Geography – Background Information – 2001 Census
Output Areas, Census Area Statistics and Standard Wards & Sectors

Statistical results from the 2001 Census are available for a wide range of census areas, from the smallest area, output area, to the largest area, Scotland.

The main building bricks for census areas are Output Areas (OAs) and all higher geographies are built from these. Any area for which census output is produced is the aggregation of OAs that approximate best to the area. OAs will aggregate exactly to a council area but not necessarily to any other type of area.

All census geography is based on the set of postcodes and their boundaries, which were frozen in December 2000. Any postcode collected in enumeration that did not belong to this set was replaced during processing by the most appropriate frozen postcode. Counts of the number of households with residents and the number of residents in each postcode were generated during processing. These headcounts were used to create output areas and published in their own right as a census product on the postcode index.

Output Area

Output Areas (OAs) for 2001 were created as groups of postcodes nesting as well as possible into the following areas:

- Council Area,
- 2001 locality,
- 1991 OA,
- postcode sector and
- 2001 electoral ward

in descending order of preference (when not all postcodes in the OA belong to a single combination of these area types).

The main aim governing this order of areas is to give continuity with the 1991 OA while ensuring, as far as possible, that 2001 OAs fit into the locality or urban area which is seen as an increasingly important area type.

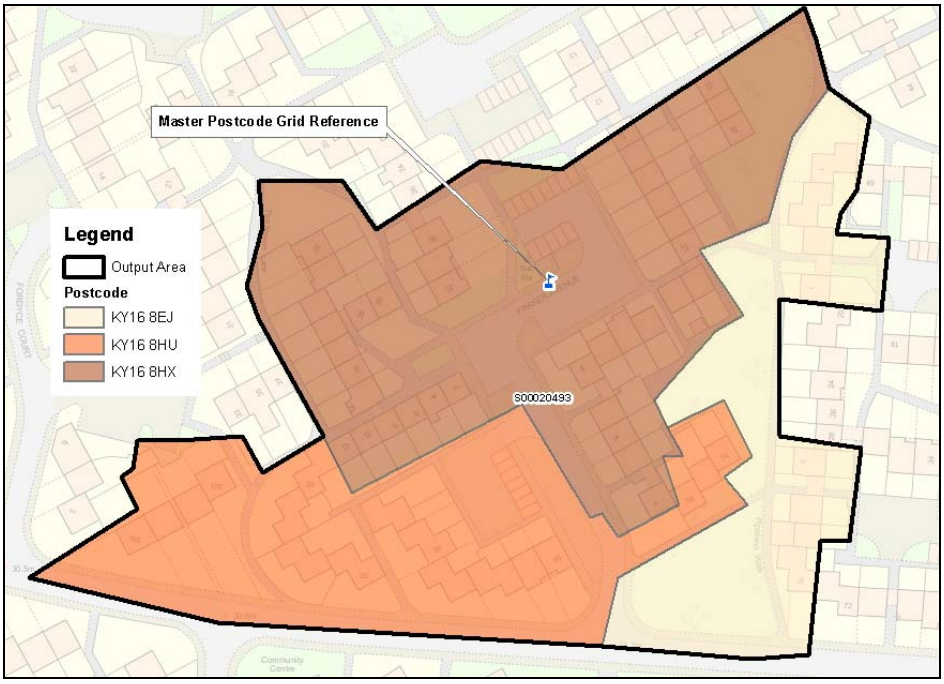
The output areas cover a sufficiently small area that user defined, or ad-hoc, areas can be created while maintaining a sufficient level of quality for user defined areas. National Records of Scotland (NRS) creates only one set of OAs and allocates all other output geographies using the output area as the building brick. Each output area is assigned to an area in a ‘higher’ geography by first selecting one of the postcodes in the OA as a ‘master’ postcode. The OA inherits all of the characteristics of the master postcode including its assignments to higher areas and its centroid grid reference.

For the 2001 Census the grid references were weighted by Household only.

An index, or a look-up table is available which provides a link between the OA and the ‘higher’ areas that the OA belongs to, enabling users to aggregate OA level census results to ‘higher, areas, such as council areas or user defined areas.

Example of a 2001 Census Output Area

	Household Count	Population Count
2001 Output Area 'S00020493'	61	116
Contains 3 postcodes		
KY16 8EJ	8	16
KY16 8HU	17	31
KY16 8HX	36	69



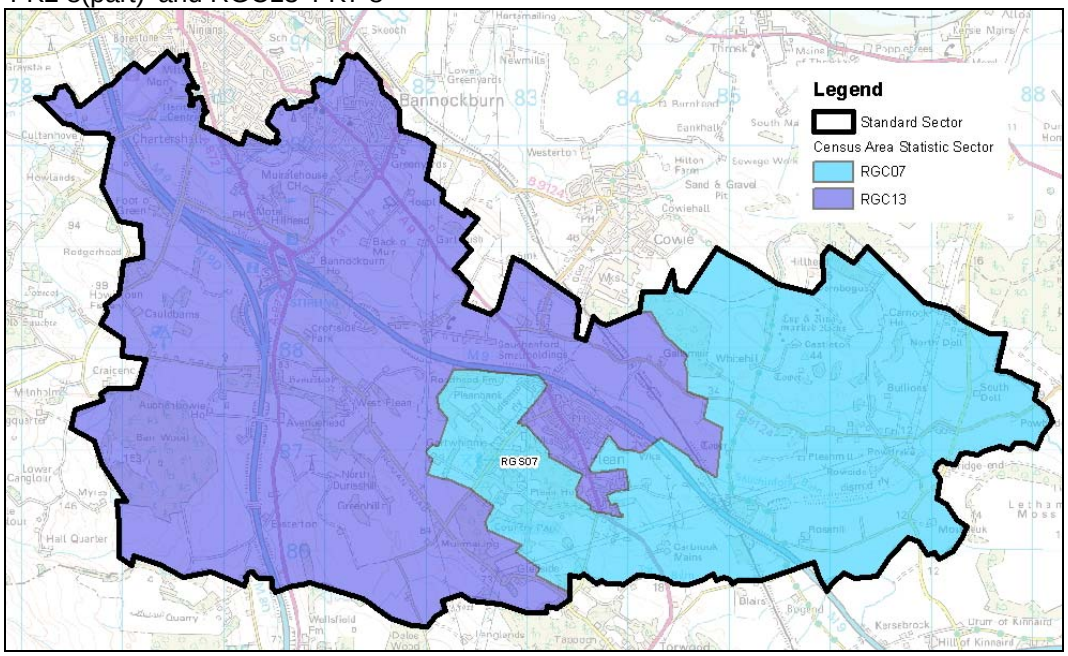
Postcode sectors

A postcode sector is the set of unit postcodes that are the same apart from the last two characters and has been used in census output since 1981. Special postcode sectors are created for census output to ensure that sectors conform to a minimum threshold and do not cross Council Area boundaries. Because the confidentiality thresholds (method B disclosure control) differ for Census Area Statistics (CAS) and Standard Tables (ST), there are two types of postcode sectors in census output: ST and CAS.

- **Census Area Statistics (CAS)** - First postcode sectors that cross council areas are split and each treated as a postcode sector in its own right. Then as described above (using master postcodes) OAs are assigned to postcode sectors. The resulting 1,010 aggregations were denoted CAS sectors will meet the minimum threshold for CAS (20 households and 50 persons). CAS sector names that include '(part)' indicate that the original sector had to be split.

- **Standard Table (ST)** - Where a CAS sector fails to meet the minimum threshold for Standard tables (400 households and 1,000 persons) it is merged with one or more neighbouring CAS sectors within the same council area so that these thresholds are met. ST Sectors that are mergers of CAS sectors are labelled 'DD1 1;DD1 3' with a semi-colon to indicate the merger.

Standard Sector RGS07 'FK7 8; FK2 8(part) contains 2 Census Area Statistic Sectors: RGC07 'FK2 8(part)' and RGC13 'FK7 8'



Census data is not available for true postcode sectors because they cross council area boundaries.

Wards

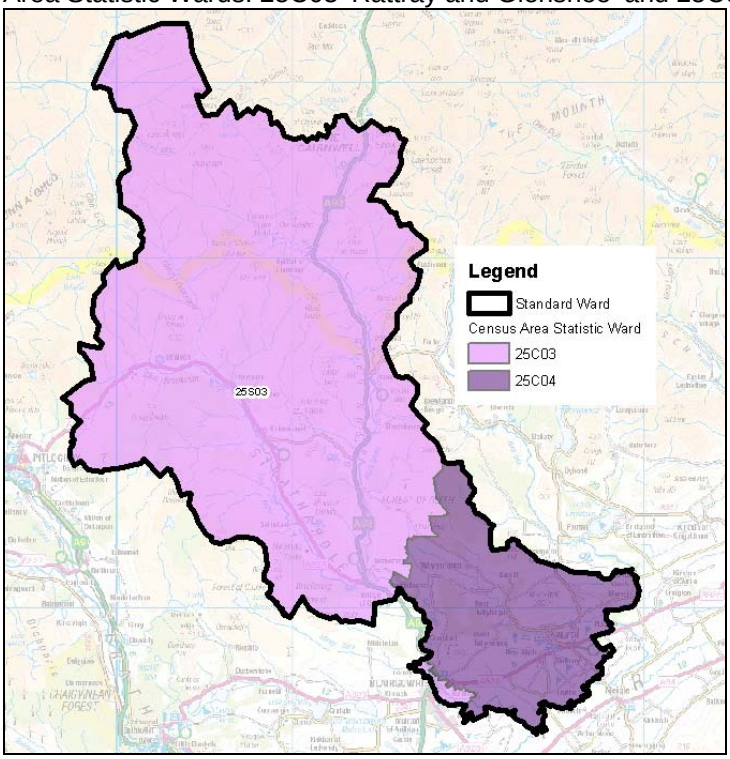
There are two types of census wards, Census Area Statistics and Standard Table. These are both created by aggregating output areas and are only best fit for electoral wards.

- **Census Area Statistics (CAS)** - As described above (using master postcodes) OAs are assigned to electoral wards. The resulting 1,222 aggregations are denoted CAS wards and will fall within a council area boundary and meet a threshold of 20 households and 50 persons.

- **Standard Table (ST)** –Where CAS wards fall below the ST thresholds (400 households and 1,000 persons) they are merged with neighbouring CAS wards to exceed the threshold. It is also necessary to make a few adjustments to ST wards so as to remove any 'slivers' below ST threshold created by differencing ST wards and ST sectors. The processes result in 1,176 ST wards.

  ST Wards that are mergers of CAS wards are labelled 'South Ronaldsay; Holm and Burray' with a semi-colon to indicate the merger. For slivers, ST wards containing part, or sliver, of a CAS ward are labelled ending in pare 'Innerleithen and Walkerburn; Peebles and District South (part)'.

Standard Ward 25S03 ‘Rattray and Glenshee; Alyth and Old Rattray’ contains 2 Census Area Statistic Wards: 25C03 ‘Rattray and Glenshee’ and 25C04 ‘Alyth and Old Rattray’



No census information is available for true electoral wards.

Multi-extent wards and sectors

The method for creating CAS and ST sectors and wards can lead to cases of multi-extent sectors and wards or instances where a sector or ward is not wholly contained within one boundary and may consist of a number, usually two, of non-contiguous boundaries for the same sector or ward.

NRS create all census output geographies using the Output Area (OA) as the building brick. During processing, some non-contiguous census output geographies have been created for census wards and sectors i.e. they are split by another area of the same type.

Details of the areas affected are:-

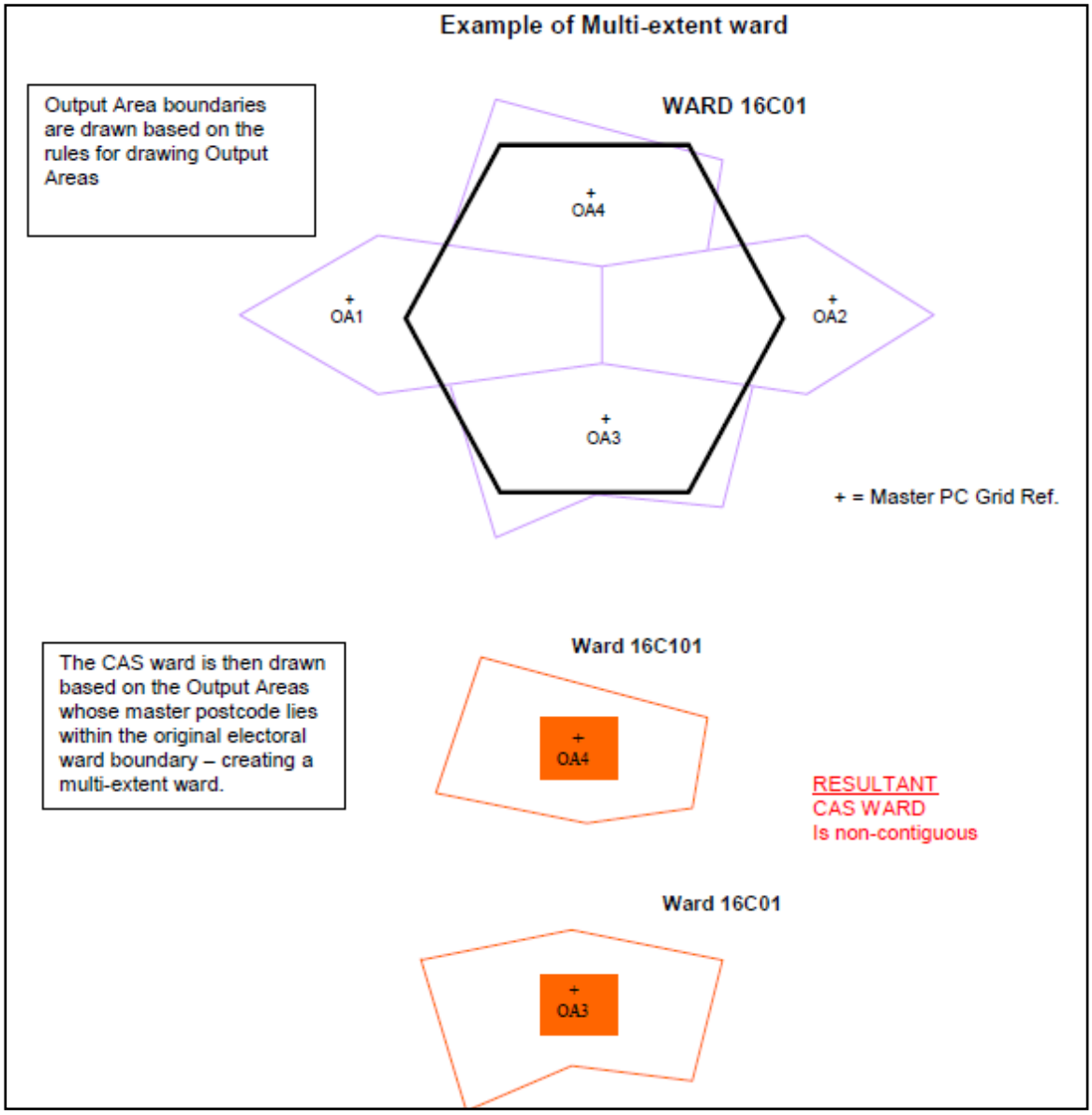
- CAS Wards: 172 of 1,222 areas have two (or more) extents.
- CAS Sectors: 59 of 1,010 areas have two (or more) extents.
- ST Wards: 158 of 1,176 areas have two (or more) extents.
- ST Sectors: 51 of 859 areas have two (or more) extents.

How does this happen?

For example, there are 158 non-contiguous Standard (ST) wards out of a total of 1,176 i.e. these CAS Wards have more than one extent.

- Each postcode has a National Grid Reference (NGR) assigned by inspection to the building nearest the centre of the populated part of the postcode. OAs are groups of adjoining postcodes and are the lowest geographic level used in the presentation of census results. A Master Postcode is selected for each OA and its Grid Reference becomes the OA Grid Reference in order to index the complete OA to higher census geographic areas.

- Postcode boundaries - and hence OA boundaries - do not match Electoral Ward boundaries exactly, other than by coincidence. Each OA whose Grid Reference is inside the same Electoral Ward boundary is used to aggregate to a CAS Ward. Non-contiguity occurs when the shape of the constituent OAs of one CAS Ward splits another CAS Ward.



Disclosure Control

There is a legal obligation not to reveal information collected in confidence in the census about individual people and households. In presenting very detailed results from the census, protecting this data is of key importance. Disclosure of information in census output is prevented by a combination of methods.

A. Setting a target or average size for output areas (50 households).
B. Setting a minimum size of areas for key output (e.g. 20 households and 50 residents for CAS).
C. Creating only one set of output areas (two sets of overlapping OAs could be 'differenced' to create unintended below-threshold areas).
D. Limiting the detail in classifications used in tables.
E. Record swapping before tabulation.

Methods A to D are aimed at ensuring that there is only a limited number of cases in which all the households or persons in one of the categories of a variable in a table belong to a single category in another variable. When this happens, information can be disclosed from the table about those households or persons. For example, if there were only one chinese person in an output area, a table for that output area tabulating ethnicity (with 'Chinese' as a category) by employment status would reveal that person's employment status. Therefore, a further measure is needed so that no one can be certain that any such instance relates to actual individuals or households. That measure is method E which completes the disclosure control package by swapping a small proportion of census records. A swapped record is then tabulated in a different output area from where the data was collected but the aggregated statistics are not materially affected. This approach has been independently reviewed and endorsed by Dick Carter of Statistics Canada.

In addition to the above, one of the conditions of using census data is that users will undertake not to attempt to obtain or derive information about a specific individual or household, nor to claim to have obtained or derived such information.

The means to protect confidentiality varies within the UK but all three UK Census Offices include the essential method E in their package of measures.