

Edge Analytics
Demographic Scenario
Analysis for Kirklees
Council

July 2016 and October
2016

Kirklees

Additional Scenario Analysis

July 2016

For the attention of:

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Acknowledgements

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1 Context & Requirements

Context

- 1.1 In September 2014, Edge Analytics produced a range of demographic forecasts for Kirklees Council using POPGROUP technology. Ten **core** scenarios were presented, including:
- The 2012-based sub-national population projection (SNPP) from the Office for National Statistics (ONS).
 - Alternative trend scenarios based upon five-year and ten-year migration histories, plus a 'natural change' scenario.
 - Jobs-led scenarios, based upon an employment forecast from the Yorkshire and Humber Regional Economic Model (REM).
 - Jobs-led scenarios, based upon employment forecasts specified by Kirklees Council.
- 1.2 Additional **sensitivity** scenarios were included to examine the sensitivity of the jobs-led growth outcomes to variations in the key assumptions on unemployment and economic activity. The household growth implications of each scenario were assessed using assumptions from both the 2008-based household projection model and the 2011-based interim household projection model from the Department for Communities and Local Government (DCLG).
- 1.3 In March 2015, Edge Analytics provided an addendum to the report in which assumptions from the newly released 2012-based DCLG household projection model were applied to each scenario.
- 1.4 In January 2016, two additional employment forecasts were considered, targeting jobs growth of 43,400 and 32,200 over the 2013–2031 plan period respectively. The analysis produced core and sensitivity variations of the scenarios, applying alternative economic assumptions as follows:

Table 1: Economic assumptions underpinning the additional jobs-led scenarios

Scenario	Economic Assumptions		
	Economic Activity Rates	Unemployment Rate	Commuting Ratio
Core	Economic activity rates from the 2011 Census, with uplifts applied in the 60–69 age groups to account for state pension age (SPA) changes.	The unemployment rate is reduced from 8.1% to 4.5% (2013–2020).	A fixed 2011 commuting ratio of 1.15 is applied.
SENS1	The economic activity rate for the labour force (aged 16–74) is maintained at its base-year level (68%).	The unemployment rate is reduced from 8.1% to 4.0% (2013–2020).	

Requirements

1.5 Using the POPGROUP model created for the scenario analysis completed during 2015/16, Kirklees Council has requested the evaluation of a new ‘jobs-led’ scenario for the plan period 2013–2031. This **Jobs-led (July 2016)** scenario needs to consider full-time equivalent (FTE) jobs growth of 23,197 for the 2013–2031 period (Figure 1), lower than that tested within the January 2016 scenario analysis.

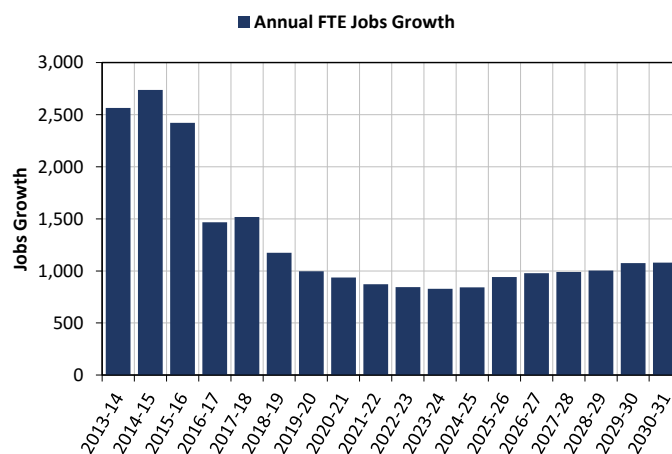


Figure 1: Kirklees FTE jobs growth forecast - **Jobs-led (July 2016)** scenario

1.6 The scenario analysis is required to use household assumptions from the latest 2014-based household projections from DCLG.

- 1.7 In line with previous scenario analysis, the jobs-led scenario is presented here as a **core** and **SENS1** output. The core output considers changes to state pension age (SPA) in the economic activity rates of age-groups 60–69; the **SENS1** ensures that current economic activity rates for the 16–74 age-range is at least maintained at its current level. Unemployment and commuting assumptions are consistent with the previous analysis (Table 1).

2 Scenario Results

- 2.1 For the additional **Jobs-led (July 2016)** scenario (core and sensitivity), the demographic, household and dwelling growth outcomes are presented below for the period 2013–2031 using household assumptions from the 2008-based (**HH-08**), 2012-based (**HH-12**) and 2014-based (**HH-14**) household models respectively (Table 2, Table 3 and Table 4).

Table 2: Kirklees **HH-08** core and sensitivity scenario outcomes (2013–2031)

Scenario (HH-08)	Change 2013 - 2031				Average per year		
	Population Change	Population Change %	Households Change	Households Change %	Net Migration	Dwellings	Jobs
Jobs-led (July 2016)	69,816	16.3%	36,951	20.9%	1,499	2,143	1,293
Jobs-led (July 2016) - SENS1	56,835	13.3%	31,993	18.1%	885	1,855	1,293

Table 3: Kirklees **HH-12** core and sensitivity scenario outcomes (2013–2031)

Scenario (HH-12)	Change 2013 - 2031				Average per year		
	Population Change	Population Change %	Households Change	Households Change %	Net Migration	Dwellings	Jobs
Jobs-led (July 2016)	69,816	16.3%	34,472	19.5%	1,499	1,999	1,293
Jobs-led (July 2016) - SENS1	56,835	13.3%	29,629	16.8%	885	1,718	1,293

Table 4: Kirklees **HH-14** core and sensitivity scenario outcomes (2013–2031)

Scenario (HH-14)	Change 2013 - 2031				Average per year		
	Population Change	Population Change %	Households Change	Households Change %	Net Migration	Dwellings	Jobs
Jobs-led (July 2016)	69,816	16.3%	34,483	19.6%	1,499	1,999	1,293
Jobs-led (July 2016) - SENS1	56,835	13.3%	29,832	16.9%	885	1,730	1,293

- 2.2 Dwelling growth associated with the 2012-based and 2014-based household models is very similar, reflecting the fact that only very minor changes have been made to underpinning headship rates in the new 2014-based assumptions.

- 2.3 The use of 2008-based household assumptions, results in dwelling growth that is 7–8% higher than the 2012-based and 2014-based alternatives. Headship rates in the 2008-based model estimate a more rapid rate of household formation, based on historical evidence prior to the financial crisis of 2007/08.
- 2.4 The core version of each scenario results in dwelling growth that is 15–16% higher than the **SENS1** alternative. The **SENS1** scenarios present an outlook on economic activity rates that maintains the aggregate, age 16–74, rate at its base level throughout the plan period even as the population ages. The **SENS1** scenarios result in an average annual dwelling growth of 1,718–1,855, depending upon the choice of household assumptions.



Kirklees

Demographic Scenarios

October 2016

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Requirements

- 1.1 To inform its Local Plan formulation Edge Analytics has produced a range of demographic forecasts for Kirklees Council using POPGROUP technology. The forecasting analysis has been delivered to Kirklees Council as a sequence of reports and data deliverables over the 2014-2016 period.
- 1.2 Kirklees Council has requested a refresh of its trend-based scenarios, presenting the Office for National Statistics (ONS) 2014-based sub-national population projection (SNPP-2014) alongside alternative trend scenarios which more explicitly consider five year and ten-year histories in setting migration assumptions.
- 1.3 In producing the new scenarios, Kirklees Council has requested that household estimates are based on the Department for Communities and Local Government (DCLG) 2014-based household projection model.
- 1.4 As context to the scenario analysis, this document presents a profile of Kirklees' historical population change and the components of population change that have driven this change over the 2001-2015 period. The SNPP-2014 for Kirklees is presented alongside previous official projections, with an indication of the projected components of population change for the 2014-2039 forecast period. Household growth implied by DCLG's 2014-based household projection model is compared to earlier DCLG projections.
- 1.5 The SNPP-2014 provides the 'benchmark' growth scenario against which other growth outcomes are compared. The SNPP-2012 scenario is presented, together with four alternative trend scenarios, using varying migration assumptions, derived from historical evidence on internal and international migration.
- 1.6 In each of the scenarios, historical data is included for the 2001–2015 period, with scenario results presented for Kirklees' designated plan period, 2013–2031¹.

¹ Note that the plan period includes two years of historical data

2 Review of Evidence

Historical Population Change

- 2.1 The latest 2015 mid-year population estimate (MYE) for Kirklees suggests a population of 434,321, a 11.7% increase since 2001. Kirklees has experienced a higher rate of growth than both the Yorkshire & Humber region and England as a whole (Table 1).

Table 1: Kirklees population change comparison (source: ONS)

Area	Population			
	2001	2015	Change	% Change
Kirklees	388,980	434,321	45,341	11.7%
Yorkshire & The Humber	4,976,643	5,390,576	413,933	8.3%
England	49,449,746	54,786,327	5,336,581	10.8%

- 2.2 The MYEs from 2002–2010 were ‘rebased’ to align with the 2011 Census, ensuring the correct transition of the age profile of the population over the 2001–2011 decade. At the 2011 Census, Kirklees resident population was 422,458, an 8.7% increase from 2001. The 2011 Census proved to be higher than that suggested by the trajectory of growth from the previous MYEs. As a result, the final MYEs are higher than the previous MYEs (Figure 1).

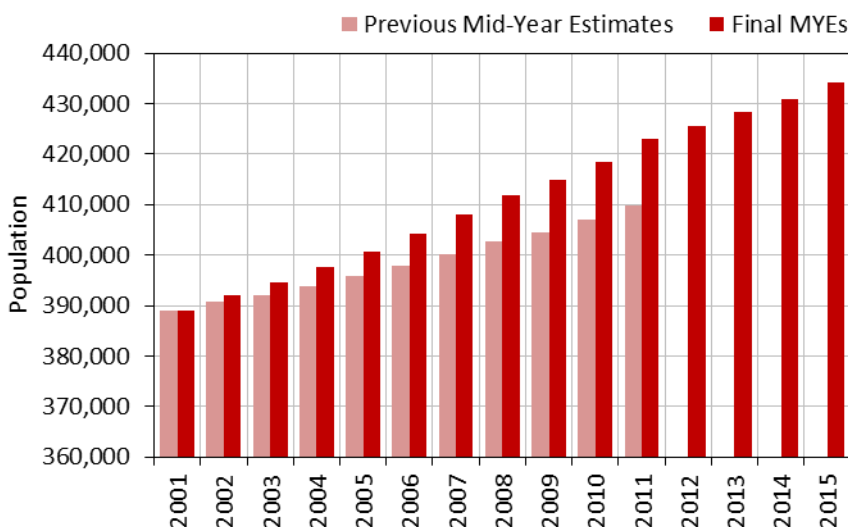


Figure 1: Kirklees – population change 2001–2015

2.3 The rebasing of the MYEs involved the recalibration of the components of change for 2001/02–2010/11. After methodological changes and errors in the components were accounted for, the remaining difference between the expected 2011 mid-year estimate and the 2011 Census-based mid-year estimate is referred to as ‘unattributable population change’ (UPC). The ONS has not attributed UPC to any one component-of-change, however, suggesting that it may be due to the Census estimates themselves, international migration estimation or internal migration counts.

2.4 In Kirklees’ case, the impact of the UPC component was an uplift to each mid-year population estimate, averaging at +1,093 per year to 2011 (Figure 2).

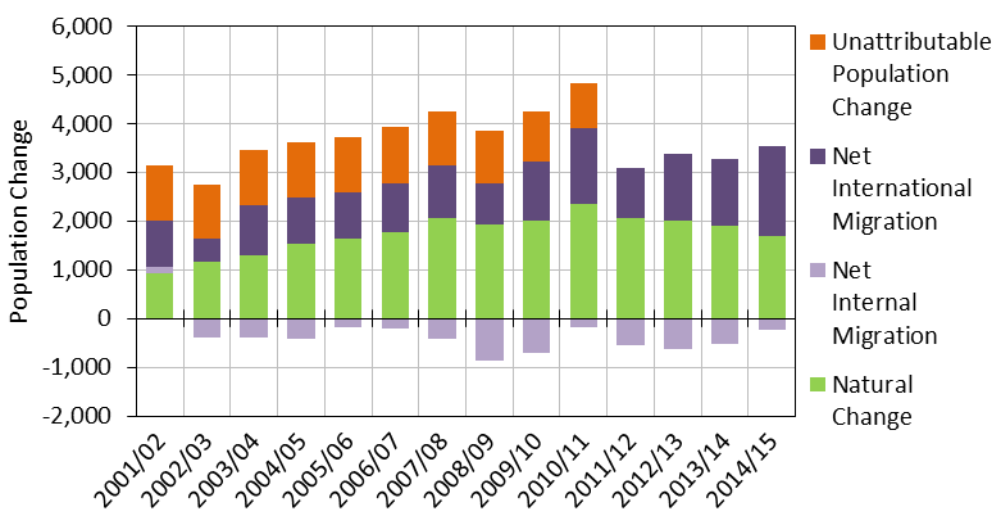


Figure 2: Kirklees – components of change 2001–2015

- 2.5 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 historical MYEs was most likely due to the difficulties associated with the estimation of migration.
- 2.6 Internal migration (i.e. migration flows to and from other areas in the UK) is adequately measured using data from the Patient Register (PR), the National Health Service Central Register (NHSCR) and Higher Education Statistics Agency (HESA), although data robustness may be lower where there is under-registration in certain age-groups (young males in particular).
- 2.7 It is most likely (but not certain) that the UPC component is associated with the mis-estimation of international migration, i.e. the balance between immigration and emigration flows to and from
- 2.8 Kirklees' population change since 2001/02 has been driven by a combination of natural change, internal and international migration. Natural change, the difference between births and deaths only, has historically been a dominant component of population change. Over the 2001/02–2014/15 period, positive natural change has resulted in population growth (i.e. an excess of deaths over births), a reflection of Kirklees' relatively young age profile.
- 2.9 Internal migration (i.e. the exchange of migrants between Kirklees and other parts of the UK) has had a negative impact on population growth, with a net outflow of migrants since 2001, highest in the period 2008-2010. International migration is estimated to have had a significant impact on Kirklees' population growth year-on-year, higher if the UPC component is associated with the mis-estimation of international migration.

ONS Sub-National 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 subnational population projection is the ONS 2014-based SNPP, released in July 2016. These

projections use demographic assumptions derived from a pre-2014, 5–6 year historical period in combination with national assumptions on fertility, mortality and international migration².

- 2.11 Figure 3 presents the ONS population projections series for Kirklees. Under the latest, 2014-based SNPP, the population of Kirklees is expected to increase by 61,308 over the 25-year projection period (2014–2039), an increase of 14.2%.
- 2.12 With the exception of the 2004-based SNPP, the rate of growth under the 2014-based SNPP is *lower* than that estimated by previous projections. Its rate of growth is closely aligned with that of the 2012-based SNPP.

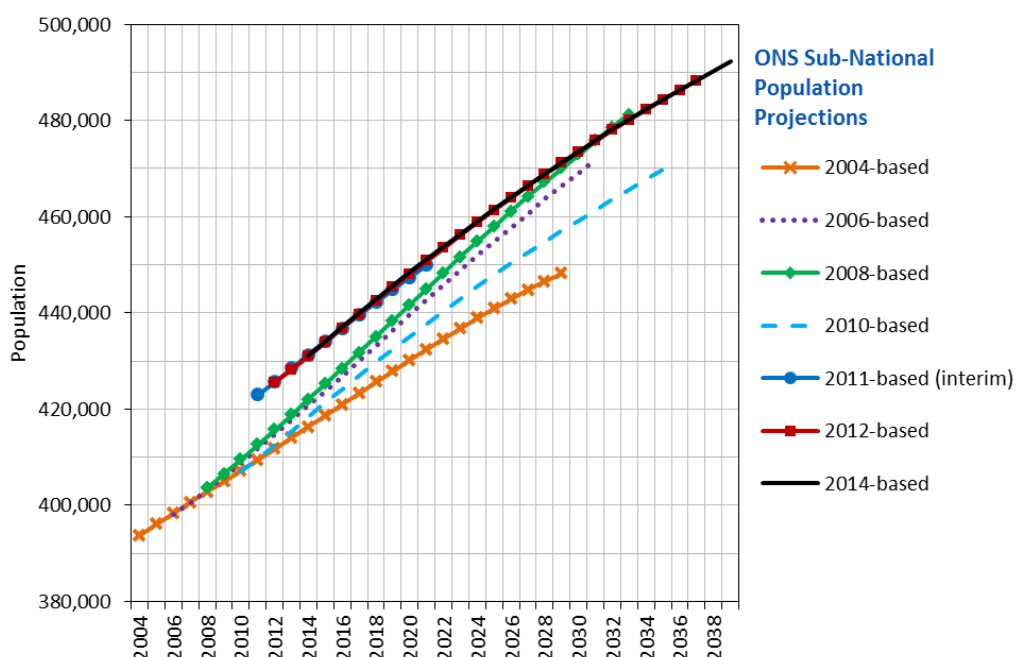


Figure 3: Official Projections for Kirklees (Source: ONS)

- 2.13 The components of population change that underpin the 2014-based projection for Kirklees are presented in Figure 4, with the historical components of change for 2001/02 to 2013/14 included for comparison. Natural change is projected to be the dominant driver of population growth over the projection period. International migration is also expected to have a significant impact on population growth over the projection period, whilst net internal migration is projected to have an increasingly negative impact on population growth.

²<http://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationprojections/bulletins/subnationalpopulationprojectionsforengland/2014basedprojections>

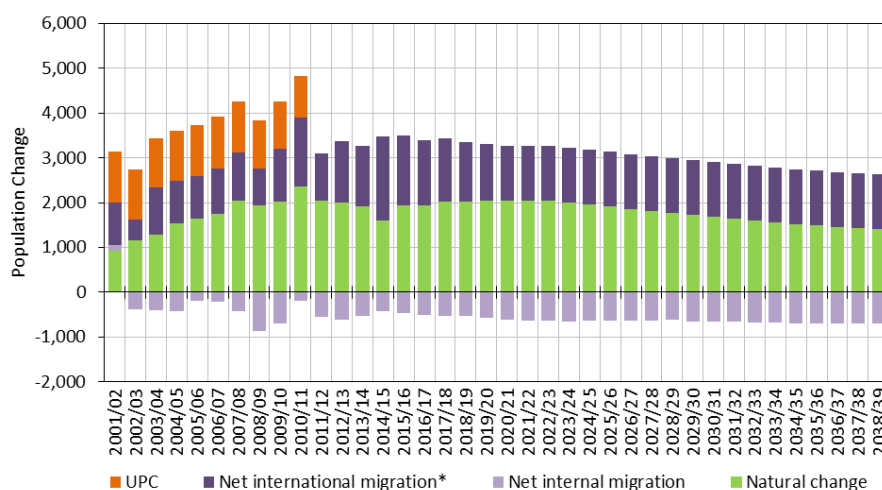


Figure 4: Kirklees historical and 2014-based SNPP components of change (Source: ONS)

2.14 To illustrate how the ONS assumptions on demographic change in Kirklees compare with the historical evidence, the annual average natural change, plus net internal and international migration change for the 2014-based projection are compared to 6-year and 13-year historical averages (Table 2).

Table 2: Kirklees 2014-based SNPP components comparison

Components of Change	Historical		Projected
	6-year average (2008/09–2013/14)	13-year average (2001/02–2013/14)	2014-based SNPP average (2014/15–2038/39)
Natural Change	2,047	1,741	1,784
Net Internal Migration	-576	-412	-619
Net International Migration (+UPC)	1,731	1,905	1,287
Net International Migration (-UPC)	1,224	1,064	

2.15 Natural change is expected to continue to be the dominant driver of population change (+1,784 per year), at a slightly higher level than that experienced over the historical 13-year period, but lower than the 6-year average. The negative influence of net internal migration upon population growth is reflected in an SNPP average annual assumption of -619 per year, suggesting a higher net outflow than that experienced in both the short-term 6-year average and longer-term 13-year average. The projected effect of international migration in the 2014-based SNPP (+1,287 per year) is estimated at a level that excludes any consideration of the prior UPC adjustment to Kirklees population growth.

DCLG Household Projection

- 2.16 In the evaluation of housing need, the PPG states that the DCLG household projections “*should provide the starting point estimate of overall housing need*” (PPG paragraph 2a-015). The 2014-based household projection model, which is underpinned by the 2014-based SNPP, was released by the DCLG in July 2016, superseding the 2012-based household projection model.
- 2.17 The 2014-based household headship rates (also referred to as household representative rates) have changed little from the 2012-based model, with only small adjustments made to account for new evidence arising from the latest Labour Force Survey (LFS) extracts. As a result, the 2014-based household projections differ from the 2012-based versions primarily on the basis of a different underpinning population projection
- 2.18 The 2014-based DCLG household projection model for Kirklees, underpinned by the 2014-based SNPP, estimates that the number of households will increase by 35,650 over the 2014–2039 projection period, equivalent to an additional 1,426 households per year, compared to 1,394 per year under the 2012-based model (Figure 5).

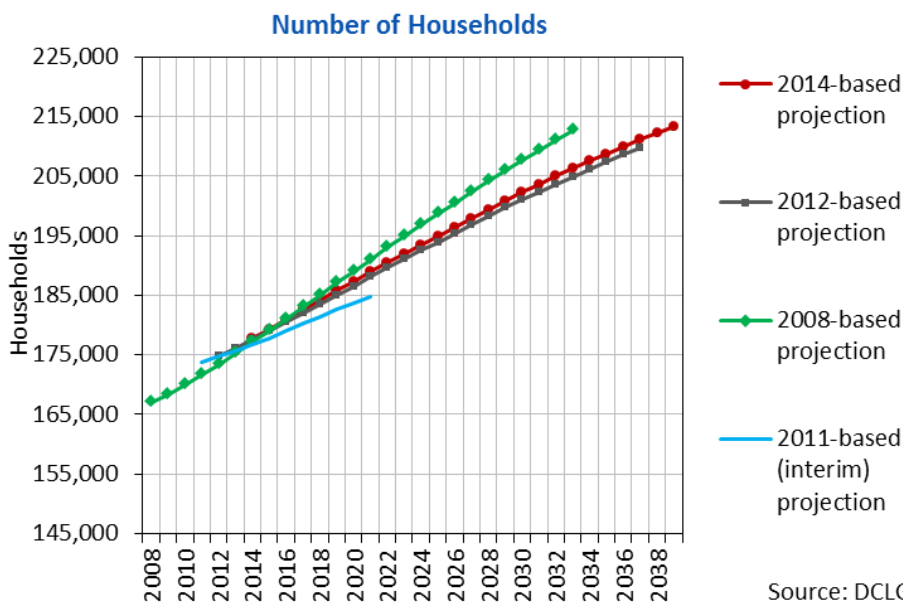


Figure 5: Household growth 2014-based DCLG household projections for Kirklees

- 2.19 A significantly larger population growth expectation in the 2008-based household projection, coupled with household formation rates that suggest a more rapid reduction in average

household size, resulted in an average annual household growth estimate of 1,830 per year under the 2008-based model alternative.

- 2.20 The DCLG household projection, underpinned by the latest ONS population projection, provides the 'starting point' in the assessment of housing need (PPG paragraph 2a-015). As outlined in the PPG, it is appropriate to consider *"alternative assumptions in relation to the underlying demographic projections and household formation rates"* of the local area (PPG Paragraph 2a-017). In the following sections, these 'official' projections are compared to alternative trend scenarios.

3 Scenario Results

Scenario Definition

- 3.1 The **SNPP-2014** scenario replicates the 2014-based population projection from ONS. With the application of the household growth assumptions from the 2014-based DCLG household projection model, this provides the 'benchmark' for Kirklees' housing growth analysis. An **SNPP-2012** scenario is included to illustrate how the latest ONS projection evidence compares to the previous output.
- 3.2 The PPG recommends, as part of the assessment of housing need, that the most recent demographic statistics from ONS and alternative demographic projections should be considered (PPG Paragraph 2a-017). The 2014-based SNPP from ONS is a trend-based projection that uses demographic assumptions based on up to six years historical evidence preceding 2014³. Given the unprecedented economic changes that have occurred since 2008, and the differences between the projected 2014-based SNPP data and the historical evidence on population change in Kirklees, it is appropriate to consider alternative time periods in the derivation of migration assumptions.
- 3.3 Four alternative trend scenarios have been developed which make more explicit use of historical evidence from a period prior to the latest (2015) mid-year population estimates. The **PG 5yr**⁴ and **PG 5yr-X** scenarios derive internal migration rates and international migration flow assumptions from the historical five year period 2010/11–2014/15. The difference between the two scenarios is that the UPC adjustment to Kirklees population growth 2001–2011, is excluded from the derived migration assumptions in the **PG 5yr-X** scenario.
- 3.4 The **PG 10yr** and **PG 10yr-X** scenarios derive internal migration rates and international migration flow assumptions from a longer 10-year period, 2005/06 to 2014/15. The **PG 10yr-X** scenario again excludes any UPC adjustment in setting migration assumptions.

³ <https://www.ons.gov.uk/populationandmigration/populationprojections/methodologies/>

⁴ Note that PG refers to POPGROUP, the demographic forecasting software used to develop the scenario forecasts.

Kirklees Scenario Outcomes

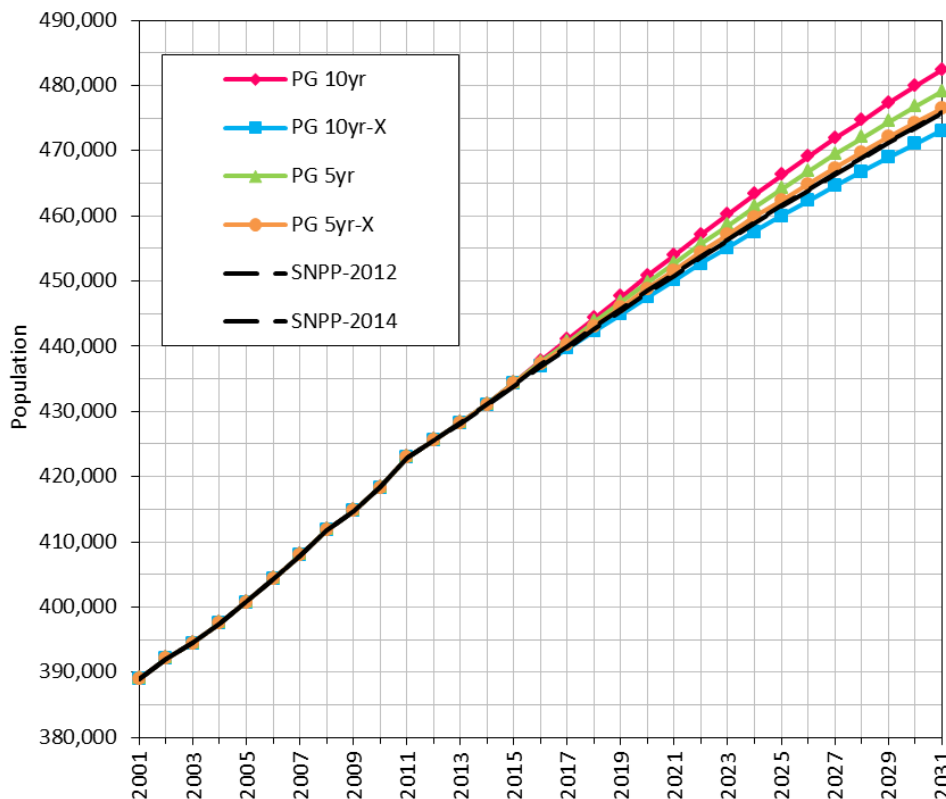


Figure 6: Kirklees population growth 2001–2031

Table 3: Kirklees scenario outcomes 2013–2031

Scenario	Change 2013–2031				Average per year	
	Population Change	Population Change %	Households Change	Households Change %	Net Migration	Dwellings
PG 10yr	54,042	12.6%	31,605	17.9%	1,080	1,833
PG 5yr	50,737	11.8%	29,923	17.0%	974	1,735
PG 5yr-X	48,185	11.3%	28,132	16.0%	833	1,631
SNPP-2012	47,617	11.1%	26,621	15.1%	427	1,544
SNPP-2014	47,581	11.1%	27,325	15.5%	734	1,584
PG 10yr-X	44,755	10.4%	26,303	14.9%	581	1,525

Scenario Results

- 3.5 Each of the scenarios has been run using historical MYEs for the 2001–2015 period. Scenario results are displayed for Kirklees’ designated plan period 2013–2031 (Figure 6 and Table 3). The plan period includes two years of historical data (2013/14 and 2014/15), with forecasts derived from a 2015 base year, except for the **SNPP-2012** and **SNPP-2014** scenarios, which retain their 2012 and 2014 base years respectively.
- 3.6 Population growth under the scenarios ranges from 10.4% under the **PG 10yr-X** scenario to 12.6% under the **PG 10yr** scenario, producing an average annual dwelling requirement range of 1,525–1,833 per year.
- 3.7 Under the **SNPP-2014** scenario, Kirklees’ population is projected to increase by 11.1% between 2013 and 2031, resulting in an average annual dwelling requirement of +1,584 per year. Under the assumptions set by the **SNPP-2012** scenario, population growth of 11.1% closely aligned to that expected under the **SNPP-2014**, however results in slightly lower dwelling growth.
- 3.8 The **PG 10yr** scenario produces a 12.6% population growth, which is higher than the **PG 5yr** scenario at 11.8%. These population growth figures result in an average annual dwelling growth of 1,833 and 1,735 respectively over the 2013–2031 plan period.
- 3.9 The exclusion of the UPC component in the **PG X** scenarios, results in lower overall population growth. Under the **PG 10yr-X** scenario, population growth is lowest (10.4% over the 2013–2031 plan period), resulting in a dwelling requirement average of +1,525 per year. Under the **PG 5yr-X** scenario, population growth of 11.3% results in an average annual dwelling growth of +1, 631 per year.

4 Summary

- 4.1 Using Kirklees' 2014-based SNPP as a benchmark, a number of alternative trend scenarios of demographic change have been presented. These alternatives consider variant migration assumptions drawn from different historical periods and both include and exclude the UPC adjustment associated with the higher population growth evident between 2001–2011.
- 4.2 With the inclusion of the UPC adjustment, the **PG 10yr** and **PG 5yr** scenarios present the highest growth outcomes and reflect a continuation of the population growth that has been recorded in Kirklees from 2001 to the latest 2015 mid-year population estimate.
- 4.3 Although using an additional year of historical evidence (2015), the **PG 5yr-X** and **PG 10yr-X** scenarios are more consistent with the **SNPP-2014** scenario approach in that UPC is not considered in the migration assumptions. These result in lower population and dwelling growth over the plan period.
- 4.4 Household and dwelling growth have been estimated using assumptions from the 2014-based DCLG household projection model for Kirklees. A summary of the dwelling growth outcomes associated with each scenario is presented in Figure 7.

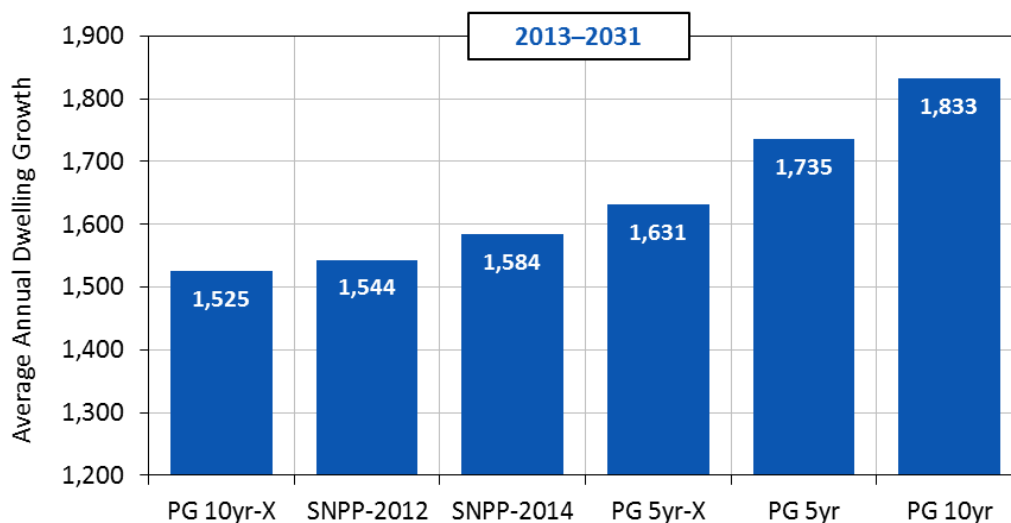


Figure 7: Dwelling growth outcomes for Kirklees 2013–2031