21

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Areas with urban character 2012

Explanatory report

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Swiss Statistics

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Authors Viktor Goebel, Florian Kohler

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Information: Viktor Goebel, FSO, tel. +41 (0)58 463 67 23, viktor.goebel@bfs.admin.ch
Authors: Viktor Goebel, Florian Kohler
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Table of contents

Summary

Areas with urban character 2012 is a new typology developed by the Federal Statistical Office for seeing Switzerland's urban structures from a statistical viewpoint. It uses a reproducible algorithm incorporating both morphological and functional criteria. Uniform criteria and thresholds are used to assign a category to every single municipality in Switzerland.

The method has a multi-step process. First, density of inhabitants, employed persons and overnight stays were examined using grid cells in order to identify potential *agglomeration cores*, in order to minimise the influence of institutional, historically entrenched borders. Possible *agglomeration commuting zones* were then marked off featuring a proportion of commuters with links to cores. Core and commuting zones were then screened for size before they could qualify as *agglomerations*.

Beyond the agglomerations, other urban categories were defined. These include *municipalities oriented to multiple cores*, which have functional links with several agglomerations, and *core municipalities outside of an agglomeration*. This same method is also used to classify *statistically* defined *cities and towns*, irrespective of agglomerations.

The various categories are aggregated into spatial types, for the purpose of simplifying analysis in relation to specific issues for municipalities with similar realities.

The revised definition affords various types of advantage. It is less sensitive to municipality mergers, facilitates international comparisons and draws clearer distinctions between types of urban area. A comparison with the definition from 2000 indicates that urbanisation has progressed since that time. However, a polycentric structure still exists featuring many small and medium-sized urban centres of regional importance.

Introduction

For many decades, it has been the duty of the Federal Statistical Office (FSO) to provide a definition of urban spaces in Switzerland. Urban structures undergo change over time. Because of creeping urbanisation, the growing importance of ever-larger functional spaces and changes in data, it became necessary to undertake a thorough revision of the existing definition of urban areas in Switzerland (based on census data from 2000).

Before the revision work began, experts defined the requirements for a new definition as well as notions of urban space. During this exercise, one of the consensus viewpoints was for the perpetuation of a scientific definition for Switzerland, which should be as robust and comprehensible as possible. Another goal was to portray the current urban reality in Switzerland faithfully and in a way that was as user-friendly as possible.

Chapter 1 serves as an introduction to the concepts and theory for identifying urban areas. Chapter 2, using easy-to-understand terms, explains the new definition of agglomerations and areas with urban character, with a description of the methodology used in each case. This chapter furthermore introduces possible combinations of different categories into spatial types as well as a revised statistical classification of cities and towns. Initial descriptive analytical results and examples of application are shown in Chapters 3 and 4. In Chapter 5, the relationship with the previous definition (based on data provided by the national census of 2000) is analysed and comparability commented upon. Chapter 6 looks ahead to the next revision of the definition and the treatment of municipalities affected by mergers or transformations.

1 Urban space theories

1.1 Why define urban spaces?

The scientific analysis of data by urban or rural categories is a long-standing tradition both in Switzerland and internationally, and the findings are much in demand. Space is defined on a continuum ranging from urban to rural by means of building density (anthropogenic morphology). Using statistical processes, this generally continuous gradient is sub-divided into concretely quantifiable, discreet categories and spatial types. Much of the data, when analysed from the standpoint of these spatial categories, often exhibit marked and interesting disparities.

But what does urban mean precisely? In the case of Zurich city centre or remote alpine municipalities with low population densities, the perceptions of most observers tend to align. Such examples are easy to slot into an "urban" or a "rural" category. However, due to suburbanisation, there are many types of intermediate spaces which are hard to place into any one category.

For a statistical definition of urban spaces, it is therefore necessary to complement popular perceptual constructs of "urban" or "rural" with objective criteria and thresholds by tapping into a long legacy of geographical research at home and abroad.

1.2 Morphological identification of urban spaces

Urbanism is generally narrowly connected with the density of specific criteria (see Lampugnani et al. 2007, Schuler et al. in FSO 2005, amongst other works). Different densities reflect factors such as urban diversity, a high division of labour, cultural activities and specific urban lifestyles. The number of inhabitants in a municipality is, to start with, a relatively accurate statistical proxy for density. Where this is high, as a rule there will be an urban core with a high density of inhabitants and/or jobs along with proximity of shops, the availability of service providers, railwaystations, and so forth. However, a more reliable measure of contiguous dense zones are uniform spatial measurements, with modern methods focusing on grid cells as a way of minimising the influence of historically rooted, haphazard institutional borders. Amongst others, current statistical processes for defining urbanisation and degrees of urbanisation by EUROSTAT (2012)[1] and Austria (Wonka & Laburda 2010), respectively, use this methodology. This is referred to as the *morphological approach*.

1.3 Functional definition of urban spaces

Urban centres have an influence on outlying areas on account of their attractiveness, namely the existence of special functions. This association has long been recognised (by Thünen 1826, Christaller 1933 and others) and has always been an important factor in the structuring of spaces. These are referred to as urban functional spaces.

[1] Degree of Urbanisation

Outlying areas, where there is a distinct urban influence and a clear connection with the central zone, can be described as a catchment area or an agglomeration commuting zone. Conversely, urban fringes also place facilities at the disposal of urban centres, e. g. space for additional dwelling units and leisure facilities. Thus, urban theories treat cities/towns and related surrounding areas as complementary in each case. The terminology used by other countries includes *Stadtregionen* (Germany and Austria), *Aires urbaines* (France) and Functional Urban Areas (ESPON 2006). The customary term in Switzerland has long been *Agglomerationen* or *agglomérations*.

At present, the best way of demarcating the catchment areas of cities and towns for statistical purposes is using commuting flows. A notable proportion of the active population employed within agglomeration cores is an indicator of a *functional link* between areas. It is also an indicator for links of an economic nature or in relation to shops, etc.

2 Definition of areas with urban character

2.1 Framework conditions

Before a new definition could be developed for Switzerland, experts on the matter met for extensive discussion on the requirements that it must meet and the properties that it should exhibit.

The fundamental principles were as follows:

- The definition should work with nationally uniform criteria and thresholds.
- The definition can be used for scientific analysis. At the same time, it can and should also be used as a basis for political decisions.
- As far as possible, the definition should be insensitive to mergers and transformations.
- The definition uses both morphological and functional criteria.
- Statistical categories are assigned on the municipality level.
- The definition works across borders (with a focus on the Swiss perspective) and can be collated with research for other countries.
- The definition follows an objective, reproducible algorithm.

2.2 Basic framework for definition

The newly developed definition builds on those used by other European countries, adapted as best as possible to Switzerland. Chiefly, factors developed by Austria (Wonka & Laburda 2010), France (INSEE 2011) and EUROSTAT and the European Commission (Dijkstra & Poelmann 2014) were incorporated into the new definition. For this methodological development, the FSO called on external service providers (in particular EFS (2009) and MICROGIS (2013)) for further support. This approach can be summarised in two key steps:

- Structurally congruent core zones are identified using density criteria (such as inhabitants per km²) and absolute-value thresholds (e. g. number of inhabitants). For Switzerland, the selected benchmarks were number of inhabitants, jobs/employed persons and overnight stay equivalents ("IJO" for short, see Box 1).
- Areas functionally linked to core zones were determined using commuting flows as the indicator.

Box 1: IJO as a metric

The revised definition of areas with urban character is in many places underpinned by the IJO variable. IJO is an acronym for **I**nhabitants (IN, permanent residential population), **J**obs (JOBS) and **O**vernight stay equivalents in hotels and health establishments. IJO is used as a measurement of both absolute size and density.
Inhabitant thresholds and population density are classic criteria used for statistical definitions of cities and towns and urban areas. The additional inclusion of employed persons is logical. Failing this, large-scale activities (e. g. office complexes and industrial estates) linked to urban spaces are not taken into consideration. This is made possible by the reliable, high-resolution spatial data obtainable in Switzerland. Inclusion of data on overnight stays takes into account the fact that tourist infrastructure in some places represents an important part of the urban landscape.
The equivalent for overnight stays is calculated as follows: a hypothetical guest that stays for an entire year in the hotel (= 365 overnight stays) should be treated the same as a person who lives and works in the same municipality. Tourists can thus be considered as day-time population (= employed persons counted at place of work) and night-time population (= inhabitants counted in their place of residence). The IJO formula is = IN + JOBS + (overnight stays x 2) / 365. The factor of 2 results from the double-counting of day- and night-time population.

2.3 The method step by step

The method is based on a nine-step procedure, which we will detail individually below. First, particular areas are defined as potential urban spaces, although these can be eliminated from areas with urban character at a later stage if further vital criteria are not fulfilled.

After the notion of urban space was defined with the help of experts, necessary threshold values were established within the individual steps. As part of the process, the notion of space was considered from a Swiss perspective and attention was paid to ensuring continuity with the previous definition. Interactions between thresholds were subsequently determined in an iterative process.

Step 1: Identification of agglomeration core zones

First, a grid with cells measuring 300m x 300m (Threshold 1) was placed over Switzerland. Only those grid cells with a density of 500 IJO per km² (Threshold 2) or more were selected. Of these selected cells, only those adjacent to other selected cells were retained – provided that all contiguous cells together had an absolute minimum size of 15,000 IJO (Threshold 3). Such cells had to connect on one side to be considered as contiguous. Grid cells touching only at corners were not taken into consideration. Gaps were not filled in.

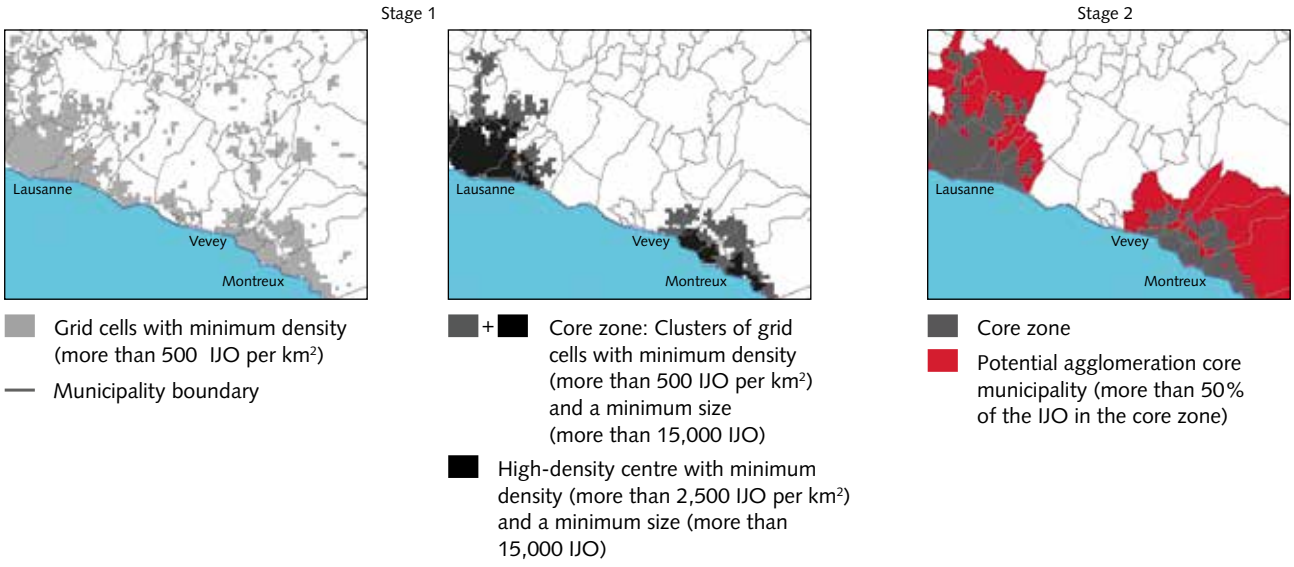
It was then checked whether these areas contained a high-density centre, by checking for contiguous grid cells with a density of no less than 2,500 IJO per km² (Threshold 4). A high-density centre exists where adjacent grid cells with this density have no less than 5,000 IJO total in absolute terms (Threshold 5). Gaps were not filled in.

Through screening, only areas with a minimum density, a minimum size and a high-density centre were retained. These were denoted as *agglomeration core zones* (Figure 1). As part of the process, we ensured that each agglomeration contained a suitably prominent centre (from a national perspective). Closely associated with the high-density centre must be a wide variety of functions (dwellings, employment, services, educational facilities, etc.) and urban spaces. These centres often correspond to historical city nuclei.

Step 2: Determining core municipalities

To display data at municipal level, the results at the grid level must then be appropriately translated to a municipal level. To ascertain whether a political municipality belongs to a core, it was observed whether the municipality was predominantly characterised by a core zone or not. In other words, a municipality was considered to belong to a core whenever more than 50% (Threshold 6) of its total IJO were located in the grid cells that make up the core zone. If this condition is met, the area is then designated as a *core municipality*.

Identification of potential agglomeration cores via grid data **Fig. 1**



IJO: inhabitants (incl. overnight stays as equivalents) + jobs

Sources: FSO – STATPOP, STATENT, HESTA; SWISSTOPO

In many cases, cores contain more than one municipality, and core municipalities may be adjacent to each other. Core municipalities, either isolated or as part of a cluster, together form an *agglomeration core* (Figure 1).

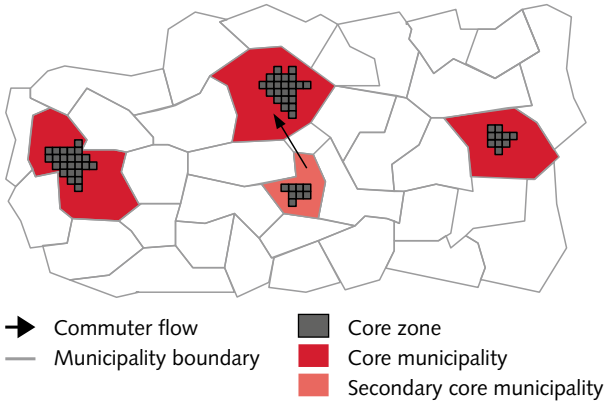
The results of the calculations described in Steps 1 and 2 depend on grid location. For example, if the grid is shifted 100 metres to the west, further grid cells previously bordering on a core zone will then meet the density criteria. In a few cases, a core zone will come into being or cease to exist, subject to size criteria. Nine possible variations were thus calculated according to grid location. If a municipality can be attached to any core zone in no less than five cases out of the nine, it can be considered as a core municipality. If these five cases involve more than one core zone, the municipality will be assigned to the one with the highest number of links.

Where the process results in enclaves within core municipalities, these communities are integrated into the core.

Step 3: Difference between primary and secondary agglomeration cores

In this step, cores were ordered hierarchically in terms of their functional links and divided into primary and secondary agglomeration cores. This involved looking for functional dependency between cores to allow for polycentric structures to be shown. Where more than 26.67% (Threshold 7) of a core's employed persons counted in their place of residency (see Box 2) travel to another core for work purposes, the first will be treated as a *secondary core* and the second as a *primary core* (Figure 2). This threshold corresponds to four-fifths of Threshold 9 (see Step 5). Primary and accompanying secondary cores are situated within the same agglomeration.

Determination of principal and secondary cores **Fig. 2**



Source: FSO

Box 2: Commuters within the definition of areas with urban character

The term **jobs** corresponds to filled job positions in companies. Covered are all people registered for OASI (old age and survivors insurance) and having an annual salary of more than 2,300 francs. This group of people (workforce) is a good proxy for the concept of **employed persons**. People may have more than one job. For the commuter flows considered in our analysis, only the highest-paying job is taken into account.

Commuters are employed persons who leave their place of residence to go to work. Commuter flows between different municipalities are taken into account when defining areas with urban character.

Commuter data is taken from a combination of three files with a reference date of 31 December 2011: Population and Households Statistics (STATPOP), data from OASI compensation offices and FSO Structural Business Statistics (STATENT). As such, it is possible to reconstruct the relationship between place of residence and place of work for approximately 4 million jobs.

The place of residence is where the person resides officially. Secondary places of residence are used as place of residence whenever the latter is situated nearer to possible sites of the company where a person is employed.

Companies may have one (single-site companies) or more sites (multi-site companies). For determining the place of work, the following process was used:

- For single-site companies, the municipality where the company is located is used (= place of work), providing a direct relationship between place of residence and place of work on a municipal level. This applies to a good half of the 4 million jobs in Switzerland.
- For groups of people working in multi-site companies, it is not known at which site a person works. By taking account of travel times between place of residency and possible sites as well as the size of the site (ascertainable from STATENT), employees working in a multi-site company can be distributed according to shortest total journey time (for all employed persons in the company).

This approach, simplified in the description above, provides information on commuting flows with a spatial breakdown at the municipal level. For validation purposes, the calculated commuting flows were aggregated at a cantonal level and then compared with the data provided by the FSO's Structural Survey. A very high correlation was demonstrated.

Cross-border commuting flows are derived from the statistics on frontier workers provided by the FSO and the national statistics offices of neighbouring countries (see Appendix).

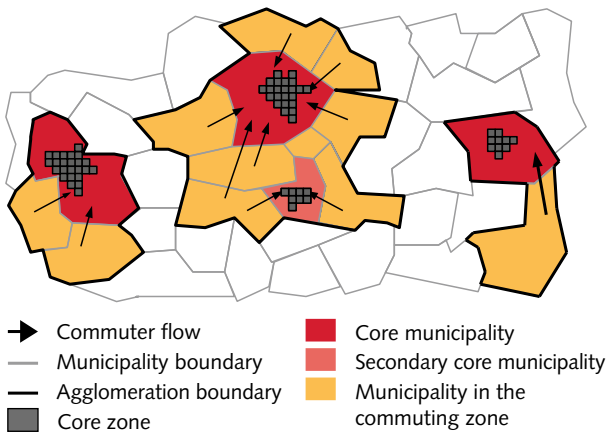
Step 4: Combinations of neighbouring cores

Some bi- or multi-polar agglomerations such as Brig – Visp or Amriswil – Romanshorn have in the past been identified on a statistical basis. Such often have a shared historical development, show particular functional links and represent a single spatial unit. It therefore makes sense that they should register as a common agglomeration on the basis of our established notion of space. Consequently, cores whose municipal boundaries touch are merged into a single core, although this only applies to those cores with a size ratio (in terms of IJO) of below 1:5 (Threshold 8) and where each core does not have more than 250,000 IJO residing. This ensures that no single pole in the agglomeration is too large in relation to the others. Those municipalities whose adjacent borders lie exclusively in undeveloped mountainous areas without modern transport routes were filtered out.

Step 5: Identification of agglomeration commuting zones

As the criterion for assigning municipalities to an agglomeration commuting zone, we took commuters – travelling to the (primary or secondary) core of an agglomeration for work purposes – as a proportion of the total resident workforce. The percentage of the workforce which commutes, tends to rise the closer a municipality is situated to an agglomeration core and reflects existing functional links. A municipality belongs to an agglomeration commuting zone if no less than one-third (33.33%, Threshold 9) of the workforce commute to an agglomeration core (Figure 3). This is referred to as an *agglomeration commuting zone municipality*.

Determination of commuting zones **Fig. 3**



Source: FSO

Application of this method may lead to enclaves or exclaves. Enclaves located in agglomeration commuting zones are treated the same as regular agglomeration commuting zone municipalities. Exclaves are municipalities which are included in agglomeration commuting zones due to their commuter flow, but which have no common border with other municipalities in that particular agglomeration. They are therefore not counted as part of the agglomeration.

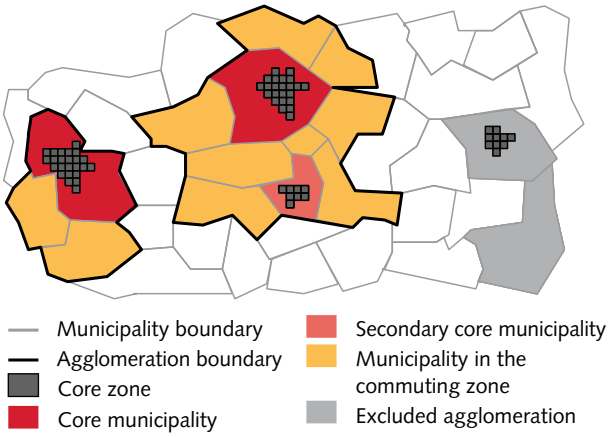
Step 6: Final definition of agglomerations using a minimum-size filter

Agglomerations have to attain a certain size to correspond to the notion of urban space in Switzerland. Those that do not are excluded as follows: agglomerations in which still-potential cores and commuting zones do not combine to attain a threshold of 20,000 inhabitants (including equivalents from overnight stays, Threshold 10) are no longer considered (Figure 4), ensuring continuity in relation to the previous definition of urban areas (dating from 2000). As the remaining core and commuting zone municipalities can be considered as final, they are no longer designated as "potential".

Agglomerations can also be identified in cross-border situations. Where a core zone (a cohesive urban space) or an area influenced by an agglomeration core (commuter activity) spans national borders, the associated foreign municipalities are included in the calculation, except where the population ratio on the Swiss side of a cross-border agglomeration is insignificant – lower than 5%.

Following the exclusion of agglomerations deemed too small, certain municipalities may need to be reassigned. This is done by carrying out Step 5 again and checking the results. The agglomeration municipalities left once Step 6 is complete are conclusively taken as corresponding to areas with urban character.

Exclusion of agglomerations when they undercut the threshold **Fig. 4**



Source: FSO © FSO, Neuchâtel 2014

Step 7: Identifying core cities and names of agglomerations

It was decided that the category of core city, i.e. the predominant centre of an agglomeration, used in the definition dating from 2000, will also apply in the future. The municipality with the highest number of IJO is designated the core city. Where another municipality in the same core has 75% or more of this value, it is also designated a core city. As a rule, agglomerations are named after these core cities. However, where it exists, priority is given to the name which was defined with the 2000 definition. If cores are aggregated as described in Step 4, the names of the largest municipalities prior to the grouping stage is used.

In isolated cases, core cities represent merely the predominant municipalities of small agglomerations but do not fulfil the statistical-city criterion (see Chapter 2.6).

Step 8: Identifying municipalities oriented to multiple cores

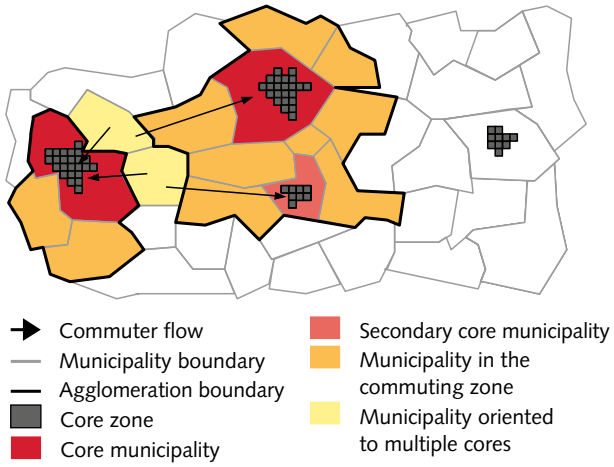
An analysis of functional commuting flows – leaving aside the now established agglomerations – showed that some municipalities have functional links with more than one core. In such cases, the total proportion of outbound commuters is comparable or even higher than values for municipalities located in agglomeration commuting zones, giving rise to a new urban category, *municipalities oriented to multiple cores* (Figure 5). A municipality is awarded this status if all of the following conditions are met:

- The proportion of the workforce commuting to agglomeration cores must amount to no less than one-third (Threshold 11, mirroring Threshold 9) of the total workforce living in the municipality.
- Only those commuting flows to one agglomeration core exceeding 6.67% (Threshold 12, one-fifth of Threshold 11) are taken into account.
- Additionally, at least one of these commuter flows must exceed 11.11% (Threshold 13, one-third of Threshold 11).

This ensures that there is a sufficiently clear connection with the individual core zones.

Enclaves in spaces oriented to multiple cores are included if they consist of only one municipality and have fewer than 1,000 inhabitants. Exclaves in spaces oriented to multiple cores are retained if the municipality in question has more than 1,000 inhabitants. Failing this, they are classified as rural area without urban character.

Determination of municipalities oriented to multiple cores **Fig. 5**



Source: FSO © FSO, Neuchâtel 2014

Step 9: Identification of cores located outside agglomerations

Other urban structures outside of agglomerations were identified. These were designated as "isolated towns" in the definition dating from 2000. So that their urban character can be taken into account, a new category – *Cores outside of agglomerations* – has been created. In this instance, a core may also consist of one or more municipalities, as with the definition for agglomeration cores. To qualify as a core outside an agglomeration, the following conditions must be met (see Figures 6 and 7):

– There is a high-density centre as determined again by Thresholds 4 and 5 (2,500 IJO per km² and 5,000 IJO in total). This involves using the same grid location as when looking to identify agglomeration cores.

– A core zone exists where there is a continuous minimum density – as with agglomerations – of 500 IJO per km² (Threshold 2) and – unlike agglomeration cores – a minimum size of 12,000 IJO (Threshold 14). The classification of grid-based core zones as core municipalities follows the same process as described in Step 2 (over 50% of IJO of the entire municipality must be situated in the core zone).

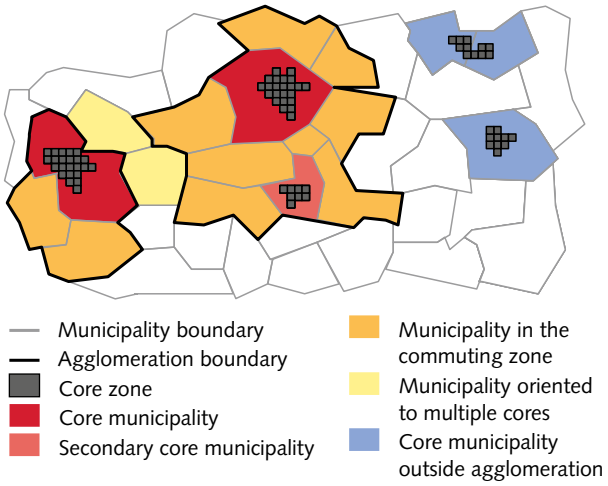
– Core municipalities outside agglomerations must together have more than 14,000 IJO (Threshold 15).

Where a municipality fulfils the conditions for both a core outside an agglomeration and a municipality oriented to multiple cores, the "core" designation takes precedence. Where a core is made up of only one municipality, the latter is equally considered as a town/city (see Chapter 2.6).

Cores situated outside agglomerations – as with agglomerations – are named after the predominant municipality in terms of size (as measured by IJO). Where another municipality attains 75% of this value, its name is also included in the designation.

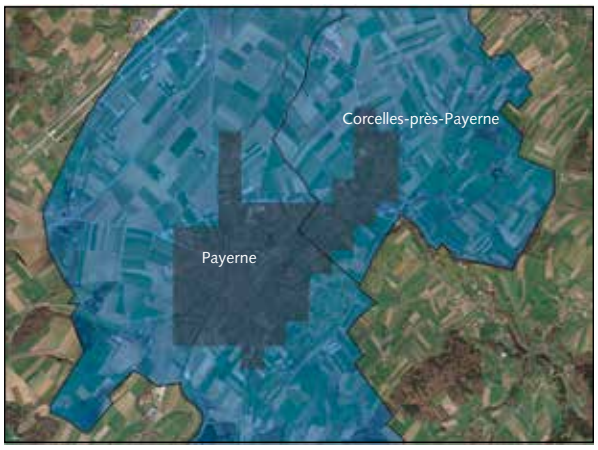
Step 9 marks the final stage of defining areas with urban character. Those municipalities not covered by the methodology are classified as *rural area without urban character*.

Determination of core municipalities outside agglomeration **Fig. 6**



Source: FSO © FSO, Neuchâtel 2014

Example Payerne (core outside agglomeration) **Fig. 7**



Sources: FSO © FSO, Neuchâtel 2014

2.4 Summary of definition of areas with urban character

The steps detailed in Chapter 2.3 can be summarised as follows (Box 3):

Box 3: Definition of the categories of areas with urban character

Agglomerations are groupings of municipalities which together have more than 20,000 inhabitants (equivalent overnight stays taken into account). Agglomerations can also cross national borders.
An agglomeration consists in general of an **agglomeration core** and an **agglomeration commuting zone**. Each agglomeration core consists of a connected zone **(core zone)** of grid cells measuring 300 × 300 m, which have a population density of at least 500 inhabitants (incl. equivalent overnight stays) plus jobs (abbreviation IJO) per km². A core zone must also have an absolute size of at least 15,000 IJO. Furthermore each core zone has a high-density centre with more than 2500 IJO per km² and a total of at least 5000 IJO. When more than 50% of a municipality's IJO is located in a core zone, the municipality is described as an **agglomeration core municipality**. Together the individual municipalities of a core zone constitute the core of the agglomeration. A distinction is made between primary and secondary agglomeration cores (satellites). **Secondary cores** have the same characteristics as **primary cores** but are functionally linked to another, larger core (primary core) due to commuting ties. The share of commuters must be at least 26.67%. Primary and secondary cores are within the same agglomeration. Furthermore, cores which have a comparable number of inhabitants and jobs whose boundaries touch, are grouped into a single agglomeration core. The **core city** of an agglomeration is the core municipality which shows the highest value for IJO.
All municipalities that are functionally linked to a core belong to the **agglomeration commuting zone**. A municipality is considered to belong to an agglomeration commuting zone if more than a third of the workforce living there work in one of the core municipalities.
A **municipality** that is **oriented to multiple cores** is one where more than a third of the workforce (counted in the place of residence) work in core municipalities of at least two different agglomerations. Thereby the flow of commuters in the core municipalities of each single agglomeration must be at least a fifteenth of the entire workforce. Municipalities oriented to multiple cores are outside of agglomerations.
Individual or bordering municipalities which fulfil the criteria for a core but not the minimum size for an agglomeration, are also found outside of agglomerations. If a threshold of 12,000 IJO in the core zone as well as a minimum of 14,000 is exceeded within the total area of the municipalities concerned, they are considered to be **core municipalities outside of an agglomeration**.

2.5 Spatial classification of areas with urban character

Typologies assign a similar character to various spatial units (e. g. municipalities). The categories of areas with urban character, together with rural municipalities without urban character, make up a comprehensive topographical whole.

The categories of areas with urban character can be grouped into overarching spatial types. By combining core and commuting municipalities into agglomerations, continuity with the previous agglomeration perimeter (under the definition dating from 2000) is provided for. Aggregates are also formed combining purely morphological and purely functional categories (T 1).

T 1 Spatial types

Spatial type	Municipality category				
	Agglomeration core municipality	Municipality in agglomeration commuting zone	Municipality oriented to multiple cores	Core municipality outside agglomeration	Rural municipality without urban character
Agglomeration *(morphological and functional definition)*	X	X			
Core (within and outside agglomeration) *(morphological definition)*	X			X	
Municipality in commuting zones or oriented to multiple cores *(functional definition)*		X	X		
Area with urban character *(morphological and functional definition)*	X	X	X	X	
Rural area without urban character					X

Source: FSO

If no urban character is yielded by the above method, the municipalities concerned are classified according to the spatial type *rural municipality without urban character*. This dispenses with a dichotomy, i. e. a sharp distinction, between cities and towns on one hand and rural

areas on the other. There is no longer a strict boundary between the two categories. It is perfectly possible for municipalities oriented to multiple cores and situated in commuting zones to exhibit rural features despite being located in an area of urban influence. The extent to which individual municipalities demonstrate rural characteristics can only be determined using a separate, to-be-defined methodology focusing on structural observations such as density and economic sectors.

2.6 Statistical cities and towns

Defining cities and towns based solely on their total number of inhabitants is becoming increasingly problematic owing to the trend towards municipality mergers in Switzerland. Take the following example: the new municipality of Val-de-Travers (NE), formed by the merger of many small, mainly rural municipalities, now has over 10,000 inhabitants. However, it is still made up of many small residential areas without a dominant centre or any expansive built-up areas. This municipality thus cannot be said to have a predominantly urban structure. The same method as set out in Chapter 2.3, Step 9, for identifying cores situated outside agglomerations was therefore applied individually to each of Switzerland's municipalities (Box 4). Only those parts of a core zone located inside the municipality were considered. This method results in a *classification of statistical cities and towns*, allowing us to state whether a given municipality is a city/town, irrespective of assignment to an agglomeration, and without interference from legal, administrative or historical considerations. Since this classification aims to provide indications about single municipalities, no spatial units made up of several municipalities are identified in this instance.

Box 4: Definition of a statistical city or town

A **city or town**, in its municipal area, has a contiguous dense zone based on grid cells measuring 300m x 300m and having a density of inhabitants + jobs + overnight stays (IJO) of over 500 per km². Such dense zones must contain no fewer than 12,000 IJO within their territory, as well as at least one high-density centre with an IJO density exceeding 2,500 per km². High-density centres have an absolute size of at least 5,000 IJO. Designated dense zones must contain more than half of all IJO from the entire municipal area. Additionally, the municipality in question must have an absolute size of at least 14,000 IJO.

2.7 Data used

The following data (T2) was used for determining the 2012 classification of areas with urban character and statistical cities and towns:

T2 Data used

Criterion / Data	Source
Permanent residential population as at 31/12/2012	FSO, STATPOP
Number of employed persons as at 31/12/2011	FSO, STATENT
Overnight stay in hotels and health establishments 2010/2012	FSO, HESTA
Commuter flows 2011	FSO, STATPOP and STATENT (linked)
Municipal boundaries: as at 1/1/2014	FSO, SWISSTOPO

Source: FSO

Data required for defining areas with urban character across national borders is available from other countries. Data quality and comparability are both adequate. Details for all data sources are provided in the appendix.

3 Results

3.1 Areas with urban character

Areas with urban character are denoted using the definition described in Chapter 2.3. They are represented in Map 1. Table 3 shows the number of municipalities belonging to each category. A list of agglomerations and cores situated outside agglomerations, together with population counts, can be found in Tables T4 and T5. Map 2 illustrates the spatial extent of the grid-based dense zones that served as the basis for identifying cores.

T3 Number of municipalities by categories of areas with urban character (as at 1/1/2014)

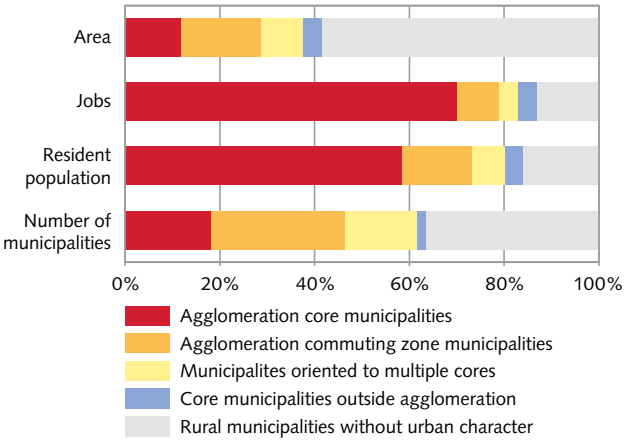
Category	Number of municipalities
Agglomeration core municipalities	430
Agglomeration commuting zone municipalities	669
Municipalities oriented to multiple cores	350
Core municipalities outside agglomerations	57
Rural municipalities without urban character	846
Total	**2 352**

Source: FSO

3.2 Spatial categories by population, employment and surface area

Under the new definition, urban spaces can be further differentiated on the basis of urban character. In total, 59% of the population and 70% of jobs were located in the agglomeration core municipalities, which accounted for 12% of the Swiss surface area and 38% of the settlement and urban areas (G1) in 2012. This ratio is more balanced in the agglomeration commuting zones, in which 15% of the population lived in 17% of the surface area. In total, 73% of the population lived in agglomerations. Rural areas without urban character make up 59% of the surface area and account for 16% of the population.

Population, jobs, and area by categories of municipalities[1] **G 1**



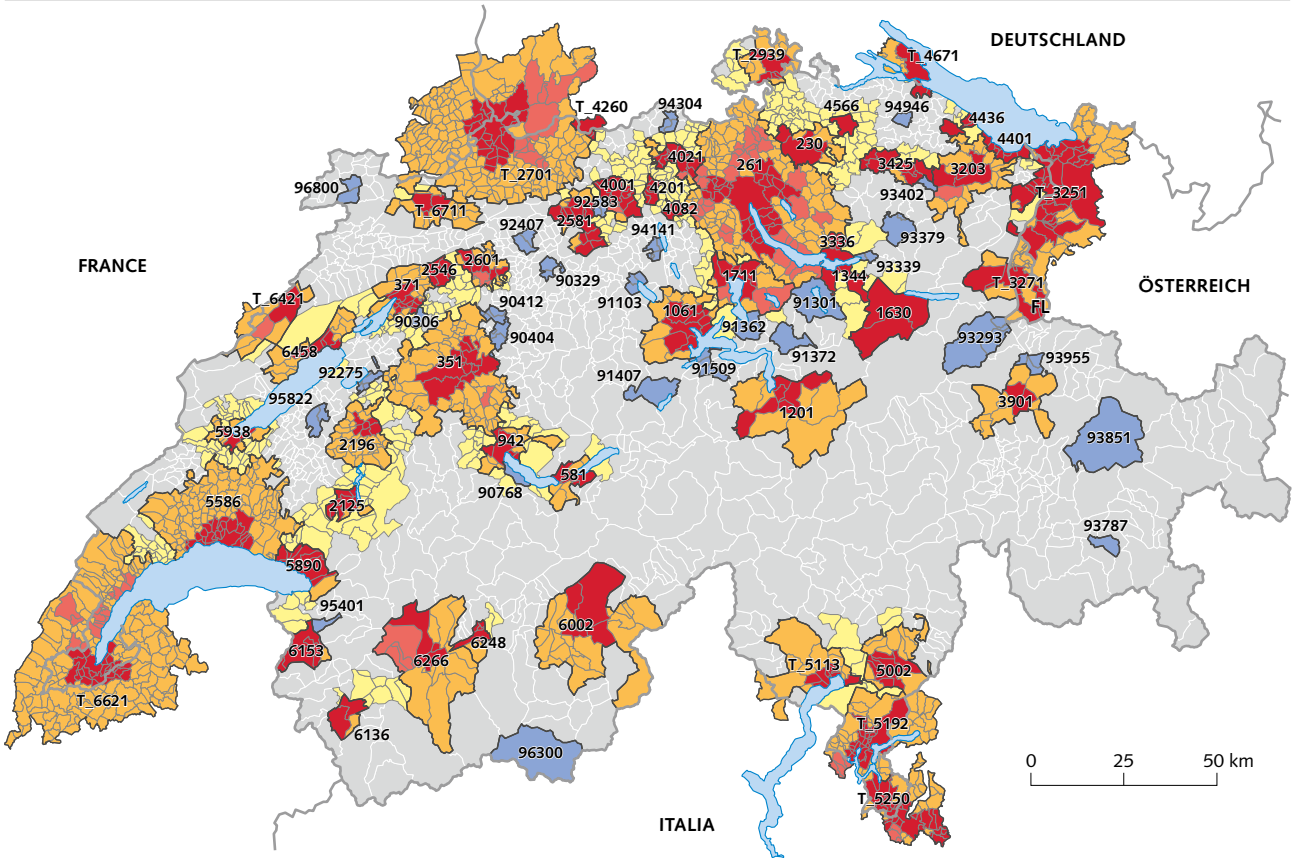
[1] only Swiss municipalities

Source: FSO – STATENT 2011, STATPOP 2012

3.3 Cross-border agglomerations

Using the algorithm described in Chapter 2.3 results in the identification of 12 cross-border agglomerations (M1 and T4), 5 of which have a predominant centre (in terms of population count) outside Switzerland. A total of around 1.2 million people lived in the foreign areas of cross-border agglomerations, corresponding to 17% of the total population of all agglomerations recorded for Switzerland.

Area with urban character, 2012 — M 1



Municipality categories

- Core municipality of agglomeration (principle core)
- Core municipality of agglomeration (secondary core)
- Municipality in the commuting zone of agglomeration
- Municipality oriented to multiple cores
- Core municipality outside agglomeration
- Rural municipality without urban character

Code* and name of agglomeration

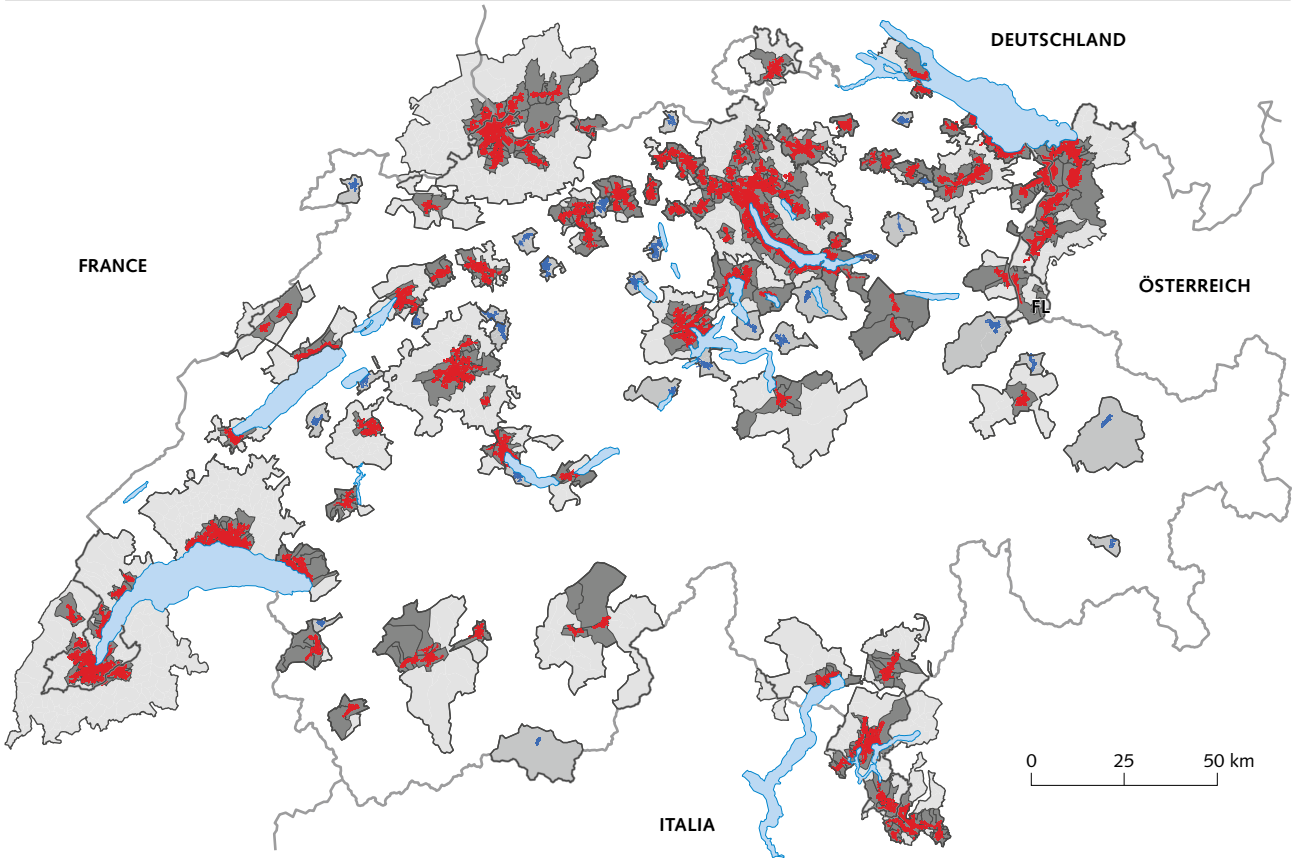
230	Winterthur	2581	Olten – Zofingen	T_4260	Bad Säckingen – Stein (AG) (DE/CH)	5938	Yverdon-les-Bains
261	Zürich	2601	Solothurn			6002	Brig – Visp
351	Bern	T_2701	Basel (CH/DE/FR)	4401	Arbon – Rorschach	6136	Martigny
371	Biel/Bienne	T_2939	Schaffhausen (CH/DE)	4436	Amriswil – Romanshorn	6153	Monthey
581	Interlaken	3203	St. Gallen	4566	Frauenfeld	6248	Sierre
942	Thun	T_3251	Rheintal (AT/CH)	T_4671	Konstanz – Kreuzlingen (DE/CH)	6266	Sion
1061	Luzern	T_3271	Vaduz – Buchs (LI/CH)			T_6421	La Chaux-de-Fonds – Le Locle (CH/FR)
1201	Altdorf (UR)	3336	Rapperswil-Jona – Rüti	5002	Bellinzona		
1344	Lachen	3425	Wil (SG)	T_5113	Locarno (CH/IT)	6458	Neuchâtel
1630	Glarus	3901	Chur	T_5192	Lugano (CH/IT)	T_6621	Genève (CH/FR)
1711	Zug	4001	Aarau	T_5250	Como – Chiasso – Mendrisio (IT/CH)	T_6711	Delémont (CH/FR)
2125	Bulle	4021	Baden – Brugg				
2196	Fribourg	4082	Wohlen (AG)	5586	Lausanne	* **T**_xxxx indicates cross-border agglomerations	
2546	Grenchen	4201	Lenzburg	5890	Vevey – Montreux		

Code and name of core outside of agglomerations

90306	Lyss	91362	Arth	93293	Mels – Sargans	94141	Reinach (AG)
90329	Langenthal	91372	Schwyz	93339	Uznach	94304	Döttingen – Böttstein
90404	Burgdorf	91407	Sarnen	93379	Wattwil	94946	Weinfelden
90412	Kirchberg (BE)	91509	Stans	93402	Flawil	95401	Aigle
90768	Spiez	92275	Murten	93787	St. Moritz	95822	Payerne
91103	Sursee	92407	Oensingen	93851	Davos	96300	Zermatt
91301	Einsiedeln	92583	Schönenwerd	93955	Landquart	96800	Porrentruy

Source: FSO – Section Environment, Sustainable Development, Territory (UNR)

Core municipalities based on raster data, 2012 — M 2



Agglomerations

- Contigous grid cells* with > 500 IJO**/km² and > 15 000 IJO in total
- Core municipality of agglomeration
- Municipality in the commuting zone of agglomeration

Cores outside agglomeration

- Contigous grid cells* with > 500 IJO**/km² and > 12 000 IJO in total
- Core municipality outside agglomeration

* Contigous grid cells, which fulfill the criteria in at least 5 of 9 calculations.
** Sum of inhabitants, jobs and equivalents of overnight stays.

Source: FSO – Section Environment, Sustainable Development, Territory (UNR)

T 4 List of agglomerations, 2012

Agglomeration code	Agglomeration name	Number of municipalities (incl. foreign)	Number of Swiss municipalities (where different)	Population 2012 (including neighbouring country)	Permanent resident population on Swiss territory, 2012 (if different)
230	Winterthur	8	-	133 691	-
261	Zürich	151	-	1 280 944	-
351	Bern	75	-	398 873	-
371	Biel/Bienne	27	-	101 271	-
581	Interlaken	9	-	23 363	-
942	Thun	15	-	78 964	-
1061	Luzern	19	-	220 741	-
1201	Altdorf (UR)	12	-	31 476	-
1344	Lachen	4	-	27 711	-
1630	Glarus	2		29 510	-
1711	Zug	14	-	121 269	-
2125	Bulle	7	-	29 437	-
2196	Fribourg	36	-	100 111	-
2546	Grenchen	3	-	25 640	-
2581	Olten – Zofingen	21	-	95 041	-
2601	Solothurn	22	-	76 750	-
T_2701	Basel (CH/DE/FR)	205	107	823 112	527 225
T_2939	Schaffhausen (CH/DE)	16	15	69 024	67 628
3203	St. Gallen	23	-	162 795	-
T_3251	Rheintal (AT/CH)	56	10	334 260	55 000
T_3271	Vaduz – Buchs (LI/CH)	15	4	62 810	26 335
3336	Rapperswil-Jona – Rüti	3	-	45 486	-
3425	Wil (SG)	10	-	70 842	-
3901	Chur	11	-	56 697	-
4001	Aarau	12	-	74 244	-
4021	Baden – Brugg	15	-	105 606	-
4082	Wohlen (AG)	2	-	21 327	-
4201	Lenzburg	5	-	20 754	-
T_4260	Bad Säckingen – Stein (AG) (DE/CH)	4	3	22 480	5 715
4401	Arbon – Rorschach	8	-	52 734	-
4436	Amriswil – Romanshorn	3	-	24 322	-
4566	Frauenfeld	1	-	24 119	-
T_4671	Konstanz – Kreuzlingen (DE/CH)	5	2	119 621	22 637
5002	Bellinzona	20	-	50 352	-
T_5113	Locarno (CH/IT)	19	17	55 750	54 737
T_5192	Lugano (CH/IT)	68	51	175 316	145 576
T_5250	Como – Chiasso – Mendrisio (IT/CH)	49	12	229 438	50 026
5586	Lausanne	131	-	389 614	-
5890	Vevey – Montreux	11	-	81 501	-
5938	Yverdon-les-Bains	13	-	39 182	-
6002	Brig – Visp	26	-	45 589	-
6136	Martigny	3	-	20 075	-
6153	Monthey	4	-	30 571	-
6248	Sierre	6	-	25 131	-
6266	Sion	18	-	79 746	-
T_6421	La Chaux-de-Fonds – Le Locle (CH/FR)	10	8	56 900	52 098
6458	Neuchâtel	17	-	87 641	-
T_6621	Genève (CH/FR)	200	88	818 668	552 305
T_6711	Delémont (CH/FR)	16	15	28 355	28 313

T_xxxx indicates cross-border agglomerations

Further information on the classification of areas with urban character, analyses and tables with the precise categorisation of the 2,352 municipalities in Switzerland (as at 1/1/2014) can be consulted by visiting www.bfs.admin.ch → Regional → Statistische Grundlagen → Räumliche Gliederungen. (in German or French)

Source: FSO

T 5 List of cores outside of agglomerations (2012) by size

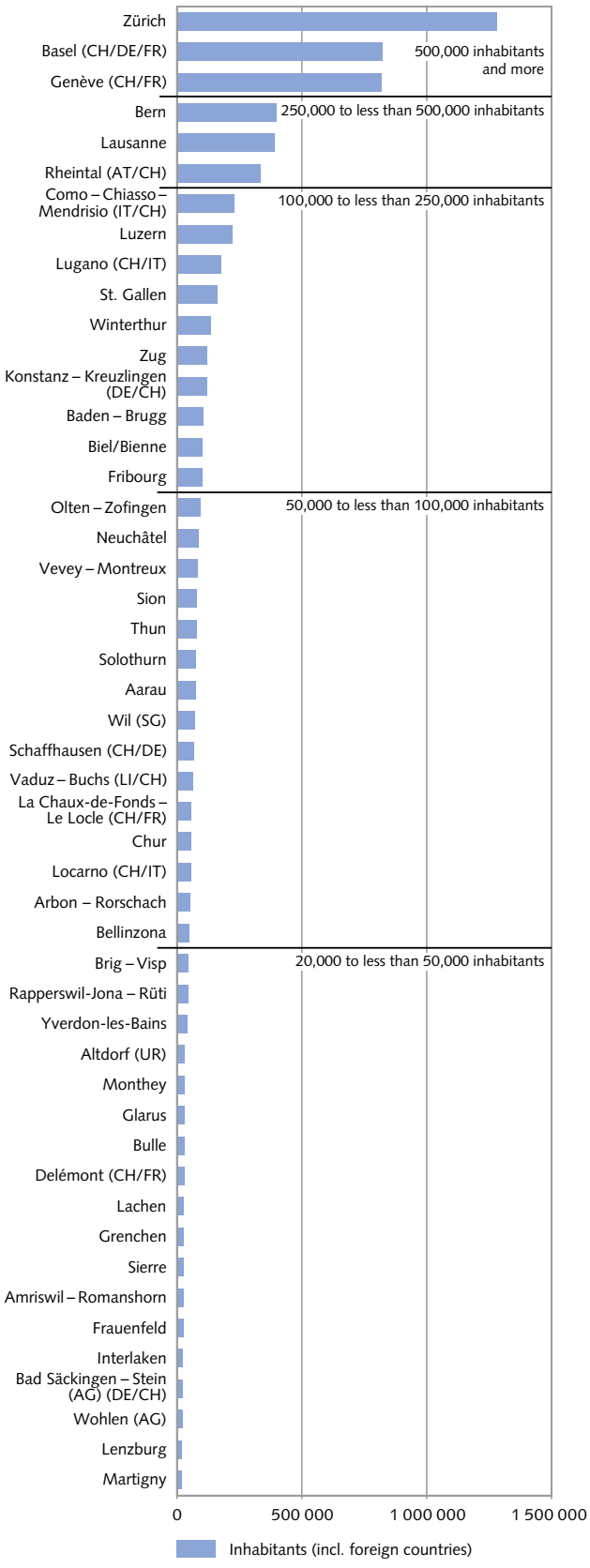
Core code	Core name	Number of municipalities	Permanent resident population, 2012
93293	Mels – Sargans	3	18 804
90404	Burgdorf	2	18 583
90329	Langenthal	2	17 666
94141	Reinach (AG)	4	17 630
91509	Stans	3	15 630
91103	Sursee	3	15 565
91372	Schwyz	1	14 663
91301	Einsiedeln	1	14 632
90306	Lyss	1	14 080
92583	Schönenwerd	4	13 800
90768	Spiez	1	12 549
93955	Landquart	2	11 650
93851	Davos	1	11 156
95822	Payerne	2	11 143
91362	Arth	1	10 924
90412	Kirchberg (BE)	4	10 743
94946	Weinfelden	1	10 699
94304	Döttingen – Böttstein	3	10 603
93379	Wattwil	2	10 306
93402	Flawil	1	10 126
91407	Sarnen	1	9 959
92407	Oensingen	2	9 944
92275	Murten	5	9 836
95401	Aigle	1	9 703
93339	Uznach	2	9 420
96800	Porrentruy	2	8 389
96300	Zermatt	1	5 786
93787	St. Moritz	1	5 147

Source: FSO

3.4 Agglomeration size rankings

Table 6 and Graph 2 show the size distribution of agglomerations from a cross-border perspective. These kinds of representation are useful for comparing specific analyses of similar agglomerations.

Size distribution and size ranges of agglomerations **G 2**



Source: FSO – STATPOP 2012

T 6 Agglomerations by size

Number of inhabitants (including on foreign soil)	Number of agglomerations	Proportion of total agglomeration population (%)
500 000 and over	3	41.3
250 000 – 499 999	3	15.9
100 000 – 249 999	10	20.8
50 000 – 99 999	15	14.8
20 000 – 49 999	18	7.3

Source: FSO

The European concept of *Functional Urban Areas* (ESPON 2006) requires no fewer than 50,000 inhabitants. This concept is similar to the one used in the present definition. Analysis of agglomerations starting at this threshold are internationally comparable, with some limitations.

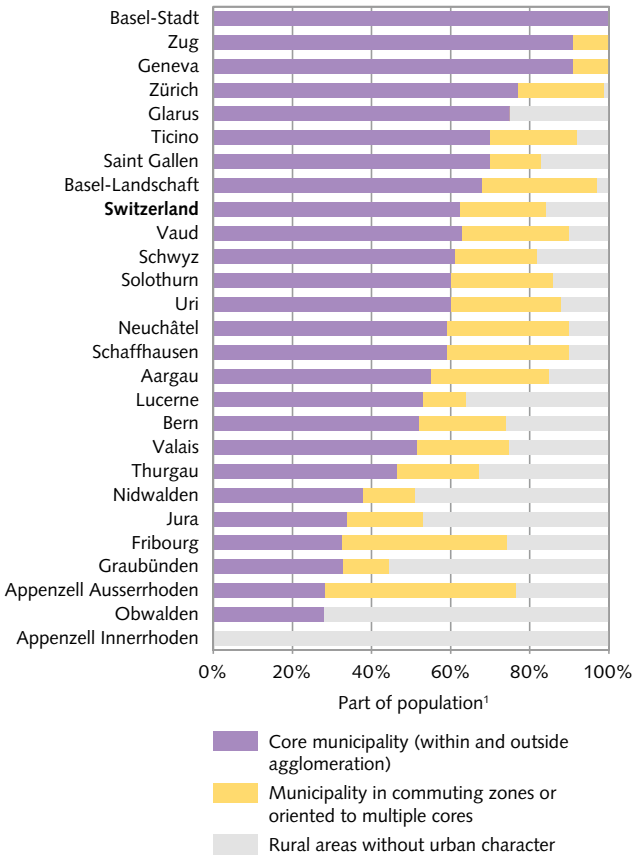
3.5 Urban population by canton

Some cantons have a high proportion of their population living in areas with urban character, e. g. Basel-Stadt, Geneva, Zug and Zurich. Cantons such as Obwalden are at the opposite end of the scale (G 3). Appenzell-Innerrhoden has no areas whatsoever with urban character.

3.6 Statistical cities and towns

The statistical cities and towns resulting from the definition described under Chapter 2.6 are shown in Map 3 and listed in Table 7.

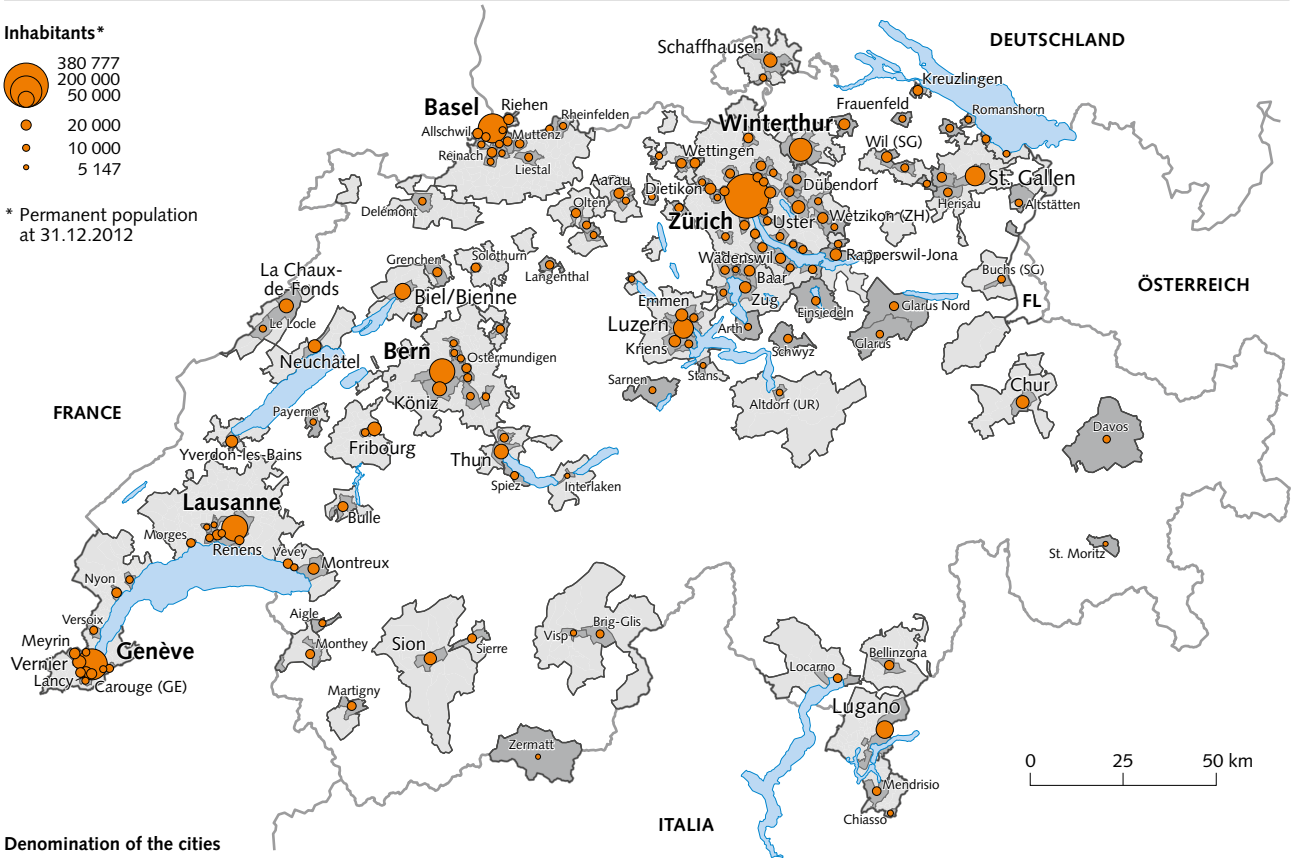
Population by types of area and cantons **G 3**



1 Permanent resident population 2012

Source: FSO – STATPOP

Statistical cities of Switzerland, 2012 — M 3



Denomination of the cities

Zürich	≥ 100 000 inhabitants
Luzern	≥ 50 000 i.
Thun	≥ 30 000 i.
Montreux	≥ 20 000 i.
St. Moritz	< 20 000 i.

Municipality area of the "statistical cities"

Other municipalities of agglomerations and core municipalities outside agglomerations

The definition of the cities is based in summary on the following criteria: density and number of inhabitants, jobs and equivalents from overnight stays.

Source: FSO – Section Environment, Sustainable Development, Territory (UNR)

T7 Statistical cities and towns, 2012

Municipality code	Name	Canton	Permanent resident population, 2012
261	Zürich	ZH	380 777
6621	Genève	GE	189 033
2701	Basel	BS	165 566
5586	Lausanne	VD	130 421
351	Bern	BE	127 515
230	Winterthur	ZH	104 468
1061	Luzern	LU	79 478
3203	St. Gallen	SG	74 111
5192	Lugano	TI	61 837
371	Biel/Bienne	BE	52 351
942	Thun	BE	42 735
355	Köniz	BE	39 375
6421	La Chaux-de-Fonds	NE	38 267
2196	Fribourg	FR	36 633
2939	Schaffhausen	SH	35 413
3901	Chur	GR	34 087
6643	Vernier	GE	33 744
6458	Neuchâtel	NE	33 474
198	Uster	ZH	32 748
6266	Sion	VS	32 167
6628	Lancy	GE	28 909
1024	Emmen	LU	28 701
5938	Yverdon-les-Bains	VD	28 486
1711	Zug	ZG	27 537
1059	Kriens	LU	26 751
3340	Rapperswil-Jona	SG	26 354
5886	Montreux	VD	25 456
191	Dübendorf	ZH	25 341
243	Dietikon	ZH	24 843
4566	Frauenfeld	TG	24 119
121	Wetzikon (ZH)	ZH	23 274
3427	Wil (SG)	SG	22 985
1701	Baar	ZG	22 355
6630	Meyrin	GE	21 718
142	Wädenswil	ZH	20 967
2703	Riehen	BS	20 699
4671	Kreuzlingen	TG	20 520
6608	Carouge (GE)	GE	20 375
5591	Renens (VD)	VD	20 232
2125	Bulle	FR	20 177
4045	Wettingen	AG	20 135
4001	Aarau	AG	20 103
2762	Allschwil	BL	19 898
133	Horgen	ZH	19 282
5724	Nyon	VD	19 170
2773	Reinach (BL)	BL	18 661
5890	Vevey	VD	18 594
4021	Baden	AG	18 522
62	Kloten	ZH	18 402
131	Adliswil	ZH	18 037
53	Bülach	ZH	17 975

T7 Statistical cities and towns, 2012 (continuation)

Municipality code	Name	Canton	Permanent resident population, 2012
3443	Gossau (SG)	SG	17 941
6631	Onex	GE	17 851
199	Volketswil	ZH	17 768
5002	Bellinzona	TI	17 744
5590	Pully	VD	17 368
141	Thalwil	ZH	17 340
2770	Muttenz	BL	17 339
247	Schlieren	ZH	17 199
1630	Glarus Nord	GL	17 198
2581	Olten	SO	17 133
96	Regensdorf	ZH	16 975
6136	Martigny	VS	16 897
6153	Monthey	VS	16 880
2601	Solothurn	SO	16 465
2546	Grenchen	SO	16 173
174	Illnau-Effretikon	ZH	16 117
66	Opfikon	ZH	16 116
6248	Sierre	VS	15 945
363	Ostermundigen	BE	15 871
1322	Freienbach	SZ	15 758
404	Burgdorf	BE	15 659
939	Steffisburg	BE	15 515
5113	Locarno	TI	15 483
2831	Pratteln	BL	15 282
3001	Herisau	AR	15 222
329	Langenthal	BE	15 184
1702	Cham	ZG	15 020
5642	Morges	VD	14 994
4082	Wohlen (AG)	AG	14 879
2765	Binningen	BL	14 817
1372	Schwyz	SZ	14 663
1301	Einsiedeln	SZ	14 632
5254	Mendrisio	TI	14 499
69	Wallisellen	ZH	14 188
306	Lyss	BE	14 080
4401	Arbon	TG	14 012
158	Stäfa	ZH	13 876
2829	Liestal	BL	13 708
1058	Horw	LU	13 618
6640	Thônex	GE	13 587
154	Küsnacht (ZH)	ZH	13 518
4280	Oftringen	AG	12 939
6644	Versoix	GE	12 879
138	Richterswil	ZH	12 832
156	Meilen	ZH	12 816
6002	Brig-Glis	VS	12 728
3408	Uzwil	SG	12 726
356	Muri bei Bern	BE	12 675
4461	Amriswil	TG	12 619
1054	Ebikon	LU	12 571
768	Spiez	BE	12 549

T 7 Statistical cities and towns, 2012 (continuation)

Municipality code	Name	Canton	Permanent resident population, 2012
1632	Glarus	GL	12 312
4258	Rheinfelden	AG	12 174
161	Zollikon	ZH	12 163
2228	Villars-sur-Glâne	FR	11 975
118	Rüti (ZH)	ZH	11 968
6623	Le Grand-Saconnex	GE	11 847
6711	Delémont	JU	11 809
2769	Münchenstein	BL	11 715
5589	Prilly	VD	11 709
5721	Gland	VD	11 693
616	Münsingen	BE	11 566
3271	Buchs (SG)	SG	11 536
5635	Ecublens (VD)	VD	11 427
2	Affoltern am Albis	ZH	11 276
52	Bassersdorf	ZH	11 243
3851	Davos	GR	11 156
861	Belp	BE	11 108
3251	Altstätten	SG	11 075
177	Pfäffikon	ZH	11 027
362	Ittigen	BE	10 997
4040	Spreitenbach	AG	10 930
1362	Arth	SZ	10 924
5889	La Tour-de-Peilz	VD	10 828
4289	Zofingen	AG	10 824
2771	Oberwil (BL)	BL	10 721
4946	Weinfelden	TG	10 699
117	Hinwil	ZH	10 615
4095	Brugg	AG	10 611
6612	Chêne-Bougeries	GE	10 530
155	Männedorf	ZH	10 470
4254	Möhlin	AG	10 455
4436	Romanshorn	TG	10 353
2766	Birsfelden	BL	10 277
6633	Plan-les-Ouates	GE	10 250
2761	Aesch (BL)	BL	10 220
2937	Neuhausen am Rheinfall	SH	10 220
6436	Le Locle	NE	10 208
3402	Flawil	SG	10 126
361	Zollikofen	BE	9 977
1407	Sarnen	OW	9 959
1707	Risch	ZG	9 779
546	Münchenbuchsee	BE	9 749
5401	Aigle	VD	9 703
4012	Suhr	AG	9 673
250	Urdorf	ZH	9 471
1708	Steinhausen	ZG	9 213
5822	Payerne	VD	9 146
1103	Sursee	LU	9 079
2763	Arlesheim	BL	9 073
1201	Altdorf (UR)	UR	8 981
3215	Rorschach	SG	8 918
4201	Lenzburg	AG	8 626
5624	Bussigny-près-Lausanne	VD	8 122
1509	Stans	NW	8 112
5250	Chiasso	TI	7 933
5583	Crissier	VD	7 402
6297	Visp	VS	7 281
6300	Zermatt	VS	5 786
581	Interlaken	BE	5 504
3787	St. Moritz	GR	5 147

T 7 Statistical cities and towns, 2012 (end)

Source: FSO

4 Application

Spatial nomenclatures such as the one describing areas with urban character can be used to search for statistical variables as expressed in their respective categories. Initial sample analyses of data from population and economic sources reveal interesting differences (T8). It is also popular to use these categories for voter analysis to see if any city/countryside divides are in play.

Categories of areas with urban character might also be used for administrative matters, although it should be noted that they were primarily developed for the purposes of statistical analysis. One example of administrative application relates to the federal agglomeration policy, which is underpinned by the FSO's definition of agglomerations in 2000.

It should be ensured that data used to analyse cross-border agglomeration areas is admissible, in the event that differences in data collection by various counties exist. The inclusion of cross-border agglomerations in any analysis should always be signalled.

T8 Frequently used values based on assignment to spatial types with urban character

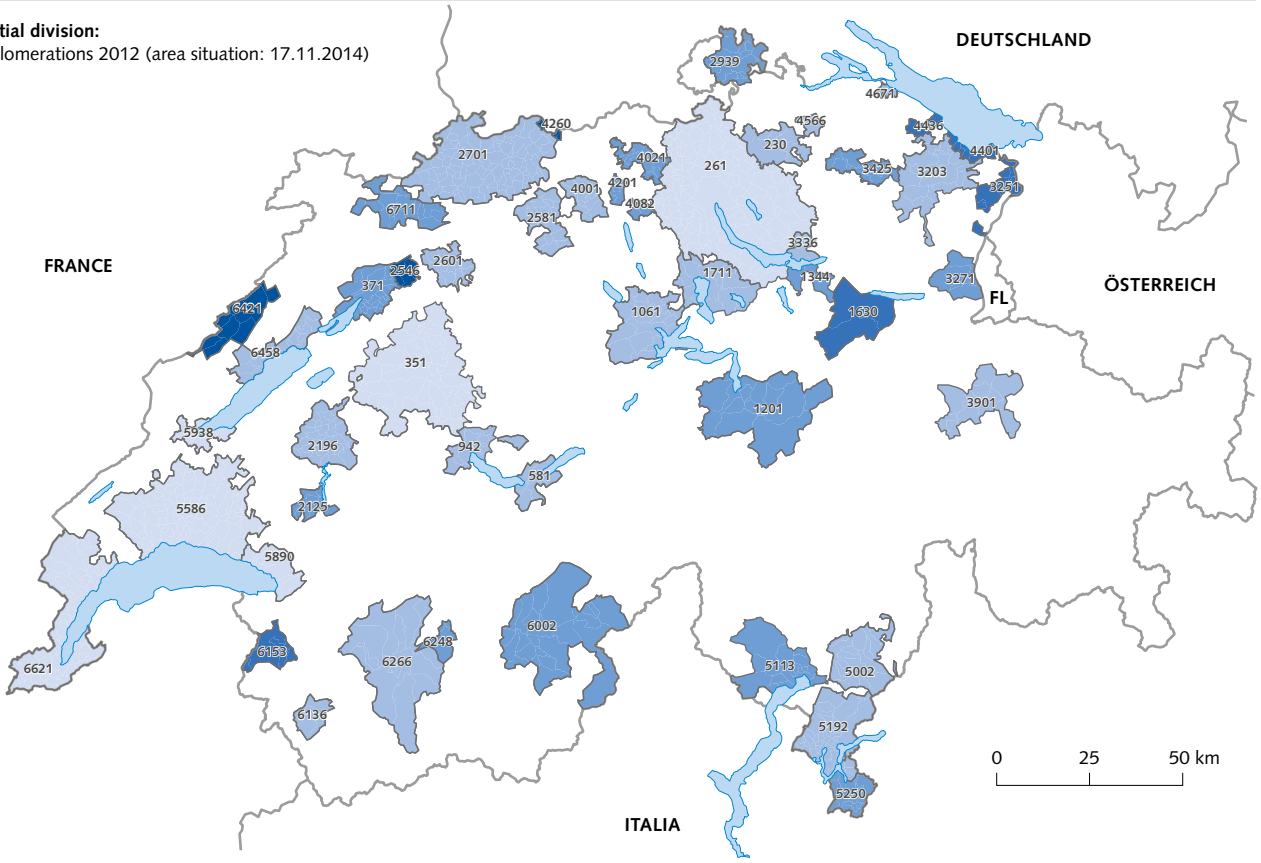
	Population density, 2013 (inhabitants per km²)	Youth ratio[1] 2013 (%)	Senior citizen ratio[2] 2013 (%)	Proportion of population with foreign nationality, 2013 (%)	Share of 1st sector, 2011, as % of full-time equivalents	Share of 2nd sector, 2011, as % of full-time equivalents	Share of 3rd sector, 2011, as % of full-time equivalents
Swiss average	204	32.7	28.4	23.8	2.8	26.1	71.0
Area with urban character	418	32.3	28.2	25.2	1.8	24.6	73.6
Cores (within and outside agglomeration)	825	31.0	28.6	28.4	0.8	22.3	77.0
Municipalities in commuting zones or oriented to multiple cores	172	35.9	26.9	16.0	7.9	37.9	54.2
Rural area without urban character	54	35.2	29.4	16.0	10.4	37.4	52.2

[1] Ratio of under 20s to 20–64 age bracket
[2] Ratio of over 65s to 20–64 age bracket

Source: FSO – STATPOP, STATENT

Jobs in the 2nd sector, 2011 M 4

Spatial division:
agglomerations 2012 (area situation: 17.11.2014)



Share of full time equivalents in the 2nd sector, as a % of total full time equivalents

< 20.0	20.0 – 29.9	30.0 – 39.9	40.0 – 49.9	≥ 50.0

Code and name of agglomeration

230	Winterthur	2546	Grenchen	4082	Wohlen (AG)	5938	Yverdon-les-Bains
261	Zürich	2581	Olten – Zofingen	4201	Lenzburg	6002	Brig – Visp
351	Bern	2601	Solothurn	4260	Stein (AG) (CH)	6136	Martigny
371	Biel/Bienne	2701	Basel (CH)	4401	Arbon – Rorschach	6153	Monthey
581	Interlaken	2939	Schaffhausen (CH)	4436	Amriswil – Romanshorn	6248	Sierre
942	Thun	3203	St. Gallen	4566	Frauenfeld	6266	Sion
1061	Luzern	3251	Rheintal (CH)	4671	Kreuzlingen (CH)	6421	La Chaux-de-Fonds – Le Locle (CH)
1201	Altdorf (UR)	3271	Buchs (SG) (CH)	5002	Bellinzona		
1344	Lachen	3336	Rapperswil-Jona – Rüti	5113	Locarno (CH)	6458	Neuchâtel
1630	Glarus	3425	Wil (SG)	5192	Lugano (CH)	6621	Genève (CH)
1711	Zug	3901	Chur	5250	Chiasso – Mendrisio (CH)	6711	Delémont (CH)
2125	Bulle	4001	Aarau	5586	Lausanne		
2196	Fribourg	4021	Baden – Brugg	5890	Vevey – Montreux		

Source: FSO – STATENT

5 Comparison between 2000 and 2012 definitions

The definition of agglomerations and towns/cities dating from 2000 was made on a basic interpretation similar to the one described here, but it used other criteria and thresholds (FSO 2005, page 148f). Furthermore, it comprised only three categories (agglomeration core cities, other agglomeration municipalities and isolated towns). Comparisons are therefore only legitimate to a limited extent, and are most feasible at the agglomeration level.

Hence, there is a certain continuity as regards agglomerations. In comparison with the 2000 definition, the 2012 version has one agglomeration less (T 9). Four agglomerations of the 2000 definition have lost their status (Burgdorf, Schwyz, Stans, St. Moritz) but four others have gained this status: Altdorf, Glarus, Martigny and the cross-border agglomeration Bad Säckingen (DE) – Stein. Moreover, the Wetzikon – Pfäffikon agglomeration has been integrated into the Zurich agglomeration (T 10). The core cities of other agglomerations no longer considered as such are still counted among areas with urban character as cores outside of agglomerations.

T 9 Comparison of key figures on agglomerations, 2000 and 2012

	2000	2012
Number of agglomerations	50	49
Total agglomeration population (%)	72.5	73.0
Surface (km²)	8 601	11 356
Number of agglomeration municipalities *(as at 1/1/2014)*	881	1 099

Source: FSO

T 10 Agglomerations added and removed

New agglomerations	Free-standing agglomerations removed
Altdorf (UR)	Burgdorf
Bad Säckingen – Stein (AG)	Schwyz
Glarus	Stans
Martigny	St. Moritz
	Wetzikon – Pfäffikon

Source: FSO

Map 5 and Table 11 contrast municipalities denoted as having urban character in 2012 with those making up agglomerations under the 2000 definition. The map shows how urbanisation has spread over the past decade using the revised classification of areas with urban character.

The agglomeration core municipalities take up more room than the core cities of the 2000 definition. According to the 2000 definition, there were 63 core cities (one to two per agglomeration). With the new definition, there are 430 core municipalities (on average nine per agglomeration). The agglomerations have expanded; today, 1,099 from a total of 2,352 Swiss municipalities belong to an agglomeration – 218 more than in the year 2000. This difference is not only the result of the process of urbanisation but also due to change of the method. Commuting zones are now demarcated solely on a functional basis, using a single criterion. In the previous definition, however, a combination of morphological, structural and functional criteria was used.

In total, 330 municipalities previously classified as rural areas have joined agglomerations, while 112 municipalities have now left the agglomeration perimeters set in 2000. In total, 60 municipalities were made municipalities oriented to multiple cores, 19 became core municipalities outside of agglomerations (including Burgdorf, Schwyz, Stans and St. Moritz) and 33 municipalities (1% of the resident population in Switzerland) are no longer considered as areas with urban character (among others municipalities surrounding St. Moritz). Several municipalities changed to another agglomeration.

Outside of the agglomerations, 290 hitherto rural municipalities changed their status to municipalities oriented to multiple cores. 34 hitherto rural municipalities became core municipalities outside of agglomerations; e. g. Porrentruy, Sarnen, Murten, Payerne and Döttingen – Böttstein.

In 2000, 119 municipalities had more than 10,000 inhabitants and were implicitly considered as statistical cities/towns. Under the new definition, 162 statistical cities or towns were identified on the basis of density.

T 11 Comparison of urban categories[1] according to 2000 and 2012 definitions

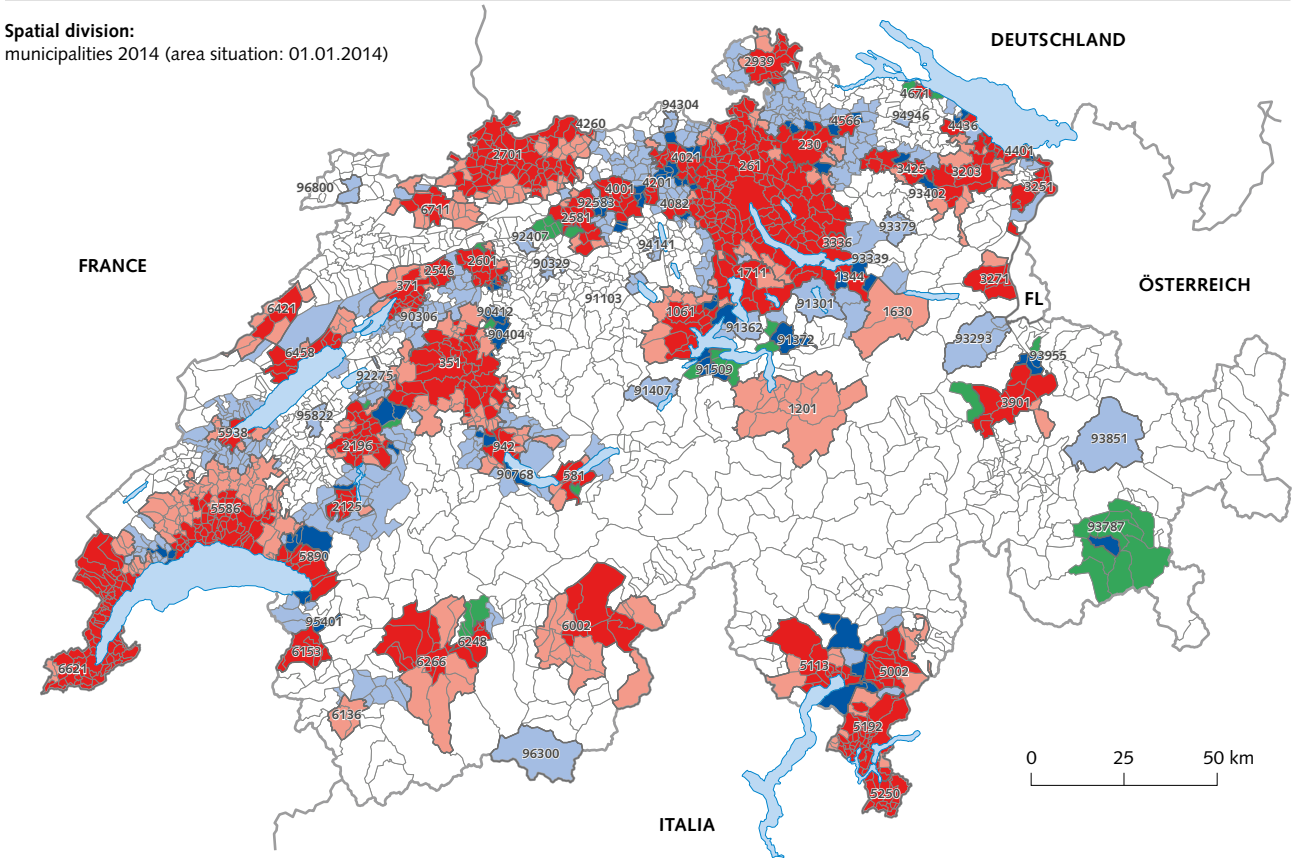
Today (2012 definition, area with urban character)	Previously (2000 definition)				
	Total	Core cities	Other agglomeration municipalities	Isolated towns	Rural municipalities
Total		63	818	5	1 466
Agglomeration core municipalities (core cities)	59	50	5	1	3
Agglomeration core municipalities (primary core)	302	4	290	0	8
Agglomeration core municipalities (secondary core)	69	2	67	0	0
Agglomeration commuting zone municipalities	669	1	350	0	318
Municipalities oriented to multiple cores	350	0	60	0	290
Core municipalities outside agglomerations	57	5	14	4	34
Rural municipalities without urban character	846	1	32	0	813

[1] Same as colour scheme used in Map 5

Source: FSO

Comparison of "Urban areas 2000" and the "Area with urban character 2012" M 5

Spatial division:
municipalities 2014 (area situation: 01.01.2014)



Categories of municipalites: previously (2000) and today (2012)

- Agglomeration 2000 and agglomeration 2012
- Agglomeration 2000 ➠ Area with urban character 2012, outside agglomeration
- Agglomeration 2000 ➠ Rural area without urban character 2012
- Rural municipality / isolated city 2000 ➠ Agglomeration 2012
- Rural municipality / isolated city 2000 ➠ Area with urban character 2012, outside agglomerations
- Rural municipality 2000 ➠ Rural area without urban character 2012

Code and name of agglomeration

230	Winterthur	2546	Grenchen	4082	Wohlen (AG)	5938	Yverdon-les-Bains
261	Zürich	2581	Olten – Zofingen	4201	Lenzburg	6002	Brig – Visp
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1630	Glarus	3425	Wil (SG)	5192	Lugano (CH)	6621	Genève (CH)
1711	Zug	3901	Chur	5250	Chiasso – Mendrisio (CH)	6711	Delémont (CH)
2125	Bulle	4001	Aarau	5586	Lausanne		
2196	Fribourg	4021	Baden – Brugg	5890	Vevey – Montreux		

Code and name of core outside of agglomerations

90306	Lyss	91362	Arth	93293	Mels – Sargans	94141	Reinach (AG)
90329	Langenthal	91372	Schwyz	93339	Uznach	94304	Döttingen – Böttstein
90404	Burgdorf	91407	Sarnen	93379	Wattwil	94946	Weinfelden
90412	Kirchberg (BE)	91509	Stans	93402	Flawil	95401	Aigle
90768	Spiez	92275	Murten	93787	St. Moritz	95822	Payerne
91103	Sursee	92407	Oensingen	93851	Davos	96300	Zermatt
91301	Einsiedeln	92583	Schönenwerd	93955	Landquart	96800	Porrentruy

Source: FSO – Section Environment, Sustainable Development, Territory (UNR)

6 Follow-up and revisions

Municipalities that are affected by a merger or transformation will have to be reclassified. In such cases, the FSO will decide in a timely manner which municipalities belong to the urban area. For this purpose, it will use the data used in the definition from 2012. The result will be as if the municipality had already merged in 2012.

Settlement areas and their infrastructures change over time. Migration flows, economic development, continued sub- and peri-urbanisation and expansion of transport infrastructure (e. g. new tunnels) all alter the density and size of agglomeration cores as well as the functional links that form the basis of the commuting-zone definition. Therefore, the FSO considers it reasonable to reassess the assignment of municipalities approximately every ten years and, where necessary, to make adjustments.

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Appendix
Data sources

Details of data used

TA 1 Switzerland: Data used at grid spatial level

Name of variable	Survey date or period	Source
Permanent residential population at year-end	31/12/2012	STATPOP
Number of employed persons at work location	31/12/2011	STATENT
Overnight stays in hotel and health establishments	1/1/2010 to 31/12/2010	HESTA (geo-coded via identification number in company and business register)

NB: These data were required to perform steps 1 and 9.

Source: FSO

TA 2 Switzerland: Data at municipal spatial level

Designation of variable	Survey date or period	Source
Spatial geometry of Swiss municipalities	1/1/2014	Euroboundarymap from EUROGRAPHICS, cross-checked with SWISSTOPO data
Permanent residential population at year-end	31/12/2012	STATPOP
Number of jobs at work location	31/12/2011	STATENT
Overnight stays in hotel and health establishments	1/1/2012 to 31/12/2012	HESTA
Number of people with residency in municipality X but working in municipality Y (flow data)	31/12/2011	STATENT – STATPOP linkage

NB: These data were required to perform steps 2 to 9.

Source: FSO

TA 3 Neighbouring countries: Data used at grid spatial level

Name of variable	Survey date or period	Source
Resident population	2010	Disaggregation of data from national statistics offices / Estimation on the basis of data from European Environment Agency (MICROGIS 2013). For Liechtenstein and Austria, data from national statistics offices has been used.
Number of employed persons at work location	2010	Disaggregation of data from national statistics offices / Estimation on the basis of data from European Environment Agency (MICROGIS 2013).
Overnight stays in hotel and tourism companies	1/1/2010 to 31/12/2010	Disaggregation of data from national statistics offices / Estimation on the basis of data from national statistics offices (MICROGIS 2013).

Source: FSO

TA 4 Neighbouring countries: Data at municipal spatial level

Designation of variable	Survey date or period	Source
Spatial geometry of municipalities or equivalent LAU2 units	1/1/2013	Euroboundarymap from EUROGRAPHICS
Resident population	2009–2011	National statistics offices
Number of jobs at work location	2010–2011	National statistics offices
Commuting flows FR → CH	2006–2010	INSEE, population census
Commuting flows AT, DE, IT → CH	2011	FSO statistics on frontier workers
Commuting flows LI → CH and CH → LI	31/12/2011	Liechtenstein Statistics Office
Commuting flows DE → DE	30/6/2011	Federal Employment Agency, Nuremberg
Commuting flows AT → AT	2011	Statistik Austria
Commuting flows FR → FR	2006–2010	INSEE, population census
Commuting flows IT → IT	2001	ISTAT, with code conversion (MICROGIS 2013)
Commuting flows CH → DE in the Kreuzlingen/Constance region	2011	Estimation using data from FSO Structural Survey (MICROGIS 2013)

Observations regarding TA 4: Information on commuting flows between foreign countries is generally not reliable at a municipal level. Relevance for defining areas is negligible as regards the Swiss territory. Commuting flows from Switzerland into neighbouring countries based on the Structural Survey are not taken into account (except for Kreuzlingen/Constance), because of their minor importance in defining areas, the lack of a spatial breakdown and problems with allocation.

Source: FSO

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