

# CITIES IN EUROPE AND CENTRAL ASIA

# TURKEY



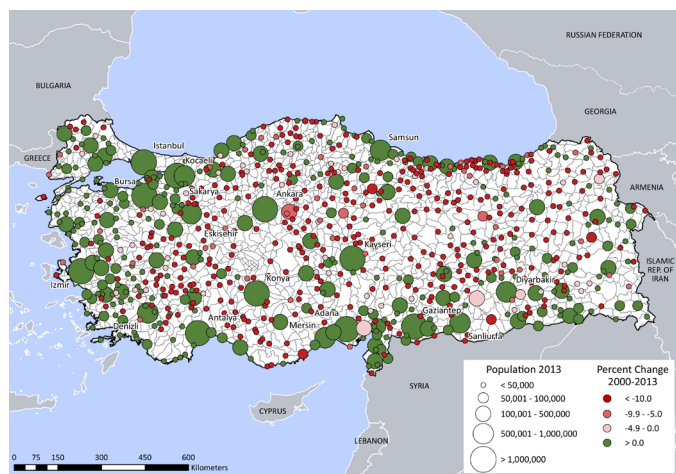
## METHODOLOGY

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, night-light (NLS) satellite imaging was used to assess spatial and demographic trends of cities. In previous studies, NLS intensity has been found to be positively correlated with economic activity as measured by GDP. Regional-level regressions of NLS and regional GDP were conducted to assess validity of using NLS as a proxy for economic activity in Turkey. The results suggest a significant and positive correlation between NLS intensity and GDP levels which proved to be robust to different model specifications. In the case of Turkey GDP to NLS elasticity was found to be 1.46 (*an increase in light intensity of 1 percent is associated with a 1.46 percent increase in GDP*). This country snapshot presents its results at the city level. Due to measurement errors economic and spatial city-level results should be analyzed with caution, and when possible, additional city-level data sources (*i.e. satellite imagery, firm level data, etc.*) should be consulted to corroborate results. This snapshot classified 832 settlements in Turkey as 'cities'. Demographic trends are available for all cities but NLS data analysis is only available for 63 cities as the remaining settlements did not produce enough light to be considered "urban" by NLS threshold employed in this analysis. Similar assessments made in 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](mailto:prestrepocadavid@worldbank.org)) or Sofia Zhukova ([szhukova@worldbank.org](mailto:szhukova@worldbank.org))



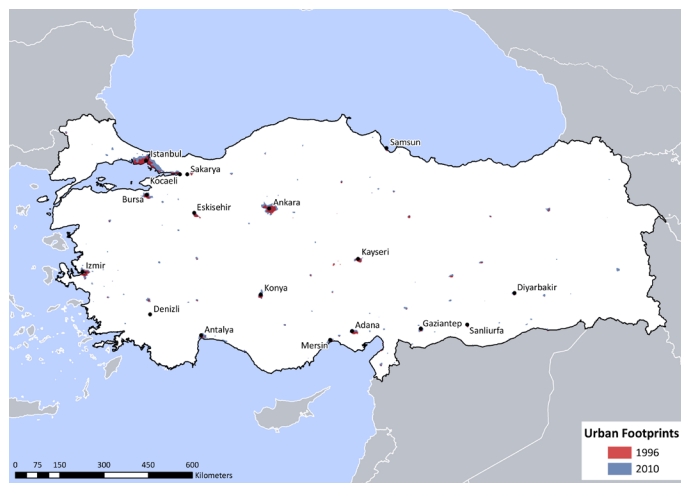
## DEMOGRAPHICS

		BEFORE	RECENTLY
Fertility Rates	Turkey	3.10 <sup>1</sup>	2.04 <sup>2</sup>
	ECA	1.95 <sup>1</sup>	1.73 <sup>2</sup>
Life Expectancy	Turkey	63.79 <sup>1</sup>	75.17 <sup>2</sup>
	ECA	72.05 <sup>1</sup>	76.77 <sup>2</sup>
% of Population Above Age 65	Turkey	4.48 <sup>1</sup>	11.59 <sup>2</sup>
	ECA	7.38 <sup>1</sup>	15.16 <sup>2</sup>
Population Growth (Average Annual %)	Turkey	1.60 <sup>3</sup>	1.31 <sup>4</sup>
	ECA	0.28 <sup>3</sup>	0.32 <sup>4</sup>
Urban Population Growth (Average Annual %)	Turkey	2.71 <sup>3</sup>	2.15 <sup>4</sup>
	ECA	0.41 <sup>3</sup>	0.55 <sup>4</sup>
Urbanization Level (%)	Turkey	57.89 <sup>1</sup>	72.89 <sup>6</sup>
	ECA	67.30 <sup>1</sup>	70.30 <sup>6</sup>
Annual Urbanization Rate (%)	Turkey	1.11 <sup>3</sup>	0.85 <sup>4</sup>
	ECA	0.00 <sup>3</sup>	0.00 <sup>4</sup>
City Average Population	Turkey	53,345 <sup>5</sup>	70,538 <sup>7</sup>
	ECA	61,105 <sup>5</sup>	64,914 <sup>7</sup>
% Cities With More Than 100,000	Turkey	6.61 <sup>5</sup>	8.65 <sup>7</sup>
	ECA	10.41 <sup>5</sup>	10.57 <sup>7</sup>
% Cities With More Than 500,000	Turkey	1.44 <sup>5</sup>	2.05 <sup>7</sup>
	ECA	1.56 <sup>5</sup>	1.83 <sup>7</sup>
% Cities losing Population	Turkey		59.01 <sup>8</sup>
	ECA		61.07 <sup>8</sup>



## SPATIAL

		BEFORE	RECENTLY
Built Up Area (100,000km <sup>2</sup> )	Turkey	6,422.52 <sup>5</sup>	13,945.49 <sup>2</sup>
	ECA	213,244 <sup>5</sup>	288,046 <sup>2</sup>
Built Up m <sup>2</sup> Per Capita	Turkey	203.66 <sup>5</sup>	186.10 <sup>2</sup>
	ECA	247.39 <sup>5</sup>	320.49 <sup>2</sup>
Built Up Area Growth (%)	Turkey		117.13 <sup>9</sup>
	ECA		35.07 <sup>9</sup>
Built Up m <sup>2</sup> Per Capita Growth (%)	Turkey		56.46 <sup>9</sup>
	ECA		29.54 <sup>9</sup>
Number of Cities in Analysis	Turkey		832 <sup>10</sup>
	ECA		5,549 <sup>10</sup>
Number of Identified Cities (NLS)	Turkey		63 <sup>10</sup>
	ECA		3,637 <sup>10</sup>
Number of Growing Cities (NLS Area)	Turkey		44 <sup>10</sup>
	ECA		1,804 <sup>10</sup>
Number of Agglomerations (NLS)	Turkey		2 <sup>10</sup>
	ECA		352 <sup>10</sup>

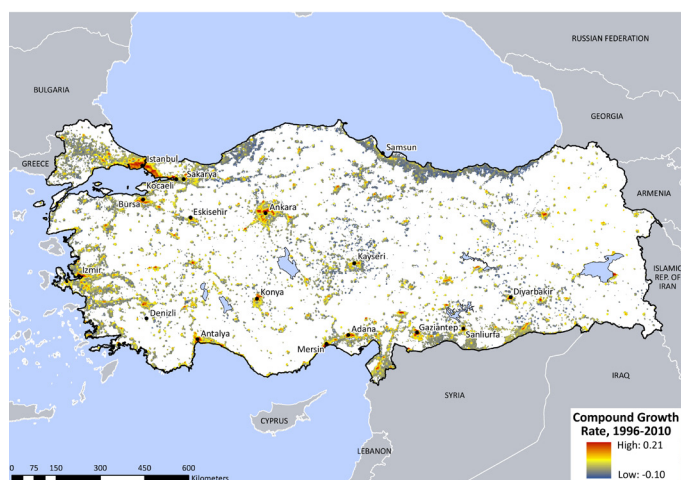


This section uses data from the Global Human Settlement layer (GHSL) developed by the Joint Research Centre of the European Commission. The GHSL extracts geospatial imagery to map and report on human settlements and urbanization.



## ECONOMICS

		BEFORE	RECENTLY
Average Annual GDP growth (%)	Turkey	3.17 <sup>3</sup>	4.15 <sup>4</sup>
	ECA	2.08 <sup>3</sup>	1.54 <sup>4</sup>
Average Annual GDP per capita growth (%)	Turkey	1.53 <sup>3</sup>	1.80 <sup>4</sup>
	ECA	2.80 <sup>3</sup>	1.20 <sup>4</sup>
Estimated contribution of urban GVA to GDP growth (%)	Turkey		77.57 <sup>4</sup>
	ECA		—
Unemployment Rate (%)	Turkey	9.80 <sup>2</sup>	9.45 <sup>2</sup>
	ECA		
Poverty rate (% at national poverty line)	Turkey	2.30 <sup>2</sup>	—
	ECA		
Urban to rural GVA ratio	Turkey	4.12 <sup>2</sup>	—
	ECA		
Urban NLS Intensity Growth (% annual average)	Turkey	3.55 <sup>10</sup>	6.92 <sup>10</sup>
	ECA		
% City Economies Growing (in NLS intensity)	Turkey	100.00 <sup>10</sup>	95.92 <sup>10</sup>
	ECA		
GDP to NLS Elasticity	Turkey	1.46 <sup>11</sup>	—
	ECA		0.55 <sup>11</sup>



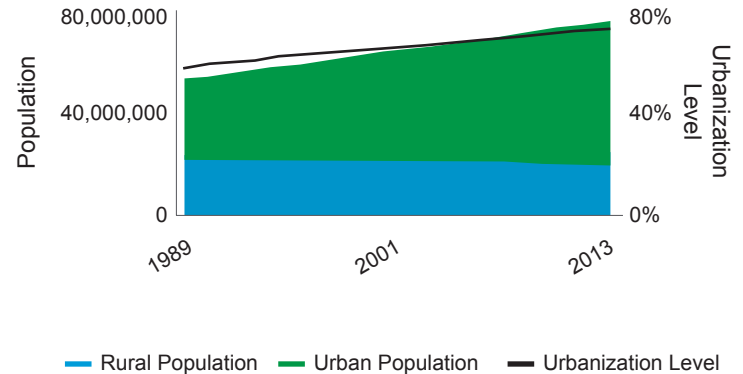
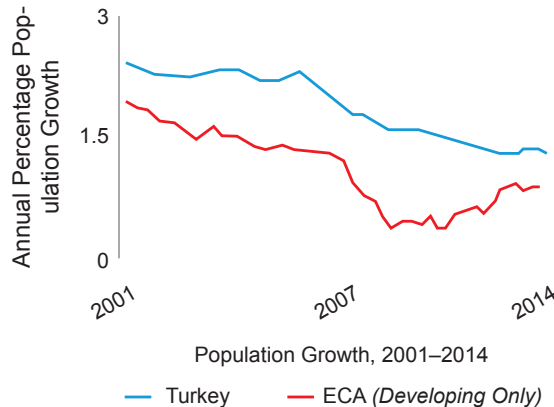
<sup>1</sup> 1989, <sup>2</sup> 2013, <sup>3</sup> 1989-2000, <sup>4</sup> 2000-2014, <sup>5</sup> 2000, <sup>6</sup> 2014, <sup>7</sup> 2012, <sup>8</sup> 2000-2012, <sup>9</sup> 2000-2013, <sup>10</sup> 2000-2010, <sup>11</sup> 2000-2011.



## URBANIZATION TRENDS

**Over the past two decades Turkey has experienced significant population growth.** Between 1989 and 2014 the country's population increased by 43 percent, much above the ECA regional average. The increase in population has been caused mainly by increases in life expectancy, which went from 63 years in 1989 to 75 years in 2013. Fertility rates remained above the replacement level (2.1) until 2010. The average age has also increased significantly. The share of population of ages above 65 has grown from an average of 4.48 between 1989 and 2000, and 7.38 between 2000 and 2014. Also, the average of the percentages of old population that depends on working age population has reached 10.36 after an increasing trend. Still, it is a lower number than the ECA average of 14 percent.

**The country level of urbanization has increased considerably over the past two decades.** In 1989, 57 percent of the population lived in urban areas. Between 1989 and 2014, the rural population stayed practically constant (going from 22.3 to 20.5 million), while the urban population increased from 30 to 55.3 million. As a consequence, the share of population living in urban areas increased to 72 percent. This represents a steady growth of urbanization levels of approximately 0.9 percent per year since 1989.

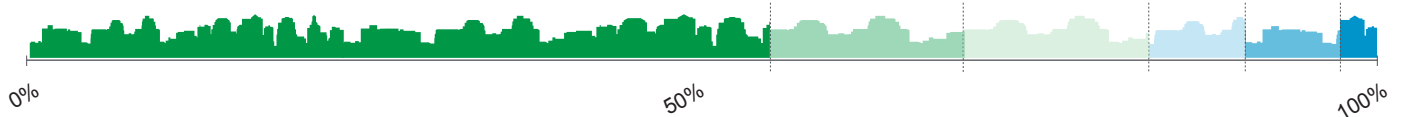


## DEMOGRAPHICS OF THE URBAN SYSTEM

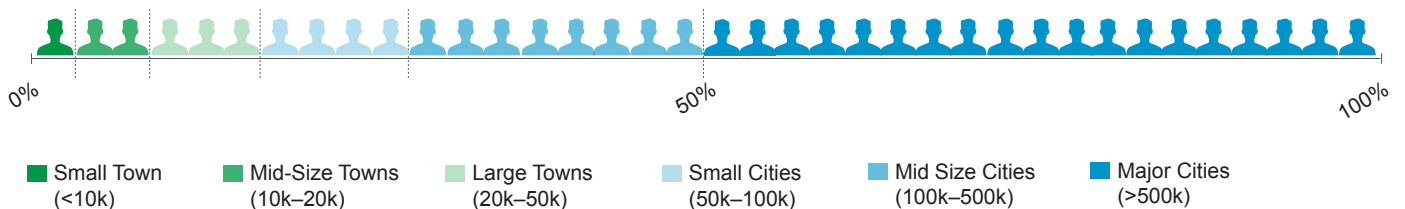
**However, Despite total positive growth of the urban population, this has not been spread out evenly across all cities.** In fact, more than half (59 percent) of the cities have lost population. This reflects divergences in growth and decline across the urban system. Most of the urban decline is concentrated in towns with less than 20,000 inhabitants while cities with larger populations present positive population growth. The average growth of major cities is 4.5 percent annually, which contrasts with annual decline of 1.5 percent for small towns. Overall, no strong spatial pattern is visible, except that a large number of cities in the Mediterranean that are growing. To a lesser extent, there is a cluster of towns whose population is declining in the northeast, along the coast of the Black Sea.

**Most cities in the urban system remain small and larger cities hold a disproportionate share of the population.** 21 percent of the cities are towns between 20,000 and 100,000, while 53 percent are small towns of less than 10,000. There are 20 cities with population larger than 500,000. Major cities, those with populations above 500,000 make up 2 percent of the urban settlements in the country. However, these cities are home to 57 percent of the total population. Cities of population higher than 100,000 cover 75 percent of the total population (while being 9 percent of the number of cities)

### DISTRIBUTION OF CITIES BY CITY SIZE: 2013



### URBAN POPULATION DISTRIBUTION BY CITY SIZE: 2013



**LARGEST CITIES BY POPULATION**

CITY	POPULATION 2012	% CHANGE 2000–2012
İstanbul	2,800,000	7.58
Ankara	1,500,000	-6.25
İzmir	1,000,000	-9.09
Bursa	997,754	-16.85
Adana	953,217	-13.34
Kocaeli	770,672	-12.81
Gaziantep	730,272	-7.67
Konya	656,478	-11.18
Antalya	496,188	-5.01
Kayseri	461,810	-11.01
Diyarbakır	425,848	-14.28
Mersin	371,698	-0.70
Eskişehir	353,918	-17.73

**LARGEST URBAN AGGLOMERATIONS**

AGGLOMERATION MAIN CITY	POPULATION 2013	% CHANGE 2000–2013	CITY COUNT
Kastamonu	102,328	102,328	2
Kirikkale	207,064	207,064	2

**FASTEST GROWING CITIES**

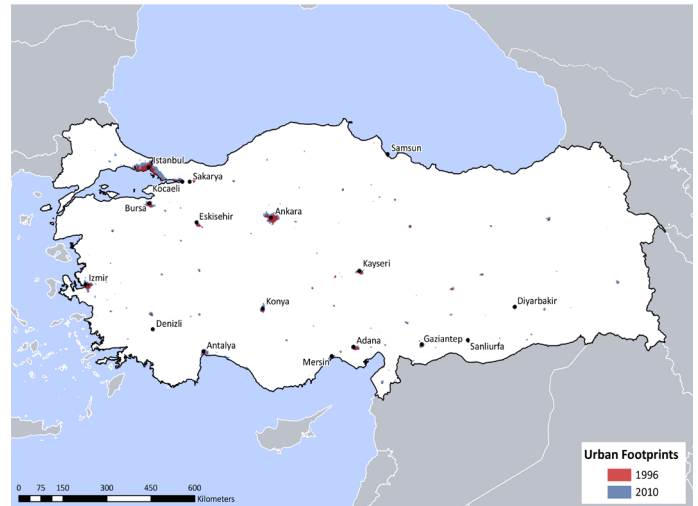
CITY	POPULATION 2012	% CHANGE 2000–2012	BELONGS TO AN AGGLOMERATION	AGGLOMERATION
Halfeti	8,536	208.60	No	N/A
Düzce	135,557	139.29	No	N/A
Çiftlikköy	21,905	127.66	No	N/A
Edremit	14,225	119.49	No	N/A
Sakarya	590,498	108.10	No	N/A
Çerkezköy	84,234	102.30	No	N/A
Kocaeli	1,527,407	97.59	No	N/A
Denizli	525,497	90.76	No	N/A
Didim	47,872	86.28	No	N/A
Serik	56,824	85.83	No	N/A
Yahşihan	14,591	77.61	Yes	Kirikkale
Antalya	1,073,794	76.98	No	N/A
İ egöl	177,617	67.63	No	N/A



## SPATIAL TRENDS OF THE URBAN SYSTEM

There has been a strong growth of urban footprints in Turkey as observed using Nighttime lights trends. Between 2000 and 2010, 45 out of 47 cities considered in the analysis presented positive area growth. On average, the area in the cities of the country increased by 51 km<sup>2</sup>. A similar pattern can be observed when looking at built-up area growth—which was 117 percent between 1990 and 2013. Overall, the largest growth in urban footprint is observed in the cities of Ankara and Istanbul.

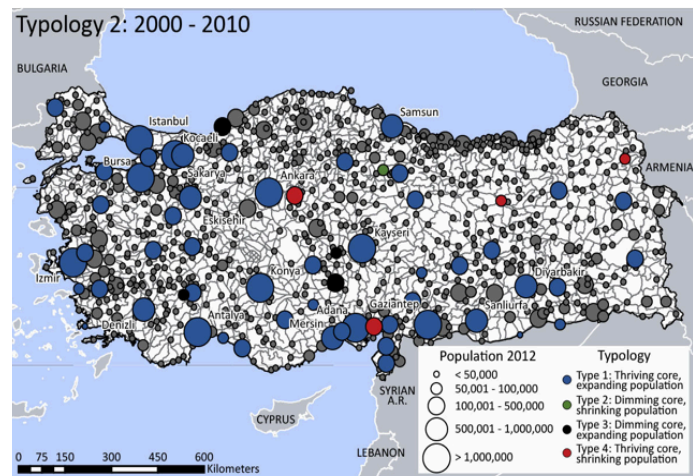
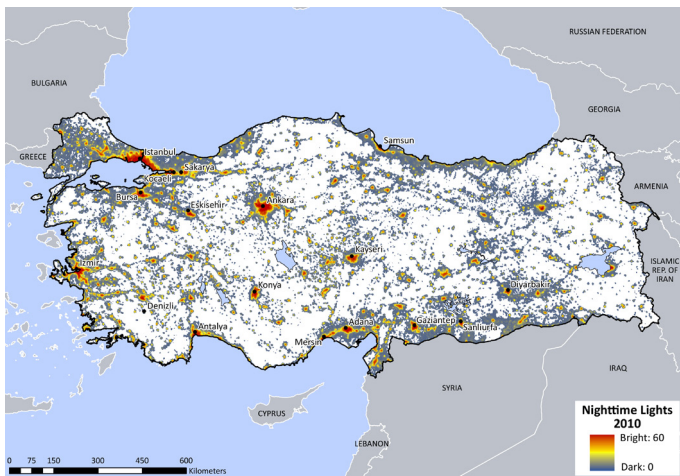
**Note:** Night-lights are used to define urban footprints and follow their change over time. A urban threshold (*above which a certain pixel is considered urban*) is estimated for each country and used to delimit cities' footprints. Agglomerations as defined by NLS—are composed of cities whose NLS footprint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



## ECONOMICS OF THE URBAN SYSTEM

Urban areas play an important role in Turkey's economic growth. Urban production is estimated to be 4 times larger than rural production while urban population is only 2.26 times larger than rural population. This reflects that productivity is higher in urban areas. Urban areas have also played a fundamental role in the recent economic growth of Turkey (*contributing on average to around 77 percent of the annual economic growth between 2000 and 2014*). To assess economic trends at the city level we use changes in nighttime light intensity. The nighttime lights analysis shows that the highest growth is happening in and around large cities, such as Istanbul, Izmir, Bursa, Adana and Ankara (*see map below—left*).

**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 methodology on page 1 of this snapshot. Gross value added (GVA) data by sector, as reported by the World Development Indicator, is used to measure urban production as a part of total production. The sectors were divided into those that are typically urban and those that are typically rural. Rural industries were oil rents, natural resource rents and agriculture value added. Urban GDP was calculated as the difference between total GDP and rural GDP. These groupings are a simplification of the urban and rural economic divide.





## CITY TYPOLOGIES

Two city typologies were created based on the light emitted by cities in 2000-2010 and population trends (*please refer to note below*). These typologies are intended to shed lights on spatial, economic and demographic trends of Turkey's urban system.

Typology divides cities depending on whether they emit enough light to be considered as urban—by NLS standards. 7.57 percent of the cities in the country were found to emit enough light to be considered urban in both periods (*Identified*); 5.77 percent were only considered urban by NLS standards in 2010 (*Emerging*); 85.58 percent were not considered as urban in both periods (*Not identified*), and 1.08 percent were considered urban in 2000 but no longer classified as such by 2010 (*Submerging*). **Typology 1** results are similar to those found in other ECA countries, with mainly cities above 30,000 inhabitants being considered urban by NLS standards and most cities above 50,000 being identified.

Typology classifies Identified cities in four types based on their nightlight trends (dimming or thriving) and population trends (*growing or declining*). 85.48 percent of Identified cities in the country have growing population and growing economic activity (*type 1*). 1.61 percent of identified cities have a growing population, but its economic activity, as proxied by nighttime lights, is decreasing (*type 2*). 6.45 percent of the identified cities have a completely different dynamic, a declining population but a strong growing estimate of economic activity identified by nighttime lights (*type 3*). 7.45 percent of the identified cities show absolute decline: both the population and economic activity, proxied by Nighttime lights, are declining (*type 4*).

**Note: TYPOLOGY 1:** Divides cities into types depending on whether they satisfy a minimum of light brightness defined as the condition for the settlement to be considered urban. The IDENTIFIED type indicate cities that have data for both periods considered (*1996 and 2010*); the EMERGING type indicates cities that have data for only the second period; the SUBMERGING type indicate cities that have data for only **TYPOLGY 2:** Divides the IDENTIFIED type cities into types according to whether they have positive or negative growth in population and NLS brightness at the core (*urban footprint in the first period*). Growth is calculated between 1996 and 2010. Cities were classified according to the following types: the first period; and the NOT IDENTIFIED type indicate cities that do not satisfy this light threshold at any period. As expected, cities with population beyond 50,000 all satisfy the condition of emitting enough light to be considered urban centers.

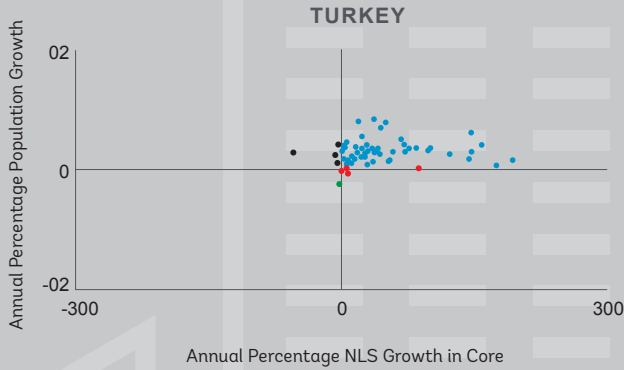
TYPOLOGY 1			
TYPOLGY 1	DESCRIPTION	NUMBER	PERCENTAGE
Identified	City emits enough light in both 2000 & 2010	63	7.57
Emerging	City emits enough light in only 2010	48	5.77
Submerging	City emits enough light only in 2000	9	1.08
Non-Identified	City does not emit enough light in both 2000 & 2010	712	85.58

TYPOLOGY 2			
TYPOLGY 2	DESCRIPTION	NUMBER	PERCENTAGE
Type 1 (Blue)	Growing population & growing economic activity ( <b>thriving core</b> )	53	85.48
Type 2 (Green)	Declining population & declining economic activity ( <b>dimming core</b> )	1	1.61
Type 3 (Black)	Growing population & declining economic activity ( <b>thriving core</b> )	4	6.45
Type 4 (Red)	Declining population & growing economic activity ( <b>dimming core</b> )	4	6.45

	<b>TYPE 1:</b> Growing Population & Growing Economic Activity	<b>TYPE 2:</b> Declining Population & Declining Economic Activity	<b>TYPE 3:</b> Growing Population & Declining Economic Activity	<b>TYPE 4:</b> Declining Population & Growing Economic Activity
Population 2012 (000s)	<b>815.55</b> (198.63)	<b>63.60</b> (N/A)	<b>96.36</b> (19.25)	<b>11.87</b> (50.66)
Average Annual Population Growth (% 2000-2013)	<b>3.35</b> (1.91)	<b>-2.79</b> (N/A)	<b>2.72</b> (0.01)	<b>-0.29</b> (0.37)
Total NLS Value in 2010 (000s)	<b>24.29</b> (56.29)	<b>1.82</b> (N/A)	<b>1.78</b> (0.29)	<b>2.10</b> (1.31)
NLS per Capita (2010)	<b>0.02</b> (0.01)	<b>0.03</b> (N/A)	<b>0.02</b> (0.00)	<b>0.02</b> (0.01)
NLS Growth (% 2000-2010)	<b>110.53</b> (59.56)	<b>131.74</b> (N/A)	<b>126.25</b> (50.89)	<b>72.25</b> (85.46)
Examples of Cities	<b>Istanbul, Ankara, Izmir</b>	<b>Turhal</b>	<b>Nigde, Ereğli, Nevşehir</b>	<b>Kars, Kirikkale, Ceyhan</b>

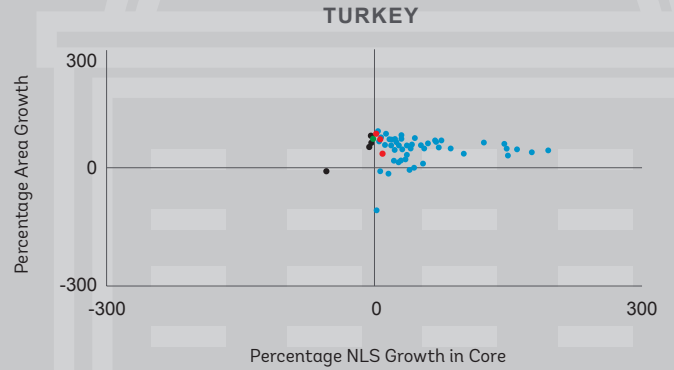
A third dimension is added to **Typology 2** classification to review the interaction between spatial, economic and demographic trends across the urban system. This reveals that most of the spatial growth corresponds to actual economic growth as cities whose footprint is growing have also experienced an increase in the nighttime lights emitted in the core of the city. Also, all **Type 1 cities** (*growing in population and economic activity*) are also growing in area. The graphs below present the distribution of cities in across these 3 dimensions and their interactions. The table presents summary statistics for **Typology 2 cities**.

### POPULATION AND ECONOMIC DYNAMICS\*



\* Econ growth is NLS growth (2000–2010);  
Population growth is annual growth (2000–2010).

### SPATIAL AND ECONOMIC DYNAMICS\*



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

### POPULATION AND SPATIAL DYNAMICS\*



\* Area growth is NLS footprint growth (1996–2010);  
Population growth is annual average growth (2000–2012).

- **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

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Turkey, in contrast with other countries in the region, has experienced an important population increase. This has been accompanied by an increased in urbanization levels, as urban population has increased at a faster pace than the rural population. Urban population increase is distributed across the country, but is more predominant in cities near the Mediterranean, while decline is more predominant in cities on the North East region. Across the urban system, decline is disproportionately concentrated in small towns while most large cities continue to grow. Compared to other countries in the region, Turkey does not have a large number of agglomerations defined by NLS footprints. However, this is the result of a recent administrative reform that grouped neighboring cities into metropolitan areas. As a result, these are counted in our analysis not as an agglomeration of cities but as a single urban area.

Cities in Turkey play a fundamental role in the country's economy. Almost all cities are growing both in economic activity and population (*Type 1—above*). Nightlights patterns show the largest cities generate most of the economic activity and also have exhibited fastest growth. Among them, the fastest growing economies are those of Istanbul, Ankara, Izmir, Antalya, Adana, and Bursa. Spatial patterns suggest that, despite a growth in population levels, most cities in the country are sprawling, as their urban footprint are growing at a faster rate than their population.

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. Moving forward, the country must assure that the right policies are in place to manage the population growth of most of its cities while acknowledging that its smaller cities and towns will likely continue to decline. With the increase concentration of economic and population density in growing urban centers, will come an increase demand for local public goods. Urban areas experiencing rapid population growth, will need to adapt infrastructure and services to ensure that new-comers are well absorbed and integrated into the city; and put in place the right policies (*governance, business climate, etc.*) to further foster agglomeration economies and reduce congestion costs.

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