

Census Geographies for England & Wales

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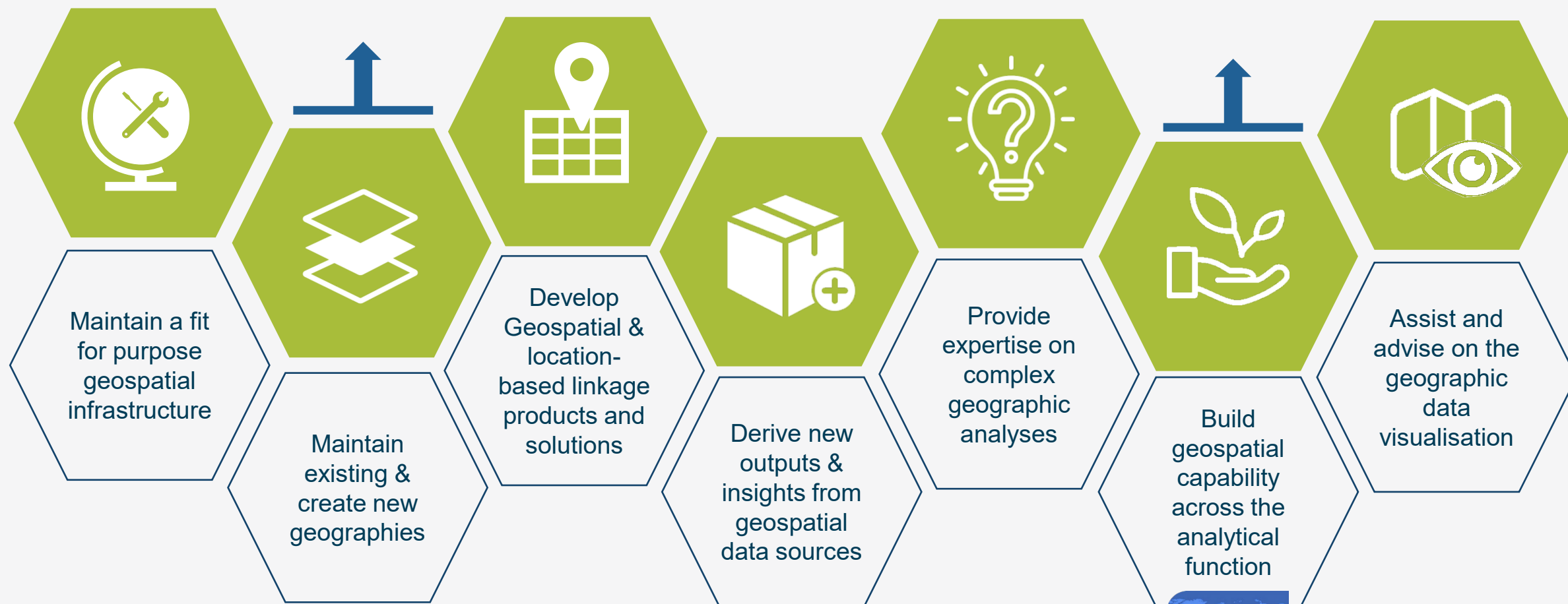
UK Census User Conference 2025



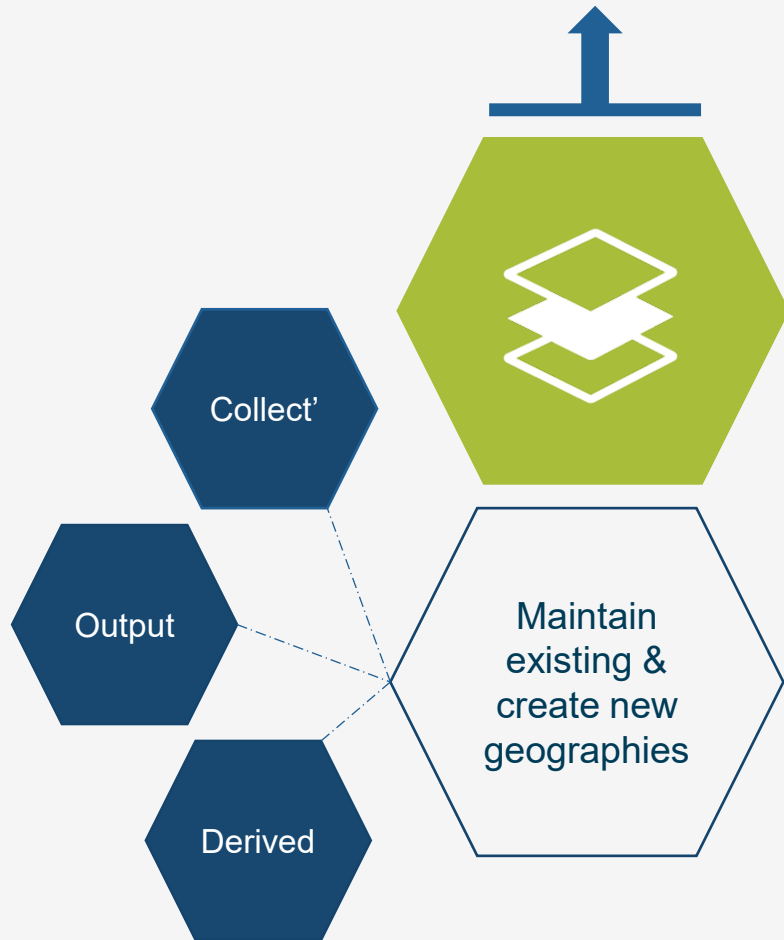
Office for National Statistics

ONS  geography

ONS Geography & Geospatial



Census Geographies



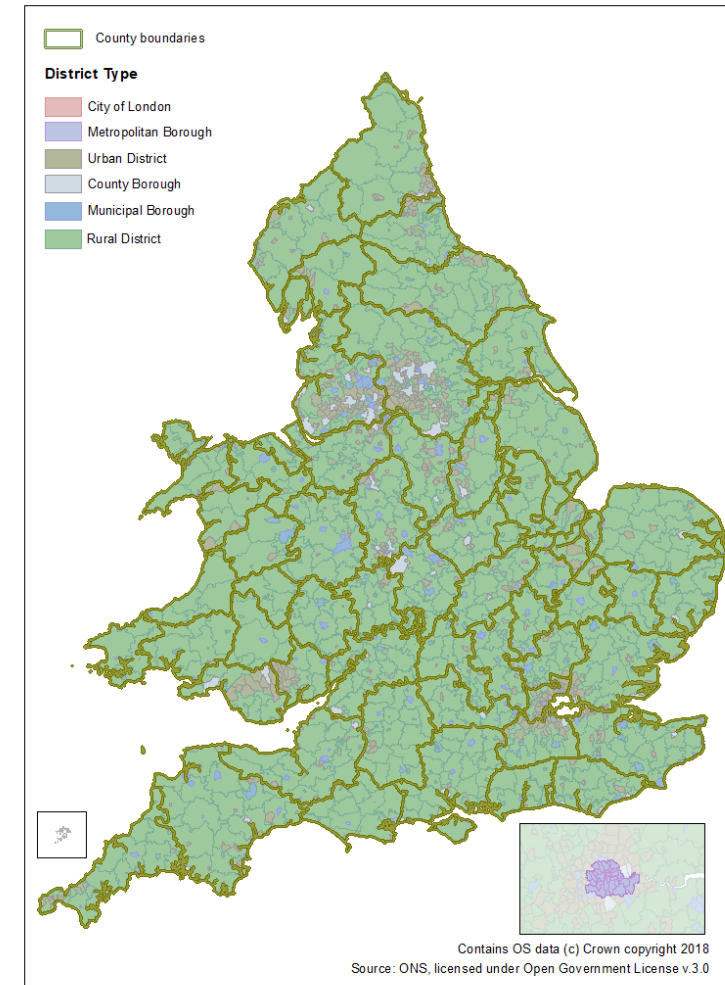
Talk outline:

- Historic Census
 - 'Century of Census' & Enumeration Districts
- Statistical geographies
 - Output Areas & Maintenance
- Evolving geographies
 - Exploring future requirements

‘A Century of Census’

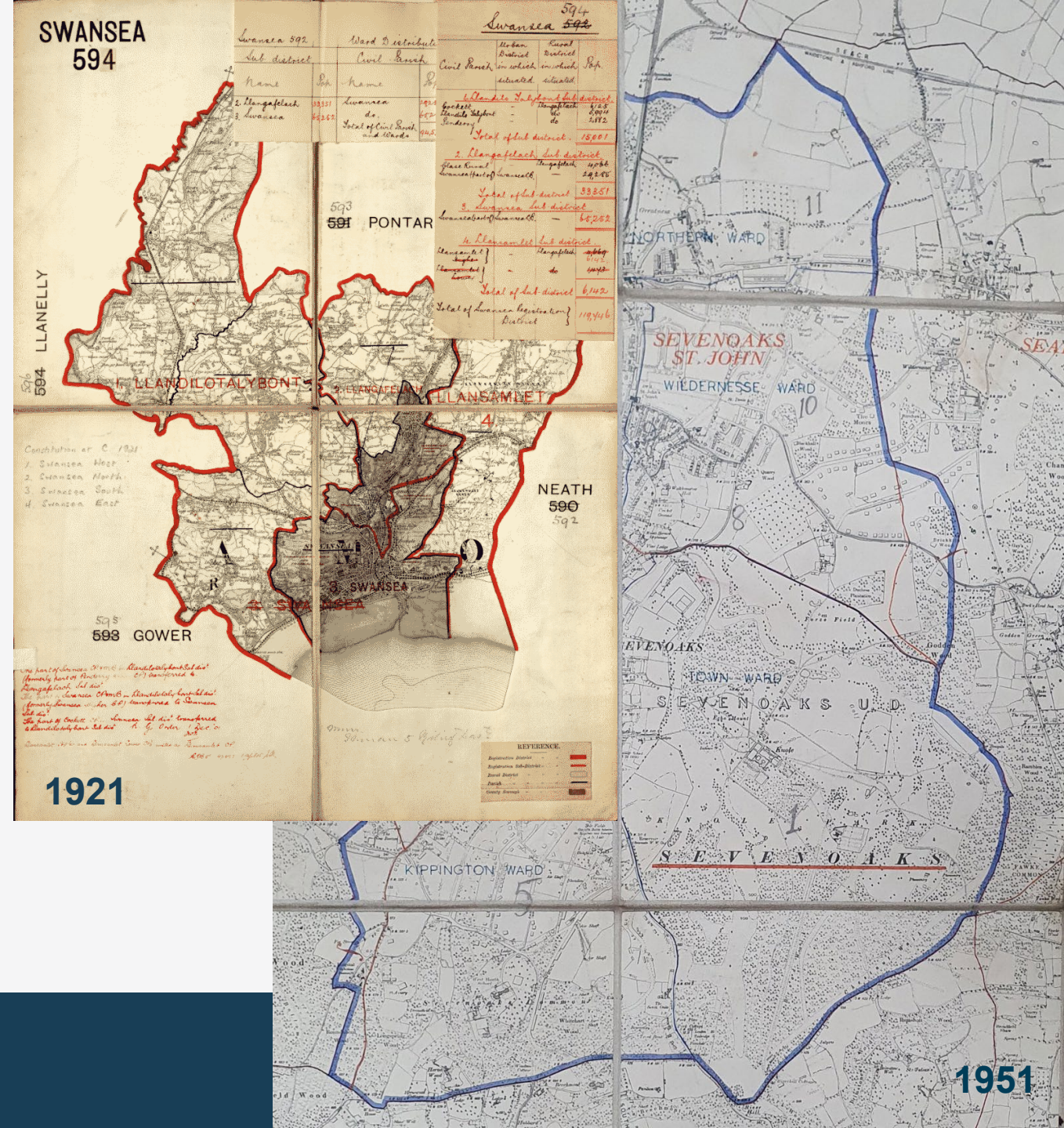
- Historic Census Digitisation Project
 - 1921-2021
 - Tabular data
 - → structured & searchable data
 - Boundary products
 - Mixed availability & data sources

Census 1921 districts
England and Wales



Enumeration Districts

- 1921 – 1961
 - Registration Districts
 - Role of registrars
 - Mixed availability
 - Land Use Surveys
- 1971 – 1991
 - Digital boundaries exist
 - Being made available via [Open Geography Portal](#)



INSTRUCTIONS TO REGISTRARS.

Preparations for the Census, 1951, require that Enumeration Districts should now be planned in accordance with present conditions.

Preliminary Steps.

- (1) Before undertaking the planning into Enumeration Districts of your sub-district you should :

(a) Study the Ordnance Map of your sub-district which accompanies the Plan. The boundaries of the Civil and Ecclesiastical Parishes, Urban Districts and their Wards are marked thereon. The boundaries of Rural Districts, Parliamentary Constituencies, Petty Sessional Divisions and County Court Districts are shown on the map only where necessary. After familiarising yourself with the map, you should :—

(b) Check the list of local sub-divisions entered in Parts A and B of the Plan. Should you find any errors or omissions respecting any of those sub-divisions, you must report them at once to The Registrar General (Census Branch), 1 Victoria Hotel, Southport, Lancs.

(c) Proceed through your sub-district (taking the Ordnance Map with you if necessary) and familiarise yourself with the exact position of the various boundaries, clearing up any point on which you are in doubt by establishing the relation of the boundaries to existing buildings or topographical features. In populous districts you will find it a considerable help, when you come to write the descriptions of the contents of the proposed enumeration districts, to have a record of the names or numbers of the first and last houses on each side of a road or street, and also the name or number of each corner house where one road or street joins or crosses another. When making this survey of your sub-district you should enter these particulars in a notebook for future reference. Information of this kind should not be derived from directories.

Planning of Enumeration Districts.

- (2) You should then proceed to plan the Enumeration Districts in the light of the considerations set forth below :—

(a) **Size.** In general, the Enumeration Districts composing a sub-district should be as few as possible, provided that none is so large that the collection and checking of the schedules cannot be accomplished by a single Enumerator in the course of a day.

In areas of an urban character, each Enumeration District should contain from about 300 to not more than 400 households (or separate occupiers).

In areas of a rural character, no fixed limit of population can be laid down ; and regard must be had both to the number of houses and the distance to be traversed by the Enumerator. The size of each Enumeration District in a rural locality should be determined by the consideration that the collection and checking of the schedules should fully occupy the Enumerator for a whole day.

(b) **Boundaries.** The boundary line of a Civil Parish, Ward or Ecclesiastical Parish must, wherever possible, be adopted. Subject to this consideration the boundaries adopted should usually be walking boundaries, i.e., they should follow the middle of a thoroughfare.

(c) **Relation to Local Sub-Divisions.** Efforts should be made to avoid the inclusion in a single Enumeration District of parts of more than one local sub-division ; but two or more small contiguous Civil Parishes may be combined to form an Enumeration District of a convenient size, subject to what is said in paragraph 6.

Description of Boundaries and Contents.

- (5) An Enumeration District, Ecclesiastical Parish or other Enumeration District boundary must be fully described.

(a) An exhaustive list within the Enumeration District which the Enumerator

(b) If only part of a road of the first and last houses describe the limits of the

(c) The names of the houses or partly contained in heading 8, village, hamlet, where the whole or part by a name which does

Districts extending into more than one local sub-division.

- (6) If the Enumeration District each part must be set out includes any detached part these in the same Enumeration

Institutions and Large Establishments.

- (7) Make a return at the

(a) Every Institution

(b) Every Establishment of persons is estimated of the number of occupiers

Special Enumeration Districts.

- (8) An Institution or Establishment commended as a separate Enumeration District, if thought desirable, a separate Enumeration District name should be entered in the name should be entered in the name with a note stating that it is

Shipping Population.

- (9) Persons on board Ships enumerated in the case of Houses of H.M. Customs ; persons on board House ; but you must arrange

Form C (1951)
DESCRIPTION OF ENUMERATION DISTRICT (1951 CENSUS)
(To be completed by the Registrar)
Enumeration District No. 7
1. Civil Parish or Urban District: *Timmestall (Civil)*
2. Ecclesiastical Parish or Rural District: *Timmestall R.D. (Parish)*

BOUNDARY OF THE ENUMERATION DISTRICT
The whole of the Civil parish of Timmestall

CONTENTS OF THE ENUMERATION DISTRICT
(To be completed by the Enumerator, and to be submitted to the Registrar for approval)
The following is a list of the houses and other buildings in the Enumeration District, and of the persons residing in them, as far as is known to the Enumerator, and of the persons who are not resident in the district but who are liable to be counted as residents in the district for the purposes of the Census, 1951.

*The Hallings and Houses adjacent Cottages near Lape
Bridge Lape Railway Station House Hill House
The Farm Burningsworth Hall Cottage adjacent
Albion Cottages Keasers Farm Hamford House
Red Farm Eby Cottages Cottages in Dabney
Grove Walk Farm Elmfield Farm Glee Farm
Red Rectory Church Farm Welkington Farm Cottages
Green House Blacksmiths House Street Farm
Brown Farm The Phoenix Farm Smithy House
adjacent Green House Farm Cottages adjacent
including all Cottages in the Village Street of
The Rectory Post Office Cottages adjacent Post
Cottages Eby Lodge Walk Farm Cottages Windmill
House Fall the Cottages in Timmestall Common
Baptist Chapel on the Heath Caravans on
the Common and the Hutments The Rectory
Nursery (if any) lying in the River
Council House Estate on Ash Road*

Estimated number of separate occupiers: *148*
Signed: *[Signature]*
Registrar

Enumeration Districts – Challenges

- Changes over time
 - Redesign at each Census → depreciation & intercensal analysis challenges
- Population size
 - 1991 Average: $n = 420$, $hh = 175$
 - Wide variation & suppression
 - Importing & Exporting EDs
- Applied use limitations
 - Too large for detailed analysis
 - Socially heterogeneous
 - Inflexible in recombination
 - Separate from other geospatial identifiers



1991 Importing and exporting EDs

Contemporary Statistical Geographies

- User consultations:
 - small area geographies should be...
 - Smaller
 - Socially homogenous
 - Separate output from collection
 - Matched with lowest level postcode
 - Data availability & digital infrastructure
 - automated zone design
 - postcode polygon building blocks
 - Output Areas!



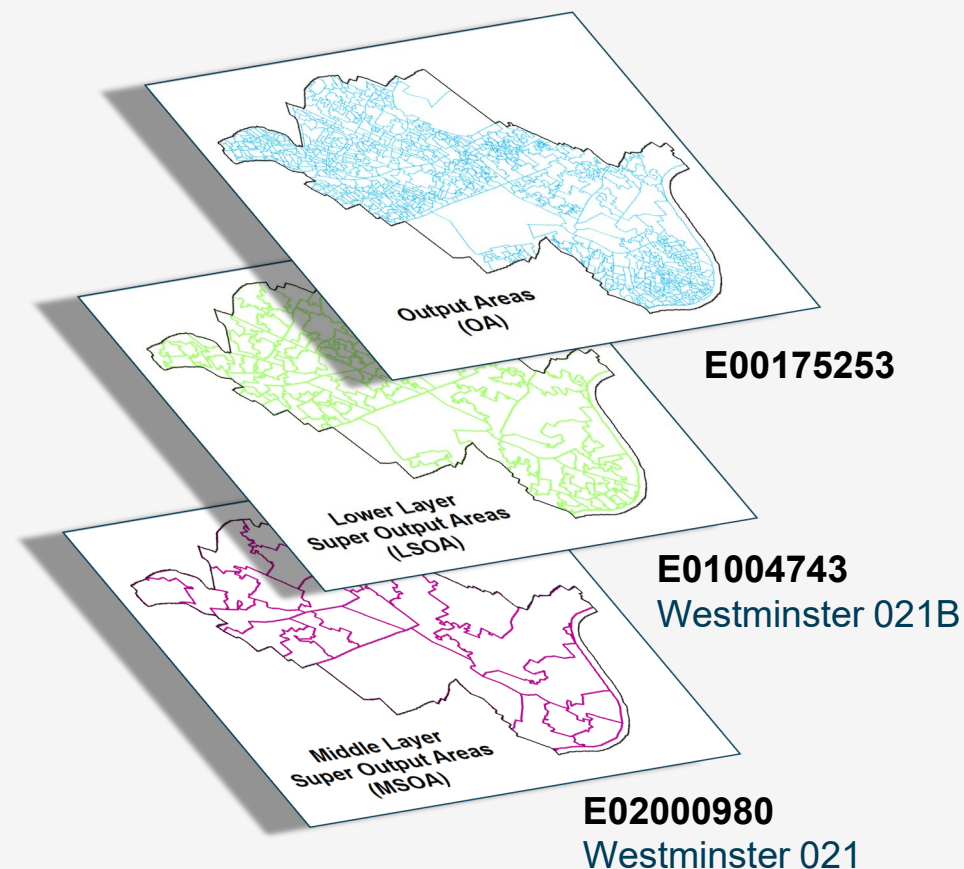
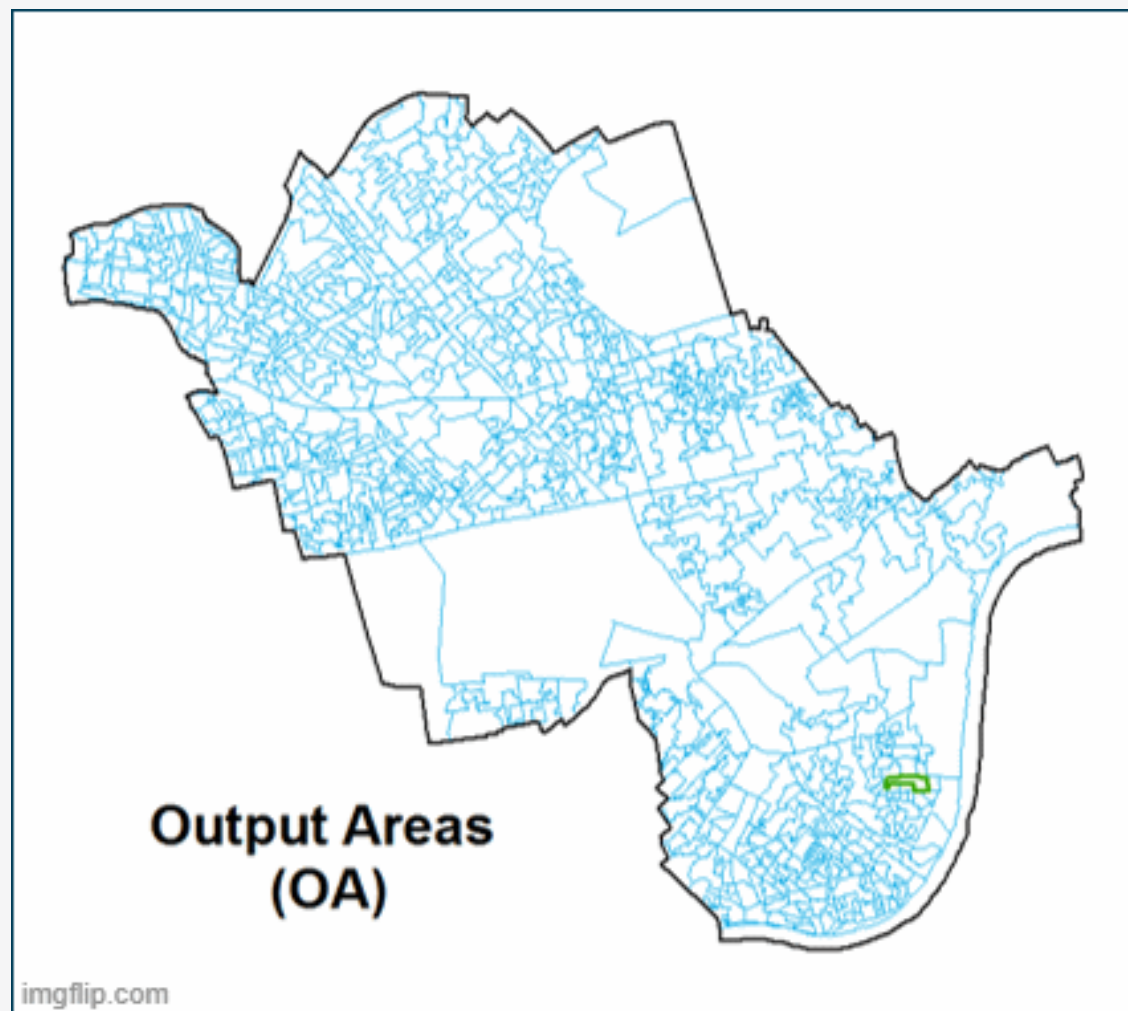
count me in
Census2001



Census

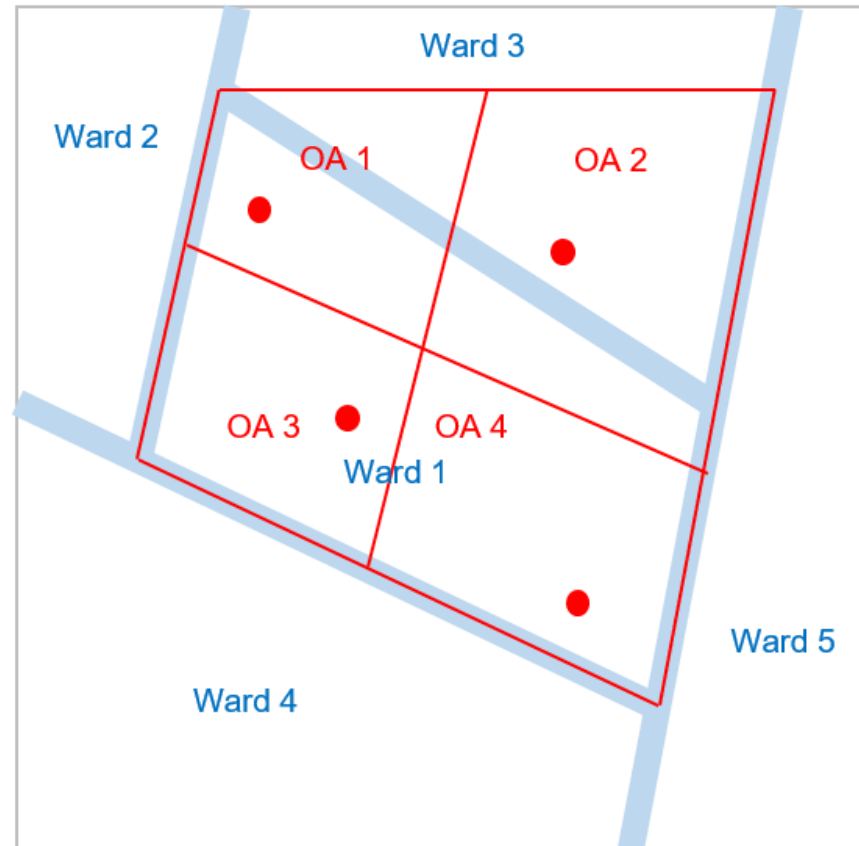
census
2021

Statistical Output Layers



Statistical Building Blocks

- Output Areas are *the* building block to derive statistics for other geographies
- Nested via exact fit
- Non-nested via best-fit using Population Weighted Centroids
- Look-ups available via [Open Geography Portal](#)



● OA Population Weighted Centroid

OA-Ward Lookup	
OA	Ward
OA 1	Ward 1
OA 2	Ward 3
OA 3	Ward 1
OA 4	Ward 1

2021 Best-fit of Output Areas to Higher Geographies



This diagram shows the geographies of the UK in a hierarchical way, divided into different geography types or groups. The main groups are shown in the central octagon, with geographies in each group colour-coded accordingly.

Geography Groups

- Census*
- Statistical*
- Health
- Administrative
- Postal
- Electoral
- International
- Other
- Experimental

* The 2011 Census count is shown where the 2001 count is not yet available.

Higher level geographies are shown towards the centre of the diagram, with increased granularity moving down the hierarchy or away from the central octagon.

Some geographies are UK-wide, while others are specific to individual nations or groups of nations.



Where applicable, GSS entity codes are shown for each geography. A full list of these can be found in the Register of Geographic Codes (RGC).

Geography Entity Code

- | | |
|---|-----------------------|
| E | England |
| S | Scotland |
| W | Wales |
| N | Northern Ireland |
| K | Cross-border Instance |
| J | Experimental |

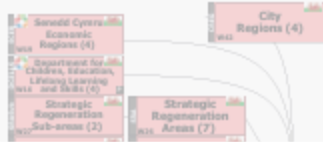
Digital boundaries are available for many geographies and can be downloaded freely from the Open Geography portal at <https://geoportal.statistics.gov.uk>



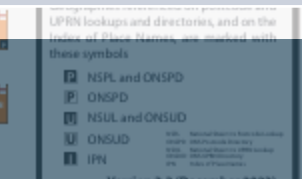
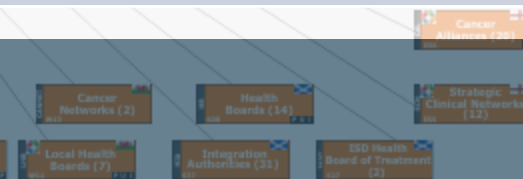
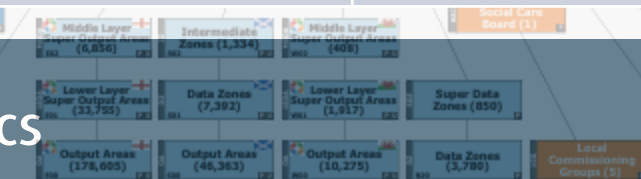
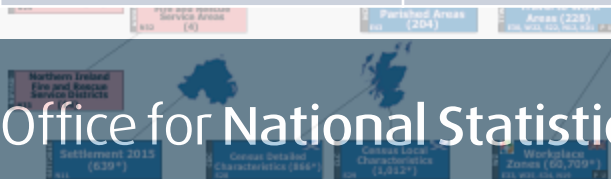
Geographies referenced on postcode and UPRN lookups and directories, and on the Index of Place Names, are marked with these symbols

- P** NSPL and ONSPD
- P** ONSPD
- U** NSUL and ONSUD
- U** ONSUD
- I** IPN

Version 3.3 (December 2023)



	'Small'	'Medium'	'Large'
England Wales*	Output Areas 100 40	Lower Layer Super Output Areas 1000 – 3000 400 – 1200	Middle Layer Super Output Areas 5000 – 15000 2000 – 6000
Scotland	Output Areas 50 20	Data Zones 500 – 1000	Intermediate Zones 2500 – 6000
Northern Ireland	Data Zones 40	Super Data Zones 400	



Maintenance & Realignment

- Maintenance:
 - Mergers and splits to maintain thresholds
- Targeted realignment:
 - Administrative boundaries & topography
- Principle of minimal change (<5%)

```
AZTool run for region: E00174800 with parameter file: OA_OT_01

IRA attempt 998
Resolving sub threshold tracts produced by IRA
Unresolvable Sub threshold tracts exist
Sub threshold tract composition: 1
IRA Tract composition:
1:24,393,1310:749:77,340,390,685
IRA failed to reach a solution

IRA attempt 999
Resolving sub threshold tracts produced by IRA
Unresolvable Sub threshold tracts exist
Sub threshold tract composition: 1
IRA Tract composition:
1:24,1310:390,393,685:749:77,340
IRA failed to reach a solution

IRA attempt 1000
Resolving sub threshold tracts produced by IRA
Unresolvable Sub threshold tracts exist
Sub threshold tract composition: 1
IRA Tract composition:
1:24,390,393,685,1310:749:77,340
IRA failed to reach a solution
WARNING: No tracts built on any run - no solution found
Duration: 6.53s
E00174800
AZTool_M
University of Southampton
Version: 1.0.5.0
```

ArcMap
AZTool
FME
R

Geography	Minimum population	Maximum population	Minimum number of households	Maximum number of households
OA	100	625	40	250
LSOA	1,000	3,000	400	1,200
MSOA	5,000	15,000	2,000	6,000

Census Addresses and UPRNs

Ordnance Survey AddressBase® data						
PAO	Street Description	Locality	Town	Postcode	Coordinates	UPRN
1	HIGH STREET		ASCOT	SL5 7JF	(492213.41, 168842.97)	10012330060
19	HIGH STREET		ASCOT	SL5 7JG	(492232.00, 168831.00)	100081043509
21	HIGH STREET		ASCOT	SL5 7JE	(492257.00, 168823.00)	100081272377
23	HIGH STREET		ASCOT	SL5 7HG	(492267.00, 168817.00)	10012304763
23A	HIGH STREET		ASCOT	SL5 7HG	(492270.00, 168835.00)	100081043510
25	HIGH STREET		ASCOT	SL5 7HG	(492275.00, 168816.00)	100081272892
27	HIGH STREET		ASCOT	SL5 7HG	(492278.00, 168815.00)	100081272863
29	HIGH STREET		ASCOT	SL5 7HG	(492282.00, 168813.00)	100081272855
29A	HIGH STREET		ASCOT	SL5 7HG	(492286.00, 168824.00)	10012304818

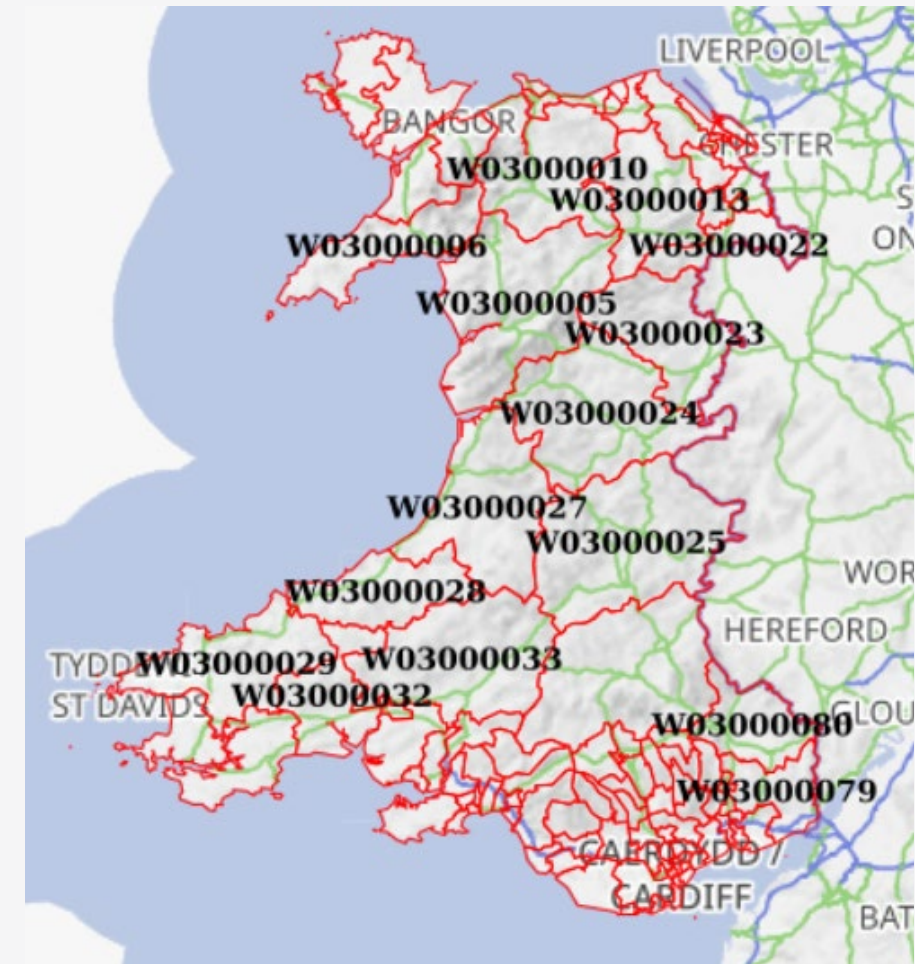
Addresses with UPRN and grid references



Illustrative plotted UPRN grid references

Evolving Geographies

- Evolving data and digital infrastructure
 - Availability; granularity; frequency; integration
 - Analytic methods & processing capabilities
 - Changing governance landscapes
 - English Devolution → boundary realignment
- Opportunity to explore alternative and complementary geographies / building blocks
- User requirements
 - Stability over time
 - Comparability across UK



2011 USOA: [DataMapWales](#)



Thank you!

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- ons.geography@ons.gov.uk