck traffic control including autonomous platoons.

Table 10.2 – Roadmap for development of ITS of the road route *Saint Petersburg – Helsinki*

##	Section E-18 (A-181)	Activity	Time frame mechanism	Responsible entities	Expected results
1.	km 47 – km 65	Upgrading THE segment of the automated system for weather support for environment monitoring on the section km 47 – km 65, including: 1. Development of the project to provide automatic road weather stations (ARWS) with modules to measure the amount and content of emissions (environmental modules) and create the information portal. 2. Providing ARWS with environmental modules and launching the information portal. 3. Providing for transmission of information on the environment to the processing center to fill the portal via the existing road data transmission system (RDTS). 4. Test operation of the reconstructed system for weather support and environment monitoring, and full commissioning of the system along with the information portal.	2021	RosAvtodor, SevZapUprAvtodor	The environmental modules on ARWS would enable analyzing the amount and composition of emissions and developing measures necessary to reduce the impact on the environment within the control zone of the ITS of E-18 (A-181). Moreover, with the environmental information available, it would be possible to inform road users of the current and forecast state of the environment via the information portal and information display panels on the section km 47 – km 65.

2.	km 47 – km 65	Implementation of the segment of the system for monitoring and management of freight transport on the section km 47 – km 65, including the platooning technology. Namely: 1. Designing the layout plan for traffic management equipment (TME) including variable message signs (VMS), road information panels (RIP), road signs (RS), T.4 traffic signals heads, traffic detectors (TDs), road video cameras, weight control stations, horizontal and vertical road markings and traffic safety equipment. 2. Adding equipment for truck traffic monitoring and control to the existing automated traffic control system (ATCS). 3. Test operation and final commissioning of the segment of the reconstructed ATCS.	2021	RosAvtodor, SevZapUprAvtodor	Creation of the segment of the truck traffic monitoring and control system including traffic control of platoons of autonomous trucks would lower emissions by ensuring more sustainable traffic modes for trucks, increase the capacity of the road thanks to denser truck flow on the section km 47 – km 134 and increase freight transport efficiency on the route *Helsinki – Saint Petersburg* .

3.	Km 65 – km 100	Creation of a segment of the automated system for weather support and environment monitoring on the section km 65 – km 100, including: 1. Development of the layout plan for ARWS on the section km 65 – km 100, which would be fitted with environmental modules 2. Upgrading the information portal to include additional ARWS. 3. Installation of ARWS. 4. Providing for transmission of information from the environmental modules to the processing center in order to fill the portal, via pavement condition sensors (PCS). 5. Test operation of the reconstructed system for weather support and environment monitoring, and full commissioning of the system along with the information portal for the consolidated section km 47 – km 100.	2022	RosAvtodor, SevZapUprAvtodor	Implementation of the segment of the automated system for weather support and environment monitoring on the section km 65 – km 100 would enable analysis of the volume and composition of air emissions, and planning actions to reduce the negative impact on the environment. Moreover, with the environmental information available, it would be possible to inform road users of the current and forecast state of the environment via the information portal and information display panels on the section km 47 – km 100 of E-18 (A-181).

4.	Km 65 – km 100	Implementation of the segment of the system for monitoring and management of freight transport on the section km 65 – km 100, including the platooning technology. Namely: 1. Development of the layout plan for traffic management equipment, variable message signs, road information panels, road signs, T.4 traffic signal heads, traffic detectors, road video-cameras, weight control stations, horizontal and vertical road markings and traffic safety elements within the project for the segment of the ATCS. 2. Construction of the ATCS segment including a truck traffic monitoring and control system. 3. Test operation of the segment of the reconstructed ATCS on the section km 65 – km 100 and its full commissioning together with the segment of the section km 47 – km 65.	2024	RosAvtodor, SevZapUprAvtodor	The truck traffic monitoring and control system on the section km 65 – km 100 including traffic control of platoons of autonomous trucks would lower emissions by ensuring more sustainable traffic modes for trucks, increase the capacity of the road thanks to denser truck flow and increase freight efficiency on the route *Helsinki – Saint Petersburg*, section km 47 – km 100 of E-18 (A-181).

5.	km 100 – km 134	Creation of a segment of the automated system for weather support and environment monitoring on the section of km 100 – 134 km, including: 1. Development of the layout plan for ARWS on the section of 100 – 134 km, which would be fitted with environmental modules. 2. Upgrading the information portal to include additional ARWS. 3. Installation of ARWS. 4. Providing for transmission of information from the environmental modules to the processing center in order to fill the portal, via pavement condition sensors (PCS). 5. Test operation of the reconstructed system for weather support and environment monitoring, and full commissioning of the system along with the information portal for the consolidated section km 47 – km 134.	2026	RosAvtodor, SevZapUprAvtodor	Implementation of the segment of the automated system for weather support and environment monitoring on the section km 100 – km 134 would enable analysis of the amount and composition of air emissions, and planning actions to reduce the negative impact on the environment. Moreover, with the environmental information available, it would be possible to inform road users of the current and forecast state of the environment via the information portal and information display panels on the section km 47 – km 134.

6.	km 100 – km 134	Implementation of the segment of the system for monitoring and management of freight transport including the platooning technology. Namely: 1. Development of the layout plan for traffic management equipment, variable message signs, road information panels, road signs, T.4 traffic signal heads, traffic detectors, road video-cameras, weight control stations, horizontal and vertical road markings and traffic safety elements within the project for the segment of the ATCS. 2. Construction of the ATCS segment including a truck traffic monitoring and control system. 3. Test operation of the segment of the reconstructed ATCS on the section km 100 – km 134 and its full commissioning together with the segment of the section km 47 – km 134.	2028	RosAvtodor, SevZapUprAvtodor	The truck traffic monitoring and control system on the section km 100 – km 134 including traffic control of platoons of autonomous trucks would lower emissions by ensuring more sustainable traffic modes for trucks, increase the capacity of the road thanks to denser truck flow and increase freight efficiency on the route *Helsinki – Saint Petersburg* and on the section km 47 – km 134.

7.	km 134 – km 200	Creation of a segment of the automated system for weather support and environment monitoring on the section km 134 – km 200, including: 1. Development of the layout plan for ARWS on the section km 134 – km 200, which would be equipped with environmental modules 2. Upgrading the information portal to include additional ARWS. 3. Installation of ARWS. 4. Providing for transmission of information from the environmental modules to the processing center in order to fill the portal, via pavement condition sensors (PCS). 5. Test operation of the reconstructed system for weather support and environment monitoring, and full commissioning of the system along with the information portal for the consolidated section km 47 – km 100.	2028	RosAvtodor, SevZapUprAvtodor	Implementation of the segment of the automated system for weather support and environment monitoring on the section km 134 – km 200 would enable analysis of the volume and composition of air emissions, and planning actions to reduce the negative impact on the environment. Moreover, with the environmental information available, it would be possible to inform road users of the current and forecast state of the environment via the information portal and information display panels on the section km 47 – km 200 of E-18 (A-181).

8.	km 134 – km 200	Implementation the system for monitoring and management of freight transport including the platooning technology. Namely: 1. Development of the layout plan for traffic management equipment, variable message signs, road information panels, road signs, T.4 traffic signal heads, traffic detectors, road video-cameras, weight control stations, horizontal and vertical road markings and traffic safety elements within the project for the segment of the ATCS. 2. Construction of the ATCS segment including a truck traffic monitoring and control system. 3. Test operation of the segment of the reconstructed ATCS on the section km 134 – km 200 and its full commissioning together with the segment of the section km 47 – km 200.	2030	RosAvtodor, SevZapUprAvtodor	The truck traffic monitoring and control system on the section km 134 – km 200 including traffic control of platoons of autonomous trucks would lower emissions by ensuring more sustainable traffic modes for trucks, increase the capacity of the road thanks to denser truck flow and increase freight efficiency on the route *Helsinki – Saint Petersburg* and on the section km 47 – km 200.
9.	km 134 – km 208	Reconstruction of the MRdBCP “Torfyanovka” to enable platoons of autonomous trucks to cross the border without stopping, including: 1. Design work reconstruction of the MRdBCP 2. Construction work for reconstruction of the MRdBCP	2030	FGKU RosGranStroi	Reconstruction of the MRdBCP would enable platoons of autonomous trucks to cross the national border of the Russian Federation without stopping

10.	MRdBCP “Vaalimaa”	Reconstruction of the MRdBCP “Vaalimaa” to enable platoons of autonomous trucks to cross the border without stopping, including: 1. Design work for reconstruction of the MRdBCP 2. Construction work for reconstruction of the MRdBCP	2030	Ministry of Transport and Communications of Finland	Reconstruction of the MRdBCP would enable platoons of autonomous trucks to cross the national border of the Russian Federation without stopping
11.	State Road (Valtatie 7) *Helsinki – Vantaa – Porvoo – Loviisa – Kotka – Hamina – Vaalimaa* (border with Russia) in Finland.	Implementation of the segment of the automated system for weather support and environmental monitoring on the section of the road route *Saint Petersburg – Helsinki* in Finland, from the national border of the Russian Federation to Helsinki.	2026	Ministry of Transport and Communications of Finland	Implementation of the segment of the automated system for weather support and environment monitoring on the section km 208 – III Ring would enable analysis of the number and composition of air emissions, and development of actions to reduce the negative impact on the environment. Moreover, with the environmental information available, it would be possible to inform road users of the current and forecast state of the environment via the information portal and information display panels.

11. Results expected from implementation of the set of actions within the Green Roadmap and the Roadmap for Development of ITS of the Road Route *Saint Petersburg – Helsinki*

Implementation of the set of measures within the Green Roadmap and the Roadmap for Development of ITS of the Road Route *Saint Petersburg – Helsinki* would enable:

- increased capacity of roads within the route;
- optimized traffic conditions and improved efficiency and quality of transport by road;
- increased sustainability of road vehicles being used in regions of the route's influence zone, and lower emissions of greenhouse gas and pollutants from road traffic.

The roads within the route *Saint Petersburg – Helsinki* are to be upgraded to the level of motorways in their entirety by 2025. The road A-181 "Scandinavia" will be reconstructed. The entire route *Saint Petersburg – Helsinki* will be equipped with ITS elements which would also support autonomous traffic. Coordination of the intelligent transport systems on the Russian and Finnish parts of the route *Saint Petersburg – Helsinki* will reduce the peak demand at the border-crossing points.

The share of vehicles of the environmental class Euro-4 or higher will reach 70% in regions of the route's influence zone in the Russian Federation.

The share of alternative fuels in the fuel balance in the regions of the influence zone will increase by 10% in the Russian regions.

Up to 10% of the future passenger travel on the route *Saint Petersburg – Helsinki* could be redirected to railway transport as well as to various types of non-motorized vehicles or personal mobility devices.

In addition to direct effects from implementation of the set of measures included in the Green Roadmap and the Roadmap for Development of ITS of the Road Route *Saint Petersburg – Helsinki*, indirect effects are also expected such as:

- increased accessibility of various areas;
- shorter travel times;
- lower transport costs due to more efficient transport;
- health benefits due to lower emissions of pollutants from road vehicles;
- a boost to small businesses in road services, tourism and related industries;

- improved attractiveness of travel in Leningrad Region for both Russian and foreign citizens;
- better quality of life.

Implementation of the measures to develop the road route would foster creation of new jobs in the tourism sector, catering and restaurant business, hotel business, services, etc.

Implementation of the ITS of the road route *Saint Petersburg – Helsinki* would foster:

- cooperation between Russia and Finland;
- growth in freight transport between Russia and Finland, and transit of cargo for other countries;
- attractiveness of regions of the Russian Federation for foreign investors and joint ventures;
- improvement of conditions for travel between Saint Petersburg and Helsinki by road;
- minimized delays of vehicles when crossing the Russian part of the Russian – Finnish border;
- development of businesses providing transport, logistics, construction, tourist and other services on the route *Saint Petersburg – Helsinki*.

A fully functional modern ITS on the route *Saint Petersburg – Helsinki* would be an important step in development of intelligent transport systems on federal roads of Russia and their integration with modern systems of the European Union.

For quantitative assessment of the results of the proposed set of measures, various scenarios of changes in operating indicators of the route *Saint Petersburg – Helsinki* have been developed. Each scenario corresponds to an area in implementation of the measures included in the Green Roadmap for the road route *Saint Petersburg – Helsinki*:

Scenario 1 describes the results of the measures in the area “Increasing energy efficiency of vehicles operating on traditional fuel, and introduction of advanced transport technologies” and mostly reflects changes in the structure of the road vehicle fleet in favor of vehicles of higher environmental classes (Euro-5 and Euro-6) using traditional fuel. The scenario also involves gradual replacement of existing vehicles with the traditional propulsion system with hybrid vehicles.

Scenario 2 reflects possible results of the measures in the area “Increasing the number of vehicles that use alternative fuels with lower emissions of GHG and other pollutants”. According to this scenario, the share of vehicles using natural gas as fuel increases among

all types of vehicles, with the share of electrical and hybrid fleet increasing among light commercial vehicles and buses.

Scenario 3 describes results of measures in the area "Developing transport infrastructure and controlling mobility to reduce unsustainable travel distances, increase capacity use efficiency, and reduce the load on the environment", and includes, among other things, possible results of further development of the ITS on the route. Primarily, the results are related to a reduction in total volume of traffic on the route. The scenario also envisages increased average traffic speeds on sections of the route after the reconstruction.

In addition to the three scenarios describing every area for implementation of measures within the roadmaps, the final scenario (Scenario 4) summarizes the results of the measures in all the areas.

Table 1 in Annex A-3 presents a forecast of the composition of the road vehicle fleet in the Russian part of the route *Saint Petersburg – Helsinki*.

Table 2 in Annex A-3 contains the traffic speeds in the Russian part of the route *Saint Petersburg – Helsinki* expected as the result of realization of Scenario 3 or the final scenario.

The future scenario for Finland is based on the Transport emission inventory forecasts by VTT Technical Research Centre of Finland Ltd (lipasto.vtt.fi/en/index.htm). The forecast model ALIISA is based on two key elements, the car fleet and the driving performance. The calculations are for the years 2018-2050. The forecasts are based on the assessments done by Finnish Transport Infrastructure Agency and VTT and it's called and baseline scenario since it takes only the actions into account which are already decided to put into practice.

The results expected from the measures under each of the three scenarios (S1, S2 and S3) and the final scenario (S4) concern reduced emissions of greenhouse gas and other pollutants are in figures 10.6 and 10.7. The scenario 4 reduces emissions the most and the scenario 3 the least. However, in all scenarios the nitrogen oxide emission (NO_x) are reduced at least by 45% and the fine particulate matter ($PM_{2.5}$) at least by 37 % compared to current situation (S0). Although significant reduction in transport emissions can be achieved if Scenario 4 becomes reality, with current development trajectory the amount of nitrous oxide (N_2O) emissions will continue growing. This is due to this GHG being generated as an unwanted byproduct in catalytic converters of diesel engines.

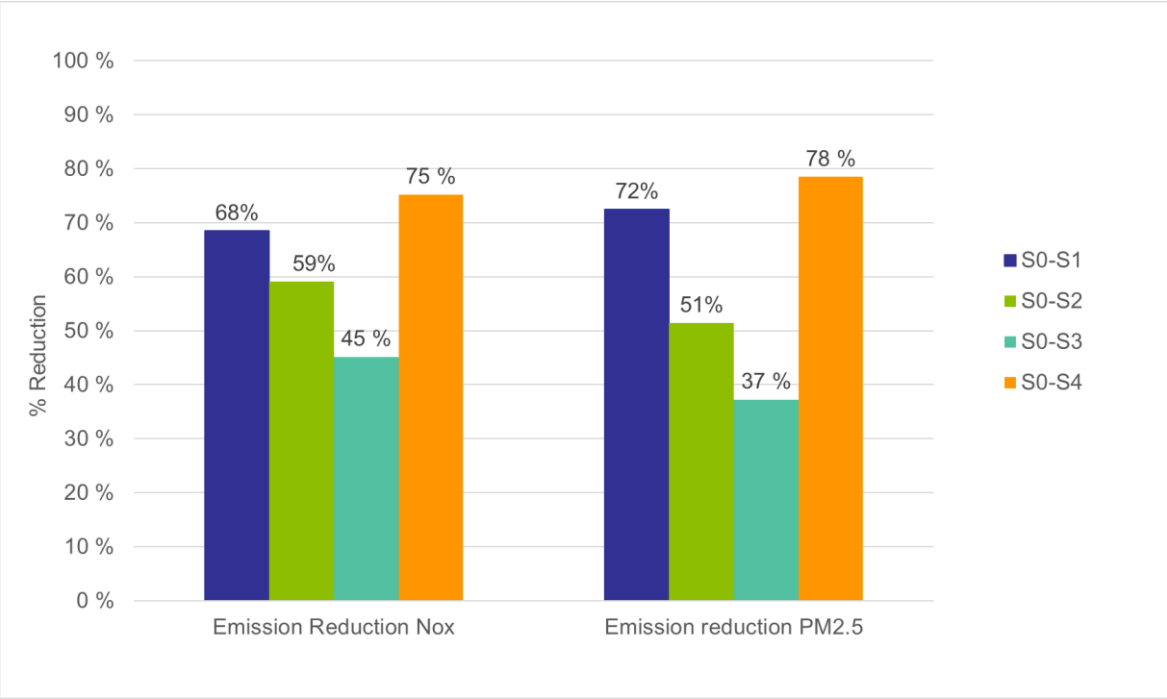


Figure 10.6 Emission reductions in each scenario compared to the present situation on the road E18 from Saint Petersburg to Helsinki.

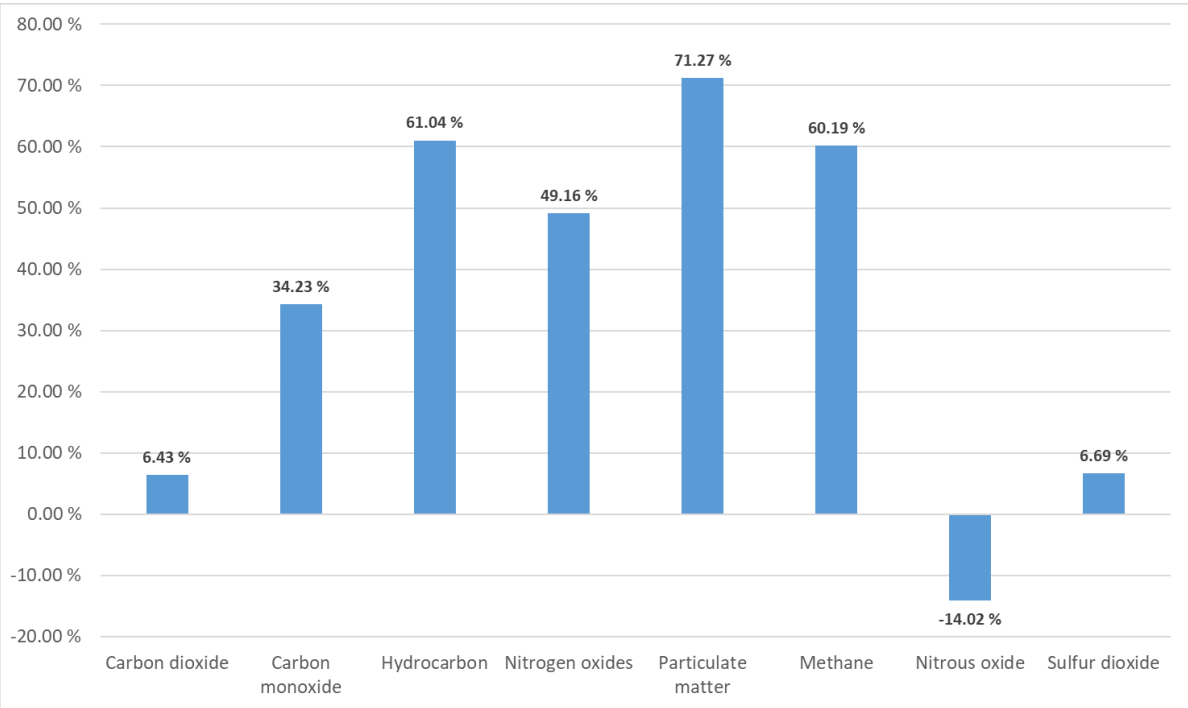


Figure 10.7 Expected emission reductions in the realization of Scenario 4 in comparison to levels of 2019.

Conclusion

1. The 380 km road route Saint Petersburg – Helsinki is playing a significant role in supporting international, interregional and local transport and travel in North-West Russia and South-East Finland.

The route consists of two roads:

- the federal public road A-181 “Scandinavia” Saint Petersburg – Vyborg – the border with the Republic of Finland in the Russian Federation;

- State Road 7 (Valtatie 7) *Helsinki – Vantaa – Porvoo – Loviisa – Kotka – Hamina – Vaalimaa* (Russian border) – in Finland.

The federal public road A181 “Scandinavia” is a part of the intermodal Pan-European Corridor IX and the international transport corridor “North – South”. By virtue of its importance as a transport link, the Scandinavia road was included in the international networks of European and Asian Highways.

2. At present, about 9 million people live in the influence zone of the road route *Saint Petersburg – Helsinki* , including 7.2 million people in the Russian Federation (80.8%) and 1.7 million people in Finland. (19.2%).

As the influence zone of the federal road A181 “Scandinavia”, section from Saint Petersburg to Helsinki, has a significant population and includes major cities and multiple populated centers, high concentration of manufacturing, carrier companies, commercial enterprises and links to Russian and Finnish Baltic ports, the road is heavily used for international, interregional and local transport.

The highest traffic (up to 20 000 vehicles / day) is observed on the road sections from Saint Petersburg to the Vyborg Bypass, from Porvoo to Helsinki and around the town of Kotka – there area where the Hamina-Kotka port is located.

3. The road route *Saint Petersburg – Helsinki* is used for transporting a significant proportion of international cargo on the link “Russia – EU” including export and import cargo flows between the Russian Federation and Finland.

The unfavorable situation in the economy which started developing in 2014 caused trade between the Russian Federation and the Republic of Finland to decline leading to a decrease in rail and road freight during the period 2014 – 2017 compared to 2013. In 2018, the amount of export-related freight from Russia to Finland went back to the level of 2013 (27.4 million tons),

while import-related freight from Finland to Russia decreased to 1.5 million tons (50% reduction compared to 2013).

From 2015 to 2018, export cargo flows from Russia to Finland were 17 to 20 times the amount of import cargo flows from Finland to Russia.

The largest volume of goods carried between Russia and Finland are transported by rail – about 57%, while trucks are used to carry 16% of such goods, with the remaining 27% carried by other transport modes.

The largest volume of goods exported from Russia to Finland are transported by rail – about 59.4%, while trucks are used to carry 12.3% of such goods, with the remaining 28.4% carried by other transport modes.

The largest volume of goods imported by Russia from Russia are transported by road – about 76%, while trains are used to move 18% of such goods, with the remaining 6% carried by other transport modes.

About a half of all freight transport between Russia and Finland is carried out via the border-crossing points located in Leningrad Regions.

An increase in volumes of international trade led to growth in freight transport between Russia and Finland via the border-crossing points in Leningrad Region: the total cargo flows went up from 13.2 million tons to 14.5 million tons (by 10.3%) in 2017 – 2018, including:

- the cargo traffic via the road border-crossing points increased from 3.6 million tons in 2017 to 4.0 million tons in 2018 (by 12.7%);

- the cargo traffic via the railway border-crossing points increased from 9.6 million tons in 2017 to 10.5 million tons in 2018 (by 9.4%).

At present, nearly all road vehicles moving within the Russian Federation towards the national border with Finland and going through the multilateral road border-crossing points “Torfyanovka”, “Brusnichnoye” or “Svetogorsk” use the Scandinavia road on the leg from Saint Petersburg to Vyborg.

4. Russia and Finland being neighbors, there is a significant amount of cross-border travel by citizens of both countries.

According to the Border Service of the FSB of Russia, the number of Russian citizens visiting Finland peaked in 2013 reaching 4 986.5 thousand people. During the period 2014 – 2016, the number of Russians visiting Finland declined by 26% due to worsening economic situation and the crush of the Ruble in relation to the Euro. However, the number of visits to Finland by Russian citizens started growing again in 2017. In 2018, this indicator reached 3 335.0 thousand

people, with 92.7% of the visitors traveling for private purposes, 6.9% – as tourists, and 0.4% – on business.

According to the Border Service of the FSB of Russia, the number of Finnish citizens who visited Russia peaked in 2015 reaching 1 416.0 thousand people. The number of such visits then declined between 2016 and 2018 going down to 950.1 thousand people (– 33% vs. 2015). In 2018, 58.4% of all Finnish visitors to Russia came on business, while 35.2% traveled for private purposes and 6.4% came as tourists.

People travel between Russia and Finland by all transport modes: by rail, road, air and sea.

The analysis of the dynamic of the number of Russian citizens visiting Finland and Finnish citizens visiting Russia shows that in 2018:

- a total of 4 285 thousand Russian and Finnish citizens traveled between Finland and Russia;
- most (88%) Russian and Finnish citizens traveled by road, while 6% took a train, 4% flew and 2% used ferries.

A total of 8849.8 thousand people traveled between Russia and Finland by land in 2017, including:

- by road – 8 237.9 thousand people (93%);
- by rail – 611.9 thousand people (7%).

About 82% of the total passenger traffic between Russia and Finland by land goes via the border-crossing points located in Leningrad Region.

In 2018, 6 666.2 thousand (92.4% of the total) out of 7 217.5 thousand passenger trips between Russia and Finland via the MRdBCPs and RwBCPs of Leningrad Region were made by road and only 551.3 thousand trips (7.6%) – by rail.

The busiest road border-crossing points in 2018 were the MRdBCP “Brusnichnoye” – 2 719.6 thousand trips (41% of the total) – and the MRdBCP “Torfyanovka” – 2 403.6 thousand trips (36%). 1 543 thousand people (23%) traveled via the MRdBCP “Svetogorsk” in 2018.

At present, the passenger traffic between Russia and Finland by road through the multilateral road border-crossing points (MRdBCPs) in Leningrad Region is 12 times the demand for travel by rail (6 666.2 thous. pax and 551.3 thousand pax respectively in 2018).

In 2018, 2.8 million vehicles (including 2.4 cars) and 6.7 million people went through the road border-crossing points in Leningrad Region, including:

- vehicle traffic via the MRdBCP “Torfyanovka” – 1.0 million vehicles, including 0.8 million cars and 2.4 million people;
- vehicle traffic via the MRdBCP “Brusnichnoye” – 1.1 million vehicles, including 0.9 million cars and 2.7 million people;

- vehicle traffic via MRdBCP “Svetogorsk” – 0.7 million vehicles, including 0.7 million passenger cars and 1.5 million people.

MRdBCP “Brusnichnoye” handled the largest amount of traffic in 2018 in terms of both vehicles (39% of the total) and people (40.8% of the total).

The MRdBCP “Torfyanovka” is in the second place in terms of vehicular and passenger traffic (35.7% and 35.8% respectively).

According to the Border Service of the FSB of Russia, 24.4 thousand cross-border bicycle trips were made via the MRdBCPs “Torfyanovka”, “Brusnichnoye” and “Svetogorsk” in 2017, the cycling traffic in 2018 being 29.8 thousand trips, and in the first 8 months of 2019 – 26.5 thousand trips.

5. The demand at the three MRdBCPs in terms of passenger traffic was beyond their design capacities in 2018.

The workload at the MRdBCP “Torfyanovka” and the MRdBCP “Brusnichnoye” in terms of passengers in 2018 was about 125%, the workload at the MRdBCP “Svetogorsk” being 169%. The workload of the MRdBCP “Svetogorsk” and the MRdBCP “Brusnichnoye” in terms of vehicular traffic in 2018 was 149% and 121% respectively.

Congestion at the multilateral road border-crossing points of Leningrad Region increases waiting times on the border.

The average time costs related to border control and customs procedures at Russian and Finnish border-crossing points for cars are 1 to 2 hours on weekdays and 3 to 4 hours on weekends and during holidays. The average time costs associated with border control and customs procedures at Russian and Finnish border-crossing points for trucks may vary from hours to days.

6. As to train services between Russia and Finland, there are the high-speed trains “Allegro” (Saint Petersburg – Helsinki) and the passenger trains “Lev Tolstoy” (Moscow – Helsinki) which cross the border at the RwBCP “Buslovskaya” – “Vainikkala”.

The total passenger traffic on trains between the Russian Federation and Finland via the RwBCP “Buslovskaya” – “Vainikkala” was 551.3 thousand pax in 2018, including 481.8 thousand people who took Allegro trains and 69.5 thousand passengers of Lev Tolstoy trains. Passenger travel between Russia and Finland by rail accounts for over 70% of the total volume of passenger traffic between Russia by Russian Railways (RZD).

7. The federal road A-181 “Scandinavia” *Saint Petersburg – Vyborg – border with Finland* is a part of the European route E-18 and the Asian route AH-8, and effectively it is also

an extension of the federal road M-10 “Russia”. This federal road is virtually the only full-fledged connection of the North-West Russia to Europe including the Scandinavian countries – the most promising part of the Baltic region.

From Saint Petersburg to Helsinki, the *Scandinavia* road is 380 km long, including the following sections:

- the section from Saint Petersburg via Vyborg to the Russian – Finnish border, km 47+571 – km 208+360 (200+062), which is 189 km long;

- the section from the Russian – Finnish border to Helsinki, which is 191 km long.

The *Scandinavia* road was built in 1984 – 1994. However, it does not meet the current safety and capacity requirements given the growing traffic level. The traffic level on the road has tripled since the 2000’s, its capacity becoming insufficient for the actual amount of truck, bus and car traffic.

Most of the Scandinavia road has one lane per direction is consistent is Technical Category II, the carriageway width being 7.5 m with the exception of the section km 47 – km 65 from the border of Saint Petersburg to the settlement of Ogonki, which after the reconstruction of 2019 has three lanes per direction (which is consistent with Technical Category I).

There being a large volume of road transport between Russia and Finland, the *Scandinavia* road has a lot of traffic. The busiest section of the road is the one from Beloostrov to Vyborg with the traffic level of 15 000 to 20 000 vehicles a day. The situation becomes worse on weekends when residents of Saint Petersburg and Vyborgsky District of Leningrad Region travel to the Karelian Isthmus or Finland for recreational purposes.

The part of A-181 “Scandinavia” with the highest average annual daily traffic is the section *Saint Petersburg* – Ogonki – over 19 000 vehicles a day. The traffic on the section from Ogonki to Vyborg Bypass is 15.6 thousand vehicles a day; Vyborg Bypass has the traffic of 6.2 thousand vehicles a day, the traffic level on the section from Vyborg to the MRdBCP “Torfyanovka” being 2.7 – 5.3 thousand vehicles a day.

8. With the high traffic levels, some sections of the *Scandinavia* road are congested beyond their capacity as the road mostly has only two traffic lanes, which leads to a significant number of road traffic accidents (RTAs).

Most RTAs are caused by speeding and crossing into oncoming traffic when overtaking.

There were 322 RTAs on A-181 “Scandinavia” during the period 2016 – 2018, with 69 people killed and 339 injured.

The number of RTAs has declined in recent years but the severity of their consequences increased: the number of deaths went up from 21 persons in 2016 to 33 persons in 2018, and the number of people injured increased from 106 to 183 over the same period of time.

Given the importance of the *Scandinavia* road for international, regional and local transport and travel, it should be developed to meet the increasing demand, and made comfortable and safe for the benefit of the population of Russia and Finland.

9. The main factors that impact the traffic levels on the *Scandinavia* road are as follows:

- socio-economic development trends in the Russian Federation, Leningrad Region and Saint Petersburg, such as the expected GDP and GRP growth, investment including in transport infrastructure, population growth and growth of real disposable income of the region's residents;
- trends in trade between the Russian Federation and Finland;
- trends in tourism, tourism infrastructure and paid services;
- introduction of free electronic visas for foreign citizens;
- increasing travel of Finnish citizens to Russia and of Russian citizens to Finland.

The forecast of travel of Finnish citizens to Russia and of Russian citizens to Finland for the period through 2030 was made in accordance with the *baseline scenario* of socio-economic development of the Russian Federation, Saint Petersburg and Leningrad Region.

With the real personal income in Russia growing as forecast, the number of Russians visiting Finland for private purposes would grow by 1.5 times by 2035. The tourist flow from Russia to Finland during the period 2019 – 2035 is expected to grow faster (by 2.9 times).

The number of business travelers going to Finland in 2035 would be 5.2 times the level of 2018 due to expansion of the economic cooperation between the two countries.

The number of foreign citizens coming from Finland to Russia on business in 2035 is forecast at 823 000 which is 1.5 times the level of 2018. The tourist flow from Finland to Russia is expected to grow faster – by 3.1 times. The number of foreign citizens traveling from Finland to Russia for private purposes in 2035 is forecast to grow by 2.3 times vs. 2018 and reach 776 000 The forecast takes into account: the development of travel over the period 2011 – 2018; the outlook for cooperation between Finland and Russia in various sectors; introduction of electronic visas for EU citizens in October 2019 (According to the estimate by the Association of Tour Operators of Russia, electronic visas may lead to a 20% to 25% increase in the tourist flow).

Therefore, according to the forecast over 7 million foreign citizens will come to Russia from Finland in 2035 (1.7 times as many as in 2018). The travel is expected grow faster between 2031 and 2035.

The forecast of passenger traffic between Russia and Finland was based on the forecast of foreign citizens' visits to Russia from Finland and Russian citizens' visits to Finland from Russia. The passenger traffic between Finland and Russia is forecast to grow by 1.7 times during the period 2019 – 2035.

According to the forecast, international passenger traffic via the border-crossing points in Leningrad Region will be 11 997.3 thousand persons in 2035 (1.7 times as many as in 2018). The growth of passenger traffic at the border-crossing points of Leningrad Region is expected to be the fastest during the period 2025 – 2035.

10. The forecast of passenger travel via the MRdBCP "Torfyanovka" was developed using:

- the socio-economic development forecast for the influence zone of the road route *Saint Petersburg – Helsinki*; and
- the forecast of tourism in the Russian Federation and Finland.

According to the Border Service of the FSB of Russia, in 2018, 7 252.9 thousand people traveled between Russia and Finland by road via the MRdBCP "Torfyanovka", the MRdBCP "Brusnichnoye" and the MRdBCP "Svetogorsk" and by rail via the RwBCP "Buslovskaya", with 2 403.6 thousand people going through the MRdBCP "Torfyanovka". (33.3%).

Implementation of the projects listed below will foster travel by road and rail between the Russian Federation and Finland:

- the construction of the new road approach road from Vyborg to the MRdBCP "Brusnichnoye" by 2025;
- the opening of the railway passenger service *Saint Petersburg – Vyborg – Svetogorsk – Imatra – Lappeenranta* in 2025;

According to the forecast, the demand for travel between the Russian Federation and Finland via the MRdBCPs and RwBCPs in Leningrad Region will increase from 7 217.5 thousand people in 2018 to 11 997.3 thousand people in 2035. After the train services on the route *Saint Petersburg – Vyborg – Svetogorsk – Imatra – Lappeenranta* start operating in 2025, there will be a significant increase in travel by rail – from 551.3 thousand people in 2018 to 2 100 thousand people in 2035. As a result, the share of passenger travel by road will decrease from 92% in 2018 to 82% in 2035.

The demand for passenger travel via the MRdBCP "Torfyanovka" is expected to increase from 2 404 thousand people in 2018 to 3 958.9 thousand people in 2035 (an increase by 1.6 times).

The cycling traffic between the Russian Federation and Finland via the MRdBCP "Torfyanovka" is expected to grow from 2.2 thousand in 2018 up to 10 thousand in 2035 with the introduction of a dedicated cycle track from Vyborg to the national border.

11. The forecast for freight transport via the MRdBCP “Torfyanovka” was developed using:

- the socio-economic development forecast for the influence zone of the road route *Saint Petersburg – Helsinki*; and

- the forecast of trade between the Russian Federation and Finland.

According to the forecast of trade between the Russian Federation and Finland:

- in 2035, export of Russian goods to Finland will amount to US$ 27.91 million with import of goods from Finland to Russia amounting to US$ 7.83 million;

- in money terms, export of goods from Russia to Finland in 2035 would be 2.5 times the level of 2018, while the imports from Finland will increase by 2.3 times;

- during the period through 2035, export from Russia to Finland is forecast to grow at the fastest rates for the following commodity groups: fertilizers, organic chemical compounds, ferrous metal products, wood and wood products;

- according to the *baseline scenario* of the socio-economic development of the Russian Federation, the external goods turnover between Russia and Finland would amount to 60 million tons, including 57 million tons of exports from Russia to Finland and 3 million tons of imports from Finland to Russia;

- the average annual growth of exports from Russia to Finland in 2019-2035 will be 104.2%, which is consistent with the forecast for Russia’s exports.

The forecast of trade between the Russian Federation and Finland was used to forecast the distribution of freight transport of export and import goods by road and rail via the MRdBCPc and RwBCPs of Leningrad Region.

According to the forecast, the amount of freight transport of export goods by road will increase from 3.4 million tons in 2018 up to 6.8 million tons in 2035 (doubling), with the amount of import cargo increasing from 0.6 million tons to 2.4 million tons (quadruple growth). Most of the growth in import-related freight transport by road is expected after 2020, after the economic sanctions are lifted and deliveries of machines, chemicals, pulp-and-paper and food products from Finland to Russia are resumed.

The share of road freight transport in servicing export and import is expected to grow from 27.6% in 2018 to 29.6% in 2035 while the share of rail transport would decline from 72.4% in 2018 to 70.4% in 2035.

According to the forecast, transport of export cargo by road via the MRdBCP “Torfyanovka” will amount to 3 million tons in 2035 (doubling compared to 2018) while transport of import cargo will be 1.4 million tons (4.7 times the level of 2018), the total being 4.4 million tons (an increase by 2.5 times compared to 2018).

12. The forecast of freight and passenger flows was used to calculate the future workload for the MRdBCP “Torfyanovka”, which is expected to surpass the design capacity of the border-crossing point in 2025.

The forecast of the growth in international freight and passenger traffic at the MRdBCP “Torfyanovka” by 2035 (freight transport – 2.5 times increase up to 4.4 million tons; passenger travel – 1.6 times increase up to 4 million people) is evidence that the border-crossing point is in need of reconstruction.

Given the anticipated growth in cargo and passenger flows, the traffic on various sections on the road route *Saint Petersburg – Helsinki* would increase by 1.5 to 2 times by 2035, leading to increased emissions of greenhouse gas and pollutants from road traffic.

13. The Federal Targeted Program (FTP) “Development of the Transport System of Russia” (2010 – 2020) includes reconstruction of five sections of the *Scandinavia* road:

- from km 47 to km 65 (from the border of Sestroretsk to the village of Ogonki);
- from km 65 to km 100 (from the village of Ogonki to the settlement of Kirpichnoye);
- from km 100 to km 134 (from the settlement of Kirpichnoye to Vyborg);
- from km 134 to km 160 (Vyborg Bypass);
- from km 160 to km 203 (from Vyborg to the road approach to the MRdBCP “Torfyanovka” on the border with Finland).

After the reconstruction of 156 km of the *Scandinavia* road, the road from Saint Petersburg to Vyborg will have three traffic lanes in each direction, a median up to five meters in width, and grade-separated interchanges at intersections with roads and railways. There will have four lanes in the Vyborg Bypass and at the approach to the national border. The road will have ITS elements and lights. As a result, the speed limit on the road will increase from 90 km/h to 120 km/h.

The reconstruction of the road A-181 “Scandinavia” is to be completed in 2025.

Environmental protection is a special focus in this reconstruction project. Wildlife corridors are being built in locations of animal migration. There are special barriers to prevent animals’ access to the road. Comprehensive water treatment facilities are to be provided in locations of water protection zones. Noise barriers are being installed along residential zones to reduce noise and road dust.

In future, the *Scandinavia* road will become a “smart road” when an intelligent transport corridor is created, with an automated traffic control system, traffic counting stations, weather stations, etc. Mobiles services and apps will provide drivers with information on queues on the border as well as on road and weather conditions in both Russia and Finland.

The reconstruction of A-181 “Scandinavia” will increase the capacity of the road, reduce travel times and improve traffic safety on the arterial road linking Russia with Finland and other EU countries.

14. The road route *Saint Petersburg – Helsinki* creates a serious load on the environment. This is due to a number of negative factors that have a significant impact on the environment in the influence zone of the route, the most important of those factors being as follows:

- there is still a significant number of vehicles of low environment class being used on roads within the route;

- the Russian part of the road route has a number of sections with technical parameters which do not allow the optimal traffic conditions in terms of smoothness and speed of the traffic flow;

The border sections of the road route *Saint Petersburg – Helsinki* constitute a major source of emissions of greenhouse gas and pollutants due to significant waiting times for vehicles queuing on the national border, especially on weekends and during holidays (when vehicle engines operate in the “acceleration – braking” mode and idle, emissions of greenhouse gas and pollutants increase by 30% to 35% compared to the situations when vehicles move smoothly at 90 km/hour);

- at present, the share of alternative fuels in the fuel balance in the regions of the influence zone of the route is still small. The retail sales of gas vehicle fuel (CNG and LPG) in Saint Petersburg and Leningrad Region is about 47 thousand tons (less than 1.9% of the total sales of vehicle engine fuel). Only 3.6 thousand vehicles registered in Saint Petersburg and Leningrad Region use alternative fuel and electricity (about 0.15% of all registered road vehicles).

- cars make a significant share in the traffic flow on the road route as most road users view cars as the most acceptable means of transport. However, cross-border travel by rail still has a lot of potential in the area.

All these factors contribute to emissions of greenhouse gas and pollutants in the area along the road route *Saint Petersburg – Helsinki*.

15. The key areas for improvement of the environmental safety of the road route *Saint Petersburg - Helsinki* are as follows:

1) legal framework:

- building a system of technical regulations with compulsory requirements regarding environmental safety of road vehicles;

- building a system of government monitoring of characteristics of vehicles and quality of vehicle fuel being sold;

- defining requirements for energy efficiency of vehicles, and developing a vehicle environmental labeling system;

2) vehicle manufacturing:

- transition to alternative fuel (natural gas vehicle fuel, biofuel, electricity, hydrogen, etc.);

- providing incentives for manufacturing a line of vehicles that use alternative fuel;

- introduction of a system of classification, standardization and marking of vehicles based on their levels of emission of pollutants and CO_2 (energy efficiency);

- building an information system to inform consumers about environmental characteristics of vehicles and vehicle labeling and identification methods, and development of appropriate federal statistical observation forms;

- providing incentives for replacement of vehicles over 10 old with modern vehicles;

- increasing energy efficiency of vehicles and improving their qualities: reducing vehicle weight, increasing engine power, reducing fuel consumption, and increasing their efficiency and sustainability;

3) transport planning:

- development of Internet services for trip planning and selecting sustainable transport modes;

- development of a user app for information exchange on air pollution level along the route *Saint Petersburg – Helsinki*;

- creation of a road vehicle environmental monitoring system;

- implementation of measures to foster the use of environmentally sustainable vehicles for public services and industries of the economy by regional executive and municipal authorities in Russia;

- supporting various forms of shared car use (car sharing, car pooling, etc.);

4) reconstruction of the road A-181 “Scandinavia” and the road border-crossing point “Torfyanovka”, and implementation of organizational and technical measures:

- reconstruction of the road A-181 “Scandinavia” and the road border-crossing point “Torfyanovka” to increase their capacities;

- increasing the capacity of the road through introduction of intelligent transport systems as well as telematics and navigation systems;

- introduction of energy efficient, resource saving and “green” technologies in the road sector;

- environmental monitoring of operation of vehicles and road companies;

- introduction of environmental audit systems in carrier companies and road sector organizations;

- use of voluntary environmental responsibility mechanisms by state organizations and companies with state participation;

- construction of recharging stations for electric vehicles and filling stations for vehicles using alternative fuels (LNG, CNG, etc.);

- banning the use of trucks and buses of environmental class Euro-2 or lower and vehicles with high levels of smoke of the exhaust;

5) economic regulation:

- introduction of economic mechanisms that stimulate the use of more sustainable and energy efficient vehicles;

- application of "green" financial tools to foster low-carbon based development of the transport sector;

- introduction of financial incentives for purchase of more sustainable and efficient vehicles that use alternative fuel;

6) professional training and education:

- training skilled specialists for transport companies in the area of low-carbon based development of the transport sector;

- training specialists for regional and local government bodies of Russia with expertise in low-carbon based development of the transport sector;

- building scientific potential in low-carbon based development of the transport sector;

- training specialists for regional and local government bodies of Russia with expertise in low-carbon based development of the transport sector;

- inclusion of efficient driving techniques, etc, in training and advanced training programs for drivers.

16. The goal of the Green Roadmap of the road route *Saint Petersburg – Helsinki* is to create the environment necessary for safe and comfortable traffic, higher efficiency and better quality of freight and passenger transport, and lower environmental impact of road transport.

The set of measures recommended to be included in the Green Roadmap for the road route *Saint Petersburg – Helsinki* in divided in three blocks:

- increasing energy efficiency of vehicles using traditional fuel, and introduction of advanced transport technologies;

- increasing the number of vehicles that use alternative fuels with lower emissions of GHG and other pollutants;

- developing transport infrastructure and controlling mobility to reduce unsustainable travel distances, improve space and load capacity use efficiency, and reduce the load on the environment.

Recommended deadlines, responsible entities and expected outcomes have been determined

for each of the measures.

17. The main objectives in creating the ITS of the road route *Saint Petersburg – Helsinki* are as follows:

- to ensure high quality of transport services for the users of the arterial road through reduced delays and increased traffic speeds;
- to increase the capacity of the route by creating an automated traffic control system operating in real time;
- to ensure reliable and safe traffic conditions and reduce the number and severity of RTAs;
- to provide users of the route with updated information on road conditions, weather, locations of road service facilities, the list of services provided, queues at the approaches to the MRdBCPs, the approximate waiting times at Russian-Finnish part of the border, etc.;
- to create an environment for comfortable rest for drivers and passengers by providing information on the locations of rest areas, tourist sites (places of interest, museums, etc.), motels and hotels and availability of rooms therein;
- to reduce the impact of road traffic on the environment by ensuring sustainable traffic speeds with minimal acceleration – braking cycles.

To reduce emissions from road traffic, the following services and subsystems should be added to the ITS of the road A-181 “Scandinavia”:

1) To limit access to the ITS coverage zone for vehicles with combustion engines that do not meet the standards for emission of sulfur oxides, nitrogen oxides and carbon oxides, as well as engines with high smoke levels, special areas for instrument-based environmental checks should be provided at the border-crossing points; Such areas exist on the Finnish side of the border. However, the instrument-based environmental control there only involves checks for carbon dioxides in the exhaust. There are no such areas on the Russia side and no instrument-based environmental control of vehicles.

2) To ensure sustainable traffic modes, extra functions and modes should be added to the traffic control system to minimize acceleration and braking cycles and enable speeds that result in minimal emissions of sulfur oxides, nitrogen oxides and carbon oxides. Primarily, these measures are necessary in the Russian segment of the ITS of A-181 “Scandinavia”. There should be a complete separation of traffic control for trucks, buses and cars since sustainable traffic modes differ by vehicle type. Practices around the world show that lane traffic control with variable message signs, T.4 traffic signal heads and road information panels enable optimal speeds and smooth traffic of various types of vehicles on a road with multiple lanes. Triple-technology traffic

detectors should be installed all over A-181 “Scandinavia” to collect information on traffic levels and composition of traffic flow which is necessary for effective traffic control.

3) To minimize idling time for vehicles with combustion engines, vehicles should be able to go through both Finnish and Russian border-crossing points by appointment and with pre-declaration of cargo. This service should be based on the principle of one request for border-crossing points on both sides. Sufficient accumulation areas should be provided for vehicles to wait for their appointment time. The accumulation areas should have the signs 6.4 “Parking area” and 8.7 “No idling”.

4) To enable constant monitoring of environmental parameters and their forecasting based on traffic levels and weather, the ITS of A-181 “Scandinavia” should be equipped with traffic detectors reading the parameters of the traffic flow and its composition, and automatic road weather stations (ARWS) with environmental modules to measure the amount and composition of emissions.

5) To enable route pre-planning and prompt information for road users as regards road conditions allowing them enough time to change the route, the ITS of A-181 “Scandinavia” should include a fully-fledge information subsystem which would use the following channels:

- an information portal accessible from PCs, tablets and smartphones and providing information on road conditions, weather, estimated arrival times, options for avoiding congested locations, roadwork, unsafe parts of the road, various incidents and environmental situation on the route;
- information panels installed within the ITS coverage zone in sufficient numbers to inform road users of road conditions, weather, options for avoiding congested locations, and environmental conditions on the route;
- RDS-channels of vehicle audio units to inform drivers of road conditions, and specialized road radio stations also transmitting information on queues at border-crossing points, environmental conditions on E-18 (A-181) and weather forecasts every 30 minutes.

6) To maintain sustainable traffic parameters and reduce pollution of surrounding areas, timely and high-quality maintenance should be provided on A-181 “Scandinavia” which would be responsive to weather forecasts.

18. Autonomous vehicles are to be used on the route *Saint Petersburg – Helsinki* in future. The use of road vehicles in an autonomous mode is based on the experience in developing autonomous transport (the *Caravan* project which has been implemented by the Federal Road Agency since 2016. The Caravan project is to use the experience of Finnish experts who are actively testing a route for autonomous trucks using the platooning technology which is the use of

a platoon of autonomous trucks moving close to each other and following the controlled lead truck. Truck platooning is to be tested in Moscow Region, the Republic of Tatarstan, Leningrad Region, Samara Region and Krasnodar Region. In relation to the environment, the advantage of platooning is fuel saving (trucks moving close to each other in a convoy are less exposed to air resistance which results in lower emissions).

At present, the following factors are preventing the adoption of truck platooning on A-181 “Scandinavia”:

- the reconstruction A-181 “Scandinavia” has only been done on the section km 47 – km 65;
- the technical capabilities of the traffic control system of A-181 “Scandinavia” as a key component of the ITS do not allow traffic control of autonomous vehicles;
-the road border-crossing points “Torfyanovka” and “Vaalimaa” on the Russian – Finnish border lack the necessary road infrastructure for truck platoons to cross the border.

19. The pre-design stage measures for further development of the ITS of A-181 “Scandinavia” should be implemented in the following order:

1) Producing more accurate information on the types of ITS users and participants including transport companies, road building and operation companies, passenger transport and trucking operators, emergency response services, service providers and other vehicle owners and users of A-181 “Scandinavia”.

2) Producing more accurate information on the types and functions of ITS subsystems and services required to achieve the intended environmental parameters on A-181 “Scandinavia”.

3) Deciding on the order (sequence) of providing ITS services for users and those traveling A-181 “Scandinavia”.

4) Making the list of measures to develop the ITS in order to achieve the goals and attain relevant environmental objectives on A-181 “Scandinavia”.

The roadway has been broadened and the initial version of the automated traffic control system (ATCS) created on the section km 47 – km 65 in accordance with the reconstruction plan for A-181 “Scandinavia”. The reconstruction of the section km 65 – km 100 has begun, and site surveys for the reconstruction of the sections km 101 – km 134, km 134 – km 159, and km 159 – km 200 are to be performed including design of the corresponding segments of the ATCS.

The Roadmap for development of the ITS reflects the set of measures for further development of the ITS of the road route *Saint Petersburg – Helsinki* including the road A-181 “Scandinavia”, the implementation schedule, responsibilities and expected results. The Roadmap was developed so as to ensure environmental monitoring on the road route *Saint Petersburg – Helsinki* and introduction of the traffic control system for autonomous vehicles.

20. Implementation of the set of measures within the Green Roadmap and the Roadmap for Development of ITS of the Road Route *Saint Petersburg – Helsinki* would enable:

- increased capacity of roads within the route;
- optimized traffic conditions and improved efficiency and quality of transport by road;
- increased sustainability of road vehicles being used in regions of the route's influence zone, and lower emissions of greenhouse gas and pollutants from road traffic.

The roads within the route *Saint Petersburg – Helsinki* are to be upgraded to the level of motorways in their entirety by 2025. The road A-181 "Scandinavia" will be reconstructed. The entire route Saint Petersburg – Helsinki will be equipped with ITS elements which would also support autonomous traffic. Coordination of the intelligent transport systems on the Russian and Finnish parts of the route *Saint Petersburg – Helsinki* will reduce the peak demand at the border-crossing points.

The share of vehicles of the environmental class Euro-4 or higher will reach 70% in regions of the route's influence zone in the Russian Federation.

The share of alternative fuels in the fuel balance in the regions of the influence zone will increase by 10% in the Russian regions.

Up to 10% of the future passenger travel on the route *Saint Petersburg – Helsinki* could be redirected to railway transport as well as to various types of non-motorized vehicles or personal mobility devices.

Implementation of the measures to develop the road route would foster creation of new jobs in the tourism sector, catering and restaurant business, hotel business, services, etc.

Implementation of the ITS of the road route *Saint Petersburg – Helsinki* would foster:

- cooperation between Russia and Finland;
- growth in freight transport between Russia and Finland, and transit of cargo for other countries;
- attractiveness of regions of the Russian Federation for foreign investors and joint ventures;
- improvement of conditions for travel between Saint Petersburg and Helsinki by road;
- minimized delays of vehicles when crossing the Russian part of the Russian – Finnish border;
- development of businesses providing transport, logistics, construction, tourist and other services on the route *Saint Petersburg – Helsinki*.

A fully functional modern ITS on the route *Saint Petersburg – Helsinki* would be an important step in development of intelligent transport systems on federal roads of Russia and their integration with modern systems of the European Union.

Annex A-1

Main provisions of documents that contain forecasts of socio-economic development of the Russian Federation, Leningrad Region and Saint Petersburg

Strategic planning documents of the Russian Federation

The *Forecast of the Socio-Economic Development of the Russian Federation 2036* features two scenarios: the *baseline* scenario and the *conservative* scenario.

The *baseline* scenario involves structural changes in the GDP generation: growth of the contribution to GDP from manufacturing facilities, transport, construction, real estate operations, services, research and engineering. Within the *baseline* scenario:

- the GDP growth will be 2.7% during the period 2019 – 2024, 3.2% during the period 2025 – 2030, 3.0% during the period 2031 – 2036, with the GDP of Russia in 2036 being 1.7 times the level of 2018;

- the share of investments in the GDP is forecast at 26% to 27%. After the more dynamic average growth of 5.7% in real values during the period 2018 – 2024, the growth in investment in equity would gradually go down to 3% during the period 2025 – 2036;

- the real disposable personal income will grow on average by 2.0% in 2019 – 2024, by 2.5% in 2025 – 2030, and by 2.7% 2031 – 2036.

Within the conservative scenario:

- the GDP shows insignificant growth during the period 2019 – 2024, the average annual growth being 2.4% in 2019 – 2024, 3.2% in 2025 – 2030, and 2.9% in 2031 – 2036;

- investment in equity would grow by 2.1 times over the period 2019 – 2036.

- real disposable personal income would grow by 1.5 times vs. the 2018 level in 2036, the average annual growth being 1.7% in 2019 – 2024, 2.4% in 2025 – 2030, and 2.5% in 2031 – 2036.

The growth forecast for the GDP, investment and real disposable personal income would boost the demand for the road route *Saint Petersburg – Helsinki*.

Strategic planning documents of Leningrad Region

The ***Forecast of Socio-Economic Development of Leningrad Region 2035*** features two scenarios:

- *Scenario 1* which assumes that the economy will develop within the existing inertial dynamics and the government policy to support investment will be implemented; and

- *Scenario 2* which involves implementation of a set of measures to accelerate the economic growth and improve the demographic situation and living standards.

According to Scenario 1, the population of Leningrad Region will be 1 918.5 thousand people in 2030 (6.5% growth on 2018), and 1 952.3 thousand people in 2035 (8.4% growth on 2018). Scenario 2 forecasts the population of 1 958.1 thousand people in 2030 (+8.8%), and 2011.5 thousand people in 2035 (+11.8%).

In the long term, the important factors in the GRP growth in Leningrad Region would be: implementation of projects in the industrial sector, the transport sector and the logistics industry (development of commercial seaports and construction of logistics terminal centers); production growth in individual processing industries (chemical and petrochemical industries and the manufacturing of transport vehicles and equipment); and a positive dynamic in housing construction.

Under Scenario 1, the GRP in 2035 would be 1.5 times the level of 2018 (average annual growth – 2.5%) while under Scenario 2 it would be 1.66 times greater than GRP 2018 (average annual growth – 3.0%).

Under Scenario 1, the manufacturing sector output in Leningrad Region would grow by 1.6 times (average annual growth – 2.8%); under Scenario 2 – 1.76 times (average annual growth – 3.4%).

Strategic planning documents of Saint Petersburg

The ***Forecast of Socio-Economic Development of Saint Petersburg 2035*** features three scenarios: *the baseline* scenario, the *baseline* + scenario, and the *target* scenario.

The *baseline* scenario involves inertial development of Saint Petersburg with the negative trend in macroeconomic indicators remaining. The economic growth of Saint Petersburg would resume on a moderate level (~ 3% a year). The industrial sector would still provide a significant input to the GRP, mostly from the processing industries that are traditional for Saint Petersburg.

The *baseline*+ scenario is viewed as the most probable and involves inertial development with a significant improvement of the macro-economic situation, strengthening of the national currency, faster growth in export operations and higher labor productivity resulting from technology transfer and

implementation of the import substitution policy. The average annual GRP growth in Saint Petersburg forecast for the horizon period under the scenario is 4%.

The *target* scenario in the long-term forecast is based on the assumption that the competitive advantages of Saint Petersburg will be utilized to the maximum. Under the *target* scenario, stable growth in investment in equity (reaching 25% of the GRP by 2035) will produce the maximum effect from development of high-priority sectors of the economy, reduce the share of Saint Petersburg's traditional industries, and bring the share of products by high-tech and science intensive industries in the GRP to 45% by the end of the horizon period. Effective implementation of measures designed to support high value-added industries (high-tech manufacturing, IT sector, research and development, and tourism) will ensure stable and rapid economic growth during the entire horizon period (3.2% to 4% in 2018-2020 and then 5% annually) and increasing labor productivity (to reach 4.4% by 2035).

According to the *baseline* scenario, the population of Saint Petersburg will be 5 675.3 thousand people in 2030 (7.0% vs. 2018), 5 818.9 thousand people in 2035 (+ 10% vs. 2018), while under the *baseline*+ scenario the population in those years will be 5 948.9 thousand people (+12.2%) and 6 079.3 thousand people (+14.7%) respectively. The *target* scenario involves the population reaching 6 355.3 thousand people by 2035 (+20% vs. 2018).

Annex A-2

Main provisions of documents that contain forecasts for tourism in the Russian Federation, Leningrad Region and Saint Petersburg

The ***Tourism Strategy of the Russian Federation 2020*** envisages integrated development of domestic and inbound tourism by means of:

- building accessible and comfortable tourism environment;
- promoting Russia as a tourist destination on domestic and international markets;
- developing social tourism, tourism for children, teenagers and young people, and discovery tourism focused on natural and cultural attractions;
- attracting more international tourists;
- international cooperation in organizing tour programs;
- improving quality of services offered to tourists in Russia to meet international standards;
- creating and developing a comfortable tourist information environment including a tourist navigation system, navigation signs, and information on tourism resources available in various regions;
- ensuring safe tourism and sustainable development of the tourism sector;
- fostering entrepreneurial initiatives by actors in the tourism sector; creating an environment to attract more private investment in tourism infrastructure.

The ***State Program of the Russian Federation "Development of culture and tourism during the period 2013 – 2020"*** is focused on tasks such as:

- improvement of the quality and availability of services offered to domestic and international tourists;
- building a good environment for sustainable development of the culture and tourism sectors;
- measures to develop tourism and recreational capacities of regions;
- participation of the Russian Federation in international projects in tourism.

The ***Concept for the Federal Targeted Program "Development of domestic and inbound tourism in the Russian Federation (2019 – 2025)"*** says that development of independent domestic tourism is a stable trend, which includes tourism by car and cycling tourism. This trend is caused by the expanding geography, better dynamics of travel and the broadening range of options offered for cultural and discovery tourism**.** The Concept envisages:

- creation and modernization of tourist attractions;
- integrated development of tourism infrastructure;

- promotion of Russia as a tourist destination, and building awareness on the global and domestic markets;

- encouraging tourism-related entrepreneurial and public initiatives by providing subsidies and grants;

- development of IT and telecommunication infrastructure for management of the tourism industry.

The Development of tourism is named an important goal in ***the Strategy of Socio-Economic Development of Saint Petersburg 2035***. The Strategy set the following priority tasks in relation to tourism:

fostering creation and development of tourism infrastructure;

development of sea and river cruise tourism, as well as private yacht tourism;

expansion of services available to tourists;

improvement of quality and competitiveness of services offered to tourists;

active promotion of Saint Petersburg as a tourist attraction on target markets and segments.

The targets for 2035:

the average annual growth in tourist arrivals in Saint Petersburg – 102.4%;

the average annual growth in the amount of fee-based services offered by hotels, hostels, etc. – 103.8%.

The Government Program of Saint Petersburg "Development of culture and tourism sectors in Saint Petersburg" for the period 2015 – 2020 (as approved by Decree of the Government of Saint Petersburg No. 488 dated 17.06.2014) includes the Subprogram “Image of Saint Petersburg” which involves:

- improved development of the tourism industry and better quality of tourism products of Saint Petersburg;

- major national and international events dedicated to significant events in national and global culture, and activities aimed to develop international and interregional cooperation in culture;

- creating political, regulatory, organizational, economic, financial, scientific, labor, logistical, information, methodological and other conditions necessary for sustainable development of culture and tourism in Saint Petersburg during the period through 2020.

The ***Government Program of Saint Petersburg "Development of the tourism sector in Saint Petersburg"*** (as approved by Decree of the Government of Saint Petersburg No. 936 dated 14.11.2017) *includes three subprograms*:

- development and improvement of tourism destinations (hereinafter – Subprogram 1);
- diversification of tourism products and services within the principles of tourism sustainability (hereinafter – Subprogram 2);
- building and promotion of the meta brand of Saint Petersburg (hereinafter – Subprogram 3).

The goal of Subprogram 1 is integrated development of tourism infrastructure. Subprogram 1 involves attracting investment in public-private partnership projects in the tourism sector, and accounting of classified mass accommodation facilities.

The goal of Subprogram 2 is to broaden the range of services offered to tourists by developing cultural and discovery tourism, event tourism, medical tourism, social tourism, and congress and exhibition activities.

The goal of Subprogram 3 is to create a good environment for sustainable development of tourism through activities designed to promote the tourism potential of Saint Petersburg, develop information and communication systems in the tourism sector, create and disseminate souvenirs, and build an attractive, safe and comfortable urban environment for tourists.

One of the main goals of the ***Strategy of Socio-Economic Development of Leningrad Region 2030*** is to attract more tourists and develop inbound and domestic tourism. To achieve this goal, the tourism sector will be developed by means of:

- creation and promotion of new tourist routes;
- creation of tourism and recreation clusters and centers of cultural and tourism development;
- promotion of Leningrad Region as a tourist destination on global and domestic markets.

Within the context of these objectives, the *Strategy of Socio-Economic Development of Leningrad Region 2030* provides for a number of priority projects (Table 1).

Table 1 – Priority projects for development of the tourism sector in Leningrad Region during the period 2030

##	Project	Implementation period
1	Implementation of the interregional tourism project “Silver Necklace”	2020-2030
2	Development of the interregional tourism project “Red Route”	2020-2030
3	Creation of the tourism and recreation cluster “Old Ladoga”	2020-2030
4	Creation of a center of cultural and tourism development – a historical settlement based on a fragment of the urban structure of Vyborg, within the framework of the project “Preservation and development of small historic towns and settlements”	2020-2030
5	Implementation of the cultural and tourism development concept for Novaya Ladoga (New Ladoga)	2020-2030
6	Creation of a cultural and tourism development center in Tikhvin	2020-2030
7	Creation of theme parks in Leningrad Region, including theme parks based on cultural heritage, natural and technology sites	2020-2030
8	Creation and promotion of major events in Leningrad Region	2020-2030
9	Development of a network of tourism information centers	2020-2030
10	Building a positive image of the region as a tourist attraction at international, interregional and regional tourist events, in the media and online; marketing and branding Leningrad Region	2020-2030

The ***Draft Government Program of Leningrad Region "Development of domestic and inbound tourism in Leningrad Region"*** envisages an increase in the tourist flow to Leningrad Region and development of domestic and inbound tourism, to be achieved through implementation of:

1) the Subprogram "Promotion of the tourism potential of Leningrad Region" which involves activities such as:

–participation of Leningrad Region in international tourism projects such as cross-border cooperation projects;

- development of the tourism potential and tourism resources of Leningrad Region by: producing information materials on opportunities for tourism in the region; producing and disseminating promotion materials and souvenirs with the tourism brand and historical symbols of Leningrad Region; holding congresses, exhibitions, information tours and media tours; creating TV programs promoting Leningrad Region as a tourism destination on domestic and international tourism markets;

- placing advertisement materials on the tourism potential and resources of Leningrad Region;

- creating information and video-content on tourism products and resources of Leningrad Region, and dissemination of such materials in the media (on the Internet, in newspapers and magazines disseminated on air planes, trains, passenger ferries, etc.), including in foreign languages;

- holding mass and specialized events (festivals, tours and rallies) to popularize domestic and inbound tourism in Leningrad Region;

- developing digital technologies for the tourism sector of Leningrad Region including: interactive, multimedia and information components, thematic mobile guides for brand routes in the region; development of a network of information terminals; promotion of the tourism potential of Leningrad Region; and expansion of information provided in foreign languages;

- implementing the priority project "Tourism and recreation cluster in the village of Staraya Ladoga, Volkhovsky District, Leningrad Region" which involves implementation of a national culture and tourism center at the village of Staraya Ladoga by building a comfortable environment, tourism infrastructure and supporting infrastructure, and preserving cultural heritage sites;

- implementing the regional project "Export of services" which includes a set of activities designed to increase export of services in the "Travel" category (all costs incurred by individuals when purchasing goods and services while being abroad, for their own needs or free handover to other individuals) and the number of international tourists visiting Leningrad Region;

2) the Subprogram "Building a comfortable environment for tourism" which involves activities such as:

- implementation of tourism infrastructure, and government support to projects aimed at building a comfortable environment for tourism, including:

- *implementation of the roadside infrastructure "Green parking" in Leningrad Region;*
- *implementation of universal accommodation facilities (camping sites) in Leningrad Region;*
- *implementation of a theme park in Leningrad Region;*
- *development of a tourist navigation system and navigation information;*

- providing subsidies to non-profit organizations for projects aimed at building a comfortable environment for tourism in Leningrad Region;
- assisting implementation and development of tourist information centers in Leningrad Region by:
  - *opening branch offices of the State Institution of Leningrad Region "Tourist Information Center";*
  - *assisting development of existing and new tourist information centers by providing methodological recommendations and information.*

The activities listed above would make tourism industry more competitive, increase the appeal of Leningrad Region and foster the development of its tourism potential.

According to the *Strategy for Socio-Economic Development of Vyborgsky District 2025* the goal in developing the tourism sector in Vyborgsky District is to create an environment for high quality tourism products and a market of diverse recreational services which would meet modern quality standards and create a recreational environment for the local population, guests from Saint Petersburg and Leningrad Region and other tourists including those from abroad.

The following measures (activities) are planned to achieve this goal:

- building a joint tourism product with Saint Petersburg; including Vyborg in interregional tours; creating a common tourism and recreation system integrated in the interregional tourism business;
- popularization of the rich cultural heritage of the historic settlement of federal significance in Vyborg and the area around it among Russian citizens and foreign guests;
- creating conditions for rapid development of hospitality infrastructure, primarily hotel infrastructure, by building new modern hotels for at least 3 000 beds in total, mostly in Vyborg and its neighbor areas;
- fostering the development of hospitality infrastructure including existing and planned local tourism centers and core route centers of Vyborgsky Municipal District (Primorsk, Kamennogorsk, Ilyichyovo, Pobeda, the ski resort Korobitsino, transit tourism centers in border areas, etc.), primarily by providing "green parking" i.e. well-equipped parking areas for tourist coaches, and related infrastructure;
- assisting in implementation of multi-functional information service centers on main tourist routes and providing adequate information navigation for tourists;
- improvement of established outdoor mass recreation sites; improvement of water-front mass recreation infrastructure; installation of waste bins and including those in garbage truck itineraries;

implementation of organized beaches; monitoring the condition of river/lake banks and the quality of water in bathing locations;

- fostering implementation of international projects in tourism and mass recreation, and attracting a large flow of foreign tourists to Vyborgsky District;
- implementation of projects aimed to develop the tourism and recreation complex in cooperation with the relevant government authorities of Leningrad Region, including assistance to repair and restoration work on architectural monuments as potential tourist attractions;
- development of mass cultural and sports events, and expanding the “event calendar” which should also target holiday makers and tourists.

Moreover, the Strategy envisages development of tourism and recreation facilities, cycling tourism and walking tourism with implementation of appropriate infrastructure in Vyborg and neighboring areas, the Roschino-Pervomaisk-Polyana macro-zone and the Svetogorsk-Kamennogorsk macro-zone. Besides, a multi-functional tourism and recreational center with a water park (in Vyborg, Smolyanoy Cape) is to be implemented by 2020.

According to the Strategy for Socio-Economic Development of Vyborgsky District 2025, these activities would allow increasing:

- the number of tourists from 300 000 in 2015 to 650 000 in 2025;
- the total number of visitors to the district (tourists, holiday makers, sightseers) from 829 000 in 2015 to 1 800 000 in 2025;
- the number of beds in hotels, etc. from 7 500 in 2015 to 12 000 in 2025.

The Strategy for Socio-Economic Development of Priozersky District 2030 provides for development of the tourism and recreation zones: Losevskaya, Igorskaya, Zaporozhskaya, Konevskaya, Priozerskaya-1, and Korobitsinskaya.

A set of activities planned to develop the tourism and recreation sector of Priozersky District is presented in Table 2.

Table 2 – Measures to develop tourism and recreational activities in Priozersky District of Leningrad Region

##	Activity	Implementation period
1	Creation of tourist routes with eating establishments/areas, special signs, and first aid facilities, and putting such routes on the list of official tourist routes	2022-2024
2	Creation of tourism programs focusing on connections between Russian and Finnish cultures	2025-2030
3	Making senior citizens part of the economy by including more areas including remote ones in tourist routes	2022-2024
4	Building a network of cycle routes to connect cultural as well as natural attractions	2022-2024
5	Development of “full cycle” tourist programs to offer comprehensive solutions to potential tourists	2025-2030
6	Promotion of rural tourism. With more tourists interested and coming to the area, the tourism sector would have to develop. The main steps to promote rural tourism: Development of the municipal program “Development of rural tourism in Priozersky District”; selecting pilot farms within the program, and offering tax benefits and subsidies to support the building and marketing of the tourist product;	2025-2030
7	Organizing experience sharing seminars with representatives of Finland and the Baltic States, for participants of the pilot projects	2022-2024
8	Creation of the local Agro-Tourism Fostering Association; building contacts with existing tourist attractions	2019-2022

The plan for development of tourism sector facilities and tourist attractions in Priozersky District of Leningrad Region is presented in Table 3.

Table 3 – The plan for development of tourism sector facilities and tourist attractions in Priozersky District of Leningrad Region

##	Activity	Implementation period
1	Implementation of a water stadium with 2 000 seats at Losevo	2019-2030
2	Implementation of a hippodrome with a riding sports base at Krutaya Gora	2019-2030
3	Implementation of yacht clubs at Pyatirechye, Solovyovo, Cheryomukhino, Motornoye, Storozhevoye, Burnevo, Beryozovo and near the cargo pier at Kuznechnoye; construction of piers and berths at the Ladoga Lake and inland water bodies	2019-2030
4	Implementation of sports and health centers operating on a year-round basis (at Plodovoye, Pochinok, Melnikovo, Novaya Derevnya, etc.)	2019-2030
5	Construction of an aviation village (at Sapyornoye); development of aviation sports on the basis of existing and planned general purpose aviation facilities and aerodromes	2019-2030

##	Activity	Implementation period
6	Implementation of motorcycle racing tracks, car racing routes, a diving center, and hang gliding sports centers; construction of a water park	2019-2030
7	Construction of additional recreational facilities with the total capacity of 500 to 700 places	2019-2030
8	Construction of three hotels with a total of 330 beds: at Melnikovo (50 beds), Beryozovo (80 beds), and Vasilievo (200 beds)	2019-2030
9	Implementation of at least 4 “green parking” lots, roadside rest areas for tourist coach buses on the *Saint Petersburg – Sortavala* road (currently under construction)	2019-2030
10	Implementation of 3 camping sites for 100 places each (at Sinevo, Plodovoye, Vasilievo (Melnikovskoye rural settlement)	2019-2030
11	Implementation of 2 “artisan villages”, facilities for cultural and recreational events, an “ethnographic settlement”, guest houses (including using existing homesteads) at Plodovoye and Vasilievo (Melnikovskoye rural settlement)	2019-2030
12	Construction of hotel infrastructure for 200 beds at the golfing center (Zaporozhskoye rural settlement)	2019-2030
13	Construction of other recreational facilities at existing and developing tourism and recreational centers, for up to 3 500 guests	2019-2030
14	Restoration of the historic Ampiala manor as a hotel	2019-2030
15	Construction of major yacht clubs including with accommodation and recreational facilities at Priozersk (for 100 places), Vladimirovka (200 places), Losevo, near the Kolokoltsevsky Creek on the Vuoksi	2019-2030

Table 1 – Forecast of the composition of the road vehicle fleet in the Russian part of the route *Saint Petersburg – Helsinki*, by scenario

Share of vehicles, %	PC							LCV							HCV							BUS						
	EURO-0	EURO-1	EURO-2	EURO-3	EURO-4	EURO-5	EURO-6	EURO-0	EURO-1	EURO-2	EURO-3	EURO-4	EURO-5	EURO-6	EURO-0	EURO-1	EURO-2	EURO-3	EURO-4	EURO-5	EURO-6	EURO-0	EURO-1	EURO-2	EURO-3	EURO-4	EURO-5	EURO-6
Scenario 0																												
Petrol	7.73	18.93	12.02	24.99	14.95	12.69	0.00	1.48	17.15	7.70	9.19	4.36	3.97	0.00	8.46	6.68	0.89	0.31	0.01	0.01	0.00	0.95	6.24	3.18	2.43	2.76	1.01	0.00
Petrol/CNG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Petrol hybrid	0.00	0.00	0.02	0.05	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Diesel	0.07	0.69	0.76	3.22	2.19	1.64	0.00	4.88	14.69	4.79	15.50	8.41	7.23	0.00	11.89	22.67	11.48	19.53	8.62	9.36	0.00	3.74	10.93	12.98	29.59	12.16	11.56	0.00
N/A	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.01	0.01	0.00	0.00	0.00	0.01	0.02	0.01	0.01	0.00	0.00	0.00
Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Petrol/LPG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.22	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00
CNG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.01	0.00	0.00	0.00	0.03	0.04	0.31	1.88	0.00
LPG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.00
Scenario 1																												
Petrol	0.00	0.00	3.61	19.99	13.46	11.42	32.84	0.00	5.14	2.31	7.35	3.93	3.58	21.55	0.00	3.34	0.45	0.25	0.01	0.01	12.31	0.00	0.00	0.95	1.95	2.48	0.91	10.28
Petrol/CNG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Petrol hybrid	0.00	0.00	0.00	0.00	0.00	0.00	10.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Diesel	0.00	0.00	0.23	2.58	1.97	1.48	2.32	0.00	4.41	1.44	12.40	7.57	6.51	23.18	0.00	11.34	5.74	15.62	7.76	8.42	34.67	0.00	0.00	3.89	23.67	10.94	10.41	32.05
N/A	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.01	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.03
Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Petrol/LPG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.20	0.19	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00
CNG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.01	0.00	0.00	0.00	0.01	0.03	0.28	1.69	0.25
LPG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.01
Scenario 2																												
Petrol	3.86	9.47	6.01	19.99	13.46	11.42	2.71	0.74	8.57	3.85	7.35	3.93	3.58	3.17	4.23	3.34	0.53	0.28	0.01	1.01	2.79	0.48	3.12	1.91	2.19	2.48	0.91	2.20
Petrol/CNG	0.00	0.00	0.00	0.00	0.00	0.00	5.42	0.00	0.00	0.00	0.00	0.00	0.00	1.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Petrol hybrid	0.00	0.00	0.01	0.04	0.01	2.00	6.16	0.00	0.00	0.00	0.00	0.00	3.00	8.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Diesel	0.04	0.34	0.38	2.58	1.97	1.48	1.79	2.44	7.34	2.40	12.40	7.57	6.51	10.11	5.95	11.34	6.89	17.57	7.76	10.42	9.45	1.87	5.47	7.79	26.63	10.94	11.41	6.74
N/A	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Electric	0.00	0.00	0.00	0.00	0.00	0.00	6.78	0.00	0.00	0.00	0.00	0.00	0.00	1.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.51
Petrol/LPG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.20	0.19	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00
CNG	0.00	0.00	0.00	0.00	0.00	0.00	4.07	0.00	0.00	0.00	0.00	0.00	0.00	4.75	0.00	0.00	0.00	0.00	0.02	3.01	15.38	0.00	0.00	0.02	0.03	0.28	2.69	10.17
LPG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.00
Scenario 3																												
Petrol	7.73	18.93	12.02	24.99	14.95	12.69	0.00	1.48	17.15	7.70	9.19	4.36	3.97	0.00	8.46	6.68	0.89	0.31	0.01	0.01	0.00	0.95	6.24	3.18	2.43	2.76	1.01	0.00
Petrol/CNG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Petrol hybrid	0.00	0.00	0.02	0.05	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Diesel	0.07	0.69	0.76	3.22	2.19	1.64	0.00	4.88	14.69	4.79	15.50	8.41	7.23	0.00	11.89	22.67	11.48	19.53	8.62	9.36	0.00	3.74	10.93	12.98	29.59	12.16	11.56	0.00
N/A	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.01	0.01	0.00	0.00	0.00	0.01	0.02	0.01	0.01	0.00	0.00	0.00
Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Petrol/LPG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.22	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00
CNG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.01	0.00	0.00	0.00	0.03	0.04	0.31	1.88	0.00
LPG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.00

Share of vehicles, %	PC							LCV							HCV							BUS						
	EURO-0	EURO-1	EURO-2	EURO-3	EURO-4	EURO-5	EURO-6	EURO-0	EURO-1	EURO-2	EURO-3	EURO-4	EURO-5	EURO-6	EURO-0	EURO-1	EURO-2	EURO-3	EURO-4	EURO-5	EURO-6	EURO-0	EURO-1	EURO-2	EURO-3	EURO-4	EURO-5	EURO-6
Scenario 4																												
Petrol	0.00	0.00	0.00	17.99	13.46	13.42	20.18	0.00	0.00	2.31	6.35	2.93	3.58	16.69	0.00	0.00	0.45	0.25	0.01	1.01	6.96	0.00	0.00	0.00	1.95	2.48	0.91	5.19
Petrol/CNG	0.00	0.00	0.00	0.00	0.00	0.00	5.43	0.00	0.00	0.00	0.00	0.00	0.00	1.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Petrol hybrid	0.00	0.00	0.00	0.00	0.00	2.00	8.08	0.00	0.00	0.00	0.00	0.00	3.00	8.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Diesel	0.00	0.00	0.23	1.58	1.97	2.48	2.32	0.00	0.00	1.44	11.40	7.57	6.51	21.15	0.00	0.00	5.74	15.62	7.76	5.42	38.32	0.00	0.00	0.00	23.67	10.94	10.41	29.61
N/A	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Electric	0.00	0.00	0.00	0.00	0.00	0.00	6.78	0.00	0.00	0.00	0.00	0.00	0.00	1.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.51
Petrol/LPG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.20	0.19	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00
CNG	0.00	0.00	0.00	0.00	0.00	0.00	4.07	0.00	0.00	0.00	0.00	0.00	0.00	4.75	0.00	0.00	0.00	0.00	0.02	3.01	15.38	0.00	0.00	0.00	0.03	0.28	1.69	10.17
LPG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.00

Table 2 - Traffic speeds in the Russian part of the route *Saint Petersburg – Helsinki* forecast as the result of realization of Scenario 3 or the final scenario

Starting point	Coordinates		End point	Coordinates		Average speed, km/h	
	X	Y		X	Y	before the implementation of events	after the implementation of events
Point 1	60.177100	29.961253	Point 2	60.200567	29.940483	110	110
Point 2	60.200567	29.940483	Point 3	60.214706	29.940653	80	100
Point 3	60.214706	29.940653	Point 4	60.289050	29.820581	110	110
Point 4	60.289050	29.820581	Point 5	60.300975	29.800731	75	100
Point 5	60.300975	29.800731	Point 6	60.303147	29.797728	90	110
Point 6	60.303147	29.797728	Point 7	60.328547	29.731156	95	110
Point 7	60.328547	29.731156	Point 8	60.330186	29.722872	70	100
Point 8	60.330186	29.722872	Point 9	60.360239	29.538422	100	110
Point 9	60.360239	29.538422	Point 10	60.360875	29.519883	80	100
Point 10	60.360875	29.519883	Point 11	60.468178	29.330111	105	110
Point 11	60.468178	29.330111	Point 12	60.472839	29.324103	90	100
Point 12	60.472839	29.324103	Point 13	60.637294	29.009322	105	110
Point 13	60.637294	29.009322	Point 14	60.647789	28.976533	95	110
Point 14	60.647789	28.976533	Point 15	60.662408	28.937889	85	100
Point 15	60.662408	28.937889	Point 16	60.668600	28.901883	80	100
Point 16	60.668600	28.901883	Point 17	60.672453	28.877164	85	100
Point 17	60.672453	28.877164	Point 18	60.677064	28.868839	90	110
Point 18	60.677064	28.868839	Point 19	60.720511	28.844025	95	110
Point 19	60.720511	28.844025	Point 20	60.729086	28.837672	90	110
Point 20	60.729086	28.837672	Point 21	60.747578	28.790122	95	110
Point 21	60.747578	28.790122	Point 22	60.752953	28.780422	70	100
Point 22	60.752953	28.780422	Point 23	60.790397	28.707767	100	110
Point 23	60.790397	28.707767	Point 24	60.789350	28.697639	80	100
Point 24	60.789350	28.697639	Point 25	60.774117	28.648031	100	110
Point 25	60.774117	28.648031	Point 26	60.772753	28.645369	100	110
Point 26	60.772753	28.645369	Point 27	60.742250	28.631692	100	110
Point 27	60.742250	28.631692	Point 28	60.622640	28.173097	100	110
Point 28	60.622640	28.173097	Point 29	60.614437	28.083902	100	110
Point 29	60.614437	28.083902	Point 30	60.609419	28.018358	100	110
Point 30	60.609419	28.018358	Point 31	60.603850	28.006686	50	110
Point 31	60.603850	28.006686	Point 32	60.597561	27.931239	70	80
Point 32	60.597561	27.931239	Point 33	60.604461	27.873133	5	30