Kirklees

Demographic Analysis & Forecasts

Assumptions, Methodology & Scenario Results

September 2014

For the attention of:

Kirklees Council

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Acknowledgements

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1. Introduction

Context & Requirements

Context

1.1 Kirklees Council is in the process of producing its Local Plan. The Local Development Framework (LDF) Core Strategy for Kirklees (now withdrawn) made provision for 22,470 new homes between 2010 and 2028 (1,250 per year). This number was defined on the basis of an 'effective demand' calculation, rather than the forecast scale of household growth suggested by demographic trends.

1.2 The evidence underpinning Kirklees Council's housing requirement has been superseded by new sources of demographic information, including:

- 2011 Census statistics from the Office for National Statistics (ONS).

- Revised mid-year population estimates for the period 2002–2010 (ONS).

- 2011-based household projections from the Department for Communities and Local Government (DCLG).

- 2012 and 2013 mid-year population estimates for Kirklees (ONS).

- The 2012-based sub-national population projection (SNPP) for Kirklees (ONS).

1.3 Government Planning Practice Guidance (PPG) has also been finalised, providing guidelines on the approach to assessing housing need.

Requirements

1.4 Given the situation with regard to the revocation of the RSS, the availability of new demographic information and the likelihood of representations challenging the Local Plan, Kirklees Council has commissioned Edge Analytics to produce an updated suite of population and household forecasts for the borough, using the latest demographic inputs and updated economic assumptions.

Approach

Official Guidelines

1.5　The development and presentation of demographic evidence to support local housing plans is subject to an increasing degree of public scrutiny. The National Planning Policy Framework (NPPF)[1] and Planning Practice Guidance (PPG)[2] provide guidance on the appropriate approach to the objective assessment of housing need.

1.6　These advocate that 'official' statistics should provide a starting point for the evaluation of growth scenarios and that local circumstances, alternative assumptions and the most recent demographic evidence should be considered (PPG paragraphs 2a-015 and 2a-017). Evidence that links demographic change to forecasts of economic growth should also be assessed (PPG paragraph 2a-018).

1.7　The use of demographic models, which enable a range of growth scenarios to be evaluated, is now a key component of the objective assessment process. The POPGROUP suite of demographic models, which is widely used by local authorities and planners across the UK, provides a robust and appropriate forecasting methodology (for further information on POPGROUP, refer to Appendix A).

1.8　The choice of assumptions used within POPGROUP has an important bearing on scenario outcomes. This is particularly the case when 'trend' projections are considered alongside population and household forecasts that are linked directly to anticipated jobs growth. The scrutiny of economic and demographic assumptions is now a critical component of the public inspection process, providing much of the debate around the appropriateness of a particular objective assessment of housing need.

Edge Analytics Approach

1.9　In accordance with the PPG, Edge Analytics has used POPGROUP (v.4) technology to develop a range of growth scenarios for the Borough of Kirklees. As the 'starting point' of this assessment, the 2012-based SNPP for Kirklees is presented, with an analysis of the 'components of population

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[1] http://planningguidance.planningportal.gov.uk/blog/policy/
[2] http://planningguidance.planningportal.gov.uk/blog/guidance/

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change' underlying this new projection. These statistics are compared to previous estimates and to the historical data on births, deaths and migration.

1.10 A number of scenario alternatives have been developed and are compared to the 2012-based SNPP 'benchmark' and the earlier 2010-based SNPP. The scenario alternatives include 'trend' scenarios, based on variant migration assumptions, a 'jobs-led' scenario, driven by a jobs-growth forecast from the Yorkshire and Humber Regional Econometric Model (REM) and additional 'jobs-led' scenarios, underpinned by jobs-growth forecasts provided by Kirklees Council.

1.11 Scenarios have been run from a start year of 2013 to a 2036 horizon, with historical data included for 2001–2013. Scenario results are presented for Kirklees' 2013–2031 plan period, and for the extended forecast period 2013–2036.

1.12 The household growth implications of each scenario have been assessed using assumptions from both the 2008-based and 2011-based household projection models, from the DCLG.

Report Structure

1.13 The report is structured as follows:

- A demographic profile of Kirklees is presented in section 2. This includes an historical perspective on population change in the borough since the 2001 Census, an analysis of the 'components of population change' from the 2012-based SNPP and an indication of the effect of demographic ageing upon Kirklees' population profile.

- In Section 3, the range of scenario alternatives is detailed, with growth outcomes presented in section 4.

- Section 5 concludes with a summary of the analysis, scenario outcomes and issues for Kirklees Council to consider in the development of its Local Plan.

- Appendix A presents an overview of the POPGROUP methodology.

- Appendix B provides detail on the data inputs and assumptions used in the development of the POPGROUP scenarios.

- Appendix C presents scenario outcomes for the extended forecast period, 2013–2036.

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2. Kirklees: Area Profile

Mid-Year Population Estimates

2.1   Between successive Censuses, population estimation is necessary. These mid-year population estimates (MYEs) are derived through estimation of the components of population change (i.e. counts of births and deaths and counts of internal and international migration).

2.2   Following the 2011 Census, the 2002–2010 MYEs were 'rebased' to align them with the new population evidence[3], ensuring the correct transition of the growth and age profile of the population over the 2001–2011 decade. At the 2011 Census, the resident population of Kirklees was 422,458, an 8.6% increase over the 2001–2011 decade. The 2011 Census population total proved to be *higher* than that suggested by the trajectory of growth from the previous MYEs (Figure 1).
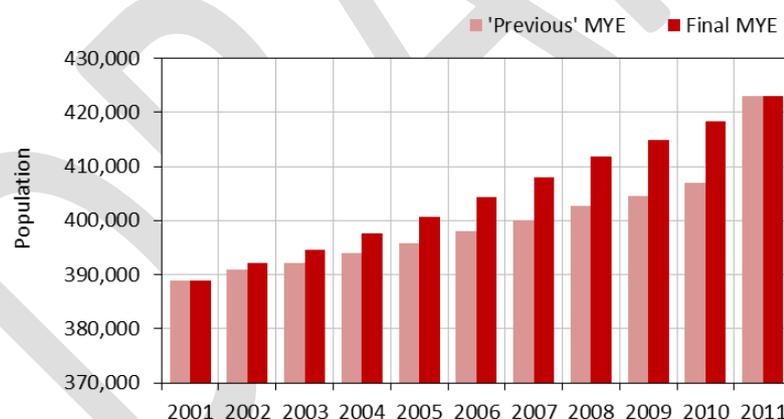

Figure 1: Kirklees – mid-year population estimates (source: ONS).

Components of Population Change

2.3   The rebasing of the MYEs involved the recalibration of the components of population change for 2001/02 to 2010/11.

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[3] Revised Annual Mid-year Population Estimates, 2001 to 2010. ONS, December 2013
http://www.ons.gov.uk/ons/dcp171778_345500.pdf

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2.4 Between Censuses, births and deaths are accurately recorded in vital statistics registers and provide a robust measure of 'natural change' (the difference between births and deaths) in a geographical area. Given that births and deaths are robustly recorded, and assuming that the 2001 Census provided a robust population count, the 'error' in the MYEs is due to the difficulties associated with the estimation of migration.

2.5 Internal migration is adequately measured through the process of GP registration, although data robustness may be lower where there is under-registration in certain age-groups (young males in particular). It is therefore most likely that the 'error' in the previous MYEs was associated with the mis-estimation of international migration, i.e. the balance between immigration and emigration flows to and from Kirklees.

2.6 However, ONS has not explicitly assigned the MYE adjustment to international migration. Instead it has identified an additional 'unattributable population change' (UPC) component, suggesting it has not been able to accurately identify the source of the 2001–2011 'error' (Figure 2).
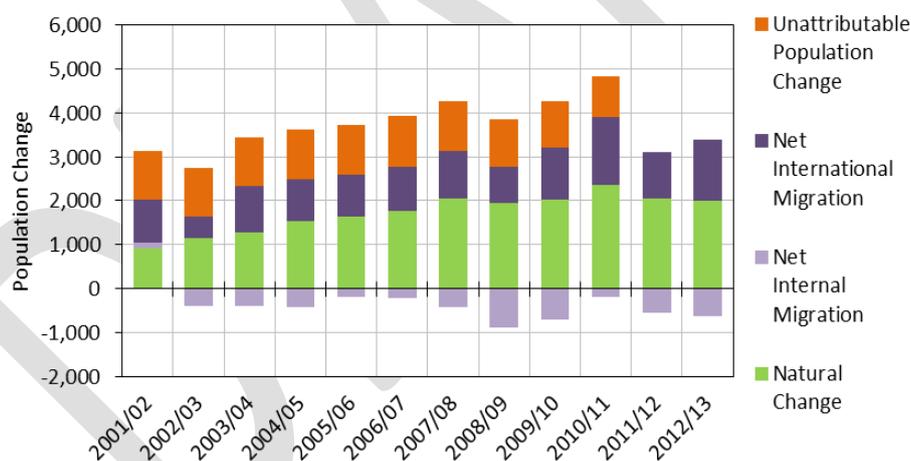
Figure 2: Kirklees – components of population change 2001/02–2012/13 (source: ONS).

Note: No UPC component is applied to the 2011/12 or 2012/13 statistics as these relate to the 2012 and 2013 MYEs, which followed the 2011 Census.

2.7 For demographic analysis, the classification of UPC is unhelpful, but given the robustness of births, deaths and internal migration statistics compared to international migration estimates, it is assumed that it is most likely to be associated with the latter.

2.8 With the assumption that the UPC element is assigned to international migration (for estimates up to 2011) and with the inclusion of statistics from the 2012 and 2013 MYEs (ONS), a twelve-year profile of the 'components of population change' for Kirklees is presented (Figure 3).

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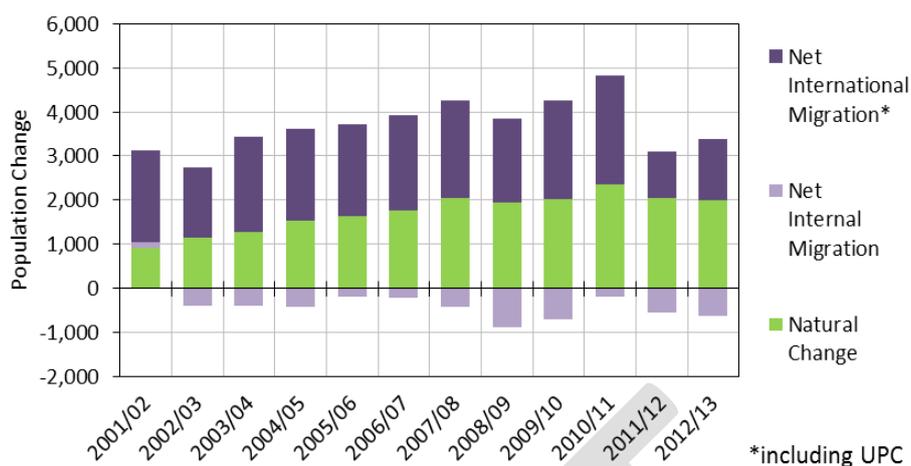
Figure 3: Kirklees – components of population change 2001/02–2012/13, including the UPC component (source: ONS).

2.9   The contribution of natural change to population growth in Kirklees was positive between 2001/02 and 2012/13 (as the number of births exceeded the number of deaths). Growth due to net internal migration was positive in 2001/02, but negative throughout the rest of the historical period. Population growth due to net international migration was positive between 2001/02 and 2012/13.

Official Population Projections

2.10   In the development and analysis of population forecasts, it is important to benchmark any growth alternatives against the latest 'official' population projection. The most recent official sub-national population projection is the 2012-based SNPP, released by the ONS in May 2014[4]. This projection is compared to the earlier ONS population projections for Kirklees, to illustrate the variation in projected growth outcomes for the borough (Figure 4).

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[4] 2012-based SNPP for England, ONS, 29th May 2014 http://www.ons.gov.uk/ons/dcp171778_363912.pdf

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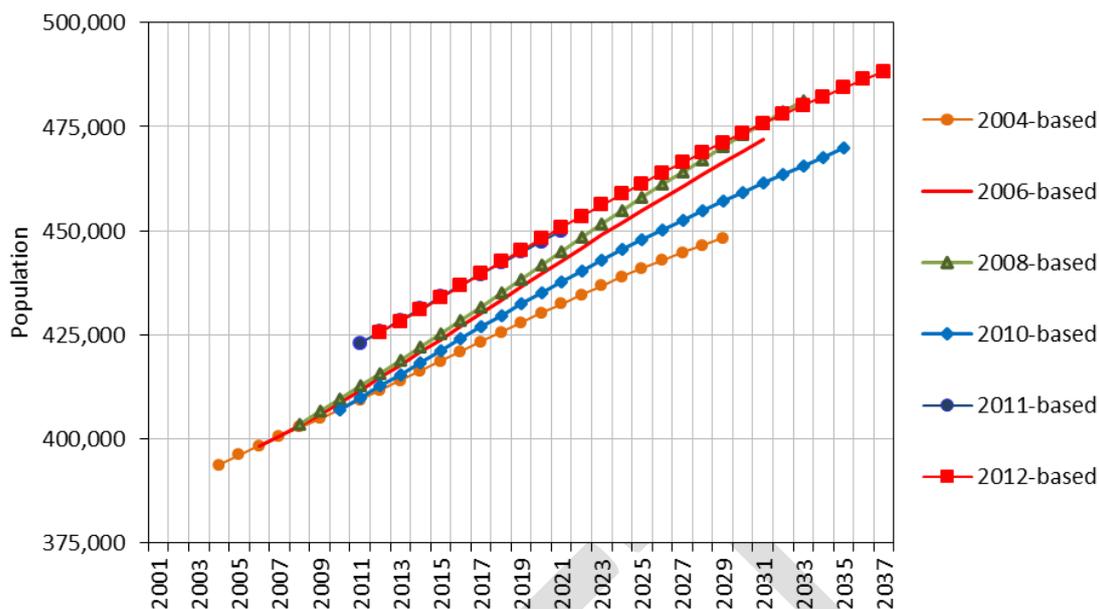
Figure 4: Kirklees – official sub-national population projections (source: ONS).

2.11   The 2012-based SNPP has a lower rate of growth than the earlier official projections (except for the 2004-based SNPP). Under the 2012-based SNPP, the population of Kirklees is projected to increase by 62,804 over the 2012–2037 projection period, a 14.8% increase. Under the 2010-based SNPP, the population was projected to increase by 15.4% over the 25-year projection period (2010–2035).

2.12   The 2012-based SNPP components of population change are presented in Figure 5, with the historical components of change for 2001/02 to 2011/12 included for comparison. The annual average natural change, net migration (internal and international) and population change for the 2012-based SNPP are compared to the historical 5-year and 10-year averages in Table 1.

2.13   Over the 5-year and 10-year historical period, average net internal migration had a negative impact upon population growth. Average net natural change was positive over the 5-year and 10-year historical period (with birth numbers exceeding deaths). Average net international migration was also positive over the historical period. The 2012-based SNPP suggests a continuing decline in net internal migration over the forecast period. It also suggests that natural change and net international migration will continue to have a positive impact upon growth.

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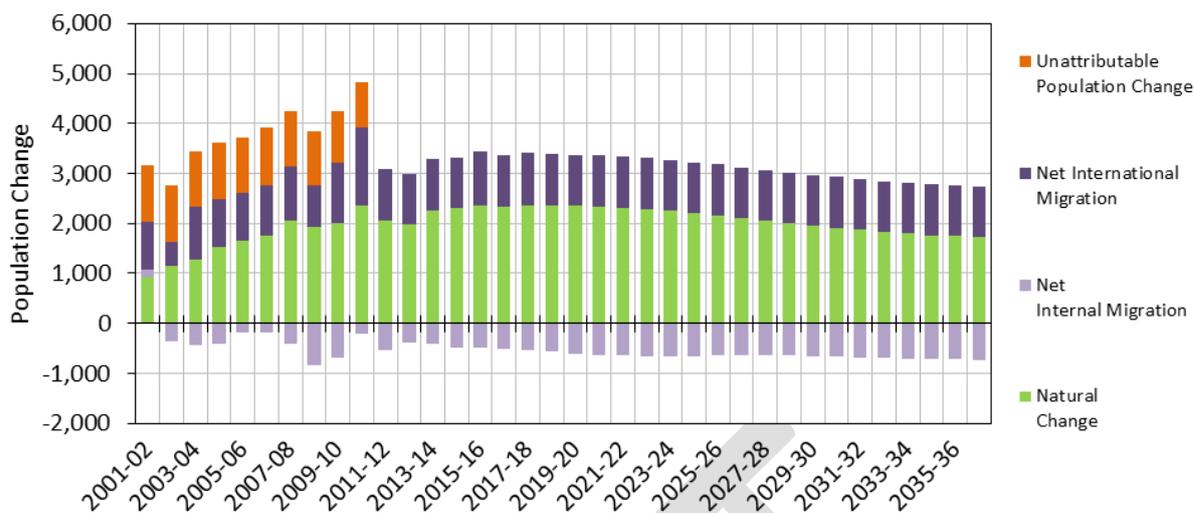
Figure 5: Kirklees – historical and 2012-based SNPP components of change (source: ONS).

Table 1: Kirklees – 2012-based SNPP components comparison (source: ONS)

Component of Change	Historical		Projected
	5-year average (2007/08–2011/12)	10-year average (2002/03–2011/12)	2012-based SNPP average (2012/13–2036/37)
Natural Change	2,083	1,778	2,106
Net Internal Migration	-539	-425	-616
Net International Migration	1,138	1,014	1,023
Unattributable Population Change*	834	980	-
Annual Population Change	3,512	3,341	2,512
Annual Population Change (%)	0.86%	0.85%	0.59%

* UPC is only applicable to the years 2001/02 - 2010/11

Note: In the historical data, annual population includes additional adjustments made by ONS to the final MYE populations.

Population Structure

2.14   The aggregate population change statistics hide the shift in the age profile of Kirklees' population that is projected by the 2012-based SNPP (Figure 6). The gradual ageing of the resident population has implications for the size and structure of the local labour force and on the expected profile of future household formation.

2.15   Summary indicators on population ageing, quantify the importance of the issue in Kirklees relative to the wider regional and national population (Table 2).
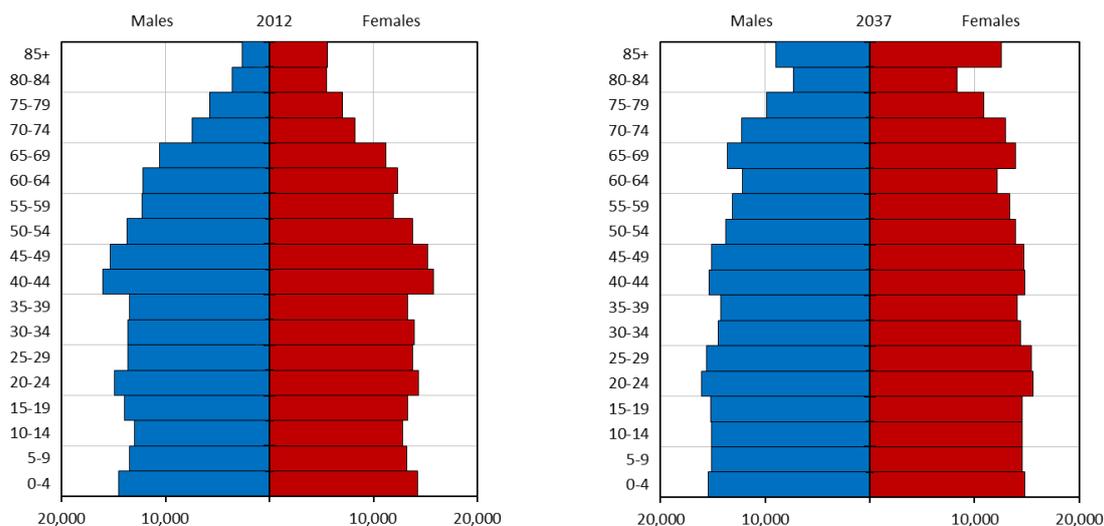
Figure 6: Kirklees – changing age structure, 2012–2037 (source: ONS 2012-based SNPP).

Table 2: Kirklees – indicators of population ageing (source: ONS 2012-based SNPP)

Ageing Indicator	Kirklees		Yorks & Humber		England	
	2012	2037	2012	2037	2012	2037
Percentage aged 65+	16%	23%	17%	24%	17%	24%
Percentage aged 80+	4%	8%	5%	8%	5%	8%
Old Age Dependency (OAD) ratio	24%	38%	26%	41%	26%	41%
Median Age	38.9	40.9	39.9	42.3	39.6	42.6

OAD = The proportion of the population aged 65+ relative to the working-age population 15-64.

Median Age = the age that divides the population into two numerically equal groups

2.16   The local picture largely reflects the regional and national perspective, although Kirklees has a slightly more youthful profile to its population. The percentage of Kirklees' population aged 65+ is projected to increase to 23% by 2037, with the percentage aged 80+ expected to double over the same period. Kirklees' median age is expected to reach almost 41 by 2037. The old age dependency (OAD) ratio, which measures the relationship between the size of the population aged 65+ and the labour force population (aged 15–64), is projected to rise from 24% to 38% over the 25-year horizon.

2.17   These projected shifts in the age structure of Kirklees' population are especially important when considering the relationship between anticipated jobs growth and future demographic change.

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As the large birth cohorts of the 1950s and 1960s move into retirement age, the size and profile of the working population will change, with in-migration being potentially necessary to maintain the labour force to enable jobs growth. Forecasts of future jobs growth in Kirklees need to consider how these new jobs are to be filled: through increased rates of economic participation in the resident labour force; through changes to the existing balance of commuting; or through the in-migration of additional population to counter-balance the ageing of the labour force.

Commuting Balance

2.18   Kirklees' commuting balance has remained unchanged over the 2001-2011 inter-censal period, with the balance between resident workers and employment remaining constant (Table 3).

Table 3: Kirklees – commuting ratio (source: ONS)

		2001 Census[1]	2011 Census[2]
Workers	*a*	174,048	192,397
Jobs	*b*	151,964	166,934
Commuting Ratio	*a/b*	**1.15**	**1.15**

[1] *2001 Census - Table T101 - UK Travel Flows*

[2] *2011 Census - WU02UK - Location of usual residence and place of work by age*

2.19   In 2001, Kirklees had a net out-commute, with the number of resident workers exceeding the number of jobs available. Whilst both the number of jobs and the size of the resident labour force have increased over the decade, the balance between the two has remained unchanged.

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3. Scenario Development

Introduction

3.1   There is no single definitive view on the level of population growth expected in Kirklees; economic, demographic and national/local policy issues will ultimately determine the speed and scale of change. For local planning purposes, it is necessary to evaluate a range of growth alternatives to establish the most 'appropriate' basis for determining future housing provision.

3.2   Edge Analytics has used POPGROUP (v.4) technology to develop a range of scenario alternatives for Kirklees. Ten core scenarios have been produced, including the most recent 'official' population projection from ONS, the 2012-based SNPP. The 2010-based SNPP is also included for comparison. Three alternative 'trend' scenarios have been developed, together with five 'jobs-led' scenarios, in which population growth is linked to jobs-growth forecasts.

3.3   In each of the core scenarios, 2011 Census economic activity rates have been applied (adjusted to account for changes to the State Pension Age), the unemployment rate has been incrementally reduced to account for economic recovery following the recession and a fixed 2011 commuting ratio has been applied.

3.4   Additional 'jobs-led' sensitivity scenarios have been produced to evaluate how changes to Kirklees' unemployment rate and its overall rate of economic activity might influence dwelling-growth outcomes.

3.5   For all scenarios sensitivity testing has been conducted to examine the impact of varying the rates of household formation on dwelling growth outcomes, using headship rates from both the 2011-based and the 2008-based DCLG household models.

3.6   In the following sections, the ten core scenarios and the five 'jobs-led' sensitivity scenarios are described and the broad assumptions specified. For detail on the POPGROUP methodology, refer to Appendix A. For detail on the household, dwelling and economic assumptions underpinning the scenarios, refer to Appendix B.

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Core Scenario Definition

Official Projections

3.7 In accordance with the PPG, the scenario alternatives are 'benchmarked' against the most recent (2012-based) official population projection for Kirklees, released by the ONS in May 2014. The **'SNPP-2012'** scenario presented here replicates this official population projection.

3.8 The **'SNPP-2010'** scenario, which replicates the ONS 2010-based SNPP for Kirklees, is included for comparison. In this scenario, the population is re-scaled to the 2012 MYE to ensure consistency with the 'SNPP-2012' scenario, with the 2010-based growth trajectory continued thereafter.

Alternative 'Trend' Scenarios

3.9 A five year historical period is a typical time-frame from which internal migration 'trend' assumptions are derived (this is consistent with the ONS official methodology). Given the unprecedented economic change that has occurred since 2008, and the differences between the historical migration data and the 2012-based SNPP projection assumptions (Table 1), it is important to give due consideration to an extended historical time period for assumption derivation.

3.10 Three alternative 'trend' scenarios have therefore been developed, based upon the latest demographic evidence:

- **'PG-5yr'**: internal migration rates and international migration flow assumptions are based on the last five years of historical evidence (2008/09 to 2012/13) with the UPC adjustment included within the international migration assumptions.

- **'PG-10yr'**: internal migration rates and international migration flow assumptions are based on the last 10 years of historical evidence (2003/04 to 2012/13) with the UPC adjustment included within the international migration assumptions.

- **'Natural Change'**: internal and international migration flows are set to zero. This provides an indication of the degree to which future population and household growth is driven solely by natural change (i.e. the balance between births and deaths).

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'Jobs-led' Scenarios

3.11   In a 'jobs-led' scenario, population growth is linked directly to the change in the number of jobs available within an area. POPGROUP evaluates the impact of a jobs growth trajectory by measuring the relationship between the number of jobs in an area, the size of the labour force and the size of the resident population. Migration is used to balance the relationship between the size of the labour force and the forecast number of jobs. A higher level of net in-migration will occur if there is insufficient population and resident labour force to meet the forecast number of jobs. A higher level of net out-migration will occur if the population is too high relative to the number of jobs.

3.12   The following 'jobs-led' scenarios have been produced:

- **'Jobs-led REM'**: population growth is linked to the annual change in 'full time equivalent' (FTE) jobs for the period 2013—2031, as specified in the Yorkshire and Humber REM (939 additional jobs per year). The REM is a regional econometric model, providing employment forecasts for Leeds City Region and the individual districts within it.

- **'Jobs-led A - Trend Employment Rate'**: population growth is linked to jobs growth of 10,375 for the period 2013—2031 (equivalent to 576 additional jobs per year). This level of job growth would result from a continuation of the 2001—2011 trend in the employment rate, i.e. the number of Kirklees residents in work as a percentage of the total potential labour force.

- **'Jobs-led B - 75% Employment Rate'**: population growth is linked to jobs growth of 18,262 for the period 2013—2031 (equivalent to 1,015 additional jobs per year). Attainment of this rate is an objective of the Kirklees economic strategy.

- **'Jobs-led C - REM + Kirklees Economic Strategy'**: population growth is linked to jobs growth of 22,125 for the period 2013—2031 (equivalent to 1,229 additional jobs per year). This level of job growth represents the intended outcome of the Kirklees economic strategy.

- **'Jobs-led D - 80% Employment Rate'**: population growth is linked to jobs growth of 27,651 for the period 2013—2031 (equivalent to 1,536 additional jobs per year). Attainment of this rate was an objective of the withdrawn Kirklees LDF core strategy.

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3.13 In the 'Jobs-led REM' scenario, the annual change in FTE jobs numbers is provided by the Yorkshire and Humber REM (Figure 7). In the other 'jobs-led' scenarios, the annual change in jobs numbers has been provided by Kirklees Council. In all cases, the forecast change in jobs for 2013/14 to 2030/31 has been rolled forward to 2035/36 to provide an estimate of jobs growth for the extended forecast period (2013–2036).
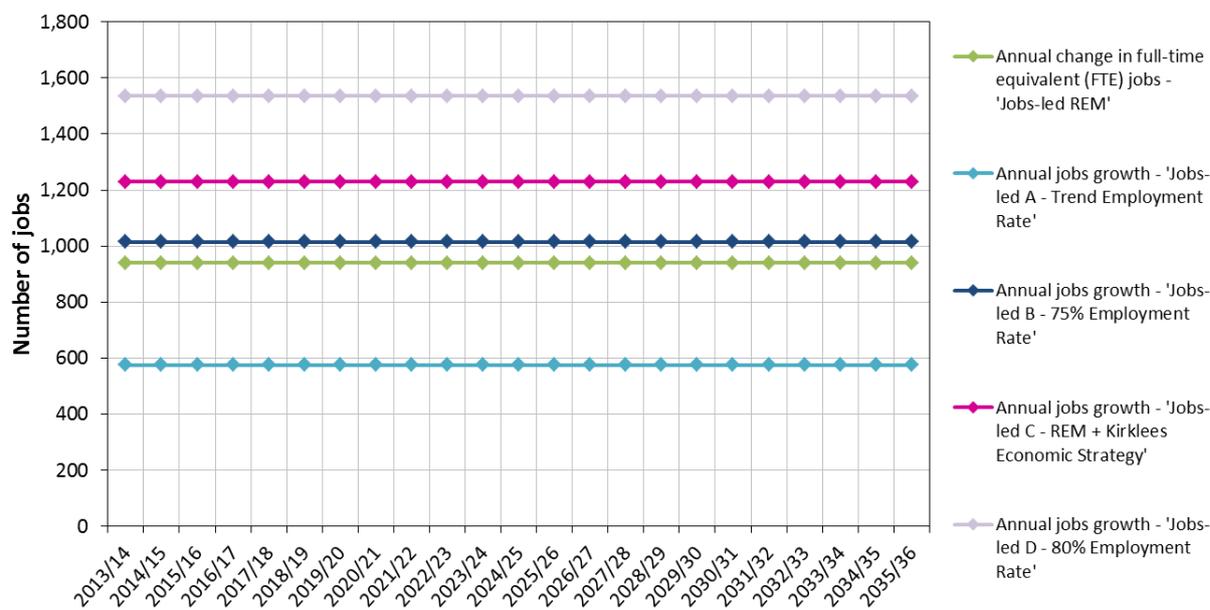
Figure 7: Kirklees – annual change in jobs numbers, from the Yorkshire and Humber REM and Kirklees Council.

3.14 Three key data inputs are required to run a 'jobs-led' scenario and link jobs growth to population change; economic activity rates by age and gender for each year of the forecast period; a corresponding unemployment rate to estimate the portion of the labour force that remains out of work; and a commuting ratio, which estimates the balance between the number of jobs available and the size of the resident labour force.

3.15 In the core scenarios, economic activity rates (from the 2011 Census) by 5-year age group and sex are applied. Uplifts to economic activity rates have been applied to the 60–69 age groups (for both men and women) to account for changes to the State Pension Age (SPA). To account for economic recovery following the recession the unemployment rate is incrementally reduced from a 'recession' unemployment rate average of 8.1% to a 'pre-recession' unemployment rate average of 4.5% (by 2020). A commuting ratio of 1.15 is applied, derived from 2011 Census Travel-to-Work statistics. This ratio, indicating a net out-commute, is fixed throughout the forecast period. More detail on these items is provided in Appendix B.

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Sensitivity Scenario Definition

3.16   In the five 'jobs-led' scenarios, population growth is determined by a defined jobs-growth trajectory using key assumptions on economic activity, unemployment and commuting to evaluate the potential impact upon population change. Given the potential scale of the population and dwelling growth implied by the 'jobs-led' scenarios, it is important to consider the sensitivity of these outcomes to changes in the key assumptions on economic activity and unemployment.

3.17   Five further 'jobs-led' sensitivity scenarios have been produced, in which the overall economic activity rate for the 16—74 age range is maintained at its base-year level (68%) to the end of the forecast period. In the core 'jobs-led' scenarios the overall economic activity rate for the 16—74 age range declines from 68% to approximately 66%, despite the adjustments made in the older age groups to account for changes to the SPA.

3.18   In addition, the borough's unemployment rate is allowed to fall to 4.0% by 2020. These changes to the base assumptions have the combined effect of maintaining a larger local labour force over the forecast period, thus reducing the in-migration requirement of the implied jobs growth.

3.19   In each of these sensitivity scenarios, the commuting ratio remains unchanged at 1.15. A reduction in this ratio over the forecast period would imply a smaller net outflow of commuters and would therefore also reduce the in-migration requirement of the implied jobs growth.

Household & Dwelling Growth

3.20   In each of the core and sensitivity scenarios, the implied number of households is derived using household headship rates, from both the 2008-based and 2011-based DCLG household models. This is in recognition of the uncertainty associated with future rates of household formation, given economic and demographic conditions.

3.21   The 2011-based headship rates were calibrated after a period of unprecedented economic change and stagnation in the housing market and thus suggest a lower rate of household formation than the previous 2008-based rates, which were calibrated from data collected in a time period with very different market characteristics. Assessing the household growth

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implications of a population projection using solely the 2011-based headship rates can be criticised as being overly dependent upon a period where household formation rates were supressed. Conversely, exclusive use of the 2008-based headship rates can be criticised as being influenced by rates of household formation associated with pre-recessionary conditions that are unlikely to be repeated in the immediate future.

3.22   The 2011-based headship rates and the 2008-based headship rates are therefore applied to each scenario, producing 'Option A' and 'Option B' outcomes:

- In 'Option A', the DCLG 2011-based headship rates are applied, with the 2011–2021 trend continued after 2021.

- In the 'Option B' alternative, the DCLG 2008-based headship rates are applied, scaled to be consistent with the 2011 DCLG household total, but following the original trend thereafter.

3.23   This approach presents a 'range' of household growth outcomes for each population forecast. The dwelling growth implications of these different household growth trajectories are then assessed through the application of a 'vacancy rate' (refer to Appendix B for further information). The 'Option A' and 'Option B' dwelling requirements are then averaged to provide an annual dwelling requirement for each scenario.

Scenario Summary

In summary, ten core scenarios have been produced for the Borough of Kirklees under three scenario types; 'official' projections, alternative 'trend' scenarios and a 'jobs-led' scenario. Five further 'jobs-led' sensitivity scenarios have also been produced (Table 4).

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Table 4: Kirklees – Edge Analytics scenario definition

Type	Name	Description
		Core scenarios
'Official' projections	**'SNPP-2012'**	This scenario mirrors the 2012-based SNPP from the ONS. This is the official 'benchmark' scenario.
	'SNPP-2010'	This scenario mirrors the 2010-based SNPP from the ONS. The population is re-scaled to the 2012 mid-year population estimate (MYE) to ensure consistency with the SNPP-2012 scenario, with the 2010-based growth trajectory continued thereafter.
Alternative 'trend' scenarios	**'Natural Change'**	In- and out- migration flows are set to zero.
	'PG-5yr'	Internal and international migration assumptions are based on the last five years of historical evidence (2008/09 to 2012/13).
	'PG-10yr'	Internal and international migration assumptions are based on the last 10 years of historical evidence (2003/04 to 2012/13).
'Jobs-led' scenarios	**'Jobs-led REM'**	In the 'Jobs-led REM' scenario, population growth is determined by the annual change in the number of full time equivalent (FTE) jobs, as defined in the Yorkshire and Humber REM.
	'Jobs-led A - Trend Employment Rate'	In the alternative 'jobs-led' scenarios, population growth is linked to annual jobs growth of: (A) 576; (B) 1,015; (C) 1,229; (D) 1,536.
	'Jobs-led B - 75% Employment Rate'	Economic activity rates from the 2011 Census are applied, with uplifts applied in the 60–69 age groups to account for changes to state pension age.
	'Jobs-led C - REM + Kirklees Economic Strategy'	
	'Jobs-led D - 80% Employment Rate'	The unemployment rate is incrementally reduced from 8.1% to 4.5% (2013—2020). A fixed 2011 commuting ratio of 1.15 is applied.
		Sensitivity scenarios
'Jobs-led' sensitivity scenarios	**'Jobs-led REM - SENS1'**	
	'Jobs-led A - Trend Employment Rate - SENS1'	Population growth is linked to the same annual jobs growth trajectory as the equivalent core 'jobs-led' scenarios.
	'Jobs-led B - 75% Employment Rate - SENS1'	The economic activity rate for the labour force (aged 16–74) is maintained at its base-year level (68%).
	'Jobs-led C - REM + Kirklees Economic Strategy - SENS1'	The unemployment rate is incrementally reduced from 8.1% to 4.0% (2013—2020).
	'Jobs-led D - 80% Employment Rate - SENS1'	Commuting ratio assumptions are consistent with the core scenarios.

Note: Refer to Appendix B for further information on the scenario data inputs and assumptions

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4. Scenario Outcomes

Introduction

4.1 Ten core scenarios have been developed for the Borough of Kirklees using POPGROUP technology. A summary of the results for each scenario is provided in a chart (Figure 8) and tables (Table 5 and Table 6). The chart illustrates the trajectory of population change resulting from each scenario. The tables are presented under an 'Option A' and 'Option B' alternative:

- In 'Option A', the DCLG 2011-based headship rates have been applied, with the 2011–2021 trend continued after 2021.

- In the 'Option B' alternative, the DCLG 2008-based headship rates have been applied, scaled to be consistent with the 2011 DCLG household total, but following the original trend thereafter.

4.2 The tables summarise the changes in population and household numbers from 2013–2031 that result from each scenario. The scenarios are ranked (high to low) according to the expected population growth over the period. The tables also show the estimated average annual net migration (internal and international) associated with the population change, the average annual dwelling requirement and the average annual jobs growth that is implied.

4.3 Note that under the 'Option A' and 'Option B' alternatives, population growth, net migration and the annual average increase in the number of jobs and labour force are the same. Only the household and dwelling numbers are different, reflecting the two alternative approaches to assessing household growth.

4.4 Scenario results for the period 2013–2036 are presented in Appendix C.

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*Kirklees: Core Scenario Outcomes (2013—2031)*
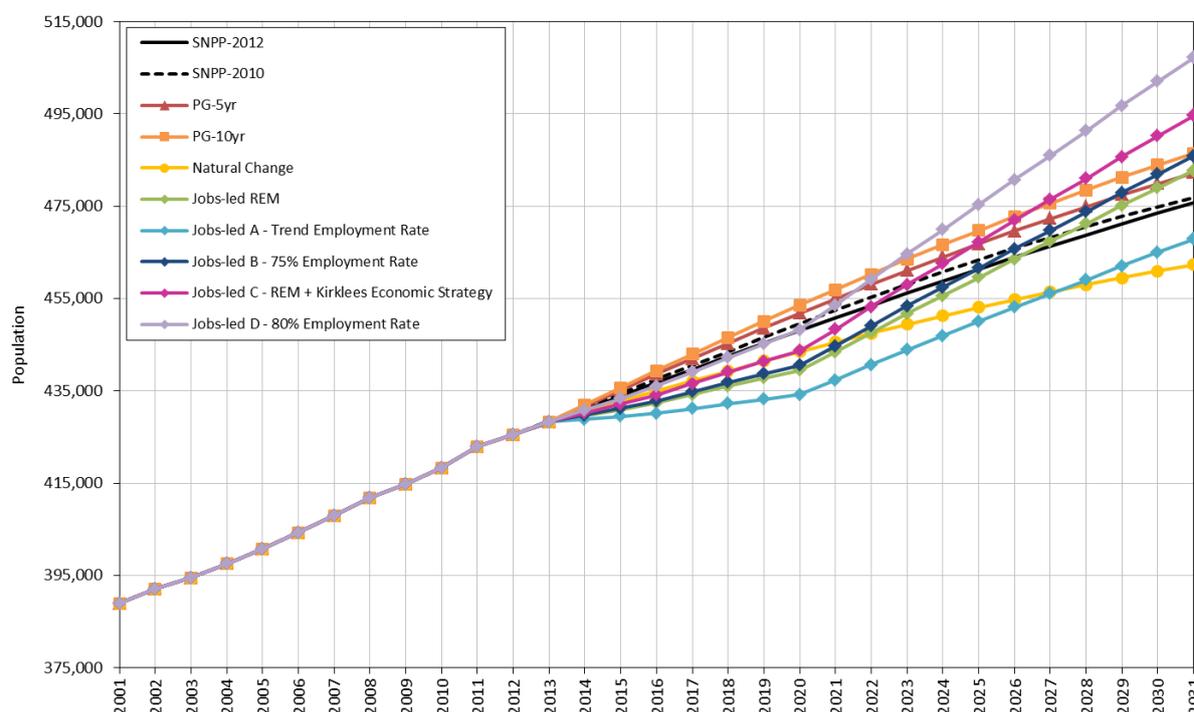
Figure 8: Kirklees – scenario outcomes: population growth 2001–2031

Table 5: Kirklees – 'Option A' scenario outcomes 2013–2031

Rank	Scenario	Change 2013 - 2031				Average per year		
		Population Change	Population Change %	Households Change	Households Change %	Net Migration	Dwellings	Jobs
1	Jobs-led D - 80% Employment Rate (A)	78,929	18.4%	32,827	18.6%	1,995	1,903	1,536
2	Jobs-led C - REM + Kirklees Economic Strategy (A)	66,348	15.5%	28,243	16.0%	1,409	1,638	1,229
3	PG-10yr (A)	58,203	13.6%	28,619	16.2%	1,043	1,659	1,070
4	Jobs-led B - 75% Employment Rate (A)	57,576	13.4%	25,044	14.2%	1,000	1,452	1,015
5	Jobs-led REM (A)	54,460	12.7%	23,908	13.6%	855	1,386	939
6	PG-5yr (A)	53,996	12.6%	27,036	15.3%	890	1,568	934
7	SNPP-2010 (A)	48,462	11.3%	21,936	12.5%	406	1,272	889
8	SNPP-2012 (A)	47,617	11.1%	21,835	12.4%	427	1,266	742
9	Jobs-led A - Trend Employment Rate (A)	39,573	9.2%	18,474	10.5%	160	1,071	576
10	Natural Change (A)	34,051	8.0%	19,051	10.8%	0	1,105	360

Table 6: Kirklees – 'Option B' scenario outcomes 2013–2031

Rank	Scenario	Change 2013 - 2031				Average per year		
		Population Change	Population Change %	Households Change	Households Change %	Net Migration	Dwellings	Jobs
1	Jobs-led D - 80% Employment Rate (B)	78,929	18.4%	40,329	22.8%	1,995	2,338	1,536
2	Jobs-led C - REM + Kirklees Economic Strategy (B)	66,348	15.5%	35,525	20.1%	1,409	2,060	1,229
3	PG-10yr (B)	58,203	13.6%	35,321	20.0%	1,043	2,048	1,070
4	Jobs-led B - 75% Employment Rate (B)	57,576	13.4%	32,173	18.2%	1,000	1,866	1,015
5	Jobs-led REM (B)	54,460	12.7%	30,983	17.6%	855	1,796	939
6	PG-5yr (B)	53,996	12.6%	33,603	19.0%	890	1,948	934
7	SNPP-2010 (B)	48,462	11.3%	28,413	16.1%	406	1,647	889
8	SNPP-2012 (B)	47,617	11.1%	28,572	16.2%	427	1,657	742
9	Jobs-led A - Trend Employment Rate (B)	39,573	9.2%	25,289	14.3%	160	1,466	576
10	Natural Change (B)	34,051	8.0%	25,478	14.4%	0	1,477	360

Note: 'Net Migration' refers to the combined impact of internal and international migration.

Note: 'Jobs' refers to the number of jobs required to meet the 'need' of the growing population, except in the 'jobs-led' scenarios, where population growth is determined by a specified jobs 'target'.

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Core Scenario Outcomes

4.5   Population growth ranges from 8.0% under the 'Natural Change' scenario to 18.4% under the 'Jobs-led D - 80% Employment Rate' scenario. These population growth figures result in a range of dwelling requirements, from 1,105–1,903 dwellings per year under 'Option A' (using the 2011-based headship rates) to 1,477–2,338 under 'Option B' (using the 2008-based headship rates).

Official Projections & 'Trend' Scenarios

4.6   Population growth under the 'SNPP-2012' scenario (11.1%) is lower than under the previous official projection, the 'SNPP-2010' (11.3%). The 'SNPP-2012' scenario results in an annual average dwelling requirement of 1,266 dwellings per year under 'Option A' (using the 2011-based headship rates) and 1,657 dwellings per year under 'Option B' (using the 2008-based headship rates). Under the 'SNPP-2010' scenario, the dwelling requirement is higher, ranging from 1,272–1,647 dwellings per year.

4.7   The 'Natural Change' scenario, in which net migration is set to zero for each year of the forecast period, results in 8.0% population growth, driven solely by the balance between births and deaths. The 'Natural Change' scenario provides an important indication of the dwelling growth expectation in the absence of migration, with a range from 1,105–1,477 dwellings per year resulting from the 'A' and 'B' headship rate alternatives.

4.8   The 'PG' scenarios provide alternative 'trend' scenarios. They incorporate fertility and mortality assumptions that are consistent with the 'SNPP-2012' but differ in their calibration of future migration assumptions. For internal migration, both a five-year ('PG-5yr') and a ten-year ('PG-10yr') history is used to calibrate migration assumptions, compared to the five years typically used in the 'SNPP-2012'. In addition, the PG scenarios use the latest, 2013 MYE in the calibration process, an additional year of historical evidence compared to the 'SNPP-2012'.

4.9   With regard to future international migration assumptions, the PG scenarios consider both a five-year and a ten-year perspective, plus they also incorporate the UPC adjustment to the international migration estimates. ONS' treatment of international migration and UPC in the 'SNPP-2012' is not sufficiently transparent to enable definitive commentary to be provided. However, a five-year history is typically used for calibration of assumptions but this is scaled to

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ensure that the aggregate long-term assumption on international migration for England, in total, is achieved.

4.10 Significantly, the 2012-based SNPP for England has assumed a lower rate of long-term growth due to international migration than has been recorded in the last five or ten years, even without the UPC adjustment.

4.11 With the inclusion of UPC within the international migration assumption, both the 'PG-5yr' and 'PG-10yr' scenarios suggest growth in excess of the 'SNPP-2012'. The 'PG-5yr' estimates dwelling growth at 1,568–1,948 per year; the 'PG-10yr', at 1,659–2,048 per year.

'Jobs-led' Scenarios

4.12 Under the 'Jobs-led REM' scenario, population growth is driven by the increase in the number of FTE jobs, as defined in the Yorkshire and Humber REM (939 additional jobs per year). The annual change in jobs numbers associated with the other 'jobs-led' scenarios has been provided by Kirklees Council.

4.13 Each of these 'jobs-led' scenarios includes economic activity rate assumptions that take account of SPA changes, an unemployment rate that reduces to a pre-recession average and a commuting ratio that remains fixed at its 2011 level (see Appendix B).

4.14 The 'Jobs-led REM' scenario results in population growth of 12.7%. The other 'jobs-led' scenarios suggest population growth ranging from 9.2% ('Jobs-led A - Trend Employment Rate') to 18.4% ('Jobs-led D - 80% Employment Rate'). In all cases, net in-migration is necessary to balance the jobs growth target against the slower rate of growth in the estimated size of the resident labour force.

4.15 The dwelling growth requirement associated with the 'Jobs-led REM' scenario is estimated at 1,386—1,796 dwellings per year. For the 'Jobs-led A - Trend Employment Rate' scenario, the dwelling growth requirement is estimated at 1,071—1,466 per year. Estimated dwelling growth associated with the 'Jobs-led D - 80% Employment Rate' scenario is 1,903—2,338 per year.

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Sensitivity Scenario Outcomes

4.16 Given the scale of the population and dwelling growth implied by the 'jobs-led' scenarios, it is important to consider the sensitivity of these outcomes to changes in the key assumptions on unemployment and economic activity.

4.17 Five 'jobs-led' sensitivity ('SENS1') scenarios have been produced with 'Option A' and 'Option B' dwelling requirements presented for each, together with an average of the two (Table 7). Each of these sensitivity scenarios maintains a higher overall economic activity rate (relative to the equivalent core scenarios) and includes a further small reduction in the unemployment rate (Table 7).

4.18 Under the 'jobs-led' core scenarios, the average annual dwelling requirement ranges from 1,269 dwellings per year ('Jobs-led A - Trend Employment Rate') to 2,121 dwellings per year ('Jobs-led D - 80% Employment Rate'). This range reduces to 999—1,839 dwellings per year under the equivalent jobs-led sensitivity ('SENS1') scenarios (Table 7).

4.19 The alternative economic activity and unemployment assumptions serve to maintain a larger local labour force, with a larger number of people living and working in Kirklees. This reduces the need for additional net in-migration (to satisfy the jobs-growth target), thereby reducing population growth and the overall dwelling requirement.

Table 7: Kirklees – 'jobs-led' sensitivity scenarios: dwelling outcomes.

	Rank	'Jobs-led' scenario	Average annual dwelling requirement (2013–2031)		
			Option A	Option B	Average
Core	1	Jobs-led D - 80% Employment Rate	1,903	2,338	2,121
	2	Jobs-led C - REM + Kirklees Economic Strategy	1,638	2,060	1,849
	3	Jobs-led B - 75% Employment Rate	1,452	1,866	1,659
	4	Jobs-led REM	1,386	1,796	1,591
	5	Jobs-led A - Trend Employment Rate	1,071	1,466	1,269
Sensitivity	1	Jobs-led D - 80% Employment Rate - SENS1	1,629	2,049	1,839
	2	Jobs-led C - REM + Kirklees Economic Strategy - SENS1	1,367	1,775	1,571
	3	Jobs-led B - 75% Employment Rate - SENS1	1,184	1,583	1,384
	4	Jobs-led REM - SENS1	1,119	1,515	1,317
	5	Jobs-led A - Trend Employment Rate - SENS1	808	1,190	999

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5. Summary

Requirements & Approach

5.1 Kirklees Council has commissioned Edge Analytics to produce an updated suite of population and household forecasts for the Borough of Kirklees, using the latest demographic inputs and updated economic assumptions.

5.2 Edge Analytics has produced a range of scenarios using POPGROUP (v.4) technology, including the latest 'official' population projection from the ONS, the 2012-based SNPP. Alternative 'trend' scenarios have also been developed, together with 'jobs-led' scenarios, in which population growth is determined by jobs-growth forecasts for the borough.

5.3 In the core scenarios, 2011 Census economic activity rates have been applied, with adjustments made in the older age groups to account for changes to the SPA. The unemployment rate has been incrementally reduced to account for economic recovery following the recession and a fixed (2011 Census) commuting ratio has been applied. Sensitivities around these assumptions have been tested to evaluate the potential impact of the maintenance of higher rates of employment in the 16—74 labour force age-groups.

5.4 In all scenarios (core and sensitivity), household growth has been assessed using household formation rates from both the 2011-based and the 2008-based DCLG household models. Outputs for each scenario have been presented under an 'Option A' and 'Option B' alternative, the 2011-based and 2008-based headship rates respectively.

Scenario Outcomes

5.5 A summary of the annual average dwelling requirement for each of the scenarios (core and sensitivity) is presented (Table 8) with the 'Option A' and 'Option B' outcomes for each scenario expressed as an average. This produces a dwelling requirement range of 999 dwellings per year under the 'Jobs-led A - Trend Employment Rate - SENS1' scenario to 2,121 under the 'Jobs-led D -

80% Employment Rate' scenario. Equivalent scenario results for the period 2013–2036 are presented in Appendix C.

Table 8: Kirklees – scenario dwelling requirement summary (2013—2031)

Rank	Scenario	Average annual dwelling requirement (2013–2031)		
		Option A	Option B	Average
1	Jobs-led D - 80% Employment Rate	1,903	2,338	2,121
2	PG-10yr	1,659	2,048	1,854
3	Jobs-led C - REM + Kirklees Economic Strategy	1,638	2,060	1,849
4	Jobs-led D - 80% Employment Rate - SENS1	1,629	2,049	1,839
5	PG-5yr	1,568	1,948	1,758
6	Jobs-led B - 75% Employment Rate	1,452	1,866	1,659
7	Jobs-led REM	1,386	1,796	1,591
8	Jobs-led C - REM + Kirklees Economic Strategy - SENS1	1,367	1,775	1,571
9	SNPP-2012	1,266	1,657	1,461
10	SNPP-2010	1,272	1,647	1,460
11	Jobs-led B - 75% Employment Rate - SENS1	1,184	1,583	1,384
12	Jobs-led REM - SENS1	1,119	1,515	1,317
13	Natural Change	1,105	1,477	1,291
14	Jobs-led A - Trend Employment Rate	1,071	1,466	1,269
15	Jobs-led A - Trend Employment Rate - SENS1	808	1,190	999

Note: 'Option A' shows the dwelling requirement derived using the 2011-based headship rates; 'Option B' using the 2008-based headship rates. Scenarios are ranked in order of the average dwelling requirement.

Issues for Consideration

5.6 This report provides a suite of demographic growth scenarios for Kirklees Council to consider as it formulates the housing growth requirements of its Local Plan. When considering the average of the 'Option A' and 'Option B' outcomes, all of the core scenarios suggest a dwelling growth requirement that exceeds the (now withdrawn) LDF Core Strategy provision of 1,250 new homes per year to 2028.

5.7 Whilst the 'SNPP-2012' scenario provides the suggested starting point for the objective assessment of housing need, the alternative 'trend' outcomes of the 'PG-5yr' and 'PG-10yr' scenarios indicate the extent of growth associated with much higher international migration assumptions. These assumptions result from the inclusion of the pre-Census UPC adjustment within the historical international migration. These scenarios reflect a continuation of the 'trend'

in population growth since 2007, but there remains considerable uncertainty with regard to the nature of the UPC adjustment that has been made, plus the ONS long-term 'national' assumption is for a lower, aggregate level of net immigration in the future.

5.8 The five alternative jobs-growth forecasts suggest a range of potential dwelling growth outcomes. Assumptions on economic activity and unemployment are key to the determination of these dwelling numbers, so Kirklees Council should consider the 'sensitivities', which maintain the aggregate economic activity rate at its base-year level, as realistic alternatives.

5.9 In addition, Kirklees Council should recognise that changes to the borough's commuting balance could alter the dwelling growth outcomes implied by the 'jobs-led' scenarios. For example, a gradual reduction in the net outflow of commuters could further reduce the dwelling requirement associated with the jobs growth forecasts.

5.10 Finally, DCLG intends to release a 2012-based household model for English local authorities in autumn 2014. The implications of these new data and assumptions upon the household and dwelling growth outcomes presented here will need to form part of the housing requirements evidence.

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Appendix A
POPGROUP Methodology

Forecasting Methodology

A.1 Evidence is often challenged on the basis of the appropriateness of the methodology that has been employed to develop growth forecasts. The use of a recognised forecasting product which incorporates an industry-standard methodology (a cohort component model) removes this obstacle and enables a focus on assumptions and output, rather than methods.

A.2 Demographic forecasts have been developed using the POPGROUP suite of products. POPGROUP is a family of demographic models that enables forecasts to be derived for population, households and the labour force, for areas and social groups. The main POPGROUP model (Figure 9) is a cohort component model, which enables the development of population forecasts based on births, deaths and migration inputs and assumptions.

A.3 The Derived Forecast (DF) model (Figure 10) sits alongside the population model, providing a headship rate model for household projections and an economic activity rate model for labour-force projections.

A.4 The latest development in the POPGROUP suite of demographic models is POPGROUP v.4, which was released in January 2014. A number of changes have been made to the POPGROUP model to improve its operation and to ensure greater consistency with ONS forecasting methods.

A.5 The most significant methodological change relates to the handling of internal migration in the POPGROUP forecasting model. The level of internal in-migration to an area is now calculated as a rate of migration relative to a defined 'reference population' (by default the UK population), rather than as a rate of migration relative to the population of the area itself (as in POPGROUP v3.1). This approach ensures a closer alignment with the 'multi-regional' approach to modelling migration that is used by ONS.

A.6 For detail on the POPGROUP methodology, please refer to the POPGROUP (v.4) user manual, which can be found at the POPGROUP website: http://www.ccsr.ac.uk/popgroup/index.html

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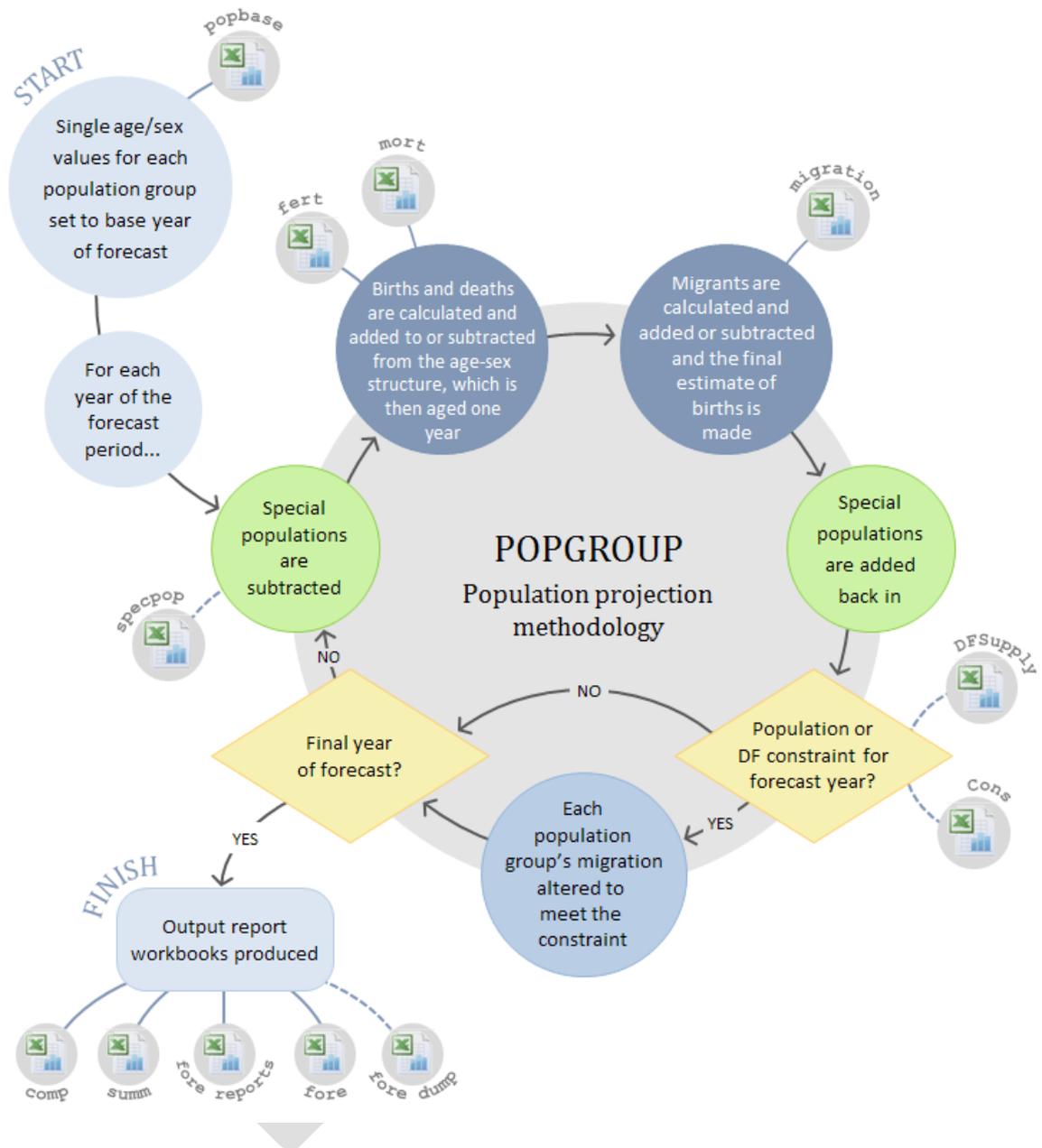
Figure 9: POPGROUP population projection methodology.
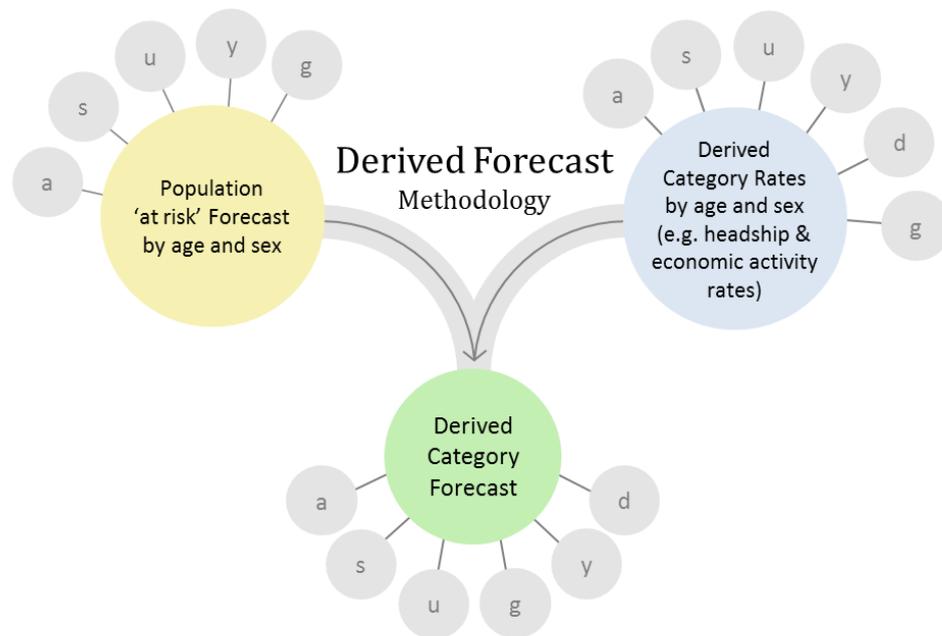
$$D_{a,s,u,y,d,g} = \frac{P_{a,s,u,y,g} \ R_{a,s,u,y,d,g}}{100}$$

D Derived Category Forecast
P Population 'at risk' Forecast
R Derived Category Rates
a Age-group
s Sex
u Sub-population
y Year
d Derived category
g Group (usually an area, but can be
      an ethnic group or social group)

Figure 10: Derived Forecast (DF) methodology

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Appendix B
Data Inputs & Assumptions

Introduction

B.1   Edge Analytics has developed a suite of demographic scenarios for the Borough of Kirklees using POPGROUP.

B.2   The POPGROUP model draws data from a number of sources, building an historical picture of population, households, fertility, mortality and migration on which to base its scenario forecasts. Using the historical data evidence for 2001–2013, in conjunction with information from the ONS sub-national population projections, a series of assumptions have been derived which drive the scenario forecasts.

B.3   In the following sections, a narrative on the data inputs and assumptions underpinning the scenarios is presented.

Population, Births & Deaths

Population

B.4   In each scenario, historical population statistics are provided by the mid-year population estimates for 2001–2013, with all data recorded by single-year of age and sex. These data include the revised mid-year population estimates for 2002–2010, which were released by the ONS in May 2013. The revised mid-year population estimates provide consistency in the measurement of the components of population change (i.e. births, deaths, internal migration and international migration) between the 2001 and 2011 Censuses.

B.5   In the 'SNPP-2010' scenario, future population counts are provided by single-year of age and sex to ensure consistency with the trajectory of the ONS 2010-based SNPP. The 'SNPP-2010' scenario is scaled to ensure consistency with the 2012 mid-year population estimate total, following its designated growth trend thereafter. This enables the two SNPP scenarios to be more easily

compared from a consistent base-year and does not alter the underlying assumptions or growth trajectory of the 2010-based SNPP.

B.6   In the 'SNPP-2012' scenario, future population counts are provided by single-year of age and sex to ensure consistency with the trajectory of the ONS 2012-based SNPP.

Births & Fertility

B.7   In each scenario, historical mid-year to mid-year counts of births by sex from 2001/02 to 2012/13 have been sourced from ONS Vital Statistics.

B.8   In the 'SNPP-2010' and 'SNPP-2012' scenarios, future counts of births are specified to ensure consistency with the official projections.

B.9   In the other scenarios, a 'local' (i.e. area-specific) age-specific fertility rate (ASFR) schedule, which measures the expected fertility rates by age in 2013/14, is included in the POPGROUP model assumptions. This is derived from the ONS 2012-based SNPP.

B.10   Long-term assumptions on changes in age-specific fertility rates are taken from the ONS 2012-based SNPP.

B.11   In combination with the 'population-at-risk' (i.e. all women between the ages of 15–49), the area-specific ASFR and future fertility rate assumptions provide the basis for the calculation of births in each year of the forecast period.

Deaths & Mortality

B.12   In each scenario, historical mid-year to mid-year counts of deaths by age and sex from 2001/02 to 2012/13 have been sourced from ONS Vital Statistics.

B.13   In the 'SNPP-2010' and 'SNPP-2012' scenarios, future counts of deaths are specified to ensure consistency with the official projections.

B.14   In the other scenarios, a 'local' (i.e. area-specific) age-specific mortality rate (ASMR) schedule, which measures the expected mortality rates by age and sex in 2013/14 is included in the POPGROUP model assumptions. This is derived from the ONS 2012-based SNPP.

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B.15   Long-term assumptions on changes in age-specific mortality rates are taken from the ONS 2012-based SNPP.

B.16   In combination with the 'population-at-risk' (i.e. the total population), the area-specific ASMR and future mortality rate assumptions provide the basis for the calculation of deaths in each year of the forecast period.

Migration

Internal Migration

B.17   In all scenarios, historical mid-year to mid-year estimates of in- and out-migration by five year age group and sex from 2001/02 to 2012/13 have been sourced from the 'components of population change' files that underpin the ONS mid-year population estimates. These internal migration flows are estimated using data from the Patient Register (PR), the National Health Service Central Register (NHSCR) and Higher Education Statistics Agency (HESA).

B.18   In the 'SNPP-2010' and 'SNPP-2012' scenarios, future counts of internal migrants are specified, to ensure consistency with the official projections.

B.19   In the alternative 'trend' scenarios, age-specific migration rate (ASMigR) schedules are derived from the area-specific historical migration data. In the 'PG-5yr' scenario, a five year internal migration history is used (2008/09 to 2012/13). In the 'PG-10yr' scenario, a ten year history is used (2003/04 to 2012/13).

B.20   In the 'Natural Change' scenario, internal in- and out-migration flows are set to zero for each year in the forecast period (i.e. no in- or out-migration occurs).

B.21   The 'jobs-led' scenarios calculate their own internal migration assumptions to ensure an appropriate balance between the population and the targeted increase in the number of jobs that is defined in each year of the forecast period. A higher level of net internal migration will occur if there is insufficient population to meet the forecast labour force increase. The profile of internal migrants is defined by an ASMigR schedule, derived from the ONS 2012-based SNPP.

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B.22   In the case of internal <u>in</u>-migration, the ASMigR schedule of rates is applied to an external 'reference' population (i.e. the population 'at-risk' of migrating <u>into</u> the area). This is different to the other components (i.e. births, deaths and international migration), where the schedule of rates is applied to the area-specific population. In the case of Kirklees, the reference population is derived through an analysis of migration into the Leeds City Region Local Enterprise Partnership (LEP), which the Borough of Kirklees is a member of. The reference population is defined by considering the areas which have historically contributed the majority of migrants into the LEP. In this case, it comprises all districts which cumulatively contributed 70% of migrants into the LEP in 2007/08–2011/12.

International Migration

B.23   Historical mid-year to mid-year counts of total immigration and emigration from 2001/02 to 2012/13 have been sourced from the 'components of population change' files that underpin the ONS mid-year population estimates. Any 'adjustments' made to the mid-year population estimates to account for asylum cases are included in the international migration balance.

B.24   Implied within the international migration component of change in all scenarios is an 'unattributable population change' (UPC) figure, which ONS identified within its latest mid-year estimate revisions. The POPGROUP model has assigned the UPC to international migration as it is the component with the greatest uncertainty associated with its estimation (see paragraphs 2.6–2.7 of the main report).

B.25   In all scenarios, future international migration assumptions are defined as 'counts' of migration.

B.26   In the 'SNPP-2010' and 'SNPP-2012' scenarios, the international in- and out-migration counts are drawn directly from the official projections.

B.27   In the alternative 'trend' scenarios, the international in- and out-migration counts are derived from the area-specific historical migration data. In the 'PG-5yr' scenario, a five year international migration history is used (2008/09 to 2012/13). In the 'PG-10yr' scenario, a ten year history is used (2003/04 to 2012/13). An ASMigR schedule of rates is derived from either a five year or ten year migration history and is used to distribute future counts by single year of age.

B.28   In the 'Natural Change' scenario, the future migration counts set the in- and out-migration flows to zero for each year in the forecast period (i.e. no in- or out-migration occurs).

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B.29   In the 'jobs-led' scenarios, international migration counts are taken from the ONS 2012-based SNPP (i.e. counts are consistent with the 'SNPP-2012' scenario). An ASMigR schedule of rates from the ONS 2012-based SNPP is used to distribute future counts by single year of age.

Household & Dwellings

B.30   The 2011 Census defines a household as:

"*one person living alone, or a group of people (not necessarily related) living at the same address who share cooking facilities and share a living room or sitting room or dining area.*"[5]

B.31   A dwelling is defined as a unit of accommodation which may comprise one or more household spaces (a household space is the accommodation used or available for use by an individual household).

B.32   For each scenario, the household and dwelling implications of the population growth trajectory have been evaluated through the application of headship rate statistics, communal population statistics and a dwelling vacancy rate. These data assumptions have been sourced from the 2001 and 2011 Censuses and the 2008-based and 2011-based household projection models from the DCLG.

Household Headship Rates

B.33   Household headship rates define the likelihood of a particular household type being formed in a particular year, given the age-sex profile of the population in that year. Household-types are modelled within a 17-fold classification (Table 9).

B.34   The household headship rates used in the POPGROUP modelling have been taken from the DCLG 2008-based and 2011-based household projections. The 2011-based household projections were released for local authority districts in England in April 2013, superseding the 2008-based model. However, as the 2011-based household model is underpinned by the 2011-based SNPP, the headship rate assumptions have only been published for the 2011–2021 period. Therefore, the

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[5] http://www.ons.gov.uk/ons/guide-method/census/2011/census-data/2011-census-user-guide/glossary/index.html

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headship rates have been trended after 2021 to extend the rates to the end of the forecast period.

B.35 Edge Analytics assesses household growth using the 2008-based *and* the 2011-based headship rates, in recognition of the uncertainties surrounding future rates of household formation.

B.36 Both the 2008-based and 2011-based headship rates have been applied, producing two alternative outcomes for each scenario:

- 'Option A': DCLG 2011-based headship rates, with the 2011–2021 trend continued after 2021.

- 'Option B': DCLG 2008-based headship rates, scaled to be consistent with the 2011 DCLG household total, but following the original trend thereafter.

Table 9: Household type classification

ONS Code	DF Label	Household Type
OPM	OPMAL	One person households: Male
OPF	OPFEM	One person households: Female
OCZZP	FAMC0	One family and no others: Couple: No dependent children
OC1P	FAMC1	One family and no others: Couple: 1 dependent child
OC2P	FAMC2	One family and no others: Couple: 2 dependent children
OC3P	FAMC3	One family and no others: Couple: 3+ dependent children
OL1P	FAML1	One family and no others: Lone parent: 1 dependent child
OL2P	FAML2	One family and no others: Lone parent: 2 dependent children
OL3P	FAML3	One family and no others: Lone parent: 3+ dependent children
MCZDP	MIX C0	A couple and one or more other adults: No dependent children
MC1P	MIX C1	A couple and one or more other adults: 1 dependent child
MC2P	MIX C2	A couple and one or more other adults: 2 dependent children
MC3P	MIX C3	A couple and one or more other adults: 3+ dependent children
ML1P	MIX L1	A lone parent and one or more other adults: 1 dependent child
ML2P	MIX L2	A lone parent and one or more other adults: 2 dependent children
ML3P	MIX L3	A lone parent and one or more other adults: 3+ dependent children
OTAP	OTHHH	Other households
TOT	TOTHH	Total

Communal Population

B.37 Household projections in POPGROUP exclude the population 'not-in-households' (i.e. the communal/institutional population). These data are drawn from the DCLG 2011-based household projection, which uses statistics from the 2011 Census. Examples of communal establishments include prisons, residential care homes and student halls of residence.

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B.38 For ages 0–74, the number of people in each age group 'not-in-households' is fixed throughout the forecast period. For ages 75–85+, the *proportion* of the population 'not-in-households' is recorded. Therefore, the population not-in-households for ages 75–85+ varies across the forecast period depending on the size of the population.

Vacancy Rate

B.39 The relationship between households and dwellings is modelled using a 'vacancy rate', sourced from the 2011 Census. A vacancy rate of 4.2% (for the Borough of Kirklees) has been applied, fixed throughout the forecast period.

B.40 Using this vacancy rate, the 'dwelling requirement' of each household growth trajectory (i.e. 'Option A' and 'Option B' - see paragraph B.36) has been evaluated. The resulting 'Option A' and 'Option B' dwelling requirements are then averaged to provide a total dwelling requirement for each scenario.

Labour Force & Jobs

B.41 For each scenario (excluding the 'jobs-led' scenarios), the labour force and jobs implications of the population growth trajectory have been evaluated through the application of three key data items: economic activity rates, an unemployment rate and a commuting ratio.

B.42 In the 'jobs-led' scenarios, these three data items are used to determine the population growth required by a jobs growth trajectory.

Economic Activity Rates

B.43 The level of labour force participation is recorded in the economic activity rates. Economic activity rates by five year age group (ages 16—74) and sex have been derived from 2001 and 2011 Census statistics. The 2011 Census statistics include an open-ended 65+ age categorisation, so economic activity rates for the 65–69 and 70–74 age groups have been estimated using a combination of Census 2011 tables, disaggregated using evidence from the 2001 Census.

B.44 For the Borough of Kirklees, rates of economic activity decreased for men and women in the youngest age group (16-19) between the 2001 and 2011 Censuses (Figure 11). For women,

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economic activity rates increased amongst the 20–24 and 40+ age groups. For men, economic activity rates increased amongst the older age groups.

B.45   In the core scenarios, the 2011 Census economic activity rates have been applied, with changes made to the age-sex specific economic activity rates to take account of changes to the State Pension Age (SPA) and to accommodate potential changes in economic participation which might result from an ageing but healthier population in the older labour-force age-groups.
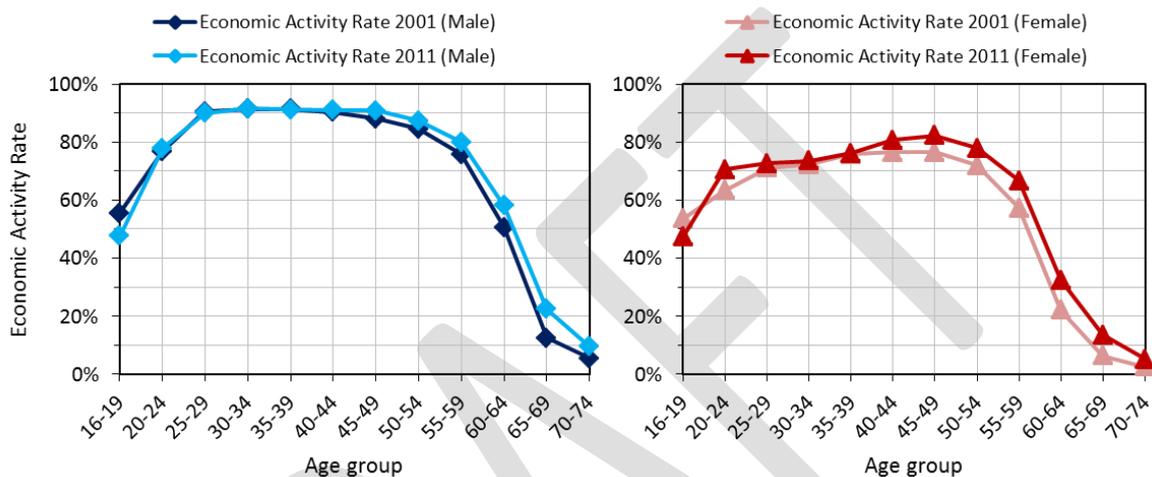

Figure 11: Kirklees – economic activity rates, 2001 and 2011 Census comparison (source: ONS)

B.46   The SPA for women is increasing from 60 to 65 by 2018, bringing it in line with that for men. Between December 2018 and April 2020, the SPA for both men and women will then rise to 66. Under current legislation, the SPA will be increased to 67 between 2026 and 2028[6].

B.47   ONS published its last set of economic activity rate forecasts from a 2006 base[7]. These incorporated an increase in SPA for women to 65 by 2020 but this has since been altered to an accelerated transition by 2018 plus a further extension to 66 by 2020. Over the 2011–2020 period, the ONS forecasts suggested that male economic activity rates would rise by 5.6% and 11.9% in the 60-64 and 65-69 age groups respectively. Corresponding female rates would rise by 33.4% and 16.3% (Figure 12).

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[6] https://www.gov.uk/state-pension

[7] ONS January 2006, Projections of the UK labour force, 2006 to 2020 http://www.ons.gov.uk/ons/rel/lms/labour-market-trends--discontinued-/volume-114--no--1/projections-of-the-uk-labour-force--2006-to-2020.pdf

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| % Change 2011 - 2020							
Age Sex	16-24	25-34	35-44	45-59	60-64	65-69	70-74
Males	-3.1%	-0.8%	-0.7%	0.3%	5.6%	11.9%	-5.6%
Females	-1.2%	1.8%	0.4%	3.9%	33.4%	16.3%	0.0%
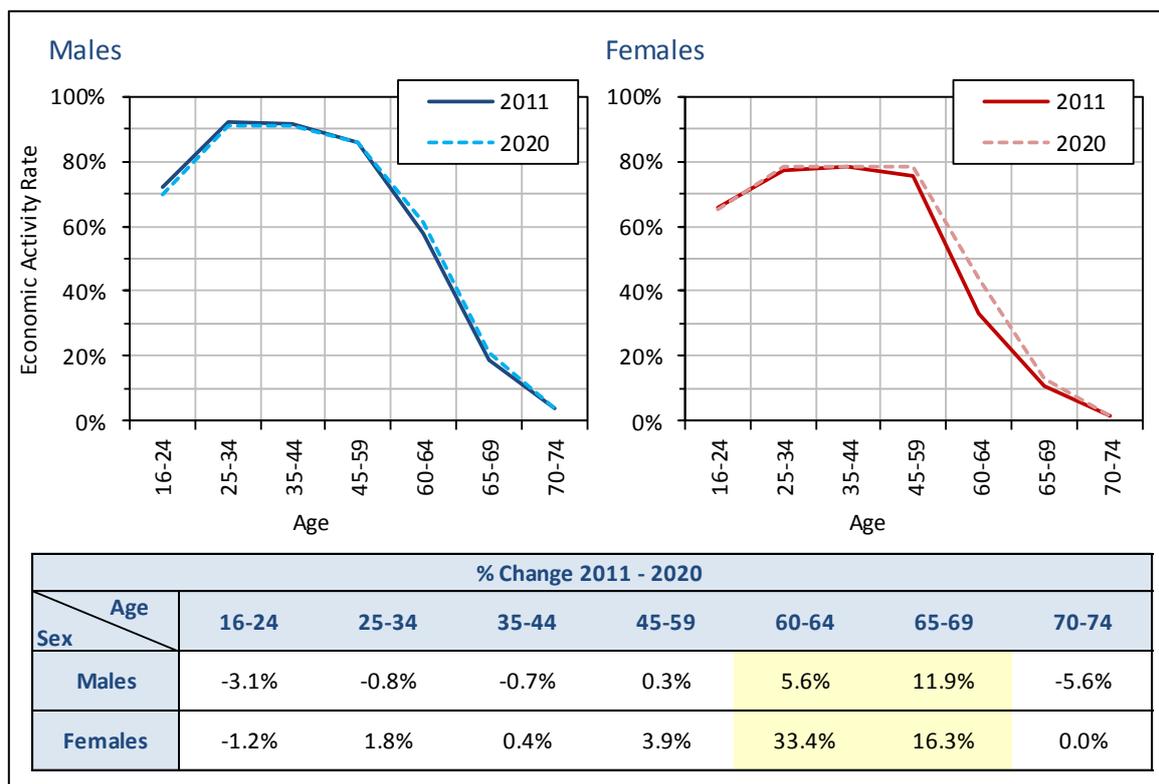
Figure 12: ONS labour force projection 2006, economic activity rates 2011–2020. Source: ONS

B.48   To take account of planned changes to the SPA, the following modifications have been made to the economic activity rates:

- Women aged 60-64: 40% increase from 2011 to 2020

- Women aged 65-69: 20% increase from 2011 to 2020

- Men aged 60-64: 5% increase from 2011 to 2020

- Men aged 65-69: 10% increase from 2011 to 2020.

B.49   Note that the rates for women in the 60–64 age and 65–69 age-groups are higher than the original ONS figures (Figure 12), accounting for the accelerated pace of change in the SPA. No changes have been applied to other age-groups. In addition, no changes have been applied to economic activity rates beyond 2020. This is an appropriately prudent approach given the uncertainty associated with forecasting future rates of economic participation. Given the accelerated pace of change in the female SPA and the clear trends for increased female labour force participation across nearly all age-groups in the last decade (Figure 11), these 2011–2020 rate increases (Figure 13 and Table 10) would appear to be relatively conservative assumptions.
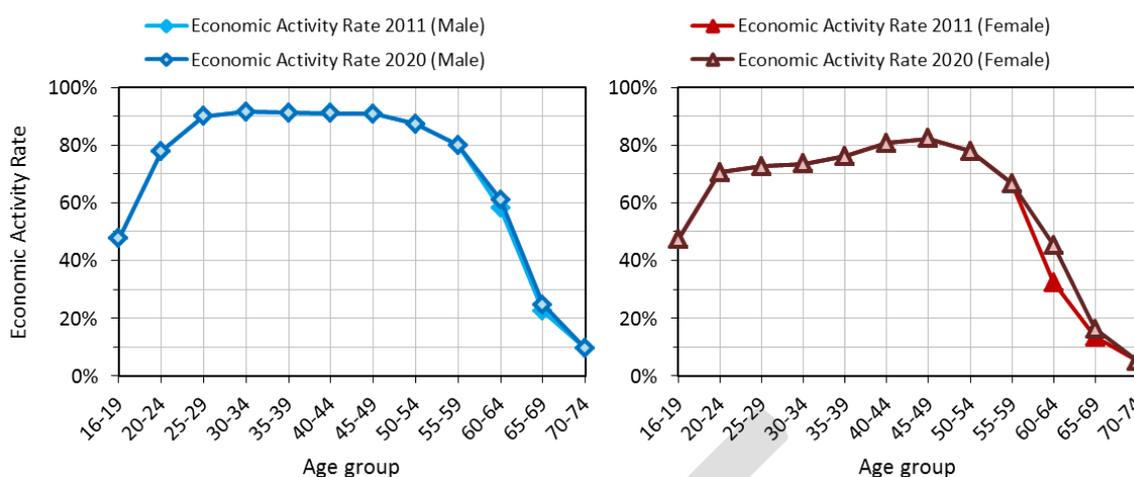
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Figure 13: Kirklees – Edge Analytics economic activity rate profiles, 2011 and 2020 comparison.

Table 10: Kirklees – Edge Analytics economic activity rate profiles, 2011 and 2020 comparison

			16-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74
Male	2011	Resident Population	11,274	14,619	13,699	13,418	14,242	16,103	15,119	13,454	12,173	12,747	9,338	7,464
		Economically Active	5,370	11,393	12,316	12,272	12,975	14,664	13,721	11,747	9,741	7,420	2,095	716
		Economic Activity Rate	48%	78%	90%	91%	91%	91%	91%	87%	80%	58%	22%	10%
	2020	Economic Activity Rate	48%	78%	90%	91%	91%	91%	91%	87%	80%	61%	25%	10%
Female	2011	Resident Population	10,659	14,207	13,776	13,536	14,043	15,551	15,141	13,472	11,828	13,098	9,985	8,248
		Economically Active	5,036	10,011	10,012	9,942	10,690	12,540	12,447	10,491	7,899	4,245	1,353	418
		Economic Activity Rate	47%	70%	73%	73%	76%	81%	82%	78%	67%	32%	14%	5%
	2020	Economic Activity Rate	47%	70%	73%	73%	76%	81%	82%	78%	67%	45%	16%	5%

B.50 The effect of the age-specific economic activity rate assumptions when considered alongside the population growth implied by the 'SNPP-2012' and 'Jobs-led REM' scenarios, is a reduction in the 'aggregate' rate of economic activity for the 16-74 labour force ages.

B.51 To counter this decline in economic activity, the 'jobs-led' sensitivity scenarios maintain the aggregate economic activity rate at its base-year level, 68% in the case of Kirklees

Unemployment Rate

B.52 The unemployment rate, together with the commuting ratio, controls the balance between the size of the labour force and the number of jobs available within an area. The same unemployment rate profile is applied in all of the core scenarios.

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B.53   An average 'recession' unemployment rate of 8.1% is applied in 2013 (Table 11). The unemployment rate then incrementally decreases to the 'pre-recession' average of 4.5% by 2020. These improvements in the unemployment rate provide an appropriate basis for what is likely to be a gradual recovery from current economic conditions.

B.54   In the 'jobs-led' sensitivity scenarios, the unemployment rate is allowed to reduce further, to 4.0% by 2020.

Table 11: Kirklees – historical unemployment rates, 2004–2013

Kirklees	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Recession average	Pre-recession average
Unemployment rate (%)	4.6	4.5	4.4	4.4	7.3	8.0	9.1	8.8	7.9	7.2	8.1	4.5

Note: Unemployment rates are for January to December. (source: Annual Population Survey, NOMIS).

Commuting Ratio

B.55   The commuting ratio, together with the unemployment rate, controls the balance between the number of workers living in a district (i.e. the resident labour force) and the number of jobs available in the district.

B.56   A commuting ratio greater than 1.0 indicates that the size of the resident workforce exceeds the number of jobs available in the district, resulting in a net out-commute. A commuting ratio less than 1.0 indicates that the number of jobs in the district exceeds the size of the labour force, resulting in a net in-commute.

B.57   From the 2011 Census Travel to Work statistics, published by the ONS in July 2014, a commuting ratio of 1.15 has been derived for Kirklees, indicating a net out-commute (Table 12).

Table 12: Commuting ratio comparison

Kirklees		2001 Census	2011 Census
Workers	a	174,048	192,397
Jobs	b	151,964	166,934
Commuting Ratio	a/b	**1.15**	**1.15**

Note: 2001 data from Census Table *T101 – UK Travel Flows*; 2011 data from Census Table *WU02UK - Location of usual residence and place of work by age*.

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Appendix C

Kirklees Scenario Outcomes: 2013—2036
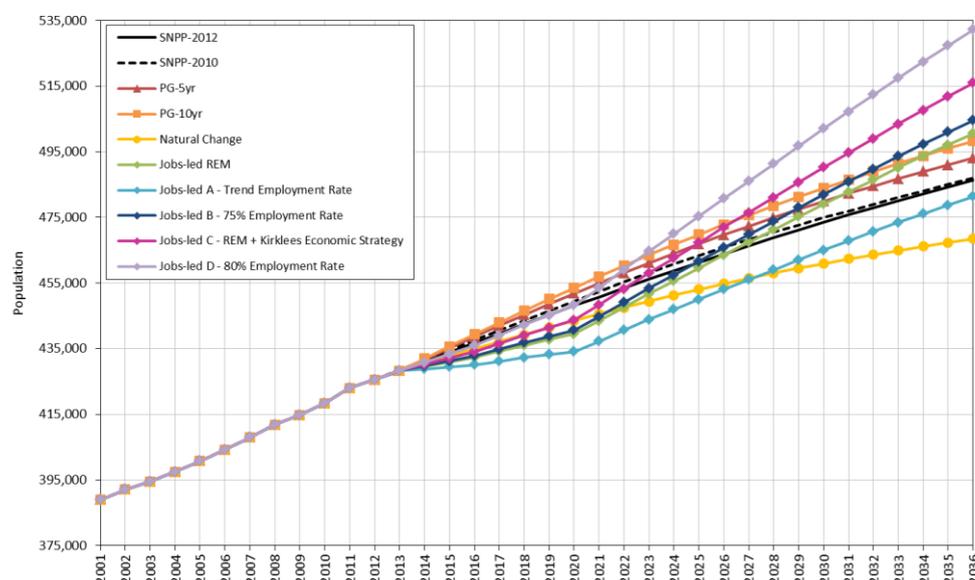
Figure 14: Kirklees – scenario outcomes: population growth 2001–2036

Table 13: Kirklees – 'Option A' scenario outcomes 2013–2036

Rank	Scenario	Change 2013 - 2036				Average per year		
		Population Change	Population Change %	Households Change	Households Change %	Net Migration	Dwellings	Jobs
1	Jobs-led D - 80% Employment Rate (A)	103,949	24.3%	43,741	24.8%	2,110	1,985	1,536
2	Jobs-led C - REM + Kirklees Economic Strategy (A)	87,682	20.5%	37,670	21.4%	1,538	1,709	1,229
3	Jobs-led B - 75% Employment Rate (A)	76,337	17.8%	33,434	19.0%	1,137	1,517	1,015
4	Jobs-led REM (A)	72,307	16.9%	31,929	18.1%	995	1,449	939
5	PG-10yr (A)	69,969	16.3%	35,078	19.9%	969	1,592	943
6	PG-5yr (A)	64,761	15.1%	33,093	18.8%	833	1,502	809
7	SNPP-2010 (A)	58,552	13.7%	27,470	15.6%	358	1,247	849
8	SNPP-2012 (A)	58,184	13.6%	27,215	15.5%	402	1,235	661
9	Jobs-led A - Trend Employment Rate (A)	53,049	12.4%	24,732	14.0%	315	1,122	576
10	Natural Change (A)	40,210	9.4%	22,861	13.0%	0	1,037	247

Table 14: Kirklees – 'Option B' scenario outcomes 2013–2036

Rank	Scenario	Change 2013 - 2036				Average per year		
		Population Change	Population Change %	Households Change	Households Change %	Net Migration	Dwellings	Jobs
1	Jobs-led D - 80% Employment Rate (B)	103,949	24.3%	52,226	29.6%	2,110	2,370	1,536
2	Jobs-led C - REM + Kirklees Economic Strategy (B)	87,682	20.5%	45,912	26.0%	1,538	2,083	1,229
3	Jobs-led B - 75% Employment Rate (B)	76,337	17.8%	41,505	23.5%	1,137	1,883	1,015
4	Jobs-led REM (B)	72,307	16.9%	39,939	22.6%	995	1,812	939
5	PG-10yr (B)	69,969	16.3%	42,597	24.1%	969	1,933	943
6	PG-5yr (B)	64,761	15.1%	40,516	23.0%	833	1,839	809
7	SNPP-2010 (B)	58,552	13.7%	34,703	19.7%	358	1,575	849
8	SNPP-2012 (B)	58,184	13.6%	34,794	19.7%	402	1,579	661
9	Jobs-led A - Trend Employment Rate (B)	53,049	12.4%	32,450	18.4%	315	1,473	576
10	Natural Change (B)	40,210	9.4%	30,274	17.1%	0	1,374	247

Note: 'Net Migration' refers to the combined impact of internal and international migration on the population.

Note: 'Jobs' refers to the number of jobs required to meet the 'need' of the growing population, except in the 'jobs-led' scenarios, where population growth is determined by a specified jobs 'target'.

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Table 15: Kirklees – scenario dwelling requirement summary (2013—2036)

Rank	Scenario	Average annual dwelling requirement (2013–2031)		
		Option A	Option B	Average
1	Jobs-led D - 80% Employment Rate	1,985	2,370	2,177
2	Jobs-led D - 80% Employment Rate - SENS1	1,750	2,127	1,938
3	Jobs-led C - REM + Kirklees Economic Strategy	1,709	2,083	1,896
4	PG-10yr	1,592	1,933	1,762
5	Jobs-led B - 75% Employment Rate	1,517	1,883	1,700
6	PG-5yr	1,502	1,839	1,670
7	Jobs-led C - REM + Kirklees Economic Strategy - SENS1	1,479	1,845	1,662
8	Jobs-led REM	1,449	1,812	1,631
9	Jobs-led B - 75% Employment Rate - SENS1	1,290	1,648	1,469
10	SNPP-2010	1,247	1,575	1,411
11	SNPP-2012	1,235	1,579	1,407
12	Jobs-led REM - SENS1	1,222	1,578	1,400
13	Jobs-led A - Trend Employment Rate	1,122	1,473	1,297
14	Natural Change	1,037	1,374	1,206
15	Jobs-led A - Trend Employment Rate - SENS1	901	1,244	1,072

Note: 'Option A' shows the dwelling requirement derived using the 2011-based headship rates; 'Option B' using the 2008-based headship rates. Scenarios are ranked in order of the average dwelling requirement.

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