# **Population and Dwelling Stock Forecasts**

# 2011 - 2031



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## Population and Dwelling Stock Forecasts 2010 – 2031

## **Peterborough Unitary Authority**

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LGSS Research, Performance & Business Intelligence Team has produced these population and dwelling stock forecasts for Peterborough City Council under a Service Level Agreement

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## **1 INTRODUCTION**

- 1.1 This report summarises forecast demographic change between 2010 and 2031 at local authority and ward level for the Peterborough Unitary Authority area. It contains detailed population and dwelling stock forecasts, the primary purpose of which is to assist in the planning and delivery of local services. The report may be read in conjunction with the Peterborough Population and Dwelling Stock Estimates report also published this year.
- 1.2 The forecasts provide an alternative and more detailed source of local population statistics to those produced by the Office for National Statistics (ONS) for central government. For the purpose of comparison, the ONS forecasts are also included.
- 1.3 Population and dwelling stock forecasts in this document refer to 2004 ward boundaries, which were the base geography for the 2001 Census. Minor changes to parish and urban ward boundaries were made under the Peterborough (Parishes) Order 2004; these are reflected in the figures published here.
- 1.4 LGSS Research, Performance & Business Intelligence Team (RPBIT) has produced the forecasts in this report under a service level agreement with Peterborough City Council. RPBIT was formerly the Cambridgeshire County Council Research Group, The team has been incorporated into LGSS, a shared service venture between Cambridgeshire and Northamptonshire County Councils.
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## 2 POPULATION FORECASTS

#### 2.1 Background

- 2.1.1 LGSS Research, Performance & Business Intelligence Team (RPBIT) produces annual population and dwelling stock forecasts for Peterborough City Council (PCC) under a service level agreement. The RPBIT forecasts are 'policy led', which means that they are consistent with planned levels of house-building within the authority. They are therefore different to projections produced by the Office for National Statistics (ONS), which are trend-based, meaning that they assume that recent trends will continue in the future.
- 2.1.2 The forecasts are largely influenced by local planning policy, particularly in relation to housing development. The location and timing of housing development is indicated within local development documents and the related housing trajectory. The forecasts reflect the population implications of development and other demographic change. All forecasts are based on a series of assumptions and are subject to change in the light of new information.
- 2.1.3 The RPBIT forecasts are consistent with housing targets laid out in the East of England Plan (the Regional Spatial Strategy (RSS), with the broad timing of future development guided by PCC's Core Strategy pre-submission document E114 housing trajectory, March 2009. For the post 2021 period, there is an assumed continuation of the planned average delivery rate of 1,420 dwellings per annum. This is marginally lower than the 1,430 indicated in the Draft East of England Plan to 2031 published in March 2010.
- 2.1.4 The proposed abolition of Regional Spatial Strategies and the provisions of the Localism Act, which give local authorities the right to set their own house-building levels, suggest that the basis for the longer term forecasts are likely to change in the near to medium term. In the interim, the Peterborough Core Strategy DPD adopted in February 2011 sets out the scale and broad location of future development to 2026 and beyond. These forecasts accord with the Peterborough Core Strategy DPD and the Peterborough Housing Trajectory.
- 2.1.5 When published elsewhere, the forecasts must be properly referenced<sup>1</sup> and rounded to the nearest 100 people.

#### 2.2 Population forecasts

2.2.1 Table 1 shows that between 2010 and 2031, Peterborough's population is forecast to grow by around 35% to 237,700. It also indicates changes in the age groups that make up the general population. All age groups are forecast to show an absolute increase, although some age groups are forecast to grow more than others. Of particular note is the level of growth in all groups aged 65+.

<sup>&</sup>lt;sup>1</sup> The forecasts should be referenced as:

LGSS Research, Performance & Business Intelligence Team (RPBIT) 2010-based ward level population and dwelling stock forecasts.

								%
Age	2001	2010	2011	2016	2021	2026	2031	change 2010-31
	2001	2010	2011	2010	2021	2020	2031	2010-31
0-4	10,300	13,800	14,300	15,900	17,500	17,300	17,100	24%
5-10	13,200	13,400	13,800	17,600	19,800	21,000	20,800	55%
11-15	10,800	11,000	10,800	11,300	14,500	16,000	17,000	55%
16-19	7,900	8,400	8,200	8,500	9,000	11,400	12,400	48%
20-24	9,700	11,300	11,400	12,200	12,000	12,000	15,000	33%
25-34	24,800	22,300	22,300	26,600	29,600	27,700	25,900	16%
35-44	23,200	26,100	25,900	25,800	27,100	29,600	30,300	16%
45-54	20,300	23,100	23,400	25,900	27,200	26,400	26,500	15%
55-64	14,950	20,200	20,300	21,200	23,700	25,500	26,200	30%
65-74	12,100	13,800	14,100	17,600	19,400	20,100	22,000	59%
75-84	7,700	9,200	9,400	10,300	11,900	14,800	16,200	76%
85+	2,400	3,600	3,800	4,800	5,900	6,900	8,300	131%
Total	157,400	176,200	177,700	197,700	217,600	228,700	237,700	35%

Table 1: RPBIT population forecast, 2001-2031

SOURCE: RPBIT 2010-based population forecasts.

NOTES: Totals may not sum due to rounding.

2.2.2 The aging trend is illustrated in Figure 1 which shows Peterborough's changing age structure. Perhaps most strikingly, it indicates that between 2010 and 2031 the proportion of the total population aged 65+ will grow from 15% to 20%. Similarly, the proportion of 5-19 year olds will grow from 19% to 21%. By contrast, the proportion of the population aged 25-39 and 40-64 will decline. These figures are broadly in line with national trends towards an ageing population.





SOURCE: RPBIT 2010-based population forecasts

2.2.3 The population forecasts in Tables 1 and 2 are based on the assumption that house-building in Peterborough will come forward as laid out in Table 2, with a near 40% increase in total dwelling numbers across the unitary authority area between 2010 and 2031. This 'policy-led' approach is explained further in Section 4, whilst Section 3 presents the dwellings forecasts in greater detail.

#### Table 2: RPBIT dwellings forecast, 2001-2031

	2001	2010	2011	2016	2021	2026	2031	% change 2010-31
Dwellings	70,200	78,300	79,020	87,350	96,850	103,900	107,050	37%

NOTE: Based on the Peterborough E114 housing trajectory, March 2009 and Peterborough Housing Development Reports.

- 2.2.4 Table 3 presents the population forecasts for Peterborough by ward. The ward forecasts indicate that, between 2010 and 2031, Orton with Hampton will grow the most (96% excluding the Great Haddon development and 216% including the Great Haddon development), with Paston also experiencing significant growth. The population of Bretton South is forecast to decline the most (9%).
- 2.2.5 Declining populations are likely in areas without further house-building, which will therefore experience no significant population growth from migration. Additionally, population ageing will result in smaller household sizes due to mortality and the out-migration of younger residents (i.e. the adult children of home owners). The population housed by the current housing stock is forecast in general terms to fall.

Peterborough	Estimates		Forecast population					%	%
Unitary Authority - Wards	2001	2010	2011	2016	2021	2026	2031	Change 2001-31	Change 2010-31
Urban Wards									
Bretton North	9,600	9,400	9,400	9,600	9,600	9,300	9,600	0%	2%
Bretton South	3,200	3,300	3,300	3,300	3,200	3,100	3,200	0%	-3%
Central	8,800	10,700	10,700	12,300	13,500	14,700	15,400	75%	44%
Dogsthorpe	8,800	9,400	9,500	11,000	10,800	10,500	10,900	24%	16%
East	8,300	10,300	10,300	12,700	13,600	14,400	15,200	83%	48%
Fletton	8,000	10,500	10,700	11,900	12,800	12,900	13,600	70%	30%
North	5,200	5,800	5,800	5,800	5,700	5,600	5,700	10%	-2%
Orton Longueville	10,500	10,400	10,400	10,400	10,200	9,900	9,900	-6%	-5%
Orton Waterville	8,300	8,300	8,300	8,900	10,200	9,900	10,400	25%	25%
Orton with	3,500	11,600	12,000	16,900	21,800	22,500	22,700	549%	96%
Hampton*									
**Great Haddon	0	0	0	900	7,100	13,000	14,000	n/a	n/a
Development									
Park	8,200	9,600	9,600	9,700	9,800	9,500	9,800	20%	2%
Paston	8,300	8,500	8,600	9,900	12,900	16,500	17,400	110%	105%
Ravensthorpe	6,900	7,700	7,700	7,800	8,100	8,500	8,800	28%	14%
Stanground Central	8,700	8,700	8,900	11,500	13,200	13,100	13,800	59%	59%
Stanground East	3,100	3,100	3,100	3,000	3,000	2,900	3,000	-3%	-3%
Walton	5,500	5,500	5,600	6,100	6,000	5,800	6,100	11%	11%
Werrington North	8,000	7,700	7,700	7,700	7,500	7,300	7,400	-8%	-4%
Werrington South	6,700	6,700	6,700	7,200	7,200	7,100	7,400	10%	10%
West	8,400	8,900	8,900	9,700	10,100	10,400	10,900	30%	22%
Rural Wards									
Barnack	2,700	2,800	2,800	3,100	3,000	3,000	3,100	15%	11%
Eye and Thorney	5,500	6,000	6,100	6,200	6,500	6,400	6,800	24%	13%
Glinton and	6,300	6,500	6,500	6,600	6,500	6,700	7,000	11%	8%
Wittering									
Newborough	2,300	2,600	2,800	3,000	3,100	3,000	3,200	39%	23%
Northborough	2,700	2,600	2,700	2,800	2,700	2,800	2,800	4%	8%
Total	157,400	176,200	177,700	197,700	217,600	228,700	237,700	51%	35%

#### Table 3: RPBIT population forecasts by ward, 2001-2031

SOURCE: RPBIT 2010-based ward-level population forecasts.

\* Orton with Hampton - geographically the ward includes the area identified for the Great Haddon development. For clarity the proposed population change associated with the Great Haddon Development is itemised separately.

\*\* Great Haddon refers to the proposed new development between Hampton and Yaxley which is located within Orton with Hampton ward. The Great Haddon population figures are set out separately for clarity,

NOTE: Totals may not sum due to rounding.

#### 2.3 Comparison of ONS and RPBIT population forecasts

2.3.1 On 27th May 2010 the Office for National Statistics (ONS) released 2008-based sub-national population projections for the UK and Local Authorities, which replaced the previous 2006-based figures. This discussion briefly explores the methodological changes that underpin the new projections, and compares the new figures to those produced by RPBIT, as well as those previously published by ONS. The period covered by the new ONS projections is 2008-2033 but this discussion only considers the period 2010-2031, as this matches the time period of the RPBIT forecasts.

#### Overview of the ONS and RPBIT forecasting approaches

- 2.3.2 ONS projections and RPBIT forecasts are produced using fundamentally different approaches. ONS uses a 'trend-based' approach where future population change is assumed to reflect the continuation of recent trends in fertility, mortality and migration at local authority level; they take no account of local development policy, economic factors or the capacity of areas to accommodate population.
- 2.3.3 RPBIT forecasts are 'policy-led'. This means they reflect planned house-building as laid out in local planning policy documents. In other words, the RPBIT forecasts illustrate the population change that results from a specific set of assumptions about future housebuilding. This makes them more suited to planning future service provision, although there is always a significant risk that house-building will not proceed as expected. Section 4 provides a more detailed description of the RPBIT forecasting methodology.

#### ONS methodological changes

- 2.3.4 The new ONS forecasts are based on two main revisions, both of which are related to the revised ONS population estimates for 2002-2008 that were also released in May 2010.
  - First, the new estimate figures provided revised population totals for 2008 for Peterborough, which in turn gives a new starting population for the projections.
  - Second, the revised estimates present an improved assessment of the population change that occurred between 2002 and 2008, particularly in terms of migration<sup>2</sup>. This revised assessment of recent population change alters the trends that are projected forward in the new ONS projections.
- 2.3.5 The remainder of this section presents the 2008-based ONS projections for Peterborough and compares them with the previous 2006-based ONS projections and the Research Group's 2009-based forecasts. In order to present consistent time frames, all forecasts presented here cover the period 2009-2031, but it should be noted that individual forecasts cover different total periods.

<sup>&</sup>lt;sup>2</sup> Related to this is an improved treatment of migration in all ONS population figures. For further explanation of the ONS estimate revisions and treatment of migration please see our discussion document: http://www.cambridgeshire.gov.uk/business/research/populationresearch/population/population/ONSpopulationestimates. htm

#### Peterborough population and household forecasts

2.3.6 ONS projections for Peterborough are now higher than previously for all years (see Fig. 2). This means that the ONS projection to 2031 is now a little closer to the RPBIT forecast. The low growth in the RPBIT forecast between 2010 and 2014 relates to the low level of house-building expected between 2010 and 2011 following the economic downturn. Building is assumed to increase after 2011, which accounts for the subsequent higher growth.



Figure 2: ONS projection and RPBIT forecast population, 2010-2031

#### Comparison of 2031 forecasts for Peterborough:

ONS (2008): 206,400 ONS (2006): 198,600 RPBIT: 237,700	00
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2.3.7 The ONS projections make no explicit assumptions about levels of house-building or household change, but a consistent set of household projections is published by the Communities and Local Government (CLG) which is based on ONS projections. By assuming that households are a reasonable proxy for house-building – based on the idea that an increase in households would 'require' an increase in dwellings to accommodate it – it is possible to infer house-building levels from projected household change. By comparing household change in the CLG projections and RPBIT forecasts, a sense of the relative house-building levels associated with each can be obtained. Figure 3 shows that the RPBIT forecasts assume considerably higher growth in households than the CLG projections, which indicates that the ONS population projections are consistent with a lower rate of house-building than is currently planned for Peterborough.



Figure 3: CLG projection and RPBIT forecast households, 2009-2031

#### What are the implications of these revised figures?

- 2.3.8 From a demographic perspective, RPBIT considers the 2008-based ONS projections to be an improvement on the 2006-based ONS projections as they are based on a more realistic assessment of growth between 2002 and 2008. As the projections are trend-based, however, they do not reflect the expected timing or distribution of future house-building within Peterborough. RPBIT will continue to produce policy-based forecasts, which do take these factors into account, and would advise users to continue to use these where possible, particularly when planning for future house-building.
- 2.3.9 The main impact of the new projections will be on funding settlements. Central government uses ONS population figures in its local authority and PCT funding allocation formulae. Specifically, ONS population projections are used to calculate the Relative Needs Amount, Relative Resource Amount and Central Allocation of the Formula Grant, along with elements of the Dedicated Schools Grant and PCT allocations. The 2008-based projections inform the three-year local government settlement from 2011/12. Central government grants constitute the bulk of local authority funding, so the ONS projections play an important role in local authority operations.
- 2.3.10 A summary of the 2008/9-2010/11 Formula Grant is available online: <u>http://www.im.dk/imEverest/Publications/imdk%20x2D%20engelsk/Papers/2007091015154</u> <u>8/CurrentVersion/Ponsford\_Distribution%20of%20Formula%20Grant%20to%20Local%20%</u> <u>20Authorities%20in%20England.pdf</u>
- 2.3.11 Some other elements of government funding, notably some Specific and Area Based grants, make use of ONS population estimates rather than projections. ONS' recent revisions to their population estimates will therefore affect some local authorities' funding.

#### Where to go for more information

- 2.3.12 On the Office of National Statistics website you will find complete projections for all local authorities for 2008-2033, including age and gender detail and components of change (births, deaths and migration): www.statistics.gov.uk/statbase/product.asp?vlnk=997
- 2.3.13 For further advice about the different sets of population figures please contact RPBIT on 01223 715300 or email research.performance@cambridgeshire.gov.uk.

#### 2.4 ONS Age Structure

2.4.1 Table 4 shows ONS' projected age structure to 2031. It indicates a broadly similar growth profile to the RPBIT forecasts. Even though absolute numbers are significantly different in most age groups, the magnitudes of growth in both sets of figures are quite similar. Exceptions are seen in the 5-19 and 40-64 age groups. RPBIT forecasts a larger proportional increase in 5-19 year olds and a larger proportional decrease of 40-64 year olds than ONS. In other words, in the RPBIT forecasts, 5-19s make up a greater proportion of the total population in 2031 and 40-64 years olds a lower proportion of the total population than forecast by ONS.

							% chango
Age							2010-
Group	2010	2011	2016	2021	2026	2031	2031
0-4	13.0	13.2	13.4	13.7	13.7	13.9	6.9%
5-9	10.6	10.9	12.7	12.8	13.1	13.1	23.6%
10-14	9.9	9.9	10.6	12.2	12.3	12.6	27.3%
15-19	10.7	10.5	9.8	10.4	11.9	12.0	12.1%
20-24	11.5	11.6	11.2	10.6	10.9	12.1	5.2%
25-29	13.5	13.8	15.0	14.5	13.8	14.1	4.4%
30-34	12.7	13.0	14.3	15.4	15.0	14.3	12.6%
35-39	13.1	12.9	13.0	14.2	15.3	14.8	13.0%
40-44	13.3	13.3	12.5	12.6	13.8	14.8	11.3%
45-49	12.0	12.2	12.9	12.1	12.1	13.3	10.8%
50-54	10.2	10.5	11.9	12.4	11.6	11.6	13.7%
55-59	9.2	9.2	10.1	11.4	11.9	11.1	20.7%
60-64	9.1	9.2	8.6	9.5	10.7	11.2	23.1%
65-69	6.8	7.2	8.5	8.0	8.8	10.0	47.1%
70-74	5.8	5.7	6.6	7.9	7.4	8.3	43.1%
75-79	4.8	5.0	5.1	6.0	7.1	6.8	41.7%
80-84	3.7	3.7	4.0	4.3	5.1	6.1	64.9%
85-89	2.1	2.2	2.5	2.9	3.3	4.0	90.5%
90+	0.8	0.9	1.2	1.5	2.0	2.5	212.5%
All ages	171.3	174.9	183.8	192.3	199.8	206.4	20.5%

Table 4: ONS projected age structure, 20	)10-2031 (1000s)
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SOURCE: ONS 2008-based sub-national population projections. NOTE: Totals may not sum due to rounding.

## **3 DWELLING STOCK FORECASTS**

3.1 This section provides dwelling stock forecasts for Peterborough. It gives figures by ward as well as for the unitary authority area as a whole. Table 5 shows total forecast dwelling stock at five yearly intervals. Table 6 shows the increase in dwellings within each ward that is forecast to take place during the period indicated. Section 4 contains a detailed methodology that describes how these forecasts were constructed.

	Estim dwell	ated ngs	Forecast dwellings				
	2001	2010	2011	2016	2021	2026	2031
Peterborough							
Urban Area:							
Bretton North	4,060	4,130	4,140	4,300	4,350	4,350	4,450
Bretton South	1,310	1,310	1,310	1,310	1,310	1,310	1,310
Central	3,960	4,260	4,280	4,950	5,500	6,150	6,450
Dogsthorpe	3,960	4,060	4,090	4,700	4,700	4,700	4,800
East	4,310	4,810	4,810	5,800	6,250	6,800	7,100
Fletton	3,990	5,190	5,240	5,800	6,300	6,550	6,850
North	2,400	2,520	2,530	2,550	2,550	2,550	2,550
Orton Longueville	4,330	4,380	4,380	4,450	4,450	4,450	4,450
Orton Waterville	3,720	3,920	3,940	4,200	4,750	4,750	4,900
Orton with Hampton*	1,760	5,460	5,670	7,650	9,800	10,500	10,650
**Great Haddon	0	0	0	350	2,850	5,350	5,800
Park	3,610	3,910	3,910	3,950	4,050	4,050	4,150
Paston	3,560	3,710	3,760	4,300	5,600	7,250	7,600
Ravensthorpe	2,980	3,130	3,130	3,200	3,400	3,700	3,800
Stanground Central	3,840	4,040	4,130	5,150	5,900	6,000	6,250
Stanground East	1,320	1,350	1,350	1,350	1,350	1,350	1,350
Walton	2,450	2,530	2,570	2,750	2,750	2,750	2,850
Werrington North	3,320	3,370	3,370	3,400	3,400	3,400	3,400
Werrington South	2,940	2,990	2,990	3,150	3,150	3,150	3,150
West	3,730	3,830	3,830	4,150	4,300	4,500	4,600
Peterborough Urban Area	61,550	68,900	69,430	77,450	86,700	93,600	96,450
Rural wards:							
Barnack	1,210	1,300	1,300	1,400	1,400	1,400	1,400
Eye and Thorney	2,580	2,880	3,000	3,050	3,200	3,200	3,350
Glinton and Wittering	2,760	2,940	2,940	3,000	3,050	3,200	3,300
Newborough	1,000	1,160	1,210	1,300	1,350	1,350	1,400
Northborough	1,080	1,130	1,140	1,150	1,150	1,150	1,150
Total	70,200	78,310	79,020	87,350	96,850	103,900	107,050

#### Table 5: RPBIT dwellings forecast by ward, 2001-2031

SOURCE: RPBIT 2010-based ward-level dwelling stock forecasts.

\* Orton with Hampton - geographically the ward includes the area identified for the Great Haddon development. For clarity the proposed dwelling change associated with the Great Haddon Development is itemised separately.

\*\* Great Haddon refers to the proposed new development between Hampton and Yaxley which is located within Orton with Hampton ward. The Great Haddon dwelling change figures are set out separately for clarity,

NOTE: Totals may not sum due to rounding.

	Estimated	dwellings					
	chai 2001-2010	nge 2010-2011	2011-2016	2016-2021	2021-2026	2026-2031	Total
	2001-2010	2010-2011	2011-2010	2010-2021	2021-2020	2020-2031	change 2001-2031
Peterborough							
Urban Area:							
Bretton North	70	10	160	50	0	100	390
Bretton South	0	0	0	0	0	0	0
Central	300	20	670	550	650	300	2,490
Dogsthorpe	100	30	610	0	0	100	840
East	500	0	990	450	550	300	2,790
Fletton	1,200	50	560	500	250	300	2,860
North	120	10	20	0	0	0	150
Orton Longueville	50	0	70	0	0	0	120
Orton Waterville	200	20	260	550	0	150	1,180
Orton with	3,700	210	1,980	2,150	700	150	8,890
Hampton*							
**Great Haddon	0	0	350	2,500	2,500	450	5,800
Park	300	0	40	100	0	100	540
Paston	150	50	540	1,300	1,650	350	4,040
Ravensthorpe	150	0	70	200	300	100	820
Stanground	200	90	1,020	750	100	250	2,410
Central							
Stanground East	30	0	0	0	0	0	30
Walton	80	40	180	0	0	100	400
Werrington North	50	0	30	0	0	0	80
Werrington South	50	0	160	0	0	0	210
West	100	0	320	150	200	100	870
Urban Area	7350	530	8,030	9,250	6,900	2,850	34,900
Rural wards:							
Barnack	90	0	100	0	0	0	200
Eye and Thorney	300	120	50	150	0	150	900
Glinton and	180	0	60	50	150	100	550
Newborough	160	50	90	50	0	50	400
Northborough	.00	10	10	0	0	0	50
Rural Area	780	180	310	250	150	300	2 100
Total	8,100	700	8,300	9,500	7,050	3,150	37,000

#### Table 6: RPBIT forecast dwelling change by ward, 2001-2031

SOURCE: RPBIT 2010-based ward-level dwelling stock forecasts.

\* Orton with Hampton - geographically the ward includes the area identified for the Great Haddon development. For clarity the proposed dwelling change associated with the Great Haddon Development is itemised separately.

\*\* Great Haddon refers to the proposed new development between Hampton and Yaxley which is located within Orton with Hampton ward. The Great Haddon dwelling change figures are set out separately for clarity,

NOTE: Totals may not sum due to rounding.

## 4 DESCRIPTION OF THE FORECASTING METHODOLOGY

#### 4.1 Introduction

4.1.1 This section outlines the methods, data and assumptions used to produce RPBIT's annual local authority-level population forecasts. The RPBIT forecasts are 'policy led'. This means that they are consistent with planned levels of house-building. They are therefore different to projections produced by ONS, which are trend-based, meaning they assume that recent trends continue in the future. The ONS forecasts therefore make no specific assumption about levels of house-building, however in general terms they implicitly assume that building continues on a similar level to recent years. They therefore do not take account of new housing developments in areas with low growth previously; similarly, they may over-estimate future growth in areas that had high levels of house-building in the past.

#### 4.2 Local authority-level forecasts

4.2.1 RPBIT uses an Excel spreadsheet model originally developed by Norfolk County Council and run at a local authority level. The main population forecasts are produced by ageing forward the population by sex and single year of age from a base date, year by year. Population change is forecast by allowing for the main components of population change: births and deaths (the balance of which give natural change), and migration. This is the standard population forecasting methodology as used, for instance, by the ONS. This section outlines the methodology in more detail.

#### 4.3 Base population

- 4.3.1 The base year for the population used in the latest forecasts is 2009. The base populations are derived from the RPBIT population model, run forward from an original base year of 2001 to give annual mid-year population estimates for each year since 2001. The original 2001 base is derived from the 2001 Census.
- 4.3.2 The population model is run to produce population estimates in the same way as it is run to produce population forecasts, as detailed below, except that actual births and deaths by age are input instead of forecast ones. Net migration rates are then adjusted until the model generates the estimated mid-year total population of the area concerned. This total estimated population is produced by rolling forward the 2001, census-based, total population on the basis of changes in electoral rolls, numbers of children aged 0-3 (from NHS GP Registrations), changes in school rolls and data on house-building. Changes in the transient population (principally students and members of the Armed Forces) are calculated separately, on the basis of surveys of institutional populations and other data sources.
- 4.3.3 The estimated population by age and sex calculated by the model is then calibrated with other known data, particularly for specific age-groups. The main groups used recently for calibration are 0-4s from the NHS GP Registrations, 4-15s from school rolls, 17+ population based on electoral rolls, older age groups from NHS GP registration data. The estimates produced by the model are further checked by comparing the numbers of households calculated by the model with information on numbers of dwellings completed since 2001.
- 4.3.4 An important feature of the population forecasting model, which is applicable in Peterborough, is the division of the population into two main groups: firstly, the resident or local population and, secondly, the transient population. The population contains a number of groups of significant size that have different characteristics to the rest of the usually resident or local population. People in the transient category include members of the armed forces living in barracks, students living in colleges and boarding schools and people living in places of detention. Armed forces personnel and their families living in married quarters and students living in ordinary households are included with the local, non-transient population. Experience suggests that most of the people in transient categories do not remain in the area

for more than a few years. They therefore do not age forward with the local population through the forecast period but instead are regularly replaced by new people with similar demographic characteristics. Because of this the numbers of people in this transient subgroup are forecast separately and then added to the figures for the resident population produced by the main population forecasts to give overall population totals.

4.3.5 The base population is therefore split between the local population and the transient population. The 2001 base transient population is derived from the 2001 Census. The figures used in 2001 were numbers of people enumerated as "resident" (census definition) in relevant institutions.

#### 4.4 Fertility Assumptions

4.4.1 Births are forecast by applying age-specific fertility rates to the numbers of women of childbearing age in the local population. These age-specific fertility rates provide a basic fertility curve that can be adjusted upward or downward according to forecast changes in agespecific fertility. The numbers of births forecast in any year are therefore dependent on the forecast age-specific fertility rate and on the numbers of women in childbearing age groups. The forecast age-specific fertility rates used in the model are derived from the national series used in the 2008-based ONS population projections. The national age-specific fertility rates are adjusted at local authority level to take account of differences between local and national fertility patterns. The adjustment is done on the basis of a detailed comparison of recent national and local age-specific rates.

#### 4.5 Mortality Assumptions

4.5.1 The process by which deaths are calculated in the model is very similar to that used to calculate births. Deaths are forecast by applying age-specific mortality rates to the number of men and women in the local population. These rates provide a basic pattern of mortality that can be varied according to forecast changes in age- and sex-specific mortality rates. The number of deaths forecast in any one year is therefore a product of the sex and age structure of the population and the death rates being applied to the population in that year. The forecast sex- and age-specific mortality rates used in the model are derived from the national series used in the 2008-based ONS population projections. The national mortality rates are adjusted at local authority level to take account of differences between local and national mortality patterns. The adjustment is done on the basis of a detailed comparison of recent national and local age-specific rates.

#### 4.6 Migration Assumptions

- 4.6.1 Migration is modelled in two stages: firstly, an age and sex structure of in- and out-migrants is determined; secondly, annual totals for the level of net migration are forecast. Net migration is the balance between migration into an area and migration from it. The age and sex structure of migrants gives the probability of migrants being of a particular age and sex. This structure is determined for the base year of the model and then fitted to forecast totals of net migration to produce numbers of migrants into or out of an area by sex and age.
- 4.6.2 The age and sex structure of migrants used in the model is based on that found at the 2001 Census. Adjustments are sometimes made to the age-structures of migrants during the course of running the model to produce annual mid-year estimates. Migration is the only variable in the model that significantly affects the size of many age-groups as they move through the population the child and adult age-groups before the ages at which mortality begins to have a major impact. When calibration with other sources of age-group data, such as school rolls, suggested that too many or too few migrants were being added to or taken out of those age-groups, the age-structure of migration in the model was adjusted to bring changes in the total numbers back in line with trends suggested by the other data sources.

4.6.3 The model operates by holding out-migration constant (at 2001 levels) and adjusting inmigration to give an assumed rate of net migration. In this model run, in-migration is adjusted such that the number of households generated by the model is consistent with the number of dwellings that are expected to be built between 2009 and 2031.

#### 4.7 Reliability

- 4.7.1 Forecasts are only as accurate as the assumptions on which they are based. Assumptions used here about fertility, mortality and migration are based on the best available information, but they are complex factors with countless influences. It is impossible to predict the future; we can only make reasoned guesses based on what we know about the past and the present. The forecasts are continually revised as new assumptions become available. This means that current figures will differ to those published (for the same time frame) in previous years. In some cases differences may be quite considerable due to revised assumptions about the phasing of planned development.
- 4.7.2 Local authority level forecasts rely on dwelling targets being achieved and are therefore subject to the same reliability issues that affect the dwelling stock forecasts (see Section 4.4 below). In general, the forecasts become less reliable the further they project into the future. The total population forecasts will be more reliable than for individual ages and sexes. Users are advised that figures have been rounded to the nearest 100 to avoid a spurious perception of accuracy.

#### 4.8 Dwelling stock forecasts

4.8.1 Dwelling stock forecasts form the basis of the population forecasts. Overall, provision has been made for more than 28,400 additional dwellings to be completed between 2011 and 2031. These include some completions as part of the Great Haddon development.

1: Actual	2: Interim	3: Planned Provision 2011-2031		
completions	building	based on continuation of planned	4: Total	5: Total
2001-2010	2010-2011	average of 1,420 dpa	2001-2031	2010-2031
8,100	700	28,400	37,200	29,300

Table 7: Summary of house-building, 2001-2031

- 4.8.2 Column 1 shows actual house-building completions for the period 2001-2010.
- 4.8.3 Column 2 indicates the anticipated house-building completions for the period 2010-2011 and is taken from PCC's Core Strategy pre-submission document E114 housing trajectory, March 2009.
- 4.8.4 Column 3 shows the planned provision for house-building for the period 2011-2031. It is based on the assumed continuation of the planned average delivery rate for 2006-2021, i.e. 1,420 dwellings per year. In the absence of other official policy targets, this provisional figure for Peterborough is used as a 'rounded target' within the forecasts, and is set at 37,000.
- 4.8.5 Column 4 is the mathematical calculation of total change over the period 2001 2031, this is the source of the 'rounded target'.
- 4.8.6 Column 5 (the sum of columns 2 and 3) shows total forecast house-building from mid-2010 to mid-2031.
- 4.8.7 The timing and location of new housing by ward is determined through the Local Development Framework (LDF). PCC produces annual housing trajectory, detailing the number and phasing of dwellings expected to come forward on individual sites. The

trajectory is has been used to broadly guide the distribution of planned house-building between wards and five-year time-bands.

- 4.8.8 The PCC Core Strategy pre-submission document E114 housing trajectory, March 2009, extends to April 2025 which leaves a 'gap' between 2025 and 2031. For this gap period the total number of dwellings forecast is based on total dwellings 2001-2031 minus dwellings indicated in the Housing Trajectory to 2025. These additional dwellings have been distributed to wards interpreting the Housing Trajectory sites where appropriate and distributing the remainder in line with a continuation of development trends in the previous five year period. It is acknowledged that for this final five year period, the locational distribution can not be interpreted as a true reflection of PCC spatial planning policy, as it does not currently exist for this time period.
- 4.8.9 The trajectory follows financial years, while the RPBIT forecasts reflect the mid-year point. For simplicity, the financial years are assumed to correspond to the nearest mid-year point. In other words, where a trajectory details development expected between April 2010 and March 2011, these are assumed to occur between mid-2010 and mid-2011 in these forecasts.

#### 4.9 Reliability & Local Factors

4.9.1 The PCC and ward-level dwelling stock forecasts present an optimistic view of dwelling stock growth as they assume that all planned dwellings are built according to policy. In terms of planning for the future it is necessary to consider the full implications of policy, even if there are questions as to whether policy can be achieved. The extent to which policy targets are achieved depends on many factors, including market forces and the economy. All development is subject to the development control system; development on designated sites depends on suitable planning applications being received from developers. In addition, "windfall" sites, which have not been allocated for housing growth, can become available.

## MAPS





## Map 2 – Peterborough Wards and Parishes

