Lappi – Murmansk liikennejärjestelmäsuunnitelman esiselvitys

Toimintaympäristöanalyysi

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ANNEX 2.2.1 Lapin ja Murmanskin alueen talouden nykytila ja kehitysnäkymät
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ANNEX 4.8.1 Eri kulkumuotojen toimintavisiot

13 maaliskuuta 2011
### ANNEX 1.1.1

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<td></td>
<td>Developing an end-user-oriented transport system that contribute to competitiveness and welfare of Lapland as well to reduction of negative anthropogenic impact on environment.</td>
<td>I)Solving the complex of tasks, including:</td>
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<td>Reduction of anthropogenic impact on climate has become the basic challenge on the state level including national policy on regional planning and transport. Moreover, together with road safety improvement this factor can be considered as one of the boundary conditions when developing regional transport systems. In Finland road transport share in total amount of greenhouse gas is about 90%.The national objective to reduce greenhouse gas by 15% till 2020 comparing to 2005 has been set out. Achievement of this goal means activities in the following spheres:</td>
<td>1. Construction and reconstruction of main roads and railways, sea and river ports’ infrastructure, internal waterways and airports,</td>
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<td>• Transport</td>
<td>2. Elimination of gaps and “bottle-necks” of the transport system,</td>
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<td>• Car technologies</td>
<td>3. Development of transport approaches to cross-border points and big transport nodes, provision of its complex development on main transportation routes,</td>
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<td>• Settlement planning and land allotment</td>
<td>4. Development of infrastructure conditions for potential points of economic growth.</td>
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<td>• Taxation and monetary-credit policy.</td>
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<td>For each region different types of measures are developed (differentiation). For big agglomerations there exist more opportunities to reduce emissions, while one should address measures to small agglomerations too. In sparsely-populated locations reduction of international transportation emissions is even more important. Absence of alternative ways of transportation complicates the process of emission reduction. Rational planning and transport policy are the fields of national importance studies. The Programme of long-term transport system development / Liikenneviraston PTS-suunnitelma (client – Finnish Transport Agency) is among the core developments, which is a basis</td>
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<td>The balanced development of transport infrastructure based on comprehensive analysis and forecasts of population and economy transport needs, harmonization of transport legislation, integration to the world system of standards and communications, and definition of quality standards of transport services. Objective: To form single Russian transport space based on balanced transport infrastructure development for:</td>
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<td>1. Dynamic growth of national economy, social development and strengthening of links between the regions, increasing competitiveness and efficiency of the sectors (industries)</td>
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<td>2. Business activity growth</td>
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<td>3. Optimization of interaction between different modes of transport</td>
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<td></td>
<td>4. Creating conditions for new quality system transport development in a new common informational environment covering all modes of transport,</td>
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for a future more scaled Programme of Actions and Transport Policy of the Finnish Government.

The draft Programme of actions and transport policy of the future government will be represented on spring, 2011 for discussions and coordination with TEN-T. The programme of the Finnish long-term transport system development will be ready by February, 2011. It aims at planning of regional transport systems coordinated with national objectives. In November the Programme will be presented for agreement after which the plan of actions will be defined. Development of Lapland transport system plan is based on national policy where needs of the province are the priorities. This means that national policy tasks are solved taking into account specifics and strengths of the province. This approach becomes available through extrapolation of framework national policy indicators (e.g. reducing impacts on climate change, safety improvement, etc.) to the regional level. Actions included to the province transport system development plan shall contribute to achievement of national indicators.

5. Development of the Murmansk transport node.
(Russian Transport Strategy till 2030, 1st stage)

II) National policy in the sphere of land use defines orientation of territorial planning to achievement of sustainable development of territories and infrastructures (engineering, transport, social) taking into account interests of population, Russia, Russian regions, municipalities on the assumption of complex socio-economic, environmental and other factors.
(City planning code of Russia, art. 9).

Conclusions:
1. The principal difference of the Finnish practice is an integrated land-use and transport infrastructure planning, when the current government prepares an instrument (programme) for the future government in order to provide continuity of policy and progressive motion to achieve goals. In Russia coordination of economy and transport development has been just included to the plans while spatial planning is only an object for discussions among specialists. It is recognized that spatial planning logic is poorly integrated to the current Russia management structure thus impeding effective work within the regional administrations. Specification of the spatial development concept to the Russian conditions has never been successful, too. New type of planning requires new institutional form.

2. Finnish transport infrastructure has been quantitatively formed and current decisions are aimed at optimization of transport activity and qualitative upgrade (increased productivity, higher safety – less accidents and environmental and climate impacts). Directions of qualitative improvement of the regional level transport system are defined by the national level indicators, which in its turn are defined with supra-national integration objectives of the EU (TEN). On the Russian side quantative expansion of transport infrastructure with its future (long-term) quality development of all modes

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1 Translator's comments: Development of the European Transport Network – programme TEN-T (Trans–European Transport Network)
3. There are no any conflicts between policies of land use and transport development in Finland and Russia as the policies are on different stages of development: the Russian policy is quantity-oriented with future changeover to quality level orientation (single transport space harmonized with the world transport system), while the Finnish one is oriented on better quality of services for the user.

4. Coordination of regional and transport planning of Lapland and Murmansk region automatically becomes a step to integration of the Russian transport system with the scaled international ones. Integration process will be a catalyst to accelerated transfer of the Russian transport system from quantity indicators to quality objectives thus contributing to the common strategic task – development and implementation of transit potential of the Arctic transport system.
<table>
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<th>No</th>
<th>State regional planning objectives in Finland (2009)</th>
<th>State regional planning objectives in Russia (2005)</th>
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<tr>
<td></td>
<td><strong>Comparing basic regional planning objectives in Finland and Russia</strong></td>
<td>Review of national objectives of regional planning, 2005 (Russian Concept of Strategy on socio-economic regional development), Russian Ministry of Regional development. Regional organization of Russia inherited from the USSR requires huge rearrangement. The Regions that were developed within command centralized economy logics couldn’t meet social and economic requirements of current market economy. Most of Russia subjects have found themselves non-competitive on global and national markets. Basic necessary processes to transform spatial system of Russia are:</td>
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</table>
|    | Review of national objectives of regional planning, 2009 (Valtakunnalliset alueidenkäyttötavoitteet (VAT)). Currently most attention within land use shall be focused on:  
- Reduction of negative anthropogenic impact on climate;  
- Transfer from scattered community structure to an integrated, single one, which would contribute to unity of the community;  
- Complex approach to issues of residential building, transport, energy, land use;  
- Defining agglomeration of Helsinki and province centre agglomerations as a base nodes of regional structure;  
- Interaction between cities, towns and districts;  
- Development of districts.  
In sparsely-populated districts most focus within regional planning shall be put on:  
- Using the existing structures;  
- Diversification of business activity and other types of activity.  
When planning land use, placing houses, working places and services it is necessary to:  
- Facilitate energy saving and implement potentials to use of renewable energy sources,  
- Reduce needs in passenger transport through shifting population to public transport as well as contribute to higher share of non-motorized traffic (light traffic);  
- Contribute to better logistics of tourism and | Forming new geopolitical space  
- Transition to new type economy  
- Integration of national economy to the world market  
- Changing administrative and budget relationships between the centre and regions  
- New regionalization (new regions as cultural and socio-economic formations based on common social and business life over the old administrative borders)  
- Forming new energy and transport markets, restructuring educational space, forming development zones along transport corridors, developing projects beyond the borders of one region  
- Appearing of signs of new urbanism when infrastructure development and spatial organization are defined not only with industrial requirements but post-industrial development needs. Reference: Annual Russia’s losses related to inefficient and ineffective spatial organization are evaluated as 2,25-3,0 % GDP. New concept of strategic socio-economic development of Russian |
|    | | |

Reference: Annual Russia’s losses related to inefficient and ineffective spatial organization are evaluated as 2,25-3,0 % GDP. New concept of strategic socio-economic development of Russian
regions is based on **spatial development principles**, concentration of efforts on formation of “poles of growth” for new spatial organization of the country.

Russian regional policy objectives on current stage are:

- Stimulating regionalization process through consolidation of resources in order to change economy structure and growth
- Developing of human capital, increasing population mobility
- Improving environmental situation in the regions for the balanced development
- Improving quality of management and using public finance
- Increasing global competitiveness of the regions

### Conclusions:

1. Mono-profile enterprise-forming settlements are most susceptible in the market economy. Such settlements are typical for the Murmansk region settlement pattern. The core development direction is economy diversification.

2. The economy (regional, municipal) is the more stable the better small- and middle-scale (SMS) business is developed. Therefore stimulation of these types of business means more working places and provides a cushion from inevitable market fluctuations.

3. Beneficial location of Lapland and Murmansk region (from the standpoint of EU strategy, national strategies of Finland and Russia) is a starting point for consolidation of resources and diversification of economies, creation of new segments for SMS businesses.

4. Transport logistics is a sector that requires numerous services for traffic flows and a wide field for small-scale business.

5. Logistics requires services with high added value as its core resources are informational technologies, innovations and high-qualified specialists. This stimulates second-level demand for the services of closely-related segments (personnel training, investigations, construction, etc.) development of which provides a basis for “growing” a trans-border logistic cluster able to offer its services to the world market.
### ANNEX 1.1.3

|---|---|---|---|
|  | Publication of *National report of the State Board on transport policy*, 2008г. (valtioneuvoston liikennepoliittinen selonteko) | The report has mentioned:  
- Economic development and policies in the sphere of climate impact reduction, public and light transport development, road traffic safety improvement;  
- Transport service markets  
- Transport infrastructure and its financing  
- Investment programme  
- List of perspective projects | Transport system common objectives till 2030 are: (Russian transport strategy till 2030, approved in 2008):  
- Forming single transport space based on balanced development of all transport infrastructures;  
- Integration into world transport environment and using transit potential of the country;  
- Providing competition environment and accessibility of transport service market for the user;  
- Transport system safety improvement;  
- Reduction of negative transport impacts on environment;  
- List of perspective projects. |
|  | The objectives of the transport system till 2020 are:  
- Long-term financial planning and sustainable financing  
- Transport network is a basis for Finnish regional development and viability (taking into account fluent cross-border transportations);  
- Efficient logistics – contribution to competitiveness of companies  
- Fair competition on transport service market, elimination of barriers for competition environment;  
- Increasing share of public transport trips with simultaneous reduction of passenger car transportations  
- Reduction of need in movement due to de-centralization and integration of land use and transport development  
- Making regional planning decisions based on public transport infrastructure which forms a skeleton of big agglomerations and is a reliable service sector in sparsely-populated regions  
- Reduction of the number of killed in road accidents to 150  
- Functional inter-sector cooperation in the sphere of road traffic safety. | The more specific tasks are:  
1. Improving quality of transport services  
2. Holding transport service primary costs and transport cost component in the end price of products  
3. Increasing effectiveness, efficiency and reliability of transport operations  
4. Increasing competitiveness of transport services on the world market  
5. Improving transport operations safety  
6. Reducing negative transport impacts  
7. Eliminating “bottle-necks”, developing network capacity and fleet stock capacity  
8. Integration of different transport modes strategies for integrated transport system development and improved multimodality of |
The report takes into account Lapland’s specifics:

- Models of post-financing for the project of road access to Suurikuusikko and Kevitsa ore-dressing plants and potentialities to use these models on other objects
- Accessibility of tourist centers
- Using the benefits of Lapland geographical location and international cooperation.


The Strategy takes into account an increasing roles of the Northern sea ports, including that of Murmansk.

<table>
<thead>
<tr>
<th>Conclusions:</th>
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<tbody>
<tr>
<td>1. Quality of life environment and mobility of people and business provided with minimized local, regional and global level environmental impacts is at the centre of the Finnish transport policy. The single transport space goal in Finland is being achieved through EU membership and integration into TEN.</td>
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<td>2. The centre of the Russian quantity-oriented transport policy is the scaled geopolitical tasks, which will have a stimulating and catalyst impact on business and social development.</td>
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<td>3. Coordinated development of Lapland and Murmansk transport systems has opportunities of:</td>
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<td>- Quantity expansion of transport space of both sides,</td>
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<td>- Harmonization of common transport space performances,</td>
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<td>4. Promotion of a user-oriented ideology via the border, which will complement ideology of quantity growth and speed up transport infrastructure quality improvement on the Russian side.</td>
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### ANNEX 1.1.4

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<tr>
<th>№</th>
<th>Comparing basic objectives of Finnish and Russian transport development</th>
<th>Plan of the Finnish Ministry of Transport and Economic Development Programme till 2013 года (Liikenne ja viestintä 2013) in transport chapter are integrated, coordinated and based on the Report of the National Board on transport policy issues. According to the vision till 2013 the following is indicated:</th>
<th>Objectives and tasks of the Russian Ministry of Transport and its relation to Programme of economy development (up to 2015)</th>
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<td></td>
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<td>Comfortable user trips and business transportations that support competitiveness are smooth within the country and on international routes;</td>
<td>Objectives and tasks of the Federal Target Programme (FTP)“Russian transport system development 2010-2015” and Russian Transport Strategy till 2030 are oriented on scenario of innovational and socio-oriented development of Russia (draft socio-economic development programme till 2020) and are integrated and coordinated in the transport chapter. According to FTP: Russian transport system is modern and effective and helps to:</td>
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<td>Transportation safety is on a high level;</td>
<td>▪ Speed up product movement and reduce transport costs</td>
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<td>Transport system is sustainable environmentally, socially and economically.</td>
<td>▪ Increase accessibility of transport services for the population</td>
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<td>This middle-term vision is supported with more long-term objectives of transport system development till 2020:</td>
<td>▪ Increase competitiveness and contribute to using transit potential of the Russian territory</td>
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<td>▪ Transport system contributes to high welfare and business competitiveness due to more functional logistics of tourist and transport links within on the national level;</td>
<td>▪ Improve safety and reliability of transportations</td>
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<td>▪ Decisions on regional planning are based on public transport;</td>
<td>▪ Increase competitiveness of transport sector for investors</td>
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<td></td>
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<td>▪ Number of killed in road accidents shall be no more than 150</td>
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<td>▪ Inter-sector cooperation on road safety is well organized and functional</td>
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<td>▪ Amount of CO2 emissions will be reduced to 11,4 mln.t. till 2020 (15 % of 2005 level)</td>
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<td>▪ Decentralization of settling structure and integrated solving of land use and transport tasks reduces needs in transportations</td>
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<td>From the above the core long-term objectives are:</td>
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- Common social
- Common economic
- Common transport
- By modes of transport
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<tr>
<th><strong>Transport network covers all regions and supports their economic viability and development</strong></th>
<th><strong>Providing accessibility and quality of transport services for population in accordance with social standards of a developed community</strong></th>
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<tbody>
<tr>
<td>Efficient logistics compensate high transport costs justified by remoteness and severe climate, thus supporting business competitiveness</td>
<td>Providing accessibility, amount and competitiveness of services for goods owners on the level of innovational development of the economy</td>
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<td>Absence of discrimination and fair competition eliminate transport market entrance barriers. Finnish transport operators are competitive on international markets</td>
<td>Forming single transport space based on balanced development of all transport infrastructures and their integration</td>
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<td>Transport sector financing is stable and has a long-term planning horizon, while budget resources are complemented with other financing sources</td>
<td>Integration into world transport space and using transit potential of the country</td>
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<td>Finances is allocated for the measures that provide maximum efficiency and achieve best transport system performances now and then.</td>
<td>Improving transport system safety level</td>
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<tr>
<td><strong>Conclusions:</strong></td>
<td>Reducing transport impact on environment.</td>
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<tr>
<td>1. The transport system development objectives are coordinated with national socio-economic development programme objectives on both sides of the border.</td>
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<td>2. Russian objectives are oriented on scaled coverage and dynamics of coordinated development of transport system elements, while the Finnish ones – on further quality improvement of current performances.</td>
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<td>3. However, development of both transport systems generally aims at quality services to end users in a form of social guarantee to population and increased competitiveness to business.</td>
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<td>4. On the Finnish side the priority for transport is an initial integration of land use and transport planning, while on the Russian side this question is not stressed.</td>
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<td>5. Principal difference between objectives in long-term planning documents in Russia and Finland is supporting of free competition in Finland (according to the EU legislation) and supporting of protectionism on the Russian side (temporary as said in the documents) with the same common objectives:</td>
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<tr>
<td>• Increasing competitiveness of the Russian transport market</td>
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<td>• Increasing competitiveness of national transport operators (with prospect openness of the Russian transport market when accessing WTO),</td>
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<td>• Extending the list of transport services and development of its export.</td>
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<td>6. Coordinated development of Lapland and Murmansk regional transport systems is an opportunity to speed up increase of its competitiveness, service development and its export in real conditions of an expanding trans-border business.</td>
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<tr>
<td>Comparing basic objectives of Finnish and Russian transport development</td>
<td>The Finnish Ministry of Transport has developed The Programme for policy implementation in the sphere of reduction of anthropogenic impact on climate (Liikenne- ja viestintäministeriön hallinnonalan ilmastoliittisessa toteutusohjelmassa), 2009 The programme:  - Sets concrete objectives (indicators)  - Defines measures to achieve the objectives  - Evaluates potentialities and cost of emission reduction measures. The programme measures are firstly aimed at road transport with specific focus on passenger car transport as the main green-house gas emissioners (90%) are generated by road transport (with car passenger transport share is 60%). The programmes aims at transport policy that would contribute to less emissions of green-house gases in all types of activities, including that of population daily life. It is planned to additionally reduce emissions by 2.8 mln.t. by 2020 through usage of bio-fuels. The Ministry adapts its decisions on infrastructure construction and maintenance to:  - The need in minimization of transport activity impact on climate in order to achieve the objectives set, taking into account developing climatic changes  - Prepare to unfavorable climate changes and use favorable changes as an advantage for development.</td>
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Approved in 2009 “Climatic doctrine of Russia” declares general directions to reduce negative impact on climate where transport is mentioned as a sphere of energy saving development on infrastructure objects, including reducing energy losses when transporting.

Conclusions:
1. Relation of Finnish and Russian transport sectors to global problem of climate change is quite different. Finland is guided with global responsibility in its local actions, sets concrete objectives and applies real mechanisms for its achievement while Russia only declares general provisions. Environmental needs are not yet formed in the Russian community.
2. Strategic documents of Russian transport sector contain objectives to reduce **negative impacts of transport on environment**, but never set such a priority as **restraining climatic changes through policy that optimize transport needs** in all fields of economic and business activities as well as in daily life of population (through integration of transport and land use, increase of transport system effectiveness, increase of public transport attractiveness, etc.). The Finnish Ministry of Transport has an active and responsible position on environmental and climate issues transcending the transport sector and managing transport needs of the community (land use), regulating transport needs (legislation) and shifting them to more efficient modes of mobility (mass public and light traffic)).
3. Due to understandable reasons currently Russia is not able to focus both on quantitative and qualitative tasks. However, after quantity tasks there appear a need in solving the quality matters. Therefore acquaintance with the methods of solving quality tasks and creating favorable conditions to solve them in the most effective and efficient ways forming environmentally-oriented type of thinking are prerequisites for innovational and socio-oriented development of Russia and its integration to the community of world leaders.
4. Coordinated development of Lapland and Murmansk transport systems could contribute to the model that optimizes solving of quantitative and qualitative tasks in Russian environment, transferring of not only new technologies but philosophy of environmental responsibility of professionals as a precondition to implement potential benefits from modern transport technologies.
5. Joining resources for scientific-research work aimed at models forecasting impacts of climate change of sustainability of transport infrastructure functioning on transit routes could be a prospect direction for international cooperation within the Barents region.

**ANNEX 1.1.6**

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<tr>
<td>№</td>
<td>Comparing basic objectives of Finnish and Russian transport development</td>
<td>The Ministry of transport and communications has developed the National Strategy on intelligent transport (Liikenne- ja viestintäministeriön Kansallinen älyliikenteen strategia), 2009.</td>
</tr>
</tbody>
</table>
According to this the concept of intelligent transport shifts the focus of transport policy from infrastructure expansion to better user trip management and transportation logistics, thus increasing the role of operative management of transport infrastructure. Intelligent transport system (ITS) is a result of wide cooperation of public and private sectors and implementation of numerous measures in this field. The priority directions of intelligent transport development are:

1. Improving quality of informational services and environmentally friendly user transport activity
2. Road traffic safety
3. Traffic smoothness/fluency
4. Increasing logistics efficiency
5. Developing intelligent transport service market
6. Updating the plan of transport infrastructure development.

To implement the above and fill the strategy with concrete programmes and project working groups are formed.

The provision of transport users are as follows:

- Implementation of Russia’s transit potential
- Safety and sustainability of transport system
- Development of intelligent transport service market
- Reducing costs of transport operator interaction with public controlling bodies.

The federal target programme “Development of Russian transport system (2010 - 2015)” provides for development of intelligent systems based on telecommunication and information technologies and system GLONASS (ГЛОНАСС).

The document «Basic principles of the Russian national policy in the Arctic till 2020 and further” (2009) also provides for usage of Glonass and multi-target space system to support single informational space, forecast hydro-meteorological changes and navigation conditions for the functioning of the Northern Sea Route and inland transport infrastructure. At the end of 2009 the 1st conference “Intelligent transport 2010” was held and the memorandum was developed to indicate the need in a consolidated position on intelligent transport system issues based on international experience. The results of the conference should be:

- Factors impeding intelligent transport system development in Russia
- Proposals to form a common policy on ITS
- Vision of a common ITS architecture in Russia as a complex of legislation, standards, technical regulations
- Concept of a law “About national system of transport complex informational support”
- Amendments to the Transport Strategy till 2030.

1. Finland has developed a strategy on intelligent transport and set up groups for its implementation. In Russia there is no state policy on intelligent transport but some activity in this direction has started.

2. To implement Russia’s mission to become a bridge between Europe and Asia the Russian transport system shall be integrated (be operationally compatible) with the systems of neighboring countries by critical operational performances:
- Transport infrastructure,
- Traffic management system
- GPS and navigation.

3. Russian documents stress the need in development of informational space to support anticipatory development of transport infrastructure in the Arctic zone which creates a wide field for actions within the cross-border cooperation programmes in Barents region.

4. Joint development of Lapland and Murmansk region transport systems may become a pilot platform to “try on” the Finnish concept on intelligent transport in Russian conditions in order to adapt technologies optimally combining requirements to compatibility and correspondence to national conditions. The revealed needs in national adaptation changes will serve a task statement for Russian innovational developments.

5. The course for operational compatibility will allow eliminating the risk of obstacles for the Russian multi-modal transport system where fluent movement of informational and physical heavy vehicle and passenger flows (components of logistic processes) will help to increase international competitiveness of the Russian transit routes.
### ANNEX 1.1.7

<table>
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<tbody>
<tr>
<td></td>
<td>The Ministry of transport and communications developed (2010) a document «Future vision» (“Digitaalinen Suomi, uusi liikennepolitiikka” - Digital Finland, new transport policy) Liikenne- ja viestintäministeriö Tulevaisuuskatsaus. The document considers three alternative “governmental programmes” of transport and communication development. The represented alternative programmes are based on existing national resources and positions but extrapolate different scenarios of actions: 1. Progressive Finland would choose the way of moderate and stable development of transport and communications 2. Active Finland would choose technological development and assign its resources to innovational development in transport sector 3. Brave Finland would focus on chosen priority directions of transport system development. One may combine these alternative options. The documents stress development of transport links and cooperation forums of Barents regions.</td>
<td>The Ministry of transport in its strategy considers three scenarios of Russian transport system development till 2030: 1. Inertial scenario 2. Energy-raw production scenario 3. Innovational and socio-oriented scenario</td>
<td>Scenario #3 is considered as a base scenario because strengthening of innovational, social and environmental orientation is a key factor of Russia socio-economic development via innovational scenario – the only one real in a modern world. Implementation of this scenario provides for 2 stages: 1(^{st}) stage – quantity rising of facilities, including that contributing to development of natural resources and elimination of bottle-necks of transport infrastructure; 2(^{nd}) stage- forming common transport space in Russia integrated with transport systems of neighboring countries, implementing transit potential of the country, functioning as a bridge between West and East. Strategic documents stress orientation on development of transport infrastructure that contributes to development of new Arctic territories.</td>
</tr>
</tbody>
</table>

### Conclusions:

1. Development of transport system on both sides of the border in long-term dimension aims at innovational development and increased national competitiveness in global world that catches up a new technological wave.
2. Directions for the next 20-40 years economic development are:
   - ubiquitous introduction of resource-saving technologies
   - desire of the Asian countries to get access to resources
   - development of intercontinental transport, trade and informational infrastructures
- providing safety of all types based on new principles and technologies

3. These directions were reflected in transport strategies of both countries and this ensures correspondence with requirements of both economies and minimizes risks of short-sighted decisions

4. Joint development of Lapland and Murmansk regional transport systems could serve as a model for mutually complementary regional interaction, which could result in more active economies, higher competitiveness with all positive effects for social sphere and environment.
### FINNISH ARCTIC STRATEGY (2010)

- Improving conditions for business activities through development of transport logistics network, links and international cross-border points,
- Developing routes of the Barents region,
- Participating in harmonization of international legislative acts on sea navigation in the Arctic region.

The strategy stresses importance of:
- Developing joint strategic approach to develop transport system in the Barents Region and infrastructure of the Northern Finland as an integral part of the Barents region infrastructure;
- Coordination of West-East transport network development with Russia.

The document assumes increasing attractiveness of the Northern sea routes (due to climate change) in long-term period.

### RUSSIAN ARCTIC STRATEGY

The document «Basic principles of Russian national policy in the Arctic till 2020 and further» (2009) declares national interests which assume the Arctic as:
1. Resource base,
2. International cooperation area
3. Reserve area of unique ecosystems
4. Development zones of the Northern Sea Route

Among others the following objectives were set:
- Studies on improving sustainability of life support and production activity in extreme conditions;
- Mutually beneficial cooperation with Arctic countries
- Economic, scientific-engineering, cultural and cross-border cooperation within regional organizations, including Arctic Council and Barents Euro-Arctic Region Board
- Modernization and development of Arctic transport system infrastructure
- Organization of transit transport routes
- Improving quality of life for population and conditions for business activities
- Forming the system of safety insurance and traffic flow system, hydro-meteorological and navigation provision
- National support of activities aimed at development of resources, introduction of innovational technologies, infrastructure, improvement of customs regulation and attraction of non-budget financing.
The Transport Strategy oriented on innovational scenario of development defines the Arctic as a zone of advanced development of transport system. The chapter “Reforming the management system in the Arctic transport system” includes creation of conditions for the Northern Sea route functioning and supportive inland infrastructure forming.

Conclusions:
1. National interests of Finland and Russia are identical in the context of developing Arctic territories as zones of sustainable transport communications;
2. Russia’s motive – realization of transit potential of the Russian territory, activization of business and improvement of quality of life of population with simultaneous preservation of Arctic eco-systems;
3. Finland’s motive – providing entrance to world markets through Russian transit routes, activization of business and improvement of quality of life of population with simultaneous preservation of Arctic eco-systems. Finnish transport system integrated with the EU transport system is a transit territory that provides EU traffic flows on Arctic routes, basically on Northern Sea Route;
4. Joint development of Lapland and Murmansk region transport systems may become a pilot project to reveal specific tasks and decisions, which will initiate scaled process of multimodal transport development of the Arctic able to optimize trans-continental logistics Europe-Asia.
<table>
<thead>
<tr>
<th>No</th>
<th>Administrative reforms in transport and regional administrations in Finland</th>
<th>Administrative reforms in transport and regional administrations in Russia</th>
</tr>
</thead>
</table>
| Comparing reform processes in transport and regional administrations | Finnish transport system development plan is under the influence of administrative and reorganizational reforms (2010):  
- Part of functions of the Sea administration, Railway administration and Road administration were integrated within the Transport Agency;  
- The regional management reform has concentrated the of province administrations, employment and economic development centers, regional centers of environment protection, ecology centers, road districts and labor protection bodies in two new regional level authorities:  
1. **The Centre of economic development, transport and the environment (ELY)**, responsible for economic development, transport and environment issues;  
2. **Regional administrative agency (AVI)**, responsible for issuing of permissions and labor protection. | In 2003 Russia started targeted activities on administrative, budget reforming (pilot projects) and implementation of the Federal target programme “Reforming the government service in Russia (2003-05)”. This resulted in instrument contributing to transition of Russia to a market-oriented democratic state:  
- City planning code, №190-ФЗ (2004), art.28 – Public hearings, attraction of population to make planning decisions  
- About placing orders for goods/products supply, services for public and municipal needs, №94-ФЗ – promoting competition (in transport sector, too);  
- About concession agreements, № 115-ФЗ (2005г) – attracting investments for infrastructure modernization  
- About general principles of local government organization in Russia, №131-ФЗ (2003) – decentralization, increasing independence of at local level (including provision of population with the services of public transport);  
- other |
| | Reorganization was smooth enough but the Transport Agency will face the second stage of reorganization. | Currently the administrative reform in Russia is implemented according to the **Concept of administrative reform in Russia (2006-2010)** and «**Concept of administrative barrier reduction and better accessibility of public services for 2011-2013**»  
The reform objective is a compact, service-oriented state. The main directions for actions are:  
- reducing administrative barriers  
- improving quality and accessibility of public and municipal services. |
| | Concurrently with this some changes were made in legislation:  
**A) on regional development (2010)**, that defined:  
- Objectives of regional development  
- Tasks for planning |  

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**ANNEX 1.2.1**
• authorities responsible for execution.

New law has strengthened the role of regional unions when planning regional transport systems, which:
• are responsible for planning of transport system development, nature protection measures and natural resource usage;
• provide interregional cooperation and coordination of works
• coordinate and agree inter-regional decisions and decisions made on the level of provinces.

Б) on public transport (2009), which came into force simultaneously with the EU directive on public transport service regulation. The changes need a decade during which:
• a staged transition to the new system will be made
• responsibility for financing of public transport will be re-distributed between municipalities and the state. Municipality’s responsibility for organization of services will be increased.
• Municipalities, regional units and the state shall define target indicators for public transport development and decide if these indicators will be higher than those that would be in case of market influence. The EU directive defines ways of state regulation of market situation with extension of opportunities to improve quality of public transport services, its accessibility and attractiveness for users.

Focusing efforts on:
• «general system measures» - approving federal laws that would facilitate entrepreneurship (licensing, accreditation, self-regulation, notification order, optimization of controlling functions and public services), as well as user-orientation of public sector services;
• «sector measures» - improvement of public administration in a number of sectors for their complex optimization (including transport sector).

The concept is bound with other reforms:
• Optimizing state management (developing informational society and resistance to corruption)
• Increasing efficiency of budget costs
• Reforming public service
• Developing inter-budget relations and improvement of separation of duties
• Logics of improvement under the Concept: problem analysis – “as is”, vision “as it should be”, development of mechanism of movement from one stage to another. The Logics is recommended for application on regional level.

Innovation for the public administration:
Evaluation of regulation impact (ERI) – identifying the risks and deficiencies in the documents during the development stage through public consultations with representatives from business and civil society.
Since 2010 the Department of ERI started its work within the Ministry of Economic Development: it prepared 37 conclusions, among which 18 are negative.

Further development:
• Applying ERI procedure to earlier developed documents
• Distributing ERI on regional and municipal levels of administration

Focus on efforts:
• «general system measures» - approving federal laws that would facilitate entrepreneurship (licensing, accreditation, self-regulation, notification order, optimization of controlling functions and public services), as well as user-orientation of public sector services;
• «sector measures» - improvement of public administration in a number of sectors for their complex optimization (including transport sector).
Monitoring of indicators of regulation objective achievement

ERI is recommended for application on regional level with methodological support of the Ministry of Economic Development.

The Programme of monitoring studies has been implemented in Russia since 2008. In 2010 – monitoring of socially important services for population and business. It aims at evaluation of costs related to public and municipal services, including that in the regions; actions to reduce these costs. In 2009 a common portal of public and municipal services was opened (www.gosuslugi.ru). Similar portals are functioning in 55 regions of Russia. The Murmansk region is among them (www.gu.gov-murman.ru)

Conclusions:

1. Administrative reforms in Finland aimed at strengthening of regional units and integration processes on EU level has changed organizational and financial procedures and contributed to integration of state structures, thus expanding their system functionality, optimizing costs and increasing responsibility of public bodies in respect of:
   - Productivity of existing transport systems restraining its expansion;
   - Quality of services of mass transport attracting users to the public transport;
   - Safety and environment-friendly nature of transport systems contributing to achievement of national and supra-national goals (EU).

2. Administrative reforms in Russia have started in 2003 and the result is evident. A package of federal laws has been prepared providing a basis to achieving the goal – deregulation, strengthened independence of regions and municipalities, more user-orientation, further democratization of the society and economy development under innovational scenario. However, practice confirms the rule – enacting legislation doesn’t guarantee success of the reforms if there are no effective mechanisms of implementation. The results of reforms critically depend on the way of implementation. Among the restrictions impeding the reforms in Russia, regions and sectors the following factors are usually mentioned:
   - Human factor (needs in development of new programmes and training of civil servants),
   - Budget process (need in modernization of budget implementation mechanism),
   - Institutional relationships (need in re-engineering of administrative –management processes and optimization of organizational structures of public administrations).

3. The above restrictions result in substitution of real mechanisms of reform implementation with its imitation in the regions and sectors, including transport sector. As an executive authority is a system, success in one separate section loses its value because of stagnation on the others.
Development of separate region or sector depends on dynamics of complex reforming in a scale of country, including administrative reform, public service and budget sphere reforms.

4. Typical peculiarity of the Russian reform is transfer of a number of power/authorities (functioning of transport infrastructures, providing population with public transport services) on a level of municipalities without provision of these powers with necessary resources – policies and supportive programmes (improving qualification of personnel, recommendations, guidelines to improve productivity, safety, environment compatibility, introduction of informational systems, etc.).

5. Reforms in Finland and Russia have a series of principal distinctions due to different quality level the reforms have started from. However, the critical difference (from the position of transport) is a relation to the process of regionalization. If in Finland regionalization is one of the core focuses of reforming while in Russia reforming is still measured as a sum of reforms in separate regions. Importance of regionalization (for improvement of national competitiveness on external markets) as a phenomenon of globalization is stressed only in the Strategy Concept of socio-economic development of Russian regions, Ministry of regional development (2005). National thinking within the regional borders is risky for the forming of optimal transport system (critically important on a stage of quantitative growth) and therefore risky for optimization of budget expenses and logistic costs of business, realization of transit potential, reduction of negative transport impacts on environment and climate.

6. The process of Lapland and Murmansk transport systems coordination represents an opportunity to expand the vision beyond the administrative limits and assist to the processes of: regionalization, overcoming of barriers and limits, development of reform mechanism, including that of transport. The possible directions are adoption of experience and mechanisms of enhancing transport infrastructure and public transport effectiveness and efficiency, safety and environmental compatibility, implementation of rights of all user categories to be mobile, etc. within the motorized democratic state with market economy.
<table>
<thead>
<tr>
<th>№</th>
<th>Development objectives of Lapland (up to 2030)</th>
<th>Development objectives of the Murmansk region (up to 2025)</th>
</tr>
</thead>
</table>
| **Comparing development objectives of Lapland and the Murmansk Region** | Long-term goals and development strategy of the lapland province are represented in the **Strategic Programme of the Lapland province development till 2030**, which is implemented with annual action plans. The Programme sets key points for achievement:  
- Lapland is a prosperous province inhabited by 195,000 people and is world known by its nature, culture and high creative potential, having a reputation of the region attractive for investments.  
  
**Lapland vision – 2030: Lapland is a region:**  
- Attractive for new inhabitants, tourists, business  
- Desirable national and international business-partner  
- with primeval nature and resources for tourism, industry and energy development based on sustainable usage of natural resources  
- with active cultural life that creates a recognizable brand for the province  
- with high creative potential that allows development of ne know-how, participate in international innovation networks.  
  
The basic Programme directions are:  
1. Products of local raw material processing and enterprises, impressions, energy of Lapland nature  
2. Innovational decisions and training – attraction of specialists  
3. Diversification of the province economy – searching for employment in rural districts  
4. Welfare through services, environment, culture of | Long-term goals and development strategy of the Murmansk region are represented in the **Murmansk region socio-economic development strategy till 2025**.  
  
**Murmansk region-2025 vision:**  
1. The Murmansk region is a site for dislocation of system of technological ports that form a logistics node specialized on shelf development, ocean bio-resources and safety in the Arctic; studies and development of Arctic technologies  
2. The regional economy is defined with **clusters**:  
- Mining and smelting  
- Ocean bio-resource extraction  
- Searching and developing new resources  
3. Nature, landscapes and unique climatic resources are involved in economic turnover within eco-, sport- and tourism routes – tourist products that are competitive on the world market  
4. Erasing sharp boundary between “constant” and “temporary/ shift team” population by value for the economy/ provision of services  
5. Stabilization of population with high mobility (labor and educational migration)  
6. Living environment of Murmansk, Kirovsk, Apatity, Polyarnye Zori, Kandalaksha is modernized, creative and corresponds to new types of activities and people mobility. It is able to attract and hold active and talented people.  
7. Energy is of distributed character and based on CO2-neutral sources (energy of atom, wind, flow) and is complemented with sustainable and safe |
highest quality
5. High level of transport system services
6. Brand “Lapland” as an advantage in a competition, which increases effectiveness of communications in the world market.

The Lapland Strategic Programme is based on:
- Lapland accessibility provided with different modes of transport with inexpensive costs;
- Project implementation in ore-dressing plants and wood industry, reliable functioning of industrial logistics taking account tourism tasks;
- Comfort of living environment provided with quality road network and sufficient services of public transport;
- Barents Region Logistics Centre on the basis of transport infrastructure and Kemi-Tornio services.

Transport system and informational society development is expected to provide:
- Higher safety and environmental compatibility through dynamic development of railway transport in accordance with the needs of Lapland ore-dressing plants and tourism sector.
- Better correspondence with tourism industry needs through electrification of Kolari and Kemijarvi railways with extension of Kolari line to Yllasa and Levi.
- Taking into account the needs of forest industry when transporting timber for construction of railways for ore-dressing plants.
- Satisfying the needs of industry in goods transportations through development of Kemi-Tornio region ports (port Ajos, port Roytta in Tornio).

network that helps to optimize energy consumption
8. Public administration is compact, effective, reportable and opened for up-to-date administration technologies, communications and remote access to public services.

The basic direction for development are:
- Strategic investment projects (Stockman deposit, Murmansk transport node, construction of new ore-dressing and mining plants)
- Clusters along strategic projects (extracting resources on the shelf, development of ores, logistics)
- Restoration of traditional fish industry
- Tourism (mountain skiing – Khibiny, Apatity, Monchegorsk, Kandalaksha, Polyarnye Zoru, Murmansk; forest, fishing, waterway, ethno-cultural, cruise, informative and business tourism)
- Restoration of agro-industrial complex and food industry
- Traditional types of management and cultures of the Northern people (rain-deer breeding)
- Development of city spaces (new types of employment, better quality of city environment and infrastructure, environmental compatibility, development of high-speed external passenger transport, new opportunities for development)
- Innovations (modernization of the university, innovational “belt”, network knowledge centre – bio-ocean resources and energy, shelf resources, Arctic eco-systems, climate change, studies for the mining complex, professional education)
- Culture and health as a foundation of human capital: forming the policy in culture, healthy way of life)
- Procurable and comfort housing: new technologies,
- New direct links with neighboring regions and basic foreign tourist centres
- Developing high-speed railway link between Southern Finland and Lapland (+flexible pricing policy)
- Developing logistics centre Tornio-Haparanda for the Bothnic Arc (Northern part of the Bothnic Gulf) to improve passenger railway transportations
- Sustainable and safe road transportations through improvement of road condition and maintenance
- Improved low volume roads (important for wood industry) and private roads maintenance effectiveness and efficiency
- Developing base network for motor-sledge traffic
- Preserving regional network of public transport, improving services in cities (through better land use decisions, sufficient public financing, extended practice of combined trips and transport chains, distribution of public transport services by call-in
- Better access to telecommunications for population, business and public organizations (99% of Lapland population will have equal access to Internet at 100mb/s by 2015)
- Developing electronic services and communication network services, phone communications and digital TV.

Participation in international project within Barents region provides for:
- Linking railway networks of the Northern Finland and the North-West Russia (reconstruction o the railway section Kemijarvi-Salla, construction of a new section to the Murmansk line)).
- Railway connection with coastal area of Norway
- Reconstruction of roads leading to cross-border development of housing market, production base, investment process, the programme “providing of young families with houses”
- Modernization of social infrastructure and services: prophylactics, remote services of healthcare sector, education and social support, optimization of budget sector, development of non-budget setor of services, support of individual categories of people
- New (CO2-neutral) energy: using local potential. The Kola AES is a structural element, modernization
- «Big environmental project» - solving the inhereted problems by attracting inernational resources, creating a new image of territory
- «Murmansk is a strategic centre of Arctic development»: place for discussions, informational, trade and economic, intelligent and cultural exchange; international brand.

Transport infrastructure development is expected to provide:
1. Development and modernization of external high-speed passenger transport, which will assist involvement of the region into the global economy:
   - Development and modernization of Murmansk and Apatity airports, extencion of the route network of regular and charter flights, construction of shuttle-sectors
   - Development of transport-change complex on the basis of railway and sea stations in Murmansk
   - Restoration and modernization of local aviation

2. Implementation of the project «Murmansk transport node», development of the port and accesses to it
3. Development of road network in direction of tourist districts and Teriberka;
Conclusions:

1. Long-term development of Lapland is provided with the instrument – the Development Programme till 2030 oriented on increased investment attractiveness and minimization of investment risks to be able to realize potential of new geopolitical opportunities and existing resources of Lapland.

2. The Murmansk region has an approved Development Strategy which considers development scenarios as responds to the regional challenges. Implementation instruments (programmes) are currently absent. Series of important programmes (focused on small business development, innovational and investment activities) that were in force some time ago has finished and new programmes are of need now.

3. Joint development of Lapland and Murmansk region transport systems could contribute to development of programmes in the sphere of transport – critically important instrument of strategy implementation. Application of modern approaches and orientation on high standards of safety, environment compatibility, quality of services to the users is required when developing these programmes. E.g. – Public transport development programme, transport logistics cluster development programme, road safety improvement programme, development programme for road-side service on tourist routes, etc. Development of any of the above programmes may be a pilot project for technology transfer and cooperation development within the Barents region contributing not only to solving of one single task but to the general improvement of Murmansk region investment climate. Know-how transfer to develop the programme, which would meet the international standards, may become one of the components of the future ENPI project.
### ANNEX 1.4.1

<table>
<thead>
<tr>
<th>No</th>
<th>Regional structure and development zones and corridors passing through the territory of Lapland till 2030</th>
<th>Regional structure and development zones and corridors passing through the territory of the Murmansk region till 2025-2030.</th>
</tr>
</thead>
</table>
| Comparing regional structures, development zones and corridors, passing through Lapland and the Murmansk region | The strategic development programme of Lapland till 2030 defines the province regional structure characteristics:  
- For Lapland sparsely-populated settlements and long distances are typical (6 big settlements and 21 municipalities).  
- Currently the most Northern of the Finnish development centres is in Oulu. It is proposed to take a course for transformation of the regional structure in such a way that employment centres could be distributed more even in the province to reduce transportation distances.  
- Opportunity to use benefits of Lapland location as a part of the Northern Calotte and the Barents Region.  
**Dynamics:**  
- Youth migration to other regions while searching jobs  
**Lapland development process vision:**  
- Development shall meet the province interests while all the development subjects with its strengths and roles shall be considered as important elements of a single cooperation network.  
As a result:  
- Lapland shall become attractive for tourists, organization of new forms of business and investments.  
- Activity and employment centres are districts of | The Strategy of socio-economic development of the Murmansk Region till 2025 defines the regional structure characteristics with concentration of most activities, population and social services in 2 areas:  
1. Murmansk and 5 ZATO (limited access autonomous territories): Severomorsk, Alexandrovsk, Zaozersk, Vidyaevo, Ostrovnoy.  
2. Olenegorsk, Monchegorsk, Apatity, Kirovsk and Polyarnye Zori.  
Other territory – Lovozersky, Kandalaksha, Kovdorsky, Tersky, Kolsky and Pechengsky districts – are sparsely populated areas and are poorly provided with social services.  
**Dynamics:**  
- Reduction of population resulting in excessive engineering infrastructure in cities, energy consumptive and having no possibilities for optimization due to strict system centralization.  
- Cities don’t meet the requirement of quality of life  
- Orientation of social services on permanent population, lack of flexibility to meet the needs of newcomers (tourism, seasonal and duty specialists)  
- Population of mono-profile cities are hostages of city-forming enterprises  
- Low mobility of labor force due to poor transport infrastructure and long distances  
- Concentration of objects and activities dangerous for environment and health.  
**The state power mission is:**  
- Improving quality of life for population, social stability |
Rovaniemi and Kemi-Tornio, which complement one another but are original and unique. Dynamic development is given to the districts oriented on tourism and ore-dressing industry. Its development is a basis of positive processes in the province as a whole.

- Multi-profile municipalities are Kemijarvi, Sodankyla, Ivalo and Kittila.
- Central settlements of other municipalities still keep the basic set of services to provide comfortable life for population.
- Settlements with development potential are located on one-trip distance from the municipality centre.
- Dispersed settlement along main roads and rivers typical for Finland will be saved and intensified.

and opportunities for development and self-actualization.

Prerequisites for mission implementation:
- Sustainability of nature using,
- Improvement of human potential
- Economy diversification (traditional activity + new high-technological sectors)
- Optimization, modernization and development of social and engineering infrastructures.

Improvement of human capital requires attractive conditions for life and work, including:
- Modernization of cities
- Development of opportunities for self-actualization for the youth.

Basic tasks for the authorities:
1. Attracting investments
2. Promoting development of new sectors
3. City modernization
4. Human development (safety, health, education, self-actualization, social integration, values, responsibility, active position)
5. Levelling opportunities and access to infrastructure, services and social benefits
6. Modernization and development of infrastructure based on best technologies
7. Sustainability (eco-medium aspect, natural resources, population)
8. International cooperation (Barents Region)
9. Forming positive and bright image of the Murmansk region

Conclusions:
1. Lapland development vision is oriented on leaving the traditional status of Northern periphery and becoming an active actor on national and international level. Development of global tendencies creates opportunities for successful fight for the basic resource of the province – population.

2. The Murmansk region visualizes new horizons for development and realizes vital need to shift to innovative and socio-oriented type of economy development. The economy structure traditionally oriented on extraction and initial processing of raw materials complicates solving of tasks and increases time terms. However, synchronization of regional objectives with the national ones creates opportunities to attract federal financing.

3. Despite difference in scales, the visions and objectives of Lapland and the Murmansk region are similar and are oriented on human, environment and infrastructures. These three components form a foundation for joint efforts to create better conditions for the next generations of both Northern territories.

4. Joint development of Lapland and Murmansk region may contribute not only to improved transportations. The transport infrastructure is known to give powerful multiplicative effect and provide direct and catalyst effects in time, space and community accelerating solving of all economic and social tasks. Moreover, international cooperation is one of the factors to overcome provinciality, strengthen human potential, create an environment, which is more interest, enriched with events and able to refrain creative people from migration to other regions, concentrate them through development of creative space as a powerful potential of economic development.
### ANNEX 1.4.2

<table>
<thead>
<tr>
<th>No</th>
<th>Development zones and corridors of Lapland, 2030</th>
<th>Development zones and corridors of the Murmansk Region, 2025</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Comparing development zones and corridors passing through Lapland and the Murmansk Region</strong></td>
<td><strong>Priority directions of economic development of Lapland are:</strong></td>
<td><strong>Regional economic development priorities according to the scenario that corresponds to the national course of innovational economy development provide for:</strong></td>
</tr>
<tr>
<td></td>
<td>Mining industry</td>
<td>1. Basement on existing city agglomerations;</td>
</tr>
<tr>
<td></td>
<td>Energy sector</td>
<td>2. Development of Murmansk as a centre of Arctic development, where numerous activities are concentrated: administrative, sea, fish industry, cultural, tourism, university;</td>
</tr>
<tr>
<td></td>
<td>Tourist cluster</td>
<td>3. Developing the Stockman oil-gas reserve, port transport-logistics complex and liquefied gas production plant in Teriberka;</td>
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<tr>
<td></td>
<td>Mining industry and tourism define the development zones (belts) and the tasks for transport system development. E.g. activization of ore-dressing plants in Lapland means higher volumes of railway transportations, which justifies construction of new railway links Salla-Sokli and Kolari-Pajala (Sweden).</td>
<td>4. Development of a mining-metallurgy and mining-chemical cluster, including new districts “South-Eastern Gremyakha” and “Sopcheozerskoye”;</td>
</tr>
<tr>
<td></td>
<td><strong>Prospects:</strong> Transport flow generation in the Barents Region as well as opening of the Northern Sea Route for traffic will change the Northern Europe transport system, sea trans-continental connection routes and geopolicy of Lapland, which gains a potential of a “logistics intersection” of all modes of transport. To use this potential the Strategic Programme of Lapland province development till 2030 considers the following development zones and corridors:</td>
<td>5. Development of transport-logistics cluster on the basis of the Murmansk transport node, including:</td>
</tr>
<tr>
<td></td>
<td>1. <strong>Kemi-Tornio development zone</strong>, where Tornio is a single one railway link between Finland and Sweden where international goods flows meet each other. Cross-border trade contributes to integration of Tornio (Finland) and Haaparanda (Sweden). Investments to logistics will stimulate development of this zone as one of the logistics nodes of the Barents Region.</td>
<td>• Construction of a complex for coal and general cargos processing (20 mln.t./year)</td>
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<tr>
<td></td>
<td>2. <strong>Port zone (belt) of the Northern part of the Bothnic Gulf</strong> – entrance to European sea ways. Therefore the arc stretching along the North of the Bothnic Gulf is a transport-industrial belt that functionally integrates coastal city agglomerations of Finland and Sweden. Together with industry, trade and logistics, the belt has become development zone for energy sector. Among big energy project the following can be</td>
<td>• Construction of a complex for oil and oil-products processing (35 mln.t./year)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Construction of an oil processing plant (6 mln.t./year)</td>
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<tr>
<td></td>
<td></td>
<td>• Construction of a container terminal (1 mln.TEU)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Reconstruction of a coal terminal (9.6 mln.t./year)</td>
</tr>
</tbody>
</table>
mentioned: bio-fuel production plant (Kemi), AES of the company Fennovoima (Simo). Availability of airports, passenger railway connections and quality road network create opportunity to develop this belt as a tourist development zone but this requires construction of a new railway link from Kolari to Yllasa and farther to Levi.

3. **Western Lapland development corridor**, which goes along the border from Kemi-Tornio to Anontekio following to Norway and Arctic Ocean. Inside this corridor in a valley Tornionlaakso a specific zone of cross-border cooperation between Finnish, Swedish and Norwegian municipalities is located.

4. **Corridor of the Arctic Ocean** passes from Kemi-Tornio through Rovaniemi and Sodankyla to Ivalo following farther to the coasts of Norway and Russia. Corridor gives way to goods flows from Baltic sea to deep ports of the Arctic Ocean, perspective zones of oil-gas industry and also on the Northern Sea Route. Development of this transport-energy corridor is important for Finland and European countries. The corridor provides for construction of a railway connection to Kirkenes.

5. **The Murmansk corridor** connects arc of the Northern part of the Bothnic Gulf (Kemi-Tornio) through Rovaniemi, Kemijarvi to Salla and then to Russia to the railway Murmansk-St.Petersburg, thus integrating West-East direction territories of the Barents Region: Northern Norway, Northern Finland and Northern Russia. Corridor development requires logistics cooperation and restoration of the railway Salla-Alakurtti.

6. **North-East Finland corridor** – zone of interregional cooperation Lapland-Kuusamo. Municipalities of the Eastern Lapland develop the region Kuusamo-Ruka on several directions, mainly by tourism development.

Development zones and Corridors of Lapland 2030 are represented on Figure XX.

- Construction of logistics complex
- Modernization of railway and road accesses
- Development of the airport of Murmansk,
Conclusions:

1. In Lapland prospects are concentrated in development zones (belts) and along the strategically important corridors which, as a rule, integrate potentials of several countries or territories within the Barents region for maximum realization of potential through rising of system effect. This tendency corresponds to global process of regionalization.

2. The Murmansk regional Strategy till 2025 considers general questions of socio-economic development. To obtain the vision of prospect heavy traffic flow directions and volumes one should make the following step – develop transport strategy of the Murmansk region, which would take into account:
   - **Current** traffic flows generated by economy sectors and social sphere,
   - **Newly generated**, potential heavy goods and passenger flows, which will be generated by prospect big projects and clusters to be formed around them;
   - **Stimulated potential traffic flows** generated as a result of reviving of economic and then trade, cultural, scientific, educational and tourist types of activities;
   - **Attracted transit flows** as a result of improved transport infrastructure, harmonization of customs rule, improved transit competitiveness of the Russian transport system (especially when the Northern Sea Route will be opened).

3. Joint development of Lapland and Murmansk regional systems could join data on potential goods flows and calculate them within transport modeling. Modeling is an instrument to identify missing links, segments of transport infrastructure with limited capacity, and to form scaled vision of development needs and scale logistics optimization, identification of international infrastructure projects of common interest, prioritization to provide system effect and progressive increase of competitiveness of the whole Arctic transport system in interests of territories-participants. Cooperation within the Barents region is not only a unique instrument of joint answer to the challenges of future and acceleration of solving strategic tasks but also an insurance necessary for effective dialogue with international investment institutions.
### Comparing prospects of integrating the Lapland and Murmansk transport infrastructures with infrastructures of international transport corridors

<table>
<thead>
<tr>
<th>No</th>
<th>Lapland: International transport corridors</th>
<th>The Murmansk Region: International transport corridors</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Strategic programme of Lapland province development till 2030 is <strong>oriented on maximum usage of potentialities created by transport corridors</strong>, development of which is coordinated on international level. These corridors are:</td>
<td>The Murmansk region development strategy till 2025 is focused on transport infrastructure projects within the region borders. The key project is the Murmansk transport node. However, orientation of the Russian transport strategy till 2030 on integration to the world transport space and usage of transit potential sets concrete objectives:</td>
</tr>
<tr>
<td></td>
<td>- «<strong>Barents Link</strong>» - corridor being planned on the basis of railway infrastructure implements the EU concept “Northern trans-national transport axis”. BarentsLink route starts in the North of Norway and Sweden (Barents transport-logistics platform formed with the Northern ports) and follows through Finland (Lapland, Oulu, Kajaani), then crosses EU/Russia border (North-West Russia) and farther to Transsib. Transit flows are oriented to the ports of Pacific transport-logistics platform and transport systems of developing industrial regions of the South-Eastern Asia. Some elements of this corridor exist, some – have a status of scaled infrastructure projects of future.</td>
<td>- Development of transport corridors passing through the Russian territory and attraction of transit international flows to them;</td>
</tr>
<tr>
<td></td>
<td>- «<strong>Sea arterials</strong>»: The Concept that integrates the Baltic sea ports with the transport system of Central and Western Europe. Corridor development means optimization of logistic chains with participation of sea and inland transport, thus improving competitiveness of the Baltic sea ports, including that in the Northern part of the Bothnic Gulf. For EU countries importance of the Baltic sea is increasing, also due to increasing transportation volumes of Finnish ore-dressing industry and European energy system development (“Northern flow” pipeline). Smooth functioning of ports and sea transport are of critical importance for</td>
<td>- Introduction of <strong>technical and technological parameters of international transport corridors on the Russian territory to provide their international competitiveness.</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Therefore every transport infrastructure object that puts a claim for federal support shall be evaluated from the position of achievement of the above objectives.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The Strategy stresses that development of international transport corridors require:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Compliance of the corridors to the international classification</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Support of international technical, technological, customs, informational and logistics standards including all modes of transport serving the corridor routes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Provision of international competitiveness of services, safety level and efficiency of goods and passenger transportations</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Bearing capacity of roads within the corridors for all year round traffic with axle loads up to 11,5 t per</td>
</tr>
</tbody>
</table>
competitiveness of the periphery and transport-dependant Finland. Implementation of province potentials requires consideration of all logistics alternative.

- **Northern Sea Route**, which may become more favorable for shipping due to climatic change – is one of the Lapland’s alternatives. This Arctic sea corridor is able to reduce shipping time between Europe and Asia by 10 days. Railway connection between the ports of Baltic sea and Arctic ocean through the Finnish territory may become a logistics chain of a trans-national multi-modal corridor between Europe and Asia via Northern Sea Route (NSR). In this case Finland would become a transit territory serving European goods flows following to the Northern Sea Route. Restoration of the railway Salla- Kandalaksha increases the number of logistics alternatives contributing to specialization of ports within the Barents transport-logistics platform. Port specialization is a way to improve quality, efficiency and cost optimization of the Northern ports functioning in more complicated natural and climatic conditions and therefore a way to improve NSR competitiveness in comparison with functioning corridors of latitudinal direction.

International corridors of the Northern Finland are illustrated on the Figure X.

- Availability of high-speed railways and roads within the international corridors

During the period till 2025 the following will contribute to forming of the North-west Russia corridors:

1. **Railway transport**: construction of links Petajarvi-Kamennogorsk, Murmashi-2 – Lavna, construction of the second bridge over Shuya river in direction to St.Petersburg; development of St.Petersburg and Murmansk railway nodes;
2. **Road transport**: improving conformity of roads to international requirements including reconstruction of M10 “Russia”-road (Moscow-St.Petersburg), “Scandinavia” (St.Petersburg-Vyborg– EU/Russia border), M8 “Kholmogory”, M18 “Kola”, reconstruction of road accesses to the border in the Leningrad, Pskov and Murmansk regions and republic of Karelia;
3. **Air transport**: modernization of airports St.Petersburg, Kaliningrad, Murmansk, Petrozavodsk, Arkhangelsk, Syktyvkar, Vorkuta, Naryan-Mar, Amderma, Usinsk, Ukhta.
4. **Sea transport**: modernization and construction of port terminals, including Murmansk transport node, construction of the terminal in Teriberka.

In 2016 - 2030 development of international corridor infrastructure in the North-West Russia will be continued with:

- Modernization of road network within the Murmansk transport node;
- Construction and reconstruction of road sections forming the shortest routes, Syktyvkar-Arkhangelsk-EU border;
- Modernization of border-crossing points on the EU/Russia, increasing its capacity 2.5 times at minimum;
- Development of inland infrastructure for the airports in Komi, Nenets autonomous area, Arkhangelsk and Murmansk regions;
- Construction and reconstruction of ports of Arkhangelsk, Murmansk, Primorsk, Vyborg, Vysotsk, Ust-Luga, Kaliningrad, Baltiysk;
- Development of the Northern Sea Route and infrastructure of the Arctic ports.

Conclusion:

1. Lapland has developed a transport system strategy oriented on implementation of its geopolitical location potential, which corresponds to strategic tasks to develop the province, Finland and EU in line with global trends. Interests of the province take into account processes that take place far away the province’s administrative borders and define foresight of decisions on local level.

2. Lapland transport system development specifics is stipulated by:
   - Integration of Finnish transport infrastructure development with that of neighboring Barents Region countries, synchronization of common interest infrastructure projects to achieve maximum system effect for investment payback, rising direct, stimulation and catalyst impact on socio-economic development of the province.
   - Orientation on market diversification, extension of logistics alternatives and minimization of transport externalities. For Lapland reduction of transport costs is extremely important as good logistics is able to compensate such weaknesses of the province like its periphery location and high operational costs due to severe climatic conditions.
   - Avoiding concentration of resources on mega-projects, preferable distribution of investments in development zones in order to support network principle of transport infrastructure development to provide: more homogeneous regional structure and settlement system, conditions for economic development and employment in municipalities and settlements, high living environment quality with minimized anthropogenic stress for susceptible Arctic ecosystems.

3. The Murmansk region has no yet its transport strategy that would consider the following future tasks:
   - Balanced development of all types transport infrastructure to facilitate solving of strategic socio-economic tasks of the Kola Peninsula;
   - Integration of regional transport infrastructure to the system of international transport zones and corridors to use maximum potential in attracting international traffic flows.

4. Incompleteness of the Russian transport infrastructure, necessity to solve quantitative tasks, limited applications of strategic planning instruments (flow modeling) make it currently impossible to optimize routes of future transport corridors on the Russian side. However, the course towards integration of the Russian transport system to TEN system (while Lapland system is a part of it) allows discussions on optimal transit routes with the Barents Region partners who are interested in competitiveness of Russian transport corridors and development of logistics services not less than
Russian partners themselves.

5. The Russian transport strategy reveals all necessary farsighted political backgrounds for joint planning:
   - Urge towards minimized border effects through increased cross-border points capacity, fluent EU/Russia cross-border traffic flows, and safety;
   - Introduction of engineering and technological parameters for future Russian corridors (development zones) harmonized with parameters of international transport corridors;
   - Development of bearing components of infrastructures by network principle with system integration of the Baltic sea ports and Arctic ocean that support the Northern Sea Route;

6. Border location of the Murmansk region gives opportunities to develop integration transport strategy that would identify competitive logistics alternatives to use transit potential and meet the needs in balanced development of infrastructures of all types. Joint planning of Lapland and Murmansk regional transport infrastructures may initiate this mutually beneficial process that meet national interests of both sides.
### ANNEX 1.4.5

<table>
<thead>
<tr>
<th>No</th>
<th>Challenges and basic factors defining development of Lapland transport system</th>
<th>Challenges and basic factors defining development of Murmansk Region transport system</th>
</tr>
</thead>
</table>
|    | The Plan of Lapland Strategic development (till 2030) singles out the following **main tasks of the province transport system development**:  
1. user-orientation  
2. contributing to improvement of economy competitiveness and welfare of the province population  
3. reducing negative transport impacts on environment.  
The main factors that define the boundary parameters for planning of all regional level transport systems in Finland (incl. Lapland) are:  
- **Reducing total negative anthropogenic impacts on climate** as a response to the main challenge of Finland, taking into account national policy in the sphere of regional and transport planning;  
- **Improving road traffic safety** taking into account differences of the regions, peculiarities of daily population movements and impacts of safety on competitiveness of local economies.  
The objectives, regional structure, development belts and corridors presented in the Strategic Plan form an **ideological basis for Lapland transport system development**.  
The **framework of prospect regional structure of Lapland** is formed with:  
- Development belts, in the impact area of which the basic points are:  
  1. developing centres of Rovaniemi and Kemi-Tornio  |
|    | The Strategy of socio-economic development of the Murmansk Region till 2025 points out importance of success in development of infrastructure for socio-economic development of the region. However, the **tasks for transport system development are not set**, only strategic transport projects related to the Murmansk transport node development are defined.  
The basic factors that define the needs in development of transport infrastructure determine the needs of strategic mega-projects aimed at resource development, acting as an outpost and a transport node. However, **concrete border parameters** for planning of the regional level transport system are not indicated.  
Currently there is no an ideology of the Murmansk regional transport system development.  
The **framework of prospect regional structure of the region has not yet been defined**, meaning that the existing system of settling is concentrated in two zones:  
4. Olenegorsk, Monchegorsk, Apatity, Kirovsk and Polyarnye Zori.  
Saving the current framework of regional structure means saving of current transport infrastructure schemes with improved capacity of some links:  
- Accesses to the Murmansk transport node,  
- Routes to the cross-border points on EU/Russia and Norway/Russia borders, |
2. regional centres that are developing in complex with the nearest tourist and mining objects

The Lapland development policy is defined based on province interests jointly promoted within the network cooperation local authorities, business and civil society, where every participant has his own role and realises his own strengths in order to improve competitiveness of local business and quality of life of population.

Economic life of Lapland is being developed as a part of a more scaled regional partnership – the barents Region. International integration requires development of international transport corridors.

- Links with the shelf resource development objects (Teriberka).

The Murmansk Region development policy is defined not with the region’s interests, but with the interests of Russia (military-industrial establishment), big-scale business (GazProm, mining and smelting complex, etc.). The Strategy defines the mission in the sphere of strategic development of the region only for the executive power bodies. Using the potential of the network cooperation of local authorities, business and civil society aimed at improved competitiveness of local business and quality of life of population is not provided for.

Economic life of the Murmansk region is not considered in the Strategy as a part of economic life of a larger scale regional partnership - the Barents Region. Membership of the Murmansk Region in the Barents Region is limited with its participation in separate bilateral transport projects (Russia-Finnish or Russian-Norwegian ones) and with actions aimed at improvement of appropriate accesses to cross-border point. The Strategy mentions the need in joint efforts to increase sustainability of resource development and solving of social problems.

Conclusions:

1. The vision, objectives and tasks of transport system development on both sides of EU/Russia border are of different level of development and are of principally different ideology. The Murmansk Region contrary to Lapland has no its own well formulated ideology of the long-term transport system development.

2. Definition of Lapland’s strategic resources, zones of development and corridors that bind the development zones (belts) in a framework and distribute positive socio-economic effect within the province territory, “tune” the transport system up for prospect – serving of flows generated by basic zones of this future regional framework.

3. Concentration of development resources in the Murmansk Region is provided for in a limited number of points (mega projects). The transport system task is to serve access to these points. The Concept of multimodal transport infrastructure development as a network with future transition to a higher level – the system – has not yet been proposed.
4. The vision of the role of Lapland transport system in the Barents Region and in TEN allows to add prospect transit flows and national and international tourism flows to the current local ones. This allows to evaluate prospect needs in development of separate links of the network.

5. The need in linking of the Russian transport infrastructures into forming of common vision of the Barents Region transport system, evaluation of its prospects, current facilities and limitations for:
   - Defining of common network of traffic flow generators (development zones) on a geographical space of the Barents Region and optimize links between them,
   - Avoiding of unnecessary expansion of infrastructures (minimization of environmental stresses and maintenance costs),
   - Optimizing logistics (reduction of transport externalities of business to support their competitiveness and reduce transport emissions),
   - Providing access to new markets and local business services (taking into account prospect Russian accessing WTO),
   - Revealing projects of common interest and provide their joint promotion on international level (increasing investment attractiveness),
   - Better correspondence to the national strategic objectives: integration of Russian transport infrastructure with that of neighboring countries, development of international transport corridors, implementation of territory transit potential and increasing attractiveness of Arctic transport routes (including attraction of freight flows to the Northern Sea Route),
   - Distributing development impacts on bigger geographical spaces, involving depressive districts and mono-profile settlements and thus contributing to development of small scale business and diversification of local economies.

6. It is evident that development of the Barents Region transport system requires multi-side coordination, development of a common strategy and promotion of a network principle of development in the Murmansk and further regions.

7. Coordination of Lapland and Murmansk regional transport systems development may become an integration step to evaluate total amount and distribute traffic flows of different types: existing, newly generated and attracted from other routes in order to:
   - Identify the needed facilities of concrete links and nodes of the network that links different modes of transport,
   - Evaluate configuration of the future Barents Region transport system, that will be able to offer competitive logistic alternatives to the third country goods consignors.

8. The tasks of transport system development are known to be solved not only with investments into infrastructure and no only with efforts of administrations. System development is not possible without extended cooperation, consensus when setting priorities and coordinating the order of project and measure implementation.

**ANNEX 2.1.1**

<table>
<thead>
<tr>
<th>№</th>
<th>Demography situation in Lapland</th>
<th>Demography situation in the Murmansk region</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comparing demography situation and its impact on transport system functioning</td>
<td>The list of demography characteristics that hold back development of transport system in Lapland include: 1. decreasing of population</td>
<td>Population size of the Murmansk region is 842.45 thousand people (2009). During the last 2 decades population losses of the region</td>
</tr>
</tbody>
</table>
and development on both sides of the border – in Lapland and in the Murmansk region

2. development of processes of dense settling in big cities and deserting of sparsely-populated areas
3. fast ageing of population

During the last two decades (1990-2009) the population of lapland has decreased by 17 thousand people. Currently population size of Lapland (2010) is **183.7 thousand inhabitants**. Some 67 % population of Lapland lives in agglomeration in Rovaniemi and Kemi-Tornio. Further emigration of population to big settlements, cities and towns adjacent to tourist centres is forecasted within the province.

From 6 agglomerations only Rovaniemi has demonstrated population growth. Decreasing of population size and its ageing has the most unfavorable dynamics in municipalities Tornionlaakso and Itä-Lappi.

Ageing of population is an important signal for transport, as it means the increased need in:
- improved accessibility of transport system for all population user groups,
- advanced safety requirements,
- introduction of specific technical requirements on information clearness, simplicity, etc.

The objectives of the Strategic programme are (2030):
1. facilitate to stopping of unfavorable demographic tendency inside the province by providing mobility of inhabitants of sparsely-populated districts and mitigating the feeling of isolation;
2. prevent from emigration of population outside of the province by improving quality of life (reducing negative transport externalities and increasing mobility of all user groups) and create conditions where were 329,2 thousand inhabitants (28%), despite most of population lives in cities (92,1%). It is evident that if a Murmansk region citizen makes a decision to leave he emigrates outside the region. This emigration is complemented with natural losses of population due to different reasons. See Diagram 1 to this Annex.

**Road accidents** are among these reasons and are an important factor of above losses because most of killed and seriously injured in road accidents are active age people.

Together with population migration there are difficulties with attraction of “talented people” and “specialists” due to:
- reduction of labor market because of economic stagnation, mono-profile economy of most cities of the region, providing no opportunities for entrepreneurship or creative abilities of youth;
- unfavorable conditions to develop own business (See analysis in Annex 2.4.2)
- gap between existing city spaces to modern and prospect requirements of comfort, flexibility, variety and mobility.

The number of active population in the Murmansk region (2009) is high representing 522 thousand people because baby-boomers born in 1980-s have come to the age of adults. However, the number of employed in the economy has decreased to 482.2 thousand people. One of the reasons for that are difficulties with searching of work by graduated students. They leave the region for Russian megalopolis and sometimes abroad. As the numebr of born in 1990-s is small, the forecast is not favorable – reduction of active population and increase of elderly people.
for selfactualization, opportunities to have own business, etc.

3. promote attraction of new inhabitants to the province by optimal combination of high mobility and quality of environment, which is more often evaluated as an advantage quickly vanished in other countries and regions.

Target indicator for the province for 2020 is 188.0 thousand inhabitants (+4.3 thousand inhabitants to the level of 2009);
The target indicator for 2030 is 195.0 thousand people (+11.3 thousand inhabitants).

The target indicators are justified with:
- perspectives of mining industry and tourism development
- growth of vacancies on labor market due to population ageing and retiring on a pension.

This results in migration policy of the province – holding youth from emigration and attracting migrants to permanent place of abode.

Services of transport sector is an important argument that affects on quality of life and attractiveness of Lapland for migrants and native population.

| The Strategy (2025) provides for “erasing” the border between “permanent” and “temporary” population of the Murmansk region with means of: |
| - educational migration of youth (i.e. youth will prefer to obtain education in other regions) |
| - shift teams related to implementation of resource projects. |

Therefore main city centres that will serve extraction and processing of raw materials – Murmansk and city system Kirovsk-Apatity-Polyarnye Zori-Kandalaksha will experience most immigration and emigration flows of population.

The Strategy sets a task to modernize environment of Murmansk region settlements in order to intensify:
- variety of economic and creative opportunities for the youth, attract and hold youth and creative people.
- Stability of community and reduce inequality by creating equal access to infrastructure, services and public goods.

The Russian Transport Strategy provides for (2030):
- Increasing of passenger transportations by public transport where the main growth will be provided by road transport;
- Making the mobility indicators of the Murmansk region to meet those of the developed countries;
- Reducing discrimination on accessibility of transport services for different regions and social groups;
- Optimizing transport externalities of economy causes by transport
- **Focusing transport development** in cities where significant innovational and human capitals are concentrated.
Conclusions:

1. Lapland transport system is an active actor implementing the province policy aimed at improvement of demographic situation. Transport is looking for opportunities to contribute to mobility, accessibility, safety and environmental-friendly nature of transport services for the population, to adapt them for different user groups, e.g. elderly people. The task is set to improve quality and quantity of transport services and expand opportunities of mobility on the base of economically feasible measures. Transport of Lapland is not only adapting to demographic situation but it participates in its improvement, as an attractiveness of territories; dynamics of their economic and social development depends first of all on quality and quantity of transport services.

2. Transport of the Murmansk region is closed up on its own problems. There is no a word about user-orientation. The transport companies are interested in users only from the standpoint of paying capacity. User neglect is demonstrated in absence of any needs studies taking into account demography situation and needs of different user groups. However, even in cases when information is available (e.g. road accidents statistics) the problems are only fixed never transforming into algorithm of logic actions. The reason for this is a deep-rooted habit to wait for orders from above, dissociation, absence of coordination and cooperation between single components of the transport cluster. The Russian transport (including that in the Murmansk region) cannot be characterized as an active actor and conductor of demography policies because of its disability to:
   - React on long felt needs of the users
   - Prevent evident events, which will result in changes of user needs (e.g. population ageing, changing requirements of the youth, etc.).

3. Coordinated development of transport system of two neighbouring territories – Lapland and the Murmansk region – is an opportunity to provide smoothness of basic principles and professional ethics, which ensure success of transport business – user-orientation, primary attention to safety issues, environmental and economic efficiency issues. Statistics demonstrates significant «border effect» to be eliminated. See Table 1. Both territories have similar problems and it is rational to harmonize basic approaches to solving these problems because active position of transport to demography issues is a fundamental of its commercial success as this is services for the user that justifies transport’s activity. Therefore studies of user groups, their current and future requirements and activities to meet them in a best way (taking into account world experience) is a starting point for Murmansk regional transport complex development in accordance with modern and prospect needs.

### Table 1: Dynamics of birth rates, death rates and lifetime in the Murmansk region

<table>
<thead>
<tr>
<th>Year</th>
<th>Birth Rate</th>
<th>Death Rate</th>
<th>Lifetime</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>6.9</td>
<td>6.0</td>
<td>61.0</td>
</tr>
<tr>
<td>2011</td>
<td>7.2</td>
<td>6.0</td>
<td>62.0</td>
</tr>
<tr>
<td>2012</td>
<td>7.2</td>
<td>6.0</td>
<td>63.0</td>
</tr>
<tr>
<td>2013</td>
<td>7.4</td>
<td>6.0</td>
<td>64.0</td>
</tr>
<tr>
<td>2014</td>
<td>7.6</td>
<td>6.0</td>
<td>65.0</td>
</tr>
<tr>
<td>2015</td>
<td>7.8</td>
<td>6.0</td>
<td>66.0</td>
</tr>
<tr>
<td>2016</td>
<td>8.0</td>
<td>6.0</td>
<td>67.0</td>
</tr>
<tr>
<td>2017</td>
<td>8.2</td>
<td>6.0</td>
<td>68.0</td>
</tr>
<tr>
<td>2018</td>
<td>8.4</td>
<td>6.0</td>
<td>69.0</td>
</tr>
<tr>
<td>2019</td>
<td>8.6</td>
<td>6.0</td>
<td>70.0</td>
</tr>
<tr>
<td>2020</td>
<td>8.8</td>
<td>6.0</td>
<td>71.0</td>
</tr>
<tr>
<td>2021</td>
<td>9.0</td>
<td>6.0</td>
<td>72.0</td>
</tr>
<tr>
<td>2022</td>
<td>9.2</td>
<td>6.0</td>
<td>73.0</td>
</tr>
<tr>
<td>2023</td>
<td>9.4</td>
<td>6.0</td>
<td>74.0</td>
</tr>
<tr>
<td>2024</td>
<td>9.6</td>
<td>6.0</td>
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</tr>
<tr>
<td>2025</td>
<td>9.8</td>
<td>6.0</td>
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<tr>
<td>2026</td>
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</tr>
<tr>
<td>2027</td>
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</tr>
<tr>
<td>2028</td>
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<td>79.0</td>
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<td>2029</td>
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<td>80.0</td>
</tr>
<tr>
<td>2030</td>
<td>10.8</td>
<td>6.0</td>
<td>81.0</td>
</tr>
</tbody>
</table>

**Dynamics of birth rates, death rates and lifetime in the Murmansk region**

- **Per thousand inhabitants**
- **Expected lifetime, years**
Diagram 1  The Murmansk Region: Dynamics of demographic changes

Table 1  Comparing several socio-economic indicators of territories located within the impacts of the Northern Sea Corridor

<table>
<thead>
<tr>
<th></th>
<th>Northern countries</th>
<th>Russian territories of the Barents Region, incl.:</th>
<th>The Murmansk region</th>
<th>The Republic of Kareia</th>
<th>The Arkhangelsk region (incl. Nenets Autonomous Area)</th>
<th>The Republic of Komi</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. RESOURCES:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Territories, thous. km²</td>
<td>1173.3</td>
<td>1328.7</td>
<td>144.9</td>
<td>180.5</td>
<td>587.4</td>
<td>415.9</td>
</tr>
<tr>
<td>Population, mln.inhabitants</td>
<td>19.0</td>
<td>3.84</td>
<td>0.86</td>
<td>0.70</td>
<td>1.291</td>
<td>0.99</td>
</tr>
<tr>
<td>II. SOCIO-ECONOMIC INDICATORS:</td>
<td></td>
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</tr>
<tr>
<td>GDP of the territory, bln.$</td>
<td>831.2</td>
<td>16.5</td>
<td>4.1</td>
<td>1.9</td>
<td>5.5</td>
<td>5.0</td>
</tr>
<tr>
<td>GDP per capita, thous. $</td>
<td>41.8</td>
<td>4.1</td>
<td>4.7</td>
<td>2.8</td>
<td>4.2</td>
<td>5.03</td>
</tr>
<tr>
<td>Average lifetime, years</td>
<td>79.6</td>
<td>62.9</td>
<td>64.0</td>
<td>62.5</td>
<td>62.5</td>
<td>62.7</td>
</tr>
<tr>
<td>III. TRANSPORT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public road network length, thous. km</td>
<td>269.3</td>
<td>25.1</td>
<td>2.6</td>
<td>7.8</td>
<td>8.4</td>
<td>6.3</td>
</tr>
<tr>
<td>Railway network length, thous.km</td>
<td>26.8</td>
<td>5.1</td>
<td>0.87</td>
<td>0.70</td>
<td>1.78</td>
<td>1.76</td>
</tr>
<tr>
<td>Motorization rate (number of personal cars/1000 inhabitants)</td>
<td>445</td>
<td>205</td>
<td>192</td>
<td>195</td>
<td>129 (Nenets area)</td>
<td>232</td>
</tr>
<tr>
<td>Number of killed in road accidents</td>
<td>1059</td>
<td>751</td>
<td>115</td>
<td>132</td>
<td>272</td>
<td>232</td>
</tr>
</tbody>
</table>


### ANNEX 2.2.1

<table>
<thead>
<tr>
<th>№</th>
<th>The current situation and dynamic of change in Lapland economy needs</th>
<th>The current situation and dynamic of change in Murmansk region economy needs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Economy and logistic functional environment of transport</td>
<td>Economy and logistic functional environment of transport</td>
</tr>
<tr>
<td>Comparing economic situation and changes of future needs in transport services in Lapland and Murmansk region</td>
<td>The factors defining changes of external transport environment in Lapland are:</td>
<td>For decades the transport infrastructure of the Murmansk region has been adapted to the needs of traditional sectors of regional economy, most of which were raw material and port sectors. The prospects of the port are presented in detail in the megaproject of Murmansk Transport Node development and are not repeated here. Total generation of freight flows of big enterprises is evaluated in this work using the FRESBEE model. Small and middle scale business are out of the evaluation. Innovational scenario of Russia economy development (approved as a basic one within the Transport Strategy (2030) provides for non-raw resource way of economy development. The basis of this scenario is small and middle scale business. Therefore it is necessary to evaluate the transport needs of small and middle scale businesses for the transport sector. This Annex attempts to evaluate the needs of small scale business and compare its role in the structure of economies of Lapland and Murmansk region.</td>
</tr>
<tr>
<td></td>
<td>• Globalization, technologies, age structure and migration of population, changes in business structure.</td>
<td>Before comparing territories by volumes of small business and its contribution to economies of neighboring territories it is necessary to compare the notion “small business”.</td>
</tr>
<tr>
<td></td>
<td>The basics of Lapland economy are the following sectors:</td>
<td>Before the Federal Law ФЗ N 209 was put in force &quot;Concerning development of small and middle scale business in Russia &quot; (2007) the sphere of development and support had been regulated by the Federal Law ФЗ N 88 &quot;Concerning state support of small business in Russia &quot; (1995).</td>
</tr>
<tr>
<td></td>
<td>• Mining</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Timber</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Metal processing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• tourism.</td>
<td></td>
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<tr>
<td></td>
<td>These sectors:</td>
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<td></td>
<td>• define the requirements (directions of trips and loads);</td>
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<tr>
<td></td>
<td>• are characterized with high traffic volumes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• keep average statistic logistic costs despite longer distances;</td>
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</tr>
<tr>
<td></td>
<td>• affect structure of economy of every agglomeration and province as a whole</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• toughen requirements of business to logistics</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• increase loads on road network with further increasing of allowed loads of heavy transport (from 60 to 74 tones).</td>
<td></td>
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<tr>
<td></td>
<td>International border crossing points with Sweden and with Russia borders are considered as traffic flow generators.</td>
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<tr>
<td></td>
<td>Transportations are mainly concentrated on definite road routes involving arterial and collector roads.</td>
<td></td>
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<tr>
<td></td>
<td>Putting new ore-dressing plants into operation will result in:</td>
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</table>
increase of railway transportations which is the basis for railway lines construction (Salla-Sokli, Kemijärvi-Kolari).

Reconstruction of sea channel in Kemi

Timber sector sets requirements to different elements of transport system (all-year-round operation and capacity of main network, services of terminals).

95 % all enterprises of lapland is small-scale business, including “micr-business” (more than 50 %) with one entrepreneur working.

Against to heavy industry, small companies are dispersed along the province thus requiring the following from the roads:

- Permanent operable condition
- Wide assortment of transport services
- Developed telecommunication and electronic services within the whole province.

Tourism (which is a sector of small-scale business) becomes more and more important. The objects of attraction are tourist centres, which are more oriented on foreign clients. The critical question is accessibility of objects and tourist logistics. Additionally to traditional modes of transport (air, railway, road) tourism strengthens importance of light traffic infrastructure (walking trips, cycling trips, snowmobiles). Accessibility of these infrastructures is a resource for tourism development.

Climate changes, global economic changes decrease reliability of transport connections (especially air ones) and create risks for tourism development. Therefore importance of railway transport increases as it is more

<table>
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<tr>
<th>N 88-ФЗ</th>
<th>N 209-ФЗ</th>
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</table>
| The subjects of small scale business are commercial organizations in statutory fund of which the share of participation of Russia, Russian subjects, public and religious organizations (associations), charitable and other funds doesn’t exceed 25%, the share owned by one or several judicial bodies that are not subjects of small business, doesn’t exceed 25 % and in which average number of employees doesn’t exceed the following limited levels:  
- In industry - 100 people;  
- In construction - 100 people;  
- In transport - 100 people;  
- In agriculture sector - 60 people;  
- In scientific research sphere - 60 people;  
- In wholesale trade - 50 people;  
- In retail trade and domestic servicing of population - 30 people;  
- In other sectors - 50 people. |
| Micro-enterprise is a business with turnover less than 60 mln. RUR and number of employees not more than 15 persons, small enterprise – less than 400 mln.RUR and 100 employees, middle scale – less than 1 bln. RUR and 250 employees. |
reliable than air transport and more environment-friendly that road one. The question on the need to extend the railway from Kolari to Levi through Yllas is raised. Combining railway transport and light transport is an insurance for the tourist business.

During winter time good winter road and light traffic paths maintenance is critically important. For tourist important territories one more requirement is set to maintenance – protecting aesthetics of winter landscapes and views, as this is the first factor attracting attention of tourists to Lapland (according to inquiries of foreign tourists).

The trade:
- Small village shops are important for sparcely-populated districts – low class roads;
- Big market centres – for densely-populated agglomerations Rovaniemi and Kemi-Tornio and cross-border Tornio-Haparanda. Competition of commercial objects is active and busy and requires planning of transport system not only within national boundaries but taking into account cross-borderness of trade.

Energy sector: the plans to build Nuclear Power Plant in Simo, enterprise to produce liquid bio-fuel in Kemi-Tornio and condensation electric station in Rovaniemi. These objects will become a support of energy sustainable logistics and mobility.

The prospects:
- Transport infrastructure of the Barents Region and the Northern Sea Route re-distribute flows on the territory of whole Northern Europe and affect sea transportations on a global scale.
- Lapland has good prerequisites to become terminal region that will serve all modes of transport.

Comparing sectors of small and middle scale business on both sides of the border is not possible with formal statistics because it is impossible to label enterprises as small ones is not comparable.

Dynamics of changes of small business sector is represented in Table 1 «Development of small and middle scale business in the Murmansk region» to this Annex.

Statistics of small scale enterprises and employment is shown on Diagram 1.
In Kemi-Tornio there are international corridors that play a role of development corridors. Development of port and continental logistics will promote forming of Barents transport-logistic platform linked with world transport arterials.

The low class roads that provide mobility of small business are most critical from the standpoint of economy mobility and population employment.

Conclusion:

1. Tourism is one of the strategic sectors of Lapland competitiveness of which depends on small business. Mobility and efficiency of small business is defined first of all with conditions of roads and light traffic infrastructure. Corresponding measures are included in the Strategic Plan of transport system development in Lapland. Investments into infrastructure will be paid back through more tourist services, earnings to the budget and employment for inhabitants of Lapland thus preventing from emigration to other places.

2. Analysis of policy pursued in Russia/Murmansk region during the last two decades demonstrates its impact on changes in the sphere of small business and allows to conclude that longterm stable policy aimed at small business development hasn’t been formed. Small-scale business in the Murmansk region is alive not due but despite of. Absence of farsighted and pragmatic policy for small business development impedes implementation of potential of local entrepreneurs and obtaining of outcome to solve economic and social tasks of the region.

3. General condition of business-climate in the Murmansk region doesn’t provide environment favorable for small-scale business, as basic indicators of small- and middle scale business development in the Murmansk region are lower than average ones for the North-West Russia.

4. The basic obstacles for small/middle scale businesses and entrepreneurship in Russia as a whole (incl. Murmansk region) are (according to small business representatives):
   - Ineffective tax and tariff policy
   - Administrative barriers
   - Complicated access to financial and credit resources
   - Lack of premises/facilities
   - Growing tariffs on transport services, electric energy, land and premises lease
   - Underdevelopment of regional infrastructure (incl. transport) to facilitate business (education, training, consultations, incubators, technoparks, venture assistance, credits).

5. Elimination of obstacles for small/middle scale business development depends not only on effectiveness of national policy aimed at business support but on territorial policy and activity of public organizations and local civil and entrepreneurship society.

6. Coordinated development of transport systems of Lapland and Murmansk region offers an opportunity to adopt the approach applied by the transport sector (especially by road transport) to create favorable conditions that meet the requirements of tourism mobility. Harmonization of
applied approach will facilitate **harmonization of road conditions** and create opportunity to develop **cross-border tourist routes**, which contribute to increased attractiveness of Arctic tourism on the world tourism market.

### Table 1: The Murmansk region: Dynamics of changes in the sector of small scale business during 1990-2010

<table>
<thead>
<tr>
<th>Years</th>
<th>State regulation and external economic factors</th>
<th>Impacts on small scale business</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990-1995</td>
<td>Introducing legislation on small enterprises, forming legislative basis for small business development, training programmes for entrepreneurs, tax discounts for small business.</td>
<td>The first half of 1990s became the most favorable period for Russian small scale business development, which served as a shock absorber during the period of general slump of production and destruction of big enterprises, which: Saved the country from mass unemployment and gave resources for living for thousands of families, Proved a huge potential of small business in Russia, Put a foundation for Russian entrepreneurship and middle class. In the Murmansk region: ● in 1993 there were 2.5 thousand small enterprises, ● in 1994 – more than 3.0 thousand enterprises, ● in 1995 – more than 5.0 thousand enterprises.</td>
</tr>
<tr>
<td>1996</td>
<td>Legislative changes (re-registration of enterprises, payments) that resulted in toughened «state racket» in a form of different check-ups and extortions together with: ● deficit of premises, equipment, qualified personnel, ● complexities with forming of start capital, absence of bank crediting, raw material supplies, production distribution, development of personnel</td>
<td>Entrepreneurship stood still, inverse processes started.</td>
</tr>
<tr>
<td>1998</td>
<td>Economic crisis (default) in Russia</td>
<td>Many small enterprises became bankrupts because of: ● failures in bank system functioning ● cancellation of agreements ● stopping of import of equipment and materials ● reduction of paying capacity of population ● reduction of outlets. As result, army of unemployed was increased with hundreds of thousands former small business employees.</td>
</tr>
<tr>
<td>2000-2001</td>
<td>In 2000 the regional Duma approved the Programme of state support of small entrepreneurship in the Murmansk region in 2000-2004, which contained</td>
<td>In the Murmansk region: ● level of unemployment was 14.7% (average for Russia 10.7%).</td>
</tr>
<tr>
<td>Year</td>
<td>Description</td>
<td>Notes</td>
</tr>
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<tr>
<td>2002-2003</td>
<td>Tax pressure on small scale business is still heavy. There are more than 30 territorial directorates of federal executive power bodies in the region that execute different control functions in relation to small scale business, basically on paid basis. This increases prime cost of products and, therefore, the price of products to the consumers, reduces competitiveness ans profitability of local producers, impedes market expansion and accessing of Murmansk small business to national and international markets. The budget receives less taxes. The period of declaration state support of small business together with absence of real interest among Murmansk region authorities to development of small business.</td>
<td>The dialogue between authorities and small business doesn’t exist. Representatives of small business are skeptical to ability of authorities to provide long-term policy for small business development and increase of its contribution to the regional economy. This resulted in emigration of active population and judicial migration of small business outside the Murmansk region. Example: 13 enterprises in Olenegorsk changed their belonging to the Voronezh region, authorities of which develop small scale business and give tax discounts. Enterprises continued working in Olenegorsk but taxes were paid to the Voronezh region. This resulted in forming of new type of Russian businessmen and owners with different mentality, who recognized that only own business the result of which are of need to the consumers may become a basis for the new Russian economy.</td>
</tr>
<tr>
<td>2004-2007</td>
<td>Activization of Murmansk region administration in policy to support small business and entrepreneurship, significant increase of financial resources for small scale business assistance. The Programme “Development of small business in the Murmansk region in 2005-2008” was approved with financing from regional budget - 13,46 mln. RUR. During programme implementation this sum increased every year and finally the funding of the programme was increased by 6,2 times and was 84,06 mln. RUR (2005-2008).</td>
<td>According to 2007 statistics in Murmansk there were: 1219 small enterprises (37% of total number of small enterprises in the Murmansk region), 33 middle-scale enterprises, 8453 individual entrepreneurs (44% of regional value). The number of employees of small and middle scale enterprises in the city in 2007 was 19,1 thousand and 4,508 thousand people respectively.</td>
</tr>
<tr>
<td>2008</td>
<td>The Federal Law on small and middle scale business development in Russia, new criteria to consider business as a small-scale one Starting of financial crisis</td>
<td>The number of small enterprises in the Murmansk region was 1722 pcs., total turnover – 59519,03 mln. RUR, number of employees 25,42 thousand people. Note: The record keeping changed because of changes in principles of small scale business definition. See Figure 1. The first period of world crisis hasn’t affected small business significantly. The share of employees of small scale enterprises was 7,9 % (12,6 in Russia). According to evaluations, the total number of working places in small scale business sector exceeds 130 thousand people taking into account employees of individual entrepreneurs and those employed in small enterprises (about 30 thousand people). During 2007-2008 small scale business and entrepreneurship created new 2 thousand working places. The share of employed in small business in the Murmansk region exceeded 29%.</td>
</tr>
<tr>
<td>Year</td>
<td>Description</td>
<td>Details</td>
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</tbody>
</table>
| 2009 | Strengthening of crisis impact on small business and entrepreneurship: | • Reduced demand for products and services,  
• Reduced volume of state orders and advanced payments,  
• Strengthening of requirements to crediting, less accessibility of bank credits  
The Murmansk region government has taken measures to support entrepreneurship:  
• Reduced tax pressure on small business implementing production activities and social services (taxes on property and profit),  
• Simplified taxation systems  
• “freezing” rentals for usage of state property of the region for small and middle scale business up to reduction of rentals by 20% for socially important activities.  
Further development was given to subsidizing mechanisms, guarantees and micro-financing, support of new entrepreneurs. Totally in 2009 75,2 mln. RUR were provided for small and middle business support. Support of those who planned to open own business was a direction of anticrisis activity of the Murmansk region (Decision “Concerning state support of novice entrepreneurs”).  
The target programme “Development of small and middle scale business in the Murmansk region in 2009-2011”. |
| 2010 | Deepening of crisis with: | • Reduction of total demand for products and services of small business and entrepreneurship;  
• Strengthening of competition  
• Increasing of prime cost of products and services of small and middle scale business due to increased tariffs of natural monopolies.  
For crisis conditions the level of crediting of small and middle scale enterprises of the Murmansk region is high, weakening of demand for products and services against the background of growing costs and strengthening competition impede enterprises from having necessary profit for paying credits, stable functioning and development.  
The average Russian number of small enterprises is 154,7 per 100 thousand inhabitants. During the last year the number of small enterprises in Russia decreased by 5,6%. In the Murmansk region one of the worst indicators of small enterprises decreasing was registered - by 67,3% (from 191,2 to 123,9).  
In 2010 unemployment rate in the Murmansk region was 2,5% (August 2010) when average Russian value is 6,8 % (June 2010). |
|       | Growth of: | • Current costs  
• Bill payable.  
According to official statistics:  
• By the end of 1 quarter 2009 the number of small enterprises has reduced to 1611pcs. Thus decreasing turnover by 7% (18,04 bln. RUR) comparing to the similar period of the last year.  
• Amount of products (not-owned production) sold decreased by 12% as a result of decreased demand and competition growth by bigger scale networks.  
• Volume of own products sold increased to 6,63bln. RUR (by 1,6%),  
• Average number of employees hasn’t decreased but increased to 25301 people (in the I quarter 2008 – 25172 people).  
In 2009 unemployment rate in the Murmansk region didn’t exceed the Russian average value (for the first time during the last years) (2,7% for the region and 2,8% average Russian value). |
Development of small scale business in the Murmansk region

Diagram 1  The Murmansk region: Changes in number of employees of small scale enterprises and employment

Since 2008 the Federal Law #209 was put into force with new criteria for small scale business
### ANNEX 2.3.1

<table>
<thead>
<tr>
<th>No</th>
<th>Community structure and its impact on mobility in Lapland</th>
<th>Community structure and its impact on mobility in the Murmansk region</th>
</tr>
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<tbody>
<tr>
<td></td>
<td><strong>Comparing characteristics reflecting community</strong>&lt;br&gt;<strong>structure and its impact on development of Lapland and</strong>&lt;br&gt;<strong>the Murmansk region</strong></td>
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<tr>
<td></td>
<td><strong>Lapland</strong> has a <strong>network regional structure</strong>, which includes:&lt;br&gt;province center, centers of municipalities and sparse settlements. All settlements are connected with <strong>arterial and capillary roads</strong>. All tourist areas have its centers and this approach will be also applied in future for mining industry areas, which <strong>will be integrated</strong> into the existing network structure. Changes in the regional structure and the structure of Lapland community are characterized with:&lt;br&gt;- <strong>Population emigration</strong> from sparsely populated territories to the cities, towns and centers of municipalities (national tendency).&lt;br&gt;- Expanding built-up areas in settlements together with <strong>reduction of population density</strong>, which decreases justification of public transport services. The consequence of low population density is <strong>reduction of volume of services</strong> with simultaneous growth of mobility needs. The mobility of citizens becomes dependent from personal cars thus resulting in unfavorable impacts for environment. Rovaniemi and Kemi-Tornio (67% population) play the main role in the development of the province. These centers have specializations:&lt;br&gt;- Rovaniemi – is, first of all, an administrative and educational center.&lt;br&gt;- Kemi-Tornio is specialized on industry and logistics. Both centers are well provided with commercial services. The border with Sweden is a specific characteristic of the province, which contributes to <strong>economic recovery of settlements on both sides of the border due to cross-border activities</strong>. The bordering area Haaparanda-Tornio is developing as a specialized trans-border commercial area. Part of settlements is strongly attracted to <strong>the tourist objects</strong> and&lt;br&gt;<strong>The municipal structure of the Murmansk region is as follows:</strong>&lt;br&gt;- 7 ZATO (limited-access territorial settlements where military officers live with their families),&lt;br&gt;- 7 city counties (Murmansk is the regional center, 5 cities with lower territories),&lt;br&gt;- 5 municipal districts.&lt;br&gt;<strong>The tendencies of</strong> demographic development in the region are:&lt;br&gt;- high rates of population decrease due to emigrational processes, low birth rates and high mortality rates;&lt;br&gt;- population ageing;&lt;br&gt;- high concentration of population in cities.&lt;br&gt;The forecasts of the Region Government predict <strong>further unfavorable tendencies</strong>. Regional population inquiries show general <strong>dissatisfaction of citizens with living conditions, city environment and public transport services</strong>, as well as with condition of communal services:&lt;br&gt;- accessibility and quality of some types of social services is decreasing for all citizen groups;&lt;br&gt;- the most critical level of social services (including public transport services) is provided for the most vulnerable categories – mobility-challenged people and elderly people.&lt;br&gt;Dissatisfaction of population with quality of social services contributes to unfavorable demographic situation. Regional population is concentrated in cities and settlements adjacent to roads and railways. Population of the Eastern part of the Kola Peninsula lives in coastal settlements of the White and the Barents seas. Population density varies a lot:&lt;br&gt;- in Murmansk population density is more than 2000 inhabitants/km²,&lt;br&gt;- in other city districts – 9-24 inhabitants /km².</td>
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ore-dressing plants. The centers of municipalities (Kemijarvi, Sodankyla, Ivalo and Kittila) have a higher level of services comparing to that of the municipality centres located far from the main transport corridors. The sparsely populated territories become the protected zones (first of all in the district of Pohjois-Lappi).

**Concentration of population in settlements located along the main road corridors and along the coast** is a typical tendency for population migration in the province. The Lapland Development Programme till 2030 supports this tendency and provides concentration of resources along the corridors and in zones of development. Concentration of population along the main roads increases justification of public transport services.

The settlements that are located in a trip-distance from the centre of province are the most viable. Quality level of life in sparsely populated areas shall be supported with:

- Provision of basic set of services,
- All-year-round accessibility (roads),
- Good level of telecommunication services (mobile communication, internet, remote access services).

**The changes in trade structure** are typical aspects that affect mobility:

- Concentration of big comercial objects in cities;
- Reduction of the number of “corner-shops” in small settlements;
- Decreasing of shop networks in sparsely populated areas.

There is a tendency for shopping trips to Rovamiemi and Kemi-Tornio where the number and assortment of goods is wider and the volume of services is more various. This tendency is a threat for commercial sector and services of smaller settlements. The threat can be eliminated with the flows of tourists from adjacent tourist centers.

Leisure accommodation construction is expected to grow thus contributing to better viability of small settlements. As leisure accommodation development is close to tourist centers and roads, the flow of vacationers will increase commercial viability of

- in regional districts – low density with the highest – 4.5 inhabitants/km² in the bordering Pechenga district and Southern industrial districts.
- Lowest density – less than 0.3 inhabitants/km² is typical for the Eastern part of the peninsula, where olest Pomor settlements are located.

Taking into account uneven settling structure, the most part of budget network institutions is concentrated in two big agglomerations:

- Murmansk agglomeration,
- Agglomeration incorporating Olenegorsk, Monchegorsk, Apatity, Kirovsk and Polyarnye Zori.

The rest part of the regional territory is less developed in respect to the budget network.

Poor development of road network in the region and low population density create prerequisites for extended application of the principle of remote budget servicing based on communications and medical, educational and socio-humanitary technologies of remote access.

The typical peculiarity of the Murmansk region is the principle heterogenity of settlements and its inhabitants, which stipulates instability of the regional community structure, which is a sum of different settlements, namely:

- Remote and hard-to-get-to historical pomor settlements of the Kola Peninsula Eastern coast, which step by step become abandoned because of low quality of life and unemployment;
- Mono-cities built during the Soviet period around the enterprises of mining, metallurgy and energy industries and formed of migrants from all the Soviet Union. Population of such mono-cities was dependent from city-forming enterprises. The youth emigrate from these cities to other places because of low quality of living and unemployment;
- ZATO (limited access territorial settlements), population of which are military servants and their families, is oriented on temporary living in the region;
commercial objects and public transport services.

- The Murmansk agglomeration (the port city, which was established in 1916 and became an administrative center in 1938, with more than a half of all regional population, all main services (educational, medical, administrative, commercial, transport).

The character and structure of the community, the needs of population and business in mobility are poorly studied. System information that allows to reveal tendencies and development dynamics is missing.

Conclusions:

4. Both Lapand and the Murmansk region face the same problem – emigration of population from small settlements. In Lapand this process is well studied, forecasted and managed with means of adapted decisions to:
   - Plan population provision with needed services (including public transport services);
   - Minimize negative consequences of population emigration from traditional settlements;
   - Take benefits from this unfavorable situation (including increasing of public transport services viability).

5. In the Murmansk region the unfavorable process of population emigration and changes in unfavorable regional structure are spontaneous, because to make adequate decisions no initial information is available. Instability of community structure decreases investment justification of the transport infrastructure development projects.

6. Coordinated development of transport systems of Lapland and the Murmansk region is an opportunity to join efforts to study possibilities to stabilize regional structures, minimize investment risks and increase justification of transport projects through implementation of opportunities of trans-border cooperation.
ANNEX 2.4.1

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<tr>
<th>No</th>
<th>Impact of climate change in Lapland</th>
<th>Impact of climate change in the Murmansk region</th>
</tr>
</thead>
</table>
| Comparative activities to adapt transport of Lapland and Murmansk region to climate change | Importance of reduced climate impacts as a factor that regulates development of communities will be enhanced with means of new international limitations and requirements for greenhouse gas emission reduction. Obligations within the agreements are aimed at:  
- Increasing of efficiency of energy sector and share of renewable energy sources;  
- Decreasing of transport emissions by reducing emission amount per network km and driven km.  

Lapland makes appropriate actions to rationalize mobility and reduction of transport emissions is currently provided through:  
- Road technologies and quality of fuels and lubricants;  
- Integrated transport and landuse planning  
- Providing favorable conditions to shift mobility to more environmental modes of transport for freight and passenger transportations;  
- Planning solutions on the level of road street network and its maintenance, traffic management, traffic calming;  
- Transport choice, environmental driving style, more efficient car usage.  

Adaption of transport sector activities to climate change is important, too. Climate changes affect all transport system but impact rate changes depending on the mode of transport. Susceptibility of different components of transport system is different. The measures to be taken with climate change are related to:  

A series of national strategic documents were approved to declare the need to adapt to uncertainties when developing Arctic territories. namely: Strategic Actions Programme on Arctic Zone Environment Protection from Anthropogenic Impacts on Global Ecosystems. The document promotes the principle of sustainable development, liquidation of environmental consequences of human activities in conditions of global climate change. The Russian Climate Doctrine declares:  
- Global characer of Russia’s interest to climate change and its consequences;  
- Directions of actions related to climate change and its socio-economic consequences  
- The need in active actions to study and monitor climate change  
- Prevention of negative impacts  
- Adaptation of activities to new conditions.  
The need to take climate change impact on economy and transport infrastructure into account is recognized. Data of longterm observations testify the tendency to climate change in the Murmansk region:  
- Tendency to temperature growth, especially in winter. During 1976-2006 average speed of temperature changes on the Kola Peninsula was 0,6 °С/10 years;  
- Reduction of total ice square in the Barents Sea. During 1961-2007 icyness has decreased by 3,7%/10 years at average.  

Climatologist’s conference (the Murmansk region)
Road transport is vulnerable to climate change. For freight transportation this factor can become critical when organizing complex management of logistic chains in different off-optimum situations.

The plans of Lapland transport system development consider:
1. increase of average temperatures. In winter the need in anti-icing measures will increase. Choosing the technology of de-icing will be a question because environmental considerations will not allow much application of salt.
2. Lifecycle of road pavements will decrease due to increased number of thawing-freezing cycles and more precipitation.
3. Operational opportunities for winter roads and river crossings will decrease
4. The permafrost level will decrease (reducing of bearing capacity of low volume roads, forest roads)
5. Unfavorable combination of different weather factors (spring thaw intensity, autumn slush on gravel roads), increased probability of extreme phenomena (floodings, forest fire).
6. changing of average amount of precipitation. In summer dry weather will prevail, winter will bring more precipitation: snowfalls will be more severe thus requiring more winter maintenance costs.
7. The risk of sudden floodings will increase (slumps/flash of embankment, gravel road deterioration, additional costs for drainage rehabilitation, etc.).
8. The risk of inundations will increase (deterioration of demonstrated the impacts of climate changes in regional districts:
- Temperature deviation from climatic norms (86% districts);
- Increased number of extremely hot/cold days (78% districts);
- Changes in precipitation mode (66% districts).
Inhabitants of region mark warmer winters and stormy winters.
Social inquiry of population (2010) showed:
74% - know about climate change problem
46% - see these changes in the Murmansk region and consider anthropogenic activities as the main reason for this;
62% - suppose that climate change threaten their lives
82% - are ready to do something to mitigate environmental damage due to anthropogenic activities

Climate change has an impact on:
- Ecosystems
- Environment
- Infrastructure, especially in coastal territories;
- Health of population
- Traditional way of life.

The list of climate change impacts on transport activities expected by Russian transport specialists include:
- Reduced period and opportunities for freight delivery to remote hard-to-get-to districts by winter roads;
- Complicated icy conditions (reiteration 10–20%) in straits that limit without-ice-breaker navigation along the Northern Sea Route;
- Interruptions of transport communication because of more frequent and intensive abnormal weather phenomenae.
- The risks for transport infrastructure, including pipe
9. Groundwater level will decrease due to dry summer (gravel roads maintenance and operation, increased costs for dust control).

- Deterioration of coastal zone infrastructure resulted from intensive storm activity, shore erosion and sea level rising.

Arctic is an area where the most noticeable impacts of climate change is expected. This requires evaluation of climate change risks when developing strategies, programmes and projects. Possible ways of adaptation of transport and its infrastructure to climate change:

- Revising methods of winter road furniture, periods of its usage, vehicle design
- Planning of new routes and methods of transportation
- Extended usage of water transport
- Constructing all-year-round roads sustainable to weather phenomenae
- Constructing dams, embankments, walls and barriers as well as usage of soft structures (e.g.: bedding course on beaches, renovation of dunes and developing oversaturated lands) to protect coastal area from sea level rising and erosion;
- Transferring potentially vulnerable infrastructure objects from coastal to inner districts;
- Taking into account the factor of climatic changeability when planning new built-ups in coastal area
- Developing and introducing new engineering normatives, regulations, that consider climate change and reduce risks of permanent frost thawing;
- Taking into account the factor of climate change when constructing new infrastructure;
- Making evaluation of geocryologic risk in relation to infrastructure objects within the considered area;
- Reconstructing or transferring objects from dangerous zone;
• Developing and introducing new climat-sustainable technologies of construction
• Increasing quality of monitoring and forecasting of climate changes, weather conditions in Arctic seas, creating local systems of hydro-meteorological provision;
• Creating special services to control iceberg and ice danger in the Arctic
• Toughening current norms of construction and rules of operation of sea structures taking into account forecasted changes of main meteorological parameters;
• Improving forecasts for maritime activities;
• Implementing measures to reduce air pollution with transport gases, which is one of the main directions of policy aimed at improvement of living environment in settlements.

Conclusions:
1. Lapland applies approach to climate change based on the principle: think globally, act locally. In modern strategic documents the concrete objectives are set and the clear tasks are defined to be solved by specialists within their current professional activities, without any extraordinary investments. Actions are aimed at changing of planning and design solutions, integration, promotion of ecological compatibility of everyday operations by population and business. This approach will provide readiness of the community and transport system to changes with minimum costs and protect the fundamentals of the province existence – mobility.

2. On the Russian side the corresponding documents declare intentions for the sake of propriety. However, there is no real concern on this issue. The principle of reacting on critical challenge of the future in Russia can be stated as follows – thinking locally with global inactivity. The list of measures to reduce climatic changes has no transport professionalism because there is no answer to the critical question: with what resources? At the same time there is a demonstrated readiness to do something. But what? And how? – these questions are left without answer. Increasing of motorization rate in Russia shows that informing of population that can affect environmental behavior of population and business is an actual and real task which can be solved here and now and provide positive results.

3. Coordinated development of transport systems of Lapland and Murmansk region is an opportunity to speed up the process of changing of environmental consciousness of transport activity participants on the Russian side, increase responsibility and minimize or even eliminate negative transport impacts on environment on local, regional and global levels.
### ANNEX 3.1.1

<table>
<thead>
<tr>
<th>№</th>
<th>Water transport in Lapland province</th>
<th>Water transport in the Murmansk Region</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Export of the province enterprise products is served by the ports of the Northern part of the Bothnic Gulf – Kemi and Tornio, which:</td>
<td>Export of products of the regional enterprises and transit flows are served by the ports of:</td>
</tr>
<tr>
<td></td>
<td>• Are provided with developed infrastructure, railway and road accesses,</td>
<td>• The Barents Sea – Murmansk</td>
</tr>
<tr>
<td></td>
<td>• Are integrated into TEN (including inland, water and air communications).</td>
<td>• The White Sea – Kandalaksha, Vitino.</td>
</tr>
<tr>
<td></td>
<td>Additionally to the ports mentioned above, the potential participants in logistic schemes of province business transport provision are other ports of BEATA (both Finnish and Swedish). Using of Norwegian and Russian ports in Finnish business logistic schemes is restrained because of absence of accesses. Therefore it is impossible to integrate them with TEN system. Characteristics and specialization of BEAR ports are represented in Table 1 to this Annex.</td>
<td>The ports are provided with railway accesses. The principles of spatial planning of infrastructure objects development require taking into account the ports of BEAR as existing and potential logistic alternatives for goods consignors. The BEAR ports are represented in the Table 1 to this Annex.</td>
</tr>
<tr>
<td></td>
<td>Development of Lapland’s mining industry will increase demands for water transport services. The following issues will be of critical importance:</td>
<td>The Russian Transport Strategy till 2030 and the Federal Target Programme “Development of Russian Transport System (2010–2015)” includes development of the Murmansk Transport Node to satisfy the forecasted demand for servicing of:</td>
</tr>
<tr>
<td></td>
<td>• Deepening of shipping canals (Kemi),</td>
<td>• The Northern Sea Route goods flows</td>
</tr>
<tr>
<td></td>
<td>• Providing fluent shipping during winter in the Northern sea routes,</td>
<td>• Hydrocarbons transportations from Stockman and Prirazlomnoye deposits.</td>
</tr>
<tr>
<td></td>
<td>• Attracting investments to improvement of water transport infrastructure.</td>
<td>The project provides for:</td>
</tr>
</tbody>
</table>

1. Construction of transshipping facilities for coal and general goods (20 mln.t.), oil and oil products (35 mln.t. of raw oil), oil processing plants (6 mln.t.), container terminal (1 mln. TEU), logistic complex (within the special economic zone development)  
2. Reconstruction of coal terminal (9,6 mln.t.)  
3. Modernization of railway and road accesses (federal road KOLA, access to airport Murmansk).  

Conclusions:

1. The plan of Lapland transport system development links transport generators (incl. ports) into one network. The network serves as a basis of regional province structure thus stimulating development of zones and corridors not only in Lapland but also in neighboring countries of the Barents Region.
2. The level of Lapland transport system development is sufficient and the need in construction of new links arises only with the need in engaging new tourist and mining objects into economic turnover, and for optimization of transport system within the Barents Region level. This need exists, e.g., to provide the shortest passenger and freight connection between the Northern part of the Bothnic Gulf and the White Sea.
3. The transport network of Lapland forms a structure for logistics chains for transportation of people and goods with minimum costs.
4. Specific peculiarity of the Lapland transport network is absence of “own needs” in development. All needs in transport system development are answers to the question asked by:
   - Province population and business,
   - Integration tasks solved by the province together with other countries of the Barents Region.
5. Development of transport complex of the Murmansk region implies increasing of transport infrastructure facilities of all types where the key role is given to the Murmansk port mega-project. The demand for its development is concerned with two mega-projects with uncertain risks – Arctic shelf development and Northern Sea Route functioning, therefore the launching date of the project may be postponed for an uncertain time until the investment decision will be made.
6. Coordination of Lapland and Murmansk region transport systems’ development and coordination of ports of the territories within the Barents transport logistics platform will allow to define potential freight flows generated within and outside the Barents region. Freigh flow modeling is a procedure that allow to evaluate real potential of ports in a global logistics of Europe-Asia direction, identify bottle necks and missing links that prevent from optimization of logistic chains with participation of ports. Such a work could help in finding the ways to:
   - Reduce dependence of the Murmansk port from risks related to mega-project implementation;
   - Compensate higher costs for the clients of the Barents region ports, which are related to nature and climatic factors;
   - Satisfy potential demand of goods consignors from Barents region and third countries.

The risks: Toughening of international environmental legislation concerning reduction of sea transport impacts on environment due to taking into force (1.07.2010) a package of measures of the International Maritime Organization. The measures are aimed at reduction of SO2 and NOx emissions within the Kyoto protocol. Toughening of environmental requirements will affect on a number of related sectors of world economy (inland water transportsations, oil processing, and shipbuilding). Execution of measures within ship operations will bring in significant changes in activities of the navigable and bunkering companies.

The forecast: Increasing of prices for waterway transportations up to 60% (by 2015 in SECA zone – the Baltic and the Northern Sea, by 2015 in the world as a whole).
The consequences of this growth are:

1. Development of a trend when part of freight flows divert to railway and road transport, **reduction of freight flows passing through the ports**;
2. Actions of ship owners to keep these freight flows for sea transport by reducing the costs, e.g.:
   - Fuel savings (deceleration from 20-22 nodes to 17-19 nodes) especially on long routes Europe – Asia. As a result, current costs are reduced but transportation time is increased (1-2 days). To compensate increased transit time the shipping companies will introduce additional ships to reduce tonnage excess and pressure on shipping rates. As world tonnage growth is unlikely to slow down until 2020, the shipping rates will be enough flexible for the next 10 years;
   - Maneuverings and usage of different types of fuel in different regions of the world ocean, which will need costly additional equipping of ships;
   - Improvement of sea transportation technologies thus increasing efficiency of existing ships by 10%, new ones – by 30% with sequent growth of capital and operational costs;
   - Introduction of scrubbers – equipment for emission purification to achieve the goals set by IMO;
   - Blending of dirty black oil with more pure fuel types by fuelers, strengthening of supervision under the fuel quality by ship owners, increasing of a number of reclaims addressed to fuelers, increasing of cases of blending on ships.
3. Changes on the market of bunkering services and replacement of independent fuelers with vertically integrated oil companies. As a result, oil companies will take all the chain – from oil extraction to retail sale - under their control and have a margin at every technological stage. The consequence of this monopolism will be high fuel prices. The only way to withstand the monopolization and save the share of market for the independent fuelers is to integrate them and consolidate. However, they are not ready for such steps and compete with one another loosing time. The situation on a bunkering market and the consequence – fuel prices increase – will have a **negative impact on comparative advantages of water transport and loading of ports**.

<table>
<thead>
<tr>
<th>Table 1</th>
<th>The Ports of BEATA</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ports and their location</strong></td>
<td><strong>Port capacity, mln.t./year</strong></td>
</tr>
<tr>
<td>The Baltic Sea, The Bothnic Gulf</td>
<td></td>
</tr>
<tr>
<td><strong>Tornio</strong></td>
<td>1.8</td>
</tr>
<tr>
<td><strong>Kemi</strong></td>
<td>13.0</td>
</tr>
<tr>
<td>Location</td>
<td>Port capacity, mln.t./year</td>
</tr>
<tr>
<td>-----------</td>
<td>---------------------------</td>
</tr>
<tr>
<td>Oulu</td>
<td>14.0</td>
</tr>
<tr>
<td>Raahe</td>
<td>12.0</td>
</tr>
<tr>
<td>Kokkola</td>
<td>15.4</td>
</tr>
<tr>
<td>Pietarsaari</td>
<td>6.2</td>
</tr>
<tr>
<td>Kalajoki</td>
<td>0.55</td>
</tr>
<tr>
<td>Luleo</td>
<td>8.5</td>
</tr>
<tr>
<td>Piteo</td>
<td>1.8</td>
</tr>
<tr>
<td>Skelfteo</td>
<td>1.7</td>
</tr>
<tr>
<td>Umea</td>
<td>N/f (low)</td>
</tr>
<tr>
<td>Kalix</td>
<td>0.23</td>
</tr>
</tbody>
</table>

**The Barents Sea**

<table>
<thead>
<tr>
<th>Location</th>
<th>Port capacity, mln.t./year</th>
<th>Maximum fairway depth</th>
<th>Port specialization</th>
<th>Seasonal limitations, comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Narvik</td>
<td>14.0</td>
<td>20.0-30.0</td>
<td>Bulk cargo (ore), containers</td>
<td>Non-Freezing year round functioning port</td>
</tr>
<tr>
<td>Murmansk</td>
<td>9.0</td>
<td>11.5-16.0</td>
<td>General and bulk cargo, scrap metal, chemicals, construction materials, equipment, containers, coal, food</td>
<td>Non-Freezing year round functioning port</td>
</tr>
<tr>
<td>Belokamenka</td>
<td>12.0-20.0</td>
<td>30.0</td>
<td>LUKoil transfers oil from Varandey deposit and Obskaya Guba deposit through the terminal.</td>
<td>The Belokamenka terminal has been functioning since 2004 (stockholders: Russian RosNeft and Norwegian Bergesen). Terminal launch has improved oil transportation logistics from Komi Republic.</td>
</tr>
<tr>
<td>Varandey</td>
<td>The project aimed at increased capacity up to 12 mln.t. oil</td>
<td>3.3 Full water</td>
<td>The project of Varandey terminal modernization for transporting of oil from Timano-Pechorskaya (the prospect volume up to 22-23mln.t./year). 162 km long oil-pipeline will link the place of oil extraction with the on-shore reservoir park.</td>
<td>The terminal is the basic way to transport oil from Timano-Pechorskaya oil-gas province. During winter oil transportation is provided with ice-breaker support.</td>
</tr>
<tr>
<td>Naryan-Mar</td>
<td>N/f</td>
<td>4.7-5.2</td>
<td>General and timber goods, bulk cargo, containers, metal, equipment vehicles, with depth near quay walls up to 6 m, near raid - 7-10m</td>
<td>4.4-5 months navigation (mid June – October, ice-breaker support is available till mid November) The key disadvantage – missing connection with the railway network.</td>
</tr>
</tbody>
</table>

**The White Sea**

<table>
<thead>
<tr>
<th>Location</th>
<th>Port capacity, mln.t./year</th>
<th>Maximum fairway depth</th>
<th>Port specialization</th>
<th>Seasonal limitations, comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kandalaksha</td>
<td>1.5</td>
<td>9.8</td>
<td>Bulk cargo and general goods: coal, fertilizers, iron ore concentrate, salt, stone materials, scrap metal, containers, timber goods.</td>
<td>Freezing, ice-breaker provision (mid January – end of April)</td>
</tr>
<tr>
<td>Vitino</td>
<td>11.0</td>
<td>3.5-13.7</td>
<td>Oil products, which can be transported using mix-type bulk-tankers &quot;oil-ore transporter&quot;. When using this type of vessels it is possible to load the ship with dry goods in Kandalaksha on the return way.</td>
<td>Freezing, ice-breaker provision (mid January – end of April)</td>
</tr>
<tr>
<td>Belomorsk</td>
<td>0.80</td>
<td>3.6 low water</td>
<td>Saw timber</td>
<td>Freezing (navigation since 15.05-15.11)</td>
</tr>
<tr>
<td>Ports and their location</td>
<td>Port capacity, mln.t./year</td>
<td>Maximum fairway depth</td>
<td>Port specialization</td>
<td>Seasonal limitations, comments</td>
</tr>
<tr>
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<td>------------------------------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------</td>
</tr>
<tr>
<td>Onega</td>
<td>0.20</td>
<td>5.0</td>
<td>Export of saw timber</td>
<td>Freezing (navigation 6-7 months, since mid of May)</td>
</tr>
<tr>
<td>Arkhangelsk</td>
<td>5.0</td>
<td>7.5 - 9.2</td>
<td>Saw timber, cellulose, paper, cardboard, coal, metals, fertilizers, equipment, dry bulk, bulk cargo, oil products, containers.</td>
<td>Freezing, ice-breaker provision (January- April)</td>
</tr>
<tr>
<td>Onezhskoye Lake</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Petrozavodsk</td>
<td>2.8</td>
<td>4.0</td>
<td>Saw timber, round timber, dry bulk cargo, containers, scrap metal</td>
<td>Freezing port (navigation 15.05-15.11), connection with the White and the Baltic Seas through Belomoro-Baltiyskiy Channel.</td>
</tr>
</tbody>
</table>
### ANNEX 3.1.2

<table>
<thead>
<tr>
<th>№</th>
<th>Comparing basic features of railway transport infrastructure of Lapland and the Murmansk Region</th>
<th>Railway transport in Lapland province</th>
<th>Railway transport in the Murmansk Region</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>The railway passes through Rovaniemi/Kemijarvi in direction to Salla and Kolari, where the end stations near the border are Kemijarvi and Kolari. The main railway stations of Lapland are: Rovaniemi, Kemi, Kolari and Kemijarvi. Railway terminals on these stations serving passenger and freight transportations are traditionally considered as:  - Important transport nodes from position of railway transport,  - Generators of freight and passenger flows from position of other modes of transport. The level of service of the Lapland railway network allows to provide the speed 130 – 140 km/h on the section Oulu-Kemi-Koivu. On other sections the level of service is lower due to:  - Depreciated tracks (some of them are 30 years old)  - Absence of electrification. In Lapland the permitted axle load is 25 ton-force/axle and this is the goal of modernization. There is a deficit of financing of basic railway network infrastructure maintenance. Current level of service doesn’t satisfy future passenger and freight transportation needs. It is expected that implementation of mining industry development projects will create a demand which would justify the investments into modernization of passenger and freight railway connections in Lapland. Identifying additional freight flows for Lapland’s railways would certainly increase investment justification and speed up modernization of railways.</td>
<td>The arterial railway St.Petersburg-Murmansk, which is a part of the Russian Railways system, passes through the territory of the Murmansk region. The railway is North-South oriented, “catching up” the ports of the White and the Barents Seas. Accesses to ore-dressing enterprises and metallurgy has West-East orientation and the end stations in Russia/Finland border directions are Nickel, Kovdor, Alakurtti. Since 2001 the Railway Transport Reform has been implemented. The reform will result in transformation of the monopolist JSC “Russian Railways” into an infrastructure company with gradual reduction of its presence on transportation market, which becomes competitive. In 2008 the Strategy of railway transport development till 2030 was approved. The Strategy defined basic directions of railway transport development in accordance with the goals of the Russian Transport Strategy till 2030. The main objectives and tasks of the Russian Railway Development Strategy are presented in Table 1 to this Annex. Increasing weigh normative is one of the priorities of railway effectiveness improvement for those railways that form a handling polygon of trains with extended length and weigh. In future importance of railway directions with higher weigh normative will increase due to increasing transportation to the North-West ports. The main polygons handling extended weigh trains will be directions of coal, oil, ore and metal transportations: Kuzbass-St.Petersburg-Murmansk, Kovdor, Olenegorsk. To provide heavy railway traffic the following is needed:  - Developing infrastructure (tracks, power supply</td>
</tr>
</tbody>
</table>
systems, central blocking system, communications, etc.) to let the 25-30 ton-force/axle trains pass on the whole route;

- Reconstruction of engineering communications with exceeded lifetime, e.g. the second bridge across Shuya river is planned for construction on Myagrenka-Kem’ railway section (St.-Petersburg-Murmansk railway).

The project of Murmansk Transport Node development provides for construction of technological lines Murmashi 2 – Lavna.

Economic justification of the Murmansk Region railway infrastructure development projects increases with implementation of projects that contribute to optimization and improvement of railway flow fluency. A number of projects that provide system effect is represented in the Table 2.

Conclusions:

1. Lapland railways are integrated to the railway network TEN despite it has a different width of gauge. Connection with the system of railways standard 1520 is provided on the Finnish-Swedish border (Tornio-Haparanda). The Finnish railways are integrated with the Russian railway network as they have the same standard of gauge. On the Lapland territory railway has some limitations due to wear, insufficient load capacity and absence of electrification on a number of sections. Railway development is justified only with the needs of a developing mining industry. The perspective of additional freight flows could increase investment justification and speed up modernization of Lapland railway.

2. Murmansk regional railways are the part of the national railway system. Justification of railway modernization (strengthening of loading capacity) is related to development of the Murmansk Sea Port. The strategy of railway transport development provides for development of infrastructure as a reaction to additional economy freight flows. Railway is considered as an access to the Murmansk port, while the project of the Murmansk Sea Port development is connected with implementation of risky Arctic development projects. Therefore inclusion of the railway into serving of transit flows increases investment justification and speeds up modernization of the railway.

3. The Russian strategy of railway transport development sets the task – integration of the Russian railway system to the EU system (including countries of 1520 space). The struggle for transit is a sustainable trend of the world transport market. Transit is an export of transport services, therefore any international transport corridor is a space of international trade of services with all the corresponding consequences for economic and social development of territories affected by the corridor. Implementation of transit potential by Lapland and the Murmansk region is a field of mutual interest both for Lapland and Russia. This is also due to increased justification of investments into capital-intensive projects aimed at modernization of railways of both countries. Connecting two stub railway tracks on both sides of the border is a way to integration of railway infrastructure and its modernization in order to use transit potential.

4. According to the Russian Railway Development Strategy, implementation of transit potential shall be developed on the basis of complex
development of all modes of transport. However, the status of a railway as a system, which serves as a framework for the territorial structure of Russia on the Euro-Asian space, allows to consider it not only from the position of an access to the ports but also as a leading transcontinental arterial transit resource, which is served by the ports. The Russian railways are connected with the railway systems of the Northern America through the sea ports. Therefore currently the volumes of transit railway transportations can be determined by the volumes of Euro-Asian trade, in the future – by the volumes of intercontinental trade.

5. Distribution of flows between sea and railway transport will be unstable in future due to a series of global factors, including energy resource market, redistribution of freight flows between different modes of transport, and toughening of international environmental legislation, which will increase sea transportation costs and divert part of flows to the land corridors.

6. Identification of logistic alternatives and increase of flexibility of chain combination using advantages of different modes of transport in Lapland and Murmansk region is a way to increase competitive positions of the Barents region transport system on the world market. It is possible to form a vision of a future Barents transport logistics system able to meet the demands of world economy for transport services within the coordinated development of Lapland and Murmansk transport infrastructures.

### Table 1

<table>
<thead>
<tr>
<th>Provisions</th>
<th>Description</th>
</tr>
</thead>
</table>
| Critical factors of railway transport condition | • Engineering and technological developmental lagging and necessity of accelerated renovation of capital assets  
• Limitations for transit  
• Insufficient safety  
• Territorial disproportions of infrastructure development  
• Limited capacity of some railway lines  
• Insufficient investments |
| Geopolitical function based on railway role in the Russian transport system | Implementation of Russia’s transit potential on the basis of complex development of all modes of transport through advanced development of railway network as a base of sectoral and regional development. |
| Objective | Forming conditions for sustainable socio-economic development of Russia based on innovational development of railway transport integrated with development of economy sectors, transport modes, and regions. |
| Strategy tasks for the railway transport | • Forming accessible and sustainable transport system as an infrastructural basis for integrity, safety and socio-economic growth  
• Integrating of railway transport into international transport systems  
• Creating conditions for mobility of labor resources  
• Reducing total transport externalities of goods consignors  
• Making transportation quality and safety meet the international standards  
• Increasing investment attractiveness of railway transport |
Principles of the Railway development Strategy

The Russian railways are:

- one of the fundamentals of political, social, economic and cultural integrity of Russia
- a component of defense and security potential of Russia
- a sphere of state regulation and market self-regulation mechanisms
- infrastructural basis of socio-economic growth
- a sphere of safety improvement
- a priority of development, modernization and scientific research.

Table 2: The railway infrastructure, basic limitations and missing links of the Barents Region

<table>
<thead>
<tr>
<th>Section</th>
<th>Current condition and future prospects</th>
</tr>
</thead>
<tbody>
<tr>
<td>St.Petersburg - Murmansk section</td>
<td>There are sections with limited flow capacity and bearing capacity (the need in reconstruction of engineering structures, construction of second lines, electrification, modernization of track facilities). Reduction of operational costs (including that due to liquidation of stations having no generation of productive freight flows with provision of road accesses from settlements that have no stations to the nearest big railway nodes. Coordinated development of railway and road infrastructures is a step forward to multimodal transport system, which is able to optimize transport costs of infrastructures and, therefore, those of users.</td>
</tr>
<tr>
<td>Missing link Kirkenes - Nickel</td>
<td>The missing 57 km long link is the shortest way for Nickel production to the sea port of Kirkenes, that optimizes logistics and competitiveness of Russian products on the external market. The port of Kirkenes becomes one more entry for the transit to the Russian trans-continental railway network. Additionally to logistic benefits and contribution to the Russian Transport Strategy implementation, this link allows to diversify economy of the mono-city Nickel, while partnership with Kirkenes will allow to develop prospect trans-border platform (e.g. technopark) of the Barents Region, which will be able to contribute to innovative development of the Murmansk Region economy.</td>
</tr>
<tr>
<td>Missing link Salla-Kandalaksha</td>
<td>171 km long link was partly demolished after the WWII following the ideology of the Iron Curtain. Inquiry of representatives of the authorities and business of the Murmansk, Arkhangelsk, Tyumen regions and republics of Karelia and Komi (2004) revealed the opinion of responders in favor of rehabilitation of Salla-Kandalaksha railway connection, which could provide the shortest link between the Baltic and the White Sea ports. The level of support of the project varies from restrained attitude (the Murmansk and the Arkhangelsk Regions) to the positive one (Komi Republic and the Tyumen Region). The negative attitude was received only from the Karelia Republic authorities because of possible reduction of cover of expenditure into Ledmozero-Kotchkoma link. The tendency: The far is the territory from the EU/Russia border, the more scale is its transport vision and the more positive is its attitude to increase of the number of logistic alternatives. This is natural because the longer is the distance of transportation on the shoulder “producer-market”, the more dependent is producer competitiveness from logistics and the higher attention is given to the ways of transport cost reduction. The attitude of business to renovation of this connection is positive because it allows to optimize transcontinental transit and reduce transport costs of goods consignors and, in future, provide extra freight flow from Europe to the Northern Sea Route. The...</td>
</tr>
<tr>
<td>Section</td>
<td>Current condition and future prospects</td>
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<tr>
<td>---------</td>
<td>----------------------------------------</td>
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<tr>
<td>connection has a potential for tourism business logistics development as it provides link between the seas (cruise tourism) and connection with the popular tourism centre of Lapland- Rovaniemi, creates opportunities to increase tourist flows to the existing skiing resorts and develop new tourist objects in the Murmansk Region and Lapland. The link is able to facilitate development of trans-border production facilities in Alakurtti settlement thus creating conditions for transportation of products to the EU and Russia markets. The common opinion: it is necessary to model distribution of flows taking into account of this currently neglected link.</td>
<td></td>
</tr>
<tr>
<td>Existing railway Ledmozero-Kotchkoma</td>
<td>The connection is an element of Europe-Asian bridge (Barents Link) designed to serve the flow of 28 mln.t./year. The full potential of the link will be implemented after launching of the missing Belkomur line, which will provide access for freight flows from internal industrial regions of the Komi Republic, Ural, Kazakhstan to the markets of Europe and America through EU border and the Northern ports.</td>
</tr>
<tr>
<td>Missing link Belkomur</td>
<td>The project “Belkomur” is beneficial for all the Northern ports increasing their participation in logistic patterns of goods consignors from internal industrial regions. Optimization of logistic patterns and decreasing obstacles on both near and far accesses to the ports reduces the critical importance of costs related to natural limitations (e.g. the need in ice-breakers). The port specialization, speed and quality of goods processing, assortment of additional logistic services, business image, and safety of goods become key factors.</td>
</tr>
<tr>
<td>Railway Corridor “Barents Link”</td>
<td>Barents Link railway corridor functioning starts with launching of Ledmozero-Kotchkoma and Belkomur, which will provide direct railway connection between the Barents Region and Transsib. See the Figure 1.</td>
</tr>
</tbody>
</table>

![Figure 1](image.png)

**Figure 1** Prospect pattern of the Barents Link railway corridor
Photo 1  
Abandoned railway station in Lapland
### ANNEX 3.1.3

#### Comparing main characteristics of road transport infrastructures in Lapland and Murmansk region

<table>
<thead>
<tr>
<th>№</th>
<th>Road transport in Lapland</th>
<th>Road transport in the Murmansk region</th>
</tr>
</thead>
</table>
|  | Roads are the basis of daily mobility of business and population in Lapland. Road network length is **9.100 km** (11% of total Finland’s road network length). About 67% (6.100 km) are paved roads, 3.000 km are gravel roads. | The length of Murmansk region road network is **2573,2 km** by 01.01.2010, including:  
- federal importance roads - 537,4 km  
- territorial importance roads - 2 035,8 km. |
|  | Lapland’s road network is basically in good condition, but not all road sections meet the current requirements to the road performances. The weakest network is in the Northern and Eastern Lapland. To provide transport accessibility to the main network of Lapland high speed mode is provided even during the winter (100 km/h). The framework of the road network is formed with:  
- Main links of **North-South direction** (transit traffic);  
- Territorial directions **West - East** (connections between agglomerations and municipalities). | Composition of territorial roads is as follows:  
- 96,3 km – unpaved (soil),  
- 563,1 km – sand-gravel mixture pavement,  
- 1 376,4 km – paved roads, where 981,0 km – with black (bituminous) crushed stone pavement; 359,5 km – asphalt pavement; 35,9 km – concrete pavement. |
|  | Low volume roads condition is of special concern. **The forecast:** It will be more difficult to keep lower class roads in good condition because of:  
- Necessity to maintain extended road network with means of less population;  
- Reduced budget financing of road maintenance needs. | The roads are classified as follows:  
- The federal road M18 “Kola” (**North-South direction**) is under the jurisdiction of the federal body – UprDor “Kola” (Petrozavodsk branch office);  
- The territorial roads are under the jurisdiction of the Murmansk regional road administration “Murmanskavtodor”, including roads:  
  1. connecting the Republic of Karelia, Murmansk and the cities and regional districts;  
  2. providing **latitudinal links** of the Murmansk region with the Barents Region countries (See Table 1 for details);  
  3. providing local district links. |
|  | Additionaly to public road network the network of **private roads** that provides logistics of local business is important for the sparsely populated territories. Minor and private roads form a **capillary system** of roads that supplements the **main network**. Public roads stretching through the settlements are | The scheme 1 represents the road network of the Murmansk region. The region has approved the sub-programme “The roads” within the target programme “Development of the transport
considered as a part of settlement planning environment, i.e. are built and maintained to meet the requirements of street-road networks and will be transferred into municipality’s ownership in future. The difficulties are that in most small settlements with low population the street networks are long due to typical for Lapland sparse built-up area. The weak places of street-road network and light traffic paths are its low quality of maintenance, especially on settlement outskirts, and existing gaps in light traffic networks impeding from completeness and fluency of traffic, e.g. on the way to school.

Achievement of higher level of road maintenance not with means of financing but through improved maintenance work organization is a challenge for the road sector. On road sections with increasing traffic volume due to tourism the class of maintenance is also increasing. The task is to clarify the needs in adaptation of road maintenance taking into account the rythm of public transport functioning and business logistics.

The road users evaluate the road maintenance level in cities and municipalities as a sufficient one. The reform of authorities have integrated several tasks within one organization, and now it is possible to make complex decisions and optimize public road and light traffic paths maintenance work schedules by efforts of one organization, the Center for economic development, transport and the environment (ELY). Higher popularity of tourist centers requires improvement of road maintenance management in order to better meet the requirements of all user groups (tourist activities, business logistics, daily mobility of population – both motorized and non-motorized).

The whole network of Lapland is divided into two big tender lots on road maintenance (Rovaniemi, Ranua).

The Programme objectives are:
- Development of an effective territorial public road infrastructure providing accelerated movement of goods and reduction of transport costs of the economy;
- Implementation of transit potential of the region;
- Improvement of transport system safety and sustainability.

The measures are:
- Maintenance, rehabilitation and reconstruction of public roads and engineering structures;
- R&D.

Currently the road administration “Murmanskavtodor” considers the latitudinal orientation roads reconstruction as its priority:
- Kola-Verkhetulomsky- cross-border point “Lotta” (the road “Lotta”),
- Kandalaksha-Alakurtti- cross-border point “Salla” (the road “Salla”)
- Nickel – Prirechniy- road “Lotta”.

The main obstacles for attracting the road sector to implementation of transit potential are:
1. noncomformity of road structures bearing capacity to the needs of modern traffic flows;
2. High road accident rates;
3. Underdeveloped roadside services.

Note: The standard container requires powerful haulage truck which when loaded weighs 38-44t and is 4.2m high, and if with the trailer the length of the articulated lorry can exceed 24m. These standards are international and are approved for road design on international routes.

The Russian roads were designed for the loads up to 6-10 t per axle, and some time ago the trucks built by the Russian truck
Difficulties in private and forest roads maintenance are:
- Long networks but low traffic volumes,
- Under-maintenance and deteriorating roads (poorer road performance);
- Absense of accurate data on network condition because of big number of owners and process actors.

The road network TEN in Lapland includes motorway vt 4, motorway vt 5 to Kemijarvi, motorway 21 to Tornio and the territorial importance road 82.

To integrate road networks of neighboring countries with the Trans-European transport system it is proposed to include the following roads into TEN:
- vt 21 to Kilpisjarvi (towards Norway)
- № 91 on the section Ivalo-Raja-Ioseppi (towards Russia).

Industry met that requirements. However, today KAMAZ trucks produced in Russia are oriented on European standard loads that provide minimum primary freight transportation costs by roads. The sales volumes of foreign trucks are increasing in Russia. Simultaneously with this the heavy traffic loads are increasing as the share of such trucks becomes higher in traffic flow. The Russian roads are deteriorating much quicker under heavy loads and it takes more and more budget resources to keep acceptable road performances. The State policy in road sector has recently been oriented on reduction of road sector financing.

Therefore worsening road performances in Russia resulting in higher transport costs is the consequence of two components:
- Operation of roads above its engineering/bearing capacity,
- Chronic “undermaintenance” and “underrehabilitation” of roads.

To solve this problem it is necessary to:
- Harmonize the Russian standards of road bearing capacity with the international ones (11.5t per axle) first of all on international transport corridor routes;
- Make a political decision on stable financing of road needs.

Conclusions:
1. The principles of road network forming in Lapland and in the Murmansk region are similar. Main roads of national importance are North-South oriented, while territorial ones are located in latitudinal direction West-East. The national strategies of Finland and Russia are aimed at implementation of transit potential of both countries, which means shifting of national priorities to latitudinal roads. The transport load on latitudinal roads having territorial importance status is increasing, road deterioration is accelerating, thus requesting big maintenance and rehabilitation works. Both territories are trying to change the status of latitudinal roads in direction of cross-border points.
2. The road sector of Lapland considers the task - keeping current level of maintenance with reducing financing as a challenge. To answer this challenge the following decisions are proposed:
   - Differentiation of maintenance levels depending on participation in logistic chains of local business (tourism, timber and mining industries) and public transport.
• **Consolidation** of state authorities responsible for operational condition of road network in order to optimize management costs, expand system effect of the decisions made.

• **Consolidation of lots** when forming the contracts on road maintenance to expand opportunities of contractors to reduce their costs through implementation of scale-effect and risk reduction.

3. In order to implement the national transport strategy the Murmansk region has the regional **programme** (2011-2013), which provides for development of territorial roads contributing to **implementation of transit potential**, safety and sustainability improvement. Implementation of transit potential automatically implies harmonization of principles, approaches and technologies to provide **homogeneous performances on transit road corridor routes**.

4. Coordinated development of transport systems of Lapland and the Murmansk region is an opportunity to:

• Adapt management and technological know-how on Russian roads to **increase output of available financing and thus to optimize costs**;

• Jointly solve innovational tasks (R&D). An example of such activities in the road sector is the project being implemented within the Kolarctic ENPI CBC Programme - “Barents Low Volume Road Management” (2011-2013), in which Lapland, Murmansk and Arkhangelsk region and the Republic of Karelia take part. The project aims at adaptation for the Russian periphery conditions of the technologies developed during the long-term cooperation of road engineers of the Northern countries within the ROADEX-project.

Similar project may be accepted, e.g., on road safety issues. In this case the programme’s resource on R&D component can be considered as the **project’s co-financing**.
### Table 1: The Murmansk region: Road sections that form a latitudinal transit direction (by 01.2007)

<table>
<thead>
<tr>
<th>№ on the scheme</th>
<th>Road sections</th>
<th>Administrativ e importance</th>
<th>Road category</th>
<th>Length, km</th>
<th>Pavement type</th>
<th>Traffic volume (ADT), v/day / % heavy trucks</th>
<th>Roadside service (hotels and petrol stations)</th>
<th>Speed limit, km/h</th>
<th>Availability of mobile communicatio n</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Kola – Verkhnetulomsky – cross-border point “Lotta” with accesses to Verkhnetulomsky settlement (the road “Lotta”)</td>
<td>territorial</td>
<td>III, IV, V</td>
<td>232,05</td>
<td>Penetration macadam PM (black crushed stone) (198,18 km), gravel (33,87 km)</td>
<td>530 / 25%</td>
<td>Hotel (Verkhnetulomsky settlement) / 3 petrol stations</td>
<td>40 km/h on km 6-12 (dangerous curvatures), 30 km/h (before the CBPoint, km 130)</td>
<td>km 0 - km 85</td>
</tr>
<tr>
<td>3</td>
<td>Kandalaksha – Alakurtti – cross-border point “Salla” (the road “Salla”)</td>
<td>territorial</td>
<td>IV</td>
<td>166,07</td>
<td>Asphalt concrete (89,54 km), penetration macadam (31,83 km), gravel (44,7km)</td>
<td>440 / 30%</td>
<td>Hotel (Alakurtti) / 2 petrol stations</td>
<td>30 km/h (before the cross-border point on km 92 and km154)</td>
<td>km 0 - km 40, km 60 – km130</td>
</tr>
<tr>
<td>4</td>
<td>Nickel – Prirechny – road “Lotta”</td>
<td>territorial</td>
<td>III, IV</td>
<td>83,03</td>
<td>Penetration macadam (38,03 km), gravel (45 km)</td>
<td>550 / 60%</td>
<td>Hotel and petrol station in Nickel settlement</td>
<td>Reconstruction km 0-20, speed limit up to 40 km/h</td>
<td>km 0 - km 10</td>
</tr>
</tbody>
</table>

Total length of collector roads of regional importance in the Murmansk region – 481,15 km, including:
- Asphalt concrete - 89,54 km, penetration macadam - 268,04 km, gravel - 123,57 km. 
Scheme 1  The scheme of main roads of the Murmansk region
### Annex 3.1.4

<table>
<thead>
<tr>
<th>№</th>
<th>Air transport in Lapland</th>
<th>Air transport in the Murmansk region</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Comparing condition and prospects of air transport in Lapland and the Murmansk region</strong></td>
<td>**Air transport infrastructure is represented with two airports:</td>
</tr>
<tr>
<td></td>
<td>Air transport is a transport mode that supports Lapland's connection with other countries. Most foreign tourists arrive to Lapland by air. Some 20% Finnish tourists arrive to Lapland by planes too. Therefore air transport is a <strong>basis of international tourism logistics</strong> of Lapland. Air transport is important for <strong>electronic industry and spare parts supplies</strong> logistics. Lapland has land infrastructure objects of air transport, including:</td>
<td>- Murmansk (Murmashi) connected by regular flights with Moscow, St.Petersburg, Arkhangelsk. It is the only airport opened for international flights – Helsinki (Finland), Tromso (Norway).</td>
</tr>
<tr>
<td></td>
<td>- Three regular all-year-round functioning airports – Rovaniemi, Kemi-Tornio, Kittila,</td>
<td>- Apatity (Khibiny) handles only middle-class airplanes and serves regular flights with Moscow and charter flights during the tourist season.</td>
</tr>
<tr>
<td></td>
<td>- Two seasonally functioning airports (winter tourist season) – Enontekiö and Ivalo.</td>
<td>Settlements Lovozero, Krasnoschelie, Kanyovka, Sosnovka (Lovozersky District), Umba, Tchavanga, Tetrino, Tchapoma (Tersky District) has airfields of local airlines (LAL). Their task is to connect remote settlements of Lovozersky and Tersky districts with population – 900 inhabitants. The LAL implements sanitary flights, ice conditions reconnaissance, rescue works, delivery of urgent goods. Air transportations of tourists to the remote districts of the Peninsula are implemented by helicopters.</td>
</tr>
<tr>
<td></td>
<td><strong>In 2009 there was a decrease of air transportations, the volume of passengers arrived was 800,000 people, which is 100,000 – 150,000 less than in the previous years.</strong></td>
<td><strong>In 2009 public air transport transported more than 0.5 mln.t. goods and 181.2 thousand passengers.</strong> Since 2007 the state regional enterprise “Murmansk base of aviational preservation of forests” became the owner of local aviation.</td>
</tr>
<tr>
<td></td>
<td><strong>In prospect air transportation growth is forecasted due to increasing:</strong></td>
<td>In 2009 the landing strip of Murmansk airport was reconstructed within the Federal Target Programme «Modernization of the Russian Transport System in 2002-2010». The FTP “Development of the Russian Transport System in 2010-2015” intends a further modernization of the Murmansk airport with means of the federal budget.</td>
</tr>
<tr>
<td></td>
<td>- Tourist flows,</td>
<td>In future an international hub is proposed to be developed on the basis of the Murmansk airport in order to increase attractiveness</td>
</tr>
<tr>
<td></td>
<td>- Number of business trips while the Barets Region will integrate into the world economy.</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Growth of demand for:</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Charter flights,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Regular air transportations in latitudinal direction (centers of the Barets region territories – Murmansk, Arkhangelsk, etc.),</td>
<td></td>
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<tr>
<td></td>
<td>- Regular air connections with the capitals: Moscow, St.Petersburg, Stockholm, Copenhagen</td>
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<tr>
<td></td>
<td>is expected.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The risks for air transport development are:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Sensitivity of air transport to economy state and potential</td>
<td></td>
</tr>
</tbody>
</table>
user welfare;
  • Sensitivity of air transport to weather anomaly, which can become more frequent because of climate change.

It is more difficult to forecast air transportations than other modes of transport therefore Lapland provides for special measures to insure tourism industry – development of railway alternatives to air transport.

of the region for tourists. Th shuttles, aerotropolis and hotel zones are to be provided. However, crisis condition of civil aviation impedes from implementation of competitive advantages of this mode of transport to increase freight and passenger transportation volumes.

The Russian President has signed a decree (2010) N 403 "Concerning complex system of population safety on transport, according to which the transport infrastructure objects will be equipped with engineering means of violation prevention, the personnel will be trained. Evaluation of vulnerability of air transport infrastructure is being made and the measures to improve its safety is being developed.

Conclusions:

7. The volume of passengers transported in Lapland is 4.4 times higher than in the Murmansk region indicating a significant dependence of Lapland (and especially tourism industry) from air transport. The passenger flow forecasts are missing. However, sensitivity of air transport to economy condition, welfare and weather anomalies makes the province to develop logistics alternatives of tourism based also on railway transport.

8. On the Russian side a modernization of land infrastructure is executed within the federal target programmes with federal resources. However, general crisis condition of the Russian civil aviation (worn out plane fleet, plane building industry condition, low safety of flights, lag from international environmental requirements, etc) impedes from balance of air transport components. This reduces output from investments into the land infrastructure modernization and prevents from implementation of air transport competitive potential within the logistics chains. The forecast data of freight and passenger flow dynamics on air transport are missing.

9. Coordinated development of transport systems of Lapland and the Murmansk region can contribute to joint searching of ways to enhance the role of air transport in the Barents Region, e.g. with means of specialization of air transport services with traditionally developed directions (servicing of tourists, inhabitants of remote settlements, monitoring of ice situation, sanitary aviation).
### ANNEX 4.2.1

<table>
<thead>
<tr>
<th>№</th>
<th>Public transport of Lapland (till 2030)</th>
<th>Public transport of the Murmansk Region (till 2025)</th>
</tr>
</thead>
</table>
| Comparing public transport characteristics in Lapland and the Murmansk Region | **The objectives** of the national policy of Finland are:  
- Accessibility of public transport services to provide daily mobility of citizens on the whole territory of the country.  
- Increasing the share of trips made with public transport on both city and inter-city connections through improvement of quality of services.  

The Ministry of Transport and Communications define the **national level of services** for the public transport.  
Territorial bodies responsible for public transport strengthening policy implementation are to:  
- Define the level of public transport services for the territory;  
- Approve management model that would ensure achievement of the set level of services.  

In Lapland the **responsible bodies** are:  
- The Lapland Centre of economic development, transport and the environment (ELY),  
- City administrations of Rovaniemi and Kemi.  

Determination of level of services has been done for the first time and shall be completed by the end of 2011 with further actualization of levels of service once a five years or when necessary.  

The Ministry of Transport and Communications has defined the preliminary target indicators of basic levels of public transport services in Finland, including those: | The Russian Transport Strategy sets the common social **check points**:  
- Ensuring population mobility and accessibility of transport services;  
- Improving transport safety;  
- Reducing environment pollution.  

The public transport shall provide accessibility and quality of services for population in accordance with the **social standards**:  
- Satisfying the increasing transportation needs of population  
- Satisfying special requirement (physically-challenged people);  
- Providing sustainability of connections between settlements and main network of transport communications  
- Price accessibility of socially important services.  

Development of urban and suburban connections, rolling stocks and its quality comparable to that of the world level.  

In the Murmansk Region the **responsible bodies** are:  
- The Ministry of Transport of Russia  
- Administrations of municipalities.  

The Strategy provides for development of minimum social standards of mobility for different **population categories** by territories. These standards will define requirements to development of passenger transport of all modes (rolling  |
In the areas of middle-scale agglomerations, for inter-city connections.

According to the above target values population of municipality centres will have an opportunity to use public transport for making trips to:

- The places of work, training and terminals of other modes of transport (railway, air transport).
- The capital of the country and to big cities of provinces.

When organizing transportations in provinces and municipalities the basic level of services is guided by the principles of efficiency and safety of transportations of sufficient volume in order to provide the right of people having no a personal car for mobility.

The Lapland Strategic Development Programme till 2030 provides for development of:
- Public transport in two agglomerations with sufficient density of population: Kemi-Tornio and Rovaniemi.
- Intraurban public transport in Tornio, Rovaniemi and Kemijarvi.

The work of public transport in every city has its specifics, e.g.:
- **Rovaniemi**: 11 routes, including 4 regular ones with 1-hour interval. Other routes are adapted to functioning of organizations and educational institutions. The work on defining new improved target levels of service and the needs in route network is being executed.
- **Kemi, Tornio**: For most of the routes the interval of traffic is 1 hour and half an hour during peak hours, including Kemi-Tornio (27 km) inter-city route. Some routes connect Kemi and Haparanda (Sweden). During 2011 the basic target levels of service will be determined and the model of public transport stock, price accessibility of services, frequency of servicing for the settlements). The National policy on accessibility and quality of transport services provides for:
  - Setting of minimum social standards in legislation;
  - Compensation mechanisms of transport companies’ losses resulted from state regulation of tariffs for passenger transportations.

The expected results are:
- Increasing population mobility
- All year round road connections of all settlements having prospects of development with public road network;
- Price accessibility of services for all population categories in accordance with social standards.

The instruments of national Transport Strategy implementation are federal, regional and municipal programs of transport development coordinated on the stage of its developing.

The Murmansk Region Development Strategy till 2025 sets no objectives for public transport development but allow to assume them in the composition of other objectives, namely:
- Ensuring high mobility of resources (including labor ones)
- Improving quality of living environment (including reduction of transport pollution)
- Implementation of measures aimed at creation of environment accessible for low-mobility groups of population (including smooth access to public transport).

The list of tasks for accelerated development of production infrastructure sectors includes modernization of public transport in a form of measures that provide comfort of
transport management will be defined. In future a new joint bus station will be built on the border of these two cities.

**Kemijarvi:** Intraurban passenger transportations are made with school buses, during summer – with means of special public transport.

Rovaniemi, Kemi, Tornio, Keminmaa, Sodankyla have their **special public transport**, which is subsidized by the municipality and by the state.

In **sparsely populated districts** the volume of public transport services is low or zero.

The offer of public transport services fully depend on the amount of Subsidies. Provision of basic level of public transport service in rural areas will be made with **call-in public transport**.

The level of service by transport areas:

- **Tunturi-Lappi area** is served with airports Kittila and Enontekiö, railway station Kolari and bus connection along the Western Lapland development corridor.
- **Northern Lapland area** is served with airport Ivalo and bus connection along the Arctic Ocean Corridor. Railway connections are not available.
- **Eastern Lapland area** is served with airports Rovaniemi and Kuusamo, railway station Kemijarvi, bus connection along the Murmansk Corridor and North-East Finland Corridor.
- **Rovaniemi area** is served with airport Rovaniemi, which is important for the whole Lapland, railway station Rovaniemi.
- **Kemi-Tornio area** is served with all the modes of transport: air, railway transport. Bus connections follow the Northern Arc of Bothnic Gulf towards Rovaniemi, Oulu and Luleo.

The Strategy considers development of Murmansk **agglomeration** and the city system Kirovsk-Apatity-Polyarnye Zori-Kandalaksha, which means improvement of transport services for population. There is no any concrete document on development and modernization of public transport.

The public transport functions in 11 cities and towns of the Murmansk Region (2009):

- **Murmansk (+ suburbs):** 11 bus and 5 trolleybus routes, 18 route taxi
- **Kirovsk:** 2 bus routes with 30-60 minutes interval, during peak hours – 15 minutes, and 8 suburban routes with >1 hour interval.
- **Apatity:** 9 urban routes with 1 hour interval or functioning during peak hours or when local enterprises start and finish their working day. One of the routes (11) has a 10-15 minutes interval. 7 suburban routes. Buses to Kirovsk have a 15-20 minutes interval, others make several trips a day during the peak needs.
- **Kandalaksha:** 3 urban routes with 1 hour interval and 5 suburban one with interval >1 hour.
- **Olenegorsk:** 1 urban route with variable interval – 10 minutes in peak hours and 1 hour during other periods, 1 route servicing the needs of local plant.
- **Monchegorsk:** 3 urban and 3 suburban routes.
- **Umba:** 1 urban route
- **Severomorsk:** 6 urban and 5 suburban routes
- **Zapolyarny:** 3 suburban routes
- **ZATO Alexandrovsk (Polyarny, Gadzhievo, Snezhnogorsk):** 1 urban route with 10-15 minutes interval (Polyarny) and 6 suburban routes with 1 hour interval, 1 inland water route (Severomorsk – Polyarny)
**Intercity** public transport of Lapland is oriented on servicing the tourists and offer commercial services. Organization of regular public transport services is complicated with seasonal nature of tourism and transport demands’ fluctuations. Tourist flows use different modes of transport depending on time of the year, district and external mode of transport used. Foreign tourists basically arrive on air transport. Domestic tourists arrive on:
- Personal cars - 60%
- Air transport - 20 %,
- Railway transport or train/car combination - 5-20 %
- Charter buses 5-10 %.

External modes of passenger transport include:
- **Air transport** – three regular yearly functioning airports – Rovaniemi, Kemi-Tornio, Kittila and two seasonally functioning airports (winter tourist season) – Enontekio and Ivalo. In 2009 the volume of air transportations decreased, the number of passengers arrived reduced to 800.000 passengers, which is 100.000 – 150.000 less than in previous years.
- **Railway transport** - the biggest railway stations are: Rovaniemi, Kemi, Kolari, Kemijarvi. The volume of passenger transportation though these stations was 600.000 people (2006) with tendency to growth. During the next 5-10 replacement of rolling stock becomes actual. The Finland’s (EU) policy: railway transport shall become an alternative to the personal car, because diverting passengers from personal cars to railway transport reduces transport impacts on environment of tourist districts of Lapland and the Barents Region as a whole.

**Polyarnye Zori:** 1 urban route and 2 suburban routes with interval >1 hour.
**Kovdor:** 1 urban and 1 suburban routes (to Rikolatva), 2 trips a day.
**ZATO Ostrovnoy:** 1 urban route.

There is no data on using of transport by domestic and foreign tourists.
There is no level of service data analysis by transport zones (round the district centers and population-attraction centers).

External modes of passenger transport include:
- **Air transport** – 2 airports in Murmansk (Murmashi) and Apatity
- Local transportations are made from airdromes in Lovozero (to Krasnoschelye, Kanevka, Sosnovka) and in Umba (to Tchapoima, Tchavaga, Tetrino).
- **Water transport** - port "Murmansk" – start point of cruises, the port used by cruise ships from Europe. The port Kandalaksha also has a potential to serve cruise routes. Settlements on the White Sea shore are served with the water transport but not on a regular schedule.
- **Railway transport** – railway Murmansk – St.Petersburg links two regional agglomerations: big stations – Olengorsk, Apatity, Kandalaksha. One railway line starts at station Pinozero in direction to Kovdor, one start at St. Kola to Nickel and Pechenga. A short railway line goes from St. Apatity to Kirovsk. Total length of railway network in the region is 891 km. Suburban trains serve between district centers that are located along railways.
- **Road transport** – all district centres are connected with bus routes, some – with railway routes. The only exclusion is ZATO Ostrovnoy, which is provided only with water and air connection with Murmansk. International
All tourist strategies and development programmes accessibility is a priority condition. Specific attention is paid to regularity of functioning of the whole tourist chain, where air and railway transport are feeders. It is important to organize smooth (uninterrupted) connections for the mobility within the tourist zones.

Public transport trips made by citizens of Rovaniemi, Kemi, Keminmaa, Kemijarvi, Simo and Tornio are subsidized by the state and municipalities. Subsidizing is a condition for public transport promotion. A question on expediency of discounted tickets for tourists depending on transportation type is brought up. There is a demand for purchasing of tickets via Internet covering different chains of tourist logistics.

Commercial public transport in Lapland is less competitive in conditions of free competition, therefore there is a need in decision to be made on the national level concerning special approach to increase the share of public transport in servicing mobility needs.

Currently the available public transport infrastructure doesn’t meet the demands. In future difficulties may appear because of depreciated and out-of-date infrastructure — railway and road transport ones. Recently big investments were made into land infrastructure of air transport, and new airports are able to serv big volumes of tourists, especially if the flow will be homogeneous within the year.

The Strategic Programme provides for:

- Construction of a new railway from Kolari through Yllas to Levi having a big potential of development,
- Construction of passenger terminal in Tornio. Development of bus terminals as transfer nodes with good level of equipment is very important.
- Bus routes link Murmansk and Rovaniemi, Kemijarvi, Ivalo (Finland) and Kirkenes (Norway).

There is no accurate data on passenger transportations in rural areas.

Passenger transportation by public transport types (2009) — totally 113.3 mln. pass., including:
- Railway transportations - 1.2 mln.pass.
- Bus - 70.5 mln.pass.
- Sea - 127.4 thousand pass.
- Air - 181.2 thousand pass.

During the last years passenger transportation volumes decreased on all modes of transport except air transport (while the total number of transported passengers has decreased by 3 times since 2000, the number of air transport passengers has doubled). In the Murmansk Region (2008):
- Level of population provision with public buses is 60 buses/1000 inhabitants which is higher that the Russian average value (45 buses/1000 inhabitants).
- Density of paved public roads is 18.5 km/1000 sq.km, which is 2 times less that Russia’s average.

The regional budget subsidizes socially important routes (Order N 300-ПП «Concerning population servicing by road and railway transport in the Murmansk Region», 27.06.2008).

The fare in urban public transport is paid directly in the buses. One can buy a season ticket for one or several types of transport. In 2010 introduction of electronic tickets was planned for Murmansk but it failed. The reasons for this are unknown. One trip price for urban transport in settlements (Murmansk
The main **obstacles** for public transport development are:

1. **sparsely populated settlements and long distances, low passenger flow volumes.** However, public transport shall provide the same rhythm of life as in the territories with high population density and compact living. Provision of basic level of public transport services is a costly task because of long distances and low passenger volumes.

   The following is needed:
   - effective approaches to organization of work (e.g. call-in public transport, car pooling, etc.). Responsibility of authorities for the public transport work organization increases.
   - Decisions on target public transport indicators without information on state subsidies to support public transport.
   - Strengthening the role of organizations managing the public transport functioning in agglomerations and municipalities, mastering new management methods.
   - New ways of coordination so that the public transport could serve both population and tourists.

2. **Low demand for passenger transportations** is incapable to support economy of transport services. Increasing the level of transport service will require state support and subsidies of routes in sparsely populated areas to keep acceptable ticket price for the passengers, safety of transportations and viability of transport companies. However, comparing to other regions, Lapland has opportunities to support public transport with means of tourism. To increase the share of public transport services share in tourism services volume, adaption of services is needed, namely:
   - Operability and year-roundness
   - Simplicity and accessibility for the foreigners

   Attraction of tourists to public transport is not yet considered.

   The Strategy **provides for**:
   - Modernization and development of regional **infrastructures** based on up-to-date technologies;
   - Construction of new tracks of Oktyabrskaya railway to double its capacity till 2025;
   - Development of regional and municipal road networks
   - Development of regional airports
   - Other measures that provide both sustainable goods transportations and **comfort of passenger transportations**.

   To improve **attractiveness of the region to the tourists** the Strategy provides for **development of high-speed external passenger transport**.

   The main infrastructure of external passenger transport for the region are airports Murmansk and Apatity, which need:
   - Modernization and expansion of regular and charter flights;
   - Development of necessary sectors like shuttles to the city (or other destination point), aerotropolis, hotel areas.

   The Strategy plans:
   - Increasing of **social protection standards** for physically-challenged people, including provision of access to territorial transport networks and public transport. About 60-70% all rolling stock of urban, inter-city and suburban transport must be adapted to phisically-challenged people by 2025;
Forming of tourist logistic chains.

For bringing the inter-city public transport on a new quality level the community shall invest into its development. The new quality level objective is commercial viability of public transport services to serve both tourists and local population.

3. Insufficient development of transport latitudinal connections called-for by tourists. Tourist chains fail in transfer nodes and on some route sections.

4. incapability of ticket sales system to provide sale of transport service packages.

5. Difficulties with provision of required number of sleeping cars and special rolling stock for transporting of personal cars during the tourist seasons.

6. Seasonal character of functioning of some airports due to tourism.

The obstacles for public transport popularity enhancement among different groups of population. Classification of obstacles is presented in Table 1 of this Annex.

Investments into transport-transfer complex on the basis of railway and sea stations in Murmansk and into development of roads along the tourist districts and Teriberka.

The Tourism Development Strategy provides for completion of transport infrastructure construction:

- Road from Murmansk through Prirechny to Nickel and Lotta;
- Road from kandalaksha through Alakurtti to the state border (cross-border point “Salla”);
- Network of campings, rest areas, petrol stations, vehicle checkup stations, roadside cafe, shops,
- Post-telephone communications and road information along the routes (signs, guide books, memos for the travellers).

The obstacles for public transport development are Low population density (in Lovozersky and Tersky districts - 0.2 inhabitans/1 sq.km) and undeveloped road network, which creates prerequisites for distribution of principle of the remote medical, educational, social and humanitarian services with means of communication technologies.

Analysis of needs of different groups of population in public transport services has not been done.

Conclusions:

1. The Finnish strategic documents of all levels set the clear objective - increasing the share of public transport in servicing transport needs of population through improved quality of services and expansion of the list of user groups, for which public transport shall become more accessible. The list of user groups include tourists, which are considered as a potential user group able to complement the existing low local passenger flow and increase commercial component by reducing dependance of public transport from subsidies. Studied and summarized requirements of user groups, and obstacles for development form a starting point for public transport development in Lapland so that it could achieve the national standard of services.

2. Russian strategic documents set no clear objectives for public transport development just defining check points for development and higher
accessibility of infrastructures (which is supposed to include public transport too). Studies of obstacles for public transport development and data on user group needs are not available. Such indicators like price accessibility of public transport for all social groups and comfort of trip are only two elements of the big list of criteria of good quality services and attractiveness of public transport. This argues about “inertion” of Murmansk region public transport functioning supported with subsidies. Adaption of the Murmansk regional public transport to market conditions and dynamic growth of motorization level with means of actual policies and professional methods has not been yet launched.

3. On the Russian side the responsibility for population servicing by public transport has been given to the municipal level (Federal Law ФЗ-131). Independent solving of tasks by municipalities, when state and regional policies on public transport are absent, complicate application of system approach on agglomeration level. While system approach is the key condition for optimization and development of any infrastructure. The modernization mentioned in the above strategy means technological “filling”, but world practice shows that any technological modernization (e.g. introduction of electronic ticket systems) never justifies itself if the system is not organized optimally beforehand. In this case technological innovations will result in more costs to end users.

4. National legislations provide opportunities for coordinated development of Lapland and Murmansk regional public transport development. This is beneficial for both territories because finally this will allow to harmonize standards of public services in both territories. The first step is collection of missing data on levels of services and user group needs in the Murmansk Region. Following the same format of initial data is a basis for application of up-to-date instruments (models) in order to:

- Shift from right but fuzzy intentions of the Russian strategic documents to concrete and clear objectives of public transport development;
- Optimize existing and plan new passenger transportation routes (incl. cross-border ones) that would be attractive to users;
- improve quality of services up to the level required by the modern user;
- increase incomes and reduce operational costs of transport companies, and thus reduce the needs in subsidies;
- attract more users to Arctic routes.

5. Increasing the role of Barents region public transport in ensuring of population mobility in settlements, agglomerations, on inter-city and international connections is a way to higher efficiency of passenger transportations, less road accidents and less negative transport impact on susceptible Arctic ecosystems, which meets the interests of both countries.
<table>
<thead>
<tr>
<th>User group</th>
<th>Sparsely populated areas</th>
<th>Agglomerations</th>
</tr>
</thead>
</table>
| Children and youth                     | • Mobility dependence on school bus schedules during the week or on motorised adults during week ends, etc.;  
• Long distances from home to school/university;  
• Absense of public transport services for independent trips. | • Public transport services do not provide freedom of leisure-time trips excluding that in central planning districts of Rovaniemi and Kemi-Tornio. |
| Adults                                 | • Work, shopping and other trips are possible only with means of personal cars excluding central planning areas of Rovaniemi and Kemi-Tornio. | • Dependence on personal car for work and shopping trips, etc.;  
• In weekends and in summer the number of bus runs is decreased, thus making leisure-time trips difficult;  
• High ticket prices for tourists |
| People with limited mobility (elderly people, physically-challenged people) | • Small assortment and amount of public transport services reduce mobility of this user group;  
• Hampered accessibility of public transport services (non-adapted infrastructure and rolling stock, lack of comfort, difficulties when using, absence of call-in public transport services);  
• Limited accessibility of taxi services in rural areas. | • Insufficient accessibility of infrastructure and public transport rolling stock limit independent travellings of this user group;  
• Orientation difficulties  
• High ticket price. |
| People having no own personal car      | • Impossibility to make daily trips to work because of lack of public transport services. | • Insufficient development of routes and lack of public transport services limit daily trips. |
| Tourists and vacationers               | • Undeveloped route of suburban public transport (from railway stations, bus terminals),  
• Lack of express haul services, bus and taxi services.  
• Lack of information  
• Long distances, rare runs of bus and railway transport, low travel speeds,  
• Lack of latitude direction links | • Lack of information (routes, schedules on bus stops)  
• Lack of suburban connections to tourist centers;  
• Absense of unified system of ticket sale;  
• Lack of services during summer. |
### ANNEX 4.3.1

<table>
<thead>
<tr>
<th>№</th>
<th>Road transport of Lapland</th>
<th>Road transport of the Murmansk region</th>
</tr>
</thead>
</table>
| Comparing characteristics of road transport in Lapland and Murmansk region | For Lapland **a car is a main means of daily mobility** because of:  
- Sparsely-populated area, low population and long daily trip distances;  
- Insufficient services of passenger transport (buses, railway).  

For most of the territory a car is the only means of mobility without an alternative (except light transport on short distances). This fact explains higher motorization level in Lapland (520 pass.cars/1000 inhab.) comparing the national one (510 pass.cars/1000 inhab.).  

Daily life of Lapland’s population **depends on a car**, which provides trips to the work, educational institutions, shopping, social issues and leisure-time trips.  

**Optimum safety/speed** is an important criteria of road infrastructure quality. To **keep transport accessibility** without any detriment to safety it is important to provide 100km/h basic speeds. This task is to be solved by the road maintenance services.  

**Difficulties** that come from settling structure in Lapland, high motorization rates and poor role of public transport define the level of mobility of different user groups:  
1. Inhabitants of sparsely settling territories **have to own a car** and use it for daily trips, most of which are made on long distances. The biggest problem for this group of inhabitants is **dependence on low class road condition**, especially in winter and during spring thaw. | Motorization level is a macro-economic indicator of market economy. In the Murmansk region the level of motorization is gradually increasing and **the role of motor transport in mobility provision of economic activities and population is increasing, too.**  

The population of the region is not critically dependent on personal cars because:  
- Most population live in cities;  
- Most work places are located near households or within one agglomeration;  
- Public transport services are available.  

The vehicle fleet of the Murmansk region is 212.7 thousand vehicles (2009). The motorization level is about 200 pass.cars/1000 inhab. (from other sources - 185-227 pass.cars/1000 inhab.).  

Forecasts of vehicle fleet growth, increasing of freight and passenger transportation volumes, as well as experience of other countries and Russian megapolises allow to foresee **growth of negative after-effects** of motorization level growth:  
- Increasing of transport externalities – road congestion, road accidents, environmental impacts;  
- Increasing of costs and retarding of economic development because of transport eternalities affecting all activities that depend on transport (trade, tourism, etc.);  
- Increasing of investment risks and reducing of investment attractiveness of the region. |
2. Pupils reach schools using school buses and depend on schedule. For other trips they use bicycles and the problem is to ensure safety of this non-motorized user group.
3. Inhabitants of settlements see a problem in lack of parking places, non-timely snow removal, for Rovaniemi, Kemian Tornio – road congestion on main streets and intersection during peak hours.
4. Elderly people and physically-challenged people are concerned with safety issues and accessibility of different institutions.

Community development in Finland has attained the level when interests of all population groups and all ways of mobility are taken into account when transport planning but not only vehicle transport as it had been earlier. Transport concerned issues of population are:
- High levels of transport noise in built-up areas adjacent to roads;
- Emissions that polute air, soils, water (despite high quality fuel that meets the EURO standards).

Community controls necessary measures that compensate negative transport impacts (externalities) when implementing all transport projects in Lapland:
- Concerning levels of noise and emissions (designing roads in cuts, construction of soil walls, landscaping, planting trees, etc.);
- By location of water spreading from roads and transport objects (parkings, road-side service objects, etc.);
- By safety assurance through protection of non-motorized road users with means of conflict situation prevention (channelling, roundabouts, dividing motorized and non-motorized road users), prevention of road user mistakes that could result in road accidents (road safety audit).

Illustrations to assess externalities in % of GDP are given in Table 1 to this Annex. The table shows that the basic transport factor functioning as a locomotive is road congestion. The higher is road congestion the higher are road accident rates and negative environmental impacts of transport. This relationship can be illustrated with the Figure 1.

The problems of different user groups resulted from increasing motorization level in the Murmansk Region hadn’t been specially studied. However, mass media review shows that citizens are mostly concerned with:
1. lack of temporary and stationary parking places resulting in un-controlled parking of vehicles on carriageway, lawns, playgrounds, etc. and this:
   - Impedes road infrastructure maintenance, disturbs public transport functioning;
   - Impair quality of city environment;
   - Causes social tension.

Note: The Strategy of socio-economic development of the Murmansk Region (2025) assumes that parking place provision level (temporary and stationary) will be 650-700 places/100 thousand vehicles till 2025.

2. Growth of vehicle fleet and traffic volumes worsen quality of air, especially in cities.

Note: The Strategy of socio-economic development of the Murmansk Region (2025) provides for implementation of measures to reduce levels of air pollution by road transport.

Mass media review shows that society doesn’t demonstrate any concern about air pollution with transport emissions,
noise affecting areas adjacent to roads, storm sewage from transport objects and road safety. These issues are redirected to design and construction companies, which are concerned first of all with construction costs. In Russia the construction projects never include real measures that guarantee reduction of negative transport externalities.

Conclusions:

1. Population of Lapland strongly depends on personal cars. Motorization level and intensity of car use are really high. Therefore after effects of transport activities are significant – road congestion in settlements, road accident risks and negative transport impacts on environment. However, Finnish legislation (EU), professionalism of road designers, contractors and active position of society allow restraining and minimizing externalities with means of organizational and engineering solutions. However, there are directions for scale work aimed at adaptation of transport system to the needs of definite target groups, as well as correction of mistakes made earlier, when providing mobility with means of cars was a priority for transport system development and all other types of mobility were neglected.

2. The Lapland Development Strategy provides for the need in increasing mobility, and shifting of this mobility to public and non-motorized transport becomes the main challenge for the transport system of the province. The objective is to reduce externalities, costs for its compensation and improve quality of living environment (comfort, safety, environment-friendly practices, purity, primordial nature, silence, calmness, etc.) – as an economic resource of the province, the demand for which always increases on the world market.

3. Finland and other countries with long motorization experience are now conscious of benefits and costs of motorization and gained experience how to manage externalities and apply adequate instruments – organizational, legislative, technological, and monitoring, etc. The mistakes made are eliminated and this require some investments.

4. Mobility of the Murmansk region population is not in critical dependence on personal cars. Public transport services are a good alternative. However, motorization rate gradually increases and results in more transport externalities. City inhabitants feel worsening of quality of life, but this process is currently unmanaged. Delay in making right decisions generates snowball – a complex of problems which will cost much to next generations. Unconcern and lack of information of today’s generation reduces quality of life of future generations.

5. One must admit that in the context of motorization issues and its after effects the most significant is a border effect between two neighbouring territories. It reflects principal difference in maturity and readiness of society to meet the challenges. It is possible to manage mobility and externalities. Joint coordination work aimed at development of Lapland and Murmansk region transport systems is a real chance and flinging it away would be unwise and unforgivable. Best world experience shall be used as soon as possible and then transferred to other Russian regions having no such opportunities as the Murmansk Region. This mission of the region is an opportunity to log in the list of Russian innovation territories, increase its investment attractiveness and implement real transport projects for the public good.

Table 1  Transport externalities in EU and Russia, %GDP
### External transport factors and its share in total community transport costs

<table>
<thead>
<tr>
<th>External transport factors and its share in total community transport costs</th>
<th>Average value for the EU countries *</th>
<th>Average value for Russia</th>
<th>Average value for big Russian cities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transport congestion (48.8%)</td>
<td>2.0</td>
<td>6.7</td>
<td>7.3</td>
</tr>
<tr>
<td>Road accidents (36.6%)</td>
<td>1.5</td>
<td>5.0**</td>
<td>5.5</td>
</tr>
<tr>
<td>Environmental impacts (14.6%)</td>
<td>0.6</td>
<td>2.0</td>
<td>2.2</td>
</tr>
<tr>
<td>Among that:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gas pollution (9.8%)</td>
<td>0.4</td>
<td>1.3</td>
<td>1.5</td>
</tr>
<tr>
<td>Noise pollution (4.8%)</td>
<td>0.2</td>
<td>0.7</td>
<td>0.7</td>
</tr>
<tr>
<td>Total (100%)</td>
<td>4.1</td>
<td>13.7</td>
<td>15.0***</td>
</tr>
</tbody>
</table>


** - Road accident data, national Concept of transport safety in Russia (July 2005). Other external transport factors are evaluated based on relationships obtained in OECD studies.

*** - Data of the Scientific-Research Institute of Road Transport (NIIAT), Moscow
Figure 1  Transport externalities: relationship between reasons and consequences

Negative transport externalities

Road congestion

Road accidents

Environmental impacts
### ANNEX 4.4.1

<table>
<thead>
<tr>
<th>№</th>
<th>Light traffic (non-motorized mobility – pedestrians, cyclists, physically-challenged people) in Lapland</th>
<th>Light traffic (non-motorized mobility – pedestrians, cyclists, physically-challenged people) in the Murmansk region</th>
</tr>
</thead>
</table>
| Comparing objectives of light traffic development in Lapland and Murmansk region | Urban development of post-industrial period based on increased popularity of all mobility types except personal car one (public transport and non-motorized movements) is a predominate world trend. National policies of many countries promote development of this tendency. Non-motorized infrastructre is being extended, more and more streets in cities are transferred into pedestrian streets and zones – **public spaces**. In most European countries with high motorization level (incl. Finland) **light traffic** becomes more and more popular – pedestrians, cyclists, people with limited mobility. **Infrastructure for light traffic** includes: cycling/pedestrian paths adapted also for wheelchairs, bicycle parking and storage. The main advantage of light traffic is mobility, which:  
- Never pollutes air  
- Never causes noise  
- Requies no much space  
- Is efficient  
- Is democratic and accessible for all population groups  
- Improves physical and psychological health of the community. Pedestrian, bicycle and wheelchair traffic on short distance trips (which make up more than 50% urban population movements) is the most competitive type of mobility accessible for everyone, even physically-challenged one. In Lapland areas for priority development of light traffic infrastructure are cities, settlements – centres of | Russian cities, including those in the Murmansk region (having 8 cycling clubs, See Table 1) are out of the world tendency of light traffic popularization, with created demands for light traffic infrastructure. The prerequisites for this are:  
- Increasing number of cyclists on carriageway and increasing number of bicycle related accidents, mostly with severe consequences;  
- Extending model range of bicycles, appearance of leading bicycle brands, including mountain bikes, which helps to eliminate broken country terrains as obstacles for cycling;  
- Russia’s accessing the **Convention on the Rights of Persons with Disabilities**, which will require implementation of rights of people with disabilities and development of infrastructure to provide mobility of people in wheelchairs;  
- Experience of countries with high motorization rates proves that in case of good infrastructure bicycle can serve up to 30% of all transport needs of citizens and become a **rightful component on transport system**.  
Note: By 01.01.2009 in the Murmansk region there are 41.5 thousand physically-challenged people (5% total population), including 2.3 thousand children. The rights of these people, including the rights for mobility, are handled by 21 public organizations. The list of these organizations is given in Table 2. Currently in the Murmansk region **non-motorized traffic** |
municipalities and tourist zones. Provision of tourist zones with light traffic infrastructure is a guaranteed contribution to increase tourist potential. Lapland has obtained experience in planning of comfortable and safe pedestrian-cycling routes (which can be transformed into skiing routes in winter) with provision of its continuity on long distances, which is important for tourist pedestrian and cycling trips. 533 km cycling paths were developed within road projects on public roads: mostly along Kemi-Tornio, Rovaniemi, Kemijarvi. Every municipality has its own network of light traffic paths. The networks are linked with those stretching along the roads. The level of service on light traffic networks:

- In cities – satisfactory despite gaps in the network due to missing links;
- In sparsely-populated areas – there are complaints to maintenance of existing and insufficient construction of paths because of limited financing.

In all national, regional and municipal programmes light traffic is a rightful type of mobility with clear requirements to the level of services. The main reasons for complaints addressed to light traffic infrastructure are:

- Insufficiently complex approach to maintenance and development of light traffic infrastructure because of several owners (road administration, municipalities, tourist objects);
- Missing links within municipal networks
- Unsuccessful planning solutions (curvatures, cul-de-sacs);
- Insufficient integration of public and light traffic infrastructures (park-and-ride parking for bicycles near public transport terminals);

infrastructure is absent. There are parts of street-road network in the region’s centre, which are not provided even with sidewalks and pedestrians have to walk along the road shoulder or carriageway. Maintenance of existing sidewalks in some city districts is not provided at all, snow during snow removal operation is piled up on the sidewalks. Neglect to the needs of user group “pedestrians” result in road accidents involving them.

The Strategy (2025) stresses importance of measures contributing to longer lifetime of population with means of physical culture and better life comfort in cities. This means that cycle traffic is considered only as a variety of physical training an not more. Light traffic is not considered as a type of mobility, equal in rights with other type of transport. The objective to shift mobility from motorized to non-motorized transport has not yet been set. However, President Medvedev has a different opinion on this issue (See interview with Mr. Medvedev).

Despite absence of corresponding policy to promote cycling, one should focus the process of mobility shifting to the bicycle as a consequence of:

- Road congestion and increased mobility costs of personal cars;
- Implementation of planned measures aimed at higher accessibility of social objects, transport networks and public transport for low-mobility people,
- Extension of pedestrian paths, sidewalks, underground crossings and cycle paths.

The Strategy sets development of cities, modernization and transformation of city spaces as one of the main directions to prevent youth emigration from the Murmansk Region.

This development includes:
<table>
<thead>
<tr>
<th>Lack of bicycle parkings in city centres</th>
<th>Modern comfort and improvements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insufficient route information.</td>
<td>Equal opportunities and access to infrastructure, services, public goods.</td>
</tr>
</tbody>
</table>

The Concept of life comfortable city automatically implies non-motorized mobility, therefore:
- By setting an objective to transform region’s cities into comfortable places for living
- One should set a logically resulted task – development of infrastructure for light traffic – basis for non-motorized mobility.

Additionally to this:
- **The Federal Law ФЗ 181 «Concerning social protection of people with disabilities in Russia»** (1995) puts on regional and local authorities responsibility to develop accessibility of engineer, transport and social infrastructures for disabled people;
- Russia signed (2008) the **Convention on the Rights of Persons with Disabilities (UNO)**, which commits to adapt all types of infrastructure to the needs of physically-challenged people.
- The Region has approved a target programme "**Social protection of people with disabilities in the Murmansk region in 2010-2012**", and one of the tasks of this programme is to create conditions for smooth access of people with disabilities to the objects of engineering, transport and social infrastructure. No data about the results of this programme has been found.

**Conclusions:**
1. The Policy of Lapland is aimed at shifting the population mobility from motorized to non-motorized transport. Improvement of infrastructure for light traffic used by pedestrians, cyclists and people in wheelchairs is the basis for this. Development of light traffic is a trend common or all countries with high motorization levels, and Finland is a world leader in issues of planning, design, construction and maintenance of light traffic infrastructure.
2. Despite growing number of cyclists on city streets and availability of all necessary legislative documents that require observing the rights of low-
3. The forecast: Increase of non-motorized mobility is an objective process; therefore the number of cyclists on Russian streets will increase. Road accident rates will increase, too. This means that ignoring the growing needs in development of light traffic infrastructure is turning a blind eye to higher number of killed and seriously injured (as road accidents with cyclists are always severe) and violating of the rights of low-mobile people. Pressure from the civil society and growing number of civil actions will force the authorities to undertake necessary actions. The Strategy of socio-economic development of the Murmansk region and Russian mass media (See magazine “An expert”) focus the critical importance of improving quality of living environment in accordance with modern principles of city planning. One of the basic principles concerns conditions for non-motorized mobility of all population groups. The objective is to execute this strategic task with maximum quality.

4. Coordinated development of transport systems of Lapland and the Murmansk region is an opportunity to adopt modern principles of planning and design, construction and maintenance of light traffic infrastructure thus forestalling transport crisis and effectively using limited budget resources with means of:
   - Programmes of measures to develop municipal infrastructures for light traffic for the cities of the Murmansk region by attracting civil society (cycling clubs, NGOs protecting low-mobility population groups, schools and parents interested in safe and healthy leisure time of their children);
   - Measures to develop infrastructure components (parking and places for car storage) within partnership with business, which is interested in increasing tourist potential of the region, comfort and quality of living environment.

Table 1 Cycling clubs. The Murmansk region (8 organizations)

<table>
<thead>
<tr>
<th>№</th>
<th>Name of the cycling club</th>
<th>Address in the Murmansk region</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>NordBike</td>
<td>Murmansk, Cycling club under the Committee on physical culture and sport of the Murmansk regional Administration +79212814001, <a href="mailto:nordbike@mail.ru">nordbike@mail.ru</a>, <a href="mailto:nordbike-news@mail.ru">nordbike-news@mail.ru</a>, <a href="http://www.nordbike.ru">www.nordbike.ru</a>, Marchenko Vladimir Valerievich</td>
</tr>
<tr>
<td>2</td>
<td>&quot;Murman&quot;</td>
<td>Murmansk, +79113243818, <a href="mailto:fomin-sever@yandex.ru">fomin-sever@yandex.ru</a>, <a href="http://www.murman.velotourism.ru">www.murman.velotourism.ru</a>, Fomin Alexander</td>
</tr>
<tr>
<td>3</td>
<td>&quot;Pilgrims&quot;</td>
<td>Severomorsk, City children public organization +7921155817; 8 815 37 50148; 8 815 37 48849, <a href="mailto:lipin@severm.mels.ru">lipin@severm.mels.ru</a>, <a href="http://www.pilgrims.murman.ru">www.pilgrims.murman.ru</a>, Lipin Anatoliy Mikhailovich</td>
</tr>
<tr>
<td>4</td>
<td>&quot;Apatit&quot;</td>
<td>Apatity, Club – structural division of the Department of phisical culture of the Kola branch insitute of the PetrState University +79216643618 <a href="mailto:neonoff@inbox.ru">neonoff@inbox.ru</a>, Barashin Gennadiy Nikolaevich</td>
</tr>
<tr>
<td>5</td>
<td>&quot;Virazh&quot;</td>
<td>Polyarny, Cycling club, 1-Gandukhina St, Children and youth sport school, Orlov Stanislav Konstantinovich</td>
</tr>
<tr>
<td>6</td>
<td>&quot;Sariola&quot;</td>
<td>Monchegorsk, sariola.h17.ru</td>
</tr>
<tr>
<td>7</td>
<td>&quot;Saida&quot;</td>
<td>Gadzhievo, Sport club association +7 921 282 88 62; 8 815 39 47157, <a href="mailto:sayda_bikeclub@mail.ru">sayda_bikeclub@mail.ru</a> Gal’ Andrey</td>
</tr>
<tr>
<td>8</td>
<td>&quot;ENERGY SC Kola NPP&quot;</td>
<td>Polyarnye Zori, Club under the labor union committee of the Kola NPP 89522921933, 89212843275, <a href="mailto:tiv.1980@yandex.ru">tiv.1980@yandex.ru</a> Savelyev Valeriy Mikhailovich, Tyuterev Ilya</td>
</tr>
</tbody>
</table>

Table 2 Public organizations of people with disabilities. Murmansk region (21 organizations)

<table>
<thead>
<tr>
<th>№</th>
<th>Organization</th>
<th>Address in the Murmansk region</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Interview with President Dmitriy Medvedev

QUESTION: It is known that in your native city St. Petersburg the bicycle traffic is strong enough but one can count cycling paths by fingers. What is your attitude to a bicycle as a **means of transport** and shall we expect that someday a lot of Russians shift from cars to the bikes?

DMITRIY MEDVEDEV: Before I had hold this position, I could freely move in Europe. I liked very much when in one European countries a prime-minister cycled to a restaurant to have a lunch where we sat at that moment. This inspired me a lot. I think personal example is very important. We have a lots of problems with this. We fail in traffic culture, our cyclists are afraid of cycling on the streets because there are no special paths, and car drivers don’t understand why cyclists try to get to the carriageway. There’s much to talk about. There’s a need to follow European example because bicycle means healthy way of life. I would like to see more cyclists on the streets of St. Petersburg and other Russian cities. I hope, this type of transport will be accessible to Russian government, too.

**Photo 1, 2** Murmansk: Examples of sidewalk winter maintenance
### ANNEX 4.5.1

<table>
<thead>
<tr>
<th>№</th>
<th>Comparing road safety situation in Lapland and the Murmansk region</th>
<th>Road safety dynamics in Lapland</th>
<th>Road safety dynamics in the Murmansk region</th>
</tr>
</thead>
</table>
| | | According to the Lapland Road Traffic Safety Report presented on 1.12.2010 during the first RTS forum in Lapland:  
- In 2000-s the number of road accidents in Lapland was stable: about 1070 road accidents annually  
- During 2006-2008 about 16 people were killed in road accidents in Lapland annually.  
- In 2009 the least number of road accidents with killed was registered (9 killed) since 1950-s.  
Motorization level in Lapland is high and stable (520 cars/1000 inhabitants).  
Unfavorable factors of functional environment that increase road accident risks are:  
1. ageing of population  
2. insufficient financing of transport system  
The impact of above unfavorable factors can be compensated by activation of activities aimed at forming safe road traffic behavior. To support this work a RTS specialist was hired to handle not only province level RTS work but municipality level too.  
Enhanced RTS work is justified with the following:  
1. growth of tourist flows  
2. high traffic volumes due to basic industries  
3. climate changes, that will complicate traffic conditions (in future prospect)  
The distribution of road accidents in Lapland are as follows:  
1. single vehicle accidents (25% total number)  
2. vehicle conflicts (14%)  
3. accidents with elks (13%)  
4. other (48%)  
The least number of accidents are those with non-motorized transport and those with rain-deers. However, light traffic |
| | According to the Murmansk Regional Road Traffic Safety Inspection (GIBDD):  
- Road accident dynamics in the Murmansk region is presented on Diagram 1 to the Annex.  
- During 2006-2008 annual average number of killed in road accidents was 80 people.  
- In 2009 the number of killed was 84 with further growth to 103 in 2010.  
The motorization level in the Murmansk Region is not high* (185-227 veh./1000inhab.acording to different sources) but is permanently increasing.  
Unfavorable factors of operational environment of recent years that increase risks of road accidents are:  
- Significant share of young inexperienced drivers involved in road traffic simultaneously (baby-boomer drivers born at the end of 1980-s)  
- Reduced financing of road infrastructure needs.  
Evident positive road safety dynamics with stable growth of motorization rates testify some success of road safety measures:  
- strengthening of legislation and penalties (e.g. introducing new Russian Code of Administrative Violations with more strict penalties (2008)  
- gradual annual vehicle fleet improvement (more modern cars, less old cars in the fleet) (since 2000-s)  
- implementation of the Federal Target Programme “Road Traffic Safety Improvement in 2006-2012”  
- Implementation of the Regional target programme “Improving road safety and reducing road transport traumatism in the Murmansk region in 2009-2012”;  
- Start of informational work with population aimed at safer traffic behaviour  
Start of informational work with population aimed at safer traffic behaviour |

Still, road accident rates in the Murmansk region and in
accidents are most severe, more often with killed comparing to other types of accidents. Most road accidents in Lapland occur during late autumn and winter, the least number is registered in April and May (this is different from average situation in Finland). Most road accidents occur during Fridays and Saturdays. The share of heavy traffic in road accidents is 12% of total number of accidents in Lapland. Data is very different within the municipalities: e.g. in Ylitornio heavy traffic share is 25%, in Enontekiö and Simo – 20%. Heavy vehicles are rarely guilty in road accidents. The number of road accidents with snowmobiles has been increasing. In 2006-2009 16 people were killed in road accidents with this type of transport. Most of the accidents occur in tourist municipalities like Kittila, Rovaniemi, Sodankyla, Inari, Muonio, Enontekio). Road accidents with killed occurred with drivers that were drunk. There is not enough information about road accidents with all-terrain vehicles, but it is assumed that half of them were drunk. Comparing with population of Finland as a whole, Lapland population uses these devices more rare. The number of drunk drivers has decreased during the last years, while the number of traffic rule violations has increased.

Russia as a whole iare high due to:
1. weak national road safety strategies and policies, absense of clear national objective
2. lack of coordination between organizations involved in road traffic safety work on all levels
3. lack of up-to-date road safety furniture on roads and streets
4. low quality of driver training
5. poor involvement of civil society and business in road safety informing and promotion
6. lack of professionals able to prepare informational campaigns and RTS programmes
7. increasing gap between current mobility needs and quality and quantity of road infrastructure due to insufficient financing of transport system

The distribution of road accidents in the Murmansk Region is as follows:
1. 16.8% - single vehicle accidents (Driving-off the road – 12,2%, Driving on an obstacle – 4,6%)
2. 35.8% - vehicle conflicts (Collision – 34%, Driving on a parked vehicle – 1,8%)
3. 41,5% - accidents between motorized and non-motorized road users (Driving on a pedestrian – 40,2%, Driving on a cyclist – 1,3%)
4. 5,9% - Other.

Most road accidents occur in October. The share of heavy traffic in road accidents differs within municipalities and may be up to 20%. There is no official statistics on road accidents with snowmobiles available.

Conclusions:
5. Comparison of number of killed in road accidents in Lapland and Murmansk region demonstrates that Russian side accident rates are many times higher while motorization level is half less. There are numerous reasons for this starting from differences in operational environment and ending by neglect to road safety problems on the national level. This can summarized as a “border effect” expressed in different base values and community maturity on both sides of the border in relation to road safety problems (i.e. saving a human life). Finland and other European countries had the situation similar to that of Russia in 1970-80-s.

- Experience of neighbouring Lapland proves that the problem can be solved and the algorithm of its solving (taking into account all success and failures) is a priceless value for the Russian side able to speed up reduction of road accidents and save lives and health of tens and hundreds of
Russian citizens.

- Solving of road accident problem within the partnership of the Leningrad Region and South-Eastern Finland, within partnership of the Arkhangelsk Region and Northern countries has already allowed adapting a lot of effective approaches and solutions of world road safety leaders to the Russian situation. All of them prove effectiveness of the measures in Russian conditions and reduce the number of road accidents. E.g. - no children killed in road accidents in Arkhangelsk during the last 5 years due to complex approach to children road transport traumatism problem based on experience of Northern countries.

- Comparison of statistics of neighbouring territories reveals priorities for actions in the sphere of road death reduction – increasing safety of vulnerable road user groups – pedestrians and cyclists (non-motorized mobility). Solving this task is the fastest, easiest and cheapest way with means of black spot management (traffic calming at schools, polyclinics, etc.: channelling with traffic islands, elimination of conflict zones on intersections and junctions (roundabouts). The resources spent to this are paid back within weeks.

- Coordinated development of Lapland and Murmansk regional transport systems is an opportunity to reduce road accidents and is a priority for actions both from the standpoint of life saving and economic development (implementation of tourism development strategy, increasing attractiveness of the region, etc.). The region that is not able to provide the basic value – human life has no moral rights to spend resources on any ambitious projects that increase traffic volumes or risks for the population.

*- According to the world practice high motorization level starts 300 pass. cars/1000 inhabitants.

Comparing logistics development levels in Lapland and Murmansk Region

Operational environment of Lapland’s logistics business is being formed under global factors and tendencies:
1. Placement of enterprises by different countries increases the role of transport in the world economic development.
2. Urging towards cost reduction requires increase of transportation effectiveness, environmental compatibility, safety and integration of different modes of transport.

Modes of transport:
- Road transport serves main traffic flow on main road network. The lower class road network serves the needs of timber industry and primary production.
- The role of railway transport is significant for high volumes of goods and long-distance transportations (mining industry).
- The sea ports Tornio and Kemi allow combination of transportations on water and inland transport.
- The role of air transport is significant for logistics of electronic industry and spare parts supplies.

The networks:
Roads:
South - North: trans-European roads (4,5 and 21), territorial roads (78, 79 and 81),
West - East: territorial road (82).
Roads to border crossing points are critical for the

The share of transport complex in the structure of regional GRP is about 14%. Railway transport is of most significance (more than 60% of total volume transported by all modes of transport). In 2009 the volume of freight transportations has decreased by 16.4% to the level of 2004. Growth of sea transportations in 2009 is conditioned with increased number of ships registered in the Russian register of ships.

In 2009 all modes of transport of public use handled more than 38 mln.t. of goods:
- Railway transport – 24 mln.t.;
- Road transport – 6.1 mln.t.;
- Sea transport – 8.3 mln.t.;
- Air transport – 0.5 mln.t.

The dynamics of changes in goods volumes transported by all modes of transport in the Murmansk region is represented in Table 1 and on Diagram 1.

The networks:
Roads:
South - North: federal road M-18 «Kola»,
Territorial roads – accesses to Severomorsk, to Apatity, road Apatity - Kirovsk;
West - East: road Kola-Verkhnetulomsky-BCP Lotta, Kandalaksha – Alakurtti - BCP «Salla».
Railways:
South - North: the main railway St.Petersburg-
development of international transport corridors.

Railways:
South - North: connection Northern Ostrobothnia (Sweden) – station Kolari.
West - East: direction towards station Kemijärvi.

Transport nodes:
Tornio-Haparanda: concentration of trade.
Rovaniemi: concentration of enterprises which are significant from the standpoint of logistics, distributional terminals, timber terminals.
Kemijärvi: timber terminals.

Road transport:
Unfavorable factors for logistics are:
- Road street network condition and level in settlements
- Deficiencies of the main network (vt 4, sections Oulu-Kemi, Koivu-Rovaniemi-Vikajarvi) and networks of lower classes – during spring thaw;
- Deficiencies of accesses to the mines, terminals, big commercial objects
- Deficiencies of routes for freight distribution in settlements.

Basic freight flow falls on the main road network. Freight flow on lower class roads is not significant, but the role of this network is huge for the province. Integration of farmer economies have resulted in growing road transportations.

Murmansk “picks up” the ports of the White and the Barents seas.
West - East: railway accesses to enterprises of the ore-dressing and metallurgy industries and end stations in direction to the border – Nikel, Kovdor, Alakurti (See Annex 3.2.1).
The branch of the JSC Russian Railways - Oktyabrskaya Railway has 1046,7 km of tracks (including 491,9km of electrified ones) and 50 stations.

In the region there are:
4 sea ports: The Murmansk Commercial and Fishing ports, Kandalaksha Commercial and specialized port, Vitino;
2 airports: «Murmansk» and «Apatity».

Road transport:
Unfavorable factors for logistics are:
- Low density of public paved roads - 17 km/1000 km, which is 2 times less than Russia’s average;
- Poor road and street performances;
- Deficiencies of the road section Murmansk-St.Petersburg within Murmansk city borders;
- Imbalance between vehicle fleet growth and level of road infrastructure development;
- Needs in total modernization of road transport infrastructure and development;
- Growth of tariffs on road freight transportations;
- Ineffective cross-border points.

Note: In 2006 a decision was made on the federal level that only border and customs services must be placed on border crossing points. However, introduction of the decision is hampered and some 5 different services continue its functioning on BCPs.
Transportation volumes are represented in the Table below:

<table>
<thead>
<tr>
<th>Freight flows of road transportations, thousand t.</th>
<th>2008</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Export from Lapland</td>
<td>1935</td>
<td>1037</td>
</tr>
<tr>
<td>Import to Lapland</td>
<td>3924</td>
<td>1760</td>
</tr>
<tr>
<td>Within the province</td>
<td>15000</td>
<td>18000</td>
</tr>
</tbody>
</table>

Most freight flows are between Lapland and Oulu province. **Imbalance in export/import** is typical for road transportations.

The tasks for logistics development are:
- Increasing accessibility of remote districts;
- Developing infrastructure of West-East direction to optimize the routes;
- Increasing sustainability of road functioning regardless of the season;
- Reconstruction of the road VT4 on sections Oulu-Kemi and Koivu-Rovaniemi-Vikajarvi;
- Elimination of bottle-necks on roads VT8 and V22 as well as improving sections, which are in poor operational condition;
- Reconstruction of ports Kemi and Ajos;
- Reconstruction of the road VT4 (Rovaniemi);
- Reconstruction of the road Vt 21 near the bridge over Liakanjoki river (Tornio), improving road safety on the section Palojensuu-Kilpisjarvi;
- Improvements on the road MT 19891 and Veskonnientie (Inari);
- Reconstruction of the territorial significance road № 79 (Kittila, Kaukosenkyla);
- Construction of the road MT 9554 on the

**Railway transport:**

Unfavorable factors for logistics are: bearing capacity limitations of the railway sections Belomorsk-Apatity, Apatity-Olenegorsk, Olenegorsk-Murmansk.

In 2001 the following works were made within modernization of railways:
- Shifting electrified section Loukhi-Murmansk from constant to alternating current, which allowed to increase the arm of electric locomotives by 2.5 times and decrease energy consumption. As a result, turnover towards the Murmansk railway node increased in 2007 to 27.78 mln.t. A complex of measures is being implemented to increase capacity of the railway on approaches to the Murmansk transport node.
- Construction of fibre optical communication line on sections Loukhi-Murmansk, Olenegorsk-Monchegorsk, Apatity-Aikuven with transferring to digital systems of communication.

In 2008 the Strategy of railway transport development (till 2030) was approved, which defined the directions of railway transport development in accordance with the objectives of the Russian Transport Strategy till 2030. The basic objectives and tasks of the Railway Strategy are represented in Table 1 to the Annex 3.1.2.

The Strategy provides for the following:
- Increasing productivity of railways through increasing weigh and length of trains with permitted axle loads up to 25 - 30 t-forces/axle.
- Scaled reconstruction and modernization of infrastructure.
section on the section Hanhimaa-Kiistala (Suurkuusikko).

**Railways**

Single-track railway electrified on Kemi-Rovaniemi section goes through the province. Maximum allowed axle load is 22.5 t. The railway section Kemi-Rovaniemi has high traffic volumes. On the section Tornio-Kolari the upper structure of the track is under reconstruction. Development of railway infrastructure depends on the demand of mineral resource industry for transportations.

The demand is small but it can increase a lot if new mining projects will be implemented.

The tasks of logistics development:

- Elimination of restrictions on railway connection with the Northern Ostrobothnia;
- Increasing the number of direct routes, planning railway connections Ratayhteyden Ääkisjoki/Rautuvaara - Ajos, Ääkisjoki - state border, design of railway links Kolari – Ääkisjoki and Kemi - Ajos;
- Holding the growth of tariffs for freight transportations;
- Design of Rovaniemi-Kemijarvi railway electrification;
- Improving bearing capacity of railway tracks.

**Sea transport:**

The ports Tornio and Kemi are all-year-round functioning ports. Provision of winter shipping is important for stable logistics of enterprises. Firstly, the ports serve local metal processing and timber industries. Development of mineral resource industry

The basic polygons of future excess weight train circulation will be the sections:

- Kuzbass – St.Petersburg – Sortirovchniy - Murmansk;
- Tcherepovets – Kostomuksha, Kovdor, Olenegorsk;

The tasks solving of which will contribute to logistic development are:

- Construction of the second bridge across Shuya river on the section Myagrenka-Kem’ of St.Petersburg-Murmansk railway to increase capacity of the section;
- Construction of second main tracks to increase capacity of the section Olenegorsk-Murmansk;
- Construction of technological lines Murmashi 2-Lavna within the Murmansk transport node development;
- Specialization of railway stations, e.g. transferring sorting works to the station Vyhodny and changing the station Kola to a pre-node one;
- Extending of transceiving tracks to 1050 m on stations Murmansk, Vykhnodny, Apatity-1, Polyarnye Zori, Kandalaksha – technical, Beloye More (White Sea), Polyarny Krug (Polar Circle).

The number of logistic alternatives could be increased in case of:

- Restoration of the section Salla-Alakurtti-Kandalaksha as a shortest connection between the Baltic and the Barents seas;
- Construction of railway link Nikel-Kirkenes to provide access for freight flows from the Norwegian ports to Euro-Asian railway area, see Table 2, Annex 3.1.2.

**Sea transport:**

The total freight flow through the regional ports – Murmansk, Kandalaksha and Vitino was:
will require additional development of ports. The port of Tornio is specialized on export-import transportations of metal processing industry. In 2009 export was 528,919 t, import – 811,618 t. The port of Kemi is specialized on export-import transportations of timber industry. In 2009 export - 883,964 t, import – 523,959 t.

**Imbalance of container flows** reduces competitiveness of ports. Data on the ports are in the Annex 3.1.1. The tasks of logistics development:
- Providing conditions for winter shipping
- Increasing competitiveness of ports through development of logistic chains with participation of ports, uninterrupted process of feeder transportations, development of associated services
- Reconstructing the port Ajos in Kemi – deepening to 12m of the existing faivay (2012 – 2013);
- Developing the ports Kemi and Tornio.

**Air transport:**
Inland infrastructure – 5 airports: Kemi-Tornio, Rovaniemi, Kittila, Enontekio, Ivalo. The air freight volumes are small, basic flow is served by Rovaniemi airport. Most of the goods are postings. In 2009 Rovaniemi airport served 376 t. Airport Kemi-Tornio - 57 t. Airport Kittila and Ivalo - 10 t.

The tasks for logistics development:
- Increasing participation of air transport in freight transportations.

**Multi-modality:**
Cooperation between different modes of transport is a

In 2009 35 mln/t of goods were transported through the Murmansk transport complex, including:
- 7 Mt crude oil from Varandei by short sea shipping tankers to Murmansk (Belokamenka)
- 7 Mt crude oil from Murmansk (Belokamenka) by ocean tankers to external markets
- 1 Mt crude oil from Arkhangelsk by short sea shipping tankers to Murmansk (Belokamenka)
- 1 Mt crude oil from Murmansk (Belokamenka) by ocean tankers to the world.
- 12 Mt coal (by rail) as transit from Kuzbass to external markets
- 6 Mt ore concentrates from the Murmansk region to the world.
- 1 Mt different goods from North-West Russia to the world.

The freight flow shows the **imbalance of export/import flows.**
The Kola Bay of the Barents Sea, deep and non-freezing, incorporate:
- The Murmansk commercial port
- Base of the nuclear icebreaking fleet
- The Murmansk sea fishing port, which serves not only fishing ships, floating fish factories and transport refrigerators but is also mastering the processing of package and oil goods.

Development of logistic services in free economic area can contribute to strengthening of logistic positions of the transport complex located in the Kola Bay.
critical condition for uninterrupted functioning of transport chains and thus – for the functionality of the whole logistic system.

**Logistic system** implies for availability of:
- Physical development of infrastructures (links and nodes)
- Extention of logistic services
- Through management of logistics
- Adequate maintenance of infrastructures.

**Challenges of the logistic system:**
Lapland’s logistics is characterized with:
- Long distances
- Small freight flows
- Imbalance in freight flows (freight flows from the South are served by road transport, while the products are exported by sea transport) requires solutions for balancing freight flows by directions and by modes of transport;
- Concentration of freight flows on directions of main corridors.

However, the share of logistic costs in primary costs of products and services of Lapland’s business corresponds to the average level for Finland.

To provide competitiveness of leading industries of lapland’s economy all-year-round services of the following modes of transport are critically important:
- Railway transport
- Road transport
- Ports and terminals
  daily communications “home-work”.

The logistic chain of crude Russian oil transportation to the external markets is provided with the following functioning complexes in the Barents sea:
- Complex Belokamenka – capacity 12 mln.t./year – oil transfer to big tankers to the USA;
- Terminal of the JSC “Commandit service” – former fuel warehouse of the Northern fleet in Mokhnatkina Pahta, which was put into operation and reconstructed in 2002 – for transferring of black oil from railway cisterns to the accumulating tanker with subsequent transportation by tankers to the external market (1.3 mln.t.-2009).

The Russian Transport Strategy provides for development of the Murmansk Transport Node (MTN), the basis of which is the sea port with turnover to exceed 50mln.t/year. MTN development provides for:

Development of coastal infrastructure:
- Reconstruction of a coal terminal 9,6 mln.t.;
- Construction of the coal terminal 20 mln.t. on the Western shore;
- Construction of the container terminal 1 mln. TEU;
- Construction of the oil terminal 35 mln.t.;
- Construction of an ecological bunkering complex.

Development of logistic and warehouse infrastructure:
- Construction of the **distribution-logistic complex**;
- Construction of a **logistic centre**.

The ports of the White sea – port Kandalaksha and Vitino. Port data are presented in the Annex 3.1.1.

From the position of logistics the following perspective is of interest:
- Coordinated work of two above ports: transportation of oil products by mixed type bulk-tankers “oil-ore-transporter” to provide reverse loading in the
Logistics of commercial networks has already changed and will affect in future the character and volume of freight flows. Retail logistics is based on:
- Main road network and consignor centres in big settlements;
- Accessibility of commercial objects by personal cars (high traffic volume management near commercial objects, safety, parking places).

The tasks for logistics development are:
1. Deconcentration of population creates the need in integration of small freight flows and joining them with other transportations in order to reduce transport costs.
2. Similar task arises from reduction of population mobility costs— it is necessary to shift mobility to public transport and link it with servicing of tourist flows.

Solving these tasks require improved functioning of the logistics system, which becomes real with more scaled view outside the province boundaries.

In Lapland there are available basic logistic services (small companies – road carriers). However, small freight flows and imbalance in transportations:
- Reduce profitability of transportations,
- Increase primary costs
- Decrease competitiveness.

The factors mentioned increase costs and reduce accessibility of logistics services. Accessibility can be kandalaksha port with dry goods.

The perspective of Shtokman gas and gas condensate field implies construction of a terminal in Teriberka the role of which is to support logistics of liquefied gas supplies to the world consumers.

Air transport:
Airport Murmansk is the only airport servicing international flights. The perspective of Arctic development requires its development. The federal target programme “Development of the Russian transport system (2010-2015 годы)” provides for:
- Development of land infrastructure of the Murmansk airport with federal financing;
- Construction of engineering infrastructure, air terminal and goods complex – with means of other sources.

There are airdromes of local airlines in the Murmansk region which are owned by JSC «Murmansk aviation company» - Lovozero, Sosnovka (Lovozersky district), Krasnoschelie, Kanyovka, Umba, Tchavanga, Tetrino, Tchapoma (Tersky district).
To develop small civil aviation infrastructure the Murmansk region has to purchase the stuff of small air terminals to its ownership.

Multimodality:
The objective –creation of transport-logistic cluster in the Murmansk region requires coordination of development plans of different modes of transport within single transport system integrated both to the Russian and world transport systems.
improved with:
- Extended cooperation in logistics
- Higher qualification of logistics specialists,
- New logistic centres.

The forecast: Concentration of population in big settlements and its growth will enhance concentration of freight and passenger flows on the restricted number of long routes on directions of transport corridors. This means that requirements to accuracy and speed of handling the transport orders, profitability, safety and quality of services. These requirements will be met only with combined transport chains, using comparative advantages of different modes of transport on different links and effective interaction of modes in shifting places.

Lapland has obtained experience of international cooperation in the sphere of logistics. This cooperation shall be enhanced. Beneficial geographic location of the province and prospects of mineral resource industry development create prerequisites for increasing freight and passenger flows, which include:
- Flows generated by ore-dressing industry of Lapland: Sukhanko (forecast 0.2 mln.t/year), Kevitsa (forecast 0.2 mln.t/year), Kolari (forecast 13 mln.t/year), Sokli (forecast 2 mln.t/year), «Suurkuusikko» (forecast 21 mln.t/year);
- Transit flows in direction «EU markets – Asian-Pacific Region», that go through the Russian territory;
- Flows generated by shelf resource and Arctic shore activities, functioning of the Northern Sea

**Challenges of the logistics system:**
- Coordination of development plans of economic activity objects and infrastructures of different modes of transport;
- Coordination of development plans of different modes of transport with the prospect of their integration into the system;
- Reducing border effects through harmonization of transport infrastructure performances and transport services within the Barents region;
- Assisting to coordination processes aimed at integration of the Murmansk region transport system with that of the neighboring countries and territories;
- Participation in the work to develop transit corridors stretching through the Murmansk region (Barents Link, Northern Transport Corridor, etc.);
- Implementation of projects aimed at forming of components of future transport-logistics cluster, personell development, intelligent transport elements, etc.
- Maximum usage of opportunities of transit to catch up mono-cities and diversify their economies with means of orientation to services for transit flows;
- Implementation of transit potential of the Murmansk region territory (within the more scaled task – implementation of Russia’s transit potential) to attract flows to the Northern Sea Route, develop transport-logistics competitive services in the region for the external market.
Conclusions:

1. Effective logistics based on quality and multimodal transport system is the main instrument to compensate transport costs of the periphery Northern territories. Therefore optimization of routes requires scaled approach on the level of the Barents Region transport system at least.

2. On both sides of the border the land main transport infrastructures are developed mostly in South-North direction. Connections of West-East direction, which are significant for implementation of geopolitical benefits started to develop only during the last 10-15 years. Their “not-main” status and limited local resources impede from necessary dynamics of latitudinal transport infrastructure development.

3. Taking into account strategic decisions of international and national levels, latitudinal links are critically important to implement transit potential of Lapland and the Murmansk region. The Russian transport strategy emphasizes the mission of the transport infrastructure – serve as a bridge between the markets of the Northern America, Northern Europe and growing economies of the Asian-Pacific Region countries. This mission can be implemented only based on modern transport-logistics services.

4. Lapland has obtained experience of international cooperation in the sphere of transport logistics and has a vision and concrete plans for further development within the strategic plan of province’s transport system development till 2025.

5. On the Russian side the railway transport has more or less formed logistic vision. As the railway transport takes the lead over other modes of transport by scale and system approach, it is the railway transport which has real perspective to become a basis for the main scaled trans-continental logistic system on the Russian territory in case of its integration with the ports and railway systems of other countries.

6. Currently on both sides of the border there are separate components able to become a basis for future transport-logistic cluster of the Barents region. However, existing imbalance of transportations of different directions impedes from minimization of goods consignors’ costs and increase competitiveness of transport operators on the world transport market.

7. «Raising» trans-border transport-logistic cluster is a challenge which can be answered only by joint efforts of Barents region partner-countries. This activity requires elimination of negative impact of border effect, including:
   - harmonizing principles, approaches, performances of transport infrastructures and their integration through inter-modal chains;
   - revealing total needs in development of transport infrastructure and intelligent transport;
   - setting priorities among the revealed needs in development;
   - revealing the projects of common interest, implementation of which can be accelerated with means of Barents Cooperation and international programmes.

8. Coordinated development of transport systems of Lapland and Murmansk region can be a start of long-term targeted actions to eliminate negative impacts of border effects and «raising» trans-border transport-logistic cluster in the Barents Region able to offer competitive transport services.
services to the world transport market thus attracting transit to the Arctic routes.

<table>
<thead>
<tr>
<th>Table 1</th>
<th>The Murmansk Region: Dynamics of changes in goods volumes transported by all modes of transport, thousand t.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2000</td>
</tr>
<tr>
<td>Total</td>
<td>42199,1</td>
</tr>
<tr>
<td>railway</td>
<td>24660</td>
</tr>
<tr>
<td>road</td>
<td>12304,6</td>
</tr>
<tr>
<td>sea</td>
<td>5234,1</td>
</tr>
<tr>
<td>air</td>
<td>431,6</td>
</tr>
</tbody>
</table>

1) by transport of organizations of all economy activities.
2) According to the Federal Service of State Statistics.
3) Including evaluation of work volumes executed by entrepreneurs (physical bodies), involved in commercial freight road transportations.
4) Since 2006 – including bareboat-charter transportations.
5) from regional airports by airplanes of all air companies.

Annual Statistics— the Murmansk Region.
Diagram 1  The Murmansk Region: Dynamics of changes in goods volumes transported by all modes of transport, 2000-2009
### ANNEX 4.7.1

<table>
<thead>
<tr>
<th>No</th>
<th>Operational environment – opportunities and challenges for Lapland transport system development</th>
<th>Operational environment – opportunities and challenges for Murmansk Region transport system development</th>
</tr>
</thead>
</table>
|    | Current operational environment and tendencies create not only opportunities for development but also **the challenges**. The Strategic Plan of Lapland development till 2030 emphasizes the following factors that provide difficulties for the transport system of Lapland:  
  - Demography situation  
  - Requirements of business  
  - Need in higher efficiency and effectiveness to survive and develop in a competitive environment  
  - Climate change. | The characteristics of operational environment necessary for the development of the regional economy (including transport complex) are defined by the Strategy of socio-economic development (till 2025) as:  
  - An innovational model of economic growth;  
  - Improving of life of population.  
The characteristics mentioned are **challenges** for the transport sector.  
**Regional factors** of the functional environment that represent **difficulties** for transport are:  
  - Lack of investment resources;  
  - Delay between infrastructure development and current and future needs in freight and passenger transportations;  
  - Imbalance of export/import flows;  
  - Limitations for some user groups to access the services of transport infrastructure;  
  - Unrealized transit potential of the territory;  
  - Reduction of population. | |
|    | **The regional factors** of operational environment are:  
  - Geographic location and international transport corridors  
  - Long distances and sparse population settling and economic activities. | **National tendencies:**  
  - Increasing level of motorization;  
  - Growing transport costs and externalities because of increased fuel prices, increased travel times due to road congestion, high accident rates, poor quality of environment in cities;  
  - Weak process of regionalization and integration of transport infrastructures of neighboring territories;  
  - Limited assortment and quality of transport-logistic |
|    | **World globalization tendencies**, impact of which on transport development of the province is enhanced with:  
  - Toughening of competition in world transport business;  
  - Strengthening of user requirements (terms, safety);  
  - New business-models of production and distribution;  
  - Climate change and more strict environmental legislation;  
  - Growth of fuel process  
  - Lack of investments. |  |
|    | **Demographic tendency:** |  |
Ageing of population, which requires adaptation of transport environment to:
- Provide higher level of safety
- Simplify orientation and movements.

**Tendency for population decrease**. «warp» in age groups structure and violation of balance between active population and dependants:
- Creates difficulties for supporting of services on local level;
- Reduces justification of investments into transport system development;
- Weakens public transport system economy.

Therefore **reversing the situation from negative dynamics** (youth emigration and population ageing) to **positive demographic dynamics** is a critical issue for Lapland as a whole and for transport business particularly.

Emigration of population from countryside to bigger settlements improves operational environment for transport services in these settlements. Demographic factors require differentiated approach to transport services.

Lapland’s economy depends on mining, metal processing and timber industry, tourism and transit. All sectors are dependent on road, railway and sea transport. The main **risk** for the economy of periphery industry is a lag between transport system development and needs of economy development. This risk can be minimized through investment justifications convincing for the investors and through **new schemes of infrastructure project financing**, alternative to traditional budget schemes.

**World tendencies**:
- Toughening of competition in the world transport business;
- Increasing requirements of users (time terms, safety);
- New business-models of production and distribution;
- Climate change impacts and toughening of environmental legislation;
- Lack of investments.

**Demography tendency** – population emigration the additional reasons for which are:
- Severe nature conditions and environment unattractive for living;
- Limited capacity for self-actualization;
- Неразвитость инфраструктур и услуг.

Youth emigration and absence of factors to attract “talented people” from outside stipulate the process of uncontrolled closing of the system of settling.

The Strategy of socio-economic development of the Murmansk region **provides for no a reverse of unfavorable demography situation** and forecasts further reduction of population in every scenario with simultaneous concentration of population in big city agglomerations. Together with population reduction the vehicle fleet and traffic volume growth is forecasted. The consequences are:
- Road congestion, especially in cities,
- Lower travel speeds,
- Increased costs for the community because of lower mobility, higher accident rates, poorer environment;
- Increased need in financing of maintenance of rehabilitation of territorial and municipal roads with simultaneous reduction of taxpayers.
Timber industry traditional for the province economy requires stable functioning of low class road network. The routes and directions of timber transportation permanently change depending on timber resource development and enterprise, which process the timber. 

**The threat:** Emigration of population to more dynamically developing municipalities and increasing of difference in levels of economic development of different parts of Lapland may result in significant differences in non-main low class road network maintenance.

Growth of transportation volumes by railway and through the ports is forecasted after launching of a number of ore-dressing plants in the Northern Finland. Freight transportation growth can be also stimulated by the needs of:

- Oil and gas infrastructure development in Norway and Russia;
- Northern Sea Route infrastructure operation;
- Growing importance of trans-border commercial cluster with participation of neighboring countries, which creates demand for modernization and development of trans-border transport system.

Development of air transport and related transport chains depends on tourism industry condition. The critical aspect of tourism is a seasonal character, which results in sharp fluctuations of demand for public transport and associated services (hotels, cafeteria, etc.), as well as for employment. Taking into account climate change and respective weather anomalies the threat of excess dependence of Lapland from air connection becomes more evident.

Strong dependence of economy and social welfare of Lapland from transport creates a threat – restraining

The key enterprises of mining and ore-dressing complex are involved into established chains of products supplies to the world market. However, the perspectives of end-market functioning (steel, fertilizers, nickel and aluminum), as well as resource base of extractive (mining) companies of the Kola Peninsula provides for no significant growth of production volumes. Therefore development will be focused on keeping the current levels of extraction with means of «substituting, replacing capacities» and modernization of technological processes (efficiency, environment compatibility).

**The threat:** Further domination of raw material industry, which is dependent on unstable demand and on prices for raw products on the world market stipulates instability of regional economy.

Growth of sectors like tourism, coastal fishing, reindeer breeding and processing of agricultural products depends directly on condition and level of development of the regional transport system, especially on roads. However, these types of activities, which are based on small business and entrepreneurship are beyond the vision of the regional strategic documents despite its potential to provide sustainability of settling and variety of regional economy. Therefore the budget costs for road maintenance are not well justified. This creates a threat for further emigration of local population from traditional settlements.

The region plans its future with development of two megaprojects: development of the Shtokman Gas and Gas Condensate Field and the Murmansk Transport Node. Construction of new energy and fuel industry objects is another planned point of growth. **The threats** of above projects implementation are related to
province’s development due to increasing price of fuel. Mobility oriented on road transport and long distances makes one to focus on necessity of more alternatives (non-motorized mobility, variety of energy resources), increasing of transportation effectiveness (mass transport).

Climate change and consequences will affect global economy, including Lapland’s one, resulting in traffic volumes, primary cost of transportation by different modes of transport. The transport system shall be ready to actions aimed at:
- Reduction of transport impacts on environment, thus slowing down the process of climate change;
- Adaptation to changing conditions of functioning.

Non-readiness of transport system to functioning in changeable conditions becomes a threat and results in higher transport costs of transport companies and lower competitiveness of products and services of the province on the world market.

From the position of Lapland reducing negative transport impacts on environment is a priority. However, if reduction transport impact on environment will be implemented through higher prices, this will be a threat for economic and social development of the province. For most population a personal car or public transport is a must for everyday activities, and accessibility of transport shall be guaranteed in future.

The requirements to people and goods mobility in different districts of the province are different:
- For agglomerations within the development belts transport services are well accessible;
- For the territories of sparse settling provision of basic global instability of financial markets and therefore - abstention of investors from investments during such periods. The situation is worsened with the necessity to increase social component in the budgets of all levels to reduce impacts of negative external factors on population life, to support labor market and to react on new challenges. The threat – inability of budgets to provide leading development of the transport system as a precondition for economic and social development despite favorable changes on some modes of transport (e.g. reforming of railways system).

Negative impacts of climate change are first of all expected in transport infrastructures, especially in coastal territories where the threat of traffic interruption is high due to weather anomalies. Climate change will affect mining industry, too.

The strategic documents of regional level provides for not reduction of transport impact on environment nor concrete measures to adapt the transport sector to climate changes. This creates a threat – non-readiness of transport companies and infrastructures f the region to adapt to changing conditions thus increasing costs and negatively affect logistics of regional enterprises and their competitiveness on external markets. The regional priority is extension of transport infrastructure, renovation of vehicle fleet. The threat is limitation of efforts to reduce negative transport impacts on environment only with declaration of environmentally responsible intentions because no any real mechanisms have been proposed for that.

The strategic documents admit inevitability of population reduction and orientation on reduced need of industrial
Services and its accessibility is a critical issue.

*Services in the mode of remote access* are considered as a means to mitigate the problem of daily movements in Lapland. This increases requirements to quality of telecommunication network services.

Increasing attractiveness of transport services for tourists and opportunity to form transport chains is a basis for stabilization of passenger transportation market and reduction of dependence of operators from subsidies. The main requirements to transport chains are:
- Accuracy and reliability of services,
- Speed,
- Safety,
- High quality (information, comfort),
- Acceptable price for services.

Alternative logistic chains shall compete with one another to promote operators for optimization of routes and costs.

Lapland depends on road transport. It is forecasted that together with concentration of population in big settlements transportations will focus on a limited number of routes and corridors. New freight flows will be added to them, namely flows from:
- North-West Russia;
- Transit through Russia;
- Ports of Finland, Sweden, Norway;
- Mining industry of Lapland.

However, there is a threat of road infrastructure destruction due to insufficient maintenance.

The reserve of transport complex efficiency increase is based on development of multimodal transportations – interaction between modes of transport. There exist an opportunity to increase freight flows with development of latitudinal Northern Transport Corridor, which will provide connection North America – Scandinavia – Russia – Kazakhstan – China.

However, there is a threat to miss transit opportunities, because there has be no any analysis of transport chains involving the region and no evaluation of its competitive ability. The following represent serious threat for implementation of innovational regional development component:
- Depreciation of assets of all transport operators
- Wear of transport infrastructure;
- Discrepancy of territorial road performances and sector in labor resources. This will affect on:
- The volume of freight and passenger flows, which will be a challenge for local transport companies to survive;
- Completion of budgets, which will be a challenge for organizations responsible for maintenance and modernization of engineering communications, including roads.

Low density of road network and sparsely populated settlements become preconditions to propose introduction of the principle of remote budget resources with means of communications – medical, educational, social and humanitarian technologies. It is assumed that *remote services* will compensate undeveloped transport networks.

It is assumed that activation of business activity in the Murmansk region will increase freight- and passengerflows on air transport. However, the threats related to climate change and fuel price growth can negatively affect on mobility of freights and passengers based on air transport.

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agglomerations, tourist centers and sections between. The load on main network will increase significantly thus increasing the need in reconstruction of roads to the cross-border points. The gap between the needs and availability of financial resources will increase and result in the gap between the required road performances and actual road condition. Operational condition of Low class roads, on which timber industry logistics, small business and quality of population life depend on, can become a critical threat. Revising of network owners is also possible. Since now operational condition of roads important for the timber industry was kept due to budget financing.

The Strategy of tourism development and reduction of seasonal dependence of this sector implies improvement of road maintenance for the lower class road network. Development of tourist centers requires good maintenance of streets and light traffic infrastructure.

The level of railway development in the province doesn’t meet the needs in passenger and freight transportations. To eliminate the threat when it will be impossible to meet the challenge, its is necessary to do the following:

- Participation in international projects within the Barents Region and deepening of integration with the Russian railway system, which implies:
- Reconstruction of railway connection from Kemijarvi to Salla,
- Restoration of the railway connection to the main railway track St.Petersburg-Murmansk.

The threats for Lapland from the standpoint of transport system are:
- Insufficient depth of fairway in Kemi;
- Absence of favorable conditions for winter shipping;
- Delay in implementation of projects of the Lapland’s parameters of modern vehicle fleet (axle loads);
- Underdevelopment of basic network.

Infrastructure development requires investments. The threat is absence of functioning economic instruments and mechanisms of reproduction of capital assets to dorm starting point of innovational development.

The strategy of railway sector development - leader of freight transportation in the region – assumes that:

- Modernization of existing and construction of new sections and lines shall be implemented based on extended market principles, i.e. with federal budget and budgets of subjects;
- Extension of railway network to improve transport provision of economy growth points with construction of freight-generating and technological lines shall be implemented with the resources of the state and private investments.

The critical projects of railway development in the region require primary investments:
- Strengthening railway structure (to increase weight of trains to loads of 25 - 30 ton-forces/axle);
- Reconstruction of outdated lines on approaches to the Murmansk port.

The regional road industry has overcome reduction of financing during the last 10 years. Under-financing of road maintenance together with traffic volume and loads growth have increased length of sections with poor road performances.

Within financial limitations the task of rational usage of available resources to prevent the threat – increasing number of problem road sections – becomes critical. The
mining industry, which deprives the transport projects of economic justification.

Lapland is now on the way of several international transport corridors. It is impossible to cover everything therefore one should set priorities for development of province transport system development from the position of optimization of ration «investments into transport infrastructure development/ development of the province». When setting priorities it is important to take account of:

- EU interests concerning development of Trans-European Transport system TEN.
- Obligations concerning cooperation and promotion of common interests of the Barents Region.

The groups, which participate in priority setting, involve experts, responsible representatives of authorities, and politicians. Comprehensive discussion is the main way to reduce threats of short-sighted and erroneous decisions.

Healthy economy of Lapland depends on several industries. Situation is always changing under globalization and competitive environment is extremely shaky. Therefore to survive one needs promptness, flexibility, pro-active approach. These conditions are set not only for business but for authorities responsible for making decisions concerning transport infrastructure maintenance financing. The common interest – complex and balanced development of transport system – requires alliances, functioning forms and mechanisms of cooperation. Inability of neighboring municipalities and territories to shift from local competition-model to regional cooperation-model in order to enter “new quality category” of competitive struggle on the global arena becomes a threat.

decision – application of programme-target budgeting in road sector. Development of roads implies investments, first of all, into:

- Maintenance and reconstruction to existing road network;
- Increase of road capacity on approaches to cross-border points.

The threats for regional development may appear from lack of investments for:

- Modernization and development of port infrastructures,
- Dredging works in the ports of the White Sea,
- Improvement of shipping safety (incl. environmental one).

The Russian Transport Strategy (till 2030) provides for extension of financial schemes to implement infrastructure projects, including sources: federal, territorial, municipal budgets as well as non-budget sources. Special hopes are laid on PPP and private investments. To attract private investments it is critical to effectively use available financial resources. The threat for infrastructure development is inability of transport sector to optimize production costs and hold on primary costs of products and services. International component may play one of the key roles in development of the region. The region has found itself in the area of several globally important spheres, e.g.:

- Development of ocean and earth resources;
- The Arctic and climate change, scientific research;
- Energy savings and energy efficiency;
- Economic activity within extremely sensitive eco-systems;
- Preserving natural and historical heritage
- Project within the Concept “Northern Dimension” in the
This model requires scaled approach to provision of mobility and development of transport systems. Functional hierarchy of road transport system includes:

1. Arterial main network formed with international transit corridors – the function of framework of global mobility for products and services to enter the external markets and serve transit;
2. Collector, capillary network – the function of daily technological logistics when creating products and services by local business.

Integrated into the system, above two components of mobility are the basis for sustainable competitiveness of local economy with means of its integration into a scaled scheme of economic relations.

The basis for cooperation between the Murmansk region and Northern territories of Norway, Sweden and Finland are open-ended mutual agreements. The Strategy of socio-economic development of the Murmansk region (till 2025) stresses the importance of active interregional and international exchange as an opportunity to accelerate development and strengthen non-raw material component of the economy. The main mechanism in the system of international affairs is a cross-border cooperation and cooperation within the Barents region, which open wide opportunities for development of trans-border clusters of economic activities, contributing to employment and entrepreneurship potential, keeping youth from emigration to other regions. Missing available opportunities means threats:

- Inability to achieve the Strategy’s indicators – standards of life of population similar to that in the Northern countries;
- Inability to implement an image mission – to become a source of ideas, experience and best practices for other Russian territories.

Conclusions:

1. Difficulties that define challenges for the transport systems of Lapland and Murmansk region are similar. The main of them is population reduction. At the same time both territories are under the pressure of global processes – toughening of competition in the transport sector, strengthening of user requirements and world environmental legislation. Climate changes require from transport readiness to function in abnormal conditions and react on them to keep competitiveness of local economies. Growth of transport externalities is unavoidable when there is a lack of budget financing and investments. The gap between the needs and possibilities in road sector when maintaining roads of territorial importance is extremely tangible.

2. In both territories reduction of population is accompanied with growing weight and volume of traffic flows, which accelerate road wear. However, there is no any possibility for the budget to compensate this accelerated road destruction with means of additional maintenance measures.

3. The Transport Strategy of Lapland is active in the struggle for the main development resource – population. The province answers to the challenge
by setting the tasks:

- To reverse negative demography dynamics and shift to positive one;
- To reduce the gap by volume and quality of transport services with means of differentiated approaches to agglomerations and districts with sparse settling.

4. The Murmansk region as opposed to Lapland avoids main challenge – demographic challenge. All scenarios in the Murmansk Region Development Strategy consider population emigration as an objective factor, inevitability and proposes to adapt to this situation by using “unmanned” technologies when developing raw materials. However, emigration of population from territories recently developed and economically favourable means higher losses than just deficit of labour resource:

- The less is the number of population, the less is the number of tax-payers and the less are the possibilities of local budgets, the more are the gaps between quantity and quality of social services, opportunities for economic development in the districts of sparse settling and city agglomerations;
- The smaller are the budgets, the worse is the maintenance of secondary and municipal roads, the higher are transport externalities and less mobility of local business;
- The lower is mobility; the less is competitiveness of traditional types of activities, which helped not only to survive but to keep high level of human welfare in the climate of Arctic. With leaving of people from historical places of living a genotype adapted to living in extreme conditions disappears, like disappears the lifestyle and experience of a human, who is organically integrated into eco-systems without violation of their sustainability. Human-free space of Arctic is a very comfortable place for trans-national corporations and “unmanned technologies”, not burdened with costs for expensive environmental safety. Russian Arctic collides with the real threat to become a raw materials appendage of energy wasteful countries, the source of cheap resources taken away from future generations.

5. Tourism industry is considered by both territories as a strategic sector, with which hopes for involvement into economic turnover of natural resources and employment for local population are pined. Primordial nature is a tourist product value of which on the world market will increase. However, modern tourism requires safe mobility and, first of all, roads of territorial and municipal importance. Therefore reduction of local population and worsening of infrastructure quality, disappearance of traditional way of life and activity of trans-national resource corporations is an undermining for implementation of tourist potential of Arctic territories.

6. Lapland tends to insure tourism industry with means of environmental responsibility of mining, timber and transport business, development of multimodal logistic alternatives able to adapt the sector to climate change, growth of prices for fuel, demand for active rest. Tourists are started to be considered by passenger transport companies as internal “user group”, the requirements of which is one of the directions of development and improvement of economic viability of public transport.

7. On the Russian side transport is inertially guided mostly by an extensive model (quantity extension and increase of new assets) of infrastructures and vehicle fleet under-evaluating opportunities of an intensive model of development (increasing effectiveness, efficiency, quality of existing assets). It is assumed that maintenance and operation of new transport infrastructures will be supported with federal resources and taxes from traditional industries of raw material orientation dependent from unstable demand for resources on the world market.

8. The reserve for transportation effectiveness laid in extension of multimodal approach has not yet been studied in the Murmansk region as opposed
to Lapland. It is known that **absence of transport activity data** for modelling of situations and forecasting of investment risks is a factor that impedes from effective dialogue with potential investors.

9. In both territories additionally to the main tasks – **keeping the population** – the need for progress in two directions is evident:
   - A. Attraction of additional transport flows to **justify investments** and increase budgets
   - B. **Increasing output** from existing resources of road sector – protector of rights of population to social services and mobility of local economies.

10. Attraction of transit flows and development of associated logistic services based on small scale business - **justification** for development of all modes of transport and first of all for roads.

11. Comparing characteristics of operational environment on both sides of the border reveals the **leading readiness** of Lapland’s transport system to react to changes of the environment and to answer the current and future challenges.
### ANNEX 4.8.1

<table>
<thead>
<tr>
<th>№</th>
<th>Development vision of different transport modes within the multi-modal transport System of Lapland (till 2030)</th>
<th>Development vision of different transport modes within the multi-modal transport System of the Murmansk region (till 2025)</th>
</tr>
</thead>
</table>
| **Comparing development visions of different transport modes within the multi-modal transport systems of Lapland and the Murmansk region** | **Air transport:** Lapland forecasts growth of air transportation volumes in future because of increase of:  
- Tourist flows,  
- Number of business trips accompanying integration of the Barents region into the world economy.  
One can assume growing demand on:  
- Charter flights,  
- Regular air connections in latitudinal direction (centers of the Barents region territories – Murmansk, Arkhangelsk, etc.),  
- Regular air connections with the capitals: Moscow, St.Petersburg, Stockholm, Copenhagen.  
Air transport is **sensitive to economy condition and to the level of welfare of potential users.** As air transport is required to increase ecological compatibility and safety of transportations one can forecast cost increase and therefore – ticket price growth. However, it is more difficult to make forecasts for air transport than for any other modes of transport.  
**Railway transport:** Growth of both freight and passenger transportations is expected on railway transport. Passenger flow growth is expected due to increasing number of tourists. Freight flow increase is related to:  
- Development of logistic node in Tornio-Haparanda area in the Northern part of the Bothnic Gulf;  
- Development of mining industry projects in Lapland;  
- Development of international transport corridors.  
Implementation of above components of prospect growth of demand | **Air transport:** The positions of Russian civil aviation are weakened with worn out fleet, aircraft construction condition, low safety and developmental lag from international environmental requirements, problems with qualified specialists, land infrastructure engineering lag, absence of investments for its modernization. Air transport difficulties impede from implementing its competitive potential in logistics transport chains. The Russian Transport Strategy (till 2030) and FTP "Development of Russian Transport System (2010 - 2015) » provides for development of the Murmansk airport. Forecast data on freight and passenger flow dynamics on air transport are missing.  
**Railway transport:** Growth of freight flows on railways is forecasted due to development prospects of:  
- The Murmansk transport node,  
- Transit transport corridors, incl. That of latitudinal direction,  
- Local industry.  
One is expected to handle growing freight flows with means of:  
- Infrastructure modernization,  
- Increasing of loading norms,  
- Construction of new technology lines.  
**The threats** for implementation of freight flow growth perspectives on the railway transport are:  
- Delays with launching of big projects in the Murmansk region able to generate demand on railway transportations; |
for railway transportation is a justification for investments into development of railway infrastructure.

Sea transport:
Growth of sea transportations is expected in direction of Kemi-Tornio.
Grounds for expectations: Coordinated development of different modes of transport in Kemi-Tornio area and its forming as one of the logistics centers of the Barents region thus improving competitiveness of the port area.
The Northern Finland has a potential to become a transit zone for freight flows from EU to the Northern Sea Route.
The threat for sea transport development are winter shipping costs.

Road transport:
Traffic volume growth on roads is basically expected on main road networks due to:
- Development of tourism industry,
- Launching of mining industry projects.

Personal car traffic volumes changes under two parallel processes:
- High motorization levels and dependence of daily life from personal cars increase total mileage;
- Population ageing and its concentration in agglomerations provided with public transport services will decrease mileage.

Public transport:
Provision of public transport in sparsely populated territories is a costly task for the budgets because of:
- Long distances,
- Small passenger flows.

Despite organization of accessible public transport services in sparsely populated periphery is a real challenge, the strategic task of public transport development as a guarantee of Lapland’s population mobility has been set. To solve the task one should find effective and innovational solutions not only to support current level but to increase it.
Some districts of the province have opportunities for public transport development by means of its involvement into servicing of growing

- Non-competitiveness of logistics chains with participation of ports of the Barents and the White seas in the transport services market;
- Deficit of investments to modernize railway bottle-necks on approaches to the ports of the Barents and the White seas;
- Delay in implementation of projects of construction of missing railway sections on remote approaches to the ports of the Barents and the White seas, which prevent from development of railway transit corridors.

Information on forecasts of railway transport passenger flow changes is missing.

Sea transport:
Growth of sea transportation volumes in direction of Murmansk port is expected due to development of Arctic fields and increase of export freight flows.
Grounds for expectations: Plans for implementation of the mega-project «Murmansk Transport Node», which includes:
- Development of a big logistics cluster,
- Formation of a specific port economic zone in the Kola Bay to increase goods processing effectiveness.

The main threat for sea transport development is:
- Deficit of investments to implement the projects that define demand for sea transportations.

Road transport:
Forecast data for road transport (vehicle fleet growth, its structure changes, formation of road network and approved strategies of road maintenance, traffic management and risk (road congestion, accident rate, environmental impacts) management are missing in the Murmansk region.

As a substitution of forecasts a scenario of events universal for all the countries during the period of motorization rate growth can be used:
- Increasing motorization level to 450-500 veh./1000 inhabitants (comparing to the current level of 200 pers. cars/1000 inhab.);
Tourist flows. Implementation of this opportunity requires adaptation of services to the requirements of additional user group and to the specifics of **tourist multimodal chains** functioning. Deepening of public transport integration into the province economy contributes to achievement of another strategic objective – reduction of transport impacts on environment.

The challenges for the public transport are:

- Critical condition – reduction of state subsidies for public transport to the level which is sufficient only for **basic level of services for mobility of population**, but not for the public transport support;
- Decreasing dependence of public transport from subsidies, strengthening economic basis with means of cost optimization, increase of commercial component;
- Modernization of planning methods and operational activities (adaptation to the requirements of extended number of user groups, integration with external modes of transport to **integrate public transport into logistics of tourism industry**).

**Light traffic:**
Modern principles of sustainable mobility and high quality living environment require creation of favorable conditions for non-motorized transportations. Light traffic is considered when planning transport system as a rightful and in some cases priority way of mobility (tourist, health resort, historical areas). This approach is an indication of community maturity, which appears with high motorization level and awareness of inability to provide high quality living environment if the priority is a personal car based mobility. Therefore light traffic in Lapland is not only the way of daily mobility but an integral part of active tourism logistics, the demand for which is increasing in the world.

- Growing traffic volumes;
- Growing traffic flow loads (standard container truck has 11.5t/axle while most of the Russian territorial and local roads were designed for 6-10t/axle);
- Accelerated deterioration of roads because of its operation above its bearing capacity;
- Increasing transport externalities – broken traffic flow fluency, bigger travel times, higher risk of accidents, bigger environmental stresses;
- Increasing needs in resources for road maintenance and rehabilitation;
- Deficit of budget resources, under-repair, worsening road performances, growing transport costs and externalities, reducing competitiveness of local business (including tourism);
- Decreasing investment attractiveness, decelerated economic development, worsening quality of population social servicing;
- Reducing quality of life and emigration of population.

To reverse negative tendency and to jump-start the road sector a strategy and its instrument of its implementation – the programme is needed. Experience of countries with long motorization record proves that despite national and climate specifics successful coming out of crisis provides application of **one and the same basic principles, approaches, mechanisms and technologies** from which like from a lego-constructor it is possible to construct the programme of a system coming out of crisis adapted to local specifics.

**Public transport:**
The national policy on public transport development in Russia is missing. The Federal Law ФЗ 131 «Concerning local governing fundamentals» has **shifted responsibility for population provision with public transport services from federal to local level**. The Strategic documents of national level state a common thesis – necessity of public transport development.

**Light traffic:**
The national policy, data on current and forecasted light traffic
Conclusions:

1. Comparative analysis of different transport modes development prospects in Lapland and the Murmansk region reveals principle differences in approaches to development of transport system on both sides of the border. The difference is in the following:

   - **Lapland** focuses on integration of closely related modes of transport to develop multimodal logistics transport chains (including ports) for smooth transportation of goods and reduction of goods consignor costs (e.g. with means of reverse logistics when empty transportations are decreased). Freight flow is attracted not to the port but to the logistics route with port’s participation. Team game of all modes of transport within logistics approach allows to compensate costs of one chains by efficiency of the others thus increasing “balance effect” with organizational improvements and additional services. Additionally to this an integrated approach increases justification of investments into modernization of transport modes — participants of integration process;
   - **The Murmansk region** focuses on extension of port assets to increase export freight flows (mainly raw material and low value-added products). The related modes of transport are not integrated by goods consignor’s interests. These approach doesn’t contribute to flow fluency and reduction of costs and therefore — to competitiveness of the route with the port’s participation. Investments into port modernization without development of logistic multimodality and alternative routes (including port) become risky for investors.
   - In Lapland decisions made for development of road, public and non-motorized transport meet national policies and are balanced on the strategy development level, are user oriented, directed to active facilitation of common objectives: better living environment and higher business competitiveness — with the end goal — to integrate living plans of youth with Lapland. The specifics is a proactive model of actions to struggle for the main resource — human, without which it would be impossible to meet the future challenges.
   - The Murmansk region has a lack of data for forecasting flows and its composition on roads and a political vacuum regarding public and non-motorized transport. Political vacuum results in passive position of transport sector towards emigration of population from the region.

2. Coordinated development of transport systems of Lapland and the Murmansk region will help to:

   - Extend the vision of multimodal transport system in a trans-border context — to the territory of the Murmansk region thus increasing the number of potential logistics alternatives, including that with participation of the Murmansk port, and revealing the needs in development of logistics chains;
   - Contribute to elimination of political vacuum regarding public and non-motorized transport and extension of its role to improve quality of living environment in the Murmansk region in accordance with privileges given by the federal legislation.
   - Create a starting point for road sector development in unfavourable conditions of reducing financing and traffic volume growth based on experience of countries that came out of crisis during the similar periods. Solving of this task is critical because of unacceptable costs from road congestion, accidents, environmental impacts, especially in the cities; critical importance of roads for business functioning and social services; integrating role of road transport in the multimodal transport system.