Development of Cities in the Baltic Sea Region

Research report

This report has been written by HESPI and Jana seta Map Publishers on the behalf of
VASAB secretariat at Latvian State Regional Development Agency

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Introduction

Cities have been the main drivers of development in the Baltic Sea Region since the days of the Hanseatic League. The structure of modern cities in the region formed along with the flourishing of major industries at the turn of the 20th century. At that time, Berlin and Saint Petersburg, both rapidly growing capitals of superstates, were among the world's ten largest metropolises. With populations of over half a million, Hamburg, Warsaw, Copenhagen, Riga and Wroclaw (formerly Breslau) were also some of the largest cities in Europe. A whole century has passed since that time, during the world has changed dramatically, but the pulling power of cities as centres of development has not decreased.

The report examines the development of cities of the Baltic Sea Region (BSR) from 2005 to 2014 (where available) in four domains:

1. **Demography** (population change)
2. **Economic performance and dynamics (**changes in GDP, multimodal accessibility potential)
3. **Human capital in cities (**population with tertiary education, employment in technology and knowledge sectors)
4. **Social inclusion and quality of life (**changes in unemployment, at-risk-of-poverty rate).

The report contains policy pointers for each of these domains.

The indicators used to assess the development of cities are the headline indicators selected in ESPON project BSR TeMo "Territorial Monitoring for the Baltic Sea Region." This project has developed indicator-based monitoring system and methodological tool that provides monitoring of the territorial development. The indicators have been selected on the basis of their relevance to policy domain, policy relevance to European macro-regional strategy - the EU Strategy for the Baltic Sea Region and VASAB Long -Term Perspective for the Territorial Development of the Baltic Sea Region, time series availability, update frequency and availability within the European Statistical System, where relevant.

In order to arrive at comparable data for each indicator, the latest publically available data from national state or regional statistic offices was used. Detailed overview about the research methodology is available in the **Annex** of the report (see Annex).

However, the development of individual cities differs due to their specific historical, geographic and economic factors. In order to provide a comprehensive portrayal of the situation in the Baltic Sea Region, the authors of this report selected **127 of the most significant centres of development**, or the largest cities, all of which have populations of over 100,000 including suburbs (**urbanised areas**). For countries with lower population densities (Norway, Sweden, Finland and the Baltic States), cities with a population of over 50,000 were chosen.

Considering the different interpretations of the city concept in authors of the report developed a methodology for calculating the urban area. These data (see Annex: Methodology

The compact nature of this report does not allow all of the changes that have taken place over the past decade to be described. The authors have therefore tried to highlight the most distinctive facts, especially regarding the lesser integrated eastern parts of the Baltic Sea Region.

1. Population

The large cities of the Baltic Sea Region can be divided into several **categories** according to the size of their **population**.

1. Global metropolises
Similarly, to a century ago, the largest metropolises in the region are **Saint Petersburg** and **Berlin**, with over four million inhabitants in each. Even though the two cities have in the meantime fallen to the further end of the world Top 100 in terms of population, they still retain considerable global influence. As the capital of the world's fourth-largest economy, Berlin has not lost any of the development impulse it received as the result of Germany's reunification, and it enjoys a growth rate that is well above average for German cities. The population of Russia's unofficial capital of the North, Saint Petersburg, has also grown quite rapidly in the past decade as a result of immigration; however, its potential still remains largely unrealised due to the country's chequered history and awaits its moment to return to Europe. The advancement towards the status of global metropolis for **Saint Petersburg** is impeded by institutional constraints prevailing in the Russian economy for the last 10-15 years. This has slowed it's economic growth and contributed to the economic recession.

2. European metropolises
This category consists of cities with populations of 1.9 to 2.8 million, namely, **Warsaw**, **Hamburg**, **Katowice**, **Minsk**, **Stockholm** and **Copenhagen**. The capitals of Poland, Sweden and Denmark are not only the main centres of development in their countries; in many spheres they transcend European borders and can be considered global metropolises. Hamburg, Germany's largest (and Europe's third largest) port city, is also definitely a metropolis on a European scale, while broader integration into Europe's structures is still a challenge for rapidly growing Minsk, the capital of Belarus. Likewise, Poland's industrial capital of Katowice, which is the centre of the polycentric Upper Silesian agglomeration, faces the challenge of adapting to post-industrial development trends and thereby counter its shrinking population.

3. Regional metropolises
This category (populations of 0.7 to 1.3 million) includes **Helsinki, Oslo, Krakow, Gdansk, Bremen, Lodz, Gothenburg, Riga, Poznan** and **Wroclaw**. These are large cities and

significant centres of development in the Baltic Sea Region. The influence of several, especially the Finnish, Norwegian and Latvian capitals of Helsinki, Oslo and Riga (the largest city of the Baltic States), extends beyond the national level.

4. National and regional centres of development

Several Baltic Sea Region cities with smaller populations have influence in various spheres that extends beyond the national level. Of particular note are the Lithuanian capital **Vilnius** and the Estonian capital **Tallinn**, although all of the cities included in this report are considered national and regional centres of development until, through the urbanisation process, they are integrated into one of the higher-level urban area categories (B**erlin-Potsdam, Gdansk-Sopot-Gdynia, Oslo-Drammen** and others).

Table 1 Populations of cities (urban areas) in the Baltic Sea region (2015, estimate, see annex of methodology)

City	Country	2015 Pop. (th)	City	Country	2015 Pop. (th)	City	Country	2015 Pop. (th)	City	Country	2015 Pop. (th)
Saint Petersburg	RUS	5712	Bergen	NOR	378	Wałbrzych	POL	162	Słupsk	POL	105
Berlin	DEU	4384	Aarhus	DNK	373	Opole	POL	162	Kuopio	FIN	103
Warsaw	POL	2734	Grodno	BLR	367	Uppsala	SWE	162	Cottbus	DEU	102
Hamburg	DEU	2703	Kaunas	LTU	360	Pinsk	BLR	157	Pori	FIN	100
Katowice	POL	2359	Brest	BLR	355	Barysaw	BLR	155	Kristiansand	NOR	100
Minsk	BLR	2169	Białystok	POL	333	Gorzów Wielkopolski	POL	149	Norrköping	SWE	97
Stockholm	SWE	2067	Tampere	FIN	331	Orsha	BLR	143	Umeå	SWE	96
Copenhagen	DNK	1951	Kiel	DEU	320	Płock	POL	141	Daugavpils	LVA	92
Helsinki	FIN	1214	Radom	POL	298	Zielona Góra	POL	139	Skien	NOR	92
Oslo	NOR	1170	Częstochowa	POL	290	Šiauliai	LTU	138	Sundsvall	SWE	89
Kraków	POL	1136	Lübeck	DEU	289	Jyväskylä	FIN	131	Karlstad	SWE	86
Gdańsk	POL	1089	Stavanger	NOR	289	Lahti	FIN	131	Eskilstuna	SWE	83
Bremen	DEU	958	Kielce	POL	279	Kalisz	POL	129	Borås	SWE	82
Łódź	POL	922	Petrozavodsk	RUS	275	Västerås	SWE	126	Gävle	SWE	82
Riga	LVA	849	Rzeszów	POL	270	Włocławek	POL	124	Liepaja	LVA	76
Gothenburg	SWE	849	Turku	FIN	264	Lüneburg	DEU	122	Vaasa	FIN	72
Poznań	POL	826	Veliky Novgorod	RUS	250	Elbląg	POL	122	Halmstad	SWE	71
Wrocław	POL	730	Toruń	POL	244	Helsingborg	SWE	121	Joensuu	FIN	70
Vilnius	LTU	633	Rostock	DEU	237	Örebro	SWE	118	Jelgava	LVA	67
Gomel	BLR	578	Tarnów	POL	230	Tartu	EST	117	Hämeenlinna	FIN	65
Rybnik	POL	571	Babruysk	BLR	223	Grudziądz	POL	117	Växjö	SWE	64
Kaliningrad	RUS	524	Pskov	RUS	218	Linköping	SWE	117	Tromsø	NOR	63
Tallinn	EST	511	Polack	BLR	200	Jönköping	SWE	117	Kouvola	FIN	60
Bielsko-Biała	POL	501	Odense	DNK	198	Saligorsk	BLR	115	Tønsberg	NOR	60
Malmö	SWE	485	Trondheim	NOR	198	Fredrikstad	NOR	113	Luleå	SWE	60
Szczecin	POL	467	Oulu	FIN	194	Panevėžys	LTU	109	Alytus	LTU	59
Lublin	POL	425	Baranavichi	BLR	193	Koszalin	POL	109	Ålesund	NOR	59
Bydgoszcz	POL	412	Klaipėda	LTU	190	Lida	BLR	108	Narva	EST	58
Mogilev	BLR	400	Olsztyn	POL	174	Legnica	POL	108	Pärnu	EST	56
Vitebsk	BLR	396	Bremerhaven	DEU	170	Schwerin	DEU	107	Lappeenranta	FIN	55
Murmansk	RUS	386	Mazyr	BLR	165	Flensburg	DEU	106	Kotka	FIN	53
			Aalborg	DNK	164	Maladzyechna	BLR	105	Rovaniemi	FIN	52

Over the past decade, populations in the majority of centres of development in the Baltic Sea Region have increased. The most rapid growth has taken place in the less-populated but prosperous Nordic countries of Norway, Sweden and Finland and more densely populated Denmark (see Map 1).

Significant growth, active suburbanisation

- **Bergen**, **Stavanger** and **Oslo** in Norway as well as **Stockholm** and **Malmö** in Sweden have experienced population changes of more than +16% in the past decade.
- The report analysed data for Poland and the Baltic States corresponding to the time period since those countries joined the European Union. Excluding the crisis of 2008–2010, the economic growth experienced by Poland and the Baltic States since their inclusion in the

European Union has also led to suburbanisation around the most dynamically developing larger cities or even urban sprawl. Even though the Baltic States have experienced sharp declines in their populations since the early 1990s due to emigration and low birth rates, comparatively large suburban areas with growing populations have grown up around the most bustling cities, namely, **Riga**, **Vilnius**, **Tallinn** and **Tartu**. Of these, **Tallinn** is developing most successfully, with a population change of over +11% since 2005 and a population level that is now approaching that of the 1990s.

- Fairly strong development and suburbanisation is also taking place in the region's largest Russian and Belarusian cities, with population changes of +9-10% in **Saint Petersburg** and **Minsk**.

Moderate growth and decline

- Even though German and Polish cities have not grown as rapidly as those in the Nordic countries, the population decline characteristic of the 2000s has been replaced with population changes of +3-9% in most of the region's cities, especially **Warsaw, Berlin** and **Hamburg**. Even eastern Germany's largest port city of **Rostock** has experienced moderate growth, although populations elsewhere in eastern Germany continue to decline. Populations also continue to decline (up to -6%) in some of Poland's industrial centres, for example, **Lodz** and Upper Silesia (Katowice).
- Growth has also picked up in **Vilnius**, although populations continue to decline in the other Baltic States cities, with some areas experiencing quite dramatic population changes of -11% to -19%.
- After a long period of stagnation, the population of Russia's western enclave of **Kaliningrad** has increased quite rapidly in the past five years (although only 5% over the past decade), mostly thanks to various military projects. The population consistently continues to decline only in **Murmansk**, Russia's remote Polar port city, where only 384,000 inhabitants remain compared to a population of half a million in the early 1990s.

The role of migration

- Migration in region have been largely driven by economic motives. The migration flows intensified soon after the economic crisis and after recent turmoil in the Middle East and North Africa. Northern countries of the BSR – Sweden, Finland and Norway and to lesser extent Germany experience a positive migratory balance, while the Eastern European countries especially Latvia, Lithuania, as well as Eastern regions of Finland, northern regions of Sweden, south-eastern regions of Poland, north-eastern regions of Germany experience negative migratory balance.
- On regional and sub regional scale country's migration trends are complex. National averages do not reflect the actual situation in different regions and cities. Overall cities and their neighbouring areas experience more internal and external migration, whereas rural regions tend to be less attractive to internal and external migrants. Cities and urban regions especially capital cities are more likely to attract young people and asylum seekers.
- Territorial patterns of migration processes are complex. It is assumed that large cities ensure more employment opportunities to local population and therefore they are less likely to face out-migration. But this does not always hold true for countries that experience negative migration balance. In Latvia where emigration accelerated after the

accession to EU and then picked up dramatically after the economic and financial crisis, large scale diaspora study was finished in 2015. The study sheds light on relatively mobile migration flows. According to this study the capital city Riga and other development centres of national significance actually lost proportionally more population due to emigration than rural areas and small and medium sized towns. People leaving from nation's capital report also reported less likelihood of return. Pushing factors of former Riga residents were mostly non-material motivations, whereas people from rural areas reported more material motivations and financial difficulties which lead them emigrate. These findings point to stabilising role of small and medium sized towns (Institute of Philosophy and Sociology of the University of Latvia, 2015).

- The recent influx of asylum seekers and displaced persons is changing the character of migration. Migrants are transiting through Europe in order to reach more developed countries. The latest data shows that in 2015 Germany has been the leading country in the EU for total asylum claims (1.1. million), followed by Sweden (approximately 163,000) (Thomas, 2016; Swedish Migration Agency, 2016). The influx of non EU migrants from war torn regions is likely to continue.

- Although immigrant integration policies are set on the national level, cities and multiple local level stakeholders such as civil society organizations, local entrepreneurs, are key agents of providing financial and humanitarian assistance. Therefore, effective coordination and support from different levels of governance is essential.

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*Sweden has high standard of immigration policy in terms of education, enforcement of ant-discrimination laws and fair access to citizenship. It's migrant population size is the highest in BSR relative to it's total population size. The size of it's immigrant population in Sweden keeps increasing from 12% in 2003 to 15% in 2015. The Swedish Migration Agency has the overall responsibility of the Swedish migration policy, which means that asylum and refugee reception is primarily a national task but local authorities at the municipal level together with the employment office have the responsibility for integration policy. Roles and responsibilities are regulated in the legislation and voluntary agreements between the government and municipalities. According to newly enacted legislation in 2016 municipalities will be obliged to accommodate refugees. Municipalities also receive compensation from the state government for education, housing and care of unaccompanied minors. Asylum seekers that need help with accommodation receive a place in one of the Migration Agency's accommodation centres, which provide an initial, temporary place to stay. There are accommodation centres in the three largest cities, **Stockholm, Gothenburg** and **Malmö**, as well as **Gävle** and in smaller municipalities where it has been easier to find available premises.*

Source: ESPON (2015) ESPON Policy Brief. Territorial and urban aspects of migration and refugee inflow.

Map 1 Cities (urban areas) population change 2005-2015

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2. Economic Performance and Dynamics

2.1. Changes in GDP

Very large differences are observed between the western part of the Baltic Sea Region (which, contrary to geographic logic, also includes Finland) and the eastern part of the region (henceforth, Western and Eastern, see Maps 2 and 3). These differences can be explained in part by the almost fifty years of Communist rule that was forced on residents of the Eastern region and led to huge losses for the region's economies.

GDP per capita in purchasing power parity (GDP/PPP) is usually used as one of the main indicators when comparing levels of development and prosperity in various countries.

1. **Eastern economies are less developed, but their development is more rapid**

Proof of this statement is provided by the level of development in Latvia and Estonia, which was approximately equal to that of Finland before the Soviet occupation in 1940. In the mid-1990s, however, when Latvia and Estonia enacted painful reforms as a part of renewing their market economies, the GDP/PPP per capita of the two countries was three times less than that of Finland. By 2014 this difference had fallen to only 1.5 times less than that of Finland. However, considering that Finland's GDP/PPP is at the average level for the European Union (EU-28), it is assumed that Latvia and Estonia – conditionally, of course – still have not regained their former, pre-war status among European states in terms of development.

The inclusion of the Baltic States and Poland into the European Union in 2004 has encouraged development in these countries to approach average EU levels. In terms of GDP/PPP, some of Poland's largest cities (**Krakow** and **Poznan**) and the Baltic capitals (**Riga** and **Vilnius**) have almost reached the average EU level, while **Warsaw** and **Tallinn** have already surpassed this level. However, income levels in many more remote regional centres of the new EU member states are still only 40-60% of the European average. These levels are lower only in Belarusian regional centres and the Russian city of Pskov. Income levels in **Saint Petersburg**, the Baltic Sea Region's largest city, approach only 80% of the European average.

In evaluating GDP/PPP per capita increases for the period 2005–2014, it has clearly been more rapid in the cities of the Eastern part of the Baltic Sea Region, where in the majority of cases this change has surpassed +55%.

This rapid change in the Eastern cities is only natural, considering their lower base level. However, as this base level increases, it will be increasingly difficult to maintain such rapid levels of growth, because low costs, which are the current main driver of development, will have to be replaced with efficiency.

## 2. Moderate economic development in the Western region, high income levels

At this same time, the GDP/PPP in almost all of the largest cities in the Western part of the Baltic Sea Region has surpassed 140% of the EU average. Only **Berlin**, which continues to integrate the less-developed post-Communist parts of East Berlin, has a lower indicator of 113%. It must be noted that, despite the authors' attempts at standardising GDP/PPP indicators in their calculations, the results ought to be looked at with a critical eye due to the various methodologies used in different countries. For example, **Stockholm's** GDP/PPP is 244% of the European average, while in Norway (which has the highest average level of all the countries in the region) this level does not surpass the national average for any of its cities, because one fourth of the national GDP (linked to oil and gas extraction) is attributed to the shelf zone and therefore does not apply to cities.

In the Western part of the region, the **most rapid change** (above +65%) during the period of 2005–2014 was in Sweden's largest cities of **Stockholm, Gothenburg** and **Malmö** as well as the German capital **Berlin** (+46%). The **lowest** rate of change (up to +30%) was observed in Finland's and Denmark's cities as well as the large cities of **Hamburg** and **Oslo.**

Capturing the economic performance of cities by using only the GDP / capita indicator does not sufficiently explain structural changes that have affected city economies during the last ten years. Among the key drivers shaping the changing the economies of cities are: increase in the share of services and the changing nature of these services, changes in the structure of production of goods in the direction of consumer and high-tech goods, closer integration of city economy in foreign trade, the growth of small and medium-sized businesses, and the presence of branch offices of large and multinational companies. The impact of these drivers on city economies have to be studied more closely to monitor the economic development of the BSR.
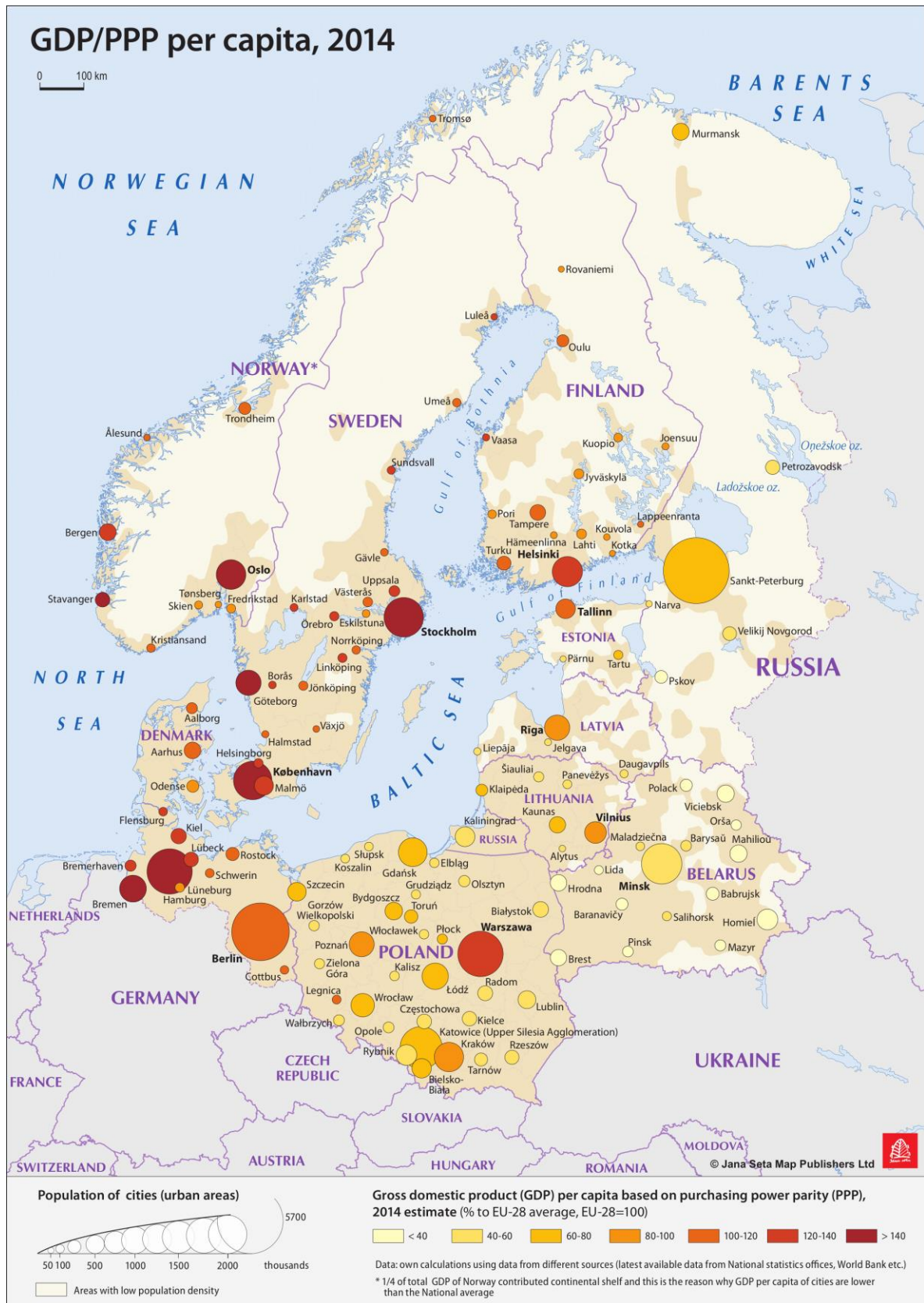
Map 2 GDP/PPP per capita (2014)
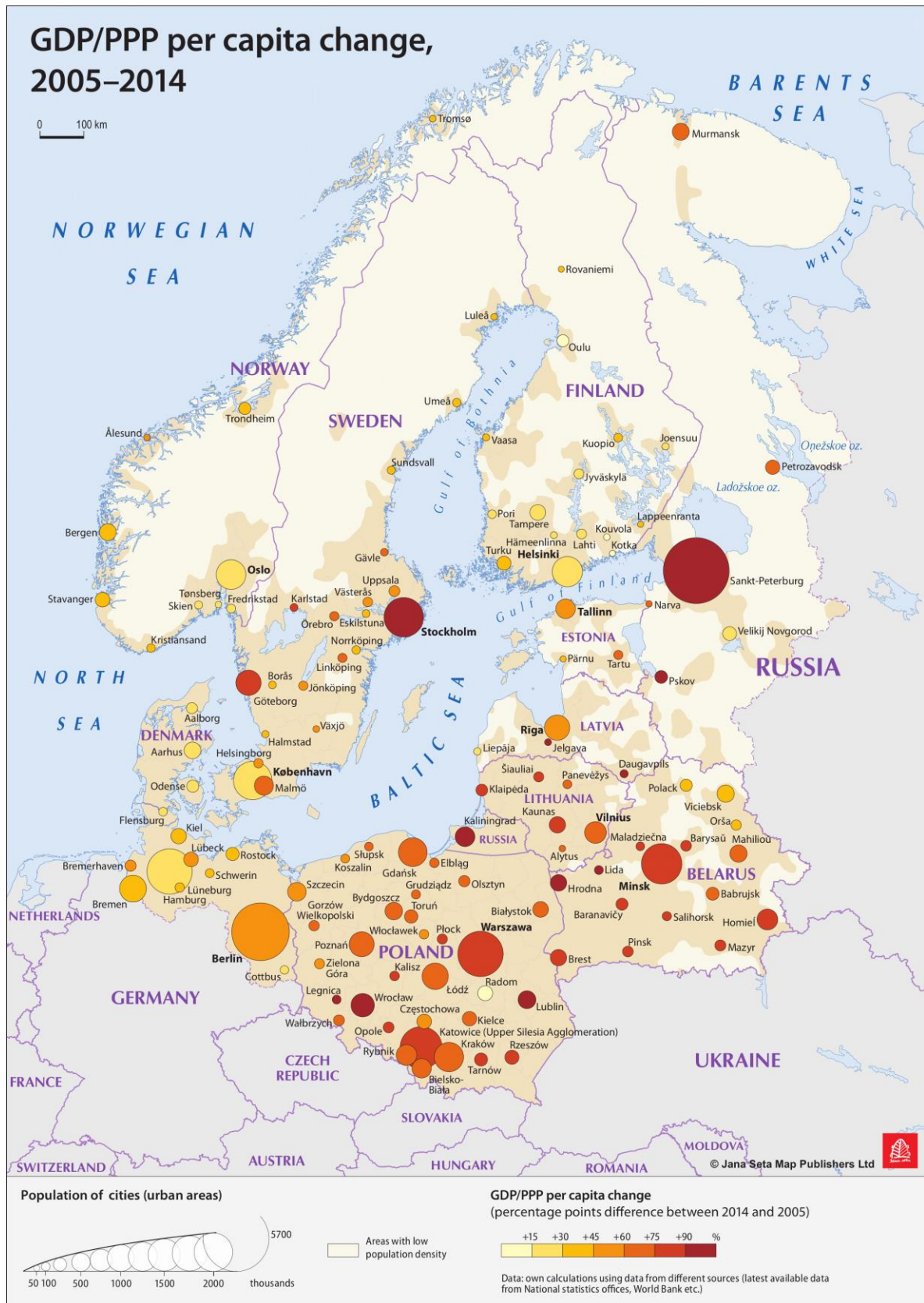
Map 3 GDP/PPP per capita changes (2005-2014)

2.2. Multimodal Accessibility Potential

All 127 cities were ranked in seven categories (see Map 4), ranging from very high accessibility potential (almost all of the cities in northern Germany and some cities in Denmark and Sweden) to low accessibility potential (**Petrozavodsk** and **Pskov** in Russia).

Accessibility of cities is of prime interest for people's daily life as well as for business and commerce. Multimodal accessibility describes the region's level of integration regarding a unified transportation system.

Western region + Poland?

Continuing with the Eastern-Western terminology established in the previous section, it must be noted that the Western region's high level of development on the base of well-developed transportation infrastructure is also clearly observed in terms of multimodal accessibility. However, especially over the past decade, Poland has in large part managed to integrate into Europe's unified transportation network by reconstructing major railway lines, completing several motorway links with Western Europe, intensifying air traffic and completing the Baltic Sea's largest deep-water container terminal in **Gdansk**.

A challenge for the Baltic States

Cargo handling capacity has also increased in the Baltic States' largest ports, although, due to the fact that Russia has purposefully reoriented its export flows to its newly built ports in the **Saint Petersburg** area, only the ports in **Riga** (Latvia) and **Klaipeda** (Lithuania) have succeeded in increasing their cargo turnover. Reconstruction of major roads continues in the Baltic States, which have a relatively dense, albeit decaying (due to the recent transition to a market economy), network of roads. In the past, the railway network in the Baltic States, Finland, Belarus and Russia was built with a different railway track gauge from the rest of Europe, which hinders rail traffic with Europe's railway system. For this reason, intercommunication between the Baltic capitals as well as their communications with Western Europe will improve only after the completion of the *Rail Baltic* high-speed railway line, planned for the coming decade. Air traffic in the Baltic States has developed dynamically, thereby providing its people convenient links with European cities, especially from the region's largest airport in Riga.

The unrealised potential of Saint Petersburg and Belarus

Following the creation of the Schengen Area, bureaucratic obstacles to crossing borders within the Area have significantly decreased. Of the Baltic Sea Region countries, Russian and Belarus are not a part of the Schengen Area, and therefore transportation links with these countries still involve considerable and sometimes unpredictable border crossing procedures. For this reason, Belarus and Russia are less integrated in the international transportation system.

This fact is best observed in air traffic, which is more widely available only from **Saint Petersburg** and **Minsk.** Even though the population of the Belarusian capital of **Minsk** is

2.5 times larger than that of Riga, the capital of neighbouring Latvia, passenger turnover at Minsk's airport is half that of Riga's airport. However, the main new "Silk Road" from China to Europe leads through Belarus, and China is thus investing billions in industrial infrastructure near Minsk (Great Stone Industrial Park) that could serve to drive development. For a post-Soviet republic, Belarus has an uncharacteristically developed road network, including a high-speed network, which could also facilitate its more rapid integration into the European transportation system.

A high-speed railway now links **Saint Petersburg** with Moscow and Helsinki, which is very important for this Russian city, whose potential integration into the Baltic Sea Region has been stifled and is not yet fully realised due to various historical circumstances. With its well-developed transportation infrastructure, Finland (and Estonia) are very useful to this end.

Development continues in the Southern-Northern dimension

One of the biggest challenges for the development of the Baltic Sea Region is to lessen the isolation of its less-populated Northern regions from its densely-populated Southern regions, which are well integrated into the European transportation system. High-speed railway lines are being built ever further north in Sweden and Finland, and there are plans (through the Copenhagen–Gothenburg–Oslo project) for Norway to also be integrated into the European network within the next decade. The same can be said for high-quality roads, which, despite the challenging climatic conditions and terrain, make use of tunnels and bridges (especially in Norway) to make the Scandinavian cities ever more accessible. Developed air traffic from remote Scandinavian cities has already become an accepted standard.

Partnership and cooperation between cities and rural areas remains a challenge

Effective partnership and cooperation can reduce the handicaps caused by weaker accessibility of small towns and rural areas. One of the VASAB Long Term Perspective for the Territorial Development of the Baltic Sea Region ambitions is overcoming the urban-rural divide in the BSR through enhanced co-operation and partnership. In the context of increasing asymmetry and a shift of power towards urban areas establishing partnerships remains challenging.

Cooperation and partnership take different shapes and occur on different scales. Typically, the cooperation and partnership is more widespread in clusters, networks, tourism and marketing. But partnerships can also be formed for ensuring better accessibility and transport, or regional chains of value added.

Important role here can be played by cities that take a "middle tier", between capital and the small and medium-sized towns (or so called secondary cities), such as **Gothenburg** in Sweden and **Krakow** in Poland. These cities have shown good results in post-crisis climate, and have the potential to provide urban functions for surrounding areas (high quality services, infrastructure and access to markets).

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Multimodal accessibility potential

0   100 km

Map 4 Multimodal accessibility potential (2014)

3. Human Capital in Cities

Human resources play a significant role in the development of cities. A highly qualified workforce is considered the most important cornerstone for business development. To assess the level of competitiveness and innovation in cities, two indicators were used: population with tertiary education, and employment in technology and knowledge sectors. This is one of the key indicators for the "Europe 2020" strategy. An objective of the EU's "Smart growth" strategy is to reach a level of at least 40% of people completing third-level education by 2020.

> *Population with tertiary education = the share of persons aged 25-64 with tertiary educational attainment. This indicator is relevant for measuring the basis for current and future high value-added economic activities and highly qualified jobs. It can be regarded as an input indicator for illustrating the innovative capacity of a region or city.*

3.1. Population with tertiary education

- Compared to other European regions, cities in the BSR have larger populations with tertiary education. **In all of the large cities within the BSR**, the population with tertiary education **surpasses 20%**, with the lowest rates in Belarusian and Polish cities. The population with tertiary education surpasses 40% in 38% of all BSR cities (see **Error! Reference source not found.**).
- **Cities with universities stand out, be they national capitals or regional centres**, because the presence of various institutions of higher education and science and research institutions stimulates the level of higher education among the population. Cities like **Rostock, Uppsala, Copenhagen, Kaliningrad (Königsberg), Vilnius, Tartu, Helsinki, Kiel, Turku** and **Saint Petersburg** take pride in having the oldest universities in the BSR, established as far back as the 14th-18th centuries. New centres of education and research, such as **Cottbus, Malmö, Oulu and Stavanger**, are also emerging.

< 50 % Berlin, Cottbus, Hamburg, Rostock, Helsinki, Stockholm, Uppsala, Malmö, Gothenburg, Linköping, Umeå, Copenhagen, Odense, Aarhus, Vilnius

41-50 % Bremen, Schwerin, Kiel, Flensburg, Aalborg, Tallinn, Tartu, Helsinki, Tampere, Turku, Oulu, Klaipeda, Kaunas, Riga, Oslo, Stavanger, Warsaw, Saint Petersburg, Växjö, Västerås, Luleå etc.

30-40 % Joensuu, Rovaniemi, Lahti, Šiauliai, Jelgava, Bergen, Tromsø, Krakow, Kaliningrad, Murmansk, Minsk, Norrköping, Borås etc.

>30 % Pärnu, Liepaja, Lodz, Katowice, Poznan, Wroclaw, Opole, Gdansk, Pskov, Petrozavodsk, Fredrikstad, Grodno, Brest etc.

Figure 1 Population with tertiary education, % (2014), city groups

In all of the BSR cities (except **Narva** in Estonia, where a decline is observed), the population with tertiary education has changed by an average of nine percentage points. The greatest change is observed in cities in Denmark, the Baltic States, Poland, Germany and Sweden.

*Over the past decade, the workforce with tertiary education has changed most (an increase of 22 percentage points) in the Danish city of **Aarhus,** where this population accounted for 64.1% of the workforce in 2014. Approximately 55,000 students currently study in a variety of fields (from architecture, art, music, journalism, engineering and medicine to biotechnology) at the 25 institutions of higher education in Aarhus. Students in the city have a positive influence on the local atmosphere and contribute to making Aarhus a dynamic urban society. The city's economy is predominantly knowledge and service-based; it is strongly influenced by Aarhus University and the large healthcare industry, though Aarhus also boasts the country's main industrial port. Aarhus will be the European Capital of Culture in 2017.*

Map 5 Share of population with tertiary education (2013)

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3.2. Employment in technology and knowledge sectors

The analysis is based on the indicator of the number of people (the percentage of the economically active population) employed in the science and technology fields. Data is not available for or comparable with areas of Belarus and Russia.

The highest proportion of employment in the science and technology fields is **concentrated in the capitals** (see Figure 2) which are historically the centres for universities, science and research centres, practical laboratories and offices of large-scale businesses. However, many countries are thinking about the evolvement of regions and specialisation by developing powerful **regional centres.**

Employment within a selection of high-technology manufacturing and knowledge-intensive high-technology service branches shows the level of knowledge intensity of the economic activity of the region. This indicator can be regarded as an output indicator for illustrating the innovative capacity of the region.
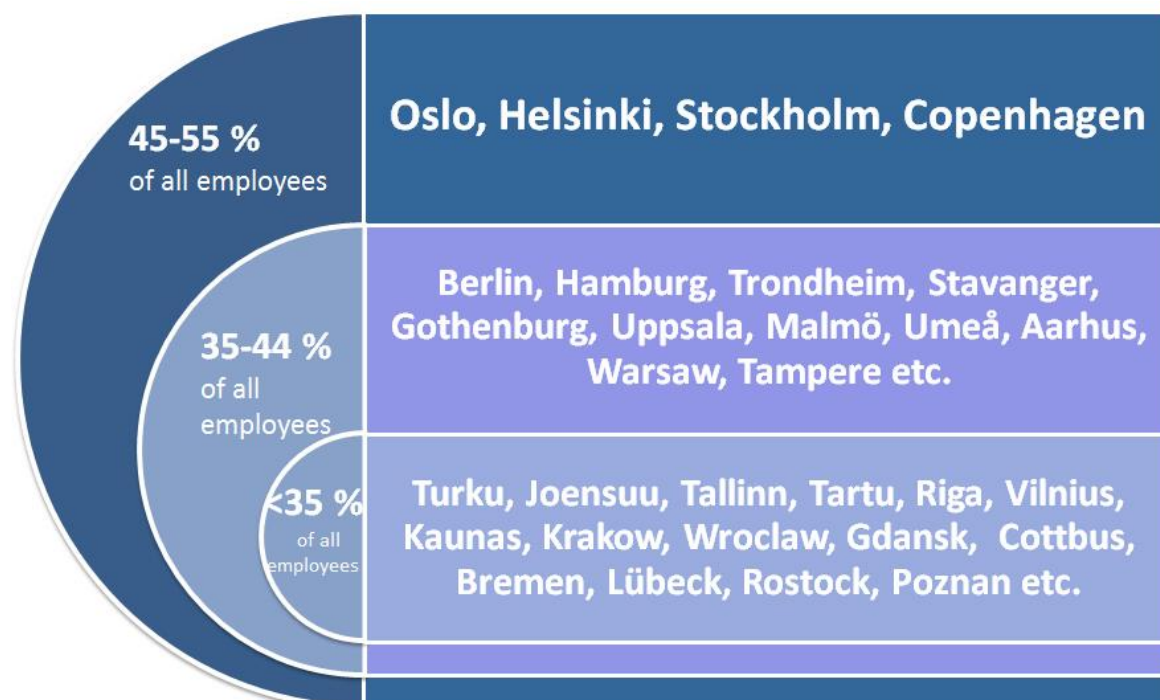

45-55 % of all employees — **Oslo, Helsinki, Stockholm, Copenhagen**

35-44 % of all employees — **Berlin, Hamburg, Trondheim, Stavanger, Gothenburg, Uppsala, Malmö, Umeå, Aarhus, Warsaw, Tampere etc.**

<35 % of all employees — **Turku, Joensuu, Tallinn, Tartu, Riga, Vilnius, Kaunas, Krakow, Wroclaw, Gdansk, Cottbus, Bremen, Lübeck, Rostock, Poznan etc.**

Figure 2 Employment in technology and knowledge sectors in cities (% of all employees)

Cities and metropolitan regions are attractive places for people to settle and businesses to operate and are thus the engines for economic growth. Areas with a high science and technology percentage may go on to establish **cluster developments**. Cities in the Nordic region are some of the most active intersectoral cluster development areas in Europe, for example, Medicon Valley (Danish **Copenhagen** and Swedish **Malmö**). Cluster initiatives demonstrate the dynamics of the indicator we have analysed. On average, over the years the number of people employed in science and technology fields in the analysed 127 cities in the whole Baltic sea region has grown by 5.6 percentage points, reaching an average of 33.5% in 2014. Despite comparably slower development of innovative industries in Russia, Saint Petersburg as main scientific centre still remains one of the most important scientific centres in the BSR.

The highest growth in percentage between 2005 and 2014 of people employed in science and technology fields is in the Finnish cities of **Helsinki, Tampere** and **Jyväskylä** as well as in Polish **Krakow a**nd Norwegian **Stavanger.**

> **Jyväskylä** is a good example of regional development. *The newest areas of expertise in the Jyväskylä region are wellness and nanotechnology. Besides the research carried out by the university, the VTT Technical Centre of Finland has laboratories in Jyväskylä. They specialise in process technology relating to the forest and energy industries. Also, the Jyväskylä Science Park hosts an R&D-oriented Excellence Centre Programme focused on ICT, paper, energy and environmental technologies.*

Innovation cities

The Innovation Cities™ Index is the world's leading index classification and top ranking of cities potential as innovation economies based on their potential for creation, implementation and communication of ideas in their urban economies. The basis of each year`s index analysis is 162 indicators which are grouped into 31 segments. In year 2015 are included 19 cities from BSR region according category *Europe and Russia* classified by the Global Innovation Agency (see Table 2). All cities are classified in five classes:

NEXUS: Critical nexus for multiple economic and social innovation segments

HUB: Dominance or influence on key economic and social innovation segments, based on global rends

NODE: Broad performance across many innovation segments, with key imbalances

INFLUENCER: Competitive in some segments, potential or imbalanced

UPSTART: Potential steps towards relative future performance in a few innovation segments.

Table 2. Rank of Innovative cities in BSR, 2015

City	Global rank	Classification	Index score
Berlin	14	NEXUS	54
Copenhagen	15	NEXUS	54
Stockholm	17	NEXUS	53
Helsinki	25	NEXUS	52
Oslo	28	NEXUS	52
Hamburg	31	NEXUS	52
Saint Petersburg	48	HUB	49
Warsaw	86	HUB	47
Bremen	157	NODE	44
Odense	161	NODE	44
Kiel	162	NODE	44
Malmö	183	NODE	44
Gothenburg	232	NODE	42
Gdansk	242	NODE	42
Tallinn	252	NODE	41
Riga	295	NODE	40
Vilnius	325	INFLUENCER	39
Krakow	332	INFLUENCER	39
Katowice	336	INFLUENCER	39

Source: Global Innovation Agency 2thinknow, 2016ain

4. Social Inclusion and Quality of Life

4.1. Changes in unemployment

Unemployment in the BSR rose sharply in the wake of the economic crisis and continued to increase until 2012. Long-term unemployment has negative financial and social effects on personal life, on social cohesion and may hinder economic growth; cities should therefore develop sustainable social and labour market policies.

It is the most widely used indicator of labour market performance. It can be measured by the unemployment rate, which is represented by the proportion between the unemployed and those of working age.

In 2014, the highest rate of unemployment for cities in the BSR was observed in the Polish cities of **Radom, Grudziadz** and **Wloclawek**, where the unemployment rate reached 16-20% of the working-age population, as well as in Finnish cities such as **Kotka, Oulu, Jyväskylä** and **Lahti** (15-16%). Even though the unemployment rate in German and Polish cities has **significantly declined** since a high point of unemployment in 2005, the unemployment rate in their cities is still 6-14% of the working-age population.

The lowest rates of unemployment can be found in Norway's cities (**Oslo, Stavanger, Tromsø** and others), where the unemployment rate is 2-3% of the working-age population. Cities in Belarus and North-western Russia show low rates of unemployment, for example, 0.2% in Minsk and 1.4% in Saint Petersburg. However, unemployment data from Belarus and Russia ought to be interpreted cautiously, because a different methodology for collecting and processing data is used there.

Unemployment dynamics are strongly influenced by the specific economic processes in each country. For example, the unemployment rate reaches its maximum during periods of recession, as was the case in Polish and German cities in 2005. For this reason, cities in these countries (**Bremen, Walbrzych, Wroclaw** and others) show the greatest increase in

their unemployment rates (10-14 percentage points) over the studied period (see

Decrease 12-6 percentage points ↓	Bremen, Berlin, Flensburg, Kiel, Lübeck, Schwerin, Cottbus, Rostock, Wroclaw, Walbrzych, Grudziadz, Koszalin, Slupsk, Katowice, Plock, Lodz etc.
Decrease 1-5 percentage points ↓	Hamburg, Lüneburg, Warsaw, Gdansk, Krakow, Poznan, Lublin, Torun, Tartu, Pori, Kuopio, Aalborg, Rovaniemi,Oslo, Stavanger, Bergen, Tromsø, Trondheim, Saint Petersburg, Vitebsk etc.
Increase 1-5 percentage points ↑	Copenhagen, Aarhus, Tallinn, Helsinki, Tampere, Turku, Oulu, Riga, Vilnius, Klaipeda, Šiauliai, Kaliningrad, Petrozavodsk, Stockholm, Umeå, Gothenburg, Västerås, Örebro, Sundsvall, Luleå, Helsingborg, Borås etc.
Increase 6-9 percentage points ↑	Alytus, Panevežys, Liepaja, Eskilstuna, Norrköping, Malmö

Figure 3). However, in the cities of the Baltic States unemployment reached its maximum in 2008, and in Finnish cities in late 2009 and early 2010. On the whole, indicators of unemployment dynamics in Baltic and Finnish cities are increasing, except for a few cities (such as **Tartu, Pärnu, Pori, Rovaniemi** and others, where a small decline in unemployment is observed.

Decrease 12-6 percentage points ↓	Bremen, Berlin, Flensburg, Kiel, Lübeck, Schwerin, Cottbus, Rostock, Wroclaw, Walbrzych, Grudziadz, Koszalin, Slupsk, Katowice, Plock, Lodz etc.
Decrease 1-5 percentage points ↓	Hamburg, Lüneburg, Warsaw, Gdansk, Krakow, Poznan, Lublin, Torun, Tartu, Pori, Kuopio, Aalborg, Rovaniemi,Oslo, Stavanger, Bergen, Tromsø, Trondheim, Saint Petersburg, Vitebsk etc.
Increase 1-5 percentage points ↑	Copenhagen, Aarhus, Tallinn, Helsinki, Tampere, Turku, Oulu, Riga, Vilnius, Klaipeda, Šiauliai, Kaliningrad, Petrozavodsk, Stockholm, Umeå, Gothenburg, Västerås, Örebro, Sundsvall, Luleå, Helsingborg, Borås etc.
Increase 6-9 percentage points ↑	Alytus, Panevežys, Liepaja, Eskilstuna, Norrköping, Malmö

Figure 3 Unemployment dynamics in BSR cities (2005-2014)

*Until the beginning of the 21st century, the economy of **Bremerhaven** in Germany was based on shipbuilding, the fishing industry and providing services to the nearby U.S. military base. But the economy began to decline in 1999. In 2005, the city's unemployment rate reached 23.7%, because increased competition had led to lower demand for fish products, the port and fish processing infrastructure had fallen out of date, and the military base had closed. Leaders searched for ways to revive the city and diversify the economy: aquaculture projects were developed together with scientists, and Germany's largest fish processing businesses, which employ approximately 8-9% of the city's workforce, were modernised. 25% of Bremerhaven's workforce is directly linked to the marine economy, and the city is Europe's fourth largest container port. However, off-shore wind energy, which employs one third of all Germans working in the wind energy field, has provided the main boost to Bremerhaven's economy and has best reduced unemployment. In 2014, the city's unemployment rate was 14.7%, a change of nine percentage points for the better in the span of nine years.*

Map 6 Unemployment rate (2014)

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Map 7 Change in unemployment rate (2005-2014)

4.2. At-risk-of-poverty rate

Economic modernisation and rapid social changes increase the number of people and groups that are left behind because they do not possess the economic, social and cultural capital that is needed to catch up with those changes.

Poverty has huge costs on society. It decreases productivity and poses higher public expenses via social benefits and health care. It also hinders personal development. Poverty is a complex phenomenon and its causes are rooted in many factors. Poverty in cities is caused by economic restructuring, a retreating welfare state and demographic changes (more elderly people, more single households, presence of excluded groups, such as migrants) as well as the suburbanisation of wealthier populations.

The at-risk-of-poverty indicator illustrates the dimension of social inclusion and quality of life. A person is considered to be at risk of poverty if his/her equalised income after social transfers is below 60% of the corresponding national median. In many countries, due to insufficient survey sample sizes, the at-risk-of-poverty indicator is not calculated for the city level, in which case this report has used NUTS-2/NUTS-3-level data.

Social polarization in eastern cities of the region is caused mainly by long term effects of economic restructuring, migration and unemployment, while in large cities of the western and northern part of the region poverty has increased more as a result of the reduction of social transfers during the austerity period.

The highest poverty risk in the BSR is observed in the Baltic States' cities, Finland and certain cities in Poland and Germany (**Bremerhaven, Bremen, Berlin**). While the prevalence of poverty in the Baltic States and Poland is linked to a lower average level of prosperity than is found in the Western countries, the situation in Finland has deteriorated due to recent economic problems. A higher rate of poverty in certain Western cities, such as **Berlin or Malmö** (Sweden), can be explained by the influx of immigrants from non EU countries to those cities. Taking into account recent events, it is most likely that this situation will worsen and become a big challenge for Europe's most prosperous countries.

The risk of poverty is lower in Norway and Sweden and also in Belarus and north-western Russia. However, data from Russia and Belarus ought to be interpreted cautiously due to the different methods of calculation used in those countries. Nevertheless, the role of national policy in providing more affordable services and social welfare regime might play some role in explaining these differences.

The at-risk-of-poverty level has increased between 2005 and 2013 for 54% the 127 surveyed city regions. In 46% of city regions the poverty level has decreased or remained the same. The greatest increase in the at-risk-of-poverty level was observed in **Bialystok, Bremerhaven, Malmö, Poznan, Gorzow Wielkopolski, Zielona Gora and Kalisz**. The at-risk-of-poverty level declined most significantly in **Veliky Novgorod** and several cities of Belarus. The situation regarding poverty has also improved in cities with previously high poverty rates, such as **Murmansk, Kaliningrad and Daugavpils.**

The quality of life in urban areas is complex mix of different factors, such as the quality of public transportation services, public spaces, city administration services, easiness of finding a job, perceived safety in the streets etc. Sometimes subjective perception of perceived quality of life in a city can tell more than a collection of indicators.

*Overall larger cities of BSR rank among the top cities in EU in terms of perceived satisfaction with life in a city. When respondents of Flash Euro barometer social survey were asked whether they agreed if they were satisfied with living in the city, more than 80% answered that they strongly or somewhat agreed. In **Aalborg, Oslo, Copenhagen, Stockholm, Rostock, Oulu, Krakow** and **Bialystok** more than 95% strongly agreed or somewhat agreed with this statement. Only a few other EU cities, such as Hamburg, Zurich, and Amsterdam reached similar results.*

Table 3 Overall satisfaction with life in cities of BSR, % (2013)

Aalborg	99	Vilnius	93
Oslo	97	Malmö	93
Copenhagen	97	Essen	93
Stockholm	96	Berlin	93
Rostock	96	Helsinki	92
Oulu	96	Warsaw	90
Krakow	95	Tallinn	89
Bialystok	95	Riga	84
Gdansk	94		

Source: EC (2013). Quality of life in cities Perception survey in 79 European cities. Flash Eurobarometer Survey, 366. Percentage of respondents who strongly agreed and somewhat agreed.

Map 8 People at risk of poverty or social exclusion (2013)

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5. Pointers for Policy

General observations

- Although the territories of BSR represent large internal heterogeneity in terms of population settlement and economic development patterns, the economic growth of cities has been a common theme during 2005-15 especially in larger cities and cities of Eastern Europe. All capital cities but especially global level metropolises and European level metropolises have significantly increased their integration into global economy.
- The economic downturn following the crisis affected the economies of some countries more than others. Although all metropolitan regions examined in the report have grown their economies 2005-14 in terms of GDP/capita, it is quite obvious that the development of the cities, including the survival of economic recession is highly embedded in contexts of national and regional policies. For large cities there is more room for manoeuvre because of better connectivity, larger presence of knowledge intensive economy sectors and easier access to investments.
- It is important to bear in mind that cities are not only focal points of economic growth but they are also serving points to surrounding areas. Although the development of small and medium sized urban areas and rural areas is not the focus of this report, it has to be emphasized that they also have an important role to play by ensuring the sustainability and territorial cohesion of the region.
- The future research is advisable to investigate reasons for development of BSR cities, including analysis of city location, for example coastal areas, inland, border areas etc.

Territorial Development Perspective of the BSR 2030 still relevant

Territorial Development Perspective of the Baltic Sea Region 2030 is based on vision of polycentric development. It envisages four functional types of urban regions and centres:

- global gateways with prominent R&D and knowledge intensive business services,
- BSR gateways with well developed R&D and knowledge intensive business services,
- urban region in process of metropolisation with growing globally linked R&D and knowledge intensive services
- regional development centres providing high quality services to residents in the surrounding areas

The vision also emphasizes the importance of strengthening the existing and potential cross border cooperation which is facilitated by integrated transport system and integrated maritime spatial planning.

Despite different planning traditions and institutional frameworks, there is a remarkable common aspiration in spatial plans and visions developed in BSR countries to favour polycentric development. In the same time it is important to emphasize that the efficiency of the development lies in networking and territorial cooperation of cities of all sizes in order to ensure critical mass of development and qualitative services

The evidence presented in this report supports the existing territorial development vision of VASAB, but it also points towards new challenges that should be addressed by appropriate policy responses, for example inclusion of a new city category as Global cities and change of the city category in some cases of cities, according to their statistics and performance of development. Elaboration of policy scenarios and recommendations are outside the scope of this report, some pointers for policy based on gathered evidence can be provided.

Population

Population size is the key variable for many policies, especially for provision and maintenance of public and private services. Population increase in most capital cities requires them to extend the capacity of services and improve the infrastructure, while population decrease in peripheral cities would require improving mobility, and restructuring of services because of diminishing demand.

Demographic development patterns are showing depopulation mainly through ageing and outmigration processes especially in the new EU member states of the region. This poses a wide range of challenges to labour market and balanced regional development. Policies should be aimed towards renewing the demographic balance and increasing labour productivity. Solutions for different types of labour force should be created aiming at increasing labour market and job flexibility.

Economic factors still determine the nature of migration flows but it is expected that cities will face growing number of asylum seekers in future. In this context it is necessary to support the role of cities so that they could develop ad hoc measures in humanitarian and financial assistance, including housing. Improving early local responses of coordination, exchange of knowledge and practices and establishing governance partnerships are steps towards effective inclusive approach.

Economic performance and dynamics

Urban areas with labour-intensive economic sectors and low cost economies are vulnerable in economically turbulent times as it was shown by the developments during the economic and financial crisis. Therefore, cities and national governments should continue to invest into restructuring of local economies to make them more competitive and resilient.

Cities with high unemployment should develop social investment packages by giving more attention to adequate and sustainable social protection; by investing more in developing people's skills and capacities to improve their opportunities to integrate in society and the labour market.

Multimodal accessibility potential

Lack of modern transport infrastructure (motorways, high-speed railways) is still a major barrier to economic development in Eastern part of the BSR. Therefore, work should continue on strategic rail, highway and sea projects.

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Accessibility across Southern-Northern dimension continues to improve thus narrowing the gap between the densely-populated Southern regions and sparsely populated Northern regions.

Cities of Belarus and Western Russia could be more integrated into international transportation system. This is currently cumbersome because of lengthy and often unpredictable border crossing procedures with Schengen area.

Partnerships between cities and rural areas are innovative instruments for improving the potentials of territories and bridging the accessibility gaps. For the partnerships to develop there is a need for trust and openness on every government level, as well as the room for policy experimentation and learning. The role of secondary cities can be important in initiating and maintaining of the relations.

Human Capital

Higher education is key driver for stimulating developments in R&D, knowledge intensive and creative industries. Therefore, national education and economic policies should be aimed to ensure that regional innovation systems translate the knowledge into important role in economic growth.

Stakeholder cooperation is crucial factor for strengthening human and social capital in the region. Strengthening of the exchanges between universities, companies, schools, NGOs of the whole Baltic Sea Region should be supported to strengthen the dissemination of new knowledge and the multiplication of best practices across different parts of the region.

Social inclusion and quality of life

Economic growth of the region has not achieved the proportional reduction of poverty. An integrated anti-poverty approach is needed combining appropriate instruments for specific actions based on collaboration between the national, regional and local authorities with common goals, targets and action plans.

Active inclusion strategies targeting employment support, providing resources for those who cannot work, and promoting social participation are needed.

Recognize the complexity of poverty and adopt place-based strategies in targeting issues of deprived neighbourhoods and inner city areas or different risk-at-poverty groups.

Developing efficient and affordable public transport systems can give residents in deprived areas opportunities for better mobility and accessibility, that can reduce the risks of poverty.

Annex. Methodology

Table 4 Data availability and methodology for estimation

Domain/ Indicator	Years/ countries	Methodology for estimation	Sources
Population			
Population of cities (urban areas)	Different years calculations for 2005, 2015	In order to provide a comprehensive portrayal of the situation in the Baltic Sea Region, the authors of this report selected 127 of the most significant centres of development, or the largest cities, all of which have populations of over 100,000 including suburbs (urbanised areas). For countries with lower population densities (Norway, Sweden, Finland and the Baltic States), cities with a population of over 50,000 were chosen. Considering the different interpretations of the city concept in various countries, the authors (*Jana seta Map Publishers*) of the report developed a methodology for calculating the population of a city's urban area. In previous studies, *OECD* researchers have offered something similar, defining large city areas (populations above 500,000) as functional urban areas. http://www.oecd.org/gov/regional-policy/Definition-of-Functional-Urban-Areas-for-the-OECD-metropolitan-database.pdf Boundaries and populations of urban areas have been computed by *Jana seta Map Publishers* using large-scale maps, Google Earth and other geospatial sources of countries in BSR and the latest available locality-level (smallest statistical units) population data from national statistics offices and *Citypopulation.de* (for Germany). Urban areas are delimited by unsettled and non-built-up areas.	Belstat, Statistics Denmark, Destatis, Statistics Estonia, Statistics Finland, Statistics Lithuania, Central Statistical Bureau of Latvia, Statistics Norway, Central Statistical Office of Poland, Rosstat, Statistics Sweden, *Citypopulation.de*, *Jana seta Map Publishers*
Economic performance and dynamics			
GDP/PPP per capita	Different years, calculations for 2005, 2015	Considering that GDP statistics for the city level is available only for some of the larger cities, the study used the territorial GDP breakdown available through national statistics sources (sometimes this corresponded with the European NUTS-3 standard, but more often with NUTS-2) and applied it to the cities in a specific region. If a city (within the borders of an urban area) comprised several NUTS-3 regions (for example, Copenhagen), the total GDP	Belstat, Statistics Denmark, Destatis, Statistics Estonia, Statistics Finland, Statistics Lithuania, Central Statistical Bureau of Latvia, Statistics Norway, Central Statistical Office of Poland, Rosstat, Statistics Sweden, Word bank, National banks of Sweden, Norway, Poland, Denmark,

		and average GDP per capita data were calculated for the entire area. In order to compare indicators from various countries and years, the study used the *Jana seta Map Publishers* methodology, which is based on annual comparison data for world countries published by the *World Bank*. (Gross domestic product (GDP) per capita based on purchasing power parity (PPP). It must be noted that, despite the authors' attempts at standardising GDP/PPP indicators in their calculations, the results ought to be looked at with a critical eye due to the various methodologies used in different countries.	Russia, Belorussia Eurostat.
Multimodal accessibility potential	Different years calculation, 2014	All 127 cities and towns have been arranged in 7 categories accordingly to their multimodal accessibility potential, from a very high accessibility potential rating (for almost all the Germany cities, some Danish and Swedish cities) to a low accessibility potential rating (Petrozavodsk and Pskov in Russia). The *Jana seta Map Publishers* methodology was used to determine the category for each city. The cities were analysed from six different aspects: 1) availability of a railway (access to the European high-speed [more than 180 km/h] railway network, access to the standard European gauge railway network, access to local high-speed railway systems, intensity of passenger traffic); 2) availability of motorways (access to the European motorway network, access to local motorway networks, intensity of passenger traffic); 3) availability of air traffic (access to airports, taking into account passenger traffic at the airports); 4) availability of sea transport (access to large seaports [with cargo turnover of 4 million tons per year), taking into account their cargo turnovers); 5) travel time to other cities in the region and the number of cities reachable within two hours; 6) participation in the Schengen Area.	Belstat, Statistics Denmark, Destatis, Statistics Estonia, Statistics Finland, Statistics Lithuania, Central Statistical Bureau of Latvia, Statistics Norway, Central Statistical Office of Poland, Rosstat, Statistics Sweden, Airport webpages, Ports webpages, The Administration of Russia Sea ports of the Baltic Sea, *Jana seta Map Publishers* data base, etc.
Human capital in cities			
Population with tertiary education	2005 (all, except BY), 2009 (BY), 2012 (LT), 2011 (LV), 2014 (DE, EE,RU) DK, FI, NO, PL, SE)	Annual and census data from state or regional statistic offices (ISCED 5 -7 level)	Belstat, Statistics Denmark, Destatis, Statistics Estonia, Statistics Finland, Statistics Lithuania, Central Statistical Bureau of Latvia, Statistics Norway, Central Statistical Office of Poland, Rosstat, Statistics Sweden.

Employment in technology & knowledge sectors	2005 (all), 2014 (all), except RU, BY	Various indicators that are used in national statistical systems do not allow comparisons. Therefore EUROSTAT indicator "Persons employed in science and technology, percentage of active population" on NUTS2 level is used.	EUROSTAT
Social inclusion and quality of life			
Unemployment	2005 (all), 2013 (RU), 2014 (all, except RU)	Annual data from state or regional statistic offices: indicator: unemployment rate %	Belstat, Statistics Denmark, Destatis, Statistische Ämter des Bundes und der Länder, Statistics Estonia, Employment Service Statistics of the Ministry of Employment and the Economy of Finland, Statistics Finland, Lithuanian Labour Exchange under the Ministry of Social Security and Labour, Statistics Lithuania, Central Statistical Bureau of Latvia, Statistics Norway, Statistics Sweden, Central Statistical Office of Poland, Rosstat.
At risk of poverty indicator	2005 (all), 2013 (all)	Annual data from state or regional statistic offices. In many countries (LT, EE, LV, PL due to insufficient survey sample sizes at-risk-of poverty indicator is not calculated for city level, therefore NUTS2 or NUTS3 level data was used. In RU and BY there is different methodology for calculating this indicator. For poverty measurement RU uses % from total population who live under the state determined minimum, BY uses sampled indicator – the proportion of low-income city population.	Belstat, Statistics Denmark, Destatis, Statistics Estonia, Statistics Finland, Statistics Lithuania, Central Statistical Bureau of Latvia, Statistics Norway, Central Statistical Office of Poland, Rosstat, Statistics Sweden.

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