



Department for  
Communities and  
Local Government

# Land Use Change Statistics in England: 2011

This release shows changes to **developed uses** in terms of the location and types of land use.

In 2011:

- 68 per cent of dwellings (including conversions) were built on previously-developed land compared with 71 per cent in 2010. (From 2010 Residential Gardens are excluded from the previously-developed land category). The proportion of new dwellings (including conversions) on previously-developed land peaked at 81 per cent in 2008. (This figure includes development on residential gardens.)
- new dwellings were built at an average density of 43 dwellings per hectare, up from 42 dwellings per hectare in 2010. Densities on previously-developed sites were 53 dwellings per hectare in 2010 and 2011.
- 2 per cent of dwellings were built within the Green Belt (unchanged since 2004) and 4 per cent of land changing to residential use was within the designated Green Belt compared to 6 per cent in 2010.
- 7 per cent of new dwellings were built within areas of high flood risk compared to 9 per cent in 2010, and 5 per cent of land changing to residential use was within areas of high flood risk, unchanged compared to 2010.
- 48 per cent of land changing to a developed use was previously-developed, compared to 42 per cent in 2010.



## Land Use *Statistical Release*

19 December 2013

Introduction	2
Changes to residential use	2
Density of new dwellings	5
Changes within the Green Belt	6
Changes within areas of high flood risk	7
Changes to developed uses	8
Accompanying tables	9
Technical notes	9
Enquiries	16

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# Introduction

Land Use Change Statistics are a rich source of information which show how land has changed use in England since 1985. 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 25 land use categories (see Table BN1). 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 up to 2011. Statistics on changes within the Green Belt and changes within areas of high flood risk are also presented.

## Changes to residential use

The latest national estimates for changes to residential use are for 2011, and the latest local authority estimates are for 2008-11. The statistics show how much residential development has taken place on previously-developed and previously undeveloped land.

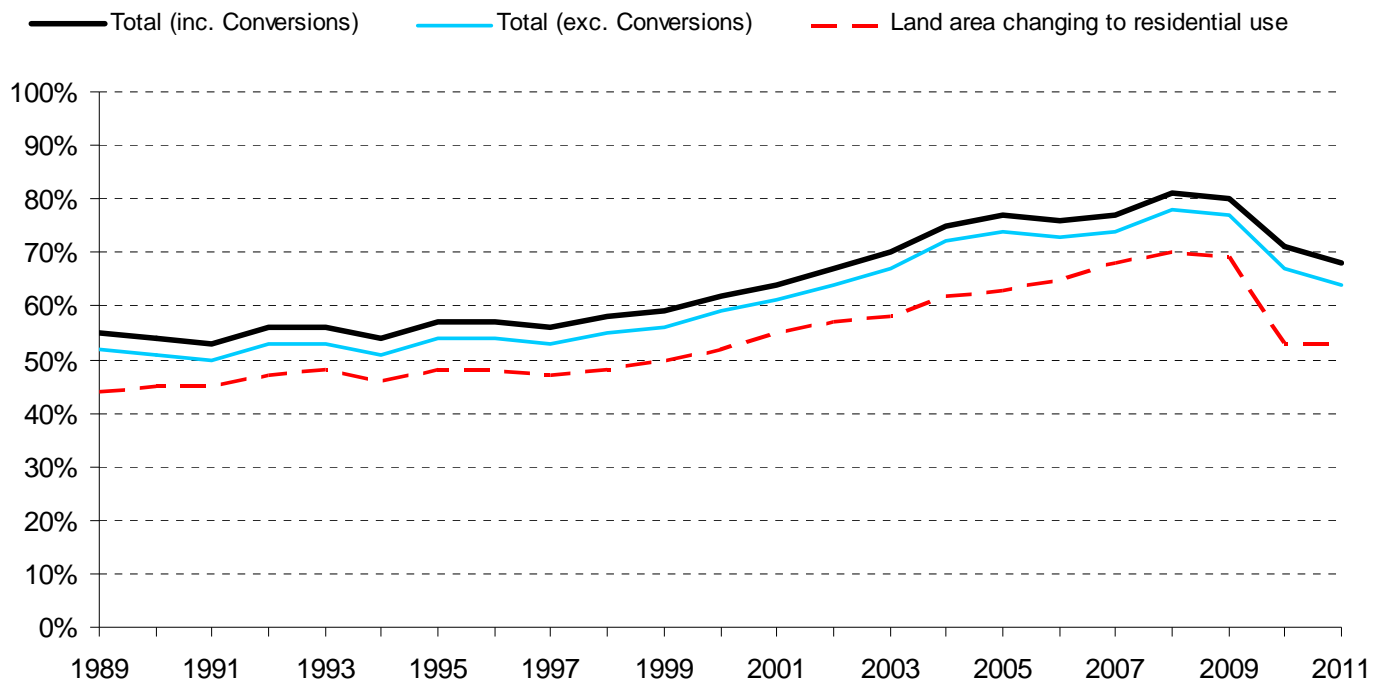
(The land use categories defined as previously-developed can be found in the background notes. From 2010 onwards, the definition of previously-developed land was changed to exclude residential gardens, to take account of the Government policy decision in June 2010 to classify such land as undeveloped).

The proportion of dwellings (including conversions) built on previously-developed land increased to a peak of 81 per cent in 2008.

- In 2011, 68 per cent of dwellings (including conversions) were built on previously-developed land compared with 71 per cent in 2010 (**Table P211**). The peak of 81 per cent in 2008 includes dwellings built on gardens. For comparison purposes, if Residential Gardens were still considered previously-developed, the percentage of dwellings including conversions built on previously-developed land would be 72 per cent in 2011 and 77 per cent in 2010.
- In 2011, the proportion of land changing to a residential use that was previously-developed was 53 per cent, unchanged from 2010. The peak of around 70 per cent in 2008 includes gardens as previously-developed. Again, for comparison purposes, if Residential Gardens were still considered previously-developed, the percentage of new residential land that was previously-developed would be 62 per cent in 2011 and 67 per cent in 2010.

*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, numbers 211 and 213.*

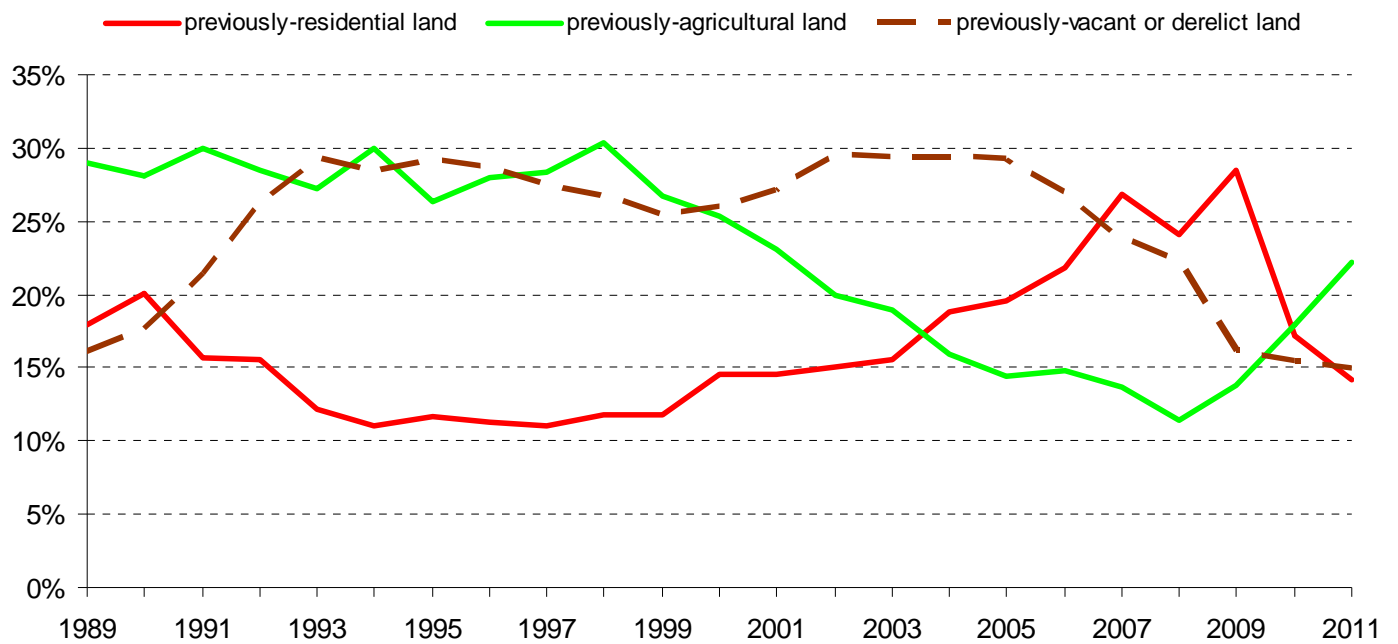
**Figure 1: Proportion of new dwellings on previously-developed land and previously-developed land changing to a residential use, 1989 to 2011**



There are 25 land use categories used in LUCS<sup>1</sup>. In 2011:

- 51 per cent of dwellings were built on land previously classed as residential, agricultural, "vacant" or "derelict".
- 14 per cent of dwellings were built on previously-residential land, excluding residential gardens<sup>1</sup>. This compares to 17 per cent in 2010.
- 22 per cent of dwellings were built on previously-agricultural land<sup>1</sup>. This compares to 18 per cent in 2010.
- 15 per cent of dwellings were built on previously-developed vacant or derelict land<sup>1</sup>. This is unchanged from the 2010 estimate.
- 5 per cent of dwellings were built on residential gardens. This compares to 7 per cent in 2010. **(Table P221)**

**Figure 2: Proportion of new dwellings built on previously-residential, agricultural and vacant or derelict land, 1989 to 2011**

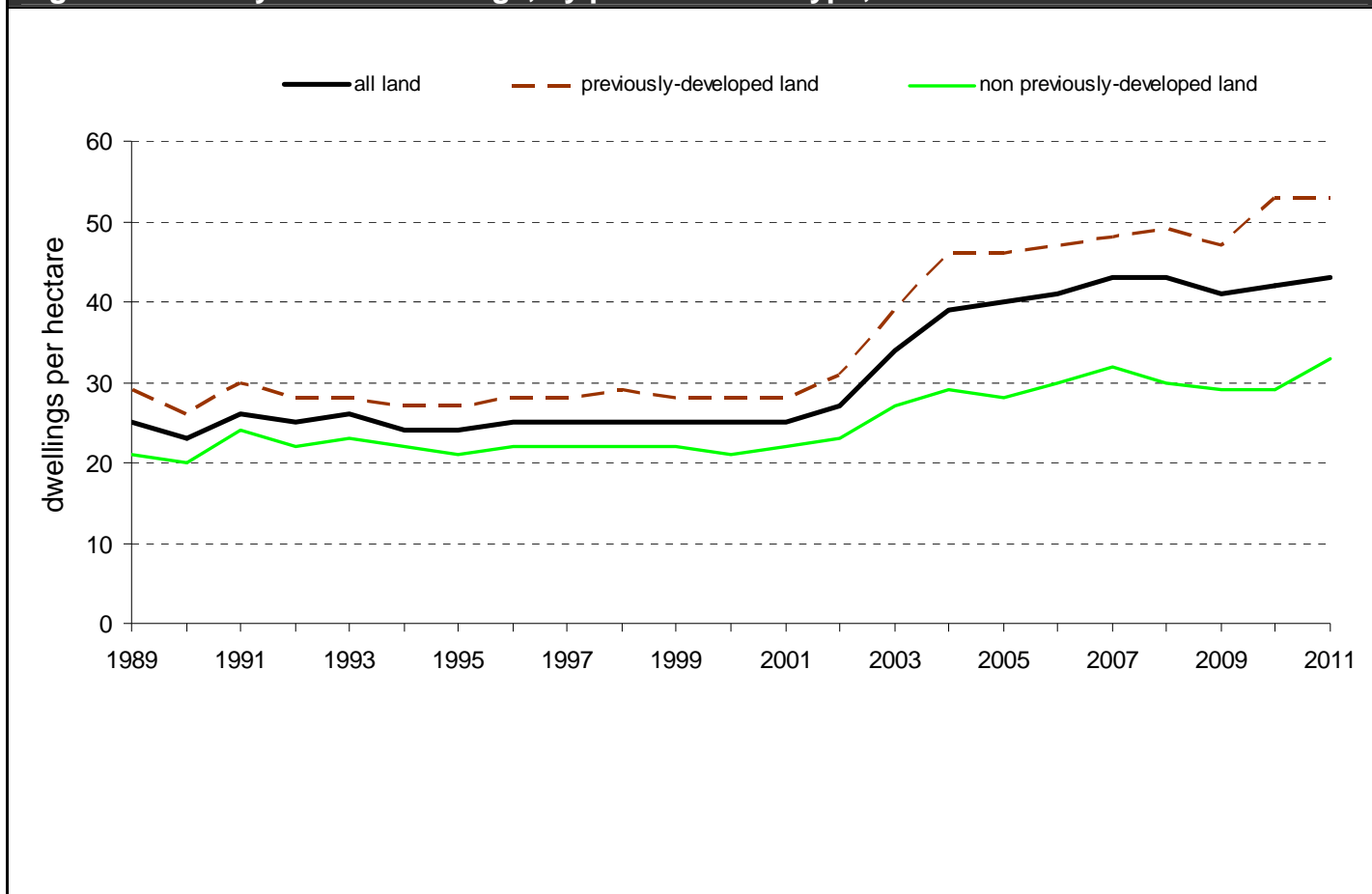


Detailed statistics on land changing to residential use can be found in the Land Use Change Statistics Live Tables, numbers 221 to 226.

# Density of new dwellings

- The density of residential development can be estimated as the Land Use Change Statistics record the land area and number of dwellings built for residential development. Density is measured in dwellings per hectare.
- In 2011, new dwellings were built at an average density of 43 dwellings per hectare, up from 42 dwellings per hectare in 2010 and the same density as 2007 and 2008. The density of new dwellings has increased by 72 per cent between 2001 (when it stood at 25 dwellings per hectare) and 2011 (see Figure 3).
- In 2011, new dwellings on previously-developed land were built at an average density of 53 dwellings per hectare, unchanged compared to 2010, while new dwellings on previously undeveloped land were built at an average density of 33 dwellings per hectare in 2011, an increase from 29 dwellings per hectare in 2010. **(Table P231)**
- For comparison purposes, if Residential Gardens were still considered previously-developed, the density of new dwellings on previously-developed land in 2011 would be 48 dwellings per hectare, while that of new dwellings on previously undeveloped land would be 35 dwellings per hectare.

Figure 3: Density of new dwellings, by previous land type, 1989 to 2011

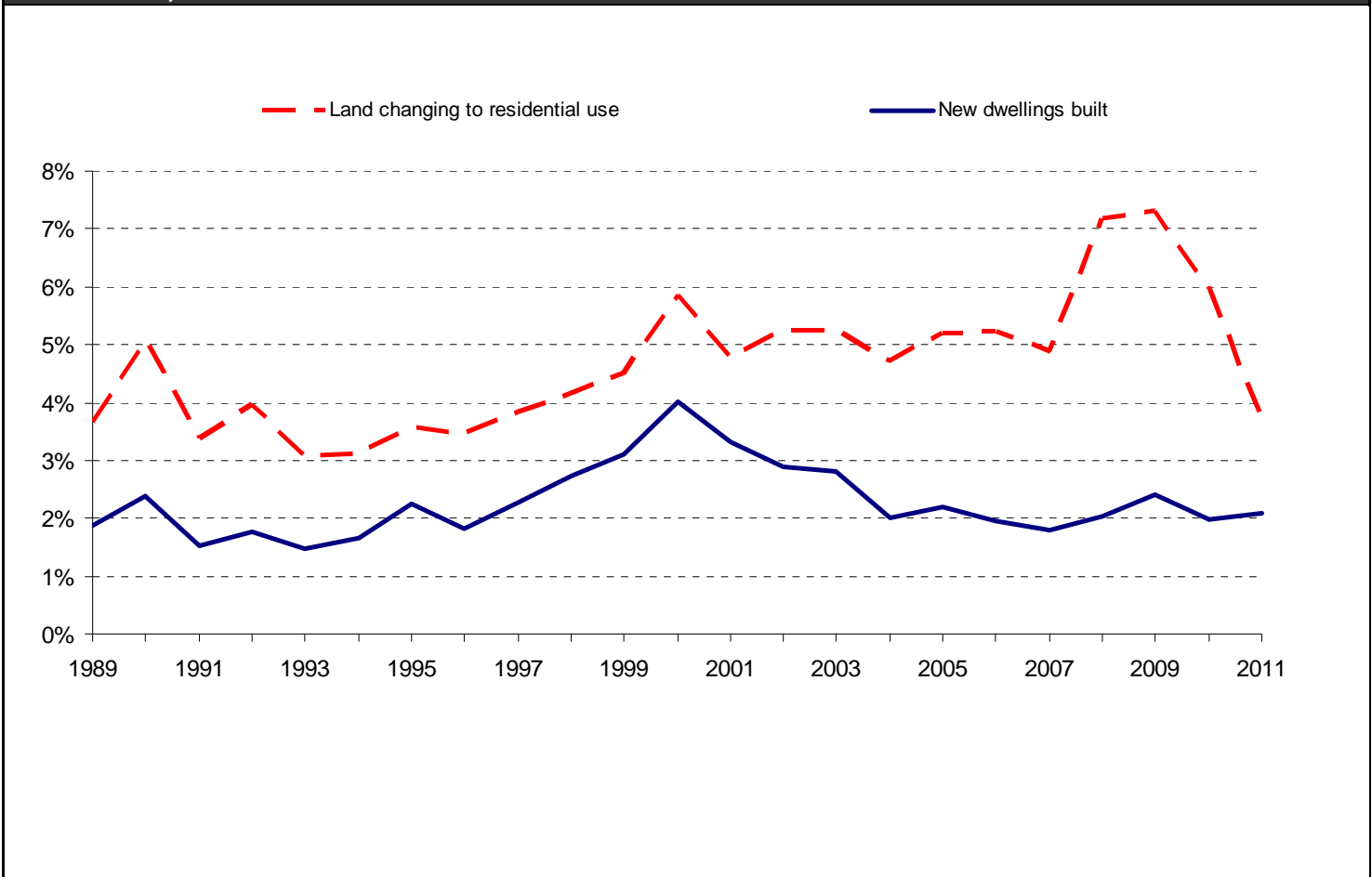


Detailed statistics on the average density of new dwellings (including data at a local authority level) can be found in the Land Use Change Statistics Live Tables, numbers 231 and 232.

## Changes within the Green Belt<sup>2</sup>

- In 2011, 2 per cent of dwellings were built within the Green Belt. This percentage has remained almost unchanged since 2004 (see Figure 6).
- In 2011, 4 per cent of land changing to residential use was within the designated Green Belt compared to 6 per cent in 2010. This figure has decreased by 3 percentage points since a peak in 2009 (see Figure 6).
- In 2011, 71 per cent of dwellings built within the Green Belt were built on previously-developed land. This compares to 65 per cent in 2010 and 75 per cent in 2009. **(Table P246)**
- In 2011, 34 per cent of land changing to a developed use within the Green Belt was previously-developed. This compares to 24 per cent in 2010 and 36 per cent in 2009. **(Table P245)**

**Figure 4: Proportion of new dwellings built and land changing to residential use within the Green Belt, 1989 to 2011**

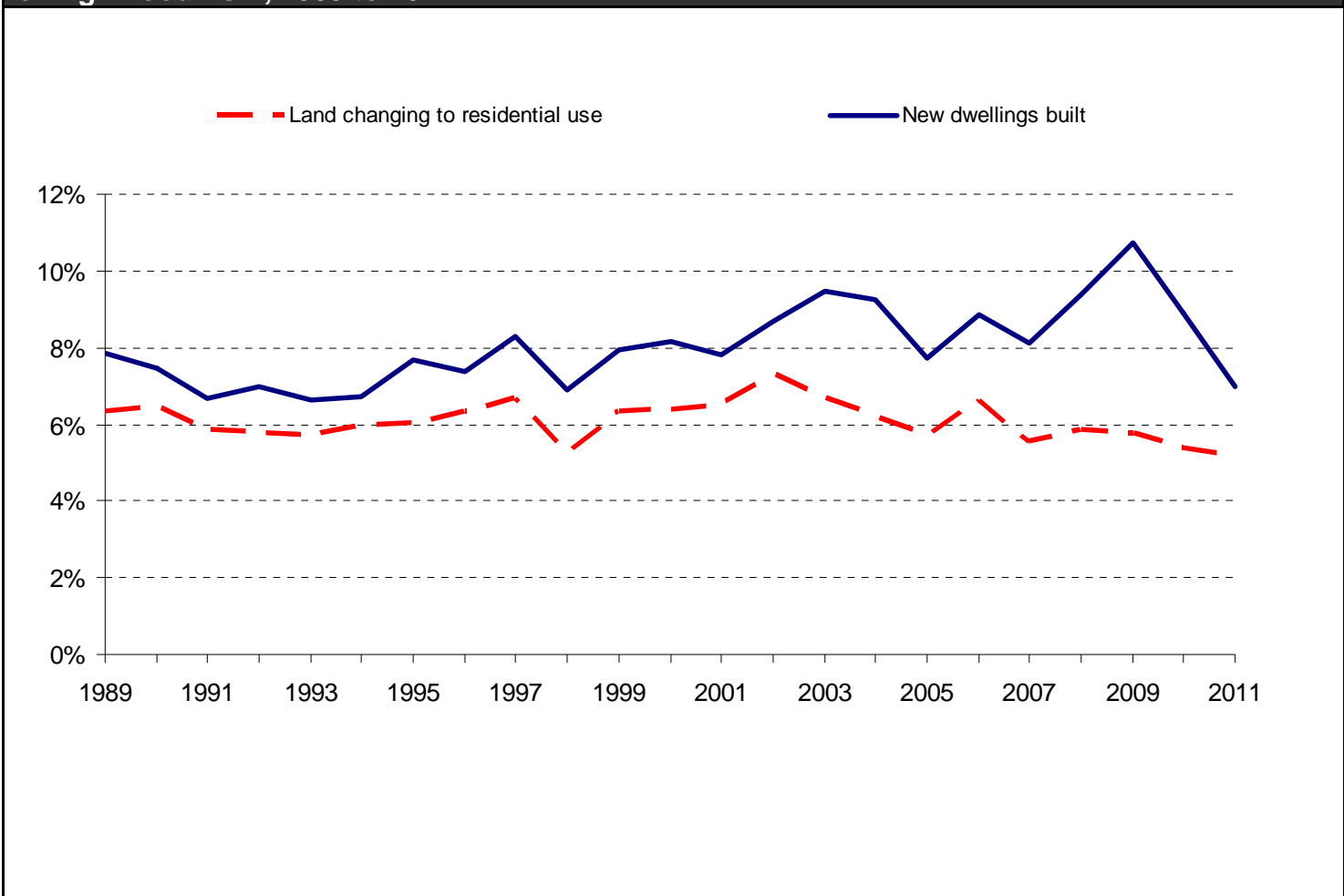


Detailed statistics on changes within the Green Belt can be found in the Land Use Change Statistics Live Tables, numbers 243 to 246.

## Changes within areas of high flood risk<sup>3</sup>

- In 2011, 7 per cent of new dwellings were built within areas of high flood risk<sup>3</sup>. This compares to 9 per cent in 2010.
- In 2011, 5 per cent of land changing to residential use was within areas of high flood risk<sup>3</sup>, unchanged compared to 2010. **(Table P251)**

**Figure 5: Proportion of new dwellings built and land changing to residential use within areas of high flood risk<sup>3</sup>, 1989 to 2011**



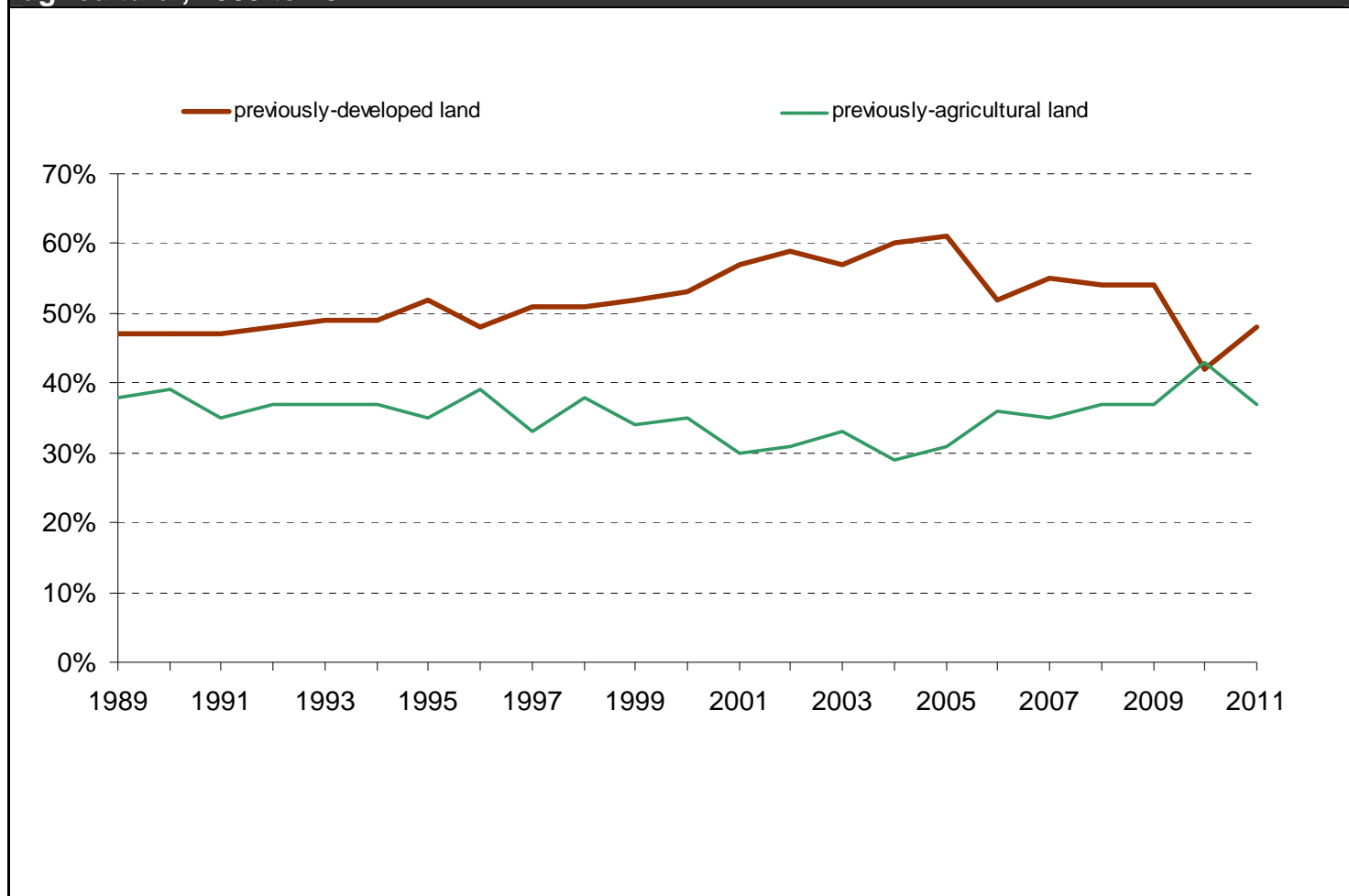
Detailed statistics on changes within areas of high flood risk can be found on the Land Use Change Statistics Live Tables, number 251.

# Changes to developed uses

In 2011, 48 per cent of land changing to a developed use was previously-developed, compared to 42 per cent in 2010.

- In 2011, 37 per cent of land changing to a developed use was previously agricultural land or agricultural buildings, compared to 43 per cent in 2010.
- In 2011, 12 per cent of land changing to a developed use was previously residential, compared to 13 per cent in 2010 and 22 per cent in 2009, which included residential gardens. In 2011, 5 per cent of land changing to a developed use was previously residential gardens compared with 6 per cent in 2010. **(Table P261)**
- In 2008-2011 an average of 46 per cent of land changing to Industry and Commerce<sup>1</sup> was previously developed. **(Table P264)**

**Figure 6: Proportion of land changing to a developed use that was previously-developed or agricultural, 1989 to 2011**



Detailed statistics on changes to developed uses can be found in the Land Use Change Statistics Live Tables, numbers 261 to 265.



# Accompanying tables

Accompanying Live Tables are available to download alongside this release. These tables can be accessed at:

<https://www.gov.uk/government/statistical-data-sets/live-tables-on-land-use-change-statistics>

Related DCLG statistical releases are available at:

<https://www.gov.uk/government/collections/land-use-change-statistics>

## Technical notes

### Land Use Context

England has a land area of just over 13 million hectares. Of this area only about 9% is developed. Around 13% of England is Green Belt encircling 14 urban areas and about 30million people. The fundamental 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 and Sites of Special Scientific Interest total another 29% of the total area of England. Together, allowing for overlaps, around 40% (5.3m hectares) of the total land area of England is protected against development by these designations.

### Data collection

Land use change data has been collected by Ordnance Survey since 1985, with the number of new dwellings built collected since 1989, and information on the development of residential gardens collected since 2010. A land use change is recorded as part of Ordnance Survey's map revision process, when the current land use category of a parcel of land differs from that depicted on the existing Ordnance Survey map. A change is also recorded where there is no change in the appropriate land use category, but there is a change to the dwelling count, such as when a house is demolished and one or more built in its place, or an additional dwelling is built within the grounds of an existing house.

Change is also recorded if Ordnance Survey is aware of a change of use of a building, such as a conversion. The data recorded in any one year depends on Ordnance Survey resources and how these are deployed on the different types of map revision survey.

When Ordnance Survey records a land use change, the information about the site collected for the Department includes:

- the date of survey
- the grid reference
- the local authority in which the site is located
- the area of the site (in hectares)
- the new and previous uses of the site
- the estimated year the change in use occurred
- the number of dwelling units demolished and built; and
- the method of survey undertaken by Ordnance Survey at each site, whether captured via surveyor or via aerial photography.

Change is captured using either ground or aerial survey methods or a combination of both. Urban areas, which are likely to see more rapid changes in land use than rural areas, are mainly covered on the ground by surveyors who make on-site visits to update maps and collect data about land use changes in response to prior intelligence about such changes. Rural areas on the other hand are less likely to experience changes and as a result Ordnance Survey makes regular, but less frequent sweeps of these areas using aerial photography.

The assignment of a parcel of land to a land use category does not, in general, depend on its location. Thus developed categories can occur in the countryside, e.g. a farmhouse (residential), and examples of undeveloped categories can be found in urban settlements, e.g. playing fields (outdoor recreation). The exception to this is vacant urban land not previously developed (category X), which can occur only within built-up areas. This is a 'parcel-based' approach to classifying land use.

## Data coverage, timeliness and robustness

There is an inevitable time lag between a land use change occurring and it being recorded. The size of this lag varies, depending on Ordnance Survey's priorities and survey practices. Specifically the lag depends upon the survey regime under which changes are recorded and upon commitments made with regard to recording particular kinds of topographic change. Ordnance Survey has traditionally responded to intelligence about land use change as it occurs. Virtually all developments in urban areas such as new housing, new commercial or industrial buildings and major road construction, as well as larger developments in rural areas, are subject to continuous revision and benefit from a commitment to survey change within six months of completion (or demolition).

Other changes are generally picked up under 'integrated revision', which is a systematic revision of rural and moorland areas. This currently operates on a revision cycle of between two and ten years, but will be moving to a cycle of 5 years shortly. Finally, there are certain land use changes which are not captured, such as extensions to private residential buildings, street furniture or traffic calming measures. Minor corrections to previous records, and changes between the same land use (except for Residential where this involves a change in the number of dwellings) are also excluded.

This "time lag" is also why information on the total number of dwellings built is not published in the Land Use Change Statistics. It would take several years for the total to become robust, whereas robust data on Housing Starts and Completions is available far more quickly.

## Data quality

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. Data at Local Authority level is published only as a four year average, as annual data at this spatial scale is highly volatile and not robust. However, annual estimates at national level are considered robust.

Ordnance Survey (OS) carry out initial quality assurance on the raw data as it is received. The location of change is checked to ensure that it is valid i.e. it has been recorded with the correct local authority information. Other checks include whether the date of change is valid, that the land use categories used are valid and that the combination of Previous Use to Current Use is valid, and that no lines are blank. Also a proportion of records are selected by OS to be checked in more detail. All the valid changes for the month are then supplied to DCLG.

The individual land use changes provided by Ordnance Survey are checked for plausibility, such as records which have very high or low densities, any very large sites or residential changes with no homes built. Any suspicious entries are queried with Ordnance Survey and if necessary amended. The records which have passed this stage are then added to the master database. This contains all recorded land use changes since 1985 and so is a vast (well over 3 million rows of data i.e. recorded changes) and extremely comprehensive dataset of information on land use change in England since 1985. Data is aggregated to local authority and national level and analysed against boundary files of the Green Belt and areas of high flood risk. Statisticians compare the aggregated data against previous and current data for comparable LA areas and national trends. All information published in the Live Tables or in the annual statistical release is recalculated to take account of any land use changes for previous years which have only recently been collected.

As there is only one supplier of data and they have been continuously responsible for providing data since the beginning of collection then the dataset is internally completely consistent.

### **Concentration of records in 1985, 1990, 2003 and 2005**

There is likely to be variation between the amount of aerial surveying that is undertaken in different years. This depends on factors such as the weather and the amount of aerial surveying in previous years. Also, Ordnance Survey cover different areas of the country in different years. The Land Use Change Statistics show peaks in the number of records received in the years of 1985, 1990, 2003 and 2005. There are several reasons for this.

Firstly, the year on year variation in the flying programmes and the recording of the year of change as being that of the year of photography means that in 2003 and 2005 the total number of records received was unusually high. In turn, the total number of changes recorded for 2002 and 2004 were lower than expected. Further analysis confirms that this variation is largely down to the amount of aerial surveying. However, percentages in all years are thought to be robust.

Secondly, the reason for the concentration of records in 1985 and 1990 is a more deliberate rounding of records to these years. This approach was used as a way of dealing with the uncertainty over the actual year of land use change given the lag between the change occurring and it being observed. In this way, between 1985 and 1988 the year of change recorded was rounded to the nearest multiple of five years.

With the Land Use Change Statistics having been introduced in 1985, the most obvious years that show this peaking of records are 1985 and 1990. This deliberate rounding of changes to five-year multiples is no longer carried out; instead surveyors or Ordnance Survey staff estimate the year of change down to the nearest year.

### **1999 Figures**

In 1999 a complete set of data could not be provided which means that total figures are understated. However, investigations have indicated that had the data been recorded they would have been spread across the country and previous uses. Therefore percentages are thought to be reasonably reliable. Further support to this is given by the fact that the percentage figures are in line with other years.

### **Conversions**

Many new dwellings resulting from the conversion of existing buildings are thought not to be included in the records supplied by Ordnance Survey. This is due to the fact that such new dwellings often lack obvious changes to the outside of the building. Therefore an estimation for England is required that takes these conversions into account.

The Housing Flow Return provides Local Authority estimates for the total number of conversions. These can be added to the estimated number of new dwellings built on previously-developed land from the Land Use Change Statistics. The resulting proportion of conversions was estimated to be around three percentage points using data available up to and including 2002.

From 2003 a more elaborate calculation has been adopted. The latest calculation uses more complete conversion data from the Housing Flow Return and a longer time series to increase data quality. An estimation of the amount of data that includes conversions has been included. An additional data field indicating whether or not each change is from the conversion of an existing building was introduced in October 2003 and is incorporated in estimates from 2003 onwards.

### **Changes to residential land**

The land use categorisation of the Land Use Change Statistics includes two categories for residential use (see 4.2 below). From 2004 onwards, published tables referring to land changing to residential use only apply to category "R" ("Residential" use). Tables in previous publications additionally included category "Q" ("Institutional and Communal Accommodation"). Statistics for dwellings built are only included when built on land classified as "R". It therefore follows that changes to residential land should only be for the same land category.

Furthermore, through checks on data quality, it was found that some data referred to residential boundary changes and not actual changes to land. Data for changes to residential uses is therefore only included when it involves the construction or demolition of a new dwelling and/or conversion. Previous data not falling into this definition has been removed.

In June 2010 the Government removed gardens from the definition of previously-developed land to give councils and communities more power to prevent development on back gardens. Statistics for 2010 and 2011 therefore class development on residential gardens as undeveloped. However, for comparison purposes some information classing residential gardens as previously-developed is given. Definitive statistics on the level of such development are being published for the first time.

## **Revisions policy**

This policy has been developed in accordance with the UK Statistics Authority Code of Practice for Official statistics and the Department for Communities and Local Government Revisions Policy (found at <https://www.gov.uk/government/publications/statistical-notice-dclg-revisions-policy>).

There are two types of revisions that the policy covers:

### **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**

When preparing each annual Land Use Change Statistics publication, previously published data is refreshed for all indicators. Investigation has shown that revisions tend to be minimal after more than a year.

**Percentage of dwellings (including conversions) built on previously-developed land by change year and date of publication**

		Change year					
		2005	2006	2007	2008	2009	2010
<b>Date of publication</b>	Jan-07	77					
	May-07	77	74				
	Jul-07	77	74				
	Oct-07	77	74				
	Jan-08	77	75				
	May-08	77	76	75			
	Jul-08	77	76	75			
	Oct-08	77	76	77			
	Jan-09	77	76	77			
	May-09	77	76	77	78		
	Jul-09	77	76	77	79		
	Oct-09	77	76	77	80		
	Jan-10	77	76	77	80		
	May-10	77	76	77	80		
	Jul-10	77	76	77	80		
	Jul-11	77	76	77	81		
Dec-13	77	76	77	81	80	71	

**Hectares of land changing to a residential use by change year and date of publication**

		Change year					
		2005	2006	2007	2008	2009	2010
<b>Date of publication</b>	Jul-07						
	Oct-07	4040					
	Jan-08						
	May-08	4170					
	Jul-08	4180					
	Oct-08	4250	4280				
	Jan-09	4240	4090				
	May-09	4250	4150				
	Jul-09	4260	4180				
	Oct-09	4260	4190	4720			
	Jan-10	4270	4190	4750			
	May-10	4270	4200	4770			
	Jul-10	4270	4200	4780	2740		
	Jul-11	4280	4200	4780	2770		
	Dec-13	4280	4210	4790	2780	2180	2640

## 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 LUCS Guidance.

**Table BN1: Land use categories, groups and divisions.**

Previously developed land			Non-previously developed land			
Group	Category (codes)		Group	Category (codes)		
<b>Residential</b>	• Residential	(R)	<b>Agriculture</b>	• Agricultural land	(A)	
	• Institutional and communal Accommodation	(Q)		• Agricultural buildings	(B)	
<b>Transport and Utilities</b>	• Highways and road transport	(H)	<b>Forestry, open land and water</b>	• Forestry and woodland	(F)	
	• Transport (other)	(T)		• Rough grassland and Bracken	(G)	
	• Utilities	(U)		• Natural and semi-natural Land	(N)	
<b>Industry and Commerce</b>	• Industry	(I)	• Water	(W)		
	• Offices	(J)	<b>Outdoor recreation</b>	• Outdoor recreation	(O)	
	• Retailing	(K)		<b>Vacant</b>	• Urban land not previously developed <sup>3</sup>	(X)
	• Storage and warehousing	(S)			<b>Residential Gardens</b>	• Residential Gardens
<b>Community Services</b>	• Community buildings	(C)				
	• Leisure and recreational Buildings	(L)				
<b>Vacant</b>	• Vacant land previously Developed	(V)				
	• Derelict land	(Z)				
<b>Minerals and landfill<sup>1</sup></b>	• Minerals <sup>2</sup>	(M)				
	• Landfill waste disposal <sup>2</sup>	(Y)				
<b>Defence</b>	• Defence	(D)				

### Notes:

Unless otherwise stated, 'previously developed land' corresponds with 'urban land use' and 'non-previously developed land' with 'rural land use'.

1. Some mineral and landfill sites may be classed as non-previously developed land (see 4.4)

2. Classified as 'rural' land use

3. Classified as 'urban' land use

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 only be removed from the Green Belt 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 National Statistics Code of Practice. They undergo regular quality assurance reviews to ensure they meet customer needs.

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/department-for-communities-and-local-government/about/statistics#pre-release-access-to-official-statistics>

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

[www.statistics.gov.uk/hub/browse-by-theme/index.html](http://www.statistics.gov.uk/hub/browse-by-theme/index.html)

Information about statistics at DCLG is available via the Department's website:

[www.gov.uk/government/organisations/department-for-communities-and-local-government/about/statistics](http://www.gov.uk/government/organisations/department-for-communities-and-local-government/about/statistics)



**Date of next publication**

To be announced in due course.

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