



Ministry of Housing,
Communities &
Local Government

Land Use Change Statistics in England: 2016-17

This release shows changes in residential addresses and land usage in terms of the location and type of change.

In 2016-17:

- 56 per cent of new residential addresses were created on previously developed land. This is a decrease of five percentage points compared to 2015-16.
- The main previous land use categories on which a residential address was created were:
 - Agricultural land at 16 per cent of all addresses created;
 - 'Other developed use' at 14 per cent of all addresses created; and
 - Industrial and commercial land at 13 per cent of all addresses created.
- The average density of residential addresses surrounding a newly created residential address was 32 addresses per hectare, unchanged from 2015-16.
- Four per cent of new residential addresses created were within the Green Belt. This is an increase from two per cent in 2015-16.
- 11 per cent of new residential addresses were created within areas of high flood risk. This is an increase on the nine per cent recorded in 2015-16.



Planning *Statistical Release*

31 May 2018

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Introduction

Land use change statistics are a rich source of information which show how land use has changed in England. The information includes the nature of the changes, the areas of land affected and the locations of the changes. These changes are recorded to and from a set of 28 land use categories (see Table BN1 in the technical notes). This Statistical Release focuses on changes to a developed use, in particular to residential development. It presents National Statistics on these changes in land use in England recorded in 2016-17. Statistics on changes within the Green Belt and changes within areas of high flood risk are also presented.

Land use context

England has a land area of just over 13 million hectares. Of this area only about 11 per cent is developed¹. Around 13 per cent of England is Green Belt, encircling 14 urban areas. The aim of Green Belt Policy is to prevent urban sprawl by keeping land permanently open. Other environmentally protected designations such as National Parks, Areas of Outstanding Natural Beauty (AONBs) and Sites of Special Scientific Interest (SSSIs) total about another 30 per cent of the total area of England². Together, allowing for overlaps, around 40 per cent (5.3m hectares) of the area of England is protected against development by these designations.³

Changes to the methodology

This is the fourth year for which land use change statistics have been published using a methodology based on changes in Ordnance Survey products, rather than from the physical observations that informed the previous series. More details are given in the Technical notes.

Underlying data sets

The statistics are produced from two underlying data sets:

- The residential address based change data provides statistics on the creation and deletion of residential addresses and changes in density. This data set provides all the headline messages in the statistics and all the data in live tables P300 to P331.
- The land use based change data covers statistics on the physical area of land changing use and includes all the data provided in live tables P350 onwards.

Users should be aware that the estimate of the number of residential addresses created fluctuates between years at a local authority level. Statistics at this level are therefore made available as a four-year average. More details are given in the Technical notes.

¹ Derived from Office for National Statistics [Built up Areas 2011](#)

² Derived from data published by the department and Natural England

³ The proportions of land in each local authority area are constrained by being Green Belt, National Park, an AONB or an SSSI were published in September 2017 in conjunction with a Housing Need consultation. They are available in the 'Publication Data' sheet at https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/644783/Housing_Need_Consultation_Data_Table.xlsx

Location of new residential addresses

The latest national estimates for changes in residential use are for 2016-17. The statistics show how many residential addresses have been created on previously-developed and previously undeveloped land, including the numbers created on Green Belt land or within areas of high flood risk. The distribution of new residential addresses recorded during 2016-17 is shown in **Map 1**, to put the rest of the findings into context.

In 2016-17, 56 per cent of new residential addresses created, including conversions to residential use, were on previously developed land. This is a decrease of five percentage points compared to 2015-16.

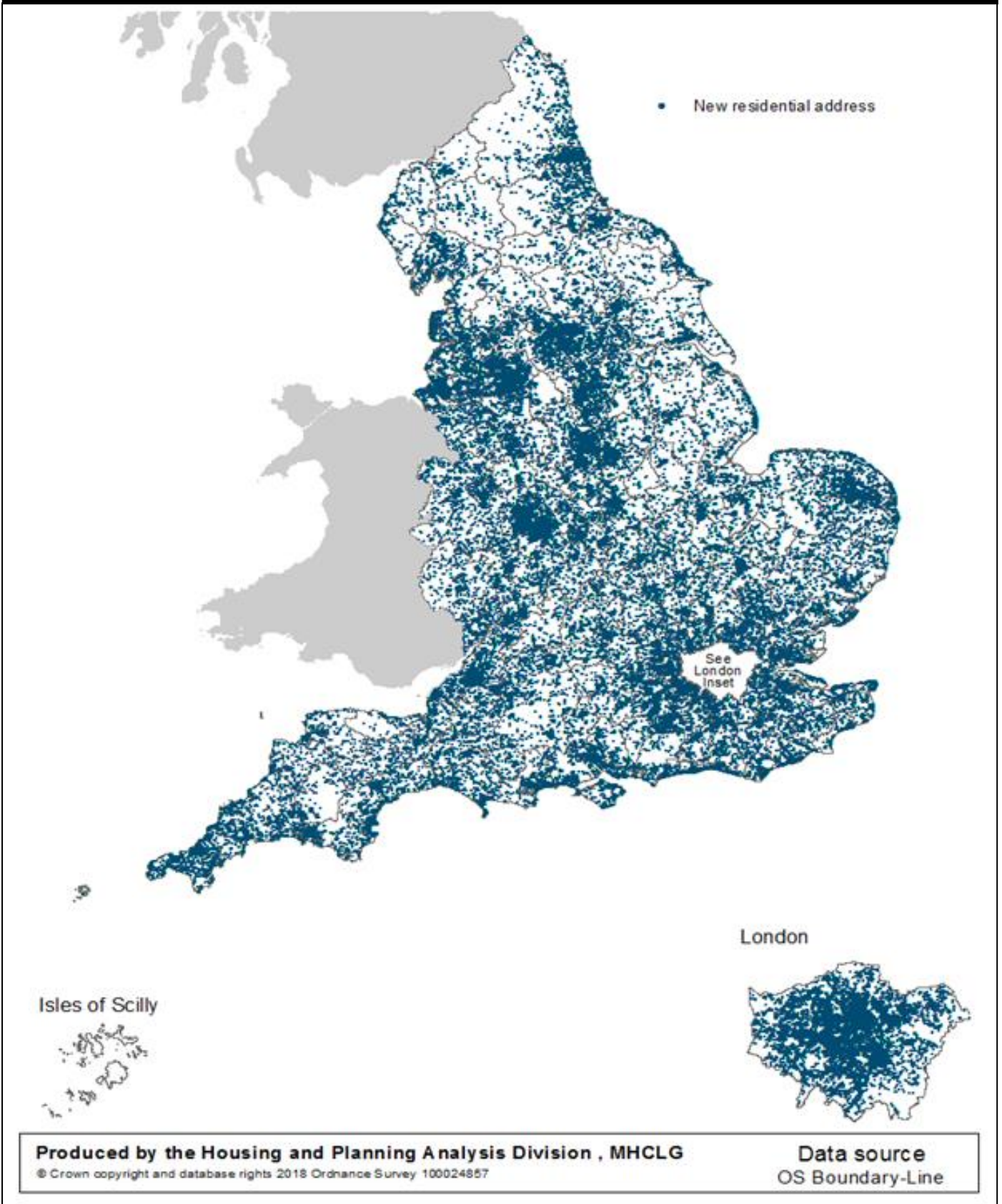
The proportion of new residential addresses excluding conversions that were created on previously developed land was also 56 per cent in 2016-17. This is also a decrease of five percentage points compared to 2015-16.

These proportions tend to fluctuate from year-to-year, as shown – including conversions - in Table 1 below. This is due partly to variations in the location and timing of developments between years.

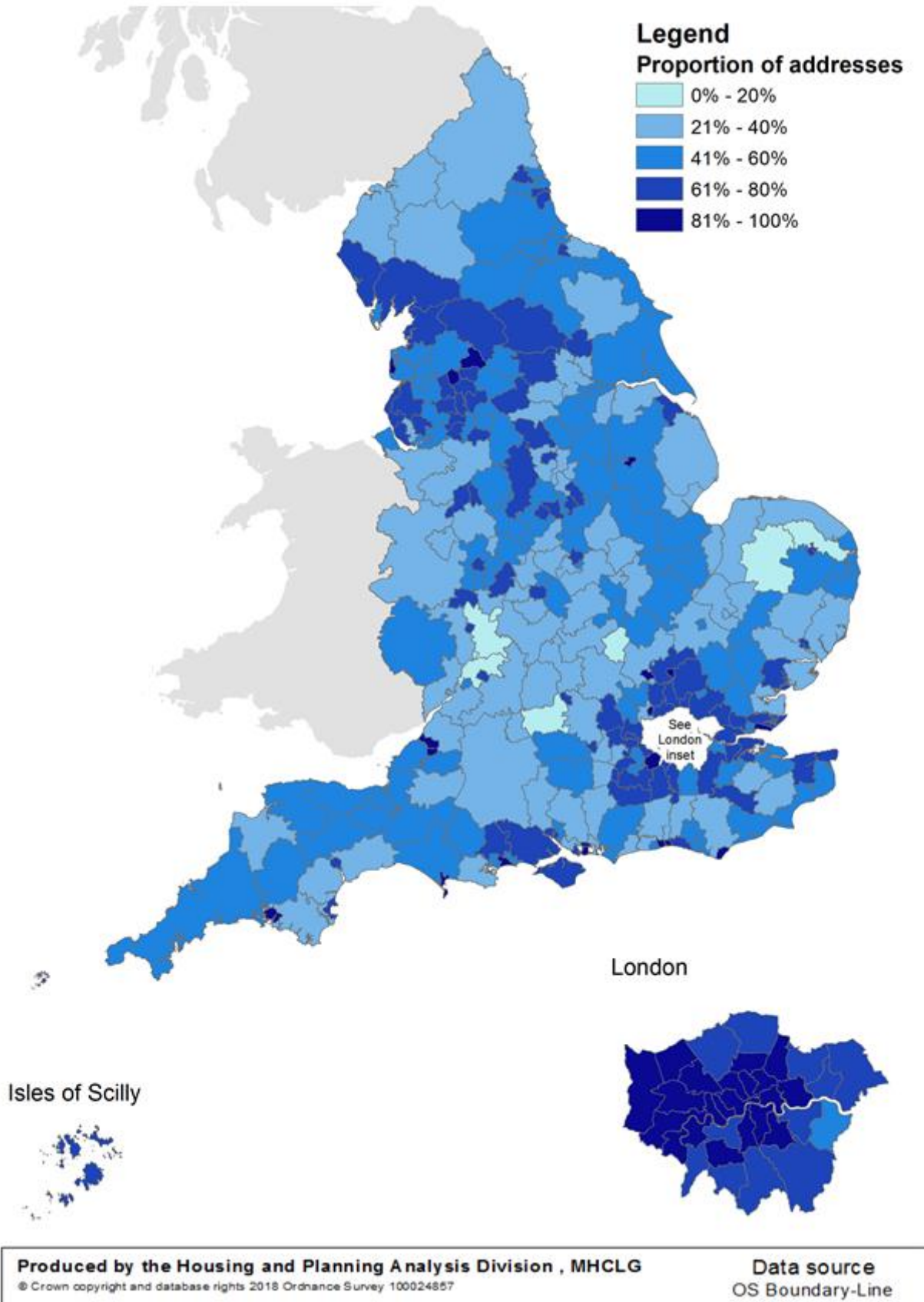
Table 1: proportion of new residential addresses created on previously developed land, including conversions	
2013-14	60%
2014-15	58%
2015-16	61%
2016-17	56%

There was wide variation in the proportion of new residential addresses created on previously developed land between local authorities in England. The lowest proportion, averaged over four years, was 13 per cent (Redditch) of all new addresses created, followed by Milton Keynes and the Vale of White Horse, both at 14 per cent. The highest was 100 per cent (City of London). More details are shown in **Map 2**.

Map 1: New residential addresses recorded, England, 2016-17



Map 2: Proportion of new addresses created on previously developed land, England 2013-17

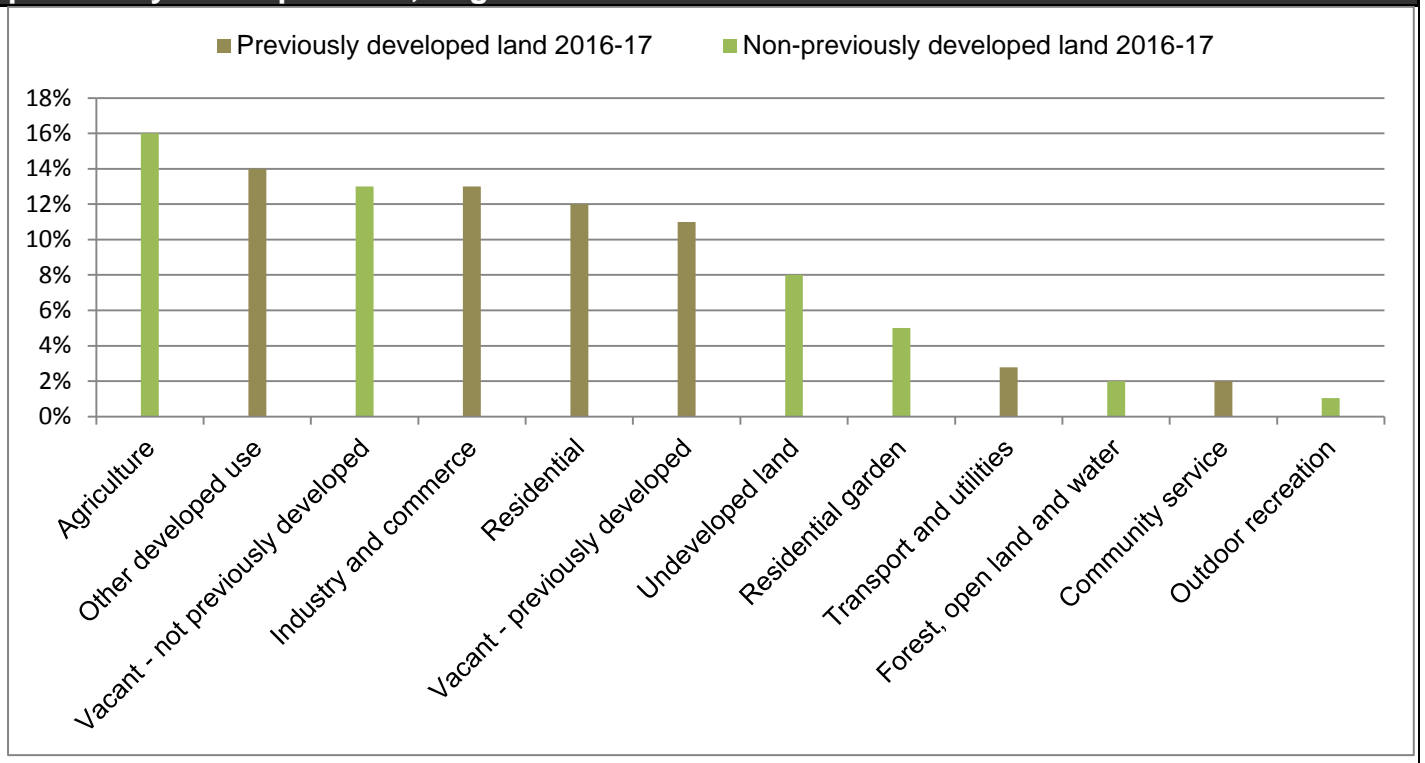


There 28 land use categories used in Land Use Change Statistics. In 2016-17, the main previous land use categories on which a residential address was created were:

- Agricultural land, at 16 per cent of all addresses created;
- 'Other developed use'⁴, at 14 per cent of all addresses created; and
- Industrial and commercial land, at 13 per cent of all addresses created; and

More details are shown in **Figure 1**. The groups used are as listed in Table BN1 in the Notes section of this release.

Figure 1: Proportion of new addresses created on previously developed and non-previously developed land, England 2016-17



Detailed statistics on residential development on previously-developed land (including data at a local authority level) can be found in the Land Use Change Statistics Live Tables P300, P301 and P302.

⁴ 'Other developed use' is mostly general paved, tarmac and hard surface areas, including some car parks, for which the land cannot be clearly and uniquely identified.

New residential addresses within the Green Belt

- In 2016-17, four per cent of new residential addresses created were within the Green Belt. This is an increase from the two per cent recorded in 2015-16.
- In 2016-17, 51 per cent of new residential addresses created within the Green Belt were built on previously-developed land. This is a decrease on the 57 per cent recorded in 2015-16.

Detailed statistics on numbers of new residential addresses created within the Green Belt can be found in the Land Use Change Statistics Live Tables P310 and P311.

New residential addresses within areas of high flood risk

- In 2016-17, 11 per cent of new residential addresses were created within areas of high flood risk, defined as National Flood Zone 3⁵. This is an increase on the nine per cent recorded in 2015-16. More details are given in the Technical notes section of this release.

Detailed statistics on numbers of new residential addresses created within the National Flood Zone 3 can be found in the Land Use Change Statistics Live Tables P320 and P321.

Density of new dwellings

The residential address statistics can be used to create an estimate of the density of new residential development. This is derived by calculating the density of all residences in the hectare surrounding a newly-created residential address. In 2016-17, the average density of residential addresses surrounding a newly created residential address was 32 addresses per hectare, unchanged from 2015-16.

For previously developed land, the average density was higher at 40 addresses per hectare, up from 37 in 2015-16. For non-previously developed land, the density was recorded at 26 addresses per hectare, the same level as in 2015-16.

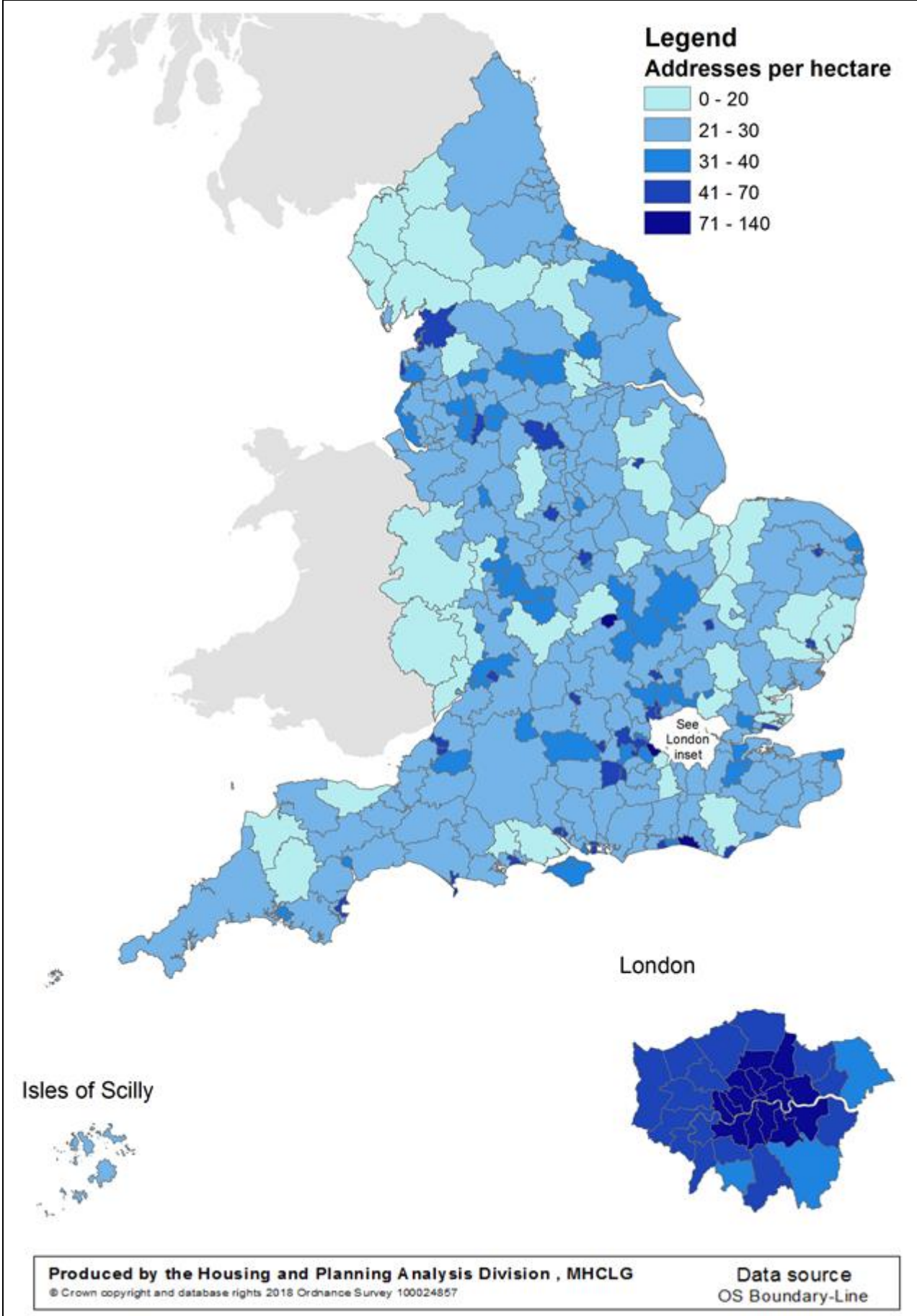
Within the Green Belt, the average density was 21 addresses per hectare. This is an increase on the 14 addresses per hectare recorded in 2015-16.

More details are shown in **Map 3**.

Detailed statistics on the average density of new dwellings (including data at a local authority level) can be found in the Land Use Change Statistics Live Tables P330 and P331.

⁵ This is defined in Table1 at <https://www.gov.uk/guidance/flood-risk-and-coastal-change#Table-1-Flood-Zones>

Map 3: Density of area surrounding new residential addresses, England 2013-17



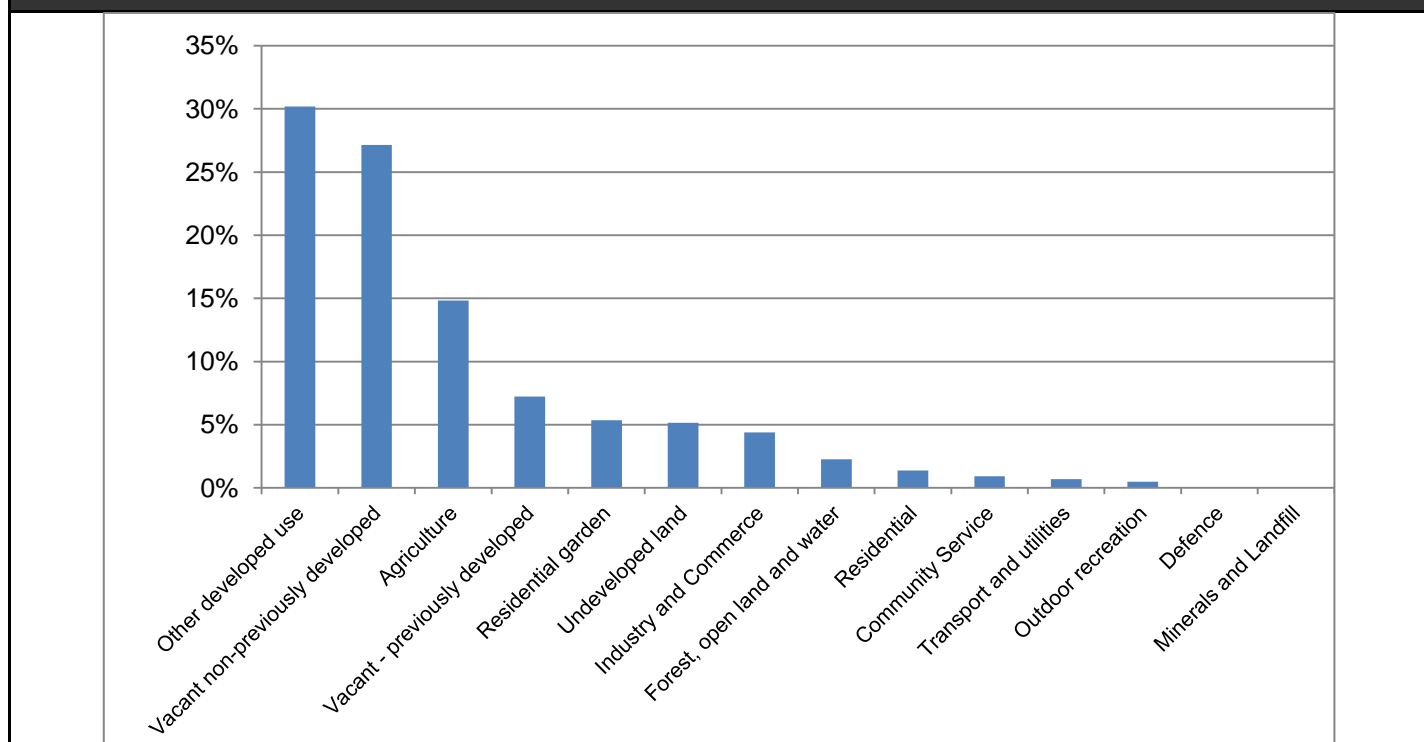
Changes in land usage

This section looks at the amounts of land recorded as changing use during 2016-17, as measured in hectares, in contrast to the changes in numbers of residential addresses discussed in the previous section.

For land area changing to residential use in 2016-17:

- 45 per cent of the area of land changing to residential use was previously developed land, up from an estimated 28 per cent in 2015-16.
- The main types of land changing to residential use, as measured by area, were:
 - 'Other developed use': 30 per cent
 - Vacant land non-previously developed: 27 per cent.
 - Agriculture: 15 per cent.

Figure 2: Proportion of the area of land changing to residential use, England 2016-17



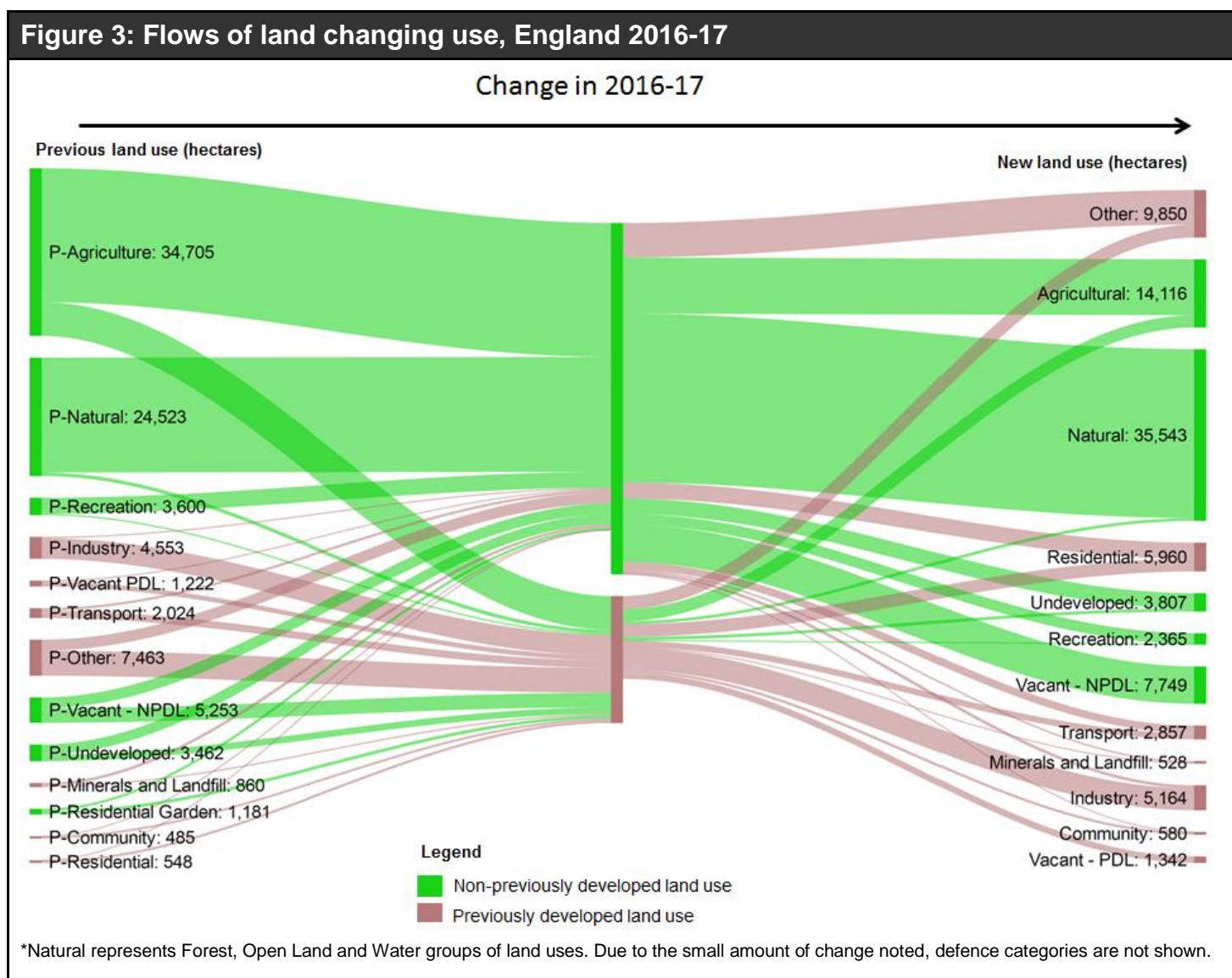
Detailed statistics on residential development on previously-developed land (including data at a local authority level) can be found in the Land Use Change Statistics Live Tables P300, P370 and P371.

Of the total area of land changing to residential use in 2016-17:

- 10 per cent was within designated Green Belt, an increase from the eight per cent recorded in 2015-16; and
- five per cent were within areas of high flood risk, down from the seven per cent recorded in 2015-16.

Detailed statistics on the area of land changing use within the Green Belt can be found in the Land Use Change Statistics Live Table P380 to P383. Detailed statistics on numbers on the area of land changing use within the National Flood Zone 3 can be found in the Land Use Change Statistics Live Table P390.

Details of the total areas of land changing use in 2016-17 are set out in the Sankey chart at **Figure 3**.



Detailed statistics on changes to developed uses can be found in the Land Use Change Statistics Live Tables P350, P351, P360 and P361.

In summary, in 2016-17, 48 per cent of land area changing to a developed use was previously-developed, up from 47 per cent in 2015-16.

- In 2016-17, the main new uses of land changing to a developed use were:
 - 'Other developed use': 37 per cent
 - Residential: 23 per cent
 - Industry and commerce: 20 per cent

- 66 per cent of the land use change recorded was between different non-developed uses, down from 76 per cent to 2015-16. This represents ongoing changes in the natural environment.

Accompanying live tables

Accompanying Live Tables are available to download alongside this release. These tables can be accessed at: <https://www.gov.uk/government/collections/land-use-change-statistics>, where they are grouped into two spreadsheets:

Residential address based change:

- P300 Proportion of new residential addresses created by previous developed usage
- P301 Proportion of new residential addresses created by previous land usage category
- P302 District authorities - Proportion of new residential addresses created by previous land usage category
- P310 Proportion of new residential addresses created in the Green Belt by previous developed usage
- P311 District authorities - Proportion of new residential addresses in the Green Belt and proportion of local authority land area in the Green Belt
- P320 Proportion of new residential addresses created in National Flood Zone 3 by previous developed usage
- P321 District authorities - Proportion of new residential addresses created in National Flood Zone 3 and proportion of local authority land area in National Flood Zone 3
- P330 Average density of residential addresses surrounding newly created residential addresses
- P331 District authorities - Average density of residential addresses surrounding newly created residential addresses by previous land usage

Land use based change:

- P350 Land changing to developed use by previous use
- P351 Land changing to developed use by new use
- P360 All Land changing use
- P361 Land changing use by all previous uses
- P370 Land changing to residential use
- P371 Land changing to residential use by previous use
- P380 Land changing to developed use within the Green Belt that was previously developed
- P381 Percentage of land changing to developed use that was within designated Green Belt
- P382 Land changing to residential use within the Green Belt, by previous use
- P383 Land area changing to residential use in the Green Belt
- P390 Proportion of land changing to residential use in National Flood Zone 3

Previous MHCLG statistical releases are available under the archived publications section.

Technical notes

Data collection

Land use change statistics are derived from data produced for the department by Ordnance Survey Ltd.

Historical Land Use Change Statistics were produced from 1985 -2011. Following a competitive tender process in 2012 a contract to produce Land Use Change Statistics using a new methodology was awarded to Ordnance Survey.

The methodology was developed by Ordnance Survey in collaboration with the department. It is designed to deliver more detailed Land Use Change Statistics at significantly reduced costs. This current data series differs in many important respects to that supplied in the previous series. Due to the changes in methodology and land use classification, comparison and interpretation between the two series is not recommended.

Further details of the methodology and the differences between the old and new data sets are available in the [Land use change statistics methodology changes guidance](#).

When a new residential address is recorded in Ordnance Survey's AddressBase product, the subsequent data it provides to the department include:

- the grid reference
- the local authority area in which the address is located
- the inferred previous uses of the address site
- the number of residential addresses created
- the number of residential addresses deleted
- the number of addresses converting to or from residential use
- the density of all residential addresses in the hectare surrounding a new residential address.

When the Ordnance Survey derives a land use change, the accompanying data provided to the department includes:

- the grid reference
- the local authority area in which the site is located
- the area of the site (in hectares)
- the inferred new and previous uses of the site.

Data availability

Information is published at several geographical levels such as nationally and by local authority. Statistics are also calculated on other geographies, such as the Green Belt or areas of high flood risk. In addition to data provided within this release and the accompanying live tables, figures for smaller geographical areas can be obtained on request from planning.statistics@communities.gsi.gov.uk. In some cases, it will be necessary for an enquirer to agree to the terms of an end user licence to comply with the terms of the contract with which the data are provided by Ordnance Survey.

Data quality

Data at local authority level on residential addresses and on land use change are made available only as an average over several years. This is because annual data at this spatial scale are highly volatile and not robust. However, annual estimates at national level are considered robust.

The Ordnance Survey's data products that were used to derive the land use change data are subjected to numerous quality assurance tests to meet the required quality criteria before their publication and subsequent use in the Land Use Change Statistics methodology.

Prior to the department formally taking receipt of the land use change data, Ordnance Survey has checked that they meet the required performance criteria and worked with the department's statisticians to test, develop and improve the outputs' validity.

The individual land use and residential address changes provided by Ordnance Survey are checked for records displaying potential anomalies, such as unusually high or low densities, or identified sites of residential changes with homes not yet built. Such anomalous entries are then queried with Ordnance Survey and if necessary amended. The records which have passed this stage are then reconfigured within the department's database.

The department aggregates the data to local authority and national level and performs analysis against boundary files of the Green Belt and areas of high flood risk. The department's statisticians compare the aggregated data against previous and current data for comparable LA areas and national trends.

The department has published a quality assurance statement alongside this publication of the Land Use Change Statistics. This document gives a full overview of the quality assurance procedures in place. It has been produced in conjunction with the UK Statistics Authority's guidance on using administrative data, available at:

<https://www.statisticsauthority.gov.uk/monitoring-and-assessment/monitoring/administrative-data-and-official-statistics/>

Corrections for high density addresses

There are a few instances when a local authority, for whatever reason, has populated the data fields governing the positional accuracy of an address' coordinates incorrectly. These can generate multiple addresses clustering in imprecise locations and in turn this can result in distorted density calculations.

To identify errors of this nature, the department analyses local authorities with a high standard deviation in density (over 100) and have all points with a density of over 100 addresses per hectare investigated, to see if they correlate with real world evidence. Those points which do not appear to match to real world change are excluded from the final analysis.

For 2016-17, this resulted in the exclusion of the following 175 points from Wolverhampton

- 122 points from university accommodation at 1 Culwell Street
- 53 points from residential developments in Compton Road (2 points), Oxley Street (34 points) and Wednesfield Road (17 points)⁶.

The estimates of the number of residential address created were found to fluctuate between years at a local authority level. Therefore statistics at this level are made available as a four-year average.

Treatment of residential addresses recorded as vacant but where no previous land type has been specified

Residential addresses recorded as vacant but where no previous land type has been specified (i.e. neither 'previously-developed land' nor 'non- previously developed land') have been grouped into the 'previously developed land' category. Whilst there is no obvious rationale for this, the numbers involved are small, and the approach ensures consistency with that taken in previous years.

Revision made to Live Table P331 of the live tables for 2015 to 2016

Live Table P331 of the live tables for 2015 to 2016, as published on 2 March 2017, has been found to be displaying incorrect figures in the 'Vacant - Previously developed' column. A revised version of the table has therefore been published at

<https://www.gov.uk/government/statistical-data-sets/live-tables-on-land-use-change-statistics>. No England level totals quoted in the table or in the statistical release were affected, and the revision is reflected in the 2016 to 2017 version of the table.

⁶ The points were excluded because each entry related to a single new address, recorded separately as part of a larger development. It was thought likely that the high residential density within the surrounding hectare reflected in the density score would be counted multiple times if every data point were to be retained for use in calculating aggregate figures, such as the local authority and national average density scores.

Residential address creation at local authority level

Ordnance Survey AddressBase® is the key product for identifying the residential address change data in the land use change statistics.

The information for AddressBase® comes predominantly from local authorities, who work with various sources in their organisation; council tax, electoral registration, planning and building control (amongst others) to identify and verify the existence and location of properties and their official address.

The timeliness of the data updates from local authorities feeding into address base can be variable, resulting in fluctuating numbers of residential address created. This causes variations in the estimates at local authority level. Therefore statistics at this level are still made available, but as a four-year average.

Changes between years in the total area of land recording as changing use

The total area of land changing recorded as changing use in 2016-17 was noticeably lower than in previous years, as shown in Live Table P360.

This is due largely to the 'natural categories' (primarily Agriculture, Forestry/Woodland, Rough Grassland and Natural Land) within non-developed land, where the amounts of land changing use can vary widely between years, depending upon: i) the Ordnance Survey capture programme in a particular year; and ii) the amounts of land often being very large, and with ill-defined boundaries.

The trend is much more consistent for other types of land, including changes to vacant land and to residential and other developed uses: recent changes here seem plausible – e.g. the increase in residential use is broadly comparable with known increases in numbers of homes.

Reasons for changing the publication date from 24 January to 31 May 2018

The department originally announced publication of the statistics on 24 January 2018, however it was necessary to move the publication date to 31 May. This was due to both delays in Ordnance Survey being able to extract and process the underlying raw data, and the need for quality assurance work to review the data following improvements in the calculation methodology. These improvements were to ensure that the data provided reflected changes as accurately as possible during 2016-17 - as opposed to changes due to on-going data quality improvements made by Ordnance Survey to the underlying data sets that it uses to classify up-to-date and robust information on land usage.

Revisions policy

This policy has been developed in accordance with the UK Statistics Authority Code of Practice for Statistics and the Ministry of Housing, Communities and Local Government Revisions Policy (found at <https://www.gov.uk/government/publications/statistical-notice-dclg-revisions-policy>). The policy covers two types of revision:

Non-Scheduled Revisions

Where a substantial error has occurred as a result of the compilation, imputation or dissemination process, the statistical release, live tables and other accompanying releases will be updated with a correction notice as soon as is practical.

Scheduled Revisions

Each annual version of the Land Use Change Statistics publication is produced from static versions of Ordnance Survey products and as such is not usually subject to any scheduled revisions.

User engagement

Users are encouraged to provide feedback on how these statistics are used and how well they meet user needs. Comments on any issues relating to this statistical release are welcomed and encouraged. Responses should be addressed to the "Public enquiries" contact given in the "Enquiries" section below.

The department's engagement strategy to meet the needs of statistics users is published here:

<https://www.gov.uk/government/publications/engagement-strategy-to-meet-the-needs-of-statistics-users>

Notes

1. The land use categories used in compiling LUCS data are shown below in Table BN1. For full details on what are included in these groups and categories please refer to the [Land use change statistics methodology changes guidance](#).

Table BN (Background Note) 1: Land use categories, groups and divisions

Previously developed land			Non-previously developed land		
Group	Category (codes)		Group	Category (codes)	
Residential	<input type="checkbox"/> Residential	(R)	Agriculture	<input type="checkbox"/> Agricultural land	(A)
	<input type="checkbox"/> Institutional and communal Accommodation	(Q)		<input type="checkbox"/> Agricultural buildings	(B)
Transport and Utilities	<input type="checkbox"/> Highways and road transport	(H)	Forestry, open land and water	<input type="checkbox"/> Forestry and woodland	(F)
	<input type="checkbox"/> Transport (other)	(T)		<input type="checkbox"/> Rough grassland and Bracken	(G)
	<input type="checkbox"/> Utilities	(U)		<input type="checkbox"/> Natural and semi-natural Land	(N)
<input type="checkbox"/> Industry	(I)	<input type="checkbox"/> Water		(W)	
Industry and Commerce	<input type="checkbox"/> Offices	(J)	Outdoor recreation	<input type="checkbox"/> Outdoor recreation	(O)
	<input type="checkbox"/> Retailing	(K)		Vacant	<input type="checkbox"/> Vacant land not previously developed
	<input type="checkbox"/> Storage and warehousing	(S)	Residential Gardens		<input type="checkbox"/> Residential Gardens
	<input type="checkbox"/> Community buildings	(C)		Undeveloped land	<input type="checkbox"/> Undeveloped land in urban areas
Community Services	<input type="checkbox"/> Leisure and recreational Buildings	(L)			
Vacant	<input type="checkbox"/> Vacant land previously Developed	(V - PDL)			
Minerals and landfill	<input type="checkbox"/> Minerals	(M)			
	<input type="checkbox"/> Landfill waste disposal	(Y)			
Defence	<input type="checkbox"/> Defence	(D)			
Other developed use	<input type="checkbox"/> Unidentified building	(~B)			
	<input type="checkbox"/> Unidentified general manmade surface	(~M)			
	<input type="checkbox"/> Unidentified structure	(~S)			

2. Change of land use in the designated Green Belt, including to a developed use, does not mean the removal of the land from the Green Belt. Land can be removed from the Green Belt only through the local planning process.

3. The flood risk analysis in LUCS is based on annually updated data sets of digitised boundaries provided by the Environment Agency. The areas of high flood risk used cover approximately ten per cent of England. They reflect the river and coastal floodplains and provide indicative flood risk areas. They are areas estimated to be at risk of at least a one in one hundred chance of flooding each year from river areas or at least a one in two hundred chance of flooding from the sea. These are approximate boundaries and do not take into account any flood defences.

4. National Statistics are produced to high professional standards set out in the Code of Practice for Statistics.

5. Details of officials who receive pre-release access to LUCS up to 24 hours before release can be found at: <https://www.gov.uk/government/organisations/ministry-of-housing-communities-and-local-government/about/statistics>.

Enquiries

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Information on Official Statistics is available via the UK Statistics Authority website:

<https://www.gov.uk/government/statistics/announcements>

Information about statistics at MHCLG is available via the department's website:

www.gov.uk/government/organisations/department-for-communities-and-local-government/about/statistics

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