Craven

Updating the demographic evidence

November 2017

For the attention of:

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Acknowledgements

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Introduction

1.1 In August 2016, Edge Analytics presented a range of economic and demographic evidence to inform the development of Craven's Objective Assessment of Housing Need (OAN). The 2014-based sub-national population projection (SNPP) from the Office for National Statistics (ONS) and the 2014-based household projection from the Department for Communities and Local Government (DCLG) formed the basis of the derived demographic scenarios.

1.2 Employment forecasts from the 2014 and 2016 Regional Econometric Model (REM) were considered, alongside economic assumptions from the 2014 Office for Budget Responsibility (OBR) labour market analysis. A later September 2016 REM forecast was presented as an *addendum* in October 2016.

1.3 All scenario evidence was presented for Craven district and for its sub-district areas (Figure 1).

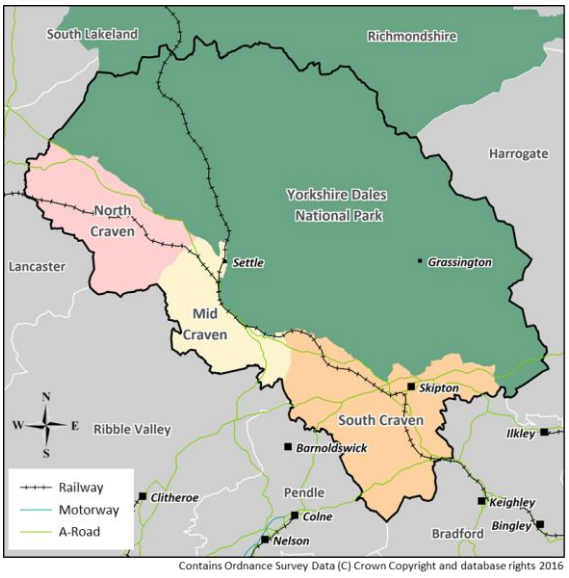


Figure 1: Craven geographical definition

1.4 The resulting Strategic Housing Market Assessment (SHMA)[1] for Craven identified an OAN of **214** dwellings per annum (dpa); informed by the PG Long Term scenario, with an uplift based on 20% of the SNPP-2014 growth outcome to account for affordability adjustments.

[1] http://m.cravendc.gov.uk/CHttpHandler.ashx?id=12060&p=0

1.5 Since completion of the SHMA, DCLG has published its Housing White Paper detailing a draft methodology[2] for a more standardised approach to OAN calculation across English local authorities. This methodology implies **165** dwellings per annum (dpa)[3] figure for Craven over the ten-year period 2016–2026 (160 dpa when applied to the extended 2012–2032 plan period).

1.6 In addition to the new DCLG evidence, Craven's 2016 mid-year population estimate (MYE) has been published by ONS, the OBR has published its new labour market analysis and revised economic forecasts have been produced from the REM.

1.7 Craven District Council is seeking to review and validate its choice of OAN in the light of the new demographic and economic evidence. In doing so, it is seeking to better align its SHMA and Employment Land Review (ELR) analysis, in preparation for submission of its Local Plan.

1.8 The analysis presented in this report, refreshes the underpinning demographic and economic statistics using the latest available evidence. In doing so, a revised suite of growth forecasts have been derived for the district and for the four sub-district areas. Consideration is given to the potential impact of higher rates of household formation amongst the young adult population.

[2] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/644955/Planning_for_Homes_consultation_document.pdf

[3] Note that the DCLG figure for Craven published in the consultation table is 151 households per annum (2016–2026).

2 Demographic Profile

Population Change

2.1 The latest MYE for Craven estimates a population of 56,308 in 2016, a 1% increase since 2015 and a 5% increase overall since 2001 (Figure 2).

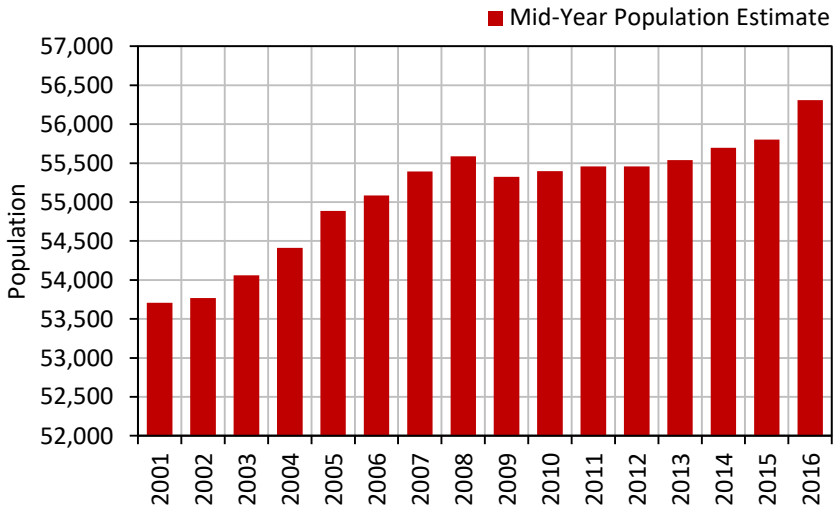


Figure 2: Craven mid-year population estimates 2001–2016

2.2 The 'components of population change' chart illustrates the drivers of Craven's population growth under the MYEs, including the 'Unattributable Population Change' (UPC) component resulting from population adjustment following the 2011 Census (Figure 3).

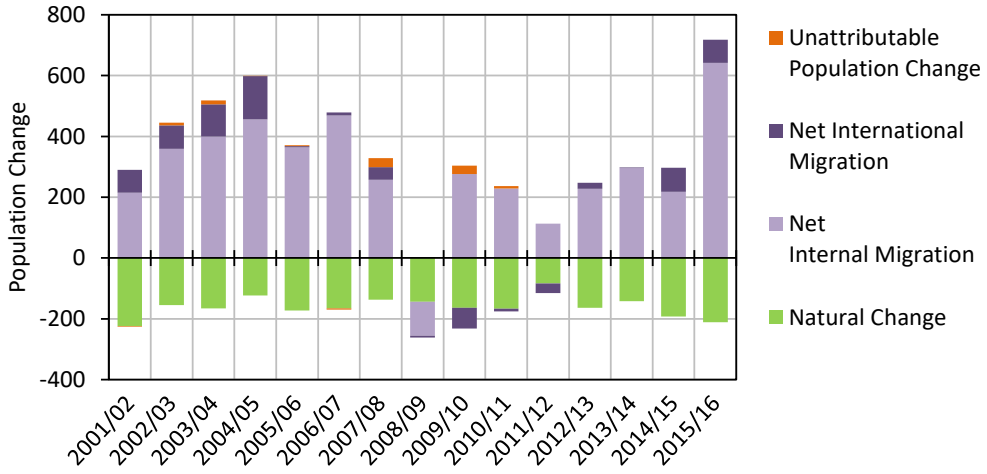


Figure 3: Craven MYE components of population change

2.3 Internal migration flows have resulted in an annual net inflow in all years except 2008/09, with a particularly large net inflow in 2015/16. Net international migration has made only a small continuation to annual population change in Craven. Natural change (the difference between births and deaths) has had a consistently negative impact upon annual growth, reflecting the older age-profile of Craven's population.

2.4 Craven's population has aged over the last 15-years. In 2001, the population aged 65+ was equivalent to 20% of the total population (Table 1). By 2016, this had increased to 26%. The Old Age Dependency (OAD) ratio compares the population aged 65+ relative to the 15–64 population. In 2001, the OAD was 33, with the size of the population aged 65+ equivalent to 33% of the 15–64 population total. This had increased to 44 by 2016.

Table 1: Craven - MYE population age structure 2001, 2011 & 2016

	2001	2011	2016
Aged 65+	20%	23%	26%
Aged 80+	6%	7%	7%
OAD Ratio	33	37	44
Median Age	43	47	50

OAD = Old Age Dependency Ratio (Population Aged 65+/Population Aged 15–64)

2.5 The net outflow of the younger population through migration, combined with the natural ageing of the resident population, is driving the process of population ageing in Craven. A continuation of this process has particular implications for the district's economic aspirations and, by default, its assessment of future housing need.

Internal Migration

2.6 For internal migration, it was the sharp fall in the level of out-migration, coupled with an increase in in-migration that led to a higher net inflow in 2015/16. In the preceding years (with the exception of 2008/09) the annual variation in in-migration had generally been followed by a similar variation in out-migration, producing a net inflow between 0–500 each year (Figure 4).

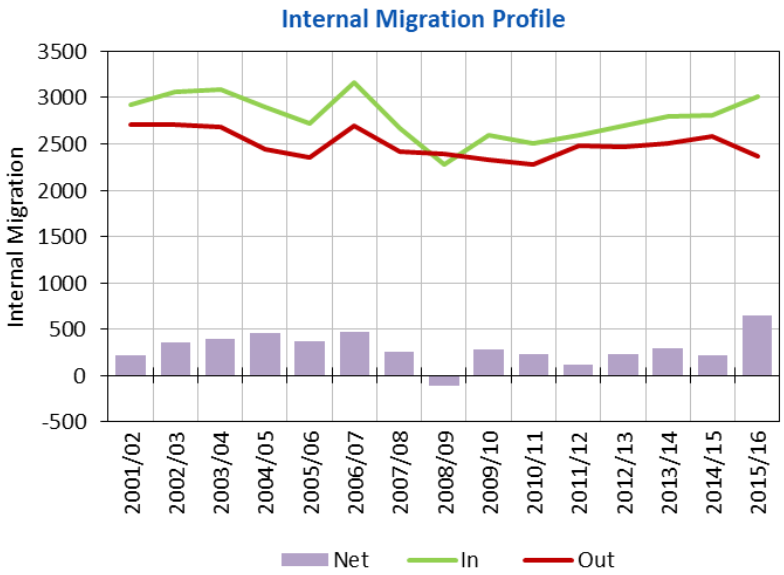


Figure 4: Craven internal migration flows, 2001/02–2015/16

2.7 Craven's largest net in-migration exchanges since 2001 has been from the neighbouring Bradford district (Figure 5). The largest (but smaller) net outflow exchanges have been to Lancaster and Harrogate.

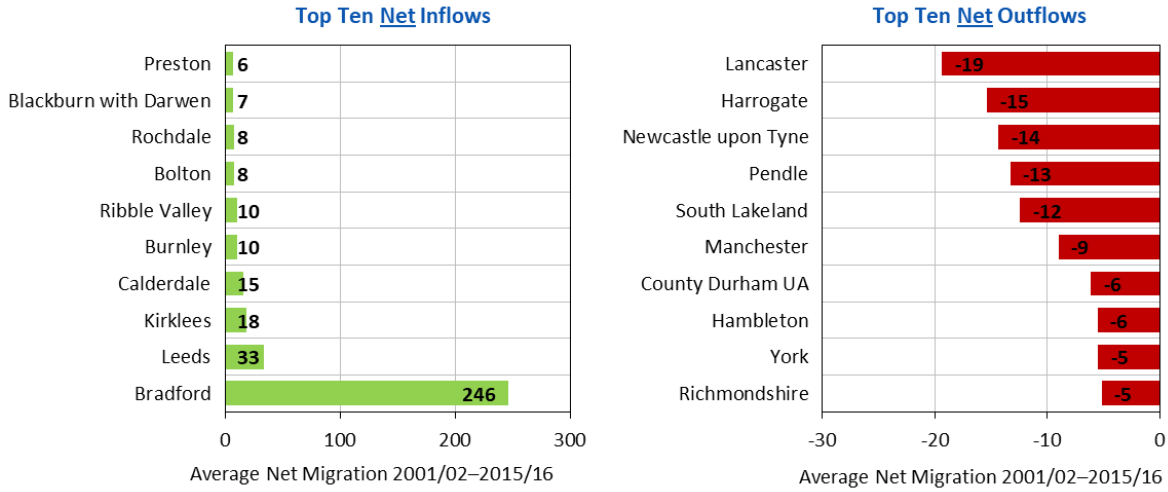


Figure 5: Average net migration outflows from Craven (2001/02–2015/16)

2.8 The age profile of migration reveals that Craven has experienced a significant net outflow in the 15–19 age-group, associated with student moves to higher education. There is no significant return flow in the 20–24 age-group, with highest net inflows associated with the 30–64 age-range.

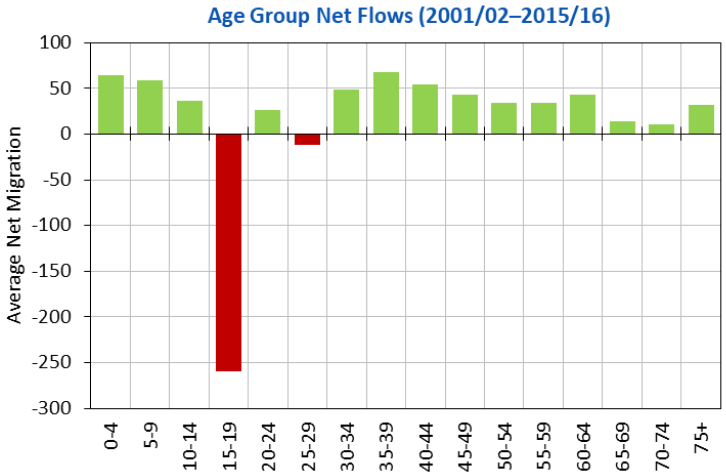


Figure 6: Craven internal migration age profile 2001/02–2015/16 (Source: ONS)

International Migration

2.9 The relatively small impact of international migration upon Craven's annual population growth is reflected in its profile of National Insurance Number (NINo) registrations. NINO registrations peaked in 2006–2008 at just over 200 per year, reducing to below 150 per year thereafter (Figure 7). The overwhelming number of migrants has originated from EU countries.

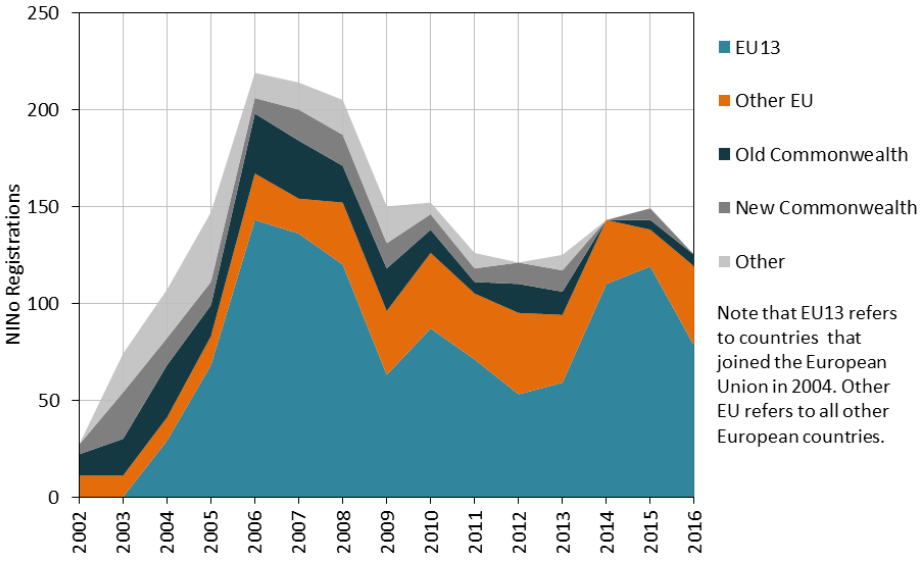


Figure 7: Craven NINo registrations 2002–2016

Sub-District Growth Profile

2.10 The Yorkshire Dales National Park (YDNP) covers 68% of Craven, yet accommodates only 18% of Craven's 2016 total population. South Craven is home to 60% of the population, with Mid-Craven and North Craven each having 11% of the district's total population (Figure 8).

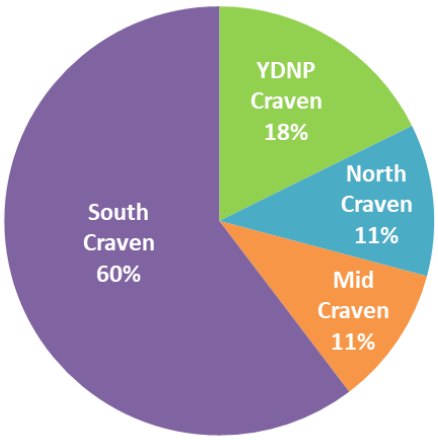


Figure 8: Craven sub-districts' share of population in 2016 (Source: ONS)

2.11 Craven's growth since 2001 has been a composite of different levels of population change across the four sub-district areas (Figure 9).

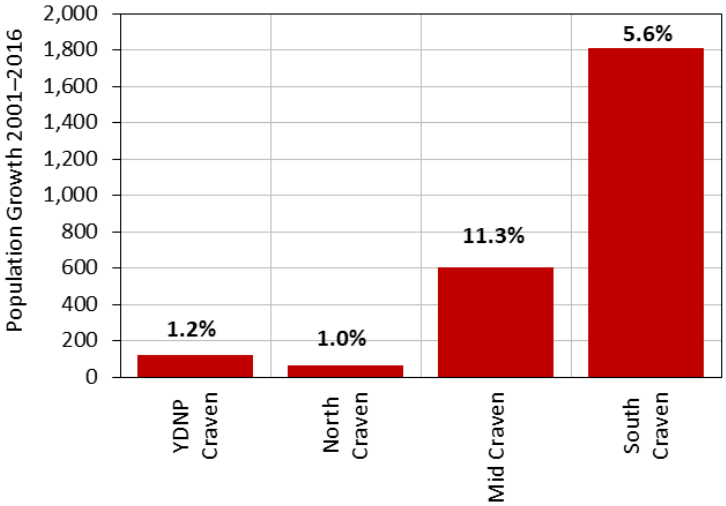


Figure 9: Craven sub-district population change 2001–2016

2.12 With 60% of the district's population, South Craven has seen the largest population growth in absolute terms, equivalent to a 5.6% rise over the 2001–2016 period. Mid-Craven's population has grown by a smaller amount but more significantly in percentage terms (11.3%), with the majority of its growth concentrated in the period before 2008 but with some recovery post-2012.

North Craven and the YDNP populations have remained relatively stable in comparison, with no growth evident in the last three years (Figure 10).

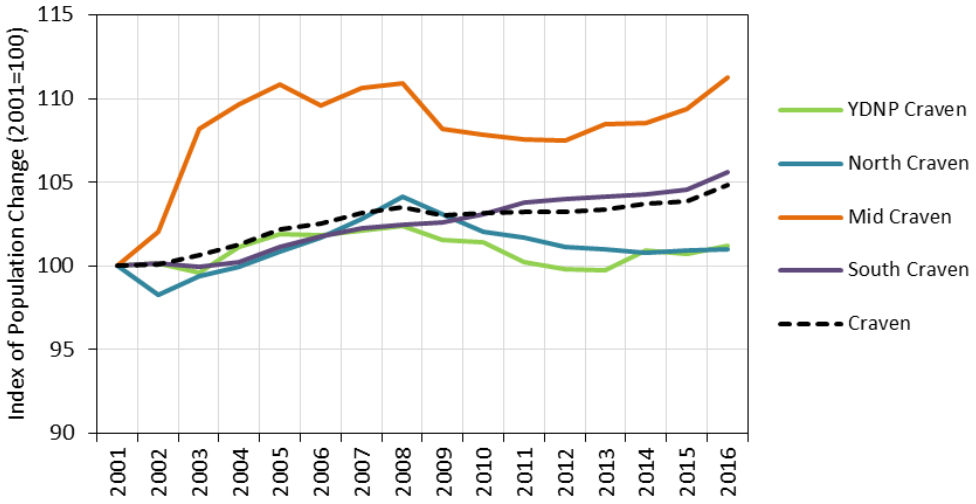


Figure 10: Craven sub-districts: index of population change 2001–2016

2.13 The components of population change illustrate how net migration and natural change have contributed to population growth in each of the four sub-district areas (Figure 11). All areas have experienced a net loss due to natural change, with an excess of deaths over births. Population change has been driven by net in-migration, linked to housing growth, particularly in South Craven.

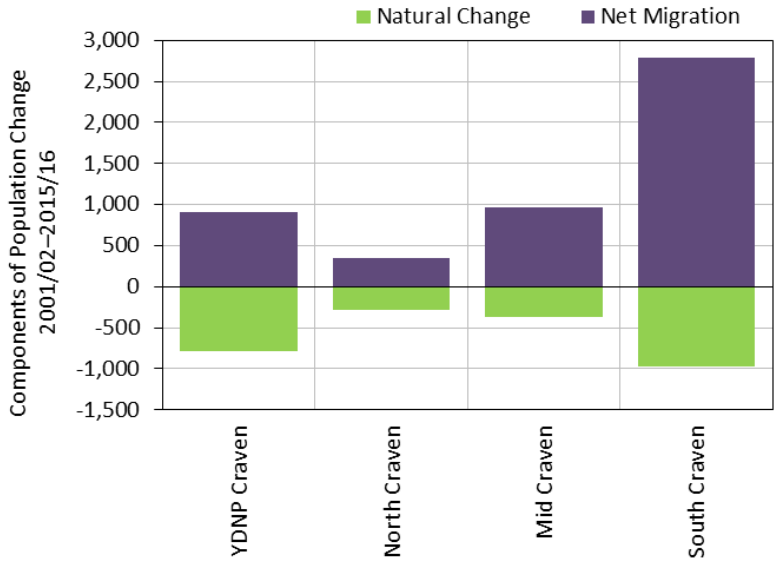


Figure 11: Craven sub-district components of population change 2001–2016

3 Demographic Forecasts

Planning Guidance

3.1 At present, the Planning Practice Guidance (PPG) states that the DCLG household projections should provide the *"starting point estimate of overall housing need"* (PPG paragraph 2a-015). The 2014-based model is the latest set of household projections from the DCLG, underpinned by the 2014-based sub-national population projection (SNPP). The 2014-based household and population projection models extend over a 2014–2039 projection period.

3.2 As a starting point for Craven, the 2014-based SNPP estimates population growth of 4.0% over the 2014–2032 period (i.e. Craven's plan period excluding two years of historical data preceding the 2014-based SNPP). This results in an annual growth in *household* numbers of 118 per year (2014–2032).

3.3 In September 2017, DCLG published its Housing White Paper detailing a draft methodology for a more standardised approach to OAN calculation across English local authorities. A three-step approach is proposed to calculating a housing need estimate:

- **Step 1:** The 'starting-point' household total is based on DCLG's 2014-based projection.
- **Step 2:** An adjustment is applied based on a local affordability ratio.
- **Step 3:** A 40% 'cap' on the level of adjustment is applicable to those local authorities that have adopted Local Plans in the last 5 years or do not currently have a Local Plan.

3.4 The DCLG methodology has presented an OAN estimate for each local authority for a 2016–2026 plan period. At present, as there are no guidelines published for Council's with an extended Local Plan period or a base date prior to 2016, there remains some uncertainty around the approach that should be taken to extrapolate the methodology to meet the requirements of the NPPF (i.e. preferably a 15 year plan period[4]).

3.5 The published OAN figure for Craven is 151 *households* per year (2016–2026). There are no guidelines in the methodology which suggest conversion from households to an OAN measured

[4] https://www.gov.uk/guidance/national-planning-policy-framework/plan-making#para150

in dwellings. However, taking account of vacant properties and second homes in Craven in the OAN calculation[5], the estimated household growth would result in an equivalent housing OAN of 165 *dwellings* per annum (dpa).

Demographic Scenarios

3.6 The demographic evidence presented in the previous sections provides context for developing a range of trend-based scenarios which consider variant migration histories. Four trend scenarios are presented, including the 2014-based Sub-National Population Projection (SNPP) 'benchmark' for Craven.

3.7 Under all scenarios, excluding the **SNPP-2014** which has a 2014 base year, ONS population estimates are included for 2001–2016. Assumptions on fertility, mortality and migration are applied to estimate the population growth and components of change over the forecast period.

3.8 The following scenarios have been developed using POPGROUP v4.0 technology:

- **SNPP-2014:** This is the 2014-based SNPP for Craven and is presented as the 'benchmark' scenario
- **SNPP-2014 Rebased:** This is the 2014-based SNPP for Craven, rebased to align with the 2015 and 2016 mid-year estimates.
- **PG Short-Term:** Internal migration rates and international migration flow assumptions are based on the last six years of historical evidence (2010/11–2015/16).
- **PG Long-Term:** Internal migration rates and international migration flow assumptions are based on the last fifteen years of historical evidence (2001/02–2015/16). The small 'unattributable population change' (UPC) component is included in international migration assumptions.

3.9 The population growth under each of the scenarios is presented in the form of a chart (Figure 12), with the population change, net migration, natural change and associated household and dwelling growth for the 2012–2032 plan period presented in Table 2.

[5] 2011 Census vacancy rate is 8.9% for Craven

3.10 Under each of the scenarios, household and dwelling growth has been estimated using assumptions from the 2014-based household projection model, incorporating a 2011 Census vacancy rate for Craven of 8.9%.

3.11 Of the four scenarios presented, the 'benchmark' **SNPP-2014** results in the lowest population growth outcome for Craven, with 4.4% growth over the 2012–2032 plan period and an estimated dwelling requirement of 130 dwellings per annum (dpa).

3.12 The **SNPP-2014** has underestimated population growth evident in 2015 and 2016, so the **SNPP-2014-Rebased** scenario aligns the growth profile of the **SNPP-2014** with this later population evidence. This results in a slightly higher population change of 5.4% over the plan period and a dwelling requirement of 141 dpa.

3.13 The alternative '**PG**' trend scenarios result in higher population growth than the **SNPP-2014** or its rebased equivalent. In addition, these scenarios result in higher growth outcomes than comparable evidence used to inform the SHMA[6]. This is because the **PG Short Term** and **PG Long Term** scenarios are influenced by the sharp rise in net in-migration to Craven evident in 2015/16.

3.14 With population growth of 7.1% over the plan-period, the **PG Short Term** scenario estimates a dwelling requirement of 167 dpa, 19% higher than the 140 dpa figure presented in the earlier SHMA demographic analysis. The sharp rise in Craven's net migration total in 2015/16 has a particularly strong impact on this scenario as its migration assumptions are drawn from the last six years of Craven's components of change history.

3.15 The **PG Long Term** scenario also demonstrates an uplift from previous evidence but to a lesser degree given that its migration history is based on a fifteen-year period, dampening the effect of the 2015/16 total. The **PG Long Term** scenario estimates 9.8% population growth, with a dwelling requirement of 199 dpa, approximately 6% higher than the 188 dpa total from previous evidence.

3.16 Whilst the **SNPP-2014**, **SNPP-2014-Rebased** and **PG Short Term** scenarios are influenced by the period of relatively flat population growth in Craven during 2009–2014, the **PG Long Term** scenario includes the period 2001–2008 in the derivation of its future growth assumptions, resulting in the highest annual dwelling growth over the plan period.

[6] *Demographic Forecasting Update: Including an addendum with additional scenario analysis.* October 2016. Edge Analytics. http://m.cravendc.gov.uk/CHttpHandler.ashx?id=12343&p=0

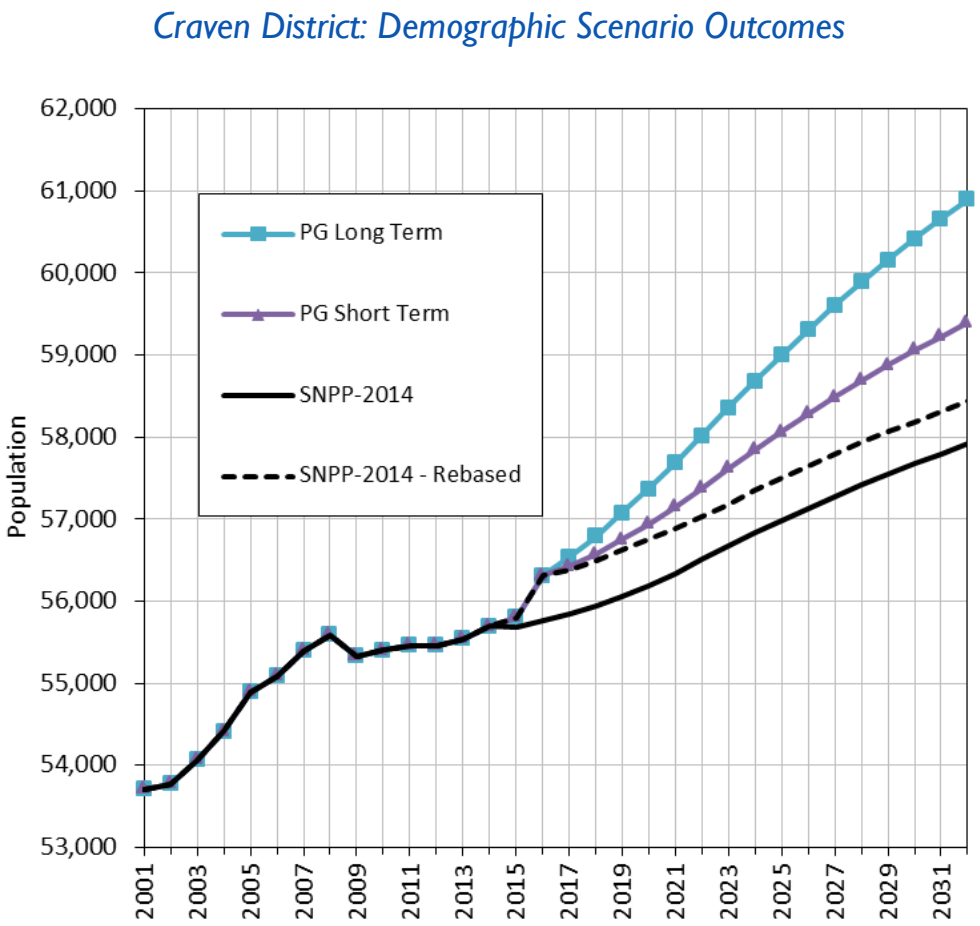


Figure 12: Craven population change 2001–2032

Table 2: Demographic scenario outcomes 2012–2032

Scenario	Change 2012–2032				Average per year	
	Population Change	Population Change %	Households Change	Households Change %	Net Migration	Dwellings
PG Long Term	5,439	9.8%	3,625	14.7%	465	199
PG Short Term	3,934	7.1%	3,040	12.3%	403	167
SNPP-2014 - Rebased	2,984	5.4%	2,567	10.4%	349	141
SNPP-2014	2,465	4.4%	2,359	9.6%	323	130

Note: Scenarios are ranked in order of population change

Household Formation

3.17 Across the UK, younger adult age groups have seen the most significant change in household formation over the last ten years, due to a combination of housing undersupply and affordability issues. In formulating an OAN, PPG recommends that *"alternative assumptions in relation to…household formation rates"* are considered (PPG Paragraph 2a-017) to evaluate a potential 'reversal' of this trend.

3.18 In the demographic forecasts for Craven detailed above, the DCLG 2014-based household headship rates (also known as household representative rates) determine the level and profile of household growth by age group and household category. The charts in Appendix B compare Craven's headship rate trends for the DCLG's 2014-based and 2008-based household projection models. The young adult, 25–34 age group suggest a lower rate of growth in the 2014-based model compared to the 2008-based equivalent.

3.19 To evaluate the effect of changes to young adult household formation over time, a *'Partial Return'* set of rates have been generated for Craven in which the 2014-based headship rates for the 25–34 age group return to a mid-point between the 2014- and 2008-based rates by 2033[7].

Table 3: Demographic scenarios average annual dwelling growth 2012–2032

Scenario	Average Annual Dwelling Growth 2012–2032	
	2014-based	2014-based Partial Return
PG Long Term	199	202
PG Short Term	167	170
SNPP-2014 - Rebased	141	144
SNPP-2014	130	132

Note that scenarios are ranked in order of annual dwelling growth change under the 2014-based headship rates.

3.20 The application of the *'Partial Return'* headship rates to each of the demographic scenarios increases the plan-period dwelling growth by **+3** dpa (approximately 1.8%). This increases the *maximum* dwellings per annum under the scenarios from **199** using the unadjusted headship rates, to **202** applying the *Partial Return* headship rates.

[7] Headship rates are returned by 2033, broadly aligning with the LPEG methodology.

4 Economic Growth

Economic Forecasts

4.1 In the assessment of housing need, the PPG states that *"plan makers should make an assessment of the likely change in job numbers based on past trends and/or economic forecasts as appropriate and also having regard to the growth of the working age population in the housing market area"* (PPG paragraph 2a-018).

4.2 In the previous demographic analysis undertaken for Craven District Council, the REM provided an economic forecast for Craven, dated June 2016. This forecast was presented alongside an earlier 2014 forecast derived from the REM. Trajectories of FTE jobs growth were provided for each, although no additional information was provided on key underpinning assumptions associated with these economic growth outcomes.

4.3 The alignment of demographic and economic model evidence is challenging due to different methodologies, data inputs and assumptions. The key underpinning assumptions that link population and economic change are: (1) economic activity rates; (2) unemployment rates; (3) a commuting ratio.

4.4 Future economic activity rates are a key consideration in seeking to align demographic and economic growth. Economic activity rates determine the size of the resident labour force. The unemployment rate and commuting ratio determine the balance between the labour force and associated level of employment. The unemployment rate, determines the proportion of the labour force that is unemployed and as a result, the proportion that is employed. The commuting ratio determines the balance between the resident labour force and the number of jobs available in an area.

4.5 In the absence of these assumptions in the previous REM evidence, the Craven analysis included a series of 'jobs-led' scenarios, in which the link between economic and demographic change was evaluated using a series of derived assumptions. This choice of assumptions enabled an estimate of dwelling growth, linked to economic change to be presented.

4.6 For the updated analysis presented here, a new REM forecast has been made available, dated March 2017. This has provided a measure of both FTE jobs growth and the change in 'workplace-based employment'. Availability of the latter is important as, with the additional provision of the underpinning assumptions on economic activity rates, unemployment rate and commuting ratio, an improved alignment of the forecast to the demographic evidence has been possible.

4.7 The March 2017 REM forecast suggests a fall in Craven's employment totals to 2018 but a recovery thereafter, assuming growth of +470 in the level of 'workplace-based employment' after 2018 (Figure 13).

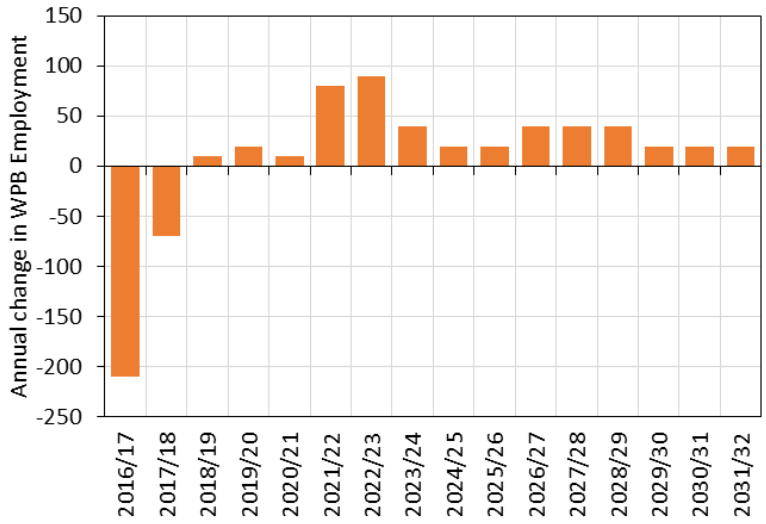


Figure 13: Craven – REM workplace-based employment change (2016–2032)

4.8 This forecast of economic growth is underpinned by a commuting ratio that remains constant through the forecast period; an unemployment rate that reduces from 3.0% to 2.4%; and an aggregate economic activity rate (ages 16–89) that reduces from 61.4% in 2016 to 59.9% in 2032.

Employment-led Scenarios

4.9 Using an 'employment-led' formulation of the POPGROUP model, it is possible to estimate the population and dwelling growth implications of the REM economic forecast. This enables direct comparison with the demographic forecasts presented in section 3.

4.10 Two employment-led scenarios are presented. The first, **Employment-led**, uses the economic activity rates, unemployment rate and commuting ratio assumptions direct from the REM, using these to estimate the population and dwelling growth impact of the employment growth

trajectory. To reiterate, these assume a commuting ratio that remains constant through the forecast period; an unemployment rate that reduces from 3.0% to 2.4%; and an aggregate economic activity rate (ages 16–89) that reduces from 61.5% in 2016 to 59.9% in 2032.

4.11 Given the uncertainty over future rates of economic activity (particularly in an area such as Craven with a relatively high older-age population profile) plus the availability of the new OBR labour force analysis[8], a second employment-led scenario has been produced, **Employment-led OBR**. The **Employment-led OBR** scenario maintains the same trajectory of employment growth and retains the assumptions on commuting and unemployment. However, it varies Craven's age-specific economic activity rates in line with evidence from the OBR's labour force projections.

4.12 The results of the employment-led scenarios are presented alongside the **SNPP-2014-Rebased, PG Short Term** and **PG Long Term** scenarios (Figure 14 and Table 4). In all cases, population growth to 2016 is determined by the MYE. After 2016, population growth is determined by the trend assumptions in the demographic scenarios and by the employment growth and economic assumptions in the employment-led scenarios.

4.13 The **Employment-led** scenario results in an average annual dwelling growth requirement of 149 dpa, slightly higher than that estimated by the **SNPP-2014-Rebased** outcome**.** The inclusion of the OBR assumptions to the underpinning economic activity rates (**Employment-led OBR**), results in a higher population growth and a dwelling growth of 161 dpa, a total that is almost consistent with the **PG Short Term** growth total**.**

4.14 The **PG Long Term** scenario results in a significantly higher population and dwelling growth outcome. Its 9.8% population growth 2012–2032, equates to an average annual dwelling growth of 199 dpa.

[8] http://cdn.budgetresponsibility.org.uk/FSR_Jan17.pdf

Craven District:

Demographic & Employment-Led Scenario Outcomes

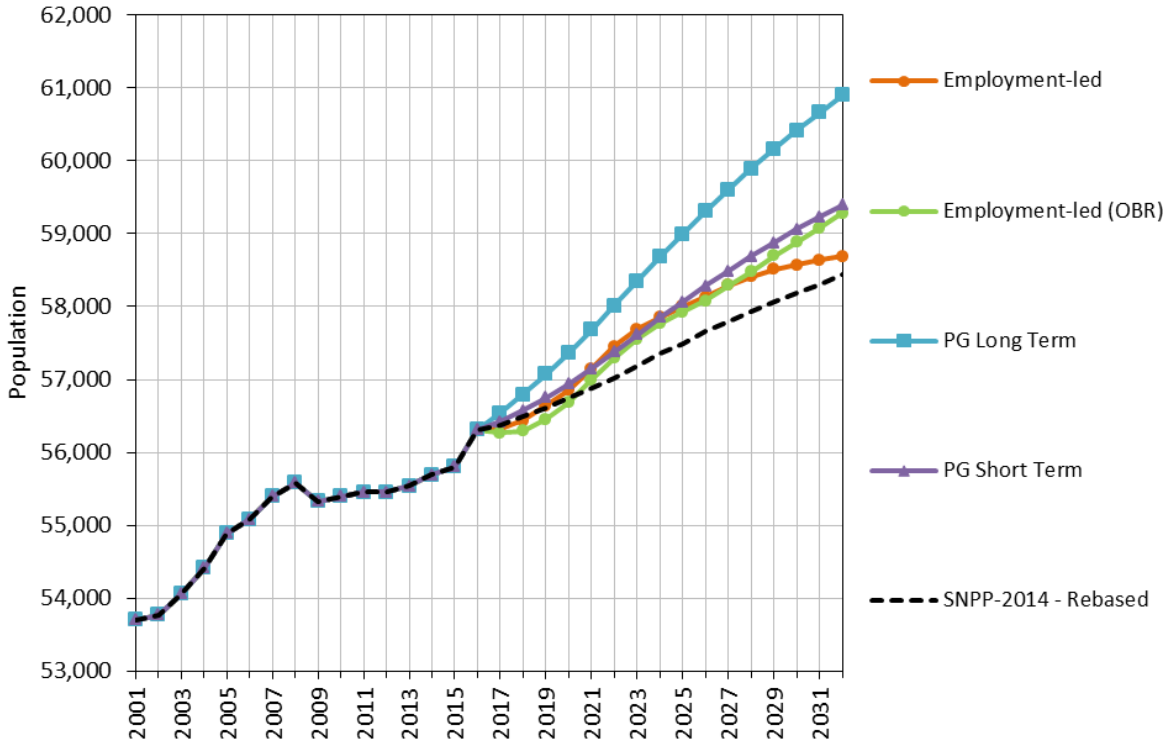


Figure 14: Craven population change 2001–2032

Table 4: Demographic and Economic-led scenario outcomes 2012–2032

Scenario	Change 2012–2032				Average per year	
	Population Change	Population Change	Households Change	Households Change %	Net Migration	Dwellings
PG Long Term	5,439	9.8%	3,625	14.7%	465	199
PG Short Term	3,934	7.1%	3,040	12.3%	403	167
Employment-led (OBR)	3,821	6.9%	2,933	11.9%	390	161
Employment-led	3,232	5.8%	2,713	11.0%	360	149
SNPP-2014 - Rebased	2,984	5.4%	2,567	10.4%	349	141

5 Sub-District Scenario Results

5.1 The following series of charts present population growth for the 2001–2032 period for each of the four sub-district areas: North Craven, Mid Craven, South Craven and the area of the YDNP that falls within Craven (see Figure 1 on page 1).

5.2 The tables present population and household change for the 2012–2032 plan period, plus the average annual net migration and the estimated average annual dwelling requirement. Household and dwelling growth is estimated using assumptions from the 2014-based DCLG household model and sub-district dwelling vacancy rate. Scenarios are ranked in order of population change.

5.3 Although the population growth estimates for the sum of the four sub-district areas are equivalent to those generated for Craven as a whole, there are differences in the household and dwelling totals produced by the sub-district analysis. These small discrepancies are the result of using different population, migration and headship-rate combinations at sub-district level. The household and dwelling outcomes are generally slightly higher at sub-district level.

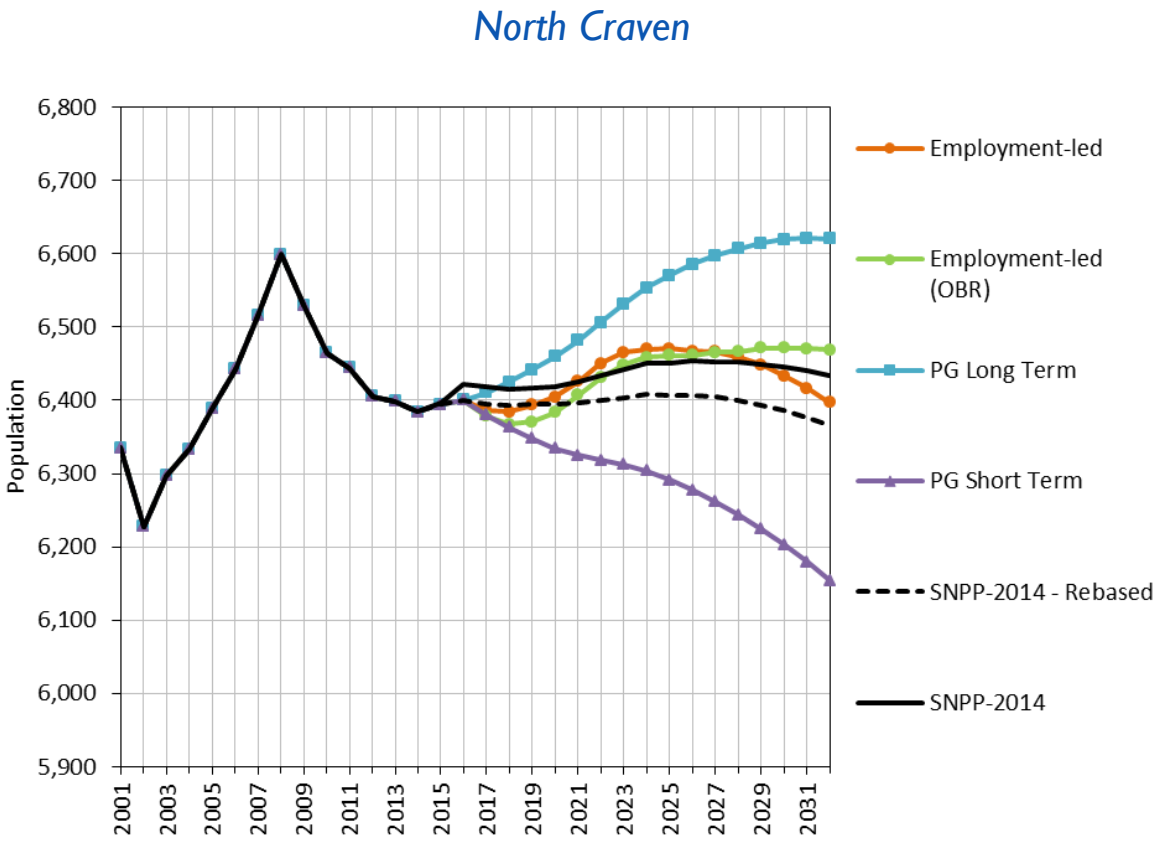


Figure 15: North Craven scenarios: population growth 2001–2032

Table 5: North Craven scenarios 2012–2032

Scenario	Change 2012–2032				Average per year	
	Population Change	Population Change %	Households Change	Households Change %	Net Migration	Dwellings
PG Long Term	214	3.3%	322	11.3%	36	18
Employment-led (OBR)	63	1.0%	255	8.9%	29	14
SNPP-2014	28	0.4%	223	7.8%	25	13
Employment-led	-9	-0.1%	228	8.0%	25	13
SNPP-2014 - Rebased	-39	-0.6%	212	7.4%	24	12
PG Short Term	-252	-3.9%	64	2.2%	14	4

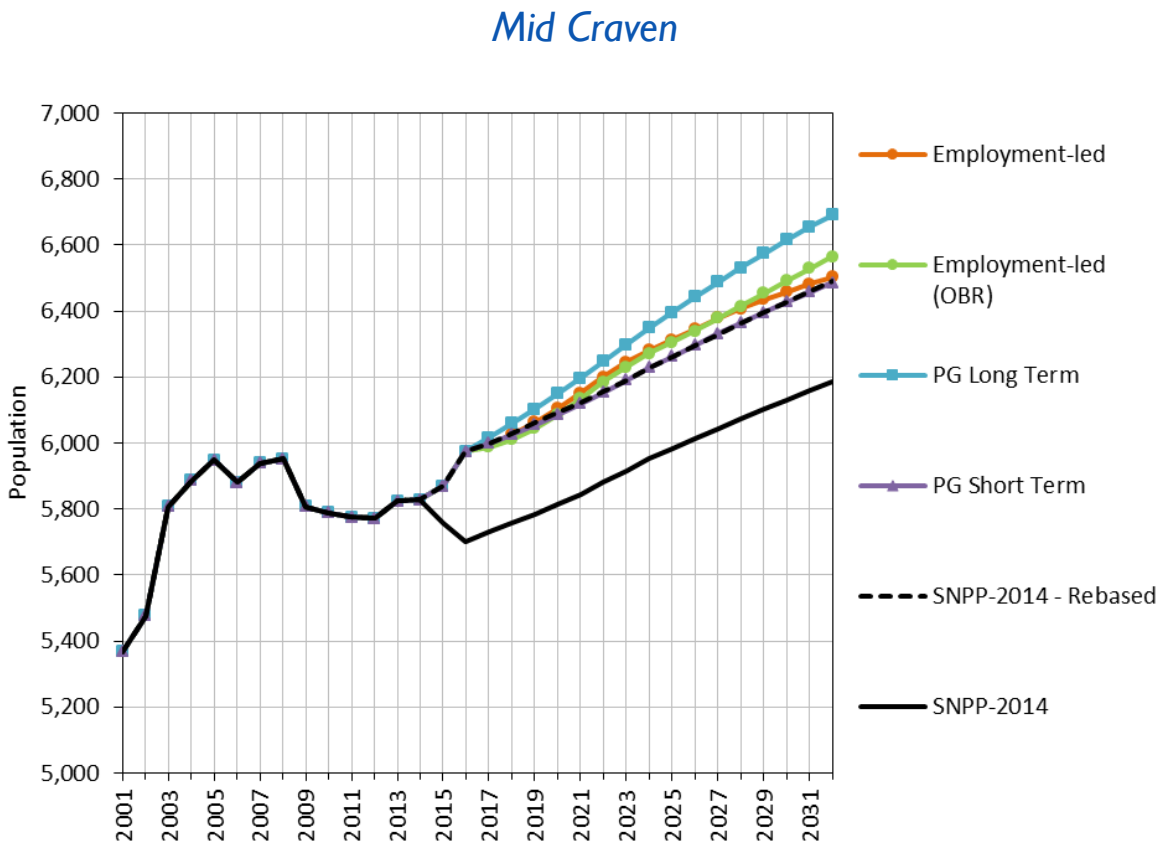


Figure 16: Mid Craven scenarios: population growth 2001–2032

Table 6: Mid Craven scenarios 2012–2032

Scenario	Change 2012–2032				Average per year	
	Population Change	Population Change %	Households Change	Households Change %	Net Migration	Dwellings
PG Long Term	921	16.0%	646	25.2%	77	37
Employment-led (OBR)	795	13.8%	586	22.9%	71	33
Employment-led	732	12.7%	560	21.9%	68	32
SNPP-2014 - Rebased	722	12.5%	523	20.4%	66	30
PG Short Term	716	12.4%	603	23.5%	68	34
SNPP-2014	415	7.2%	420	16.4%	53	24

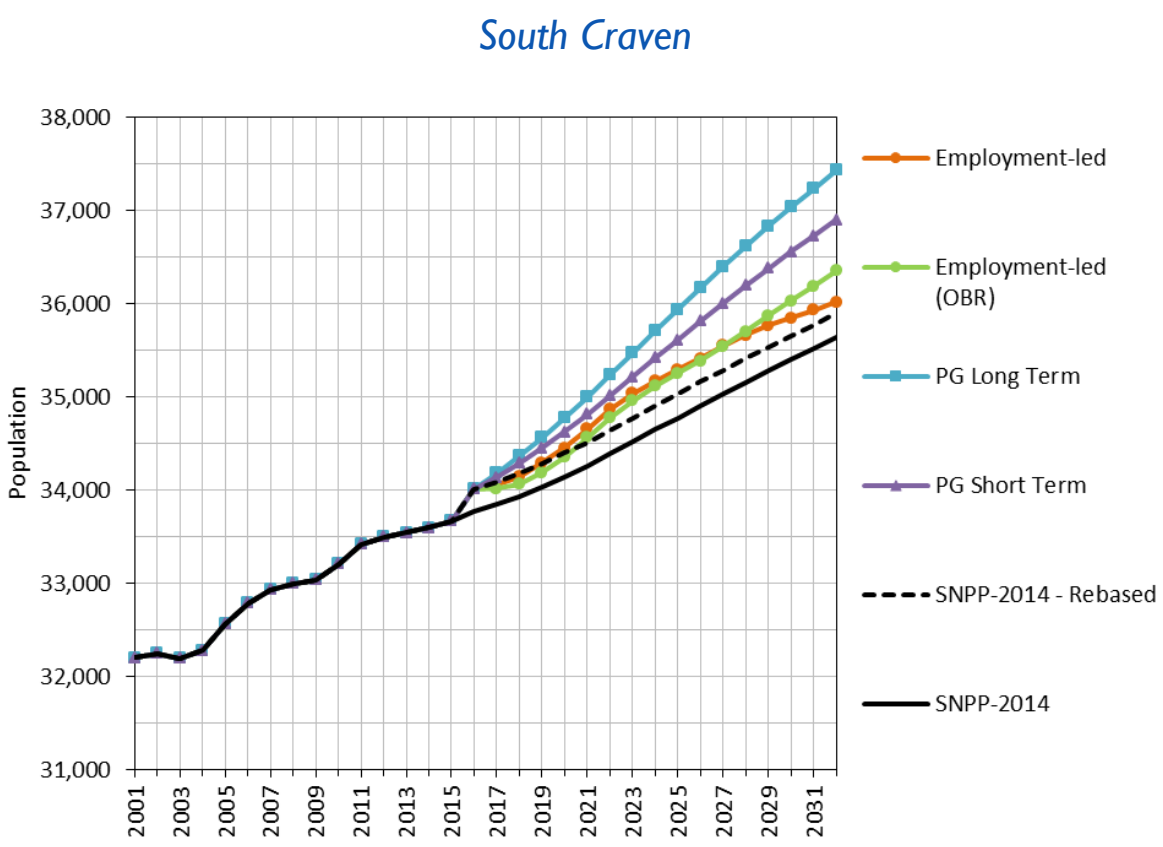


Figure 17: South Craven scenarios: population growth 2001–2032

Table 7: South Craven scenarios 2012–2032

Scenario	Change 2012–2032				Average per year	
	Population Change	Population Change %	Households Change	Households Change %	Net Migration	Dwellings
PG Long Term	3,939	11.8%	2,146	14.4%	267	114
PG Short Term	3,402	10.2%	2,014	13.5%	252	107
Employment-led (OBR)	2,861	8.5%	1,681	11.3%	216	89
Employment-led	2,520	7.5%	1,555	10.4%	199	82
SNPP-2014 - Rebased	2,408	7.2%	1,510	10.1%	196	80
SNPP-2014	2,149	6.4%	1,392	9.3%	182	74

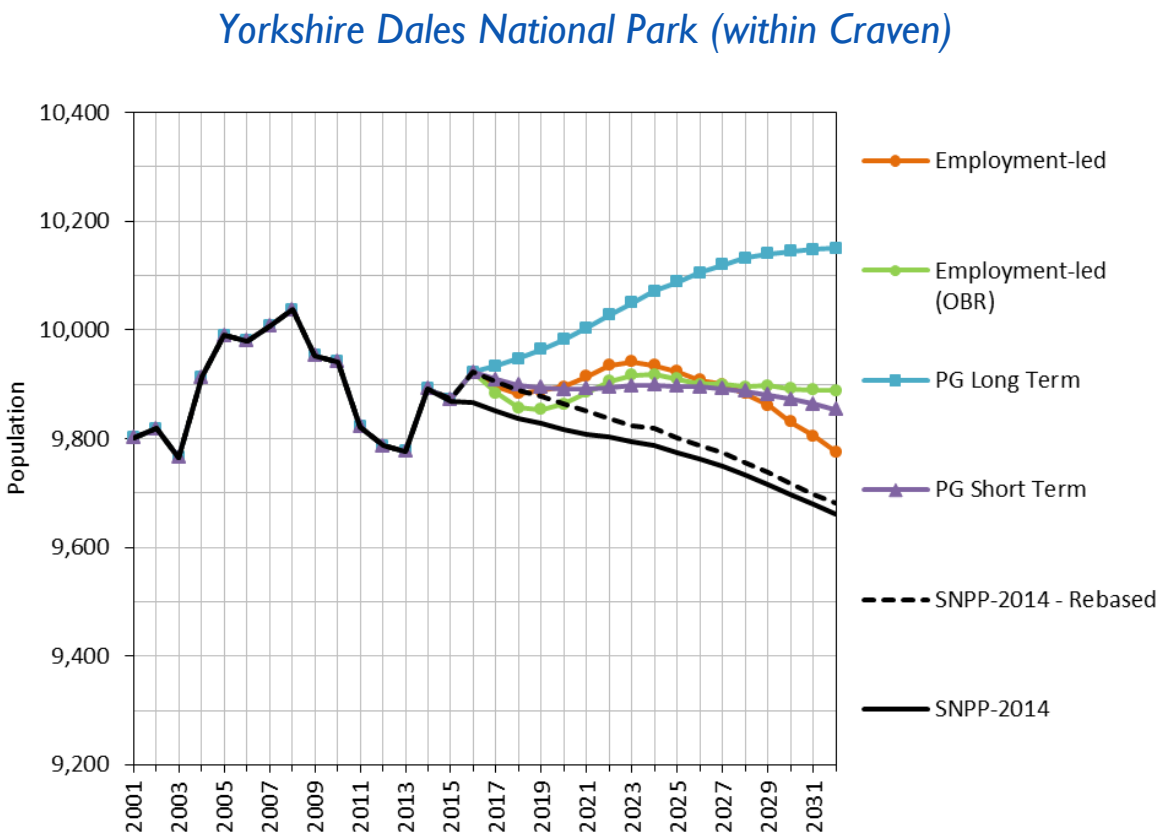


Figure 18: YDNP Craven scenarios: population growth 2001–2032

Table 8: YDNP Craven scenarios 2012–2032

Scenario	Change 2012–2032				Average per year	
	Population Change	Population Change %	Households Change	Households Change %	Net Migration	Dwellings
PG Long Term	364	3.7%	515	11.8%	91	31
Employment-led (OBR)	101	1.0%	408	9.4%	78	24
PG Short Term	67	0.7%	374	8.6%	75	22
Employment-led	-11	-0.1%	365	8.4%	73	22
SNPP-2014 - Rebased	-107	-1.1%	314	7.2%	68	19
SNPP-2014	-126	-1.3%	307	7.0%	67	18

6 Summary

Approach

6.1 Craven's SHMA (2016) has identified an OAN of **214** dpa for the 2012–2032 plan-period. This OAN was informed by a population growth scenario that derived its trend assumptions from a fourteen-year period 2001–2015 (**PG Long Term)**, in combination with an uplift based on 20% of the SNPP-2014 growth outcome to account for affordability adjustments.

6.2 Since completion of the SHMA, DCLG has published its Housing White Paper detailing a draft methodology[9] for a more standardised approach to OAN calculation across English local authorities. This methodology implies **165** *dwellings* per annum (dpa) [10] figure for Craven over the ten-year period 2016–2026.

6.3 In addition to the new DCLG evidence, Craven's 2016 MYE has been published by ONS revealing a sharp rise in population growth; the OBR has published its new labour market analysis; and revised economic forecasts have been produced from the REM.

6.4 The Council has sought to review and validate its choice of OAN in the light of the new demographic and economic evidence. In doing so, it has sought to better align its SHMA and ELR analyses, in preparation for submission of its Local Plan.

6.5 A revised suite of growth forecasts has been presented for Craven district and for its four sub-district areas, incorporating the latest demographic and economic evidence and also considering the potential impact of higher rates of household formation amongst Craven's young adult population.

[9] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/644955/Planning_for_Homes_consultation_document.pdf

[10] Note that the DCLG consultation table published household figure for Craven is 151 per year (2016–2026). This has been converted into dwelling growth using the 2011 Census vacancy rate.

Results

6.6 A summary of the dwelling growth outcomes associated with each scenario indicates a range of 130–199 dpa (+3 if a headship rate adjustment is included) (Figure 19). The DCLG recommendation for the equivalent 2012–2032 plan-period is 160 dpa[11].

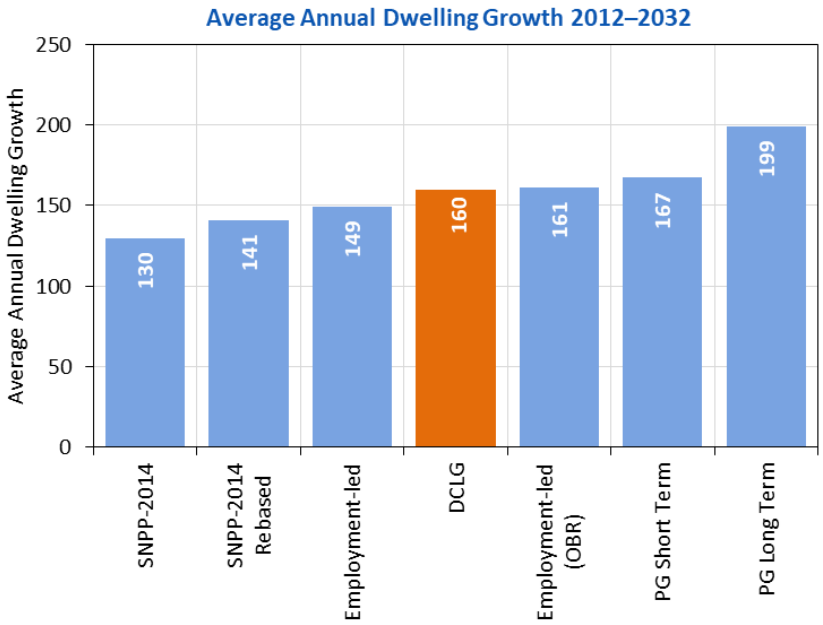


Figure 19: Dwelling growth outcomes for Craven District, 2012–2032

6.7 The **SNPP-2014** results in the lowest growth outcome for Craven, with an estimated dwelling requirement of 130 dpa. The **SNPP-2014** underestimated population growth evident in 2015–2016 MYEs. In aligning the demographic growth profile under the **SNPP-2014-Rebased** scenario, a slightly higher annual dwelling requirement of 141 per year is expected (2012–2032).

6.8 Whilst the **PG Short Term** scenario estimates higher growth than the **SNPP-2014** and **SNPP-2014-Rebased** scenarios, all three outcomes are influenced by the period of relatively flat population growth in Craven during 2009–2014. In contrast, the **PG Long Term** scenario, which includes the period 2001–2008 in the derivation of its future growth assumptions, suggests much higher population growth, with a dwelling requirement of 199 dpa.

6.9 The most recent MYE for Craven has recorded a sharp uplift in the district's population (equivalent to approximately 1% of its total). As a result, the **PG** scenarios presented in this report produce higher dwelling growth outcomes than the previous evidence that was used to

[11] DCLG methodology extended for the 2012–2032 plan period and 2011 Census vacancy rate for Craven applied.

inform the SHMA. The new **PG Short Term** scenario estimates a dwelling requirement of 167 dpa, 19% higher than the 140 dpa figure presented in the earlier SHMA demographic analysis. The **PG Long Term** records a smaller uplift of 6% from its previous 188 dpa total.

6.10 A new REM forecast has been made available (dated March 2017), providing both its employment growth trajectory and underpinning assumptions on economic activity rates, unemployment rate and commuting ratio. This has enabled improved alignment of the economic forecast to the demographic evidence.

6.11 Two employment-led scenarios have been formulated. The first, **Employment-led**, uses all assumptions direct from the REM to estimate the population and dwelling growth impact of the employment growth trajectory. This results in a dwelling growth of 149 dpa over the 2012–2032 plan period.

6.12 The second employment-led scenario, **Employment-led OBR**, replaces the REM age-specific economic activity rates with those derived from the OBR. This results in a slightly higher dwelling growth of 161 dpa.

6.13 All dwelling growth outcomes have been tested using household growth assumptions from the DCLG's 2014-based household model. To evaluate the likely impact of a return to higher rates of household formation in young adults, a *'Partial Return'* outcome has been estimated for each scenario. Under this scenario, household representative rates for adults aged 25–34 are allowed to return to a mid-point between 2014- and 2008-based rates by 2033. The result of this adjustment is a dpa figure that rises by approximately **+3** per year (on average) across all scenarios, equivalent to a 1.8% increase.

Sub-District Results

6.14 Growth outcomes for each of the demographic and employment-led scenarios have been presented for Craven's four sub-district geographies. Although the population growth estimates for the sum of the four sub-district areas are equivalent to those generated for Craven in total, there are differences in the household and dwelling totals produced by the sub-district analysis. These small discrepancies are the result of using different population, migration and headship-rate combinations at sub-district level.

6.15 Craven's current OAN has been derived from the estimated dwelling growth under the **PG Long Term** and **SNPP-2014** scenarios, considered in context of the employment growth that could be supported by the estimated level of population change. In considering the updated **PG Long Term** scenario alongside the **SNPP-2014** and **Employment-led** scenarios, the estimated proportion of Craven's dwelling growth in each of the four sub-district areas is illustrated (Figure 20). An estimated 9% is associated with North Craven; 19% with Mid Craven; 57% with South Craven and 15% with the portion of the district that falls within the Yorkshire Dales National Park.

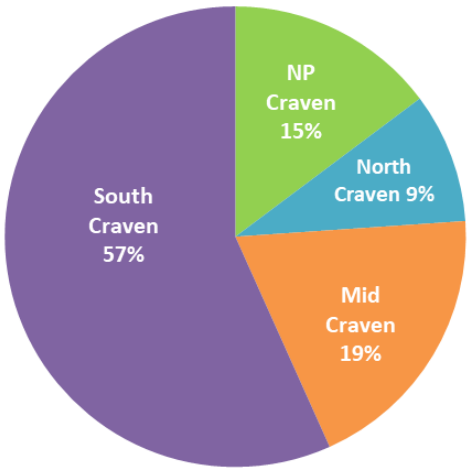


Figure 20: Dwelling growth proportions for Craven's sub-districts

6.16 In all scenarios, dwelling growth has been estimated using a Craven vacancy rate of 8.9%, with sub-district vacancy rates of 5.8% for South Craven, 11.1% for North Craven, 11.5% for Mid Craven and 16.1% for the part of the district that falls within the Yorkshire Dales National Park. Lower vacancy rates in the future would reduce the dpa estimated for the plan period under each scenario.

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 21) 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 22) 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 For further information on POPGROUP, please refer to the Edge Analytics website (http://www.edgeanalytics.co.uk/).

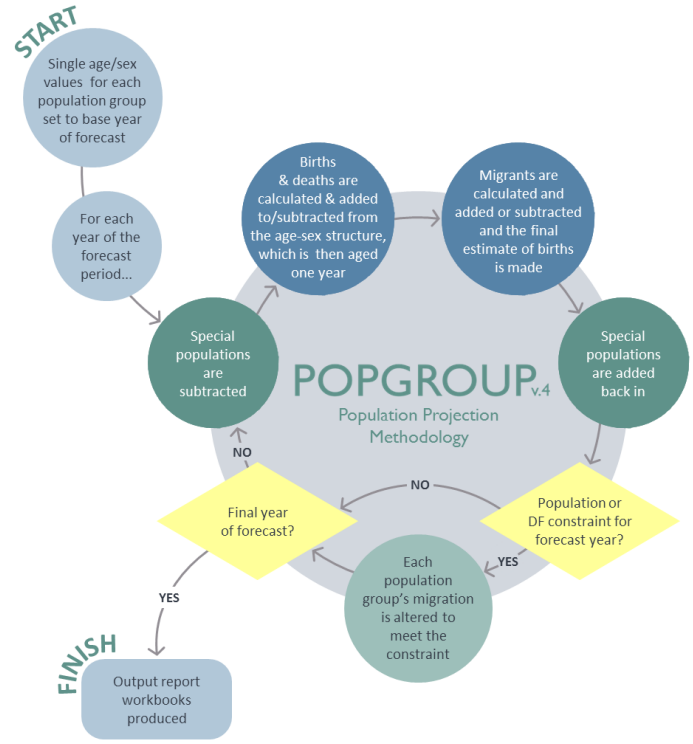
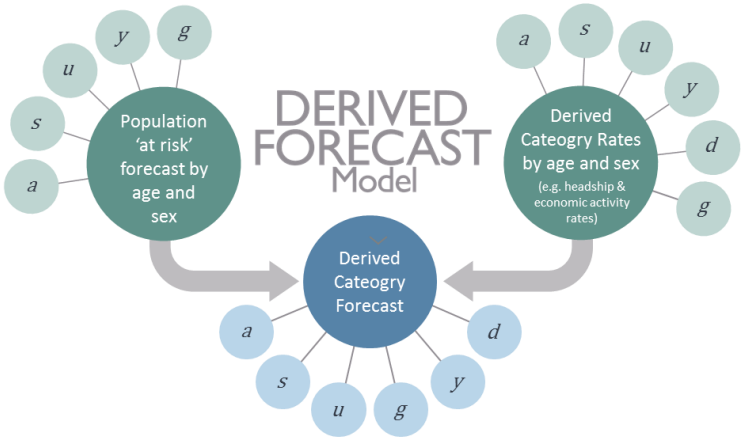


Figure 21: POPGROUP population projection methodology



$$D_{a,s,u,y,d,g} = \frac{P_{a,s,u,y,g}\ R_{a,s,u,y,d,g}}{100}$$

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

Figure 22: Derived Forecast (DF) methodology

Appendix B
Data Inputs & Assumptions

Introduction

B.1 Edge Analytics has developed a suite of demographic scenarios for Craven using POPGROUP v.4 and the Derived Forecast model. The POPGROUP suite of demographic models draw 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 historical data evidence for 2001–2016, in conjunction with information from ONS sub-national population projections (SNPPs) and DCLG household projections, a series of assumptions have been derived which drive the scenario forecasts.

B.2 The following scenarios have been produced:

- SNPP-2014
- SNPP-2014-Rebased
- PG Short Term
- PG Long Term
- Employment-led
- Employment-led (OBR)

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

Model Configuration

B.3 In developing the demographic forecasts, scenarios have been configured for Craven district, in aggregate. Sub-district area[12] forecasts have been similarly configured using a combination of Census Output Area (OA) data to derive population and components-of-change statistics. Sub-district assumptions on fertility, mortality, migration and household formation have been used to disaggregate the district-level population growth to each of the four sub-district areas, thereby ensuring consistency with the district-level population total.

[12] North Craven, Mid Craven, South Craven and the area of the Yorkshire Dales National Park that falls within Craven.

B.4 The assumptions used at sub-district level are detailed alongside the district-level assumptions in the following sections. Unless stated, the assumptions apply at district-level (i.e. Craven as a single area).

Population, Births & Deaths

Population

B.5 In each scenario, historical population statistics are provided by the mid-year population estimates (MYEs), with all data recorded by single-year of age and sex. These data include the revised MYEs for 2002–2010, which were released by the ONS in May 2013. The revised MYEs provide consistency in the measurement of the components of change (i.e. births, deaths, internal migration and international migration) between the 2001 and 2011 Censuses.

B.6 In the **SNPP-2014** scenario, the historical MYEs are used up to 2014. From 2014, future population counts are provided by single-year of age and sex to ensure consistency with the trajectory of the ONS 2014-based SNPP. Under the **SNPP-2014-Rebased** scenario, the population is scaled to the 2016 MYE, following its original rate of growth thereafter.

B.7 In the other scenarios, the historical MYEs are used up to 2016.

Births & Fertility

B.8 In each scenario, historical mid-year to mid-year counts of births by sex have been sourced from the ONS MYEs.

B.9 In the **SNPP-2014** scenario, historical births are used from 2001/02 to 2013/14. From 2014/15, future counts of births are specified, to ensure consistency with the 2014-based official projection.

B.10 In all other scenarios, historical births are used from 2001/02 to 2015/16. From 2016/17, an area-specific age-specific rate (ASFR) schedule, derived from the ONS 2014-based SNPP, is included in the POPGROUP model assumptions. Long-term assumptions on changes in age-specific fertility rates are taken from the ONS 2014-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 (i.e. from 2016 onwards).

Deaths & Mortality

B.12 In each scenario, historical mid-year to mid-year counts of deaths by 5-year age group and sex have been sourced from the ONS MYEs.

B.13 In the **SNPP-2014** scenario, historical deaths are used from 2001/02 to 2013/14. From 2014/15, future counts of deaths are specified, to ensure consistency with the 2014-based official projection.

B.14 In all other scenarios, historical deaths are used from 2001/02 to 2015/16. From 2016/17, an area-specific age-specific mortality rate (ASMR) schedule, derived from the ONS 2014-based SNPP, is included in the POPGROUP model assumptions. Long-term assumptions on changes in age-specific mortality rates are taken from the ONS 2014-based SNPP.

B.15 In combination with the 'population-at-risk' (i.e. the whole 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 (i.e. from 2016 onwards).

Migration

Internal Migration

B.16 In each scenario, historical mid-year to mid-year estimates of internal in- and out-migration by 5-year age group and sex have been sourced from the 'components of population change' files that underpin the ONS MYEs. These internal migration flows are estimated using data from the Patient Register (PR), the National Health Service Central Register (NHSCR) and the Higher Education Statistics Agency (HESA).

B.17 In the **SNPP-2014** scenario, historical counts of internal in and out-migrants are used from 2001/02 to 2013/14. From 2014/15, future counts of migrants are specified, to ensure consistency with the 2014-based official projection.

B.18 In the **PG** scenarios, historical counts of internal in and out-migrants are used from 2001/02 to 2015/16. From 2016/17, future internal migration flows are based on the area-specific historical migration data. In the **PG-Short Term** scenario, a *six* year internal migration history is used (2010/11 to 2015/16). In the **PG-Long Term** scenario, a *fifteen* year history is used (2001/02 to 2015/16).

B.19 In the **PG** alternative trend scenarios, the relevant historical time period is used to derive the age-specific migration rate (ASMigR) schedules, which are then used to determine the future number of in- and out-migrants.

B.20 In the case of internal in-migration, the ASMigR schedules are applied to an external 'reference' population (i.e. the population 'at-risk' of migrating into the area). This is different to the other components (i.e. births, deaths, internal out-migration), where the schedule of rates is applied to the area-specific population (i.e. the population 'at-risk' of migrating out of the area). The reference population is defined by considering the areas which have historically contributed the majority of migrants into the area. In the case of Craven, it comprises all districts which cumulatively contributed 70% of migrants into the Leeds City Region and the North, North Yorkshire and East Riding LEPs over the 2008/09–2015/16 period.

B.21 In the **Employment-led** scenarios, historical counts of internal in and out-migrants are used from 2001/02 to 2015/16. From 2016/17, these scenarios then calculate their own internal migration assumptions to ensure an appropriate balance between the population and the targeted increase in employment that is defined in each year of the forecast period. A higher level of net internal migration will occur if there is insufficient population and resident labour force to meet the forecast level of employment. In the **Employment-led** scenarios, the profile of internal migrants is defined by an ASMigR schedule, derived from the ONS 2014-based SNPP.

International Migration

B.22 Historical mid-year to mid-year counts of immigration and emigration by 5-year age group and sex have been sourced from the 'components of population change' files that underpin the ONS MYEs. Any 'adjustments' made to the MYEs to account for asylum cases are included in the international migration balance.

B.23 In all scenarios, future international migrant counts are specified.

B.24 In the **SNPP-2014** scenario, historical counts of migrants are used from 2001/02 to 2013/14. From 2014/15, the international in- and out-migration counts are drawn directly from the 2014-based official projection.

B.25 In the **PG** scenarios, historical counts of international in and out-migrants are used from 2001/02 to 2015/16. From 2016/17, future international migration counts are based on the area-specific historical migration data. In the **PG Short Term** scenario, a six year international migration history is used (2010/11 to 2015/16). In the **PG Long Term** scenario, a fifteen-year history is used (2001/02 to 2015/16). In all **PG** scenarios, an ASMigR schedule of rates is derived from the relevant migration history and is used to distribute future counts by single year of age.

B.26 Implied within the international migration component of change in the **PG Short Term** and **PG Long Term** 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.

B.27 In the **Employment-led** scenarios, historical counts of international in and out-migrants are used from 2001/02 to 2015/16. From 2016/17, international migration counts are taken from the ONS 2014-based SNPP (i.e. counts are consistent with the **SNPP-2014** scenario). An ASMigR schedule of rates from the ONS 2014-based SNPP is used to distribute future counts by single year of age.

Households & Dwellings

B.28 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."*

B.29 In POPGROUP, a dwelling is defined as a unit of accommodation which can either be occupied by one household or vacant.

B.30 In all scenarios, 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 2014-based household projection model from the DCLG. The 2014-

based model was released by the DCLG in July 2016, and is underpinned by the 2014-based SNPP from ONS.

Household Headship Rates

B.31 A household headship rate (also known as household representative rate) is the *"probability of anyone in a particular demographic group being classified as being a household representative"*[13].

B.32 The household headship rates used in the POPGROUP modelling have been taken from the latest DCLG 2014-based household projection model, which is underpinned by the ONS 2014-based SNPP. The DCLG household projections are derived through the application of projected headship rates to a projection of the private household population. The methodology used by DCLG in its household projection models consists of two distinct stages:

- **Stage One** produces the national and local authority projections for the total number of households by sex, age-group and relationship-status group over the projection period.
- **Stage Two** provides the detailed 'household-type' projection by age-group, controlled to the previous Stage One totals.

B.33 In POPGROUP, the Stage two headship rates have been applied by broad age groups and household classification (Table 9).

Table 9: DCLG Stage Two headship rate classification household type classification

DCLG Category	Description
One person male	One person households: Male
One person female	One person: Female
Couple no child	One family and no others: Couple households: No dependent children
Cple+adlts no child	A couple and one or more other adults: No dependent children
One child	Households with one dependent child
Two children	Households with two dependent children
Three+ children	Households with three or more dependent children
Other households	Other households with two or more adults

[13] Household Projections 2014-based: Methodological Report. Department for Communities and Local Government (February 2015). https://www.gov.uk/government/statistics/2012-based-household-projections-methodology

B.34 Two sets of headship rates have been applied to each scenario (Figure 23):

- **2014-based:** DCLG 2014-based headship rates

- **2014-based Partial Return:** From 2014, the DCLG 2014-based headship rates for the 25–34 age group return to a 'mid-point' between the 2008-based and 2014-based rate by 2033. No adjustments have been made to the other age groups.

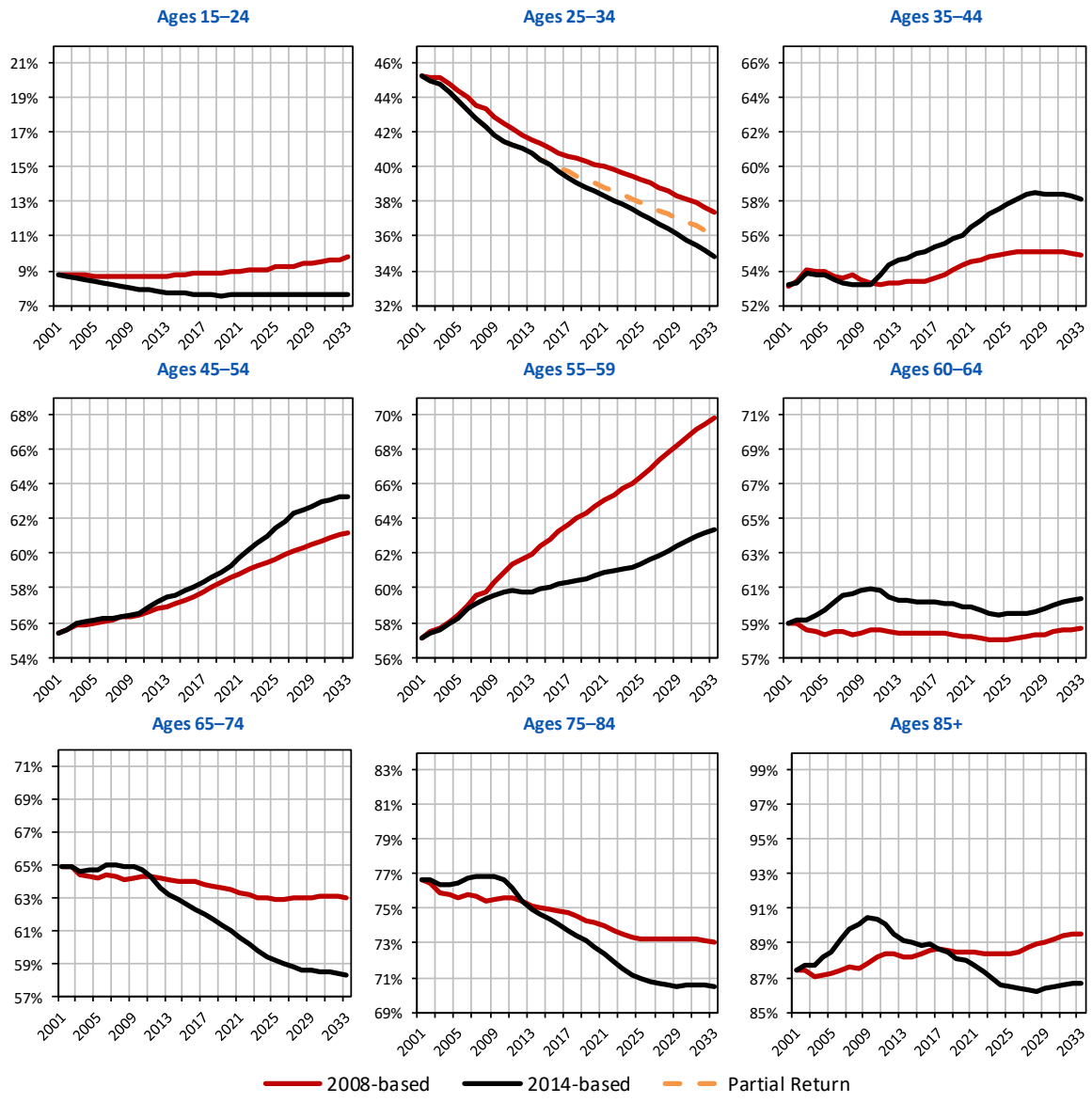


Figure 23: Headship rate sensitivities

Communal Population Statistics

6.17 Household projections in POPGROUP exclude the population 'not-in-households' (i.e. the communal/institutional population). These data are drawn from the DCLG 2014-based household projections, which use statistics from the 2011 Census. Examples of communal establishments include prisons, residential care homes and student halls of residence.

6.18 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

6.19 The relationship between households and dwellings is modelled using a 'vacancy rate', sourced from the 2011 Census[14]. The vacancy rate is calculated using statistics on households (occupied household spaces) and dwellings (shared and unshared).

B.35 Under all scenarios, a rate of **8.9%** for Craven has been applied, fixed throughout the forecast period. Using the vacancy rate, the 'dwelling requirement' of each household growth trajectory has been evaluated. For each of the sub-district areas, the following vacancy rates have been applied:

- North Craven: 11.1%
- Mid Craven: 11.5%
- South Craven: 5.8%
- YDNP: 16.1%

[14] Census Table KS401EW: Dwellings, household spaces and accommodation type