

Towards 2011 output geographies:

Adapting and evaluating automated zone design methods for maintaining the 2001 output geographies

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ESRC Census Conference, RSS, London, 13 May 2009

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Overview

- **Background – 2001 Census (E&W)**
- **What has changed since 2001?**
- **What do we want from 2011 geogs?**
- **Census2011Geog project**
 - **Aims**
 - **Methods**
 - **On-going work**
- **Summary**





2001 Output Area zone design

- Automated zone design
- Synthetic postcode polygons
 - Address-based thiennes polygons dissolved to create postcode polygons
 - Nested within wards/parishes
 - Respecting road centrelines where possible
- Output Areas (OAs) optimised for:
 - Population/household thresholds
 - Homogeneity of population size
 - Internal homogeneity of accommodation type and tenure
 - Shape

2001 Output Areas (E&W)

- 175,000 output areas
- Mean 297 persons;
123 households
- Building blocks for
“neighbourhood”
geographies: Super
Output Areas (LSOAs,
MSOAs)
- Freely available digital
boundary data

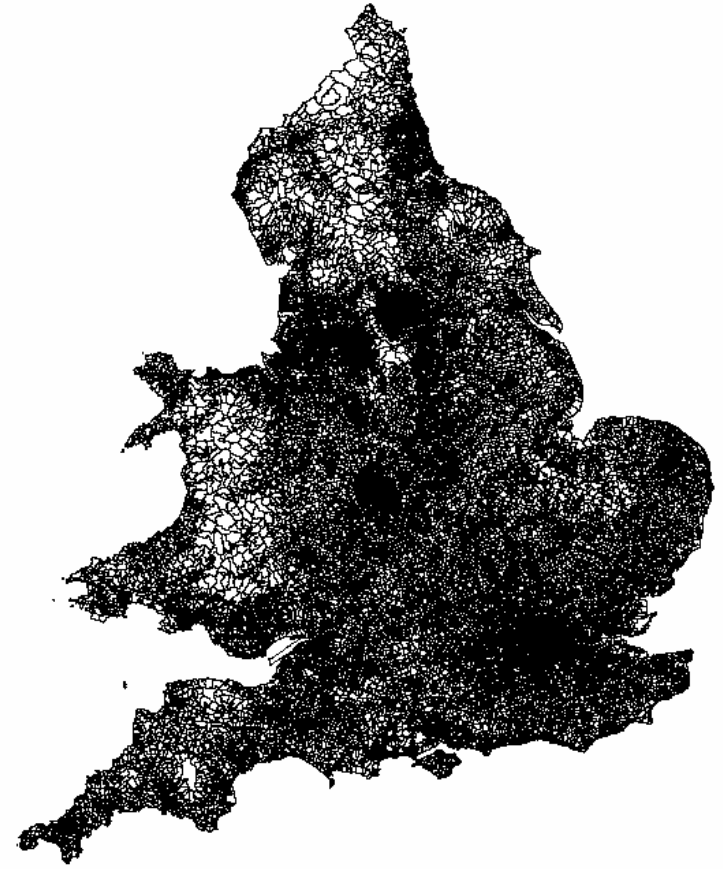


Image courtesy of David Martin. This work is based on data provided through EDINA UKBORDERS with the support of the ESRC and JISC and uses boundary material which is copyright of the Crown.



Changes since 2001

- Population growth, especially migration
- More and smaller households
- Newly built properties
 - Greenfield/new land
 - Brownfield/in-filling
- Sub-division of existing properties
- Changing socio-economic characteristics of areas





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How much change by 2011?

- 2001-2005 threshold breaches, based on mid-year population estimates

- Output Areas: **0.1%** **0.3%**

	2005 below	2005 within	2005 above	2001 totals
2001 below	221	228	1	450
2001 within	147	173553	682	174382
2001 above	0	78	506	584
2005 totals	368	173859	1189	175416

OAs: lower threshold = 100 people; upper threshold = 625 people (2 * target)
 Population thresholds = 2.5 * household thresholds

0.2%

99.1%

0.7%

How much change by 2011?

- Lower Layer Super Output Areas:

	2005 below	2005 within	2005 above	2001 totals
2001 below	6	8	0	14
2001 within	34	34242	58	34334
2001 above	0	3	27	30
2005 totals	40	34253	85	34378

99.6%

LSOAs: lower threshold = 1000 people; upper threshold = 3000 (2 * target)
Population thresholds = 2.5 * household thresholds

How much change by 2011?

- Middle Layer Super Output Areas:

	2005 below	2005 within	2005 above	2001 totals
2001 below	3	4	0	7
2001 within	8	7178	0	7186
2001 above	0	0	1	1
2005 totals	11	7182	1	7194

99.8%

MSOAs: lower threshold = 5000 people; upper threshold = 15000 (2 * target)
Population thresholds = 2.5 * household thresholds



Key messages

- Most output areas (and LSOAs, MSOAs) unlikely to have breached thresholds by 2011
- BUT, changes clustered geographically, so could breach badly in some areas
- Some areas already known to be problematic in 2001

What do we want from 2011 geogs?

- Stable ... but reflecting change ...!
- National Statistics Small Area Geography Consultation (2007)
 - Stability preferred over change (mostly)
 - Retain postcodes v use street blocks
 - Better alignment with real-world features
 - Better representation of “neighbourhoods”
 - Fix known problems e.g. Manchester, Westminster





Challenges for 2011 output geography design

- Stability at what level? OA, LSOA, MSOA?
- Building blocks? Postcodes or street blocks?
- Constrain within wards, LADs?
- Same design criteria as 2001?
- Mean high water and/or extent of realm?
- Align to real world features?
- BUT: balance against licensing issues
- Automation of processes



Census2011Geog project

- Develop automated procedures for maintaining (splitting, merging, re-designing) the 2001 census output geographies in order to create 2011 output geographies for E&W
- Assess the implications of using different building blocks (e.g. postcodes, street blocks) for these maintenance procedures





Census2011Geog: Methods

- Select study areas
- Create test data
- Developing automated maintenance procedures
- Evaluate alternative methods and building blocks





Study areas

- Six LADs/UAs: Anglesey, Camden, Lancaster, Liverpool, Manchester, Southampton
- Selection criteria:
 - magnitude of change
 - type of change
 - number of breaches of thresholds
 - nested breaches
 - urban/rural
 - geodemographic characteristics
 - challenging for automated zone design e.g. coastal
 - Census test and/or rehearsal areas
 - local knowledge



Absolute population change 2001-2005 (mid-year estimates) Camden

England MSOA 2001

England LSOA 2001

1751 - 3233

351 - 1750

41 - 350

21 - 40

1 - 20

Increase

0 Change

-14 - -1

-29 - -15

-59 - -30

-349 - -60

-794 - -350

Decrease

Population Breaches 2001

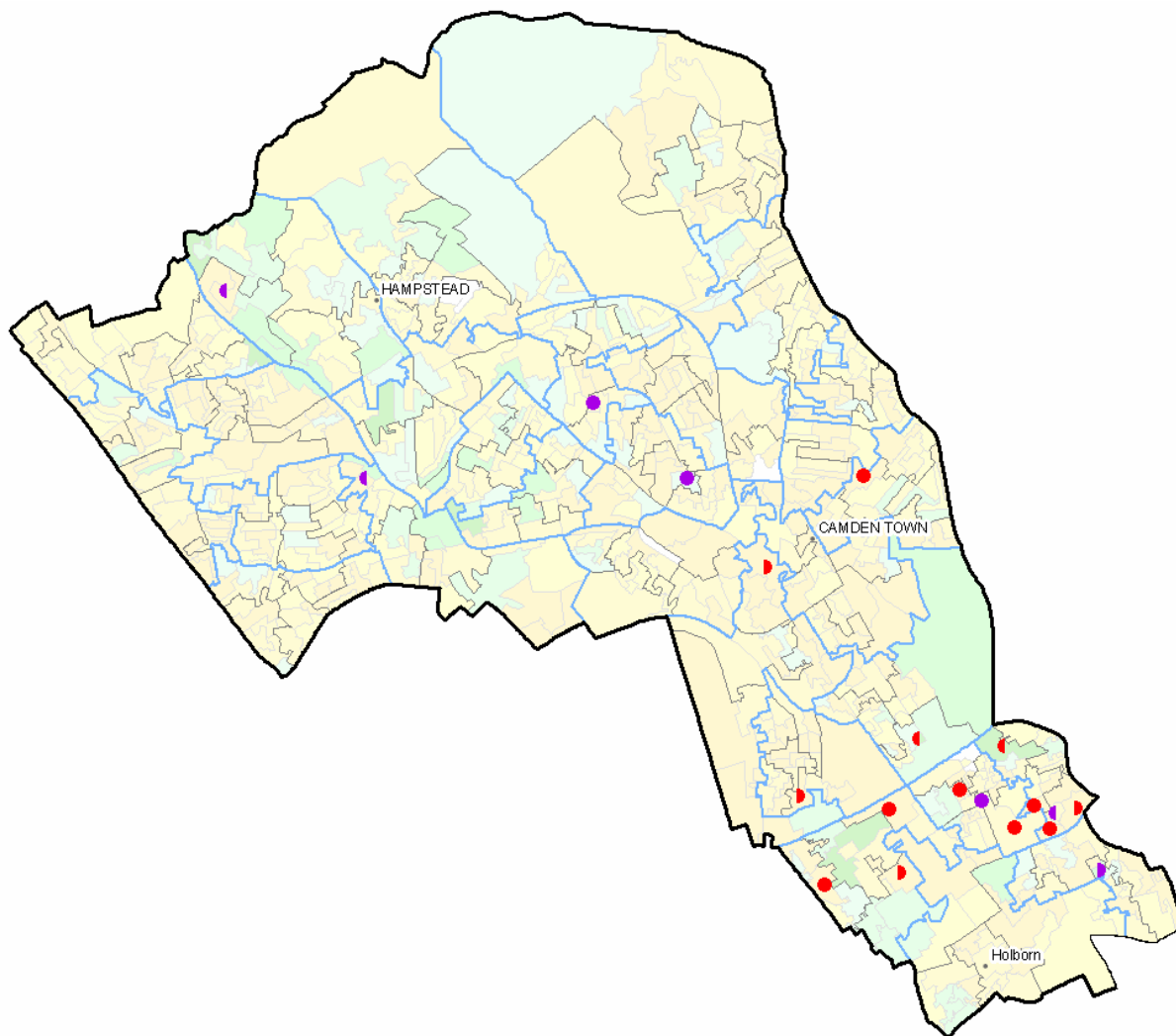
Below Lower Threshold

Above Upper Threshold

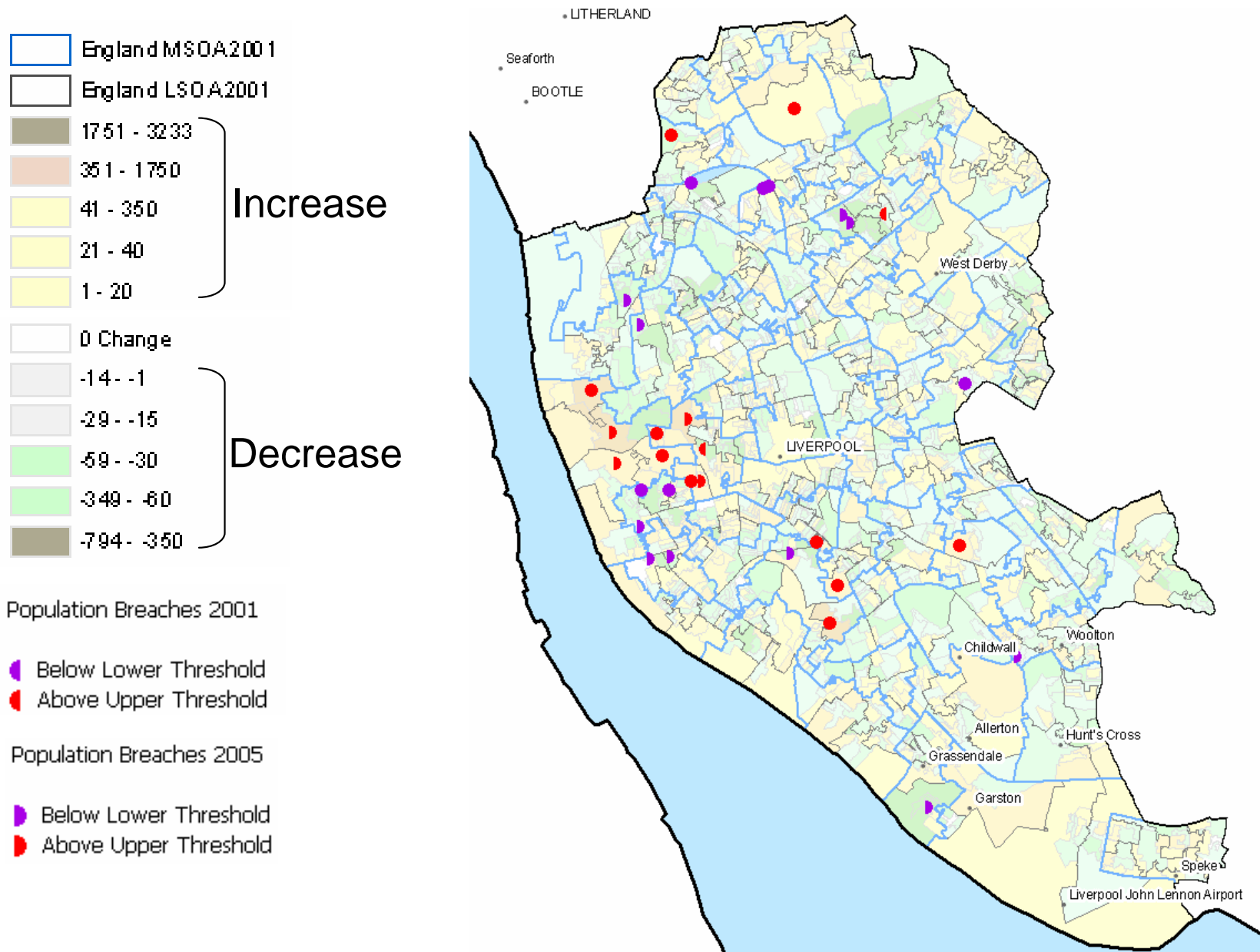
Population Breaches 2005

Below Lower Threshold

Above Upper Threshold



Absolute population change 2001-2005 (mid-year estimates) Liverpool



Absolute population change 2001-2005 (mid-year estimates) Manchester

England MSOA 2001

England LSOA 2001

17 51 - 32 33

35 1 - 17 50

41 - 3 50

21 - 40

1 - 20

Increase

0 Change

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Population Breaches 2001

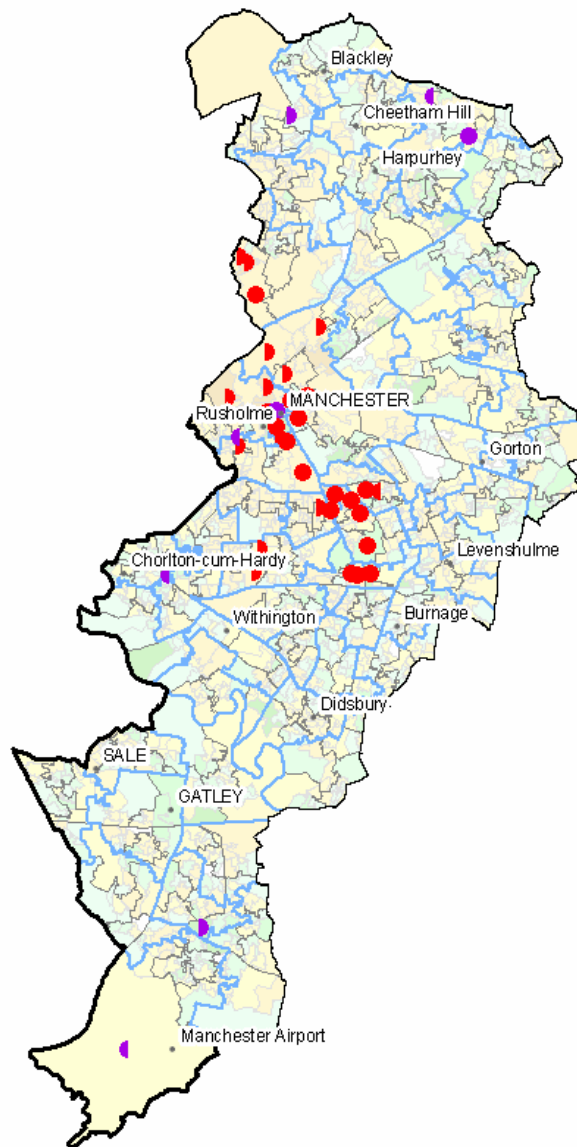
Below Lower Threshold

Above Upper Threshold

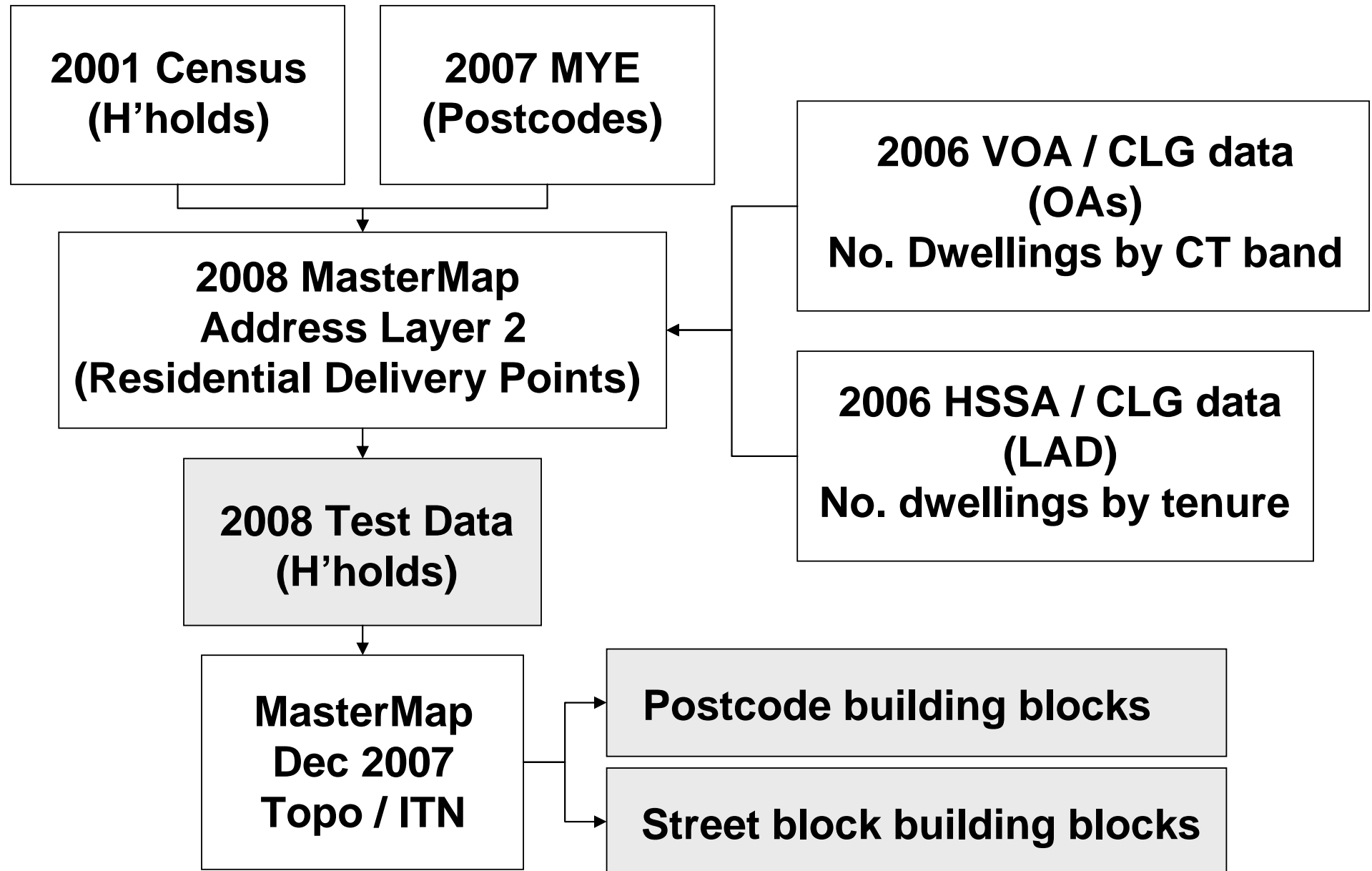
Population Breaches 2005

Below Lower Threshold

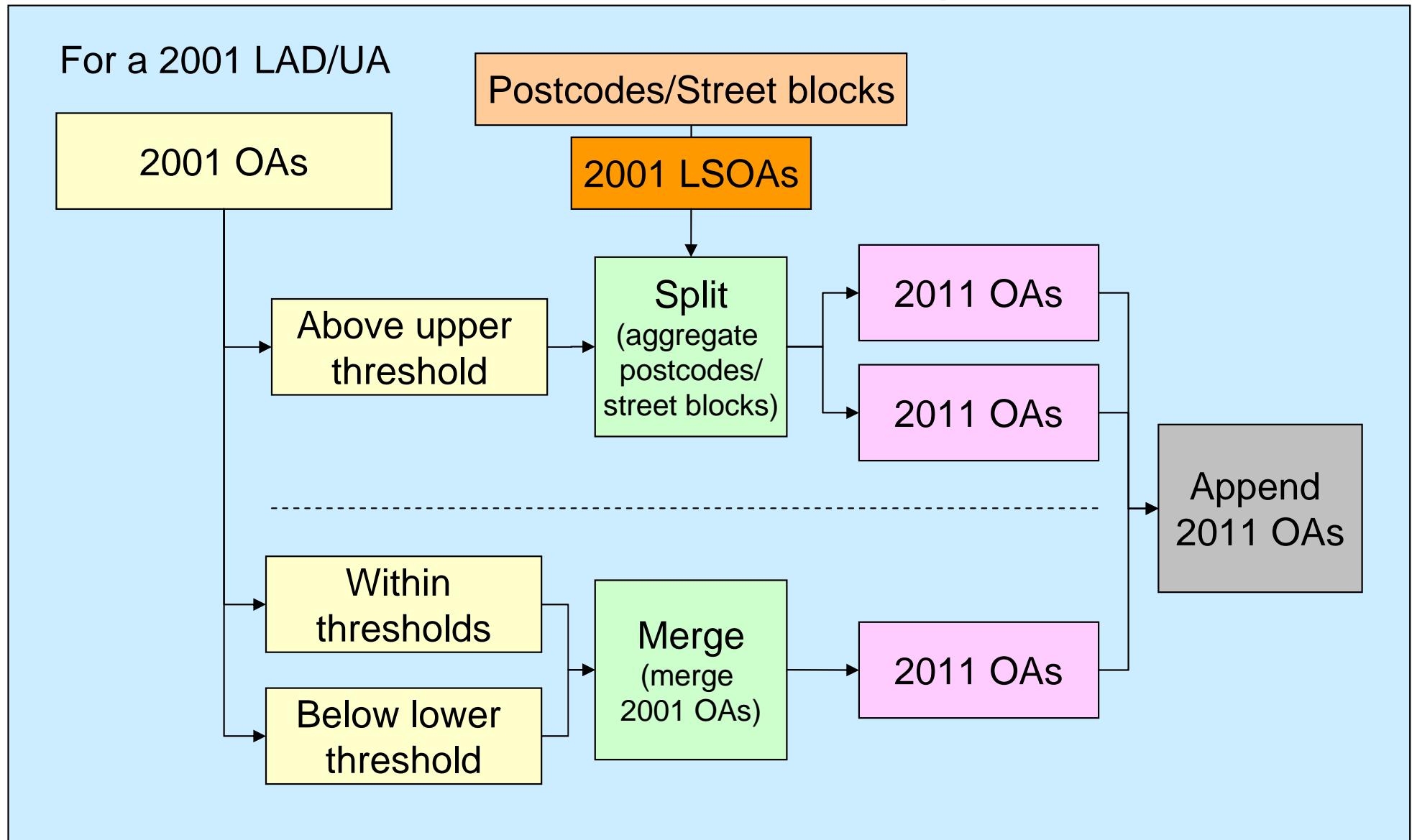
Above Upper Threshold



Create test data



Automated maintenance procedures



Merge all 2011 OAs from all LADs/UAs



On-going work

- Develop and implement automated maintenance procedures
- Evaluate robustness of methods
- Evaluate alternative methods and building blocks





Summary

- Much of output geography in E&W not likely to breach thresholds by 2011
- But, changes concentrated geographically and some areas with known problems
- Learning lots about types and size of changes and issues related to address data and 2001 zone design methods
- Address registers hopefully improving for 2011 – ONS using PAF, NLPG, AL2 and VOA data
- Research will inform users and ONS
- Final decisions on implementation lie with ONS



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