

CITIES IN EUROPE AND CENTRAL ASIA

BELARUS



METHODOLOGY

This country snapshot was produced as part of an Advisory Services and Analytics (ASA) work developed by the Urban, Social, Rural and Resilient Global Practice (GPSURR). The objective of this ASA is to analyze economic, spatial and demographic trends in the urban systems of countries in Europe and Central Asia. City-level population data was obtained from the National Statistics Institute. In the absence of city-level economic and spatial data over the period of analysis, nighttime light (NLS) satellite imaging was used to assess spatial and demographic trends in cities. In previous studies, NLS intensity has been found to be positively correlated with levels of economic activity as measured by GDP. Regional-level regressions of NLS and GDP were conducted to assess the validity of using NLS as a proxy for economic activity in Belarus. The results suggest a significant and positive correlation between NLS intensity and GDP. In Belarus, GDP to NLS elasticity was found to be 1.30 (*an increase in light intensity of 1 percent is associated with a 1.30 percent increase in GDP*). This country snapshot presents its results at the city level. Due to measurement error, city-level economic and spatial results should be analyzed with caution; and when possible, additional city level data (*i.e. satellite imagery, firm-level data, and etc.*) should be consulted to corroborate results. This snapshot classified 114 settlements in Belarus as cities. Demographic trends are available for all 113 cities but NLS analysis is only available for 57 cities; the remaining settlements did not produce enough light to be considered “urban” by the NLS threshold employed in this analysis. Similar assessments done for other countries suggest that NLS are able to capture most settlements with 30,000 inhabitants or more. For additional information on this ASA please contact Paula Restrepo Cadavid (prestrepocadavid@worldbank.org) or Sofia Zhukova (szhukova@worldbank.org)



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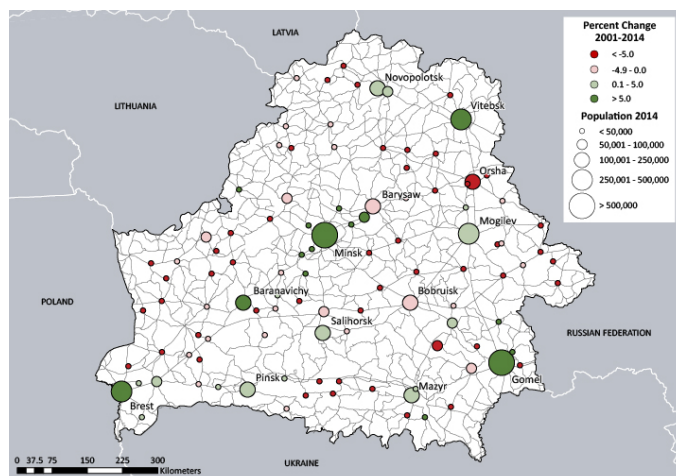


from the British people



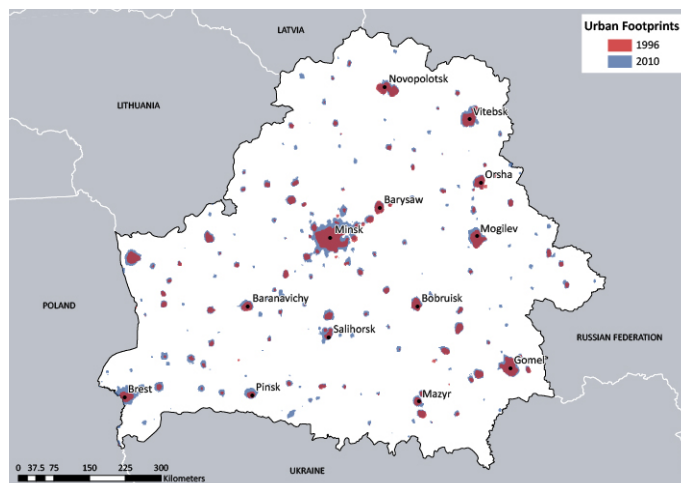
DEMOGRAPHICS

		BEFORE	RECENTLY
Fertility Rates	Belarus	1.27 ¹	1.62 ²
	ECA	1.56 ¹	1.70 ²
Life Expectancy	Belarus	68.50 ¹	72.47 ²
	ECA	73.50 ¹	76.36 ²
% of Population Above Age 65	Belarus	13.70 ³	13.83 ²
	ECA	14.07 ³	14.81 ²
Population Growth (Average Annual %)	Belarus	-0.38 ⁴	0.35 ⁴
	ECA	-0.38 ⁴	0.35 ⁴
Urban Population Growth (Average Annual %)	Belarus	0.22 ⁴	0.60 ⁴
	ECA	0.22 ⁴	0.60 ⁴
Urbanization Level (%)	Belarus	70.45 ¹	76.27 ²
	ECA	68.78 ¹	70.15 ²
Annual Urbanization Rate (%)	Belarus	0.61 ⁴	0.24 ⁴
	ECA	0.61 ⁴	0.24 ⁴
City Average Population	Belarus	58,319 ¹	61,359 ²
	ECA	61,105 ¹	64,914 ²
% Cities With More Than 100,000	Belarus	13.27 ¹	12.38 ²
	ECA	10.41 ¹	10.57 ²
% Cities With More Than 500,000	Belarus	0.88 ¹	1.77 ²
	ECA	1.56 ¹	1.83 ²
% Cities losing Population	Belarus	70.79 ⁴	61.07 ⁴
	ECA	70.79 ⁴	61.07 ⁴



SPATIAL

		BEFORE	RECENTLY
Built Up Area (100,000km ²)	Belarus	1,4040 ⁵	1,961 ⁶
	ECA	213,244 ⁵	288,046 ⁶
Built Up m ² Per Capita	Belarus	140.38 ⁵	207.24 ⁶
	ECA	247.39 ⁵	320.49 ⁶
Built Up Area Growth (%)	Belarus	39.67 ⁷	35.07 ⁷
	ECA	39.67 ⁷	35.07 ⁷
Built Up m ² Per Capita Growth (%)	Belarus	47.63 ⁷	29.54 ⁷
	ECA	47.63 ⁷	29.54 ⁷
Number of Cities in Analysis	Belarus	113 ⁴	5,549 ⁴
	ECA	113 ⁴	5,549 ⁴
Number of Identified Cities (NLS)	Belarus	57 ⁴	3,637 ⁴
	ECA	57 ⁴	3,637 ⁴
Number of Growing Cities (NLS Area)	Belarus	52 ⁴	1,804 ⁴
	ECA	52 ⁴	1,804 ⁴
Number of Agglomerations (NLS)	Belarus	3 ⁴	352 ⁴
	ECA	3 ⁴	352 ⁴

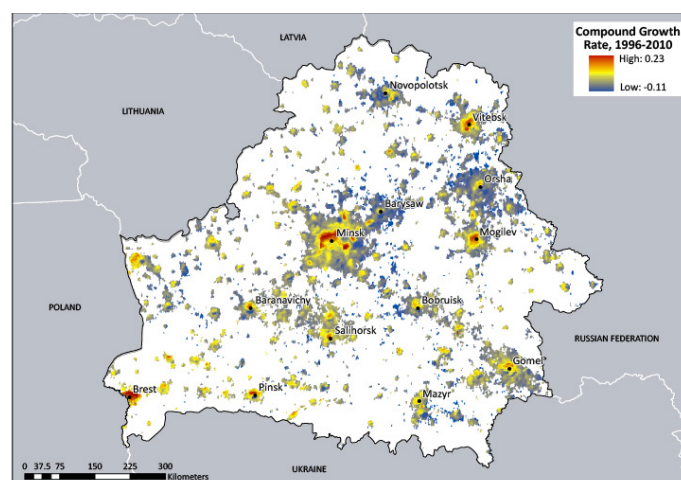


This section uses data from the Global Human Settlement layer (GHSL) developed by the Joint Research Centre of the European Commission. The GHSL extracts geospatial imagery to map and report on human settlements and urbanization.



ECONOMICS

		BEFORE	RECENTLY
Average Annual GDP growth (%)	Belarus	6.02 ⁴	1.53 ⁴
	ECA	6.02 ⁴	1.53 ⁴
Average Annual GDP per capital growth (%)	Belarus	6.44 ⁴	1.38 ⁴
	ECA	6.44 ⁴	1.38 ⁴
Estimated contribution of urban GVA to GDP growth (%)	Belarus	94.58 ⁴	—
	ECA	94.58 ⁴	—
Unemployment Rate (%)	Belarus	6.09 ⁸	9.25 ⁸
	ECA	6.09 ⁸	9.25 ⁸
Poverty rate (% at national poverty line)	Belarus	5.50 ²	—
	ECA	5.50 ²	—
Urban to rural GVA ratio	Belarus	9.37 ⁸	—
	ECA	9.37 ⁸	—
Urban NLS Intensity Growth (% annual average)	Belarus	12.33 ⁹	6.92 ⁹
	ECA	12.33 ⁹	6.92 ⁹
% City Economies Growing (in NLS intensity)	Belarus	100.00 ⁹	95.92 ⁹
	ECA	100.00 ⁹	95.92 ⁹
GDP to NLS Elasticity	Belarus	1.30 ¹⁰	0.37 ¹⁰
	ECA	1.30 ¹⁰	0.37 ¹⁰



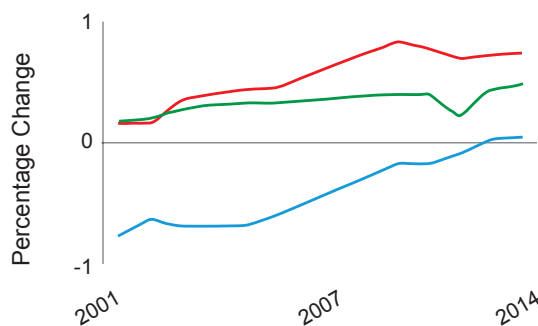
¹ 2001, ² 2014, ³ 2004, ⁴ 2001–2014, ⁵ 2000, ⁶ 2013, ⁷ 2000–2013, ⁸ 2009, ⁹ 2000–2010, ¹⁰ 1996–2010.



URBANIZATION TRENDS

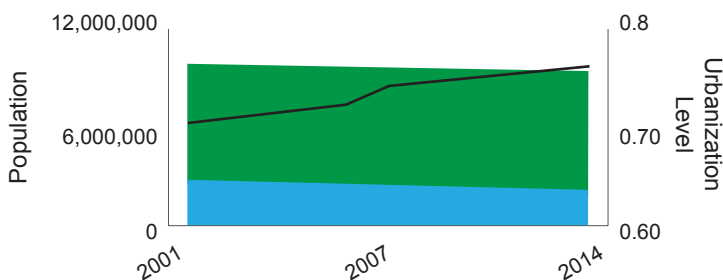
Belarus' population declined for most of the past decade but is now stabilizing. Between 2001 and 2014 Belarus' population declined an average of 0.39 percent per year for a total population decline of 4.61 percent between 2001 and 2014. Despite an overall decrease in population, the rate of decline has decreased since 2001 and began to stabilize between 2012 and 2014. The level of population decline is higher than what is observed in other countries in the region. Fertility rates have increased in Belarus and are only slightly lower than ECA's average fertility rate.

Despite population decline, Belarus, which is already highly urbanized, continues to urbanize. In 2001 Belarus was already highly urbanized with 70.45 percent of its population living in urban areas. Between 2001 and 2014 the average annual urbanization rate was 0.61 percent and in 2014, the urbanization level reached 76.27 percent. However, over that period the urban population grew by only 3.26 percent while the rural population declined by 23.40 percent. As such the increase of urbanization levels is much more a result of rural population decline than urban population growth.



Population Growth, 2001–2014

— Belarus — ECA (All Income levels)
— ECA (Developing Only)



Urbanization Trends, 2001–2014

— Rural Population — Urban Population — Urbanization Level



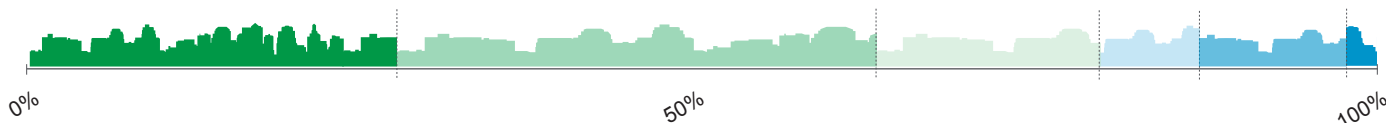
DEMOGRAPHICS OF THE URBAN SYSTEM

Cities with more than 100 thousand inhabitants are concentrating most of the urban population growth. 73.08 percent of the population lives in cities with more than 100 thousand inhabitants although these cities constitute only 13.15 percent of Belarus's urban system. Of the 15 largest cities in Belarus, 14 had populations above 100 thousand and all but three experienced positive population growth. Minsk, Hronda and Brest grew in population by an average of 15.02 percent between 2001 and 2014. Cities with less than 10 thousand inhabitants fared the worst in Belarus' urban system, declining an average of 8.30 percent in population between 2001 and 2014.

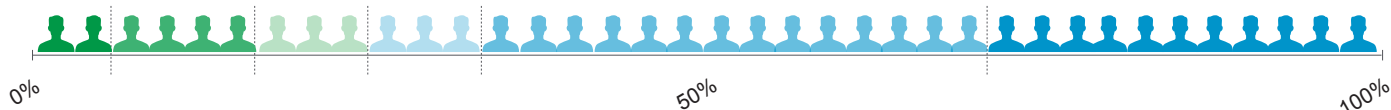
Cities in Northern Belarus have undergone the highest rates of population decline. Vitbesk, a region north of Minsk that shares a border with Latvia and Russia, underwent the highest rates of population decline between 2001 and 2014. Minsk city is the only region to have grown, growing by 13.72 percent between 2001 and 2014. Finally, the regions in the south (*Bresk and Homel*) had low levels of population decline.

There are few agglomeration in Belarus' urban system. Unlike other countries in the region, the nighttime lights threshold used in this analysis only identified three agglomerations in Belarus (*please see table below*). Of the 8 cities that belong to agglomerations in Belarus only four, those belonging to Minsk's agglomeration, are among the fastest growing cities in the country. As such, 11 of the 15 fastest growing cities do not belong to an agglomeration.

DISTRIBUTION OF CITIES BY CITY SIZE: 2014



URBAN POPULATION DISTRIBUTION BY CITY SIZE: 2014



■ Small Town (<10k) ■ Mid-Size Towns (10k–20k) ■ Large Towns (20k–50k) ■ Small Cities (50k–100k) ■ Mid-Size Cities (100k–500k) ■ Major Cities (>500k)

LARGEST CITIES BY POPULATION

CITY	POPULATION 2014	% CHANGE 2001–2014
Minsk	1,921,807	13.72
Gomel	512,314	7.42
Mogilev	370,690	3.89
Vitebsk	363,061	6.75
Hrodna (Grodno)	356,557	17.32
Brest	330,934	14.58
Bobruisk	217,660	-1.34
Baranavichy	177,177	5.22
Barysaw	145,223	-3.10
Pinsk	136,096	4.02
Orsha	116,597	-5.40
Mazyr	112,187	1.91
Salihorsk	105,376	3.23
Novopolotsk	101,860	0.62
Lida	99,928	-0.61

LARGEST URBAN AGGLOMERATIONS

AGGLOMERATION MAIN CITY	POPULATION 2014	% CHANGE 2001–2014	CITY COUNT
Minsk	1,965,937	14.00	4
Novopolotsk	186,828	2.00	2
Orsha	128,046	-5.66	2

FASTEST GROWING CITIES

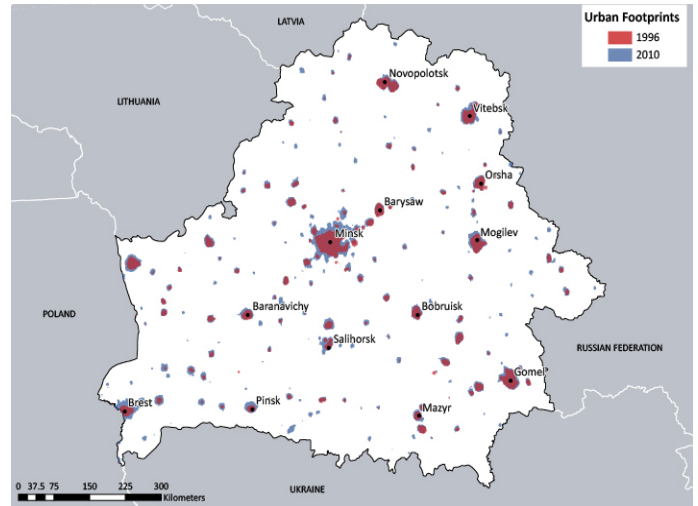
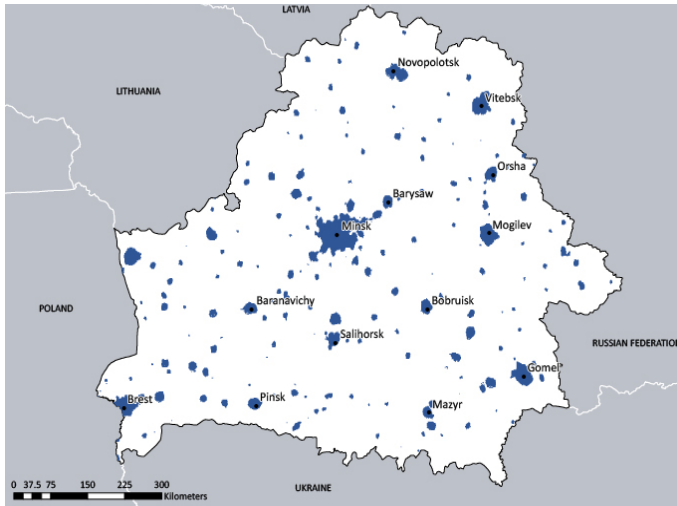
CITY	POPULATION 2014	% CHANGE 2001–2014	BELONGS TO AN AGGLOMERATION	AGGLOMERATION
Lahoysk	12,129	25.25	No	N/A
Fanipol	13,826	19.73	Yes	Minsk
Hrodna	356,557	17.32	No	N/A
Brest	330,934	14.58	No	N/A
Minsk	1,921,807	13.72	Yes	Minsk
Zaslavl	14,699	11.41	Yes	Minsk
Smalyavichy	15,605	11.08	Yes	Minsk
Dzyarzhynsk	26,338	8.82	No	N/A
Gomel	512,314	7.42	No	N/A
Naroulia	8,010	6.87	No	N/A
Vitebsk	363,061	6.75	No	N/A
Vietka	8,156	6.59	No	N/A
Zhodino	63,157	5.56	No	N/A
Uzda	9,945	5.52	No	N/A
Baranavichy	177,177	5.22	No	N/A



SPATIAL TRENDS OF THE URBAN SYSTEM

Belarus' cities are growing in area. According to the nighttime lights threshold used in this analysis, between 2000 and 2010 all of Belarus' identified cities increased in area. Minsk underwent the largest change in area. According to data on built-up areas in Belarus, built-up areas increased by 39.67 percent between 2000 and 2013; built-up area per capita increased by 47.63 percent over the same period.

Note: Night-Lights are used to define urban footprints and follow their change over time. A urban threshold (*above which a certain pixel is considered urban*) is estimated for each country and used to delimit cities' footprints. Agglomerations—as defined by NLS—are composed of cities whose NLS footprint merges. Single cities are cities who do not belong to any agglomeration.



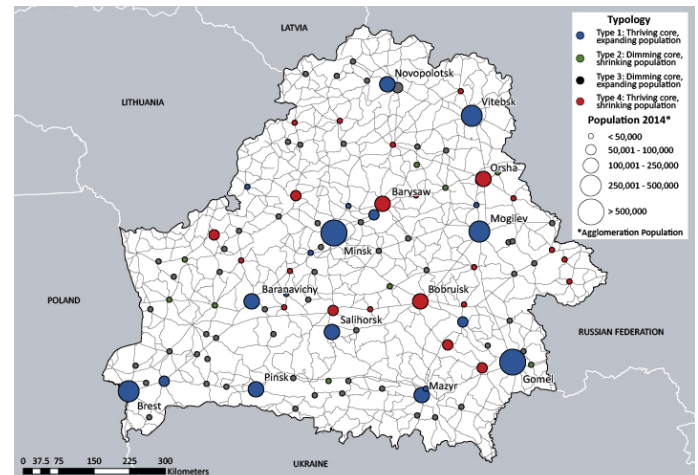
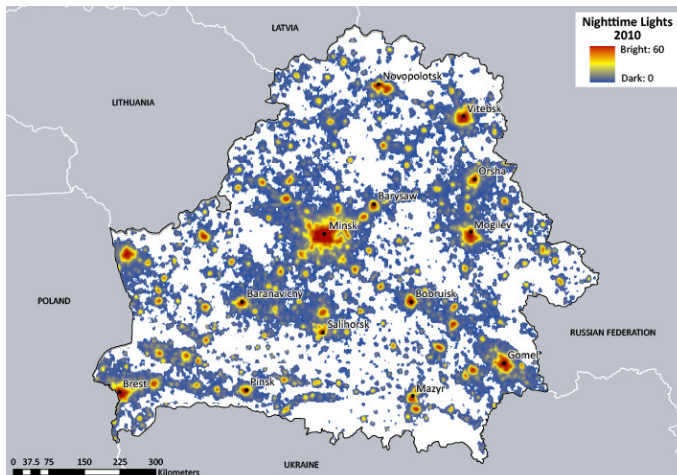
ECONOMICS OF THE URBAN SYSTEM

The urban sector is an important contributor to Belarus' economy and a driver of economic growth. Between 2001 and 2014 the urban sector accounted for an estimated 94.58 percent of growth in Belarus' gross value added. Furthermore, the urban to rural gross value added in 2014 was 9.37, while the urban to rural population ratio stood at 3.21. This suggests that the urban sector is largely more productive than the rural one.

Belarus' cities economic activity is growing as measured by the nighttime lights (*please refer to methodology on page 1*). According to the nighttime lights threshold used in this analysis, 100 percent of Belarus' cities are growing in economic activity between 2000 and 2010*. The City of Minsk grew the most followed by the region of Brest, which is located in Southwest Belarus on the border with Poland.

Note: Night-light intensity is being used as a proxy for economic activity at the city-level. For more information on the methodology please refer to page 1 of this snapshot. Gross value added (GVA) data by sector, as reported by the United Nations Statistics Bureau, is used to measure urban and rural production as a part of total production. The sectors were divided into those that are urban and those that are rural using the International Standard Industrial Classification of all economic activities (ISIC), rev. 3.

* Change in nighttime lights is measured by the change in total brightness for the urban extent between 2000 and 2010.





CITY TYPOLOGIES

Two city typologies were created based on nighttime lights (*see below*). These typologies are intended to shed light on economic and demographic trends in Belarus' urban system. **Typology 1** divides cities depending on whether they emit enough light to be considered as urban in 2000 and in 2010. In Belarus, 50.44 percent of the cities emitted enough light to be considered urban in both periods (*identified*), 40.71 percent were considered urban in only 2010 (*emerging*) and the remaining 8.85 percent were not considered urban in both periods (*not identified*).

Typology 2 classifies identified cities into four types based on their nighttime light trends (*thriving or dimming*), which are used as a proxy for growing or declining levels of economic activity, and population trends (*growing or declining*) (*please see page 3 for map of typology 2 cities*). In Belarus, 38.46 percent of the identified cities have a growing population and growing economic activity (*type 1*). Type 1 cities include Brest, Minsk and Hlybokaye. 17.31 percent of identified cities have a declining population and declining economic activity (*type 2*). Type 2 cities include Slonim, Talachynl and Mikashevichi. 53.77 percent of cities have a declining population and growing economic activity (*type 4*). Type 4 cities include Haradok, Kimavichy and Recyca.

Note: TYPOLOGY 1: Divides cities into types depending on whether they satisfy a minimum level of light brightness that is predefined for the settlement to be considered urban. IDENTIFIED indicates cities that have night-lights data for both periods used in this analysis (2000 and 2010); EMERGING indicates cities that only have night-lights data for the second period; SUBMERGING indicate cities that only have night-lights data for the first period; NOT IDENTIFIED indicates cities that do not have night-lights data for either period.

TYPOLGY 2: Divides the IDENTIFIED cities into types according to whether they have positive or negative growth in population and NLS brightness. Growth is calculated between 2000 and 2010. *Nighttime lights change is measured by calculating the change of brightness in the urban core between 2000 and 2010.

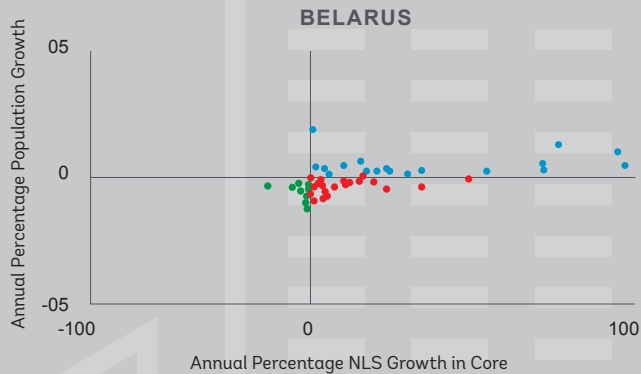
TYPOLGY 1			
TYPOLGY 1	DESCRIPTION	NUMBER	PERCENTAGE
Identified	City emits enough light in both 2002 & 2010	57	50.44
Emerging	City emits enough light only in 2010	46	40.71
Submerging	City emits enough light only in 2002	0	0.00
Non-Identified	City does not emit enough light in both 2002 & 2010	10	8.85

TYPOLGY 2			
TYPOLGY 2	DESCRIPTION	NUMBER	PERCENTAGE
Type 1 (Blue)	Growing population & growing economic activity (thriving core)	20	38.46
Type 2 (Green)	Declining population & declining economic activity (dimming core)	9	17.31
Type 3 (Black)	Growing population & declining economic activity (thriving core)	0	0.00
Type 4 (Red)	Declining population & growing economic activity (dimming core)	23	44.23

	TYPE 1: Growing Population & Growing Economic Activity	TYPE 2: Declining Population & Declining Economic Activity	TYPE 3: Growing Population & Declining Economic Activity	TYPE 4: Declining Population & Growing Economic Activity
Population 2011 (000s)	246.65 (431.67)	22.36 (15.32)	N/A	50.75 (53.78)
Average Annual Population Growth (% 2001–2011)	0.54 (0.47)	-0.65 (0.35)	N/A	-0.37 (0.27)
Total NLS Value in 2010 (000s)	44.07 (90.40)	2.10 (1.06)	N/A	6.44 (6.75)
NLS per Capita (2010)	0.18 (0.10)	0.10 (0.03)	N/A	0.13 (0.04)
NLS Growth (% 2000–2010)	168.98 (82.18)	71.25 (16.17)	N/A	97.91 (23.99)
Examples of Cities	Brest, Minsk, Hlybokaye	Slonim, Talachynl, Mikashevichi	N/A	Haradok, Kimavichy, Recyca

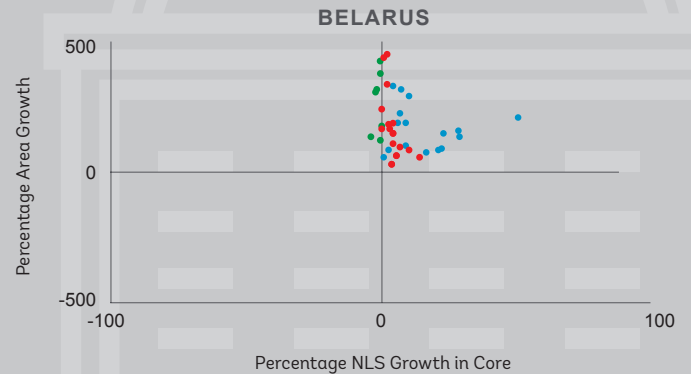
A spatial component added to the **Typology 2** classification provides insight into the interaction between spatial, economic and demographic trends across Belarus' urban system. Adding this spatial elements reveals growth in all of Belarus' cities regardless of type. **Type 1 cities** (*growing in population and in economic activity*) have undergone the greatest amount of spatial growth according to the nighttime lights threshold used in this analysis. **Type 4 cities** (*declining in population and growing in economic activity*) have undergone the smallest amount of spatial growth according to the nighttime lights threshold used in this analysis.

POPULATION AND ECONOMIC DYNAMICS*



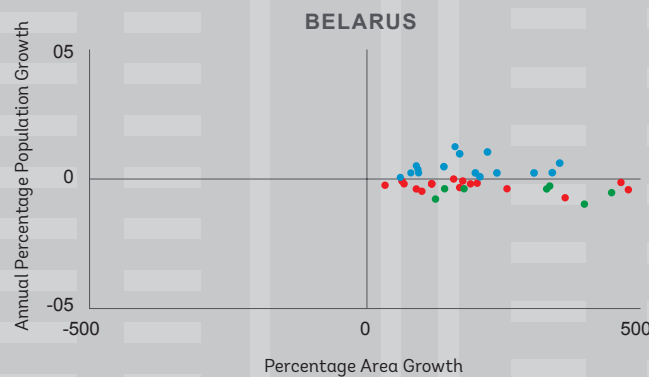
* Econ growth in NLS growth 2000–2010.
Population growth in annual avg. 2001–2014.

SPATIAL AND ECONOMIC DYNAMICS*



* Area growth in NLS footprint growth;
Econ growth in NLS growth 2000–2010.

POPULATION AND SPATIAL DYNAMICS*



* Area growth is NLS footprint growth;
Population growth in annual avg. 2001–2014.

- **Type 1:** Growing population, growing economic activity
- **Type 2:** Declining population, declining economic activity
- **Type 3:** Growing population, declining economic activity
- **Type 4:** Declining population, growing economic activity



CONCLUSIONS

Belarus's population was declining for the past decade but recently stabilized. The national demographic context has had consequences at the city level. Between 2001 and 2014 70.14 percent of cities in Belarus declined in population. Over this period, cities with more than 100 thousand inhabitants are attracting most of the population growth while cities with less than 50 thousands inhabitants are mostly losing population.

Despite population decline, Belarus' continues to urbanize. Belarus has historically had levels of urbanization above or on par with other countries in the region. However, most of the growth in urbanization levels is explained by a rapidly shrinking rural population.

The urban sector plays an important role in driving economic growth in Belarus. Estimates suggest that they are large contributors to the country's economy. According to the nighttime lights threshold used in this analysis, 100 percent of Belarus' cities are growing in economic activity. Additionally, all of Belarus' cities are increasing in nighttime light footprints, which for some cities may be indicative of urban sprawl.

Urban development trends in Belarus suggest that most of the urban system is experiencing population decline, but that this is not necessarily linked to economic decline. In addition, a few urban centers are concentrating most of the population growth. While this snapshot does not intend to study the underlying dynamics behind observed trends nor prescribe specific interventions; the analysis does have important policy implications. In particular in regards to the need to develop a dual approach in the managing of urban areas. As it will be difficult to redress trends in overall urban population decline, Belarus needs to put in place the right national policies to better manage the population decline of most of its cities. In addition, in urban areas experiencing population growth, cities should focus on adapting infrastructure and services to ensure that newcomers are well absorbed and integrated into the city and manage peri-urban growth to avoid sprawl, etc.



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