Territorial typologies for European cities and metropolitan regions

Statistics Explained

Data from February 2013

Maps can be explored interactively using the Eurostat Statistical Atlas (see User's manual).

This article describes two linked typologies which have been developed to cover, without any overlaps or omission, the whole geographical territory of the European Union (EU) , Iceland, Norway, Switzerland and Croatia at the local and regional level — the typologies cover:

- the definition of a city and its commuting zone, and;
- a typology of metro regions.

As opposed to the typologies presented in the territorial typologies article (the degree of urbanisation and the urban–rural regional typology) which rely mainly on population density, the two typologies presented in this article add a functional dimension. They are both forms of functional urban areas and are based on the flows of people commuting to work in a city.

Functional urban areas: a city and its commuting zone

Definition of a city

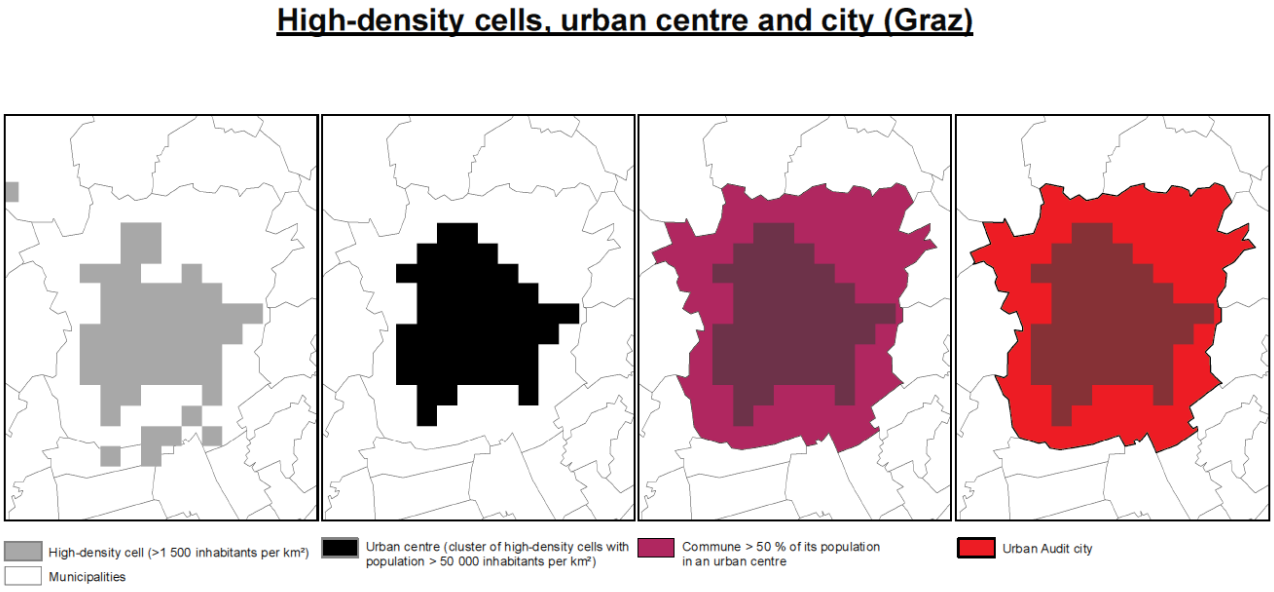


Figure 1: Defining a city — high-density cells, urban centre and city (Graz, Austria) - Source: Directorate-General for Regional and Urban Policy

The new city definition works in four basic steps and is based on the presence of an 'urban centre', a new spatial concept based on high-density population grid cells.

Step 1: all grid cells with a density of 1 500 inhabitants per km^2 or more are selected (image 1 of Figure 1).

Step 2: the contiguous[1] high-density cells are then clustered, gaps[2] are filled and only the clusters with at least a population of 50 thousand inhabitants (image 2 of Figure 1) are kept as an 'urban centre'.

Step 3: all the municipalities (local administrative units level 2 (LAU2)) with at least half their population inside the urban centre are selected as candidates to become part of the city (image 3 of Figure 1).

Step 4: the city is defined ensuring that:

- there is a link to the political level;
- at least 50 % of the population lives in an urban centre, and;
- at least 75 % of the population of the urban centre lives in a city (image 4 of Figure 1).

In most cases, as for example in Graz (in Austria), the last step is not necessary as the city normally consists of a single municipality that covers the entire urban centre and the vast majority of the city's residents live in that urban centre.

For 33 urban centres stretching far beyond the city, a 'greater city' level was created to improve international comparability (for more detail see the Directorate-General for Regional and Urban Policy's publication — Regional Focus 01/2012) .

[1] Contiguity for high-density clusters does not include the diagonal (in other words, cells with only the corners touching).

[2] Gaps in the high-density cluster are filled using the majority rule iteratively. The majority rule means that if at least five out of the eight cells surrounding a cell belong to the same high-density cluster it will be added. This is repeated until no more cells are added.

To ensure that the above definition identified all relevant centres, national statistical authorities were consulted and minor adjustments were made where needed and consistent with this approach.

Identification of a commuting zone

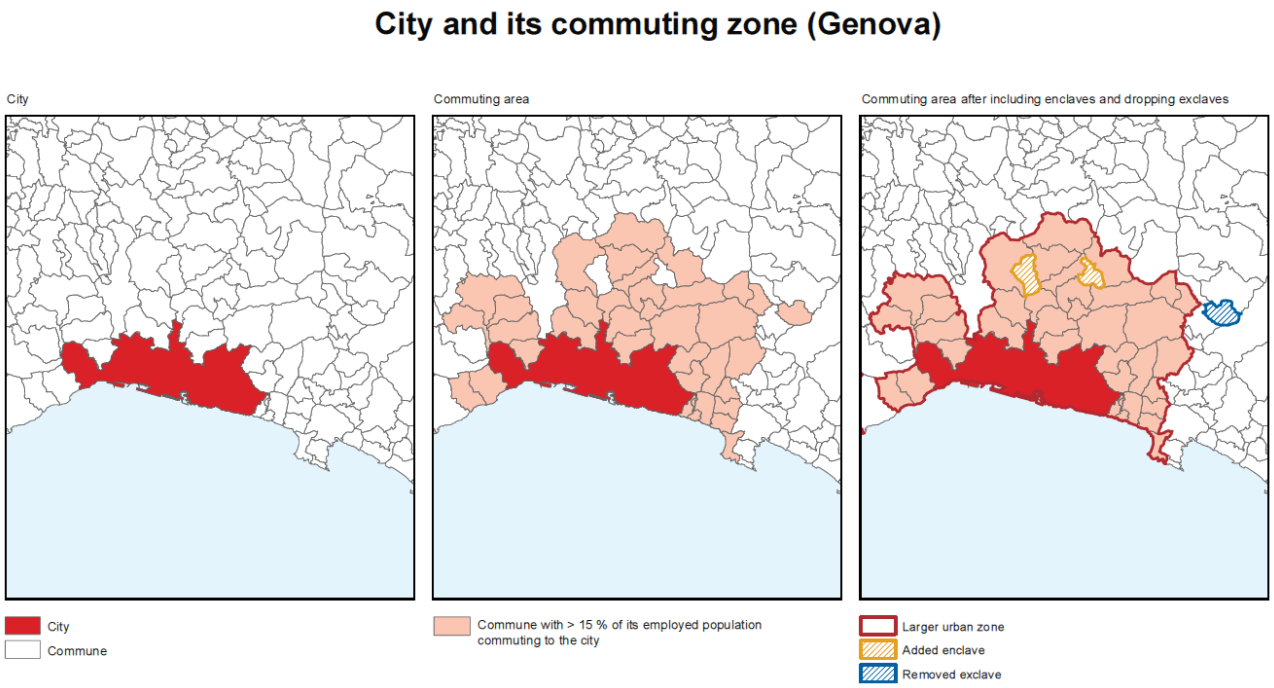


Figure 2: How to define a city and its commuting zone (Genova, Italy) - Source: Directorate-General for Regional and Urban Policy

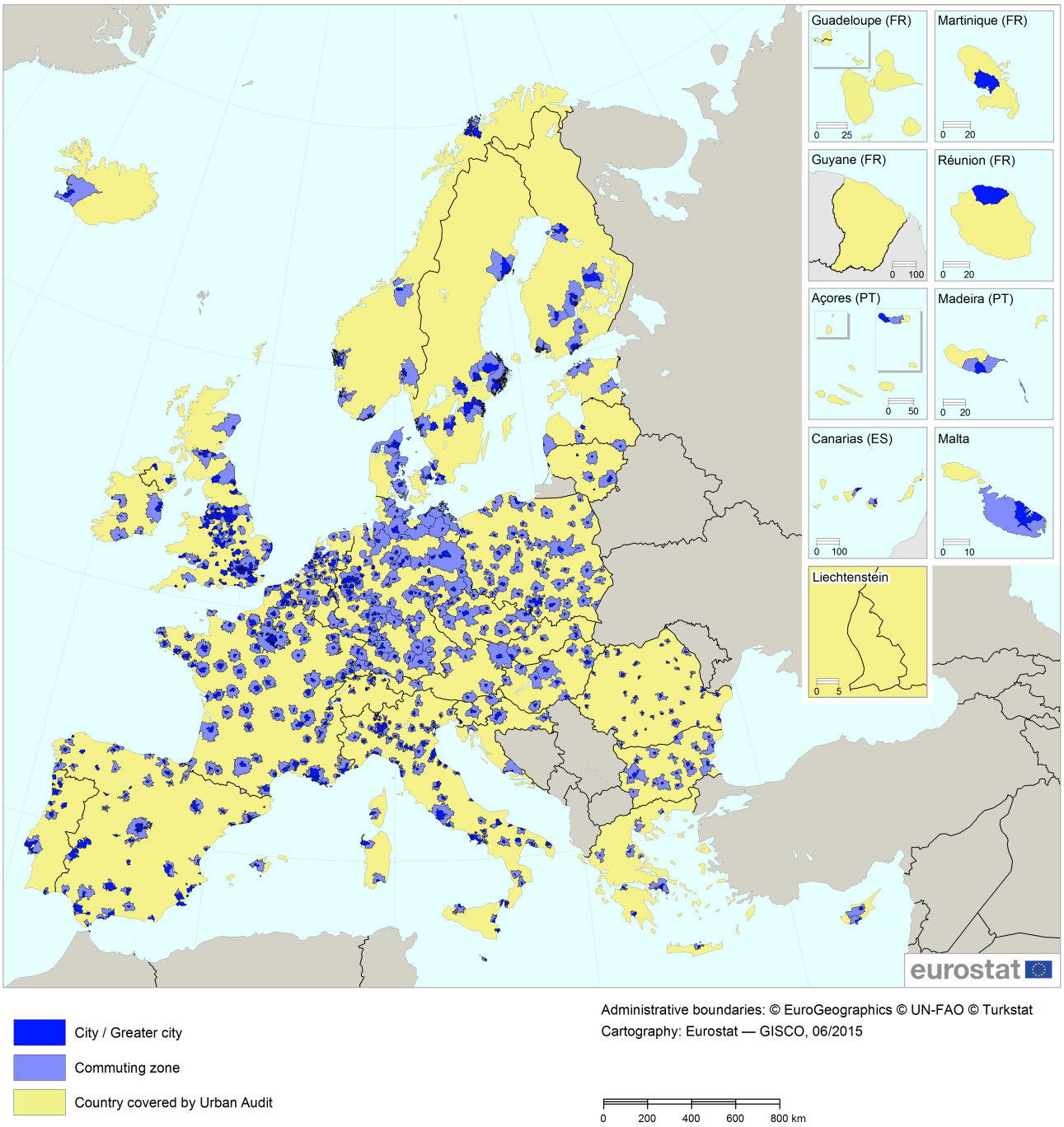
Once all cities have been defined, a commuting zone can be identified based upon commuting patterns using the following steps:

- if 15 % of employed persons living in one city work in another city, these cities are treated as a single city (image 1 of Figure 2);
- all municipalities with at least 15 % of their employed residents working in a city are identified (image 2 of Figure 2);
- municipalities surrounded[3] by a single functional area are included and non-contiguous municipalities are dropped (image 3 of Figure 2).

The functional urban area (FUA) consists of the city and its commuting zone.

[3] Surrounded is defined as sharing 100 % of its land border with the functional area.

Urban Audit cities and Functional urban areas, 2012 (1)



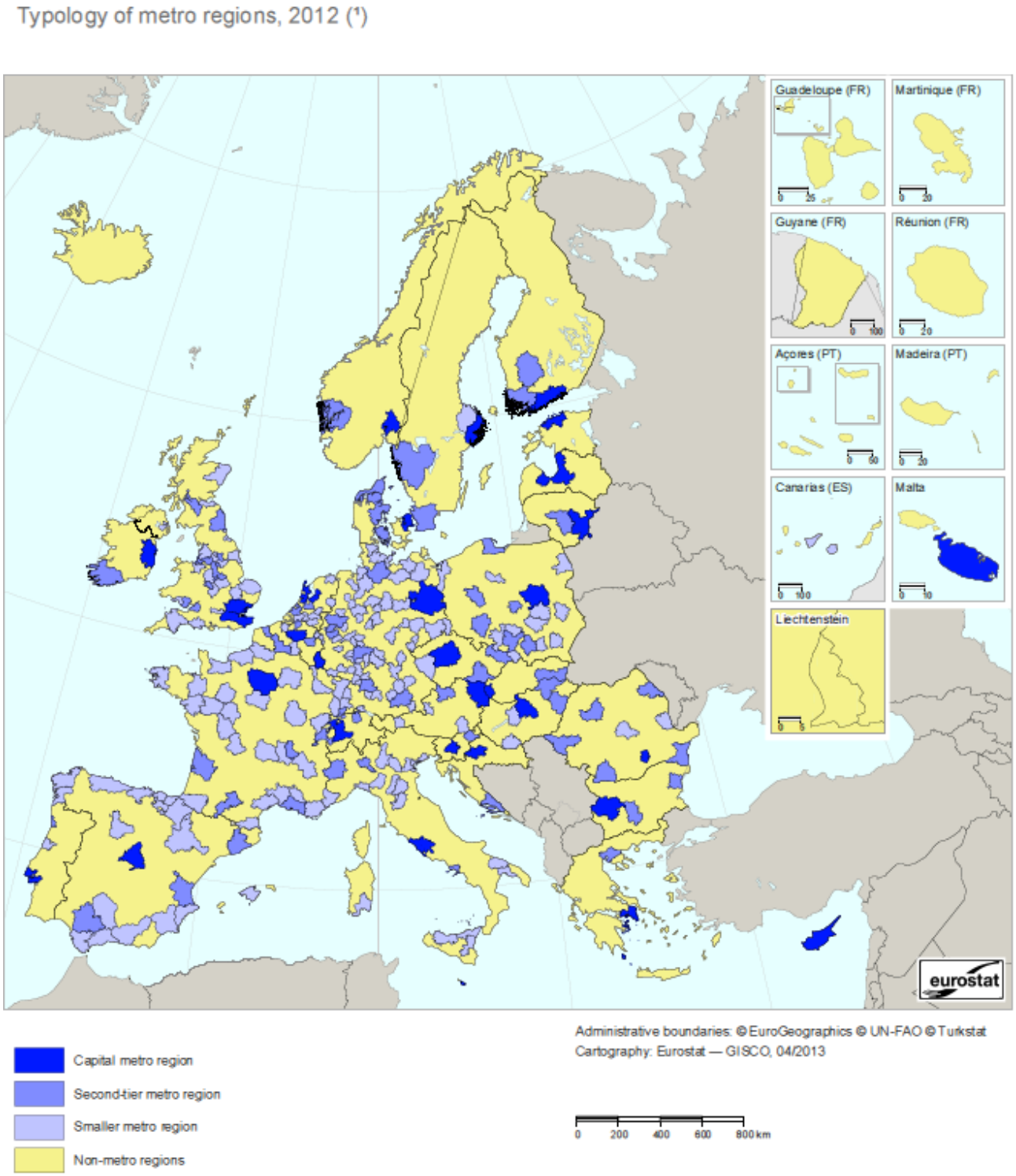
(¹) Based on population grid from 2006.

Source: Directorate-General for Regional and Urban Policy

Map 1: Urban Audit cities and Functional urban areas (FUAs), 2012 (1) - Source: Directorate-General for Regional and Urban Policy

For more details on the sources and reference years for the commuting zones, see Regional Focus 01/2012) : Cities in Europe — The new OECD–EC definition (Lewis Dijkstra and Hugo Poelman).

A typology of metro(politan) regions



Map 2: Typology of metro regions, 2012 (1) - Source: Directorate-General for Regional and Urban Policy

Metro regions are NUTS level 3 approximations of the functional urban areas (city and commuting zones) of 250 thousand or more inhabitants following the definition described above. Each metro region consists of one or more NUTS level 3 regions and is named after the principal functional urban area inside its boundaries.

The typology distinguishes three types of metro regions:

- capital metro regions;
- second-tier metro regions;
- smaller metro regions.

The capital metro region includes the national capital. Second-tier metro regions are the group of largest cities in a country, excluding the capital. For this purpose, a fixed population threshold could not be used. As a result, a natural break served the purpose of distinguishing the second-tier from the smaller metro regions. The regions which do not belong to a metro region are simply called non-metro regions. This typology can be simplified even further by grouping all individual metro regions together into metro regions.

The boundaries of a functional urban area do not necessarily coincide with those of NUTS level 3 regions. Therefore, NUTS level 3 regions in which at least 50 % of the regional population lives inside a given functional urban area were selected as the components of the metro region related to that functional urban area. In some cases, the NUTS level 3 approximation of the functional urban area is very good. In others cases, the metro region may be larger or smaller than the functional urban area. Each functional urban area is represented by at least one NUTS level 3 region, even if that NUTS level 3 region has less than 50 % of its population inside the functional urban area.

Links between the definition of a city and its commuting zone and the degree of urbanisation typology

The first building block of the city definition described above is the urban centre and this is identical to the one used in the degree of urbanisation typology . As a result, the city (or densely-populated area) as defined in the degree of urbanisation is identical to the city definition described here. The two maps below show the two local typologies for the area of the Polish–Slovakian border.

The difference arises in the second building block. The city definition identifies contiguous areas which have strong commuting flows. These are the commuting zones (see Figure 3).

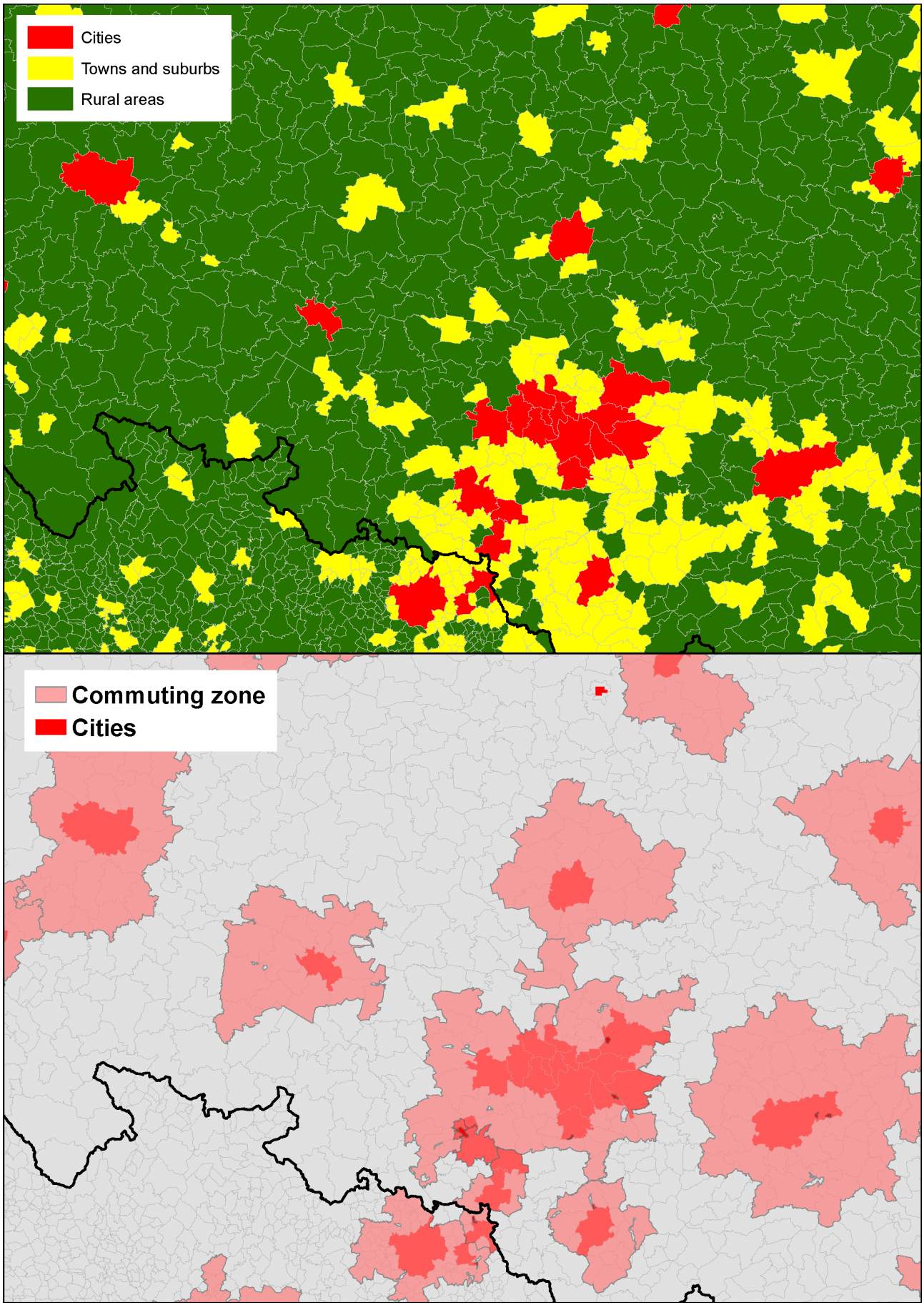


Figure 3: Cities and commuting zones compared with the degree of urbanisation on the Polish–Slovakian border - Source: Directorate-General for Regional and Urban Policy

The degree of urbanisation identifies towns and suburbs (or intermediate density areas) and rural areas (or thinly-populated areas) based on population density. As a result, these two categories partially overlap with the commuting zones. The towns and suburbs category will occur both inside commuting zones (in this case they are more likely to be suburbs) and outside (in this case they are towns). Rural areas fall primarily outside commuting zones, but some rural areas have developed a strong commuting relationship with a nearby city and thus can also be found in some commuting zones.

No link between metro regions and the urban–rural regional typology

The two local level typologies have one type in common, namely cities, whereas the two regional typologies each have different types. The typology of metro regions divides NUTS level 3 regions into metro and non-metro regions while the urban–rural typology divides NUTS level 3 regions into predominantly urban, intermediate and predominantly rural regions.

Despite the absence of an identical type or class of region, the two regional typologies are quite similar:

- most urban regions are metro regions and vice versa;
- most rural regions are non-metro and vice versa;
- intermediate regions are split between metro and non-metro regions.

Figure 4 shows the classification of regions close to the Polish–Slovakian border and contains examples of the most common links between these two regional typologies. The differences arise from three main sources: a different logic, different size thresholds, and; a different number of classes.

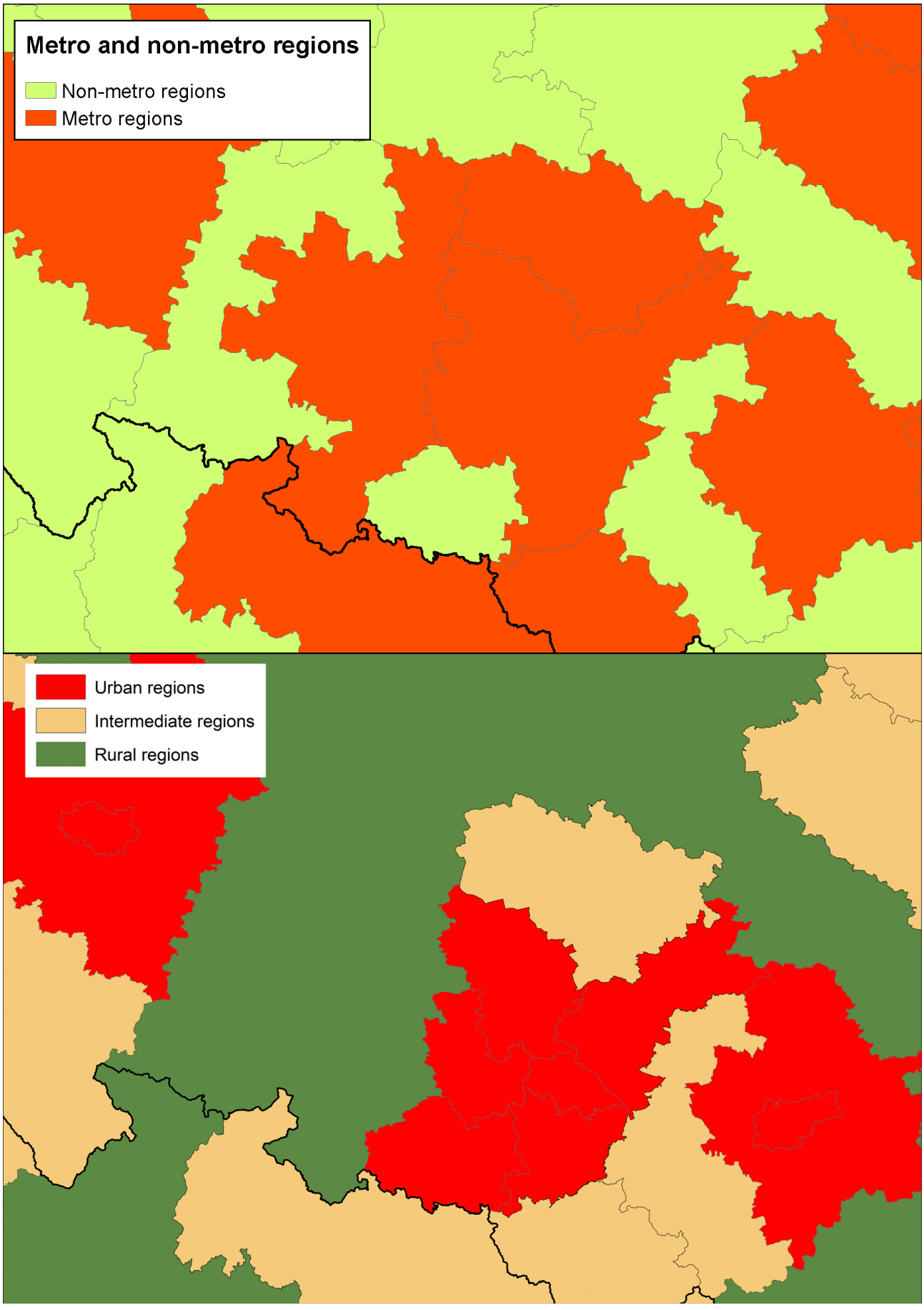


Figure 4: Metro and non-metro regions compared with the urban–rural typology on the Polish–Slovakian border - Source: Directorate-General for Regional and Urban Policy

1. The different logic behind the two typologies can be described as morphological and functional. The urban–rural typology depends more on the population size and density, which in turn is determined by urban form. So this is a variant of the morphological definition. The typology of metro regions relies on the presence of an urban centre and of functional economic ties to this centre.
2. The two typologies use quite different size thresholds. Metro regions are related to cities plus commuting zones of at least 250 thousand inhabitants. Urban regions represent urban centres of 50 thousand or more inhabitants (which also define cities) and/or urban clusters of 5 thousand or more inhabitants (which also define towns and suburbs).
3. The urban–rural typology has three types of region, while the typology of metro regions has only two.

Due to these differences, some urban regions will become non-metro regions because the city and its commuting zone are too small (or does not have a city). Some rural regions can become part of a metro region if they have strong commuting links to a city in that or a neighbouring region.

Data source

These two typologies — the definition of a city and its commuting zone and the typology of metro regions — have been developed to benefit from three different data sources: the Urban Audit; survey data using the degree of urbanisation; and NUTS level 3 data.

The Urban Audit collects a limited number of key indicators for individual cities and their Functional urban area (FUA) (city plus commuting zone) annually. This new definition ensures high international comparability both within Europe and — through cooperation with the OECD — outside of Europe.

Surveys using the degree of urbanisation can provide data points for all cities in a country. Usually the sample inside cities is sufficient to provide reliable estimates for the headline indicators, in other words the key indicators that refer to the entire population. This source cannot however provide data for the commuting zone and in most cases the sample is also too small to provide figures for individual cities. The main exception is labour force survey data for cities that are also NUTS level 2 regions, such as Inner and Outer London in the United Kingdom, the Région de Bruxelles-Capitale / Brussels Hoofdstedelijk Gewest in Belgium, Wien in Austria or Praha in the Czech Republic.

The metro regions allow an analysis of NUTS level 3 data. This is particularly useful to analyse changes in GDP and employment (by sector). This facilitates an assessment of the differences in GDP per inhabitant, labour productivity and employment shares and their changes over time. In addition, several other data collections are available for metro regions including patent data, population change and net migration.

Context

The European Commission has introduced typologies based on population size, density and commuting flows to monitor the situation and developments in cities and metro regions.

The Lisbon Treaty included territorial cohesion alongside economic and social cohesion as an objective for the EU. This concept was presented in a Green Paper on territorial cohesion: turning territorial diversity into strength (COM(2008) 616) and the background summarised in the sixth progress report on cohesion (2009). The fifth cohesion report explains the main issues related to territorial cohesion and how these could be incorporated into policy proposals. One of the main issues is the need for data on different territorial levels, particularly for lower (more detailed) geographical levels. The city definition and the typology of metro regions provide new insights into developments at the local and the regional level and improve data availability by linking and simplifying the number of territorial definitions.

Other articles

- Regions and cities
- Territorial typologies (background article)

Database

- Metropolitan regions (met)
- Urban audit

Dedicated section

- Degree of urbanisation
- Cities

Publications

- Defining urban areas in Europe (PDF)
- Eurostat regional yearbook 2013 - chapter 13
- Defining urban areas in Europe , overview poster published by DG Regional and Urban Policy (PDF file)

Visualisations

- Eurostat Statistical Atlas (Chapter 13)