NSB CoRe Project

Work Package 4 "Spatial Planning for NSB CoRe Network Development"

TOWARDS

Joint transnational SPATIAL VISION on regional development, logistics and mobility of the North Sea Baltic corridor

2050

NSB CoRe - a network of connections

April 2019

This document is the main outcome of the NSB CoRe project`s work package 4 "Spatial Planning for NSB CoRe Network Development"

The study is commissioned by the State Regional Development Agency, Latvia (VASAB Secretariat). This study was prepared by "SAFEGE Baltija", SIA. The team of experts involved in preparation of the study: Jānis Ušča, Inga Uvarova, Līga Pakalna, Krišjānis Veitners and Ieva Cēbura. The maps were developed by Zane Atstāja. Editorial comments by Liene Stikane (VASAB Secretairat)

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Contents

GLOSSARY

North Sea - Baltic core network corridor (NSB CNC)

One of nine transportation axes of the Trans-European Transport Network (TEN-T), connecting ports of the North Sea with the ports of the eastern shore of the Baltic Sea.

NSB CoRe project area

Transport and development corridor, stretching from Hamburg to Umeå with the NSB CoRe project backbone – Hamburg – Berlin – Warsaw – Kaunas – Riga – Tallinn – Helsinki – Vaasa – Umeå.

NSB CoRe project

Funded under the EU Interreg VB Baltic Sea Region Programme. It aims to enhance regional development by improving internal and external accessibility in the Eastern-Baltic Sea Region for freight and passenger transport.

Baltic Sea Region (BSR)

EU Member States around the Baltic Sea: Estonia, Denmark, Finland, Germany (Berlin; Brandenburg; Hamburg; Mecklenburg-Vorpommern; Schleswig-Holstein), Latvia, Lithuania, Poland and Sweden.

Bothnian extension

Extension of the NSB and ScanMed CNC's around the Bothnian Bay and to the Arctic

Agglomeration benefits

Agglomeration economies or external economies of scale refer to the benefits from concentrating output and housing in particular areas, incl., good supply networks, supply of trained workers, infrastructure built specifically for the industry, good transport links.

Multi-level governance

Specific structure and approach that facilitates coordination of the corridor planning and development of across different levels of public authorities, sectors and countries (TENTacle project, 2017[1], Oberg et.al, 2016[2], Rail Baltica Growth Strategy, 2013[3]).

Core European metropolitan regions

Metropolitan regions within the most urbanized and economically advanced region, also referred as EU pentagon, defined by Hamburg, Munich, Milan, Paris and London.

Main urban centres

Metropolitan regions and large cities along the NSB CoRe project backbone.

Mobility as a Service (MaaS)

Brings together all modes of transport in efficient and environmentally sound manner. This concept denotes user-centric travel system, applies ICT solutions and decreases one-off payments for travellers. It is implemented in strong collaboration between public and private sector.

[1] TENTacle project, Multi-level governance: Lessons learned, Oct., 2017.
[2] Öberg M., Nilsson K.L., Johansson C., Governance of major transport corridors involving stakeholders, Transportation Research Procedia (2016), retrieved [19.10.2018]: https://core.ac.uk/download/pdf/82241041.pdf.
[3] Rail Baltica Growth Strategy, Rail Baltica Growth Forum, Sept., 2013

INTRODUCTION

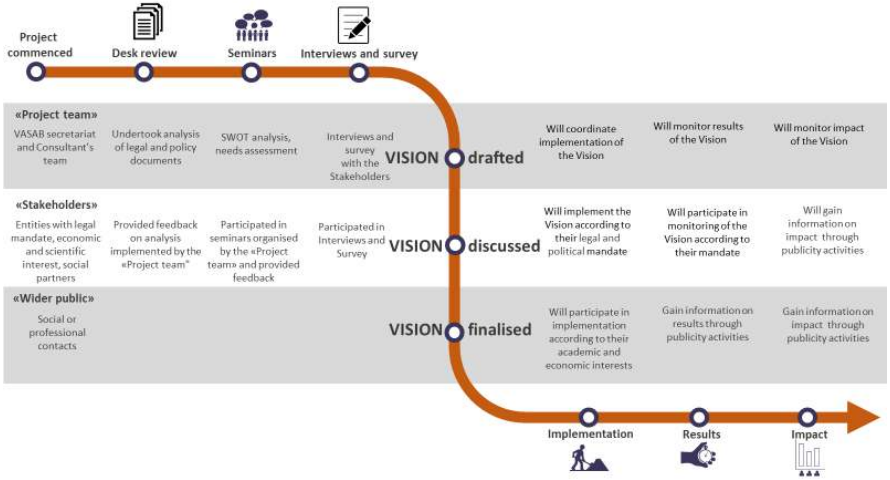
The Joint transnational SPATIAL VISION on regional development, logistics and mobility of the North Sea Baltic corridor (the Vision) is intended as a conceptual reference for public officials, advancing implementation of the transport and development corridor that is stretching from Hamburg to Umeå – the NSB CoRe project area. The Vision invites for increased cooperation between sectors and countries in order to foster greater cohesion among the EU states.

The Vision was elaborated under the NSB CoRe project that is funded under the Interreg VB Baltic Sea Region Programme. The aim is to enhance regional development by improving internal and external accessibility in the Eastern-Baltic Sea Region for freight and passenger transport.

NSB CoRe project has provided the opportunity to test transnational spatial planning in the project area supported by local stakeholders and observe the benefits of transnational cooperation along a transport corridor. Opportunities to use spatial planning to foster collaboration have been observed and discussed. Knowledge gained during spatial planning activities can be further applied.

This Vision addresses various stakeholders from seven countries (Sweden, Finland, Estonia, Latvia, Lithuania, Poland, Germany) that have interest in planning and development of the NSB Core project area, in particular, policy-decision makers and public officials at all levels, different professional, non-governmental and civil society organisations, private stakeholders, academic and research institutions.

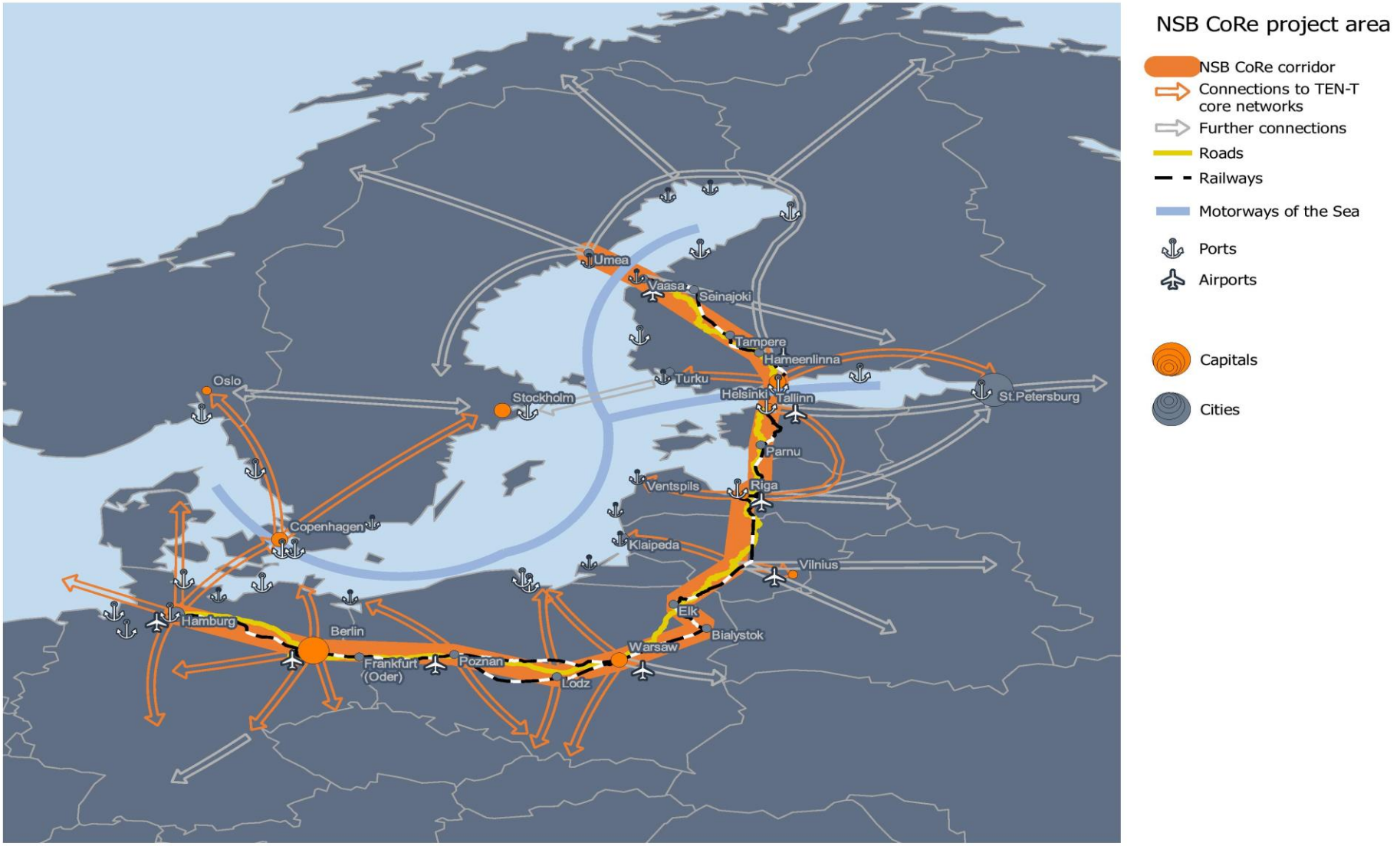
The Vision was developed through an interactive process together with the key stakeholders. The process included the fact-finding stage, the design stage and the consultation stage. During these stages, stakeholder mapping, SWOT analysis, interviews, survey were elaborated and workshops with the stakeholders were organized, as summarised below:



Picture #1. Road map of the Vision elaboration

During the elaboration process, the list of needs and bottlenecks was developed, that was based on the information gathered during the survey, interviews and workshops. The comprehensive list included infrastructural and institutional aspects relevant to the NSB CoRe project area, ranging from place specific local issues to transnational challenges. The key needs and bottlenecks addressed in the Vision are summarised and provided in the Annex 1.

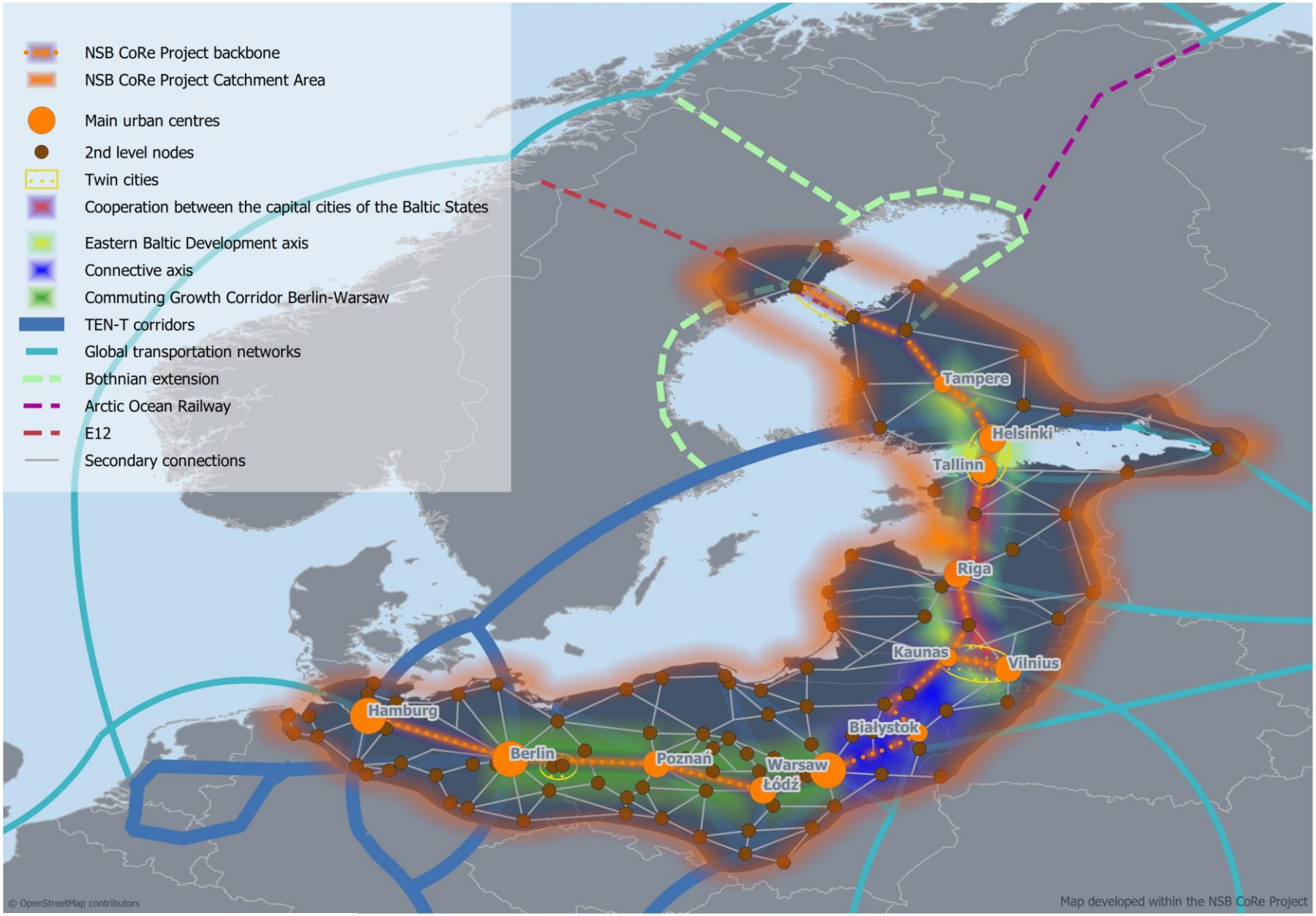
The spatial visioning process to elaborate this study has taken the first steps towards better integration of north eastern area of the Baltic Sea Region and describing regional benefits and potentials of the North Sea Baltic Corridor and its catchment area. Findings of this study may serve as input for further policy building in the area.



Picture #2. NSB CoRe project area and strategic connections

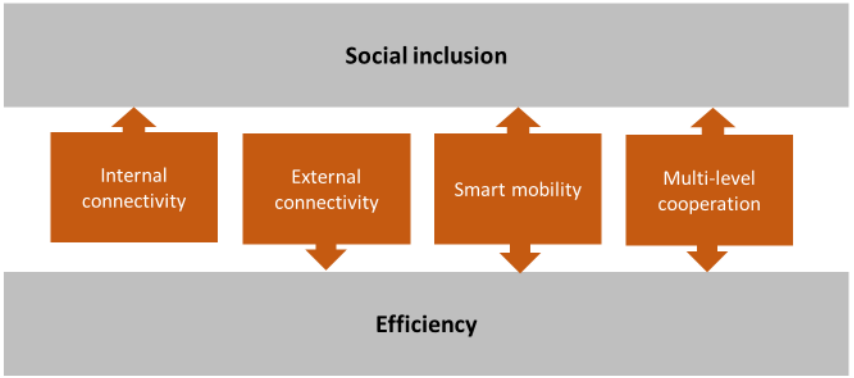
VISION 2050

In 2050 the region competes on the global scale and generates high added value, building upon knowledge, innovation, creativity, sustainability and social responsibility. Improvements vis a vis interregional and global connectivity in the NSB CoRe project area serves as a catalyst for balanced development in the region and beyond - it provides enhanced market accessibility, increased export opportunities, enlarged and more flexible labour market, raise in competitiveness and economies of scale. It also fosters creation of a territorially cohesive, attractive and liveable macro-region with high quality of life.



Picture #3. NSB CoRe Vision 2050

The Vision tackles the challenges relevant for the Baltic Sea Region and proposes solutions that shall advance **social inclusion** and **efficiency** of the BSR. Thus, it is fully integrated within the wider context of EU's transport and regional development policy goals, and should advance their achievement:



Picture #4 Social inclusion and efficiency aspect of the Vision

Competitiveness

The NSB CoRe project area covers a relatively small territory, but a wide range of differences in relation to economies, demography and spatial structures. There is a big spread from the Nordic economies at the income frontier to the Baltic states and Poland. Consequently, the businesses do not look at the Baltic Sea Region (incl., NSB CoRe project area) as one integrated market in terms of their strategies[4]. In the face of globalisation, there will be ongoing pressure on BSR economies to maintain and strengthen their competitive advantage. There are opportunities for the BSR economies to leverage its location to provide a point of connection for Europe with Asia.

New technologies, from automation to artificial intelligence, are likely to have a profound impact on GDP and productivity growth, labour markets and income inequality, leading to significant changes in the competitive positions of economies. Some of the new technologies offer the potential for relocation of supply chains to regions closer to end consumers (with labour costs of less consequence). To benefit from this, connecting transport and communications infrastructure is important across the BSR[5].

Hence, the future prosperity of the BSR will depend on the ability of all its countries to remain competitively integrated mutually and in the world economy. Transport systems of the BSR need to be integrated to strengthen regional integration across the BSR economies.

Single area

Spatial structures in the BSR are highly diverse - population densities vary from more than 1000 inhabitants/km² in southern urban areas to less than 10 inhabitants/km² in northern parts of Finland and Sweden. About 26% of people live in metropolitan areas, 45% in smaller urban areas, and 29% in rural areas[6]. Specific issues are noted in the cross border areas – often

[4]THE BALTIC SEA REGION ECONOMIES: PROGRESS AND PRIORITIES - A 20-year perspective. Baltic Development Forum, Nordic Investment Bank. 2018. http://www.bdforum.org/wp-content/uploads/2018/04/TBSREReport2018_210x297_webfinal.pdf

[5] Ibid

[6] SaTDOR European Seas and Territorial Development, Opportunities and Risks. ANNEX 4 to the Scientific Report: Baltic Sea Regional Profile. 2013. https://www.espon.eu/sites/default/files/attachments/ESaTDOR_FR_Annex_4_Baltic_Profile.pdf

considered as margins, defensive buffer zones or dead ends[7]. It is necessary to enhance territorial cooperation by building cross-border networks and therefore, connecting functional regions over administrative borders. A well-developed infrastructure is the key to diminish the gap between the living conditions in rural and urban areas and reverse the migration to the latter.

The proportion of global population aged 65 + was 5% in 1950, 7% in 2000, and is projected to reach 16% in 2050[8]. While there is a growing share of silver economy and quest to "live agelessly", there is also growing demand for medical and social services. Accessibility is crucial to diminish social vulnerability of certain social groups, incl., aging and rural population.

Hence, the transport systems within the NSB CoRe project area must be integrated in order to reflect upon the needs of all inhabitants, inlc., those residing in main urban centres, rural areas and border territories. Different spatial structures call for different solutions, but attention should be paid to maintain efficiency and enhance mobility at all levels.

Decarbonisation

Solutions need to be found to address the carbon dependence, in order to secure people's ability to travel and economic security of the region – hence new technologies for transport and traffic management need to be implemented. Meeting long-term climate goals within the transportation sector will require strong policy action both before and after 2030, including a continuation of vehicle efficiency improvements, the aggressive deployment of potentially zero-carbon vehicle technologies, and significant shifts to less energy-intensive modes, all of which can be facilitated through strong fiscal policies to help internalize the carbon impacts of transportation[9].

Within the NSB CoRe project area emphasis is put upon modal shift from road and air transportation to rail, and increased use of public transportation without sacrificing mobility.

[7] The MOT guides. Observation of cross border territories. 2014. Retrieved [19.10.2018]: https://ec.europa.eu/futurium/en/system/files/ged/cahiers_de_la_mot_9_en.pdf

[8] Demographic Development in the Baltic Sea Region. Marina Thorborg Södertörn University, Huddinge, Sweden. Retrieved [09.10.2018]: file:///C:/Users/IevaC/Downloads/ehsa-3-8-b%20(1).pdf

[9] Global Transportation Energy and Climate Roadmap. International council for clean transportation,2012, Retrieved [09.10.2018.]: https://www.theicct.org/sites/default/files/publications/ICCT%20Roadmap%20Energy%20Report.pdf

GLOBAL PERSPECTIVE

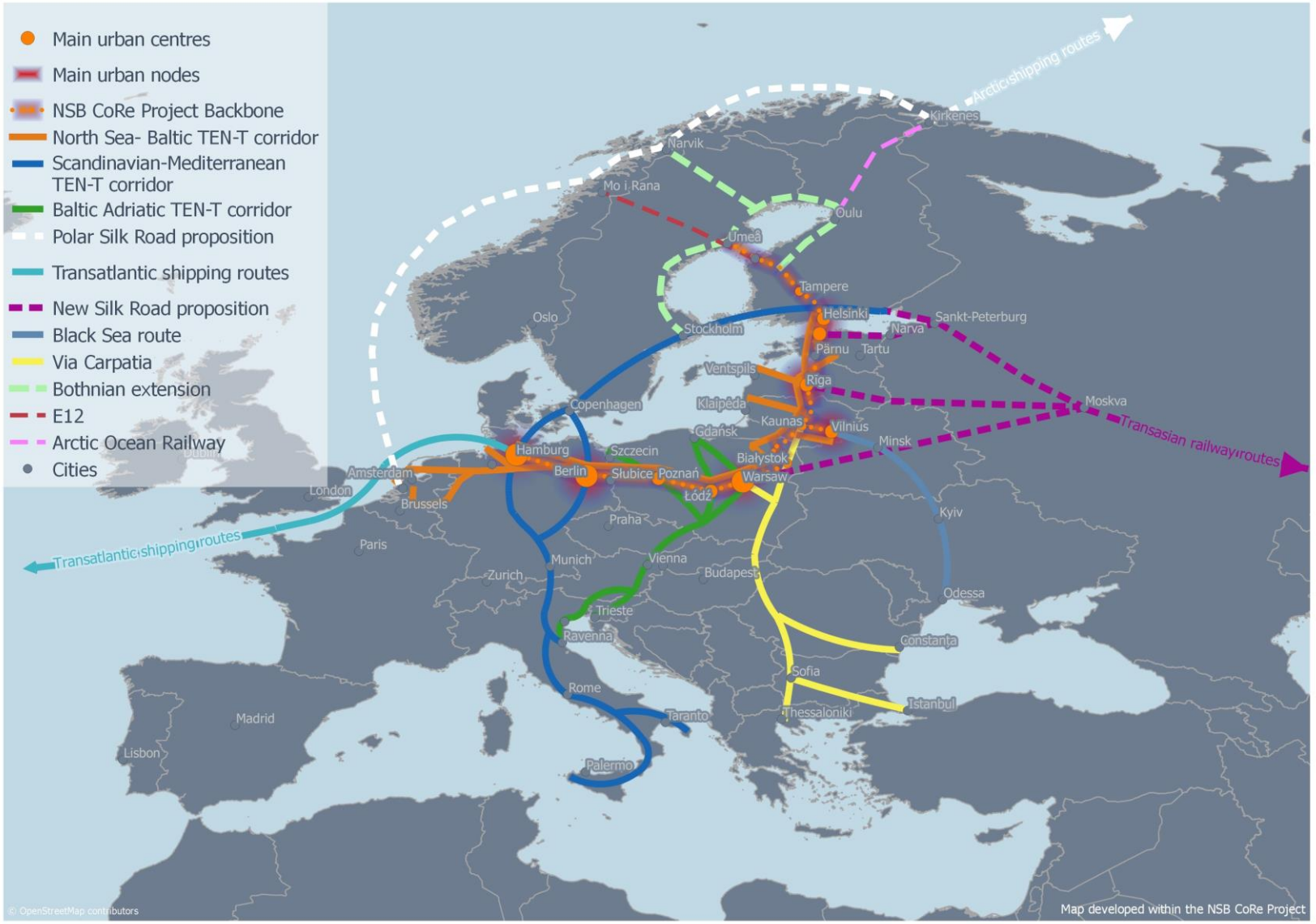
#external connectivity, #global transportation networks, #main urban centres, #spatial development potential, #trans-national connectivity

In 2050 the NSB CoRe in an integral part of development and transportation network. It is globally known as a major Trans-European connection stretching from the Arctic region to the core European metropolitan regions. The main urban centres along the corridor have become increasingly competitive and fit into larger transportation and economic networks.

Integration within global and European networks

The NSB CoRe project area will be connected to the Arctic Ocean in the north and Atlantic Ocean in the west, Trans-Asian railways in the east and the Black Sea in southeast.

The NSB CoRe backbone connection, extended with the Transatlantic shipping route, will ensure connections to North, South and Central Americas.



Picture #5 Global connections

Artic perspective

In the next 30 years the Arctic Ocean will provide an opportunity for cargo shipping, connecting Atlantic and Pacific oceans by considerably shorter distance. In the northern territories, the Bothnian extension together with the potential E12 and Arctic Ocean Railway will ensure that the NSB CoRe project area is connected to the Norwegian Arctic Ocean ports. Thus, European networks will be connected to the emerging opportunities in the Arctic. Transit across the Arctic can potentially become a viable alternative to the maritime routes through the Suez Canal, providing the fastest shipping route between Asia, Europe and the Americas.

The New Silk Road

On the eastern side of the Baltic Sea effective connections between the NSB CoRe transportation networks and the Trans-Asian railways will be developed, including the “New Silk Road” route linking the China’s and EU’s markets, thus providing the shortest route and well-established connections from the Western and Central Europe to Russia and China.

Connection to the Black Sea

On south-eastern direction, the NSB Core project area will be connected to the Black Sea route, ensuring connection to the regions around the Black Sea with further links to Central Asia and Middle East.

Global gateways

The main urban centres will be the crossing points between the TEN-T’s (Scanmed, Baltic-Adriatic, NSB CNC), east-west routes and other transportation networks and will serve as global gateways for the NSB CoRe project area. The proximity of European and global networks will increase economic potential and help to develop main urban centres as hotspots for cultural and social exchange. Therefore, efforts should be made to ensure effective interconnections between the corridors and interoperability between the networks. These developments will lead to increased cargo flows and will generate new opportunities for value creation along the backbone connection of the NSB CoRe project.

INTEGRATION AND CONNECTIVITY

#internal connectivity, #network of connections, #territorial cohesion

In 2050 territories along the eastern and southern coast of the Baltic Sea are better integrated in terms of accessibility and cooperation, therefore reducing disparities between western and eastern coast of the Baltic Sea. The NSB CoRe project area contributes significantly to the internal cohesion of the Baltic Sea Region – it provides improved connections between the main urban centres and 2nd level nodes, thus enabling social, economic and cultural cooperation. The NSB CoRe project area is a network of connections that serves the metropolitan areas, regional centres, remote and border territories.

Network of connections

The network of connections built within the NSB CoRe project area will stimulate balanced territorial development and empower cohesion within the Baltic Sea Region. The NSB CoRe backbone will integrate the Eastern Baltic transportation networks into wider European transport system and enable connections to core European metropolitan regions. It will reach to the resource rich Arctic Region and to the Scanmed corridor, and it will ensure connectivity of the macro-region from north to south and from east to west, leading to better connected, more competitive and therefore stronger BSR. The secondary connections will stimulate territorial cohesion on national and regional level, and will ensure access to the NSB CoRe related opportunities for the 2nd level nodes and rural areas.

Backbone

The NSB CoRe project backbone comprises links between the main urban centres. These cities and metropolitan regions will benefit from excellent connectivity, leading to high development potential. The NSB CoRe project backbone will facilitate development of transnational networks of functional urban regions.

Secondary connections

Secondary connections comprise links to regional and national centres, in this document defined as 2nd level nodes. These connections will provide access to the international and global networks also for regionally and nationally important centres, along with rural and peripheral areas.

Territorial cohesion

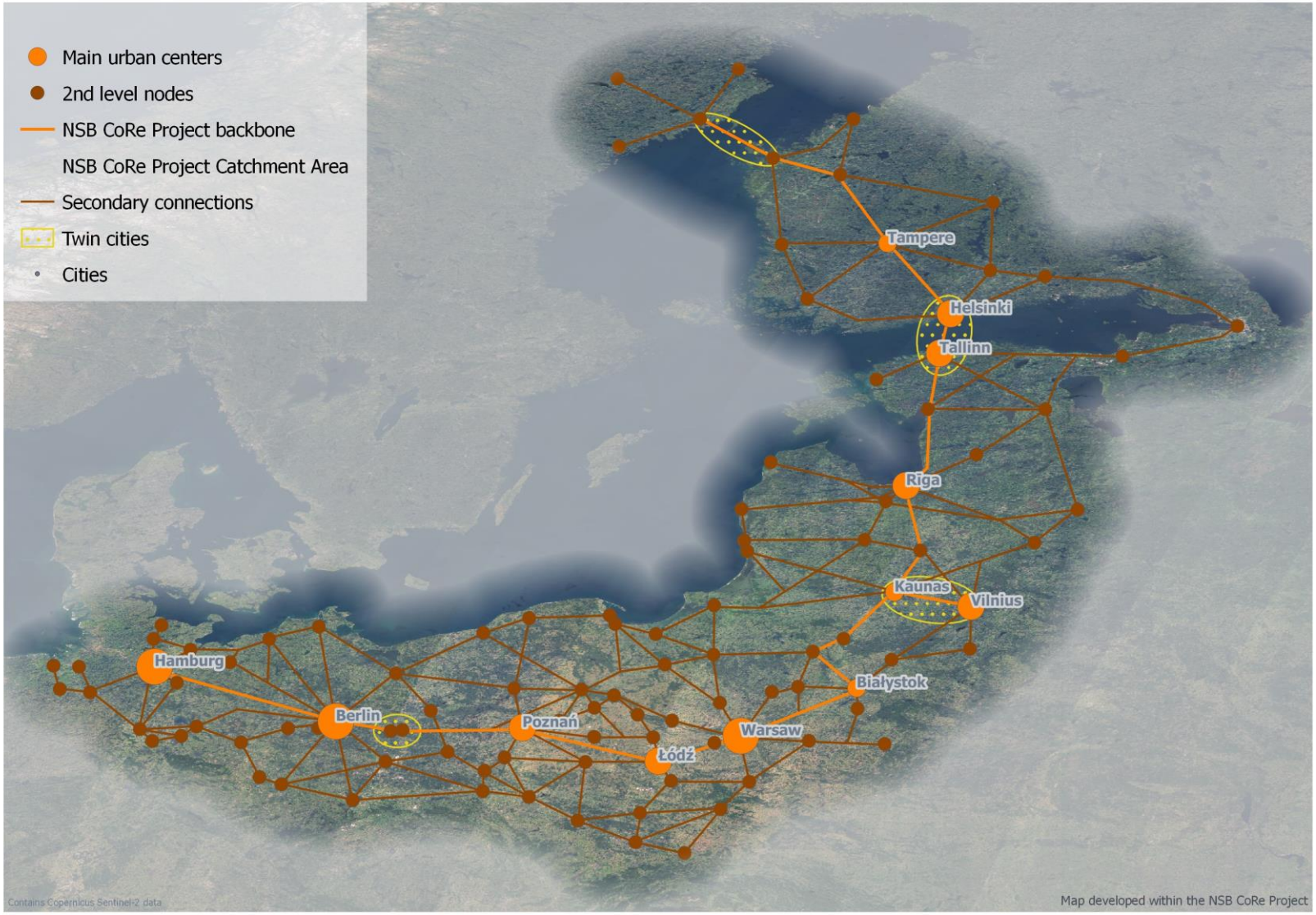
The spatial structure of the territories along the NSB CoRe project area are very diverse. Urbanization mega trend is present along the corridor. Hence development of the urban areas is of a high importance, however it should not hinder the development of rural and remote areas.

Therefore, development of effective connections between the main urban centres and 2nd level nodes will be the key to ensure that the regional centres and adjacent areas benefit from the NSB CoRe project. Efforts should be made to position the NSB CoRe project area as an integrated network that comprises primary and secondary connections within the catchment area, rather than a linear connection, that is focussed on the NSB CoRe project backbone exclusively.

Definition and understanding of the NSB CoRe as a system of mutually functioning primary and secondary networks creates conditions for reduction of the urban sprawl and densification of the settlements, and should help to provide higher quality living and working environments and reduced environmental impact.

Internal connectivity

Inter-connectivity of the NSB CoRe project area should significantly improve accessibility and promote cross-border cooperation between main urban centres, 2nd level nodes and rural areas, leading to more harmonious territorial development.



Picture #6 Network of connections

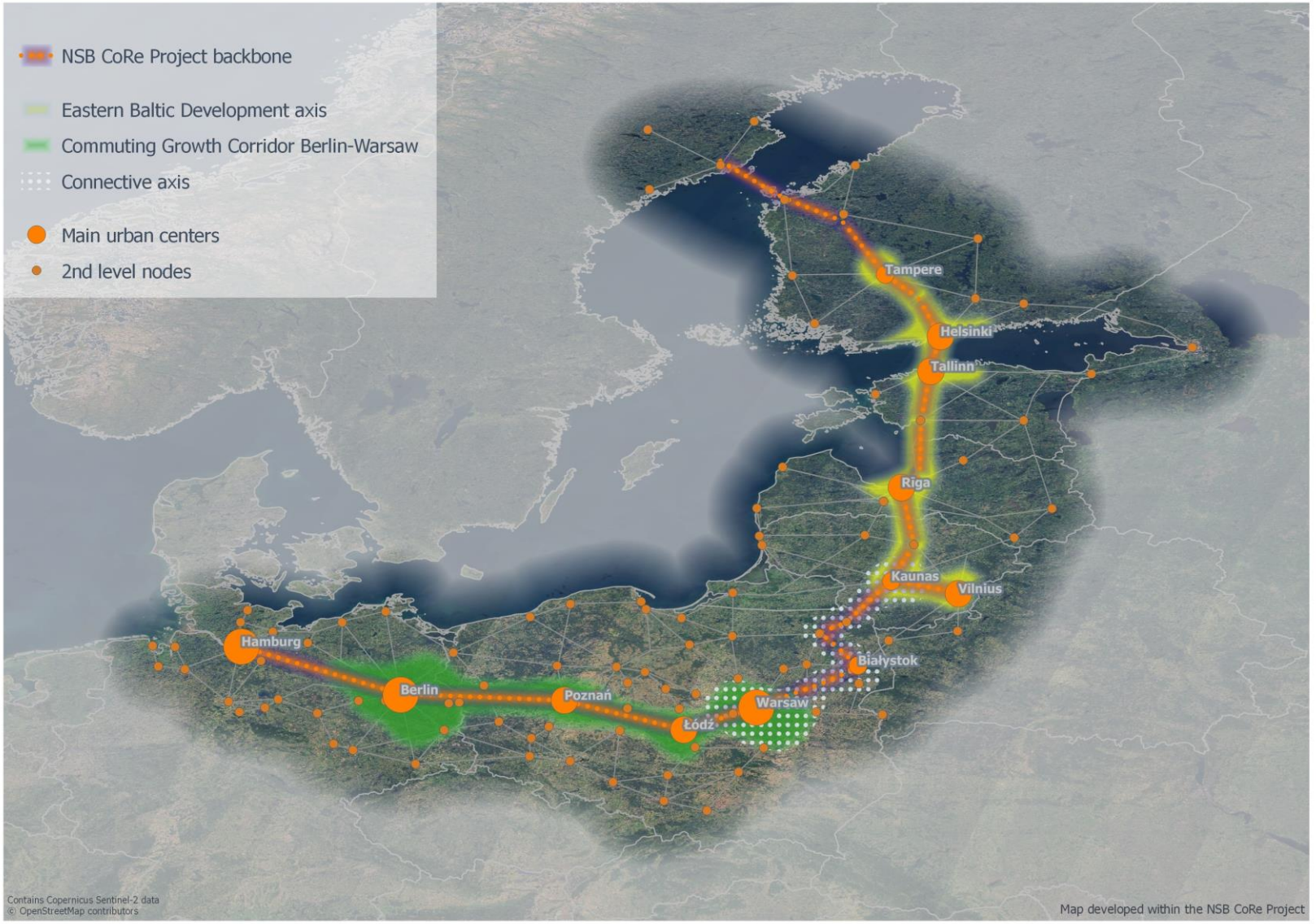
NSB CoRe BACKBONE

#functional regions #transnational cooperation #synergies # territorial cohesion

Better accessibility increases significantly the synergies between the most innovative European countries in the North and West of the region (Sweden, Finland, Germany) and the fast-growing economies located in the East and South of the region (Lithuania, Latvia, Estonia, Poland). Intensive cross-border cooperation, education and entrepreneurship boost productivity and international competitiveness of the region.

Cooperation and development axes

Transnational cooperation is facilitated via three axes along the NSB CoRe backbone – the Eastern Baltic Development axis, Commuting growth corridor Belin-Warsaw and Connective axis. These are further inter-connected with other TEN-T core network corridors and global connections through the main urban centres.



Picture #7 Cooperation Axes along NSB CoRe Backbone

Eastern Baltic Development axis

Cooperation between the capital cities of the Baltic States and Finland will form the Eastern Baltic Development axis, where *Via Baltica* and *Rail Baltica* will provide the essential connectivity. Construction of the FinEst link will provide huge boost to the cooperation between Helsinki and Tallinn, with the impact stretching up to Riga. The Eastern Baltic Development axis will serve as a backbone of the north-eastern NSB CoRe project area, reaching towards the largest cities of the region - Minsk, Moscow, Saint Petersburg, Kaliningrad and Stockholm. The Eastern Baltic Development axis will be the main driving force for territorial cohesion and will shape the future of the eastern Baltic. It will become the centre of gravity for innovation and smart specialisation in the Baltic Sea Region and will strengthen the long-established cooperation history between Tallinn and Helsinki, Riga, Vilnius and Kaunas.

Triple cities

Three Baltic capitals- Tallinn, Riga and Vilnius, have a crucial role in the national economies as they are the main urban centres in each country. In these cities the highest concentration of population is living, the most economical value is created and large part of the Baltic intellectual potential is concentrated. The Rail Baltica railway will significantly shorten travel time between these cities and will link the city centres, business districts and mobility hubs. This commuting corridor can facilitate deeper transnational cooperation between the Baltic capitals, build economic specialities based on synergies and extend the labour market and educational opportunities. Success of this development axis depends on ability for these cities to cooperate more substantially and develop their potential jointly.

Rail Baltica high-speed railway line: [10][11]

Rail Baltica high-speed railway will ensure a full integration of Estonia, Latvia and Lithuania into the single European railway network. It will connect Helsinki, Tallinn, Pärnu, Riga, Panevežys, Kaunas, Vilnius, Warsaw
Implemented in 2026
Total length 870 km, of which 213 km in Estonia, 265 km in Latvia and 392 km in Lithuania
Travel time of 1.55 hours between Tallinn and Riga and 2 hours between Riga and Vilnius
Maximum design speed of 249 km/h for passenger trains and 120 km/h for freight trains
5 million passengers and 16 million tons cargo annually in year 2030 6 million passengers and 20 million tons cargo annually in year 2055
Rail Baltica will provide fast, comfortable, environmentally friendly and safe transport services. Multimodal passenger terminals will provide convenient connections to urban, regional and long-distance services and new intermodal freight terminals will ensure fast and efficient transfer of containerized cargo between different transport modes

[10] Ernst & Young Global Ltd, RB Rail AS, 2017. *Rail Baltica Global Project Cost-Benefit Analysis Final Report,* retrieved [19.10.2018]: http://www.railbaltica.org/wpcontent/uploads/2017/04/ RB_CBA_FINAL_ REPORT_0405.pdf.

[11] Rail Baltica Official Website, *About Rail Baltica*, retrieved [19.10.2018]: http://www.railbaltica.org/

FinEst Link

The future connectivity of Helsinki and Tallinn is based on the proposed vision of the rail tunnel - the FinEst link. It will facilitate further integration and development of the twin cities Tallinn and Helsinki, and will also empower cooperation within the Gulf of Finland Triangle[12]. The potential connection between two cities will decrease the travelling time from one city centre to another to 30 minutes, it will merge the commuting areas of both cities, thus changing the existing commuting patterns. At the same time, this connection would have much wider effects – commuters from the relatively distant Riga would be able to reach Helsinki in approx. 2,5-3h time and commuters from Tampere would be able to reach Tallinn in approx. 2h.

The FinEst link will open up the Northern part for the NSB CoRe project area. It will connect and integrate the Growth Corridor Finland (Helsinki-Tampere) into the NSB CoRe. Also, it will connect the Artic regions that are rich with natural resources to the Central and Eastern Europe. The Kvarken region[13] will be connector of the potential extensions of NSB CNC and Scanmed corridor over the Gulf of Bothnia. At the same time the connection will ensure a better link between development and innovation-oriented Vaasa and Umea cities which will be strong contributors to the extension of the Helsinki-Tampere growth corridor. The proposed Bothnian extension will enable further development of transportation along the Bothnian Bay as well as to the Kirkenes port located on the coast of the Arctic Ocean.

Vision of Helsinki-Tallinn tunnel[14]	
Travel time: 30 minutes	
Completed in 2050	
13 million passangers and 4.2 million tons cargo annually in 2050	
According to estimations the discounted value of wider impacts measured in monetary value is 4000 – 6900 M€, depending on the assumptions. The biggest component is agglomeration effect, 52 % and second biggest work relocation effect, 32 %	
Half (50 %) of all the wider impacts is allocated to the Helsinki region while the share of Tallinn region is 38 %. The share of the rest of Finland is 10 % , rest of Estonia 2 %, and Riga region 1 %, respectively	

Commuting Growth Corridor Berlin-Warsaw

In the central Poland the high-speed train will be developed to connect three main urban centres - Warsaw, Lodz and Poznan. This

[12] Economic and development triangle aiming to create spatial and business cohesion between metropolitan areas of Tallinn, Helsinki and Saint Petersburg

[13] The Kvarken Region consists the counties Ostrobothnia, Southern Ostrobothnia and Central Ostrobothnia in Finland and the County of Västerbotten and the municipality of Örnsköldsvik in Sweden, retrieved [9.12.2018]: http://www.kvarken.org/kvarken-council/the-kvarken-region

[14] Helsinki-Uusimaa Regional Council, *Helsinki-Tallinn Transport Link Feasibility Study – Final report (2018)*, retrieved [19.10.2018]: https://www.uudenmaanliitto.fi/files/21452/FinEst-link-REPORT.pdf

connection will primarily improve internal connectivity of Poland. It will also create opportunity for cross-border extension of high-speed train to Berlin, therefore, strengthening connectivity and promoting closer cooperation between the main urban centres along this corridor. Better connections will facilitate new commuting patterns, e.g., Poznan inhabitants will be able to reach both Warsaw and Berlin for everyday trips. Furthermore, Berlin is very well integrated into the European railway networks and will provide easy access to/ from core European metropolitan regions for those using this commuting corridor. While the main urban centres along this corridor will be more exposed to increased competition and changes in labour market, it will also help the regions along this corridor to become more attractive and develop their potential.

Due to interconnection of the main urban centres along this corridor to different European and global transportation corridors, it has potential to develop related logistics services in cooperation with Hamburg. Warsaw is a gateway to the Eastern BSR, neighbouring Belarus and Ukraine, and even further locations in the East. Hamburg, as a logistics gateway, provides shipping services to the destinations around the globe.

”Y” high speed railway line in Poland
High speed railway line linking Warsaw, Łódź Poznan, Wroclaw, with a possible future extension to Berlin and Prague
Further connections include Nowe Skalmierzyce station (close to Kalisz, between Łódź, Poznań and Wrocław) and planned new international airport hub in Baranów located between Warsaw and Łódź
Estimated travel time: 35-40 minutes between Warsaw and Lodz, 1;00 h between Lodz and Poznan, 1:05 h between Lodz and Wroclaw

Connective axis

The north-eastern Poland axis, defined here as the Connective axis, will have a crucial role to play – it will safeguard connectivity and integration between the Eastern Baltic Development axis and the Commuting Growth Corridor Berlin-Warsaw. Bialystok, as the main economic and social centre of the region, will provide fast connections both to Central Poland and Southern Lithuania, thus it will significantly improve accessibility of the region. Fast connections to Warsaw and Kaunas will strengthen economy in the regions, that is especially important since Bialystok is located close to the external borders of the EU. Therefore, efforts should be made to ensure territorial cohesion. Considering the natural values of the region, it has also the potential to develop nature tourism, bringing the benefits not only to the cities, but also to rural areas.

Specific character of the Connective axis is the territorial fragmentation, as four countries meet in this area. Even more, two of them are non-EU member states. Therefore, the Connective axis will have the potential to enhance cross-border cooperation between the bordering regions of Lithuania and Poland, and beyond – with Belarus and Russia.

NETWORK OF SECONDARY CONNECTIONS

#balanced development # 2nd level nodes, # cross border connections

The region provides an attractive living environment made up of a network of interlinked metropolises, regional centres and rural territories with efficient transport systems operating between them. A cohesive polycentric structure of the region enables integration of a possibly wholesome territory in the dynamic development processes.

2nd level nodes

To achieve that the transportation networks complement each other, special focus will be upon development of multimodal chains for passenger travel and cargo transportation. The transportation nodes in main urban centres will ensure integration of the NSB CoRe project backbone with the secondary networks via combination of different modes of transportation (road & rail). Coordination of transportation schedules and logistic systems will be required at all levels. Multimodal solutions will be developed also in 2nd level nodes therefore strengthening accessibility of territories at their vicinity and engaging more users to the NSB CoRe project transportation networks.

Benefits of the secondary network

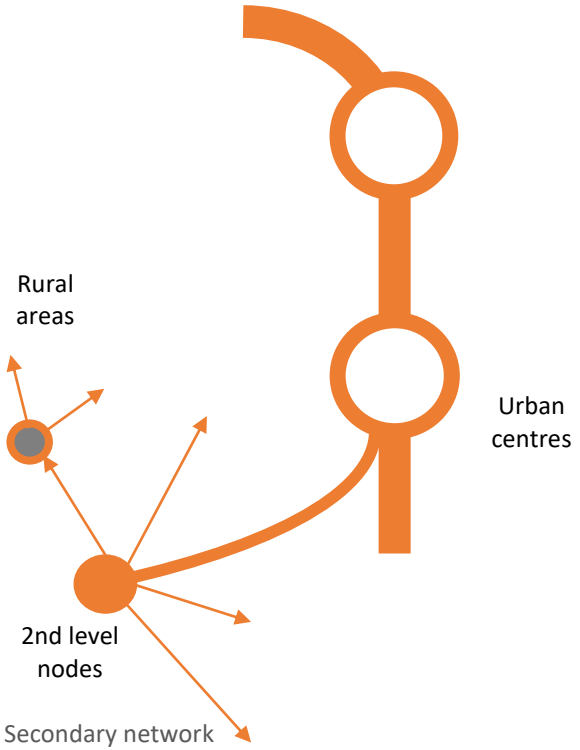
Significant travel time and cost savings in the NSB CoRe project area will enable new commute patterns, ensuring better access to the regional labour market and study places. Hitherto distant metropolitan areas will become conveniently accessible, expanding the employment and education opportunities.

Secondary connections will also improve accessibility of small and medium sized towns and rural areas, and strengthen urban-rural links. Improved accessibility will help to sustain life of small and medium sized towns. Since distant and part-time work employment models are becoming more popular, it can create opportunities for communities in smaller places to cope with depopulation, provided that easy access to 2nd level nodes and main urban centres are safeguarded.

Cross border connections

Developed cross-border connections between 2nd level nodes and cooperation between cities in border regions, will expand regional networks across borders and therefore reduce the negative effects usually associated with border regions.

Also, liberalization of border crossing rules between the EU, Russia and Belarus will help to develop border regions (East Poland, South Lithuania), as well as establish stronger connections to the neighbouring countries.



Picture #8. Secondary network

SMART MOBILITY

#safe, #integrated, #reliable, #sustainable, #contemporary, # low-emission, #effective, #environmentally friendly and user-centric, #door-to-door travel, # last-mile/ first-mile

In 2050 mobility in the NSB CoRe project area is safe, clean, flexible, integrated and efficient, with the main emphasis upon the user of the service. This mobility ecosystem builds upon new transport business models, which offer mobility as a service (MaaS). Mobility is shifted away from the conventional ownership-based transport system to an access-based one. It integrates different transport modes into a tailored mobility package and offers complementary services through a single interface including joint ticketing in functional regions. Mobility is integrated in various levels of development planning. Mobility solutions are customer-friendly and use sustainable transport modes. In mobility ecosystem there is successful symbiosis between people and technologies. Easy is the key word for trip planning, joint-ticket buying and commuting. Service is smooth, reliable and on-time. Because of cooperativity and interconnectivity of transport modes and service providers, there are no borders in the way of commuting.

Shift in mobility concept

Shift of mobility concept is based on development of technologies and behavioural changes. New transport solutions and mobility options will build upon principles of flexibility, on-demand and personalized approach, to respond to the challenges of aging population. This approach will help to minimise social exclusion and use of unsustainable transport modes. While many European companies are leaders in development of infrastructure, logistics, traffic management systems and manufacturing of transport equipment, it is crucial that European transport continues to develop and invest to maintain its competitive position in relation to smart and low-emission mobility solutions (White paper, 2017). In May 2018 the European Commission has completed its agenda for safe, clean, and connected mobility (the third Mobility Package of the European Commission)[15]. Traffic safety aspects are reflected in the incentive Vision Zero[16].

Sustainability

Sustainability is a core facet in the MaaS concept. Criteria for sustainability include technological soundness, low (zero) emission fleet, acceptance and behaviour change of users. The goal of MaaS schemes is to encourage the use of public transport services, by bringing together multi-modal transportation and letting users to choose them in their intermodal trips. In this respect, fair pricing of transport services, based on internalisation of external costs should be ensured. On the global scale the negative outcomes of the platform economy need to be addressed. Acceptance and participation of various social groups in MaaS is cornerstone of sustainability; the society sees economic benefits of smart mobility solutions.

Park and Ride. Park and ride service offers an easy way to combine walking, cycling or driving with mass transit to the city region. On the other hand, park and ride services are being used by the commuters who want to leave their vehicles to safe places and continue with trains, long distance buses, airplanes, etc
Estonians and Finns are currently working on cross-border Park&Ride solutions - private cars would use public transport in order to reach the port of Tallinn area. This project is expected to increase use of public transport and amount of multimodal travels
Bike sharing. Most current bike sharing systems are station-based, in which a bike (traditional or electric) is taken and returned to a dedicated bike parking spot, a "station". In Helsinki shared-bike system there are available 2 550 bikes in 150 bike stations within an area extending from the heart of the city

Intermodality

The transport modes functioning in the NSB CoRe project area are diverse – land (rail as a core and road), water and air transport, along with diverse transport service elements - public transport, car-sharing, ride-sharing, bike-sharing, car-rental, taxi, on-demand bus services. Within the NSB CoRe project area flights will not be the priority for short and middle-distance trips (e.g. between the 2nd level nodes and urban centres or between the urban centres along the NSB CoRe backbone). Main traffic flows are directed along the

[15] European Commission Press release database, *Europe on the Move: Commission completes its agenda for safe, clean and connected mobility*, retrieved [19.10.2018]: http://europa.eu/rapid/press-release_IP-18-3708_en.htm.

[16] *Vision Zero Initiative*, retrieved [19.10.2018]: https://trimis.ec.europa.eu/project/vision-zero-initiative.

mobility corridors (mostly railroads). Airports will generally serve clients traveling from and to external areas outside the NSB CoRe project area. At the same time high priority should be paid to the passenger comfort, leading to service-level improvement in the current fleet.

Joint ticketing. Finland case improves that joint ticketing can work without using smartphone. Travel Card is valid for all public transport in Helsinki, Espoo, Kauniainen, Vantaa, Kerava, Kirkkonummi, Siuntio and Tuusula: buses, commuter trains, the Metro, trams and the Suomenlinna ferry
Germany cases shows that rental cars can be booked on-line or using smartphone apps

Decarbonisation

Low-emission vehicles with lower fuel consumption and electric vehicles decreases emissions in all sectors - private, public and freight transport. These solutions need to be introduced at the **policy level** to contribute towards the goals of carbon reduction and air pollution reduction, increasing welfare and liveability in agglomerations. At the same time, ICT and transport innovations with harmonized technical standards should be facilitated at the **operational level** in order to achieve development of highly intermodal and multimodal transport system in the NSB CoRe project area. Autonomous-driving cars and buses, and intelligent-road systems will make travel smoother, faster and more energy efficient. These should also help to reduce significantly the number of deaths on the roads, contributing to the European Union target of close to zero fatalities in 2050.

Also, the modal shift from road and air to rail plays an essential role in reducing dependency on fossil fuels and greenhouse gas emissions. This shift will also help to decrease the costs for road maintenance and reduce noise pollution.

Agglomerations

Smart mobility solutions help society to became more inclusive and unfold the potential of agglomerations to become more attractive. Traffic management systems will become more dynamic and responsive through the use of AI. Intelligent infrastructure is helping transport networks to become more connected. Through continuous learning, the traffic patterns are constantly updated. This results in less waiting time and fewer emission. Mobility managers can make faster and more informed decisions on signal timing, suggested routing to system users, and capacity allocation. AI benefits not only motorists, but also other commuters.

Social inclusion

There will always be a part of the population who cannot function independently, and differences between rural and urban areas and different business models.[17] Notwithstanding these differences, smart mobility solutions need to be made available, to arrive at the

[17] Lintusaari, M., Frösén, N., Eloranta, P., Lintusaari, J. Transport Services Benchmarking Best Practices from North Sea Baltic Commuting Corridors, 2017. Retrieved [19.10.2018]: https://www.uudenmaanliitto.fi/files/20887/Benchmark_report_24.10.2017.pdf

point, where private car is not a necessity for travelling and people willingly choose public transport, shared-service vehicles or bikes (including cargo bikes and electric bikes). These solutions have the potential to reduce socio-economic challenges in 2nd level nodes and further rural areas, where availability of services is low or reducing due to ageing and decreasing population. For these areas, vehicle sharing systems and on-demand mobility services could play a crucial role to maintain competiveness.

Mobility corridors, that link the urban centres, 2nd level nodes and remote areas in the NSB CoRe project area, need to be developed along with the mobility hubs, that should serve to help people traveling their first/last-mile and make transfer to safe, clean and smooth public transport. Further services can be built upon the mobility hubs (e.g., medical services, care for elderly and disadvantaged, lifelong education), especially in 2nd level nodes and rural centres.

In order to increase commuting possibilities and avoid social exclusion Dörpsmobil project was invented in rural village in Schleswig-Holstein (Germany). Electric car sharing point is in the center of village and mainly focuses to local commuters. Next Dörpsmobil target group after locals are tourists.

PiggyBaggy service in Finland lets everyone become a transporter – you just request delivery, get in touch with the transporter and have door-to-door delivery. As a part of people has weekday commuting from home to work, such online platforms allow them making this way more efficient (transporters are receiving remuneration for these deliveries).

MULTI LEVEL COOPERATION

#Multi-level cooperation, #cross-border #NSB CoRe community

There is a strong and visible community of stakeholders that actively promote the network of connections in the NSB CoRe project area. Incentives to build this community shall be executed at the earliest possible time utilising existing cooperation platforms. The community of stakeholders shall set up the governance mechanism ensuring the multi-level cooperation among the EU, national, regional and local public authorities. Multi-level cooperation brings together different institutions, sectors, regions and countries across their boundaries. All relevant stakeholders from public, private, NGO and academic sector non-exclusively are involved in joint planning, development and promotion of the network of connections in order to foster internal integration within the NSB CoRe project area. The growth forum as a common space of the community of stakeholders advocates and addresses the needs of all the levels and territories within the NSB CoRe project area.

Cooperation principles

Cooperation in the context of this Vision is understood in two ways: in a restrictive sense, when it relates to the development of the NSB CoRe project backbone infrastructure and services, and in a wider sense, where it relates to the network of connections for the socio-economic integration and spatial cohesion throughout the NSB CoRe project area.

History of cooperation

The regions and countries of the NSB CoRe project area have previous cooperation history, which is successfully and actively continued via various transnational collaboration platforms, *inter alia,* the Nordic Council of Ministers, CPMR Baltic Sea Commission, VASAB and METREX.

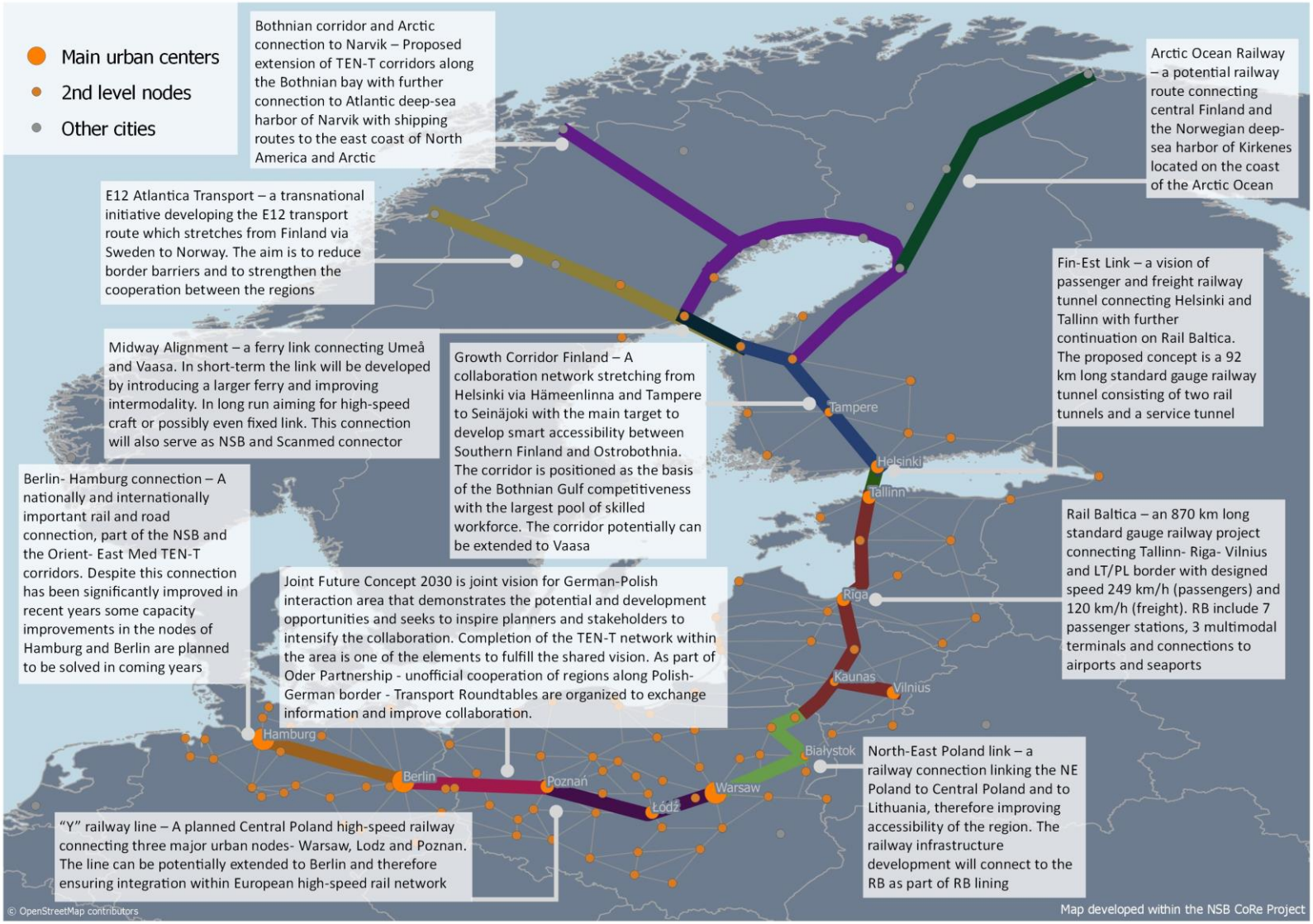
The cross-border governance experience of the Kvarken region in Finland and Sweden as well as the growing twin city partnership between Helsinki and Tallinn serve as a good basis for extending the transnational multi-level cooperation among various actors along the Eastern Baltic Development axis of the NSB CoRe. The existing cross-border institutional governance body between Poland and Germany may facilitate the further development of the multi-level cooperation along the Commuting Growth Corridor Berlin-Warsaw.

There are several existing transport related transnational collaboration initiatives alongside the NSB CoRe project backbone that ensure inter-connectivity of different countries (see picture #9). Within the next 30 years these incentives shall become an integral part of the network of connections of the NSB CoRe project area to ensure internal and external connectivity of the Baltic Sea region.

Stakeholders should take an advantage of using the best practices of already existing multi-level cooperation mechanisms. The multi-level governance of the Rail Baltica set up in accordance with the Rail Baltica Growth Strategy[18] is an existing framework for cooperation of various stakeholders. This governance model introduced the growth forum as the planning and decision-making mechanism, as well as a common platform for interaction of the stakeholders.

This is an important base for the development of transnational multi-level cooperation across different boundaries within the NSB CoRe project area. In the next 30 years the cooperation will expand regionally, institutionally and thematically in order to grow the community of stakeholders.

[18] Rail Baltica Growth Strategy, 2011, retrieved [19.10.2018]: http://www.rbgc.eu/media/rail-baltica-growth-strategy-version-1.1.pdf



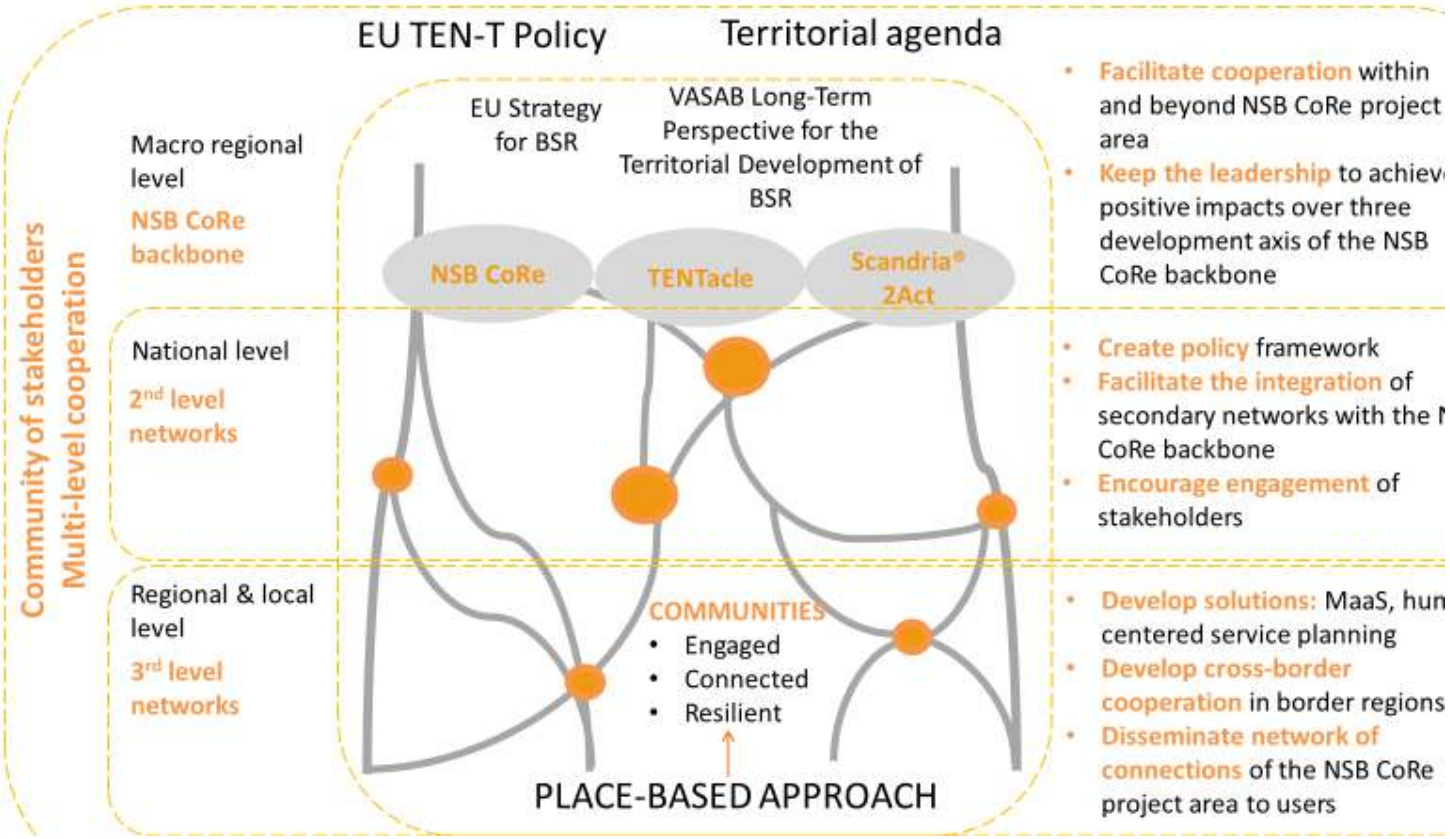
Picture #9 Existing cooperation initiatives

Community of stakeholders

This document envisages to build up the community of stakeholders that covers the whole NSB CoRe project area within different levels. The community of stakeholders has a common focus to develop the NSB CoRe project area as one integrated Baltic Sea region, while advocating the needs of the communities living there. All stakeholders will work towards positive and sustainable impacts ensuring well engaged, connected and resilient communities (see picture). It is important to strengthen the ability of 2nd level nodes to exploit maximum benefits derived from the connections with the NSB CoRe project backbone. This goal calls for place-based approach to ensure that all communities with their needs are respected.

The community of stakeholders will bring people together for multi-level interaction, exchange of information and learning from each other. Personal relationship of people is an important factor to bridge various borders of countries, institutions and sectors. Trust, respect and mutual understanding of the stakeholders are intangible assets that form strong social capital of the community of stakeholders. This community will comprise stakeholders with interest, expertise, will and power to influence planning and development decisions. Policy-makers, high-level executives and professionals will step out of their institutions, regions and countries on the global perspective to deal with the common interests of the NSB CoRe project area.

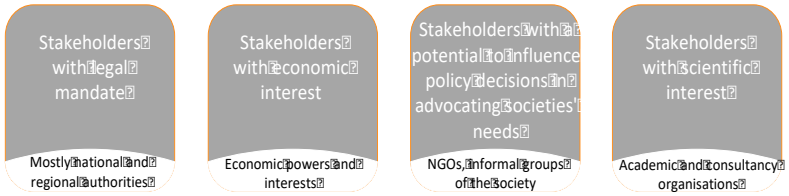
Behind this global and macro regional perspective, it is also important to keep a clear focus upon the local level needs. All the stakeholders will put efforts to disseminate and encourage active involvement of the local level peers. Instead of the traditional bottom-up and/or top-down approach, the stakeholders will collaborate in various directions, dimensions and scales, all having a common focus.



Picture#10. Cooperation principles in the NSB CoRe project area

Stakeholder mapping

Stakeholder mapping exercise revealed four key groups of stakeholders relevant for the Vision:



Picture# 11 Stakeholders' community of the NSB CoRe project area

Stakeholders with the legal mandate and **potential to influence policy decisions** will ensure integration of top-down and bottom-up planning approaches. This will empower involvement of all levels in the decision-making and facilitate development of a polycentric city region networks along the NSB CoRe project area. Their involvement will enable common political willingness to work together and stand for development of the network of connections of the NSB CoRe project area. They shall communicate to wider public the joint achievements and impacts of the NSB CoRe project area and gain the lobby power to promote it.

Synergies between the **stakeholders with economic and scientific interest** will be reinforced by the proximity, providing space for creative thinking, innovation and new technologies. Hence, improved collaboration between these stakeholders will strengthen cultural cooperation and contribute to the social cohesion within the Baltic Sea Region.

The multi-level cooperation in the wider context will enhance the economies of scale and common spatial development aspects. Deep socio-economic integration among the countries involved in the NSB CoRe project area will allow optimising the use of common resources (e.g. electricity, communications). It shall mitigate the negative demographic tendencies and attract new inhabitants to the NSB CoRe project area.

The Helsinki-Tallinn twin-city will become a North-European development centre with a common metropolitan area of 3 million inhabitants and being able to compete with Stockholm and Copenhagen[19], as well as on broader international scale.

Hence, cooperation is both the aim and the instrument – in the wider context the NSB CoRe project should enable cooperation between countries, cities, people, businesses and institutions advancing socio economic development, while it is also an instrument that should bring closer development of the NSB CoRe backbone and secondary connections.

In order to facilitate development of the community of stakeholders, ownership and leadership of this Vision should be agreed at the earliest time possible, and platform for the multi-level cooperation to enable knowledge storage and sharing should be established.

[19] Ed. Erik Terk, *Twin-city in making: integration scenarios for Tallinn and Helsinki capital regions* (Estonia: Tallinn University, Estonian Institute, 2012), retrieved [19.10.2018]: https://www.digar.ee/arhiiv/en/books/16302

ACTION POINTS

This section provides a summary recommendations and solutions for the implementation of this Vision. Actions are structured with respect to several decision-making levels: transnational level, national level, regional and local level. The action plan indicates the time scale for each recommendation: short term (here and now), mid-term (coming soon) and long-term (on-the horizon). The solutions and recommendations are structured in three thematic topics: recommendations that focus on 1) policy improvements, 2) cooperation promotion and 3) improvements of connections.

1. Actions for improving the policy

No	Actions	Time scale	Transnational (macro regional) level	National level	Regional and local level
1.1	To support and ensure political lobby (will) for development of competitive transportation infrastructure of the NSB CNC and the Bothnian extension in order to improve the internal and external connectivity of the BSR	Here and now	☑	☑	☑
1.2	To define the body that will take the leading or ownership role for implementation of the Vision	Here and now	☑		
1.3	To carry out marketing and dissemination activities in order to encourage more public discussions and support for further promotion of the network of connections of the NSB CoRe project area	Here and now	☑	☑	☑
1.4	To integrate the transport systems within the NSB CoRe project area in order to reflect upon the needs of all inhabitants, especially those residing in rural and border territories	Here and now		☑	☑
1.5	To establish a multi-level cooperation and management mechanism for further promotion and development of the network of connections of the NSB CoRe project area	Coming soon	☑		
1.6	To elaborate the strategy and the action plan for further promotion of the network of connections in the NSB CoRe project area	Coming soon	☑		
1.7	To adopt policy and actions to reduce negative carbon impacts of transportation, e.g. the introduction of the zero-carbon vehicle technologies, shifting to less energy-intensive modes	Coming soon	☑	☑	

2. Actions for promoting cooperation

No	Actions	Time scale	Transnational (macro regional) level	National level	Regional and local level
2.1	To develop the strategy for engagement of the stakeholders and raise awareness of common interests, especially at the local level	Here and now	☑	☑	
2.2	To form the community of stakeholders of the NSB core project area and strengthen their personal relationship and collaboration	Here and now	☑	☑	☑

2.3	To implement new technologies for transport and traffic management in order to decrease the carbon dependence and improve the travel and economic security	Coming soon		☑	☑
2.4	To encourage involvement of less active stakeholders that have the significant expertise or power to influence the planning and development of the network of connections of NSB CoRe project area	Coming soon	☑	☑	
2.5	To strengthen the ties between the functional urban regions with largest population on the Eastern development axis and Commuting Growth Corridor Berlin-Warsaw in order to facilitate the development of the transnational polycentric city region networks	Coming soon		☑	☑
2.6	To enhance cooperation also with the bordering regions in Russia and Belarus on the Connective axis	On the horizon	☑	☑	☑

3. Actions for improvement of connections

No	Actions	Time scale	Transnational (macro regional) level	National level	Regional and local level
3.1	To consider the option to extend NSB CoRe project area to Bothnian corridor and make connections to Norwegian ports in Narvik, Kirkenes and Mo I Rana	Here and now	☑		☑
3.2	To consider the option to extend the Helsinki-Tampere growth corridor to Vaasa	Here and now			☑
3.3	To consider re-establishment of cross-border passenger railway services to 2nd level nodes e.g. Riga-Siauliai, Vilnius-Daugavpils, Tartu-Riga	Here and now	☑	☑	
3.4	To integrate the transport systems within the NSB CoRe project area in order to reflect upon the needs of all inhabitants, especially those residing in rural and border territories	Here and now		☑	☑
3.5	To change the perception of commuters towards the network of connections of the NSB CoRe project area regarding the following: - the backbone primarily supports global, trans-national and inter-metropolitan connectivity - the secondary connections are linking national, regional centres and the periphery to the metropolitan regions on the backbone	Coming soon		☑	☑
3.6	To harmonize the planned speed of the Rail Baltica in the Baltics and Poland	Coming soon	☑	☑	

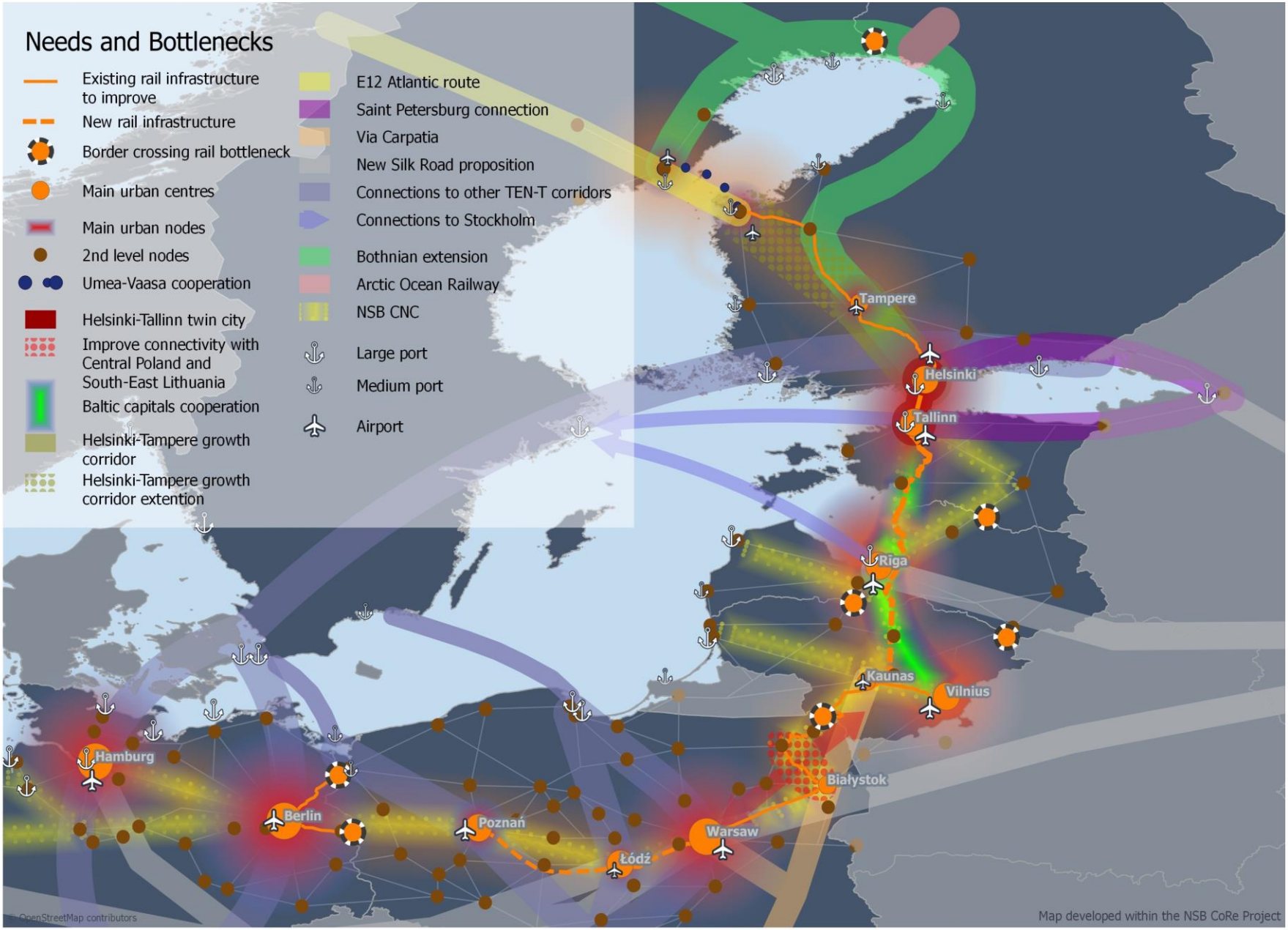
3.7	To integrate ferry within the railway network on Vaasa-Umea connection and improve the related railway infrastructure	Coming soon			☑
3.8	To improve connectivity of North-East Poland with the Central Poland and South-east Lithuania	Here and now		☑	
3.9	To develop railway tunnel extending Rail Baltica to Helsinki	On the horizon	☑	☑	
3.10	To further develop the NSB CNC external connections to the North	On the horizon	☑		
3.11	To create effective interconnections of the NSB CNC with other European and external transportation networks	On the horizon	☑		
3.12	To ensure integration between different transportation levels, develop multimodal solutions on national and regional centres (mobility hubs) and develop direct cross-border connections in the border regions	Coming soon		☑	☑
3.13	Facilitate development of the mobility system which is user-friendly and sustainable. While this approach might pose some administrative and management challenges, these aspects will determine success of the intervention.	Coming soon	☑	☑	☑

ANNEX 1

KEY FINDINGS defined in the process of elaboration of the Vision[20]

1. The railway tunnel extending Rail Baltica to Helsinki is a key need and a starting point for successful NSB CoRe project corridor further development in this territorial area.
2. Connections and infrastructure on Vaasa direction via Tampere are already existent, however improvements, especially for railway, are needed.
3. A ferry, effectively integrated in the railway network, is needed on Vaasa-Umea connection, to increase the truckload shipping and reduce the pollution. While both cities, with already well developed cooperation, can serve as a northern hub for NSB CoRe project area.
4. Need to assess the option to extend NSB CoRe project area to Bothnian corridor and make connections to Norwegian ports in Narvik and Mo I Rana.
5. Need to consider the option of Helsinki-Tampere growth corridor extension to Vaasa.
6. Rail Baltica railway with intermodal passenger and freight terminals is a key issue that will define the success of the NSB CoRe project area development. This connection shall serve as a backbone for the corridor.
7. The cooperation within NSB CoRe project area between Estonia, Latvia, Lithuania and Poland are yet the weakest. There is a need for extensive cooperation of main urban nodes to form polycentric city-region network.
8. There is a need to consider re-establishment of cross-border passenger railway services to 2nd level cities e.g. Riga-Siauliai, Vilnius-Daugavpils, Tartu-Riga.
9. Polish-Lithuanian border and NE Poland is a major bottleneck, which needs to be solved to successfully implement Rail Baltica. Considering the weak connectivity of NE Poland, NSB CoRe project need to contribute to the improvement of the connections to the main nodes in Central Poland and SE Lithuania.
10. Currently planned rail and road developments in Poland will improve the overall connectivity of the central and northern areas of NSB Core. Nevertheless, there is a need to harmonize the planned speed of the Rail Baltica in the Baltics and Poland to ensure effective operation.
11. There is a need to make connections to other transport corridors in order to effectively link NSB CoRe project areas to Western, Central and SE Europe e.g. SCANMED, Baltic-Adriatic, Via Carpatia.

[20] Summary of Needs and Bottlenecks in the NSB CoRe Project Area, 2017.



Picture# 12 Needs and Bottlenecks along NSB CoRe Project Area

ANNEX 2

POLICY FRAMEWORK

The White Paper on Transport[21] sets out the goals that need to be achieved by 2050 in order to build a competitive transport system that will enhance mobility, remove major barriers in key areas and fuel growth and employment:

- No more conventionally-fuelled cars in cities;
- 40% use of sustainable low carbon fuels in aviation; at least 40% cut in shipping emissions;
- A 50% shift of medium distance intercity passenger and freight journeys from road to rail and waterborne transport;
- All of which will contribute to a 60% cut in transport emissions by the middle of the century.

Territorial agenda of the European Union 2020 towards an Inclusive, smart and Sustainable Europe of Diverse Regions[22] sets priorities for territorial cohesion and development:

- Promotion of polycentric and balanced territorial development,
- Integrated development of cities, rural and specific regions enhancing urban-rural interdependence.
- Territorial integration in cross-border and transnational functional regions
- Ensuring global competitiveness of the regions based on strong local economies using social capitals and territorial assets.
- Improving territorial connectivity for individuals, communities and enterprises by supporting effective inter-modal solutions and developing TEN-T network for integrated transport network.
- Managing and connecting ecological, landscape and cultural values of the region.

Urban Agenda for the EU[23] stresses the significance of urban areas for economic development, employment and competiveness as well fulfilment of the EU 2020 objectives. It strives to support cities in fulfilling their potential by focusing on three pillars: better regulation, better funding and better knowledge (incl. knowledge exchange) and fostering coherence between urban matters and territorial cohesion. There are 12 priority themes among which are such as circular economy, climate adaptation, energy transition, urban mobility, digital transition as well as cross cutting issues – governance across administrative borders, sound and strategic urban planning, innovative approaches, including Smart cities. One of the key actions to support implementation of Urban Agenda is thematic partnerships.

[21] *White paper 2011: Roadmap to a Single European Transport Area - Towards a competitive and resource efficient transport system*, retrieved [19.10.2018]: https://ec.europa.eu/transport/themes/ strategies/2011_white_paper_en.
[22] Territorial agenda of the European Union 2020 towards an Inclusive, smart and Sustainable Europe of Diverse Regions,2011.

[23] Establishing the Urban Agenda for the EU "Pact of Amsterdam", 2016. Retrieved: [19.10.2018.]: https://ec.europa.eu/regional_policy/en/information/publications/decisions/2016/pact-of-amsterdam-establishing-the-urban-agenda-for-the-eu

VASAB Long-Term Perspective for the Territorial Development of the Baltic Sea Region[24] sets goals for territorial cohesion perspective of the region in 2030. Baltic Sea Region is fore-seen as a well-integrated and coherent macroregion that has overcome the socio-economic development divides. It features a well-balanced setup of metropolitan centers and accounts for fast, reliable and environmentally friendly technologies of transport ensuring linkages of territories along and across the Baltic Sea, high internal and external accessibility.

Improving internal and external accessibility is one of the set guidelines to achieve territorial cohesion perspective that emphasizes the need for a tighter integration of the regional and national economies and ability to serve the intercontinental flows. To tackle the challenges among other actions VASAB LTP addresses the implementation of TEN-T network, especially the Rail Baltica that serves as a backbone for integrated railway system in the eastern BSR. Necessity of the integrated approach of transport planning and labour market policies is pointed out, as well as accessibility of remote areas and need for integrated solutions are topics for further development in BSR.

[24] VASAB Long-Term Perspective for the Territorial Development of the Baltic Sea Region, 2009, retrieved [19.10.2018]: https://vasab.org/home/about/long-term-perspective/

ANNEX 3

WORK PACKAGE 4 CASE STUDIES

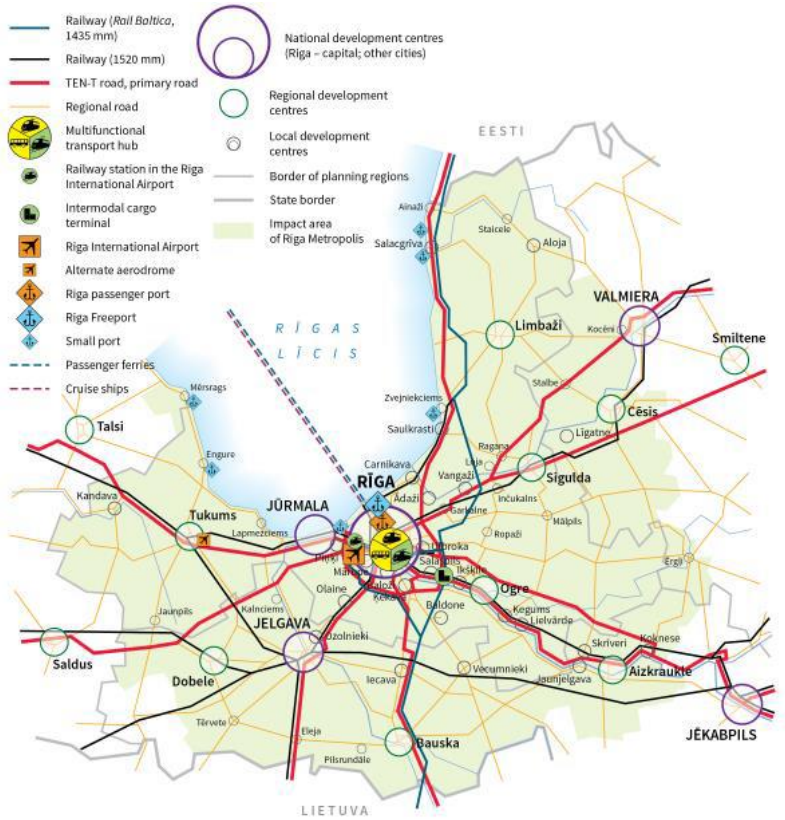
As part of the NSB CoRe project work package 4 “Spatial Planning for NSB CoRe Network Development” 4 regional case studies were elaborated on interactions between TEN-T core corridor (NSB) and 2nd level transport systems emphasizing spatial dimension.

Riga Metropolitan Area Mobility Spatial Vision

Riga Metropolitan Area Mobility Spatial Vision evaluates Riga and Pieriga Mobility Plan approved in 2010, Transport Development Guidelines 2014-2020 as well as the Riga Planning Region Sustainable Development Strategy 2014-2030 and discusses changes in the accessibility after Rail Baltica implementation and it`s integration into existing transport networks.

Riga is already an important transport hub for Northern Europe, the Baltic States and Latvia. In the future mobility in Riga metropolitan area will be determined by the new Rail Baltica railway and other infrastructure projects as well as by technology development, environmental quality objectives, development of public mobility and lifestyle. If enhancing potentials of Rail Baltica implementation, Riga can set an ambition to become a new, connected, common Baltic space for business, living and leisure.

It is suggested to develop Riga as a central multimodal transportation hub both internally in the city centre as well as externally in the whole agglomeration. Riga center will provide connections for all modes of transport - connecting Europe with high speed Rail Baltica, connecting East by conventional rail, urban public transport, Riga International Bus Station, 10-minute direct rail connection to Riga International Airport, as well a 20-minute drive connection to Riga passenger port. Catchment area will grow tremendously, and enormous competition possibilities will emerge.



Picture#13 Riga Metropolitan Area Mobility Spatial Vision

Effects of Rail Baltica investments on the Warsaw Metropolitan Area Urban Node[25]

Research in Warsaw Metropolitan Area Urban Node along the E75 line investigated the impacts of railway line modernization on the settlements structures and spatio-functional and socio-economic dimensions. Warsaw acts a catalyst for increased developing suburbanization process that stimulates and transforms areas in its immediate surroundings, hence, the E75 railway's modernization in Warsaw may influence the surrounding area in a positive way.

During the E75 railway line's modernization, the population in the case study area went up by 14,900. However, this growth was unevenly divided in the case study area with the highest growth taking place in the highest density areas near Warsaw and along the railway line, consequently, creating considerable socioeconomic differences in this project area. Intensity of changes in the population increased along with the reduction of the distance from the railway line in question. Similar situation was noticeable in the building development. Little construction activity was registered in southern territorial units further away from E75 line.

However, since the most important transport routes to reach the capital quickly was on the northern part of the railway line, the intensity of construction processes were also more varied on this side. In the scope of the economic impact of the region no particularly big changes were visible during the time of the project, hence, definite conclusions for the impact of E75 railway cannot be emphasized as the construction works were still ongoing during the analysis. Nevertheless, there is no denying that the transport accessibility and institutional facilities – including access to public services in urban centers – were among the main factors having a positive effect on the distribution of companies. The modernization of the railway did have an impact on the real estate market in the area surrounding the E75. This is noticeable in the relatively large number of transactions on the real estate market. One of the main reasons that could have impacted the real estate transaction prices is the eventual reduction of time needed to reach Warsaw. According to the passengers survey carried out during the study, overall satisfaction with the train services is rather high and train is considered a more convenient, cheaper and faster means of transportation comparing to bus or car. However, there is very poor integration of trains with local transport – timetables are not matching, bus stops are not in a proximity to the train stations and park&ride or bike&ride facilities are missing.

Profoundly it is extremely difficult to identify the impact of one factor on the main processes overseen in the study. Moreover, due to the infrastructural character of the investment in the E75 line's modernization, the trends in the area that might change in these above mentioned spheres might be identifiable only several years after the modernization is finished.

[25] Mazovian Case Study Published, 2018, retrieved: [31.03.2019.], https://www.uudenmaanliitto.fi/en/projects/nsb_core_north_sea_baltic_connector_of_regions/news_and_events/mazovian_case_study_published.33123.news

Helsinki Airport Line Study[26]

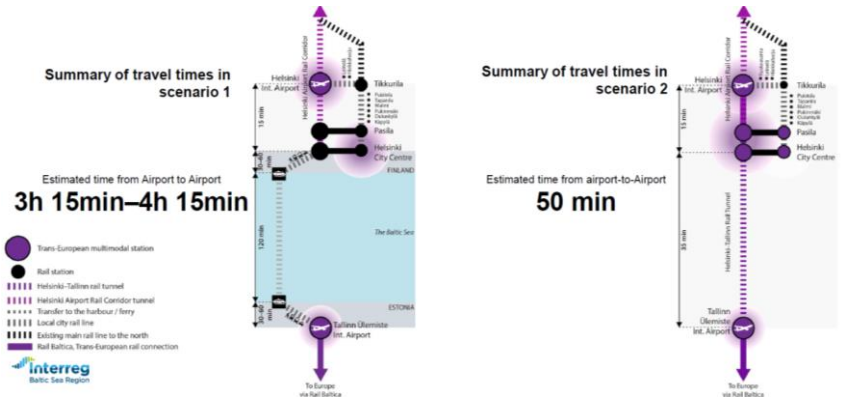
This study provides a spatial impact assessment on various scales (national, capital region, local) of a proposed underground rail connection – the Helsinki Airport Rail Corridor - from Helsinki city centre to the International Airport (Scenario 1) and the link between the proposed new rail corridor and the Helsinki-Tallinn rail tunnel (Scenario 2).

In scenario 1, the major improvement in connectivity is at the Airport station zone, where connectivity is expected to increase up to 13%. Smaller impact is calculated for the station zones around Pasila and the Helsinki Central Railway station as they are already significant national and regional train terminals.

In scenario 2, the improved rail infrastructure is expected to bring an added 4 to 5% average increase in connectivity in Helsinki and Vantaa. The benefits to be derived from the increased connectivity created by the new Helsinki Airport Rail Corridor link together with the Helsinki-Tallinn tunnel will be highest close to the stations: within a radius of 400 metres +10% in the city centre, +7% in Pasila, and +18% at the Airport. For Tallinn, the Ülemiste station area, where the new international transport hub will be located, connectivity is expected to improve attractiveness in terms of offices, services, as well as aviation and logistics. The Helsinki Airport Rail Corridor combined with the rail tunnel to Europe via Tallinn would merge both city-region's commuting areas into a single framework.

In scenario 2, superior connectivity will be created and it will likely raise real estate values in and around the new station growth zones. Increasing price levels represent higher levels of attractiveness, which in turn promote increased densification and more efficient land-use. Scenario 2 will also improve international competitiveness of the city of Helsinki.

It is also the case, that there are significant benefits in travel time for the combined rail link and tunnel in scenario 2 (Picture #14).



Picture#14 Differences in travel times

[26] Helsinki Airport Rail Corridor Study Published, 2018, retrieved [31.03.2019.]: https://www.uudenmaanliitto.fi/en/projects/nsb_core_north_sea_baltic_connector_of_regions/news_and_events/helsinki_airport_rail_corridor_study_published.30536.news

Tampere-Vaasa-Umea Growth Corridor

This case study investigates the most important linkages in the Kvarken region - internal sea routes through the Midway Alignment (shortcut within the Bothnian Corridor and a trunk line E12 to Mo i Rana, Norway) and connection to the city of Seinäjoki, Finland, and how can they contribute to better connectivity of the Kvarken area to the TEN-T core network building European competitiveness.

Accessibility to key markets is the whole idea of the NSB CoRe, hence, the main target is to merge Finland and Sweden into mainland Europe through two corridors – NSB and ScanMed. Even though these core corridors extend to the southern parts of Finland and Sweden, they leave out most parts of the two countries outside the transport network. Kvarken connection has long-lasting history of cooperation and coordinated transport development and is building a bridge to connect these two corridors. Cargo and passenger volumes are rising along Kvarken connection. This implies that the whole corridor needs better transport infrastructure and mobility services.

It is critical that the Seinäjoki and Tampere are more linked to each other with extension to Vaasa. Taking in account the perspective of the transport system public transport linkage should be seen as a whole. The principle is that rail transport carries out most of the public transport connections between the Vaasa-Seinäjoki terminals. Fast trains connect large centers closely to each other, but it means fewer stops for time reduction, so smaller centers in the corridor will miss the potential of the transport connection. Dense bus traffic can provide a reasonable level of service for those non-line access points. Attention has to be paid to the accessibility of second-tier and third-tier centers. At the same time in Umeå and Norbotten region are performing above average in Northern Sweden so improved connection to southern development centers is planned. A high priority is also given to towns further north from Umeå with the proposed new coastal rail link named Norr Botniabanan that would substitute the current inland connection. This is raised due to the concern that local labor markets are to small and too weak to provide real growth at the corridor.

Both Vaasa and Umeå are considered knowledge and competence hubs and there is an interest to develop a twin city which would have a potential to ensure critical mass in the area as well as improve attractiveness.

Vision for Kvarken suggests to concentrate on MaaS development in short-term to improve attractiveness of station areas and ensure last-mile solutions. In the midterm it aims for 3h ferry connection and in long-term – 2h connection from Vaasa to Helsinki.

Connection of Kvarken to the Growth Corridor Finland will offer mutual benefits. Such a connection would make Growth Corridor Finland more attractive with increased labour force and amount of students. Connecting Kvarken to NSB would offer a wealthier and healthier NSB.

ANNEX 4

SPATIAL VISIONING PROCESS

Spatial visioning process steps within NSB CoRe project:

STEP #1

Defining goals and needs, results of the spatial visioning process and reasoning for stakeholders` involvement.

STEP #2

Stakeholders mapping. Identification of reliable partners to work together with. Building a network of stakeholders. Awareness raising of the stakeholders by sharing the necessity and benefits of the spatial planning process. Using the spatial visioning process to build and maintain the network.

Lessons learned from NSB CoRe:

NSB CoRe project`s partnership served as a useful platform to start building a stakeholder network and having local knowledge along the whole project area.

STEP #3

Summarizing and analysing available policies and spatial planning documents along the project area. Combining of macro-regional, national, regional and local documents.

STEP #4

Active involving of stakeholders in specifying goals of the spatial vision, taking into account their expectations and consulting each step of spatial visioning. Combining macro-regional policies, existing planning documents, experts` and stakeholders` view to get a comprehensive picture.

Lessons learned from NSB CoRe:

Organizing series of workshops was helpful throughout the process. It is useful to organize the workshops closer to the stakeholders. Help from local partners was crucial to involve the right persons.

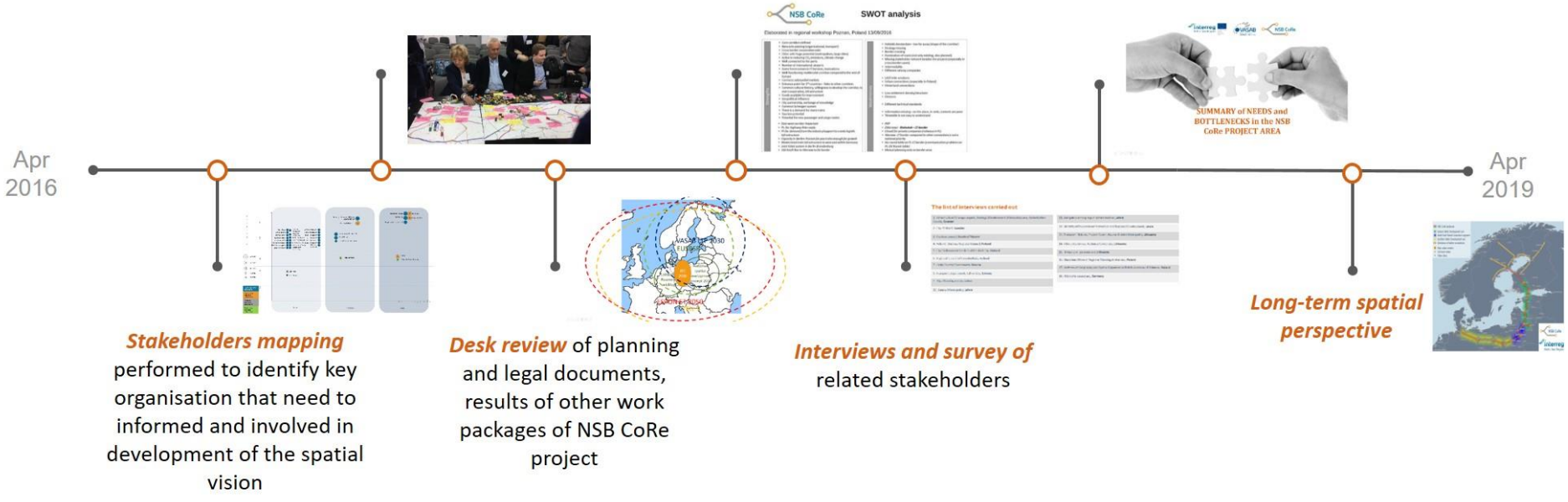
Workshops should be organized in various stages of the spatial visioning process: in the goal setting stage, information gathering stage, visioning stage, when the draft vision is prepared. Sufficient time should be allocated for each stage to have opportunity to discuss the vision with stakeholders.

STEP #5

Ensure continuous spatial planning as it is a never-ending process!

Lessons learned from NSB CoRe:

Project duration of 3 years was not a sufficient time to build a collaboration network and elaborate a spatial vision that is accepted by all involved parties along the NSB CoRe project area. Further resources should be allocated for that.



Picture#15 Spatial Visioning Process

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