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CITIES IN EUROPE THE NEW OECD-EC DEFINITION

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1. INTRODUCTION

Until recently, there was no harmonised definition of ‘a city’ for European and other countries member of the Organisation for Economic Cooperation and Development (OECD). This undermined the comparability, and thus also the credibility, of cross-country analysis of cities. To resolve this problem, the OECD and the European Commission developed a new definition of a city and its commuting zone in 2011.

This new OECD-EC definition identified 828 (greater) cities with an urban centre of at least 50 000 inhabitants in the EU, Switzerland, Croatia, Iceland and Norway. In addition, this methodology identified a further 492 cities in Canada, Mexico, Japan, Korea and the United States. This Regional Focus describes on the European cities, for information on the other cities, see *Redefining urban: a new way to measure metropolitan areas* (OECD 2012) ⁽¹⁾. Half of these European cities are relatively small with a centre between 50 000 and 100 000 inhabitants. Only two are global cities (London and Paris). These cities host about 40% of the EU population. These cities do not include towns and suburbs which cover another 30% of the EU population according to the revised degree of urbanisation classification.

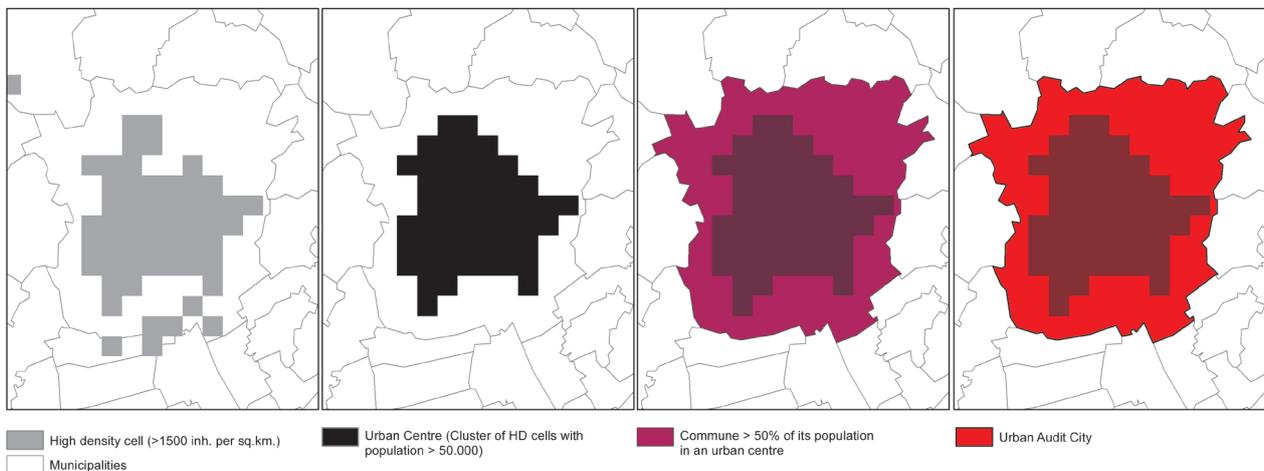
Each city is part of its own commuting zone or a polycentric commuting zone covering multiple cities. These commuting zones are significant, especially for larger cities. The cities and commuting zones together (called Larger Urban Zones) account for 60% of the EU population.

2. A HARMONISED DEFINITION

2.1. Definition of a city

This new 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.

Figure 1.1-4 How to define a city – High density cells, urban centre and city (Graz)



Step 1: All grid cells with a density of more than 1 500 inhabitants per sq km are selected (Figure 1.1.).

Step 2: The contiguous ⁽²⁾ high-density cells are then clustered, gaps ⁽³⁾ are filled and only the clusters with a minimum population of 50 000 inhabitants (Figure 1.2) are kept as an ‘urban centre’.

Step 3: All the municipalities (local administrative units level 2 or LAU2) with at least half their population inside the urban centre are selected as candidates to become part of the city (Figure 1.3).

Step 4: The city is defined ensuring that 1) there is a link to the political level, 2) that at least 50% of city the population lives in an urban centre and 3) that at least 75% of the population of the urban centre lives in a city (Figure 1.4) ⁽⁴⁾.

1 www.oecd.org/gov/regional/measuringurban

2 Contiguity for high-density clusters does not include the diagonal (i.e. cells with only the corners touching).

3 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

4 This step is not included in the non European cities.

In most cases, as for example in Graz, the last step is not necessary as the city consists of a single municipality that covers the entire urban centre and the vast majority of the city 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 (see below for more detail).

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

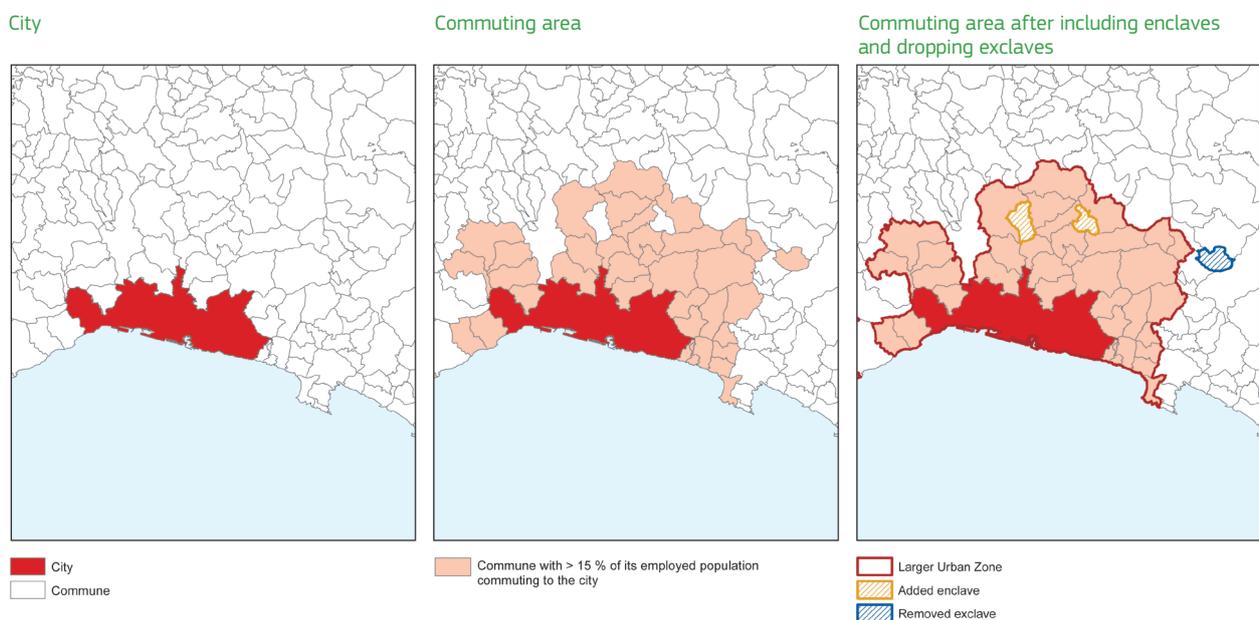
2.2. Definition of a commuting zone

Once all cities have been defined, a commuting zone can be identified based on 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.
- All municipalities with at least 15% of their employed residents working in a city are identified (Figure 2.2)
- Municipalities surrounded⁽⁵⁾ by a single functional area are included and non-contiguous municipalities are dropped (Figure 2.3).

The Larger Urban Zone consists of the city and its commuting zone.

Figure 2.1-3 How to define a commuting zone – City and its commuting zone (Genova)



For more details on the sources and reference years for the commuting zones please consult the annex.

3. WHAT DOES IT TELL US ABOUT CITIES IN EUROPE?

This definition allows for the first a comparison of the number of cities and the share of population in them on a harmonised basis across Europe.

Each country has its own method of defining a city based on a wide range of criteria. These criteria often include population size and density, but also more functional or historic ones such as having urban functions, being a recipient of national urban policy funds or having received city rights through a charter sometime between the Middle Ages and today. For example, in the UK city status is conferred by the Monarch since 16th century and still is today. This does lead to some surprising cities, such as St Davids in Wales with less than 2 000 inhabitants. Comparing the number of cities based on national definitions across countries is hopelessly distorted by difference in methodology.

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

This new definition does not rely on functions, funding or feudal history, but is purely based on population size and density. To a large extent, the definition identifies the European urban hierarchy as most people would expect it, but with some surprises here and there (see Figure 3). The two largest cities in the EU are, of course, London and Paris.

The six cities with an urban centre of around three million inhabitants however are novel: Athens, Berlin, Madrid, Barcelona, Naples and Milan, because in four out of these six cities the population of their administrative city is so much smaller than the population of their urban centre. For Athens, Barcelona, Naples and Milan, a greater city level was created to better capture this centre (see below). Among the eighteen cities with a centre between one and two million inhabitants, there are six cities for which a 'greater city' level needed to be created.

Figure 3 Number of cities per country and per urban centre size, 2006

Number of cities according to the size of their urban centre							
Country	Cities by urban centre size					Global city	Total
	S	M	L	XL	XXL		
Luxembourg	1						1
Slovenia	1	1					2
Cyprus		2					2
Malta			1				1
Estonia	2		1				3
Slovakia	6	1	1				8
Lithuania	2	2	2				6
Latvia	3			1			4
Ireland	3	1		1			5
Finland	4	2		1			7
Czech Republic	14	2	1	1			18
Netherlands	21	20	1	3			45
Denmark	1	2			1		4
Austria	1	4			1		6
Hungary	5	4			1		10
Sweden	9	2	1		1		13
Bulgaria	12	4	1		1		18
Romania	14	12	7		1		34
Greece	4	3		1	1		9
Portugal	12	1	1	1	1		16
Belgium	6	2	1	1	1		11
Poland	36	14	5	4	2		61
Spain	44	38	9	4	3		98
Italy	44	16	8	2	4		74
Germany	63	39	12	7	4		125
France	59	42	7	5		1	114
United Kingdom	43	47	12	6	2	1	111
EU	410	261	71	38	24	2	806
Iceland		1					1
Norway	4	1		1			6
Croatia	2	2		1			5
Switzerland	4	3	2	1			10
Total	420	268	73	41	24	2	828

Urban centre sizes in population	
S	between 50 000 and 100 000
M	between 100 000 and 250 000
L	between 250 000 and 500 000
XL	between 500 000 and 1 000 000
XXL	between 1 000 000 and 5 000 000
Global city	of more than 5 000 000

Further down the city list, there are still some surprises with some nationally defined cities missing and some other municipalities included (see annex). In part, this is because only the top half of the urban hierarchy has been identified here. Small and medium-sized towns with a centre with between 5 000 and 50 000 inhabitants are not yet defined in a harmonised manner. A new ESPON (www.espon.eu) project 'TOWN' will search for a harmonised definition of the bottom half of the urban hierarchy. Mostly, the surprises are due to the difference in the population of an urban centre and the administrative city.

Looking at the number of cities shows that some countries have only one city (Luxembourg, Malta and Iceland) or two cities (Slovenia and Cyprus). The three most populous countries also have the most cities with over one hundred cities in Germany, the UK and France.

Figure 4 Share of population per country per city size and commuting zone, 2006

Country	S	M	L	XL	XXL	Global City	All cities	Commuting zone	Larger Urban Zone
Luxembourg	18,1						18	82	100
Slovenia	5,4	12,6					18	22	40
Cyprus		41,0					41	20	61
Malta			48,4				48	47	95
Estonia	12,0		29,6				42	14	56
Slovakia	8,6	4,4	7,9				21	12	33
Lithuania	5,5	8,8	26,4				41	12	53
Latvia	11,2			31,7			43	4	47
Ireland	4,0	2,7		28,2			35	22	57
Finland	8,6	7,0		18,6			34	15	49
Czech Republic	10,7	4,6	3,6	11,5			30	29	60
Netherlands	10,5	17,1	1,7	14,6			44	29	73
Denmark	3,6	8,9			21,2		34	29	63
Austria	1,1	8,4			20,0		30	27	56
Hungary	5,3	6,9			16,8		29	20	49
Sweden	11,9	5,0	5,4		15,8		38	15	53
Bulgaria	13,5	9,5	4,5		15,2		43	13	56
Romania	5,8	8,9	9,7		8,8		33	5	38
Greece	2,5	4,1		2,8	27,5		37	16	53
Portugal	12,0	0,9	3,9	9,2	17,3		43	10	54
Belgium	5,2	4,2	3,4	4,4	9,6		27	32	59
Poland	7,5	6,3	4,9	7,1	9,7		35	20	55
Spain	7,6	14,1	6,3	6,1	15,8		50	16	66
Italy	6,6	4,8	3,4	2,2	16,4		33	18	51
Germany	6,6	8,7	5,3	4,9	8,9		34	40	74
France	9,0	13,6	5,3	7,8		10,6	46	19	65
United Kingdom	8,7	13,9	7,3	6,9	8,0	12,4	57	16	73
EU	7,6	9,4	5,1	5,7	9,6	2,8	40	22	62

Country	S	M	L	XL	XXL	Global City	All cities	Commuting zone	Larger Urban Zone
Iceland		62,6					63	8	71
Norway	10,8	3,4		11,5			26	18	43
Croatia	3,9	7,5		17,3			27	17	43
Switzerland	3,7	7,3	8,6	7,3			27	20	47
Total	7,5	9,4	5,0	5,8	9,3	2,8	40	22	61

Note some figures may not add up due to rounding.

Overall, in the EU two out of five residents live in city with a centre of 50000 inhabitants and one out of five lives in a commuting zone of these cities (see Figure 4). Together about three out of five residents live in a city or a commuting zone (or Larger Urban Zone). This share, however, changes substantially between countries. Following this definition, Slovakia and Romania have the lowest shares of their population living in a city or its commuting zone (33% and 38%). Germany, the UK and the Netherlands have the highest shares of population living in a city or commuting zone (73-74%), not considering Luxembourg and Cyprus which have very high shares due to their small size.

4. DETAILED METHODOLOGY

This section describes three adjustments that were made to municipalities identified as part of city based on their share of population in an urban centre.

4.1. Urban centre is much bigger than the city

In some cases, the urban centre stretches far beyond the boundaries of city. This problem is called an 'underbound' city, in other words the city is too small relative to its centre. This can be resolved in three ways: 1) create a greater city level, 2) cover a single centre with multiple cities and 3) a combination of these two approaches.

4.1.1. Creating a greater city

To better capture the entire urban centre, a 'greater city' level can be created. This is a fairly common approach and several greater cities already exist: Greater Manchester, Greater Nottingham etc. This level was created for ten capitals and 23 other large cities (see Figure 5).

The list below also indicates that underbound cities are more common in some countries. For example, nine out of the ten Swiss cities now have a greater city level.

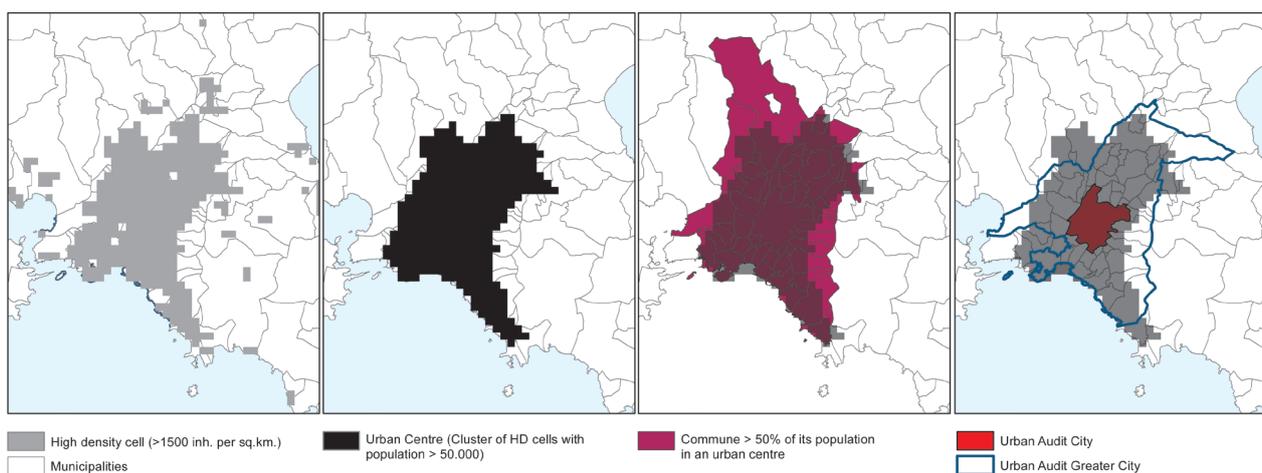
Figure 5 List of Urban Audit greater cities in Europe

Country	Greater city code	Greater city name	National capital?	Number of cities inside greater city
Denmark	DK001K2	København	Y	1
Spain	ES002K1	Barcelona	N	10
Spain	ES019K1	Bilbao	N	3
Finland	FI001K1	Helsinki / Helsingfors	Y	3
France	FR001K1	Paris	Y	1
Greece	GR001K1	Athina	Y	1
Ireland	IE001K1	Dublin	Y	1
Italy	IT002K1	Milano	N	2
Italy	IT003K1	Napoli	N	2
Netherlands	NL002K1	Amsterdam	Y	3
Netherlands	NL003K1	Rotterdam	N	5
Poland	PL010K1	Górnśląski Związek Metropolitalny	N	8

Country	Greater city code	Greater city name	National capital?	Number of cities inside greater city
Portugal	PT001K1	Lisboa	Y	6
Portugal	PT002K1	Porto	N	5
Sweden	SE001K1	Stockholm	Y	1
United Kingdom	UK001K1	Greater London	Y	33
United Kingdom	UK002K1	West Midlands urban area	N	6
United Kingdom	UK006K1	Liverpool	N	3
United Kingdom	UK008K1	Greater Manchester	N	10
United Kingdom	UK013K1	Tyneside conurbation	N	4
United Kingdom	UK014K1	Leicester	N	1
United Kingdom	UK023K1	Portsmouth	N	2
United Kingdom	UK029K1	Greater Nottingham	N	1
United Kingdom	UK541K1	Southend-on-Sea	N	1
United Kingdom	UK552K1	Reading	N	1
United Kingdom	UK562K1	Preston	N	1
Switzerland	CH001K1	Zürich	N	1
Switzerland	CH002K1	Genève	N	1
Switzerland	CH003K1	Basel	N	1
Switzerland	CH004K1	Bern	Y	1
Switzerland	CH005K1	Lausanne	N	1
Switzerland	CH008K1	Luzern	N	1
Switzerland	CH009K1	Lugano	N	1

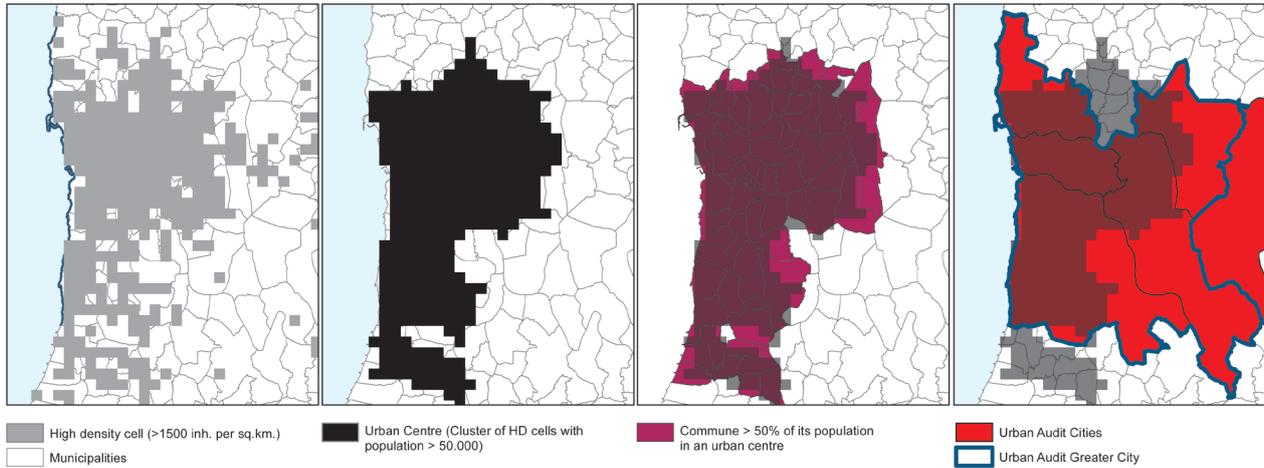
In seventeen cases, the greater city contains a single city. Athens is a clear example of such an approach (see Figure 6). The urban centre (in black) is much bigger than the city (in red). A greater city level was added (blue outline), which captures a far greater share of the population of the urban centre.

Figure 6.1-4 High density cells, urban centre, city and greater city (Athina)



Sixteen greater cities include multiple cities. In most cases, the greater city equals the combination of two or more cities. The greater city of Porto, for example, is made up of five cities (Porto, Vila Nova de Gaia, Gondomar, Valongo and Matosinhos, see Figure 7). In a few cases, the greater city includes several cities and other communes, as for example in Rotterdam, Helsinki, Milan and Naples.

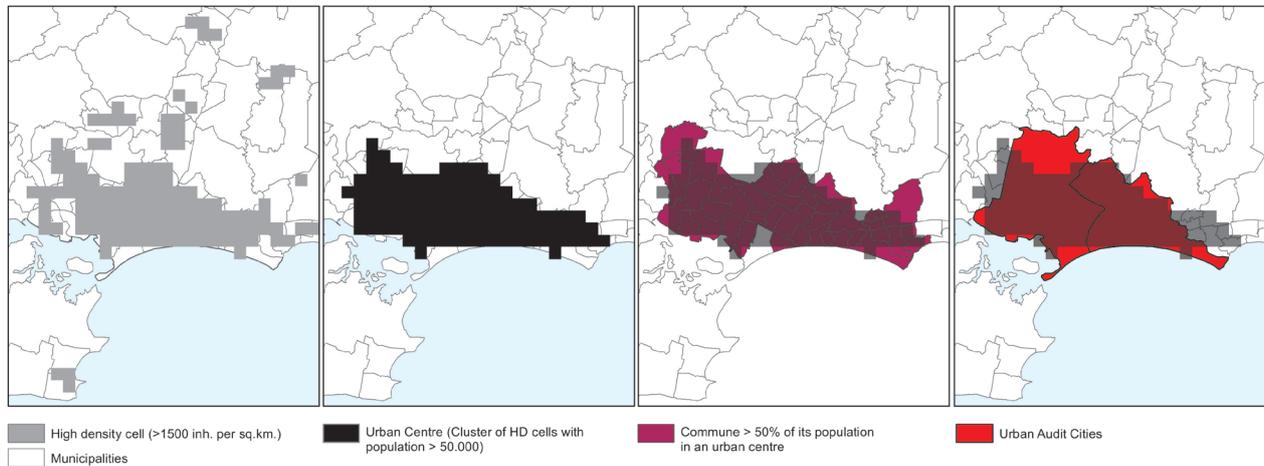
Figure 7.1-4 High density cells, urban centre, cities and greater city (Porto)



4.1.2. Covering a single urban centre with multiple cities

In some cities, instead of creating a 'greater city' level, multiple cities were used to cover one urban centre. For example, Poole and Bournemouth share a single urban centre, but no 'greater city' level was created, just two separate cities (see Figure 8). This was only done in few cases at the request of the National Statistical Institutes, when the cities were similar in size and governed separately.

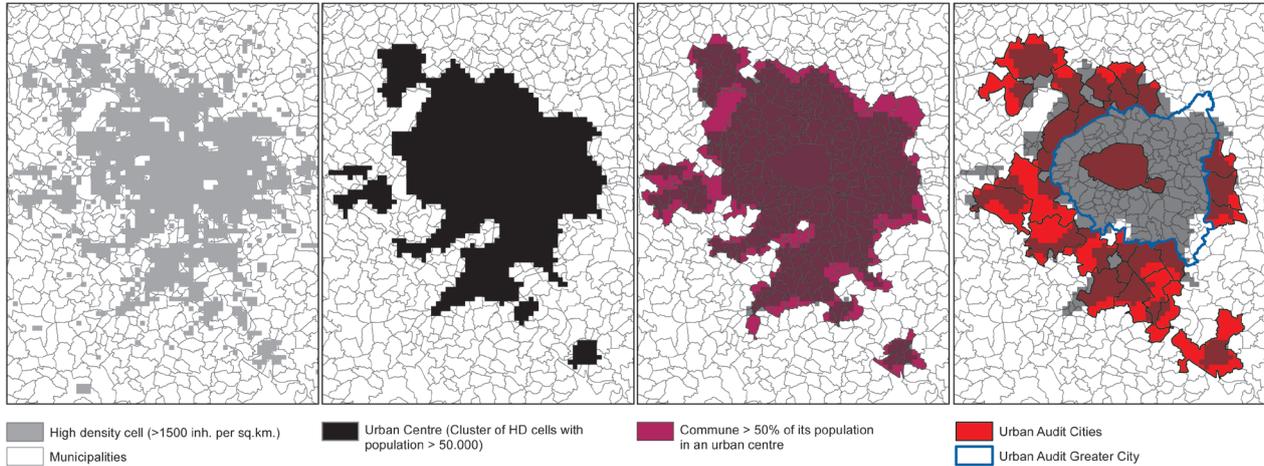
Figure 8.1-4 High density cells, urban centre and cities (Bournemouth - Poole)



4.1.3. Using both a greater city and additional cities to cover a single urban centre

In some cities a combination of both a 'greater city' level and multiple cities were used to cover a single urban centre. For example, the urban centre of Paris is covered by one greater city and several smaller neighbouring cities (see Figure 9).

Figure 9.1-4 High density cells, urban centre, cities and greater city (Paris)



4.2. Matching to the political level

The definition of the degree of urbanisation (see annex) specifies that:

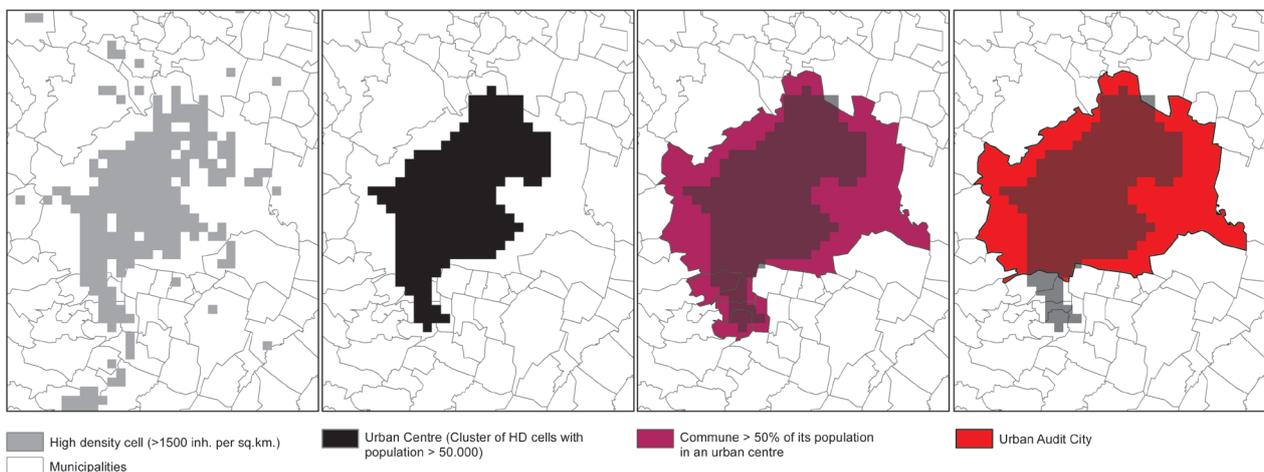
As local administrative units level 2 (LAU2s) vary considerably in area, this methodology will lead to a closer match between a high-density cluster and densely populated LAU2s in countries with small LAU2s than in those with large LAU2s. To take this difference into account, the classification can be adjusted as following:

- A densely populated LAU2 can be classified intermediate as long as 75% of its high-density cluster population remains in densely populated LAU2s.
- An thinly populated or intermediate density LAU2 can be classified as densely populated if it belongs to a group of LAU2s with a political function and if the majority of population of this group of LAU2s lives in a high-density cluster.

4.2.1. City drops a few communes

An example of the application of the first rule is Vienna. A number of small communes just south of the city of Vienna have 50% or more of their population in the urban centre of Vienna. As more than 75% of the population of the urban centre live in the city of Vienna, these smaller communes can be dropped without compromising the comparability of the result (see Figure 10).

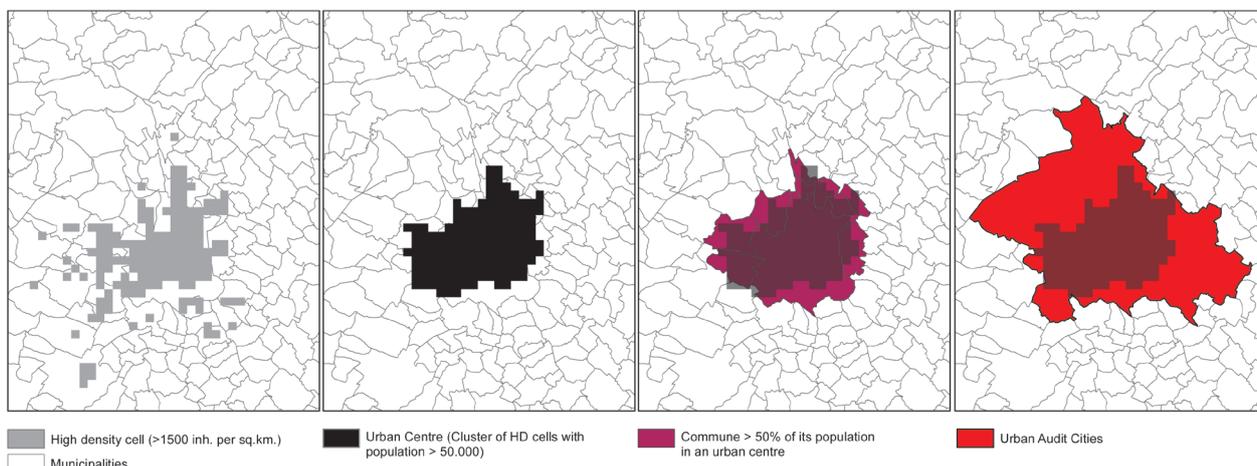
Figure 10.1-4 High density cells, urban centre and city (Wien)



4.2.2. City adds a few communes

An example of the second rule is Toulouse. The *Communauté urbaine du Grand Toulouse* is slightly bigger than the communes, with 50 % of their population in the urban centre of Toulouse. As more than 50 % of the population of the *Communauté urbaine du Grand Toulouse* lives in the urban centre, it can become the city level without compromising statistical comparability (see Figure 11). This ensures a direct link to the politically relevant level.

Figure 11.1-4 High density cells, urban centre, city (Toulouse)



4.3. Urban centres close to the threshold of 50000

The methodology developed provides an estimate of the population of an urban centre. Two elements may reduce the accuracy of this estimate: 1) geographic features and 2) the source of the population grid data.

The methodology does not take into account the specific geography of a city. Some geographic features, such as steep slopes, cliffs or bodies of water may lead to an underestimation of the population of the urban centre. This affects in particular cities with a small centre.

This method works best when a bottom up grid or high-resolution hybrid grid is available, both grids ensure that the population per sq km is very accurate. In the countries where such a grid is not yet available, LAU2 population had to be disaggregated based on land use data⁽⁶⁾. This is called a top-down method, which is less accurate. It tends to underestimate the population cells with a moderate to high density and overestimate population in grid cells with a low population density. Due to this imprecision there remains a margin of error, especially for smaller centres.

Therefore, the national statistical institutes were asked if their smaller centres were correctly identified. In some cases, a few cities were added and in others some were dropped. These adjustments are intended to correct to limitations of the methodology and the data used. As a result, it should be seen as an enhancement of the harmonised approach and not as undermining it.

4.3.1. Adding urban centres just below the threshold

In eighteen countries, a total of 77 small cities without an urban centre of 50000 inhabitants were added at the request of the national statistical institutes. In most countries, only one or two were added. In Germany, France, Portugal, and Italy more were added. All proposals were verified and only accepted if it either had an urban centre just below the threshold following the harmonised definition or if a national methodology did identify an urban centre of 50000 inhabitants. Cities that did not conform to one of these two criteria were not added. In France, the national statistical institute used the same methodology but using grid cells of 200m by 200m. This allowed it to identify more small centres.

⁶ The negotiations with the National Statistical Institutes were based on a list of urban centres based on an earlier population grid. As a result, when the final urban centres were calculated some of the cities that were added at the request of the NSIs acquired an urban centre and some new urban centres appeared which had not been considered during the discussions. The list of cities will be revised once a complete 2011 population grid is available in 2014.

4.3.2. Dropping urban centres just above the threshold

In fourteen countries, a total of 69 urban centres were not included. Virtually all of these centres had a population just above the threshold. In most countries, only one or two centres were not included. In Germany, ten centres were dropped and in the UK twenty one. A number of reasons were used to drop a centre. In Germany smaller centres which lacked urban functions and had more out-commuting than in-commuting were dropped. In other countries, population decline in a city meant that the current population of the centre was below 50000. In some cases, the centre was more a suburb of a neighbouring larger city.

5. IDENTIFYING THE COMMUTING ZONES

To identify the commuting zones, commuting shares were calculated based on the data collected by Eurostat from the 2001 Census Round held in SIRE (European infra-regional information system) for most countries.

There are a few exceptions:

- Poland used commuting data from 2006. The calculations were done by the Polish National Statistical Institute.
- Germany used commuting data for 2006 derived from the National Job Agency, which covers all employed persons with the exception of civil servants.
- In Latvia, commuting was derived from the State Revenue Service data. This worked for all Latvian cities except Riga. As all employment is assigned to the headquarters of a firm, the commuting to the capital was too inflated to be used to identify a commuting zone.
- For six countries, more census data was received to do the analysis: Bulgaria, Croatia, Hungary, Latvia, Slovakia and the UK.
- In Cyprus, only commuting data towards Lefkosia was available.
- The transnational commuting pattern in Luxembourg has not been captured in the commuting zone, where the entire country has been selected as the Larger Urban Zone.
- In four countries, no commuting data was available: Iceland, Lithuania, Malta, and Romania. In Malta, the main island was identified as the Larger Urban Zone (LUZ). In Iceland, a 70 km buffer was used to identify the LUZ. In Romania and Lithuania, the LUZ were not revised. The initial LUZs follow the proposal of the two National Statistical Institutes.

The Spanish commuting zones have not yet been revised and will be revised following the publication of the 2011 commuting data from the census. The Hungarian commuting zones may also be updated following the publication of the 2011 census results.

Switzerland has not yet revised their commuting zones. It will revise the once new census data is available and political discussion on the appropriate extent have been concluded.

The following NSIs accepted the harmonised commuting zones without any significant⁽⁷⁾ modifications: Belgium, Bulgaria, Greece, Ireland, Estonia, France, Italy, the Netherlands, Poland, Slovakia, Slovenia, Finland and Sweden.

For data availability reasons, the commuting zones had to be constructed from LAU1s in the UK and the Czech Republic, and from NUTS3s in Germany and Denmark. Depending on the city, this means that match with the commuting zone varies from good to moderate. For more information on the each Larger Urban Zone, please check:

<https://circabc.europa.eu/w/browse/59bfa33a-8f4b-413d-8552-ac0a93ad7e5f>

7 In some cases, minor modifications were needed to accommodate changes in the LAU2 boundaries between 2001 and 2011. In a few cases, one or two LAU2s were changed to match a political relevant territory within strict statistical constraints.

6. MEASURING THE POPULATION OF THE URBAN CENTRE

In most cases, the urban centre is completely contained by a single city (see Figure 12). In this case, all the people living in the urban centre also live in the city, but (slightly) more people live in the city. This is the result which is easiest to explain. However, not all cities and centre combinations are that simple. This section explains how the centre population has been calculated in the five more complicated cases.

6.1. Centre stretches beyond the city boundaries

In some cases, a small share of the population of the urban centre lives outside the city limits (see Figure 13). The population of the urban centre does include the population living outside the city. In some rare cases, this leads to the city having a smaller population than its urban centre.

6.2. A city with multiple centres

Some cities have multiple centres (see Figure 14). In these cases, the urban centre population of that city is the sum of the urban centres (including the population of these centres outside the city limits).

Figure 12

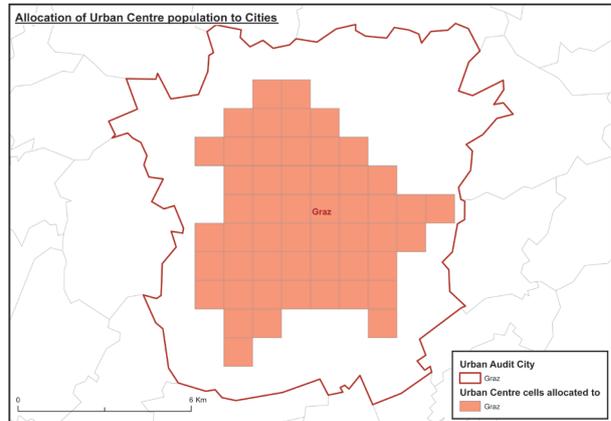


Figure 13

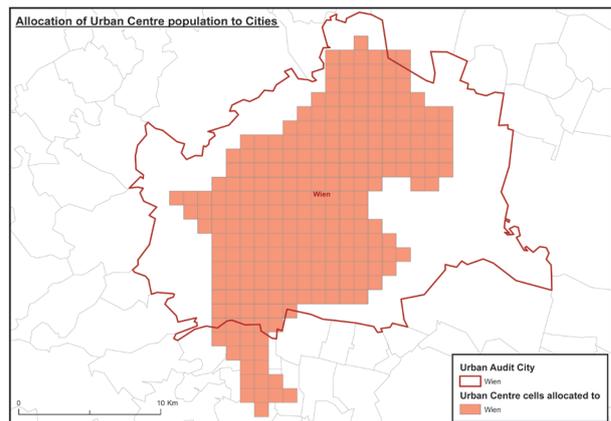
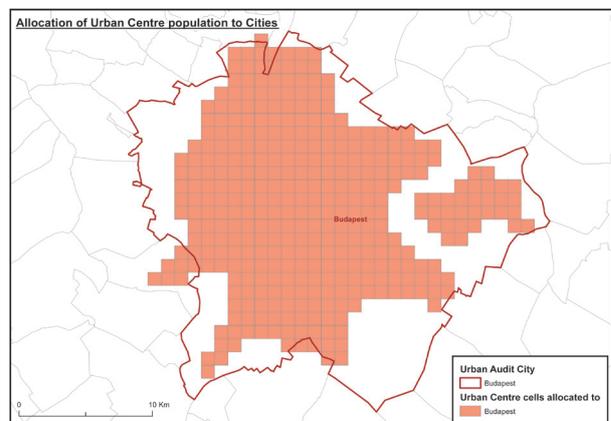


Figure 14

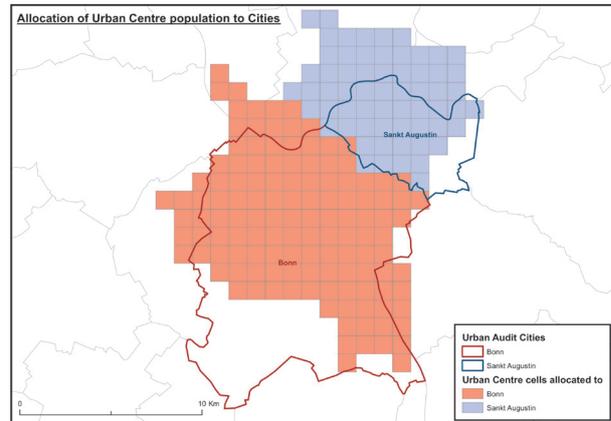


6.3. A city that shares its urban centre with another city

Some cities have an urban centre that also covers the centre of a neighbouring city (see Figure 15). In these cases, the population of the urban centre is split into two. The population of the urban centre within the city limits is attributed to that city.

The urban centre population outside the city limits is attributed grid cell by grid cell. Each grid cell of an urban centre outside a city is attributed to the city with the closest border.

Figure 15



6.4. Urban centres and greater cities

Some centres have such a large share of its population outside the city limits, a greater city level has been created (see Figure 16 and 17).

The greater city functions exactly as a city. The total population of the urban centre is attributed to the greater city, including the population outside the greater city limits.

Cities inside a greater city, however, are only attributed the urban centre population inside their city limits. As a result, the Greater city of Milan has a very large urban centre population (the entire centre in Figure 17), while the City of Milan has a much smaller urban centre population (only the centre coloured in pink in Figure 17).

Figure 16

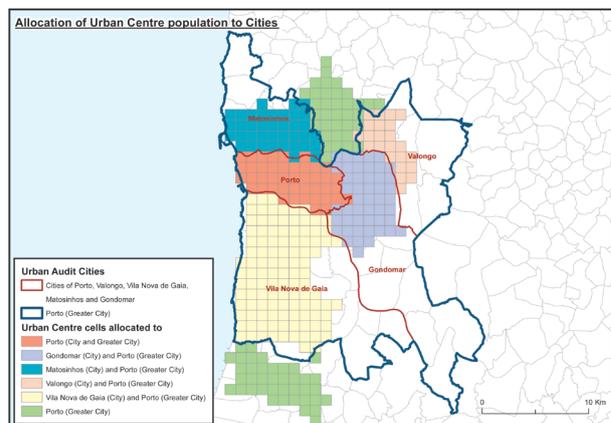
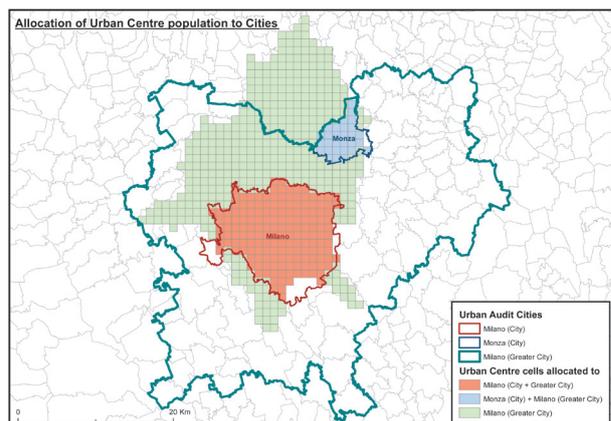


Figure 17



7. ANNEX: THE NEW DEGREE OF URBANISATION

Codes

- 1 Densely-populated area
- 2 Intermediate area
- 3 Thinly-populated area

Purpose

Variable needed to calculate employment and unemployment rate and main population characteristics separately for urban and rural areas.

Definitions

The concept of 'urbanisation' has been introduced to indicate the character of the area where the respondent lives. Three types of area have been identified and defined using a criterion of geographical contiguity in combination with a minimum population threshold based on population grid square cells of 1 km². These grid cells all have the same shape and surface, which avoids distortions caused by using units varying in size. The three types to be distinguished are:

- densely-populated (Code 1);
- intermediate (Code 2);
- thinly-populated (Code 3).

The degree of urbanisation creates a classification of all LAU2s (Local Administrative Units – Level 2) as follows:

Thinly populated area (alternative name: rural area)

- More than 50% of the population lives in rural grid cells.

Intermediate density area (alternative name: towns and suburbs/small urban area)

- Less than 50% of the population lives in rural grid cells; and
- less than 50% lives in high-density clusters.

Densely populated area: (alternative names: cities/large urban area)

- At least 50% lives in high-density clusters. ⁽⁸⁾

In the above, the following definitions are used:

- rural grid cells: grid cells outside urban clusters;
- urban clusters: clusters of contiguous ⁽⁹⁾ grid cells of 1 km² with a density of at least 300 inhabitants per km² and a minimum population of 5 000;
- high-density cluster: contiguous ⁽¹⁰⁾ grid cells of 1 km² with a density of at least 1 500 inhabitants per km² and a minimum population of 50 000. (Alternative names: urban centre or city centre).

In order to classify properly LAU2s based on the grid cell approach described, a few additional correction rules must be provided:

- if the LAU2s do not have a raster equivalent, they are classified according to the share of territory in rural grid cells and high-density clusters;
- thinly populated LAU2s may be classified as intermediate or densely populated due to border effects if rural grid cells cover most of the territory. For that reason, LAU2s with a population below 5 000 inhabitants ⁽¹¹⁾ and 90% of its area in rural grid cells are reclassified as rural area;

8 Furthermore, each high-density cluster should have at least 75% of its population in densely populated LAU2s. This also ensures that all high-density clusters are part of at least one densely populated LAU2, even when this cluster represents less than 50% of the population of the LAU2.

9 Contiguity for urban clusters does include the diagonal (i.e. cells with only the corners touching). Gaps in the urban cluster are not filled (i.e. cells surrounded by urban cells).

10 Contiguity for high-density clusters does not include the diagonal (i.e. cells with only the corners touching) and gaps in the cluster are filled (i.e. cells surrounded by high-density cells).

11 Please note that this threshold refers to the population in the LAU2, whereas the threshold used in the definition of an urban cluster refers to the set of contiguous grid cells – the cluster – which may cover cells belonging to several LAU2s.

- very small densely populated LAU2s may be classified as thinly populated due to the coarse ⁽¹²⁾ resolution of the population grid. For that reason, LAU2s with an area less than 5 km² but with a share of surface outside rural grid cells higher than 30% are reclassified as intermediate density or densely populated according to the share of the correspondent cluster.

As LAU2s vary considerably in area, this methodology will lead to a closer match between a high-density cluster and densely populated LAU2s in countries with small LAU2s than in those with large LAU2s. To take this difference into account, the classification can be adjusted as following:

- a densely populated LAU2 can be classified intermediate as long as 75% of its high-density cluster population remains in densely populated LAU2s;
- an thinly populated or intermediate density LAU2 can be classified as densely populated if it belongs to a group of LAU2s with a political function and if the majority of population of this group of LAU2s lives in a high-density cluster.

Note:

This new methodology of classifying urban and rural areas has been agreed by the Directorates-General (DGs) for Regional and Urban Policy, Agriculture and Rural Development and Eurostat. It replaces the methodology used in the Labour Force Survey so far.

The definition of urban clusters is drawn from the new methodology to classify urban and rural regions developed and agreed by the DG for Regional and Urban Policy, the DG for Agriculture and Rural Development, Eurostat and the Joint Research Centre in 2010. The definition of high-density clusters is drawn from work by the OECD and the DG for Regional Policy on a new metropolitan area definition undertaken in 2011.

8. MAP OF ALL URBAN AUDIT CITIES

A map of all cities is included on page 16. The list of cities can be downloaded here:

<https://circabc.europa.eu/w/browse/59bfa33a-8f4b-413d-8552-ac0a93ad7e5f>

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http://ec.europa.eu/regional_policy/index_en.htm

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The texts of this publication do not bind the Commission

12 'Coarse' in relation to the small area of these particular LAU2s.

