

Territorial fiche

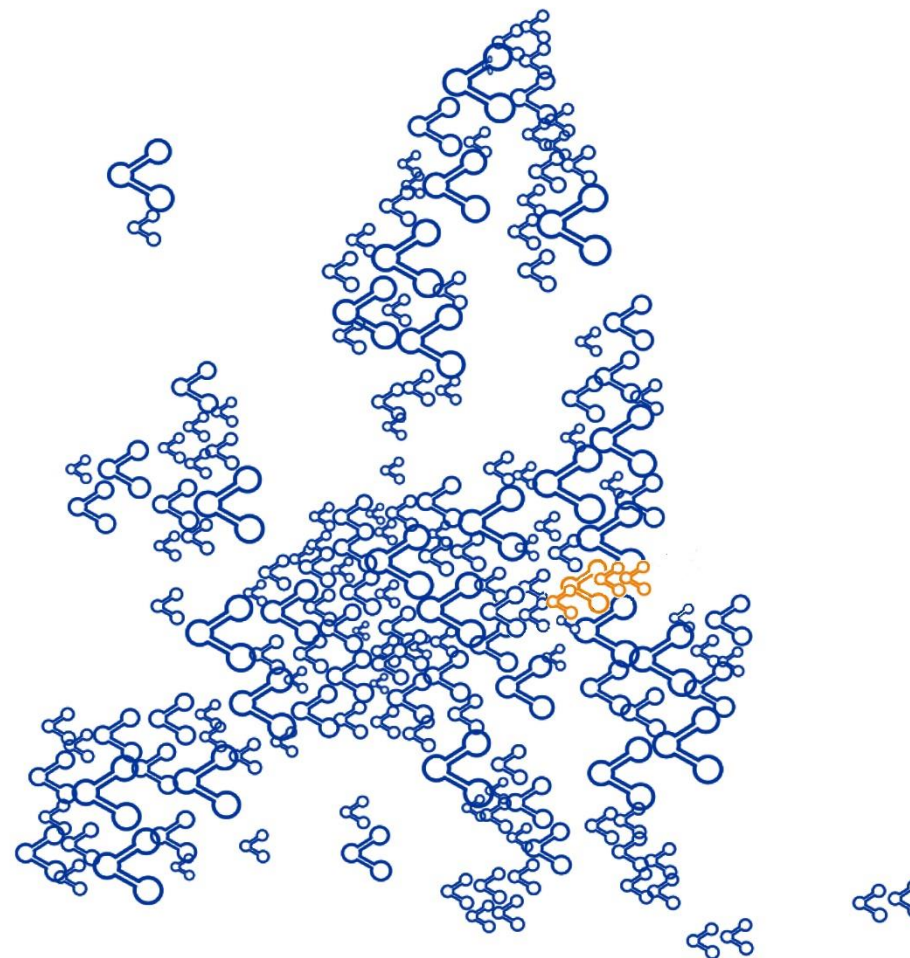
# Territorial patterns and relations in Slovakia

Urban development

Transport & communication

Urban structure

Interactive version: <http://www.espon.eu/slovakia>



### **Introductory remarks**

The content of the following overview is a summary of research results from different thematic applied research projects under the ESPON 2020 programme. Its main goal is to showcase the wide range of ESPON research and, by zooming-in on a specific country, spark interest for the results at a national and regional scale.

The indicators and analyses in this document represent the data availability at the time when the research was undertaken and not the most recent data. This overview should therefore be regarded as a collection of available findings with different time stamps, and not as an up-to-date, comprehensive analysis. Moreover, the analysis is based on data which could be collected or interpolated at the European level, and therefore may not reflect national-level information, which is likely to be more detailed, recent, and accurate. The maps can therefore best be read as benchmarks or used to identify international patterns of spatial developments.



## Urban development

Daily urbanisation rate

Typology of urbanisation per capita

Urbanisation

Urban shrinking

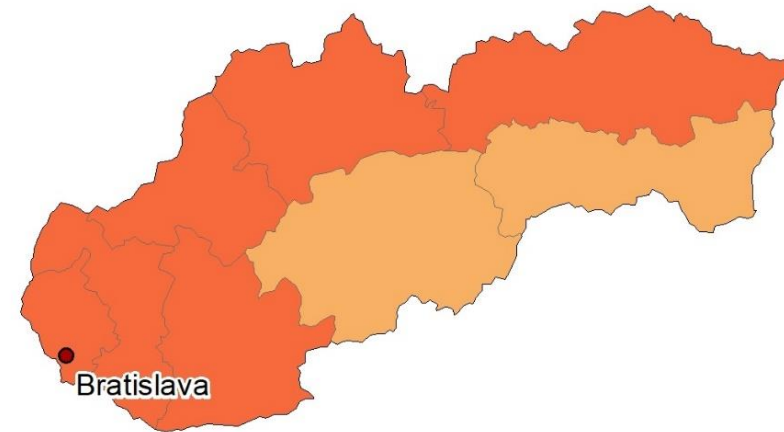
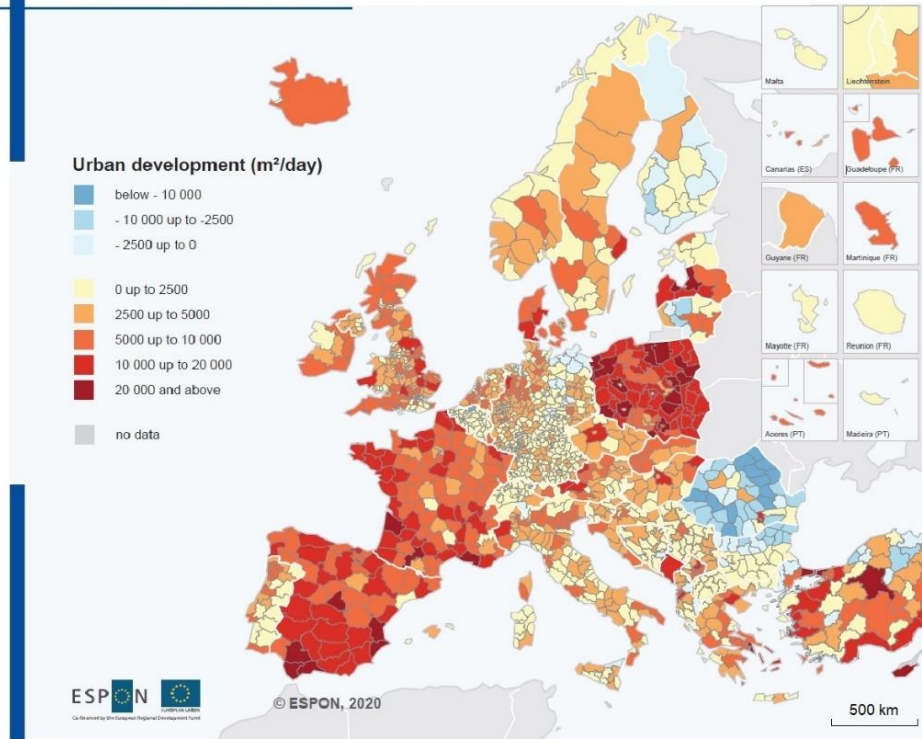
Agricultural Land Use change

The chapter on "Urban Development" focuses on daily urbanisation rate, the typology of urbanisation per capita, urbanisation, urban shrinkage, and agricultural land use change. Five maps show the situation in Europe with a focus on Slovakia.

The European Union has set a target of "zero net land take in 2050" in its *Roadmap to a Resource Efficient Europe* published in 2011. However, maps show that in most European countries, actual developments are not in line with this political target.

In terms of different types of urbanisation, there is a noticeable difference between east and west Slovakia. With regard to agricultural land use change, the eastern and central regions of Slovakia trend towards abandonment, while the western regions trend towards urbanisation.

## Development of Urban Use per day 2000 -2018



50 Km

Regional level: NUTS 3  
Source: ESPON SUPER, 2019  
Origin of data: Corine Landcover, 2019

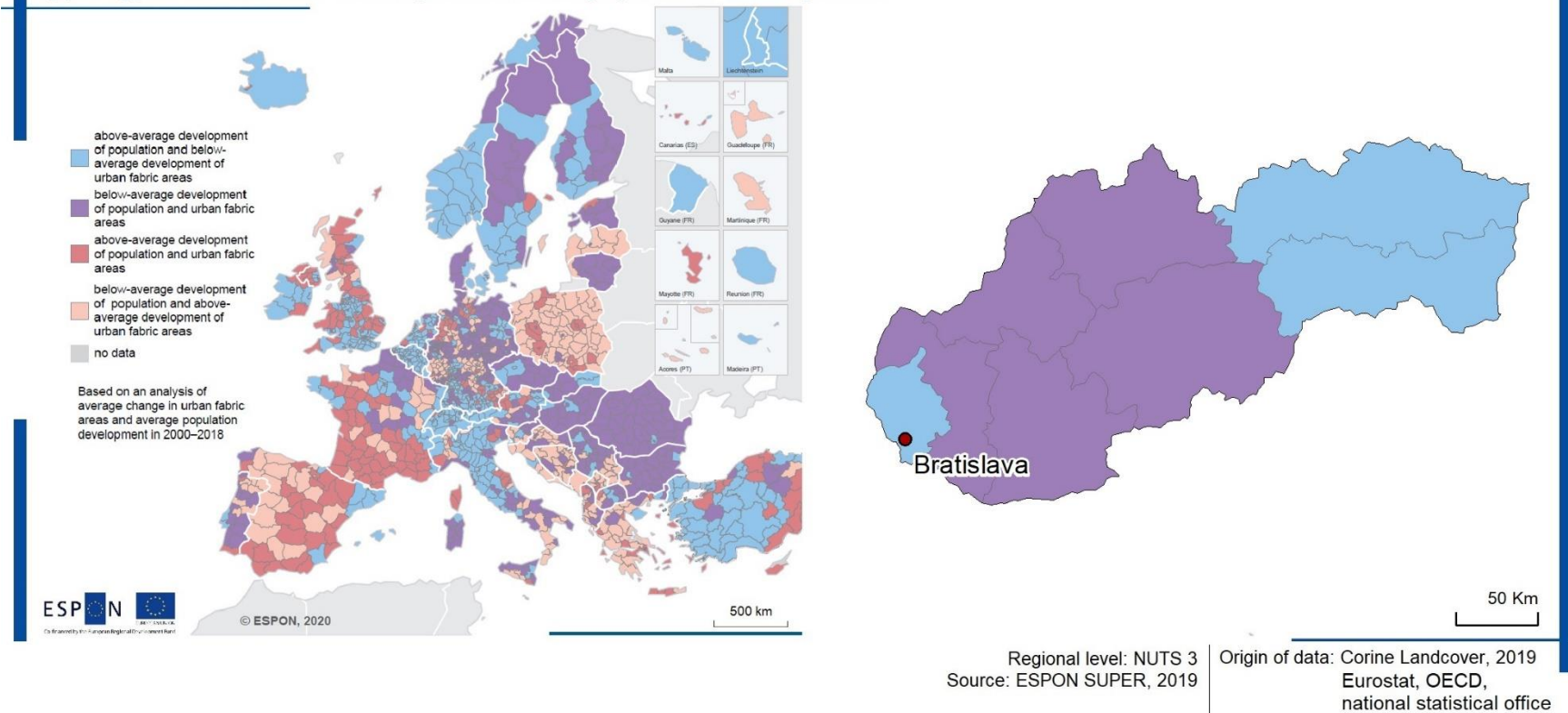


Between 2000 and 2018, about 1,170,000 hectares of land were converted to urban use, or about 248 football fields per day. The hotspots were Poland, Spain, France, Denmark, Latvia, Montenegro, some areas in the UK and Turkey. This daily rate of urbanisation is also generally seen in urban regions around capitals in other European countries. Romania, Bulgaria, Finland, and some regions in Latvia, Germany, and Turkey, on the other hand, show deurbanisation.



The highest daily urbanisation rate in Slovakia (5,000m<sup>2</sup> to 10,000m<sup>2</sup> per day) is found in the western regions of Bratislava, Trnava, Nitra, and Trenčín, where it is higher than in neighbouring regions in the Czech Republic, Austria, and Hungary; and in the northern regions of Žilina and Prešov, where it is similar to or lower than the neighbouring regions in Poland. Lower urbanisation (2,500m<sup>2</sup> to 5,000m<sup>2</sup> per day) is found in the regions of Košice and Banská Bystrica, at a rate similar to the neighbouring regions in Hungary.

## Typology of urban fabric development versus population development



The relationship between urban area change and population change from 2000 to 2018 varies across Europe. Overall, the rate of urban land use is increasing by 150 to 200% that of population growth, indicating a decrease in urban density. The map shows urbanisation per capita in relation to the European average. Dark red represents above-average increases in population and urbanisation, seen in parts of France, Spain, the UK, Germany, Austria, Italy, Turkey, and regional capitals in Poland. Light blue represents above-average increases in population and below-average urbanisation, resulting in more compact urbanisation, seen in Nordic countries, Turkey, Ireland, the UK, and the belt from southern Germany, Switzerland, western Austria to central Italy, and some other urban regions. Light red represents above-average urbanisation despite below-average population growth, which is problematic from a sustainability

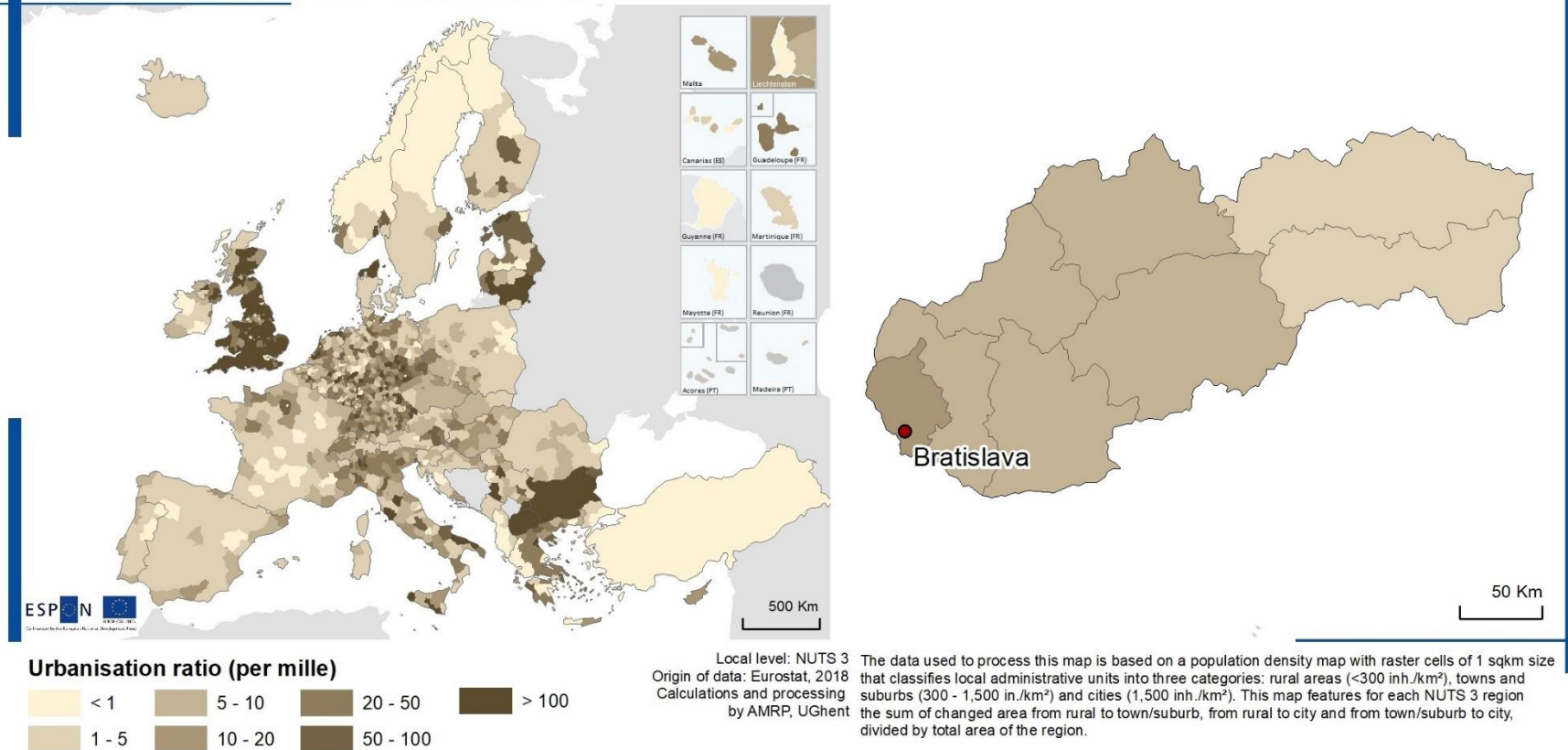
perspective, present in the Iberian Peninsula and Balkans, Poland, Latvia, parts of France, Scotland, and Italy. Purple represents both below-average population and urbanisation rates in Finland, Sweden, northern Norway, Portugal, northern France, the belt of ex-socialist countries from Denmark to Bulgaria, as well as Estonia and Latvia.



In Slovakia, the eastern regions of Prešov and Košice and the western region around the capital Bratislava show above-average population growth and below-average urbanisation, resulting in more compact urbanisation (light blue). All the regions in between show both below-average population and urbanisation rates (purple).



## Urbanisation between 2014 and 2018 per NUTS 3 region

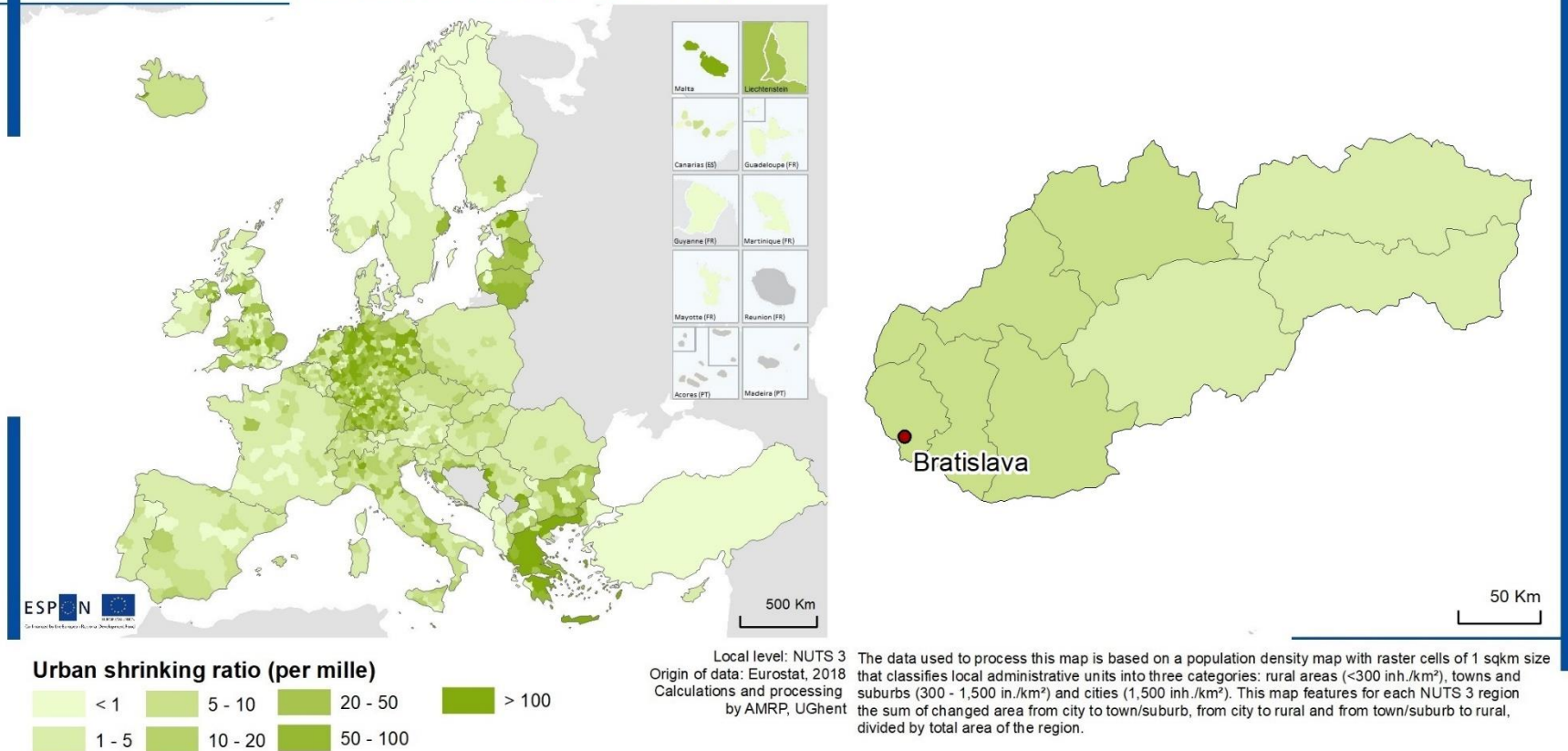


The final report of the ESPON SUPER project outlines residential development as one of the main drivers of urbanisation. Another driver is economic growth. More economic growth creates demand for more industrial areas, warehouse space, shops, and offices. This development can be independent of population development and follows a different logic in terms of location and space requirements. The speed of urbanisation is related to the composition of urban land use, which differs from region to region and from country to country. However, almost all forms of urban land use (urban fabric, industrial/commercial, infrastructure, urban green, construction sites) are present everywhere, in various compositions.



The highest level of urbanisation in Slovakia (10-20 km<sup>2</sup> per 1,000 km<sup>2</sup>) is found in the Bratislava region – the capital of the country – , which is higher than the neighbouring region in Austria, but lower than that in Hungary. In the second class (5-10), there are five western and central Slovakian regions: Trnava, Trenčín, Nitra, Žilina, and Banská Bystrica, with a similar trend to the nearby regions of the Czech Republic, Poland, and Hungary. The two eastern Slovakian regions of Prešov and Košice in the third class (1-5) have a similar urbanisation rate as the neighbouring regions in Poland, but lower than in Hungary.

## Urban shrinking between 2014 and 2018 per NUTS 3 region

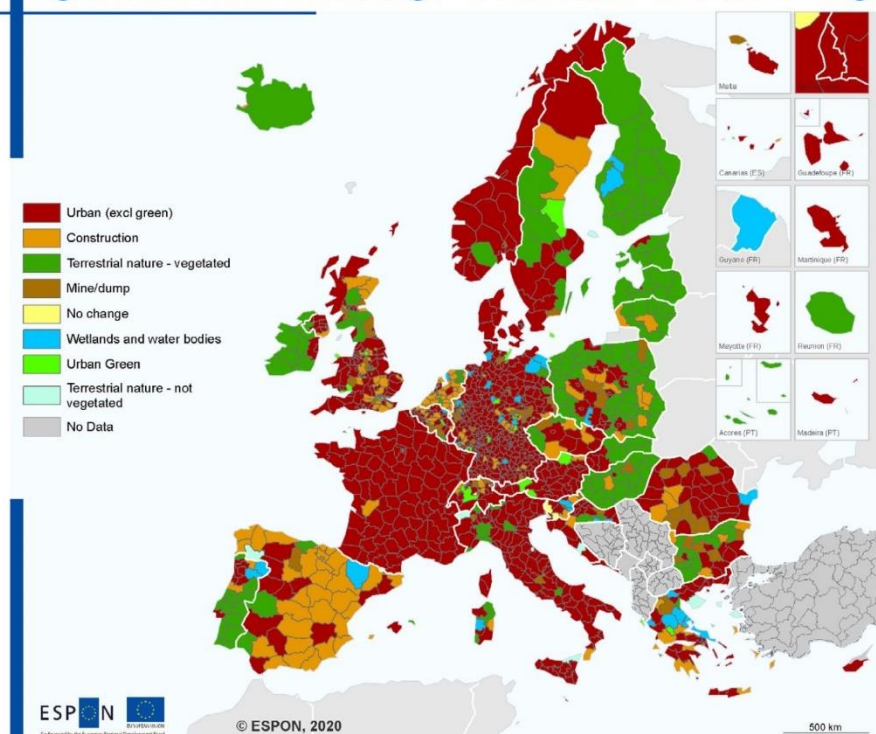


Urban shrinkage has become a widespread phenomenon across Europe, posing new challenges to traditionally growth-oriented spatial planning. Some densely populated urban areas face significant population losses over a long period. Five main drivers are found, often in a combination: economic transformation (decline of uncompetitive areas), suburbanisation (migration of people and jobs to the suburbs, hollowing out of the core city), demographic change (falling birth rates, migration to rural areas), structural upheaval (collapse of a political system, unrest, resettlement), and environmental pollution. High urban shrinkage is a characteristic feature of Greece, Bulgaria, Lithuania, Latvia, parts of Estonia, Germany, the UK, Croatia, and Serbia.



The urban shrinking ratio in Slovakian regions is generally similar to that of neighbouring Poland, Hungary, the Czech Republic and Austria. The highest urban shrinking ratio in Slovakia (5-10 km<sup>2</sup> per 1,000 km<sup>2</sup>) is found in the north region of Žilina and in the western regions of Trenčín, Nitra, Trnava, and Bratislava. In the second class (1-5 km<sup>2</sup> per 1000 km<sup>2</sup>), they are followed by south central region of Banská Bystrica and eastern regions of Prešov and Košice.

## Agricultural land use change - Destination land use of largest share



Regional level: NUTS3  
Source: ESPON SUPER 2020  
Origin of data: Corine landcover 2019

This map shows agricultural land use change in Europe between 2000 and 2018. Agricultural land is more frequently abandoned in Finland, Estonia, Latvia, Lithuania, Poland, Slovakia, Hungary, Bulgaria, Portugal, Ireland, and Iceland. In almost everywhere else, agricultural land is mostly urbanised. Change from agricultural to urban land use is predominant in Norway, France, Germany, Austria, Italy, Croatia, and Romania. A significant proportion of the land converted from agricultural land use to (currently unused) construction areas is characteristic of Spain and the Netherlands. Land use change to industrial land use and mineral extraction or dumpsites accounts for a much smaller share of land in Europe.

With regard to agricultural land use change, two trends are observed in Slovakia. The predominant trend of agricultural land use change in Slovakia is towards abandonment. It is present in eastern and central Slovakia in the regions of Prešov, Košice, Žilina and Banská Bystrica. This trend is generally similar to the neighbouring regions of Hungary and Poland. In the western part of Slovakia in the regions of Trenčín, Nitra, Trnava, and Bratislava, the predominant trend of agricultural land use change is towards urbanisation. This is the same as in neighbouring regions in the Czech Republic and Austria, but different from Hungary, where there is a trend towards abandonment.





## **Transport & communication**

Accessibility potential by road

Accessibility potential by rail

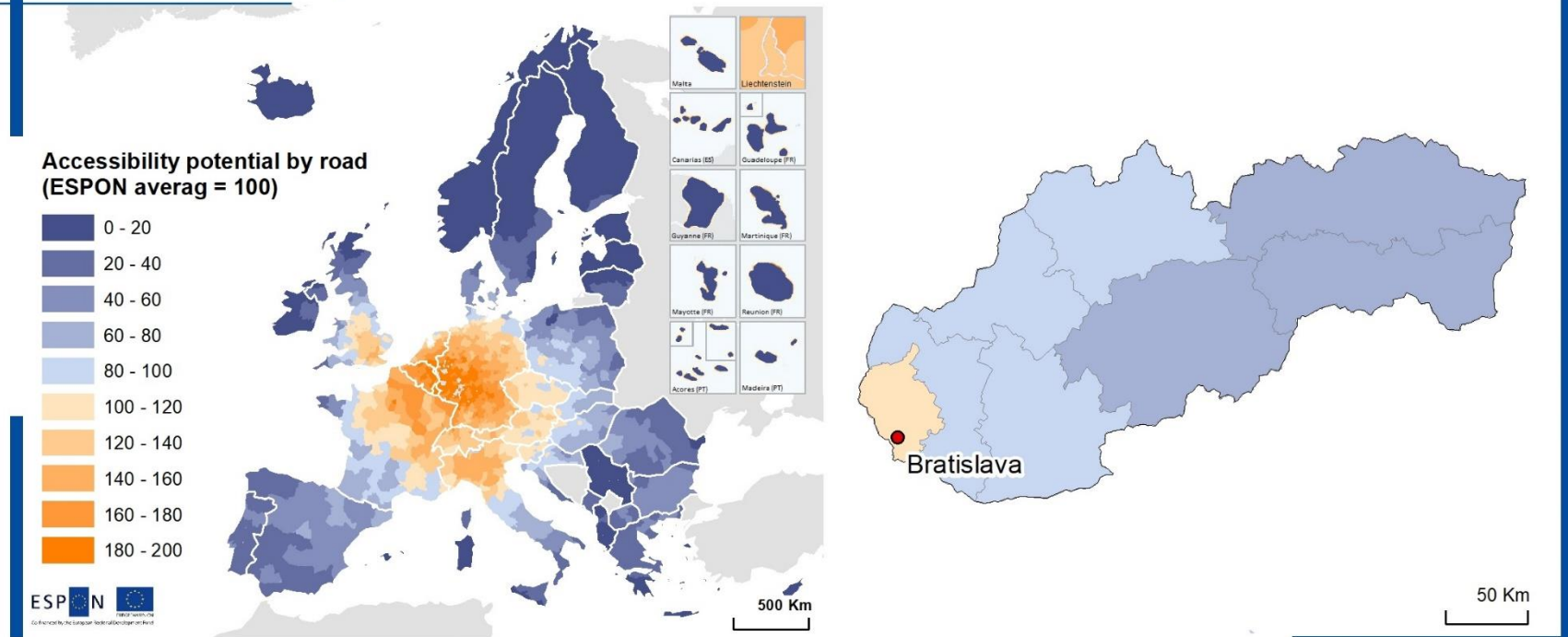
Global accessibility potential

Broadband access in households

The economic performance of the European territory is directly dependent on the accessibility through the TEN-T (Trans-European Transport network). There is a clear dominance of urban areas, followed by rural and mountainous regions. Some states are less accessible due to fewer corridors, while others are less accessible due to less developed corridors. Potential accessibility tends to be stronger in the European core and gradually decreases in the peripheral areas. This is true for both road and rail accessibility potential and global potential accessibility.

There are still large gaps in terms of digital connectivity between urban and rural regions. Low population densities and geography are the main reasons why Europe's rural areas still face major challenges in providing a viable digital infrastructure. Although high-speed internet is available in some remote regions, high costs make this service less accessible. Large urban centres with good physical and digital connectivity are where most ICT hubs are concentrated and attract highly skilled people, while rural and peripheral regions lag behind. Therefore, differences in digital connectivity reinforce the urban-rural divide.

## Accessibility potential by road in 2030



Regional level: NUTS 3  
 Source: ESPON ACC SCEN, 2017  
 Origin of the data: S&W Accessibility Model 2016;  
 RRG GIS Database, 2014.

\* For each NUTS-3 region the population in all destination regions is weighted by the travel time to go there. The weighted population is summed up to the indicator value for the accessibility potential of the origin region. All indicator values are expressed as index, i.e. related to the ESPON average. Calculations for the accessibility potential rely on an expected and realistic timetable for the development of the TEN-T.



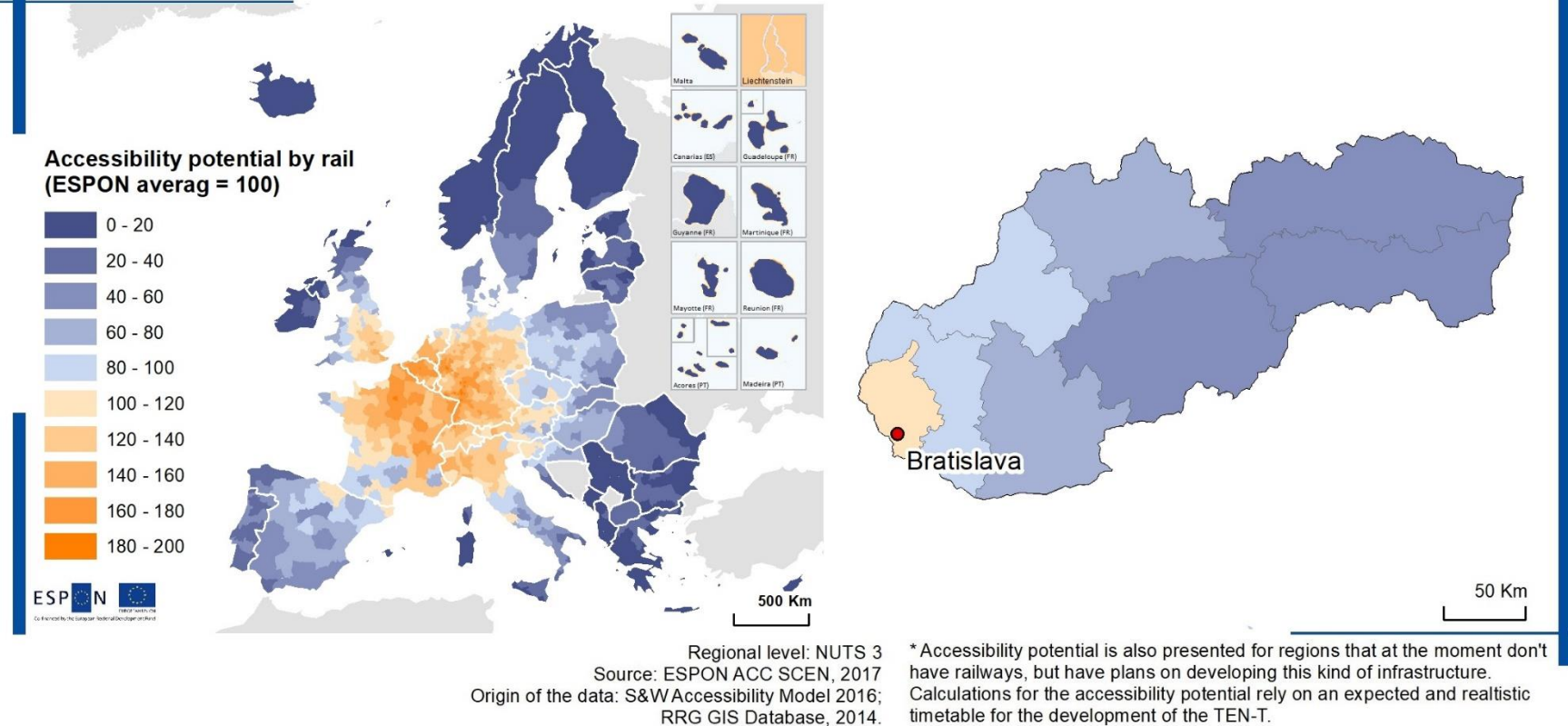
Potential accessibility is measured by travel time relative to population – how quickly people in a region can reach other people, services, and markets. Accessibility by road is a key issue for regional development and connectivity, especially for shorter and medium distances. The highest level of accessibility is achieved in the economic centre of Europe: the triangle between South East England, the north of Italy and the Czech Republic. The combination of well-developed road infrastructures, i.e. mainly dense motorway networks, and a high population concentration leads to these favourable index values. The lowest potential road accessibility is found in the Nordic and Baltic countries, Ireland, Scotland, the Iberian Peninsula, Serbia, Albania, Greece, the large Mediterranean islands, and parts of Romania. Connectivity in these regions

will continue to be lacking under the assumption that sparse population and geographical specificities prevent innovative solutions.



The only Slovakian region with above-average road accessibility potential is the capital Bratislava (100-200), which is on par with neighbouring regions in Austria. In the second class (80-100) are the regions of Trnava, Trenčín, Žilina, and Nitra, which are lower than the nearby regions of the Czech Republic. The regions of Banská Bystrica, Prešov, and Košice have the lowest road accessibility potential (60-80) which is similar to the nearby regions in Poland and Hungary. Slovakia has 780km of completed highways. Another 1,100km are under construction or planned to be built.

## Accessibility potential by rail in 2030

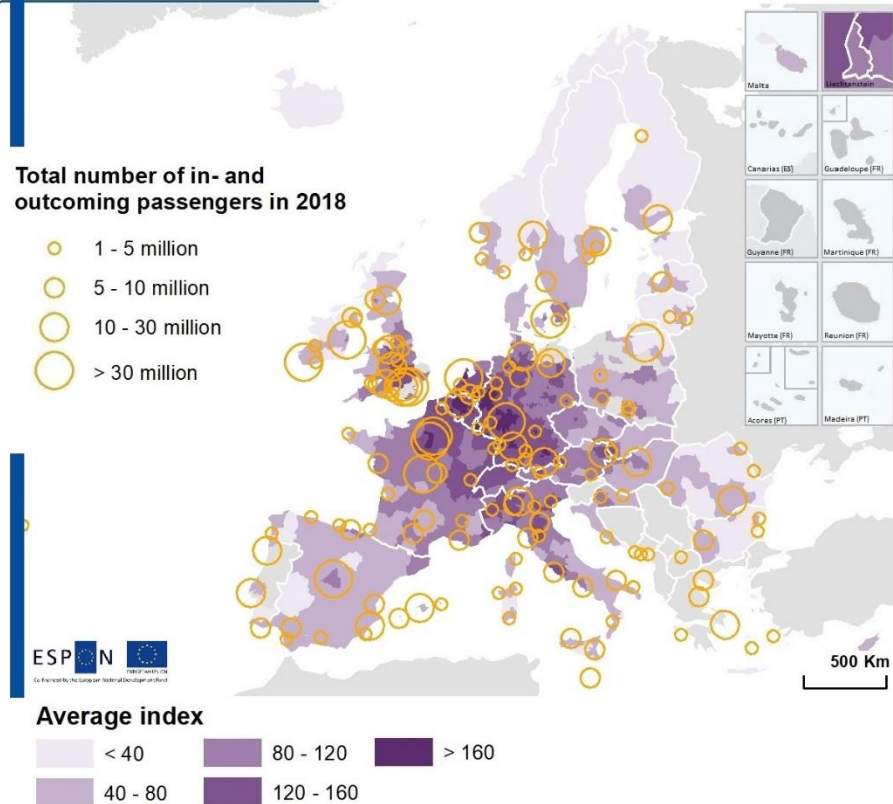


Rail accessibility has similar characteristics to road accessibility. There are differences between core European regions, where accessibility is best, and peripheral regions, where it is declining. The area of above-average accessibility potential by rail is slightly larger than that of accessibility potential by road. Above-average accessibility by rail is common in the southeast of England, Benelux, Switzerland, almost the entirety of France, Germany, Austria, Slovenia, and northern Italy. The lowest rail accessibility potential is found in the Nordic and Baltic countries, Ireland, Scotland, the Balkan countries, the west and south of the Iberian Peninsula, and the large Mediterranean islands.



From the point of view of rail accessibility potential, Slovakia is slightly on the more peripheral end than from the perspective of road accessibility. The only Slovakian region with above-average rail accessibility potential is the capital Bratislava (100-120), identical to the neighbouring region in Austria. In the second class (80-100) are the regions of Trnava and Trenčín, and in the third class (60-80) are the regions of Nitra and Žilina, both cases are similar to the nearby regions in the Czech Republic, Poland, and Hungary. Banská Bystrica, Prešov, and Košice have lowest potential of accessibility (40-60), similar to the nearby regions in Poland and Hungary. Slovakia has 3,600km of railway tracks.

## Global accessibility and main airports



Number of passengers:  
Level: Airports  
Source: Eurostat, 2020

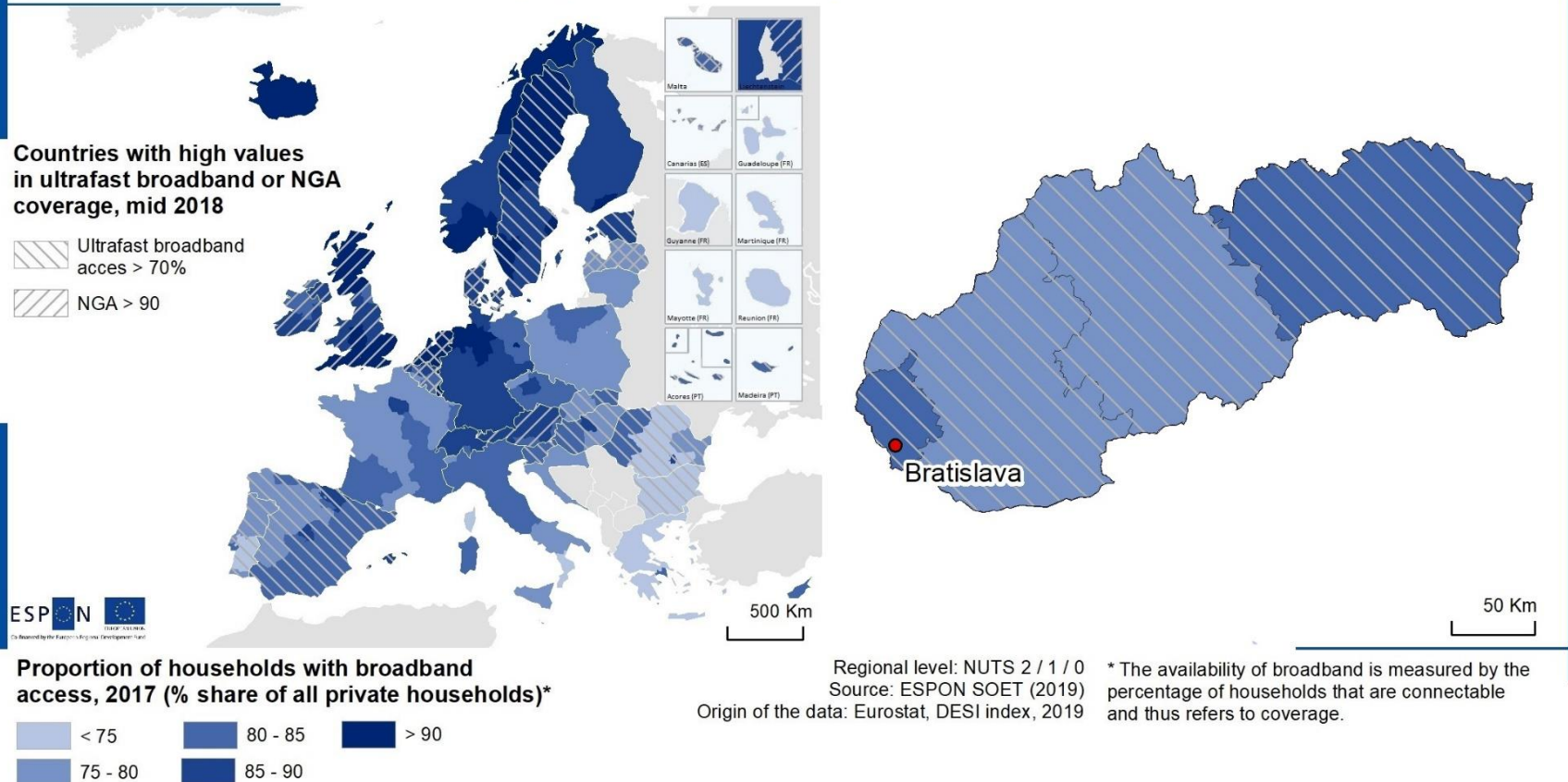
Accessibility index:  
The index is calculated as the average index from the Spiekermann & Wegener study (2014) combining the accessibility by road, rail and air.  
Source: ESPON S1W, 2014 | Level: NUTS 3

ESPON has mapped accessibility, which is a key theme of polycentric development, in several projects. The map above shows an example of calculated accessibility and the number of arriving and departing passengers in the ESPON area. The accessibility index assumes that the attractiveness of a destination increases with size and decreases with distance, travel time, or cost. Population represents destination size. Air transport is important to global connectivity, both in continental Europe and in intercontinental travel. There has been a significant growth in air transport in the EU in the last few years. In 2018, intra-EU air transport had a share of 46% of the total air transport in the EU, extra-EU air transport was 37%, while the national share was 16%. London,

Paris, Amsterdam, Frankfurt, and Madrid are the major global hubs in Europe.

Airport M. R. Štefánika - Airport Bratislava, a.s. (BTS) is the largest airport in the Slovakia with 2.29 million passengers (2019) and approximately 26,000 tons of cargo and 27,000 aircraft movements. In the last two decades, it has shown a great increase in air traffic, either despite or because of the proximity of Vienna Airport (VIE) in Austria (having an air distance of only 50km) which is the tenth most internationally connected airport in Europe.



**Broadband access in households and high speed internet coverage**

Broadband access and high-speed internet are considered essential to future competitiveness, connectivity and inclusiveness. EU 2025 targets aim to ensure fast connections for schools, main public services, public transport hubs and digital-intensive enterprises, and a minimum of 100Mbps for all European households. In 2017 ultrafast broadband access was above 70% in Sweden, Denmark, Estonia, Latvia, the Lowlands, Spain, Portugal, Slovenia, Slovakia, Hungary, Romania, and Bulgaria. Next Generation Access (NGA) broadband was above 90% in the UK, Denmark, the Lowlands, Latvia, and Austria. The share of households with broadband access was highest in central and northern Europe.

The highest proportion of households with broadband access in 2017 (80-85%) is in the western capital region of Bratislava and the eastern regions of Prešov and Košice. Bratislava has the same values as neighbouring regions in the Czech Republic and Hungary, but lower than in Austria, while the Prešov and Košice regions have higher values than neighbouring regions in Poland and Hungary. In the second class (75-80%) are the regions of Trnava, Trenčín, Nitra, Žilina, and Banská Bystrica, where the values are the same as in neighbouring regions in Poland, but lower than those of the Czech Republic and Hungary. In mid-2018, the share of ultrafast broadband access in Slovakia was over 70%.



## Urban structure

Potential physical impact of climate change

Morphology of main structures

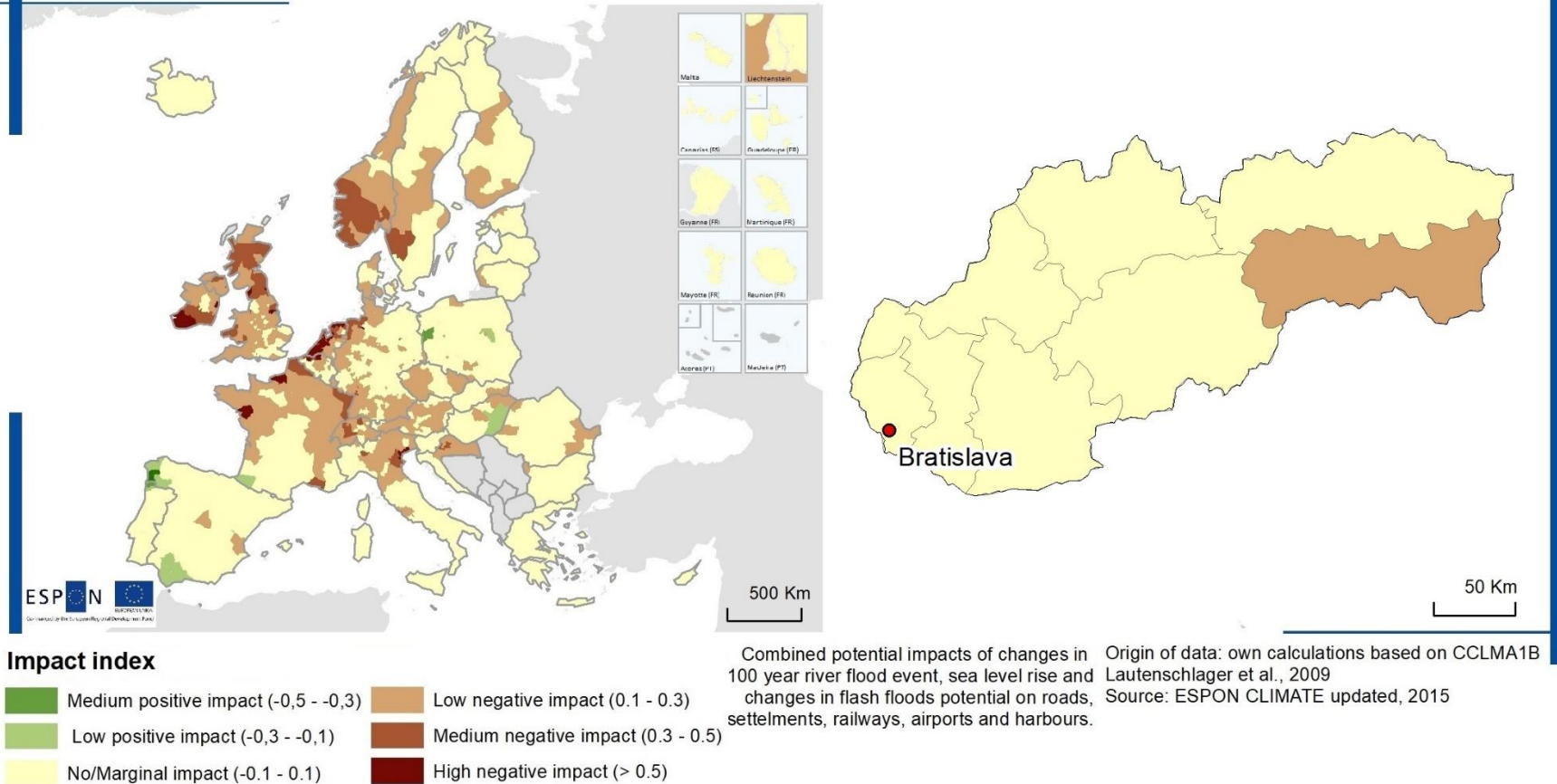
Regional share of protected areas

Share of protected urban area

This chapter focuses on the morphology, the state and the spatial patterns of the existing urban structure and green areas. Urban morphology is something that has evolved gradually over a long period of time and is difficult to manage. Much of Europe's current urban structure is the result of seeds planted hundreds, if not thousands, of years ago. This has implications for the capacity of certain territories to become more sustainable.

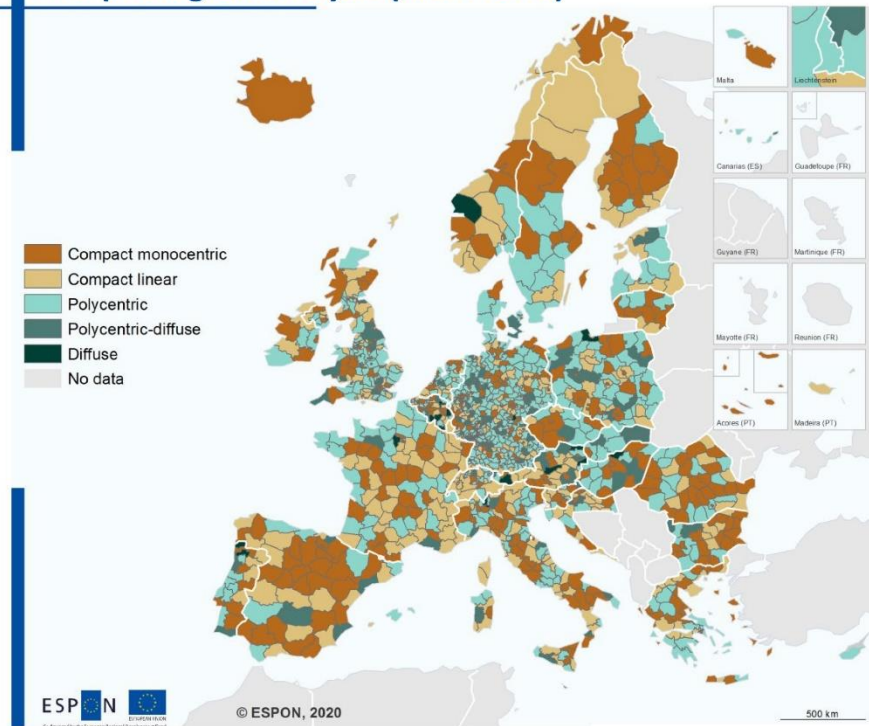
Europe's protected areas are highly diverse in character, varying in size, aim and management approach. They are numerous but generally relatively small in size. This reflects the high pressure on land use created by agriculture, transport and urban development. Since the establishment of the Natura 2000 network in 1992, it has led to an increase in the area of protected land in Europe. Further expansion of terrestrial protected areas is needed to meet the 2030 EU Biodiversity Strategy target of protecting at least 30% of EU land by law.

The share of urban land used area in protected areas is minimal to non-existent in some parts of Europe, especially at the European periphery. Other regions have a high degree of overlap between natural and urban uses. In these areas, Green Infrastructure is likely to be a major spatial planning issue and thus likely to be more fragmented.

**Potential physical impact of climate change from 2071 to 2100**

Settlements and transport infrastructure (roads, railways, airports, harbours...) may be affected by climate change. They can be sensitive to extreme weather events, such as floods and storms, which are expected to increase in many areas. The northwestern European regions along the coast may face a rise in sea level and a predicted increase in river flooding. Other small hotspots can be found in the regions in and around the Alps, at the outlet of the Rhone, in the Po Valley, and in some parts of central-eastern Europe. Most river valleys in Europe may be vulnerable to river flooding, but this is not the case for Eastern Europe due to decreasing precipitation.

The highest increase in potential physical impacts in Slovakia is predicted for the eastern region of Košice, with a low increase (0.1-0.3). For the rest of Slovakia, the model predicts that there will be only marginal or no potential physical impacts of climate change. This is in line with neighbouring regions in Poland and Hungary and lower than neighbouring regions in the Czech Republic and Austria. However, this map of the ESPON CLIMATE project merely depicts the potential impact of floods and sea level rise on a specific amount of infrastructure. The impact of other processes – such as enhanced soil erosion, droughts and heat island effects – were not included in the calculations.

**Morphological analysis (main form)**

Regional level: NUTS 3 2016  
 Source: ESPON SUPER 2020  
 Origin of data: CLC, BBSR, 2020  
 UMS RIATE for administrative boundaries



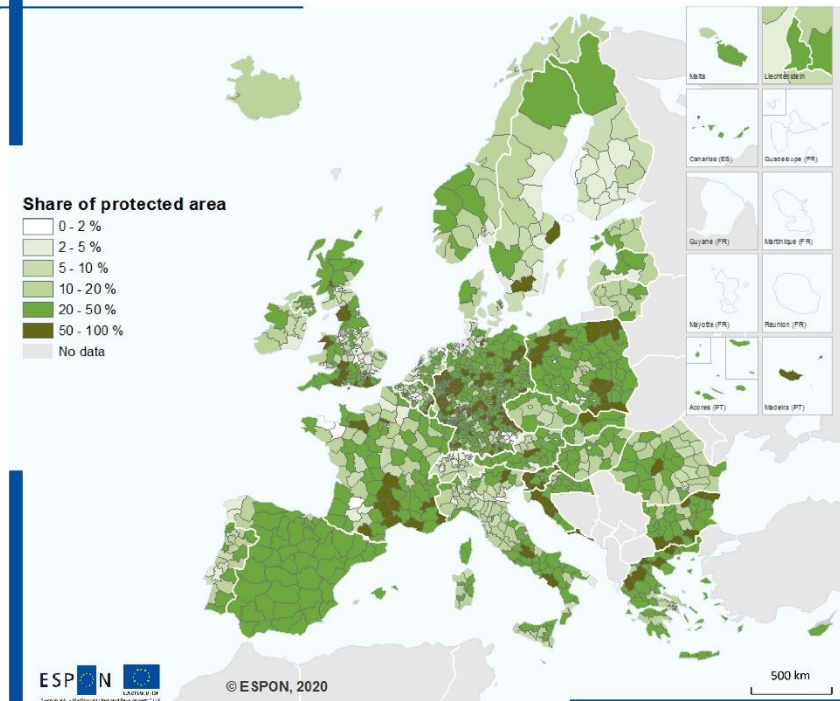
The ESPON SUPER project has attempted to classify NUTS 3 regions in terms of their urban form. The methodology used (expert judgement) is experimental, unorthodox and should be considered indicative and preliminary. The starting point for the classification of urbanisation were classes: “compact”, “polycentric” and “diffuse” - following the book “A Field Guide to Sprawl” (Hayden, 2004), which uses visual information – aerial photographs – to identify urban forms. Compact urban structures are typical for Iceland, Norway, Finland, Lithuania, Spain, and Bulgaria. Polycentric urban structures are typical for England, the Netherlands, Germany, Denmark, and Slovakia. Sweden is divided between a compact north and a polycentric south, Portugal between a compact east and a polycentric west and the Czech Republic between a compact west and

a polycentric east. France, Belgium, Poland, Romania, Italy, and other countries are all quite heterogeneous. These results challenge the conventional wisdom of a traditional compact Mediterranean urban form versus dispersed development in the more northern regions, or the stereotypes of idyllic compact Italian cities versus urban sprawl in Belgium.



In Slovakia, the compact monocentric urban main structure is typical for the capital region of Bratislava. Polycentric urban structures are typical for the regions of Trnava, Nitra, Banská Bystrica, and Žilina. Polycentric-diffuse urban structures are typical for the Trenčín region and the eastern regions of Prešov and Košice.



**Share of protected areas in NUTS3 regions**

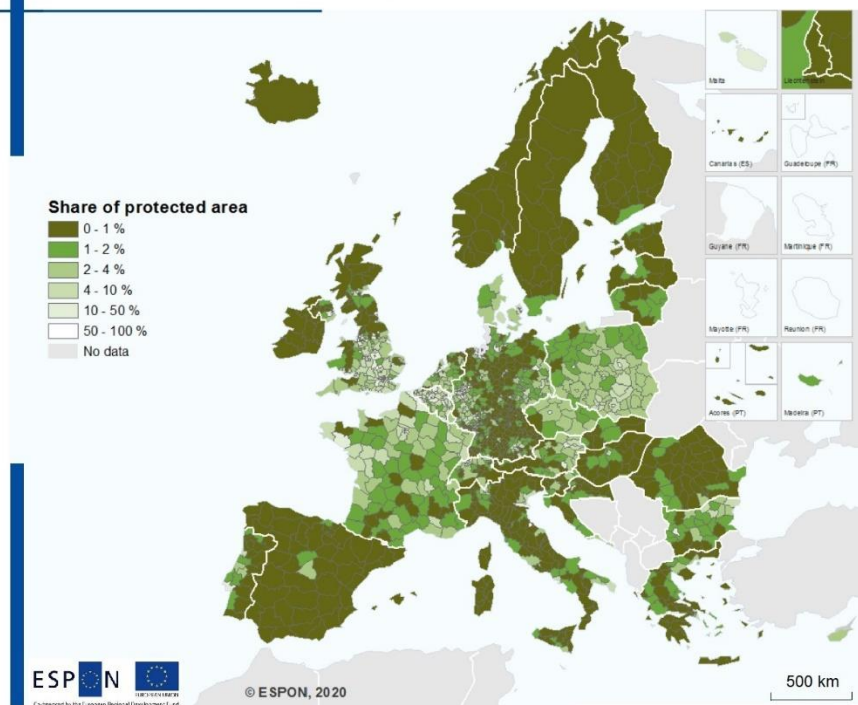
Regional level: NUTS 3  
Source: ESPON SUPER 2020  
Origin of the data: Corine landcover 2019, Eurostat



In the past, aesthetics was the main criterion for the creation of protected areas. More recently, however, biodiversity has become the predominant criterion. With the EU Birds and Habitats Directives, each member state is obliged to create the Natura 2000 network by designating sites in relation to the natural habitat types and habitats of species of European interest on its territory. In 2019, the network covered a total area of 1,358,125km<sup>2</sup>, which is 18% of the combined terrestrial area of the EU and the UK, with ca. 28,000 sites. Slovenia (38%) and Croatia (37%) have the highest share of protected areas by Natura 2000 sites, while Denmark (8%) and the UK (9%) have the lowest share.



The highest share of protected areas in Slovakia (50-100%) is in the mountainous northern region of Žilina. Most of the rest of Slovakia has a high share of 20-50% of protected areas. Slovakia has the fourth highest share of protected areas in the Natura 2000 network, covering 30% of its territory. It has 9 national parks and 14 landscape protected areas, some of which are supported by international standards. Mountain areas (Carpathians) in Slovakia make up about three-fifths of the territory. Slovakia is a member of Carpathian Convention, which aims at conservation and sustainable use of biological and landscape diversity. The importance of biodiversity as a reservoir of species is illustrated by the example of the lynx (*Lynx lynx*). After becoming extinct in Slovenia, individuals from Slovakia were reintroduced in 1973.

**Share of urban used area in protected areas in 2018**

Regional level: NUTS 3  
 Source: ESPON SUPER, 2020  
 Origin of data: Corine Landcover, 2019



The map shows the share of urban land use in protected areas to give an idea of the different types of green infrastructure and associated ecosystem services. A high degree of overlap between urban land use and protected areas is typical for England, Belgium, individual regions in the north and west of France, the south of the Netherlands, western Germany, Denmark, Poland, the Czech Republic, and eastern Austria. The share of urban land use in protected areas is very low in Iceland, Norway, Sweden, Finland, Estonia, Latvia, Scotland, Ireland, Portugal, Spain, Slovakia, Hungary, Romania, Croatia, Greece, and in the belt from northern to southern central Germany, western Austria, and Italy.



In Slovakia, urban land use in protected areas is generally low. Urban land use in protected areas is very low (0-1%) in the regions of Trnava, Trenčín, Nitra, Prešov, and Košice. Urban land use in protected areas is slightly higher (1-2%) in the Bratislava region in the west and in the central regions of Žilina and Banská Bystrica. Slovakia has a lower share of urban land use in protected areas than the neighbouring regions in Poland, the Czech Republic, and Austria and has the same or similar share as the neighbouring regions in Hungary.

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