

Population and household forecasts

2013

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Acknowledgements

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Executive Summary

Requirements

- E1. As it formulates its Local Plan, Epping Forest District Council has sought to update the supporting demographic evidence, with the development of a suite of population, household and housing forecasts which incorporate the latest demographic data from:
- 2011 Census statistics on population and households
 - Revised mid-year population estimates for the period 2002–2010 (ONS)
 - 2011-based household projections for 2011–2021 (CLG)
- E2. This report has presented the suite of alternative growth scenarios using POPGROUP technology. They evaluate trend, policy and economic considerations; they are accompanied by a transparent definition of key assumptions; and they are presented in a consistent format that contrasts the impact of scenario assumptions upon changes to population, households, dwellings, labour force and jobs. All scenarios have been run from a 2011 base year, with a 2026 and 2033 horizon. Historical data has been included for 2001–2010.

Outcomes

- E3. The latest demographic evidence has provided a timely update to Epping Forest District's population profile, aligning the new 2011 Census total with an historical time series back to 2001. The new demographic evidence has enabled the development of alternative 2011-based trend projections that consider the potential future impact of migration. These provide an important update to ONS' 2010-based and 2011-based projections.
- E4. Five-year and ten-year historical perspectives have been used to set migration assumptions in the trend scenarios. The 5-year alternative suggests a higher growth forecast than the 10-year, reflecting the increase in net in-migration to Epping Forest District since 2007.
- E5. Dwelling-led and jobs-led growth alternatives have been developed to contrast directly to official forecasts and the updated trend forecasts.

- E6. The analysis of scenario outcomes is complicated by the 'choice' of appropriate headship rates with which household (and dwelling) growth is estimated. The latest 2011-based rates have been calibrated after a period of unprecedented economic change and stagnation in the housing market and thus suggest a slower rate of household formation than the previous 2008-based rates, calibrated from data collected in a time period with very different market characteristics. Outcomes from each are presented here for comparison.

Epping Forest District: scenario summary

Scenario	Dwellings per year 2011-2033		
	Option A CLG 2011-trend	Option B CLG 2008	Average
SNPP-2010	698	741	719
Employment_Historical Trend Plus 10%	575	628	602
Employment_Historical Trend	556	609	582
Approved RSS Pure - R	455	455	455
Approved RSS Realistic - R	454	454	454
Mig-led 10yrs Zero Int Migration	360	401	381
Mig-led 5yrs	358	400	379
Draft Review RSS Realistic - R	365	365	365
Draft Review RSS Pure - R	360	360	360
Mig-led 10yrs	311	353	332
Mig-led 10yrs-5yrs	302	344	323
NetNil	240	273	257

Option A: CLG 2011-based headship rates

Option B: CLG 2008-based headship rates

Recommendations

- E7. The scenario evidence presented here has provided an important update to Epping Forest District's demographic intelligence. The District Council should give particular consideration to the longer-term impacts of migration, both internal and international and its influence upon future housing growth.
- E8. It is recommended that Epping Forest District Council evaluates the robustness of its underlying economic forecast, which suggests consistent employment growth in conjunction with an ageing population and a shrinking labour force. Higher net in-migration and a higher housing requirement is the consequence of this scenario.

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- E9. In relation to future household formation, due consideration should be given to both Option A (2011-based household model) and Option B (2008-based household model) scenarios. The Option A scenarios may be driven by assumptions calibrated from a period of slower rates of household formation, but these conditions are likely to continue, certainly in the short term.
- E10. As it formulates its Local Plan using the evidence presented here, Epping Forest District Council should continue to cooperate with its neighbouring authorities, to consider the important migration and economic exchanges between these areas and the likely impact upon housing growth in the district.

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2. Introduction

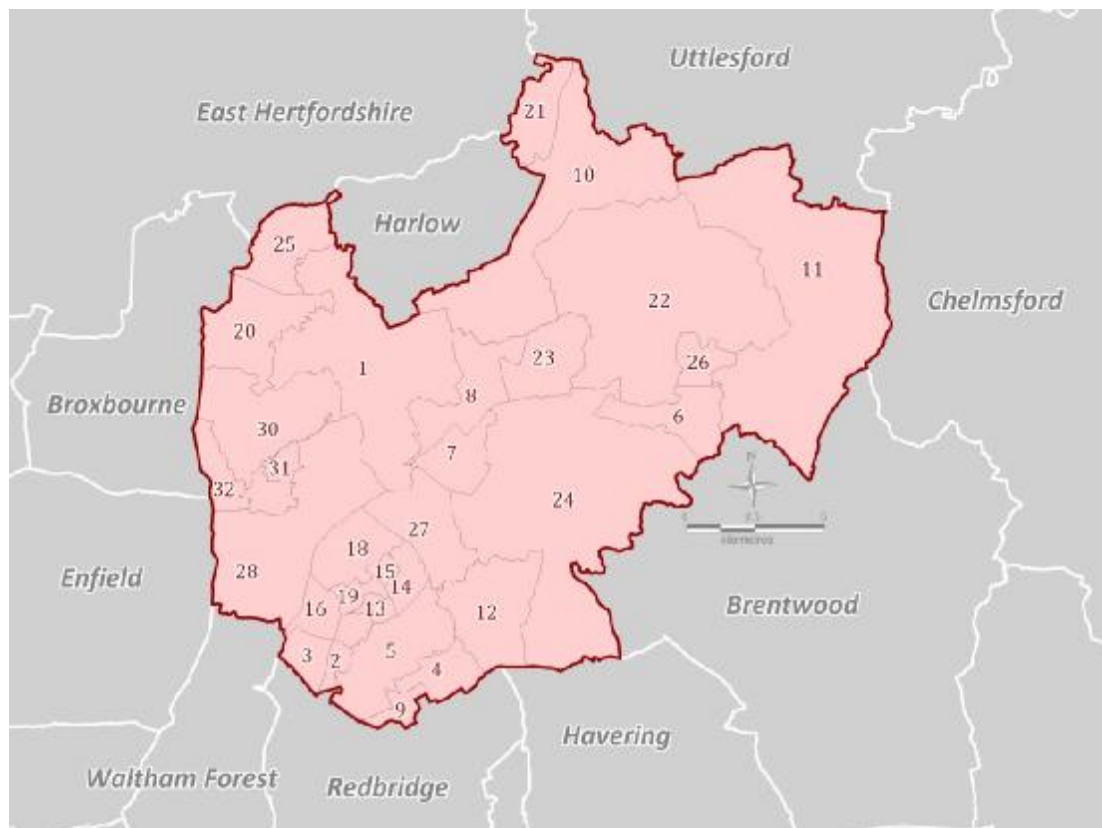
Requirements

- 2.1 Forecasts of population and household growth provide a critical input to the development of housing growth targets within Local Plans. For Epping Forest District Council (EFDC), the importance and sensitivity of these data has been reflected in the Issues & Options Consultation on the Local Plan.
- 2.2 With a concern over the robustness of previous official population projections from the Office for National Statistics (ONS) and with the release of a range of new demographic evidence, EFDC is seeking to obtain an up-to-date assessment of likely population and household growth, with due consideration for a range of demographic, economic and policy factors.
- 2.3 This new evidence is required to support the development of EFDC's Local Plan; to establish a position on future population and housing growth that can be balanced against other issues such as planning constraints and land availability, and that meets the request of the National Planning Policy Framework (NPPF) for an objective assessment of housing need.

This analysis

- 2.4 This report uses the latest demographic evidence to deliver a review of demographic change in Epping Forest District between 2001-2011 and to present a suite of alternative growth forecasts from which EFDC can consider its Local Plan housing options.
- 2.5 Historical context is provided at both district level and for smaller, ward geographies (Figure 1). Forecasts are presented for the district as a single geographical area, with the forecast horizon running to 2033.
- 2.6 The forecasting analysis incorporates the latest 2011 Census statistics on population and households, revised mid-year population estimates (MYE) for 2002-2010 and the latest household projection model from Communities and Local Government (CLG).
- 2.7 The suite of growth forecasts considers new trend projections in contrast to previous official projections and assesses the impact of a number of dwelling-led and employment-led growth

alternatives. All growth scenarios are assessed in terms of their impact upon population, households, dwellings, the labour force and likely job numbers.



Reference	Ward Name	Reference	Ward Name
1	Broadley Common, Epping Upland and Nazeing	17	Loughton Roding
2	Buckhurst Hill East	18	Loughton St John's
3	Buckhurst Hill West	19	Loughton St Mary's
4	Chigwell Row	20	Lower Nazeing
5	Chigwell Village	21	Lower Sheering
6	Chipping Ongar, Greensted and Marden Ash	22	Moreton and Fyfield
7	Epping Hemnall	23	North Weald Bassett
8	Epping Lindsey and Thornwood Common	24	Passingford
9	Grange Hill	25	Roydon
10	Hastingwood, Matching and Sheering Village	26	Shelley
11	High Ongar, Willingale and The Rodings	27	Theydon Bois
12	Lambourne	28	Waltham Abbey High Beach
13	Loughton Alderton	29	Waltham Abbey Honey Lane
14	Loughton Broadway	30	Waltham Abbey North East
15	Loughton Fairmead	31	Waltham Abbey Paternoster
16	Loughton Forest	32	Waltham Abbey South West

Figure 1: Epping Forest District: Geographical context
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Forecasting Methodology

- 2.8 Demographic forecasts have been developed using the POPGROUP suite of products. POPGROUP is a family of demographic models which enables forecasts to be derived for population, households and the labour force, for areas and social groups.
- 2.9 POPGROUP models are used extensively by local authorities across the UK, providing a desktop utility for the evaluation of alternative growth scenarios to support local planning. Under licence to the Local Government Association (LGA), Edge Analytics provides product development and technical support to the product suite and its user base.
- 2.10 Appendix A provides a summary overview of the POPGROUP model methodology. More detail can be found online at <http://www.popgroup.org.uk/>.

Report Structure

- 2.11 Section 5 provides an update on the latest demographic evidence for Epping Forest District including 2011 Census statistics, mid-year population estimate revisions and the latest household model assumptions.
- 2.12 Section 4 extends this analysis with a summary examination of the historical trends in internal and international migration that have affected population change in Epping Forest District and that influence its growth projections.
- 2.13 Section 5 provides a profile of historical (2001 - 2011) demographic change for Epping Forest District using ward geographies. The components of population change (births, deaths, and migration) are analysed alongside changes due to housing growth.
- 2.14 Section 6 defines the range of growth scenarios which are developed and tested for Epping Forest District. These scenarios include official forecasts, trend-based, dwelling-led and employment-led alternatives.
- 2.15 Section 7 provides illustration and commentary on the impacts of each scenario upon changes to population, households, dwellings, labour force and jobs growth.
- 2.16 Section 8 represents a concluding section which summarises the evidence and makes a number of recommendations for Epping Forest District Council to consider as it formulates its Local Plan.

3. Updating the Demographic Evidence

Headline Change 2001-2011

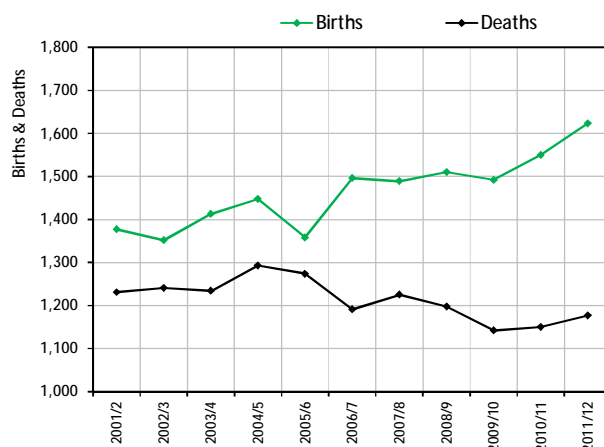
- 3.1 The 2011 Census has provided an updated and definitive view of the population of Epping Forest District. Since 2001, the population of Epping Forest District has increased by an estimated 3,728 people; a 3.1% increase from a population total of approximately 121,000 in 2001 to a total of 124,700 in 2011 (Table 1). Census evidence suggests that the rate of increase in dwelling numbers has exceeded population growth. A 4.7% growth in dwellings has resulted in an additional 2,400 properties over the decade.

Table 1: Epping Forest District: Census summary of demographic change, 2001 – 2011

	(000s)			%
	2001	2011	Change	Change
Population	121.0	124.7	3.7	3.1
Communal Establishment Population	0.7	1.0	0.3	
Dwellings	51.8	54.2	2.4	4.7

Source: 2001 and 2011 Census.

- 3.2 Since 2001, the annual number of births recorded in Epping Forest District has risen, reaching its highest level of 1,623 in the very latest year for which statistics are available, 2011/12. In contrast, the recorded number of deaths has declined, to 1,177 in 2011/12 (Figure 2). Natural change (the difference between births and deaths) has become an increasingly important component of population growth over the decade.



Source: ONS

Figure 2: Epping Forest District: Births and deaths 2001/2002 – 2010/2011

- 3.3 A population pyramid by age and sex illustrates the extent to which population growth has been distributed across the age-groups and the degree to which the movement of large birth cohorts have affected the changing age profile (Figure 3).

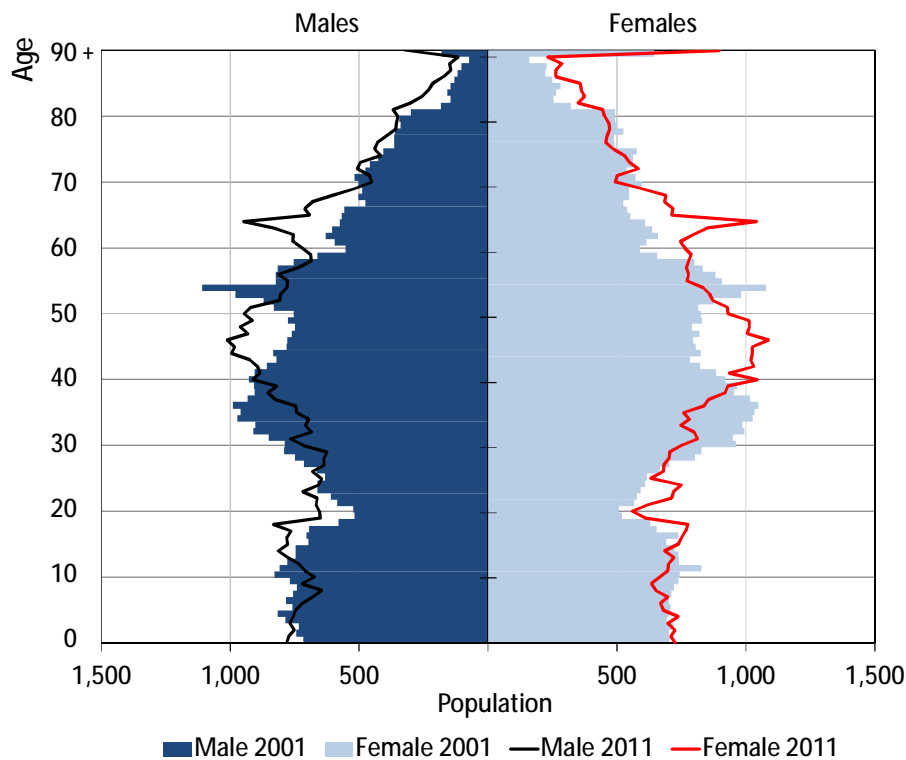
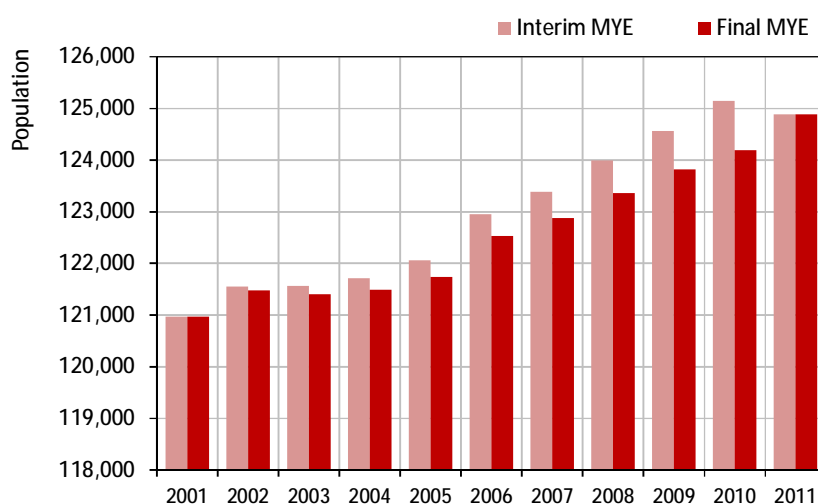


Figure 3: Epping Forest District: Changing age profile of the population, 2001 - 2011

- 3.4 The colour coding of the age pyramid illustrates where population has increased since 2001 (blue bars) and where population numbers have declined (red bars). The majority of the changes reflect the 'ageing' of the resident population over the decade, with those aged 30-40 in 2001 becoming the 40-50 age-group in 2011. The movement of the post -World War Two baby boom cohort is most evident, with a spike in the 55 year-old age group in 2001 becoming a 65 year-old spike in 2011.
- 3.5 Population ageing is a particularly important consideration for Epping Forest District as the next 20 years will see a reduction in the size of the resident labour force as the large birth cohorts of the 1950s and 1960s move beyond retirement. Retaining its young adult population or replenishing it through net inward migration is a key consideration for the district in meeting future economic and demographic growth aspirations.

Mid-Year Estimate revisions

- 3.6 In May 2013, ONS published its revised mid-year population estimates, which align the 2002-10 populations with the latest 2011 data. These new data have recalibrated the 'components of change' to ensure the correct transition of the age profile of the population over the 2001–2011 decade, taking into account births, deaths, internal migration and international migration.
- 3.7 The 2011 Census count suggested that the previous mid-year population estimates for Epping Forest District (2002-2010) had resulted in a slight over-estimation of the ten-year growth trajectory (Figure 4). This has important implications when considering the 'components of change' that have driven historical growth, particularly migration and its impact upon the calculation of 'trend' projections for the District.



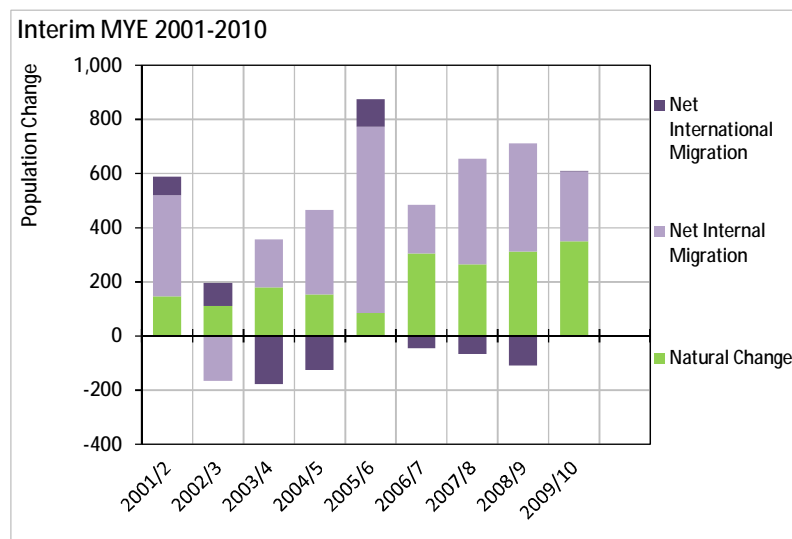
Source: ONS

Figure 4: Epping Forest District: Mid-year population change 2001 – 2011

- 3.8 Between successive censuses, births and deaths are accurately recorded in vital statistics registers and provide the most robust measure of 'natural change' (the difference between births and deaths) in a geographical area. Internal migration data are derived from GP registers, providing an accurate representation of inter-area flows, albeit with some issues with regard to potential under-registration in certain age-groups (young males, in particular). International migration is the most difficult component of population change to estimate with confidence.
- 3.9 On the assumption that births, deaths and internal migration have been robustly measured (and that the 2001 Census provided a robust population count for Epping Forest District), the 'adjustment' that resulted from the 2011 population is most likely to be associated with the mis-

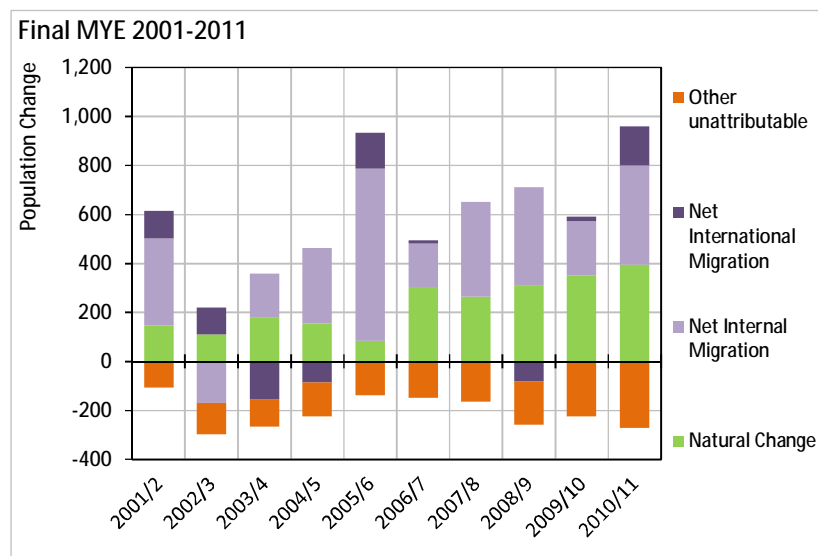
estimation of international migration; the balance between immigration and emigration flows to and from Epping Forest District.

- 3.10 ONS has recalibrated the components of change for Epping Forest District to ensure the correct age-profile of the population over the decade, taking account of natural change, internal migration and international migration. The 'before-and-after' profile of the components is presented, including the additional 2010/11 statistics that accompany the 2011 mid-year estimates (Figure 5; Figure 6).



Source: ONS

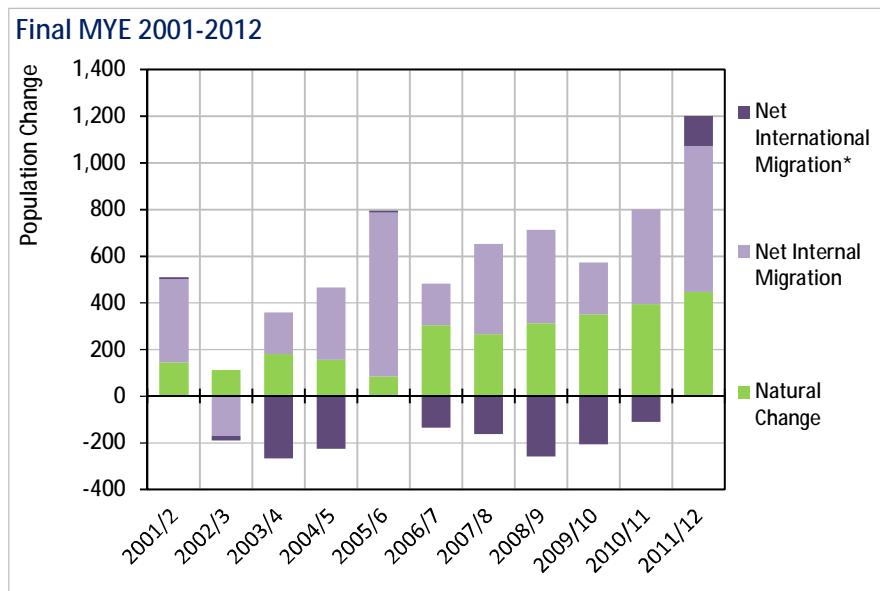
Figure 5: Epping Forest District: Components of population change, old mid-year estimates



Source: ONS

Figure 6: Epping Forest District: Components of population change, new mid-year estimates

- 3.11 The result of this recalibration is that birth and death totals (and therefore natural change) remain largely unchanged. Small changes to internal migration impacts are evident but not significant.
- 3.12 With regard to international migration, ONS has not explicitly assigned the MYE adjustment to international migration. Instead it has identified an additional 'other unattributable' component, suggesting it has not been able to accurately identify the source of the 2001-2011 overcount.
- 3.13 The forecasting analysis presented in this report assumes that the 'other unattributable' component of change is most likely associated with international migration. An alternative argument might be that the 2001 Census may have 'over-counted' Epping Forest District's 2001 population but this is unlikely and difficult to verify. Similarly, the 2011 Census may have 'under-counted' Epping Forest District's population but the 96% household response rate for the District suggests a robust enumeration process.
- 3.14 Assuming that mis-estimation of international migration is the main reason for the 2011 Census adjustment, the components of change which have determined Epping Forest District's population growth since 2001 are presented (Figure 7). This illustration includes the very latest evidence from the 2012 mid-year population and its estimated components of change for the year 2011/12.



Source: ONS

Figure 7: Epping Forest District: Components of population change, 2002 – 2011

- 3.15 These data suggest that natural change has become an increasingly important factor, supported by net growth through internal migration. These net increases have been balanced by a small net outflow due to international migration.
- 3.16 The re-calibration of the mid-year estimates presents international migration as having a negative impact upon Epping Forest District's population change, a net loss in each year 2003/4 to 2010/11. The latest 2012 mid-year estimate suggests a higher internal migration and natural change component and a small net growth due to international migration
- 3.17 There is clearly considerable uncertainty associated with the recalibration of population statistics, especially international migration as a component of change. Further evidence on both internal and international migration is presented in section 3, providing additional context for the scenario development in subsequent sections of this report.

Household projections

- 3.18 In April 2013, CLG released its latest household projections for local authority districts in England, incorporating household data from the 2011 Census and underpinned by the 2011-based interim sub-national population projection from ONS.
- 3.19 Household projections are derived through the application of household headship rates (also referred to as 'household representative rates' in the CLG documentation). The projected household headship rates used in the 2011 household model have been derived using 2011 Census data in combination with statistics from the Labour Force Survey (LFS).
- 3.20 The new household projections replace the previous, 2008-based household projections. They provide an update on likely household growth trajectories, taking account of the unprecedented economic conditions that have affected local communities since 2008.
- 3.21 The new CLG household model provides an important update to the evidence base, with the general trend in the 2011-based projections suggesting a reduction in the rate of household growth from 2011-21, compared to previous projections.
- 3.22 Rates of household growth are determined by two factors: first, the profile and change in household headship rates by household type, age and sex; and second, the underlying rate of population growth.

- 3.23 The new CLG household model projections are underpinned by the interim 2011-based population projection (ONS). This projection uses 2011 Census statistics for its base period population, but uses assumptions from the 2010-based population projection to define its fertility, mortality and migration components of change. For this reason, the 2011-based population projections do not provide a suitably robust 'trend' projection of population growth.
- 3.24 In order to present an appropriate test of the 'sensitivity' of the new household headship rates upon future household growth, the ONS 2010-based sub-national population projection has been used in conjunction with 2008-based and 2011-based household headship rates. The population projection is scaled to match 2011 Census totals, following the 2010-based growth trend thereafter.
- 3.25 The impact of the 2011 headship rates is to reduce the scale of household growth over the 2011-21 period. Using the 2010-based population projection, scaled to the 2011 Census total, household numbers are projected to increase by just 12.1% using the 2011-based headship rates, compared to 13.0% with the 2008-based headship rates (Table 2).

Please note, this is only an illustration of the difference that using different headship rates makes, using the official 2010 ONS projections as an example. The final figure would depend on which scenarios were used (see pages 34-39)

Table 2: Epping Forest District: Changing household numbers 2011-2021

	Households			Change 2011-2021	
	2011	2016	2021	Total	%
2008-based headship rates	51,847	55,006	58,579	6,733	13.0%
2011-based headship rates	51,828	54,733	58,117	6,288	12.1%

Source: CLG; Edge Analytics. Results derived using SNPP-2010 population projection.

- 3.26 With a reduction in the projected rate of household formation, a higher average household size is maintained when applying the 2011-based headship rates; by 2021, the occupancy ratio in Epping Forest District using the 2008-based headship rates is 2.33, compared to a ratio of 2.35 when using the 2011-based headship rates (Table 3).

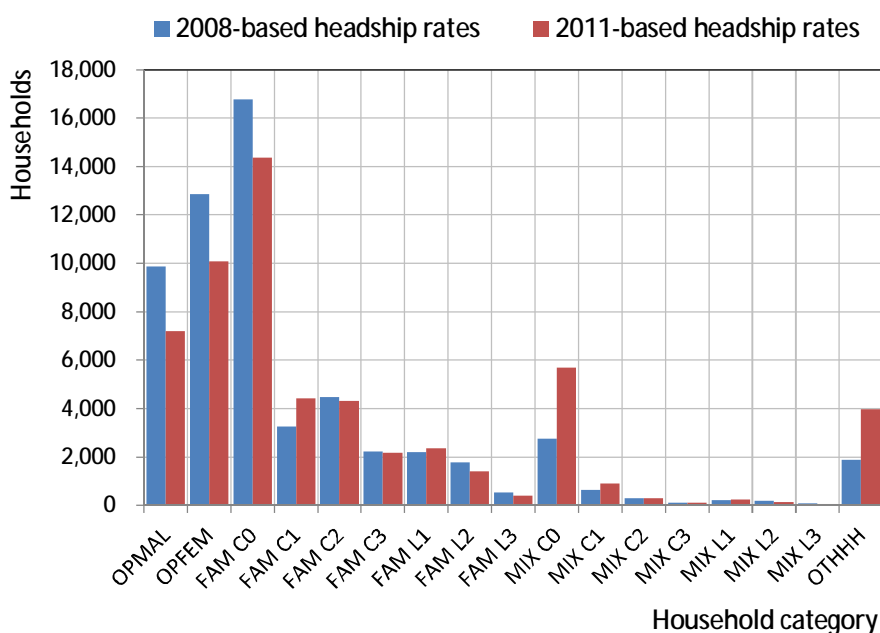
Please note, this is only an illustration of the difference that using different headship rates makes, using the official 2010 ONS projections as an example. The final figure would depend on which scenarios were used (see pages 34-39)

Table 3: Epping Forest District: Changing household size 2011-2021

	Population / Household		
	2011	2016	2021
2008-based headship rates	2.39	2.36	2.33
2011-based headship rates	2.39	2.37	2.35

Source: CLG; Edge Analytics. Results derived using SNPP-2010 population projection.

3.27 The revised 2011-based headship rates have had the most significant impact upon single-person households (OPMAL, OPFEM) and family households with no children (FAMC0). This has been slightly offset by increases in households comprising a couple and one or more other adults with no dependent children (MIXC0) and the miscellaneous 'Other' classification (Figure 8).



Source: CLG; Edge Analytics. Results derived using SNPP-2010 population projection.
See Appendix B for a definition of household types.

Figure 8: Epping Forest District: Impact of the 2011 headship rates on household growth (2011-21)

4. Internal and International Migration

Inflow, outflow and netflow - UK migration

- 4.1 In the development of official population projections, the pattern and level of internal migration observed over an historical period will typically provide the migration rate assumptions which drive the trend projections for individual local authorities. A five-year historical perspective is a typical time-period, although the unprecedented economic conditions of the last five years suggest that a longer-term view may be more appropriate in establishing a new trend projection for Epping Forest District.
- 4.2 Internal migration statistics are provided by the Patient Register Database Service (PRDS), tracking the movement of the population upon re-registration with a GP. This data is used by the ONS in its mid-year population estimates as the basis for estimating migrant flows between local authority areas. Data presented here relate to moves between local authorities within England and Wales during the period 2001/2 to 2010/11, excluding flows to and from Scotland and Northern Ireland.

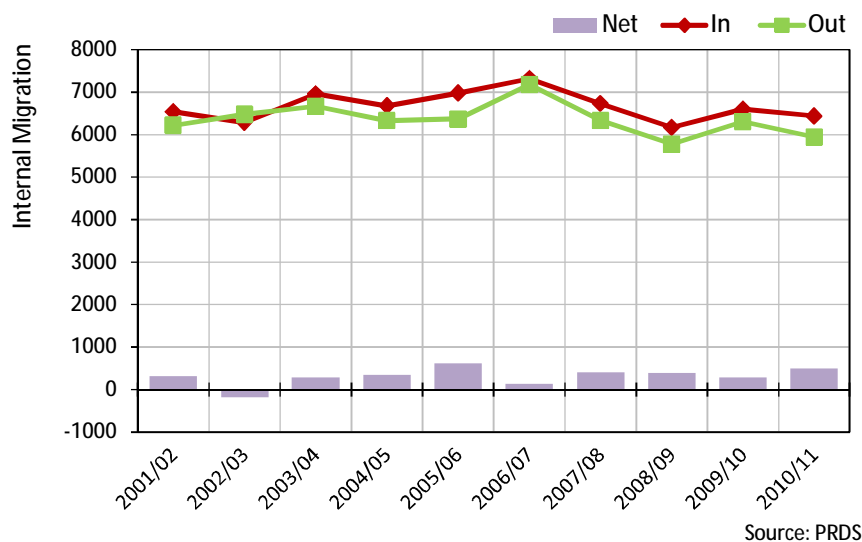


Figure 9: Epping Forest District: Internal migrant profile 2001/02 – 2010/11

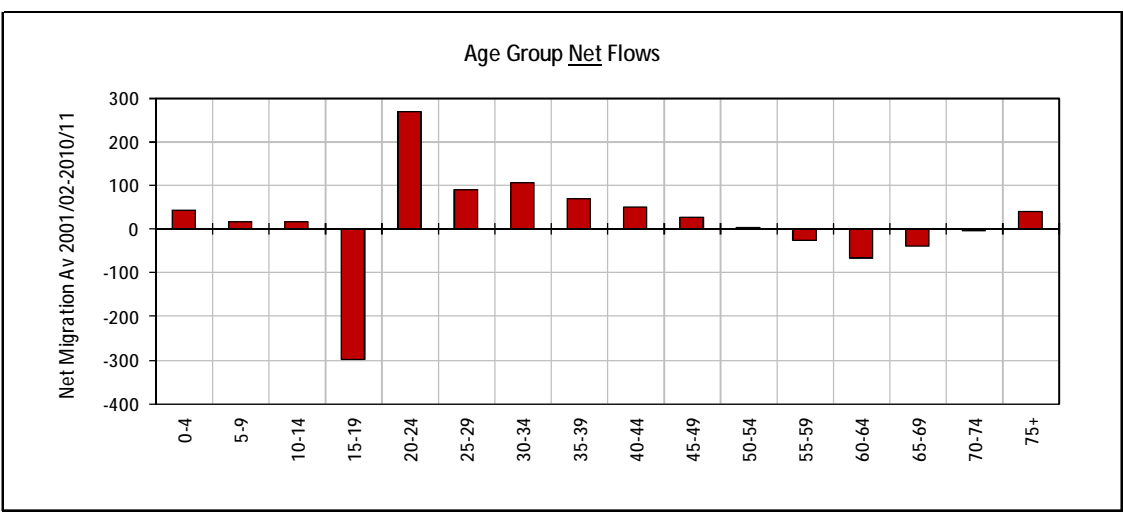
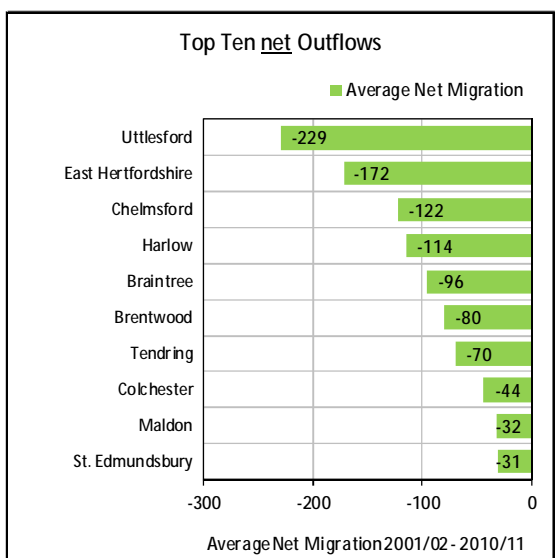
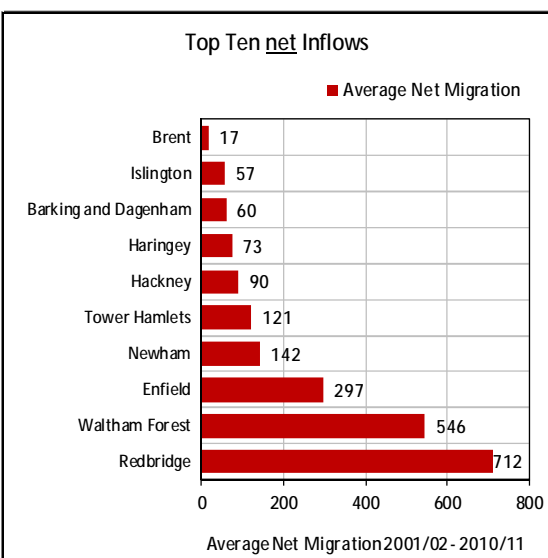
- 4.3 The internal migration profile of Epping Forest District is characterised by a large inflow (average +6,671 per year over the ten-year period) generally in excess of a large outflow (average +6,361 per year) to provide a small annual net growth (average +310 per year). In 2002/2003, out-

migration exceeded in-migration resulting in a net loss of migrants. In all other years there was a net gain through migration into Epping Forest District, with the largest inflow being approximately +610 persons in 2005/06 (Figure 9).

- 4.4 The evidence suggests that levels of both in- and out-migration increased over the first half of the decade, peaking in 2006/07, and generally declining thereafter. Despite this decline in gross flows, the net balance of inflow to Epping Forest District has been maintained.
- 4.5 The internal migration totals hide a complex mix of inflows and outflows from and to a large number of localities, across different age-groups. However, within this complexity there are some dominant trends (Figure 10).
- 4.6 The dominant feature of migration is the exchange between Epping Forest District and its immediate neighbours, particularly Redbridge. Whilst inflows and outflows are apparent with Redbridge and Waltham Forest, the overall balance has been a net gain to Epping Forest District, highest for the exchange with Redbridge (average 712 per year). In contrast, the exchange with Uttlesford and East Hertfordshire has resulted in an average net loss to Epping Forest District (-229 and -172 per year respectively).
- 4.7 Epping Forest District has a distinctive age structure to its internal migration profile with a large net outflow in the 15-19 age-group reflecting the movement of students to higher education. There is also a prominent net outflow associated with the groups around the retirement ages (55-69). A positive net-migration balance is associated with all other age groups.

Epping Forest District: Breakdown of locations which Epping Forest District most commonly gains people from, and loses people to, through internal migration

Top Ten Inflows		Top Ten Outflows	
average 2001/02-2010/11		average 2001/02-2010/11	
Redbridge	1,295	Redbridge	583
Waltham Forest	784	Harlow	434
Enfield	393	East Hertfordshire	367
Harlow	320	Uttlesford	321
Broxbourne	311	Broxbourne	295
East Hertfordshire	195	Waltham Forest	238
Newham	186	Chelmsford	207
Tower Hamlets	180	Brentwood	184
Havering	164	Havering	158
Hackney	126	Braintree	137

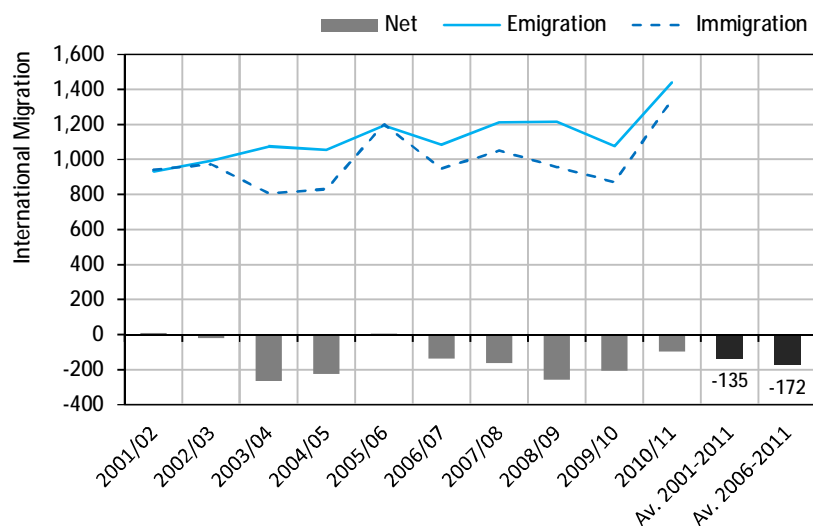


Source: PRDS

Figure 10: Epping Forest District – Internal migration profile, 2001/2–2010/11

The balance of immigration and emigration

- 4.8 International migration is the most difficult component of demographic change to measure accurately. ONS mid-year population totals include estimates of immigration (migrants entering the UK) and emigration (migrants exiting the UK) that have been derived primarily from the International Passenger Survey (IPS), distributed to local authority areas based upon evidence from administrative data records. These data provide 'long-term' migration statistics on the population that is estimated to stay or leave the UK for more than 12 months duration.
- 4.9 The international migration estimation methodology has been subject to substantial revision by ONS during the last five years and resulted in the recalibration of immigration and emigration estimates for 2005/06–2009/10 and the publication of revised, 'indicative' mid-year population estimates for each local authority. These data have been superseded by the latest mid-year population estimate revisions which provide a consistent transition in the 'components of change' between successive censuses.
- 4.10 The revised international migration assumptions from the latest mid-year estimates of population for 2001–2011 include asylum seekers. For the analysis presented here, they also include the 'other unattributable' count from the ONS estimates, which contribute to annual population change but have not been assigned to any specific component. As births, deaths and internal migration are robustly recorded, it is assumed that international migration are the most likely sources of this 'other unattributable' count.
- 4.11 Over the period 2001/02 to 2010/11 emigration is estimated to have exceeded immigration in the majority of years, resulting in a negative impact of net international migration for Epping Forest District. The net impact of emigration was highest between 2006/07 and 2010/11 (Figure 11), a result of higher emigration estimates and low immigration.
- 4.12 In consideration of the assumptions which might drive an updated trend forecast for Epping Forest District, international migration averaged -135 persons per year over the 10-year period 2001/02 to 2010/11, decreasing to -172 for the 5-year period 2006/07 to 2010/11 (Figure 11).

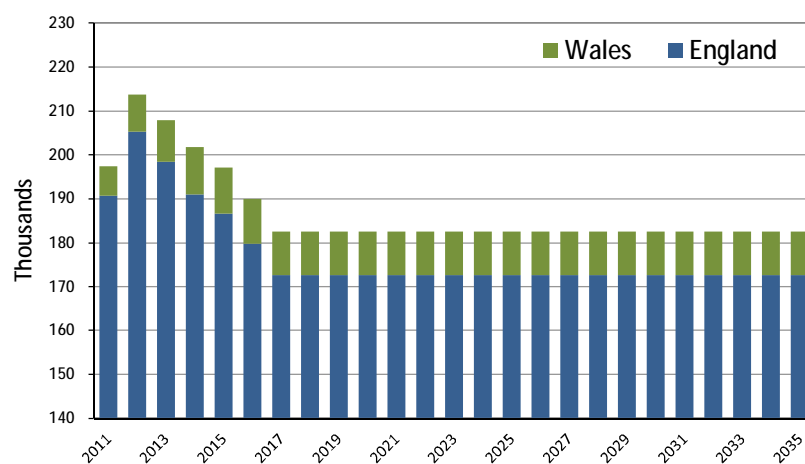


Source: ONS

Figure 11: Epping Forest District: International migration history, 2001 – 2010

ONS long-term assumptions

- 4.13 For international migration, projection assumptions are typically based upon a prior five-year period but will be scaled to the 'national' level of immigration and emigration that is forecast¹. The current long-term assumption on net immigration to England and Wales suggest an annual increase of +183,000 per year (Figure 12).



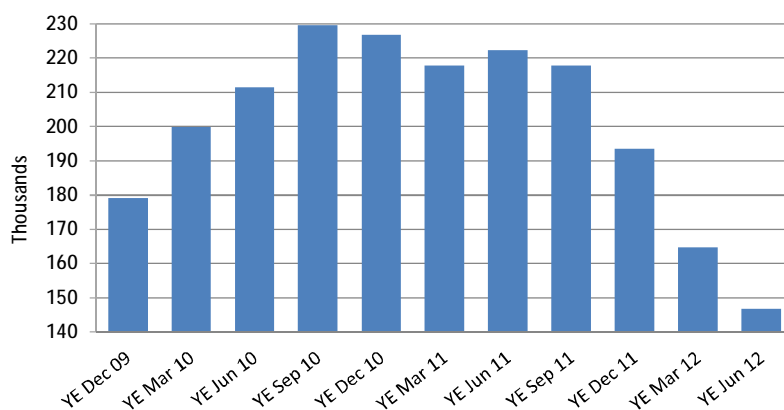
Source: ONS

Figure 12: England & Wales: International migration assumptions (2010-based projection)

¹ ONS 2012 National Population Projections 2010-based Statistical Bulletin: assumptions underlying the 2010-based projections.

<http://ons.gov.uk/ons/rel/npp/national-population-projections/2010-based-projections/stb-2010-based-npp-principal-and-key-variants.html#tab-Assumptions-underlying-the-2010-based-projections>

4.14 This net immigration assumption is high relative to the government's policy target of (less than) +100,000 per year. It is also relatively high compared to the latest net immigration evidence which reflects some of the government's policy interventions designed to reduce annual immigration totals (Figure 13). Tighter restrictions on the length of stay of international students plus constraints on non-EU immigration have begun to reduce the overall net immigration balance to England and Wales. The latest estimate for year-end June 2012 suggests a net balance of less than 150,000, significantly below the long-term assumption in the 2010-based projections.



Source: ONS (England and Wales totals estimated @ 90% of published UK totals)

Figure 13: England & Wales: Recent international migration trends, 2009–2012

4.15 These international migration trends will have an important impact upon trend projections for local authorities across the UK, particularly those where net immigration has been the dominant driver of growth in the last 10 years. Lower levels of immigration are inevitable given the current policy pressures and these should be reflected in revisions to long-term demographic forecasts.

4.16 For Epping Forest District, where the impact of international migration has been estimated as 'net loss' since 2001, the policy changes are likely to have a less significant impact but the scenario analysis presented here examines the potential sensitivity of changes to this component in determining future population growth.

5. A sub-district profile of change: 2001 - 2011

Epping Forest District ward statistics

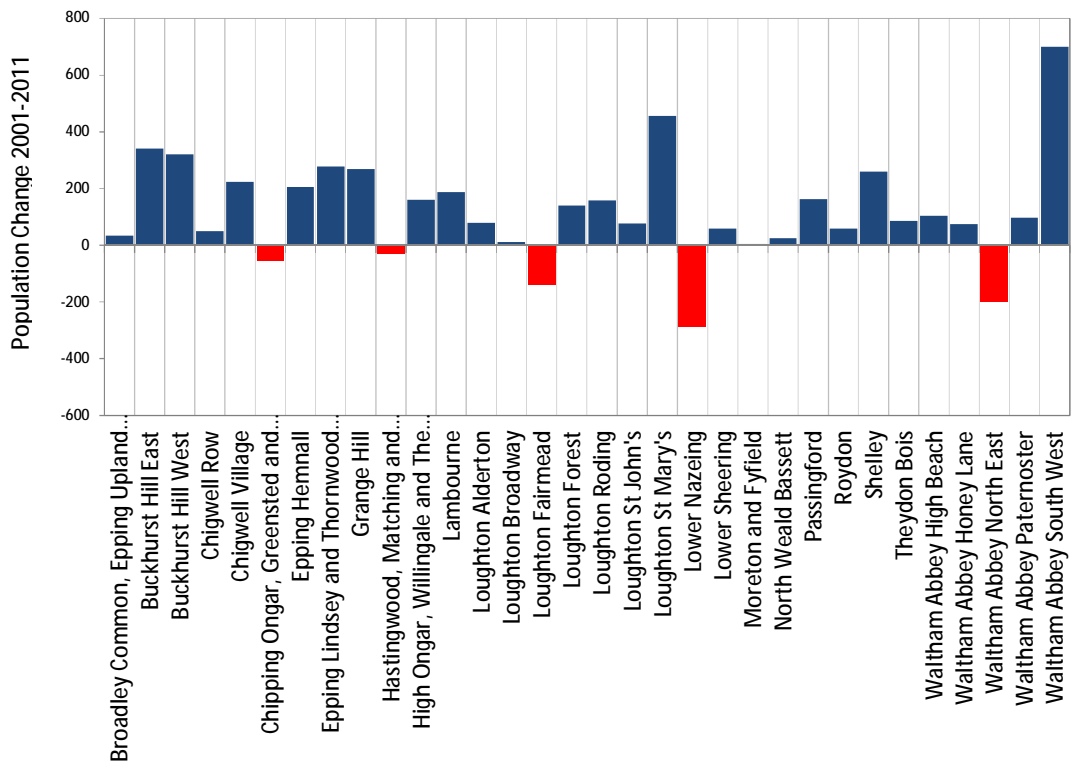
- 5.1 Within Epping Forest District, demographic change is a composite of change in smaller geographical areas. Ward-level data are presented here to illustrate how 2001-2011 population growth has varied geographically, including the relative importance of natural change and net migration as drivers of growth and their relationship to changes to the housing stock.
- 5.2 Using 2011 wards as the geographical unit for analysis, 2001 and 2011 Census data have been aggregated from individual output areas. ONS provides a (best-fit) match between 2011 output areas and wards. Where there have been changes in output area definition between 2001 and 2011, an appropriate proportional assignment has been applied based upon the distribution of address counts.
- 5.3 Given this need to manipulate Census statistics to enable the 2001-2011 comparison, there may be minor inconsistencies when change over the decade is being considered. The district totals will be robust but the ward-level analysis may incorporate small inconsistencies due to geographical alignment issues. However, the analysis does otherwise provide a robust profile of change over time for local geographical areas.

Local population change

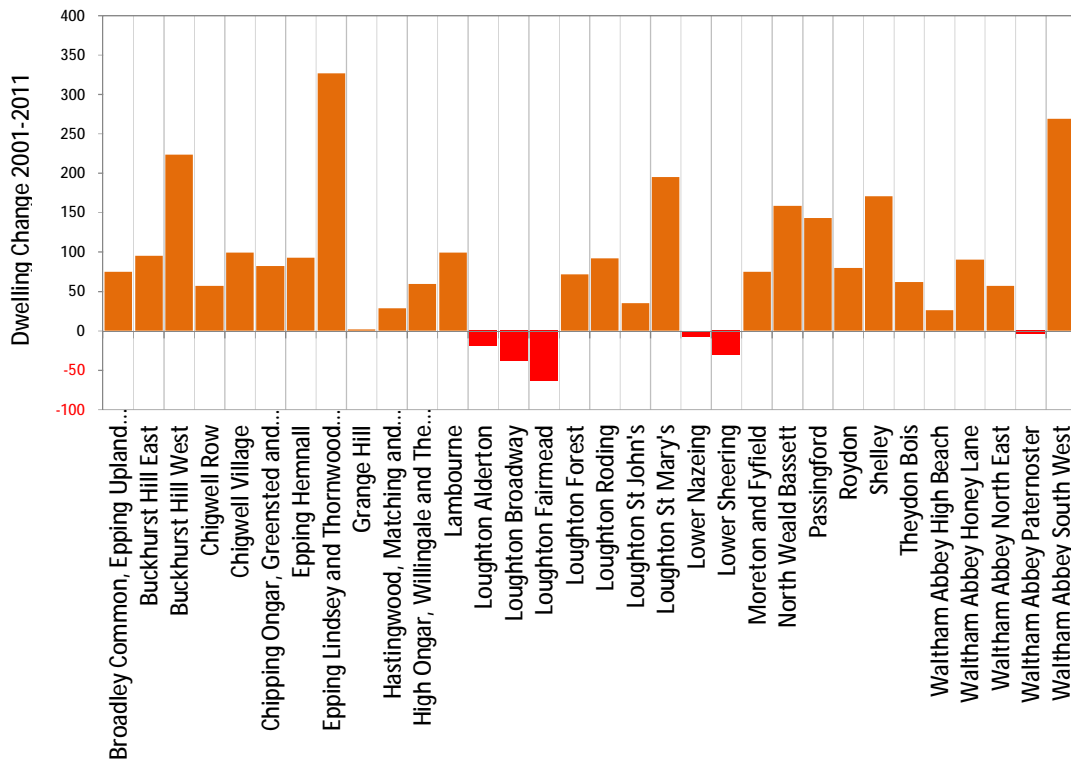
- 5.4 Epping Forest District's population change over the 2001-2011 decade reveals a number of local concentrations of growth and decline (Figure 14a).
- 5.5 The wards of Waltham Abbey South West, Loughton St Mary's, Buckhurst Hill East and Buckhurst Hill West have together accounted for 46% of population growth since 2001. Epping Lindsey and Thornwood Common, Grange Hill, and Shelley wards contributed a further 21% of growth.
- 5.6 Other wards have contributed smaller amounts to population growth, with seven wards, Loughton Broadway, Moreton and Fyfield, Hastingwood, Matching and Sheering Village, Chipping Ongar, Greensted and Marden Ash, Loughton Fairmead, Waltham Abbey North East, and Lower Nazeing suggesting either zero growth or a decline in their respective population totals.

-
- 5.7 These concentrations of population growth are generally reflected in the statistics on dwelling growth for the 2001-2011 decade although there are exceptions (Figure 14b).
- 5.8 Whilst higher dwelling growth matches higher population growth in Waltham Abbey South West, Loughton St Mary's and Buckhurst Hill West; Epping Lindsey and Thornwood Common has been an area of particularly high dwelling growth relative to population.
- 5.9 These absolute changes in population and dwelling totals translate to a geographical distribution of percentage change with particular concentrations of growth. The largest percentage growth in population (10+%) has been evident in Lambourne, Loughton St Mary's, Shelley and Waltham Abbey South West (Figure 15). Dwelling growth hotspots (10+% change) include Epping Lindsay and Thornwood Common, Lambourne, Loughton St Mary's, Passingford, Shelley and Waltham Abbey South West.

a. Population change 2001 - 2011

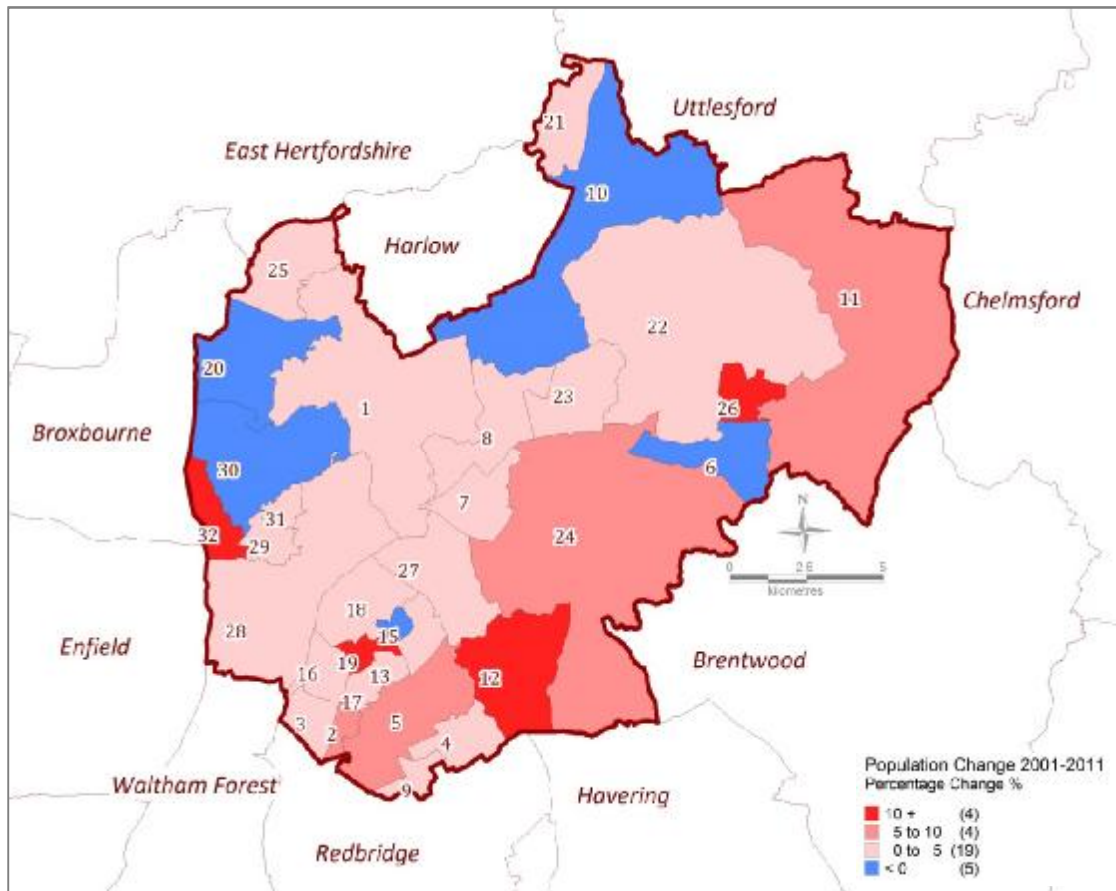


b. Change in the number of dwellings 2001 - 2011



Source: ONS; 2001 and 2011 Census

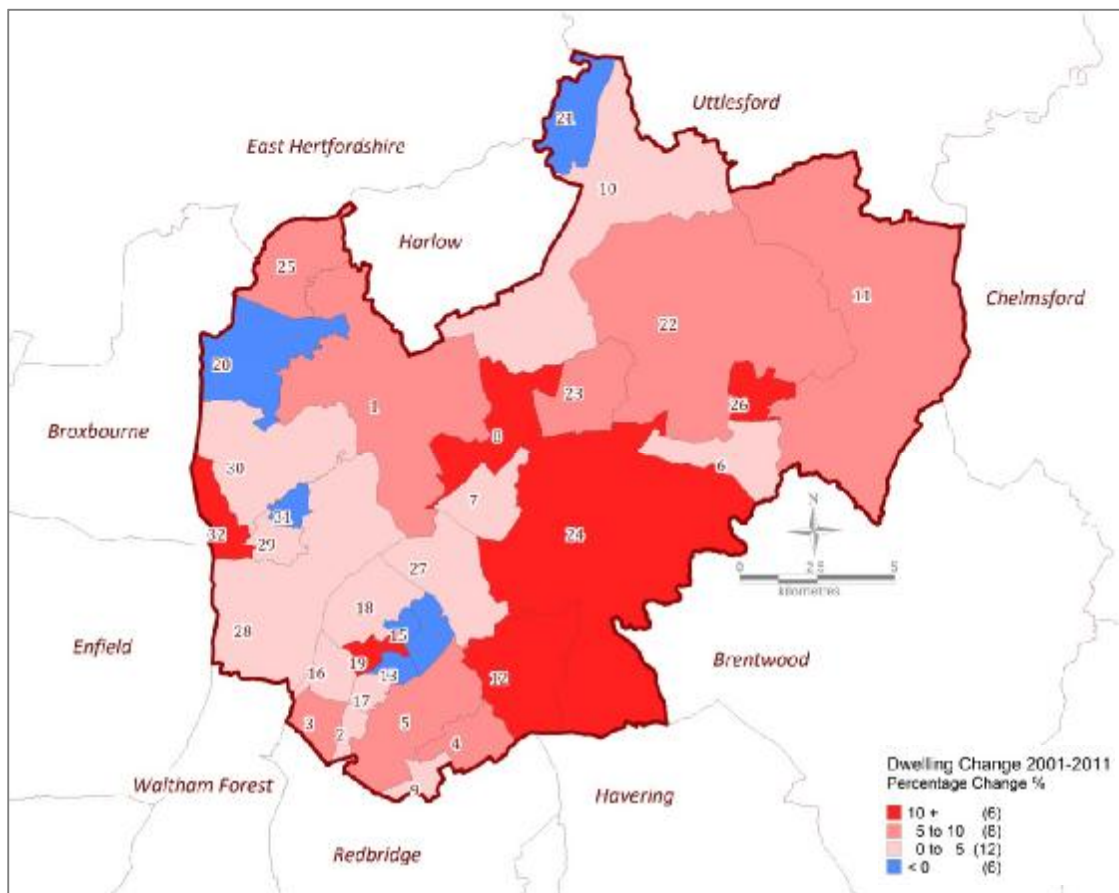
Figure 14: Epping Forest District wards: Population and dwelling change 2001 - 2011



Reference	Ward Name	Reference	Ward Name
1	Broadley Common, Epping Upland and Nazeing	17	Loughton Roding
2	Buckhurst Hill East	18	Loughton St John's
3	Buckhurst Hill West	19	Loughton St Mary's
4	Chigwell Row	20	Lower Nazeing
5	Chigwell Village	21	Lower Sheering
6	Chipping Ongar, Greensted and Marden Ash	22	Moreton and Fyfield
7	Epping Hemnall	23	North Weald Bassett
8	Epping Lindsey and Thornwood Common	24	Passingford
9	Grange Hill	25	Roydon
10	Hastingwood, Matching and Sheering Village	26	Shelley
11	High Ongar, Willingale and The Rodings	27	Theydon Bois
12	Lambourne	28	Waltham Abbey High Beach
13	Loughton Alderton	29	Waltham Abbey Honey Lane
14	Loughton Broadway	30	Waltham Abbey North East
15	Loughton Fairmead	31	Waltham Abbey Paternoster
16	Loughton Forest	32	Waltham Abbey South West

Source: ONS; 2001 and 2011 Census

Figure 15: Epping Forest District wards: Population change (%) 2001 to 2011



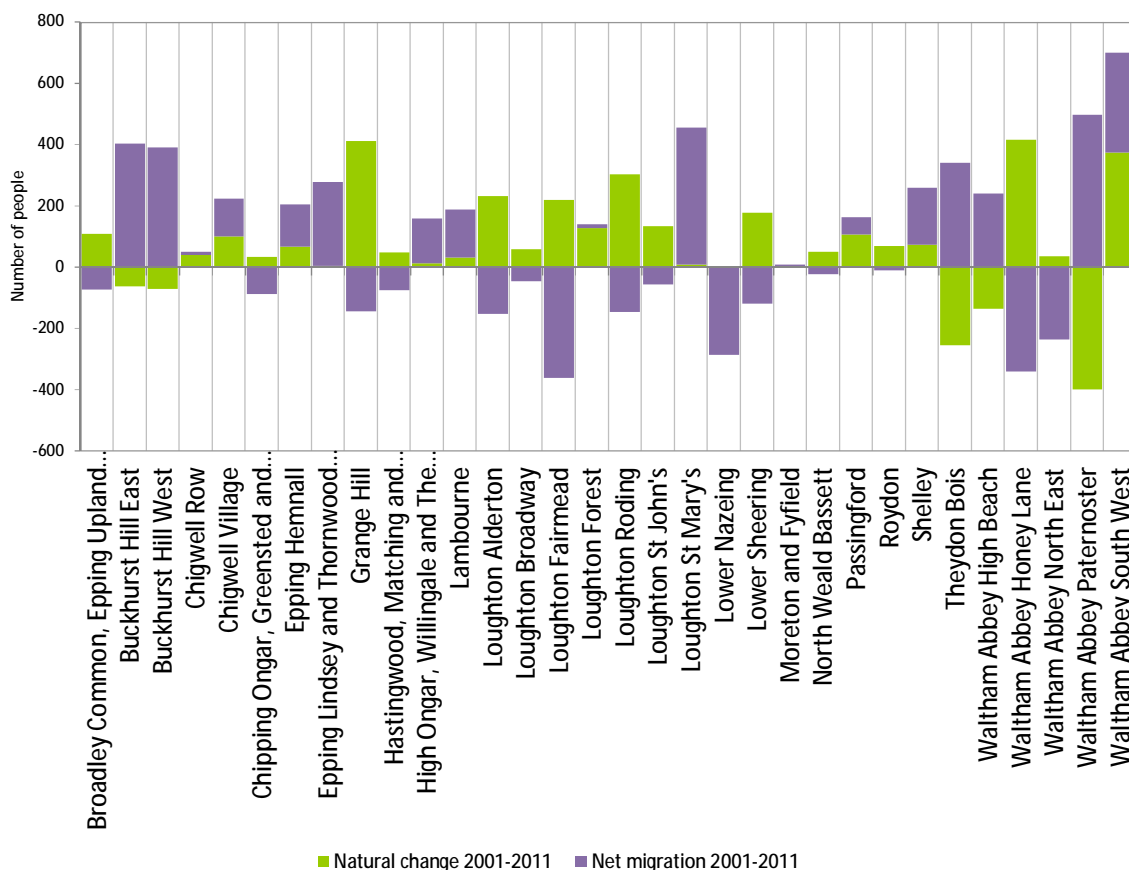
Reference	Ward Name	Reference	Ward Name
1	Broadley Common, Epping Upland and Nazeing	17	Loughton Roding
2	Buckhurst Hill East	18	Loughton St John's
3	Buckhurst Hill West	19	Loughton St Mary's
4	Chigwell Row	20	Lower Nazeing
5	Chigwell Village	21	Lower Sheering
6	Chipping Ongar, Greensted and Marden Ash	22	Moreton and Fyfield
7	Epping Hemnall	23	North Weald Bassett
8	Epping Lindsey and Thornwood Common	24	Passingford
9	Grange Hill	25	Roydon
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12	Lambourne	28	Waltham Abbey High Beach
13	Loughton Alderton	29	Waltham Abbey Honey Lane
14	Loughton Broadway	30	Waltham Abbey North East
15	Loughton Fairmead	31	Waltham Abbey Paternoster
16	Loughton Forest	32	Waltham Abbey South West

Source: ONS; 2001 and 2011 Census

Figure 16: Epping Forest District wards: Dwelling change (%) 2001 to 2011

Births, deaths and migration

5.10 Using data recorded on births and deaths in each ward in combination with 2001 and 2011 Census population estimates, it is possible to disaggregate growth between Censuses into two distinct demographic components: natural change (the difference between births and deaths) and net migration. At this geographical level, the net migration does not distinguish between internal and international migration (Figure 17).



Source: ONS

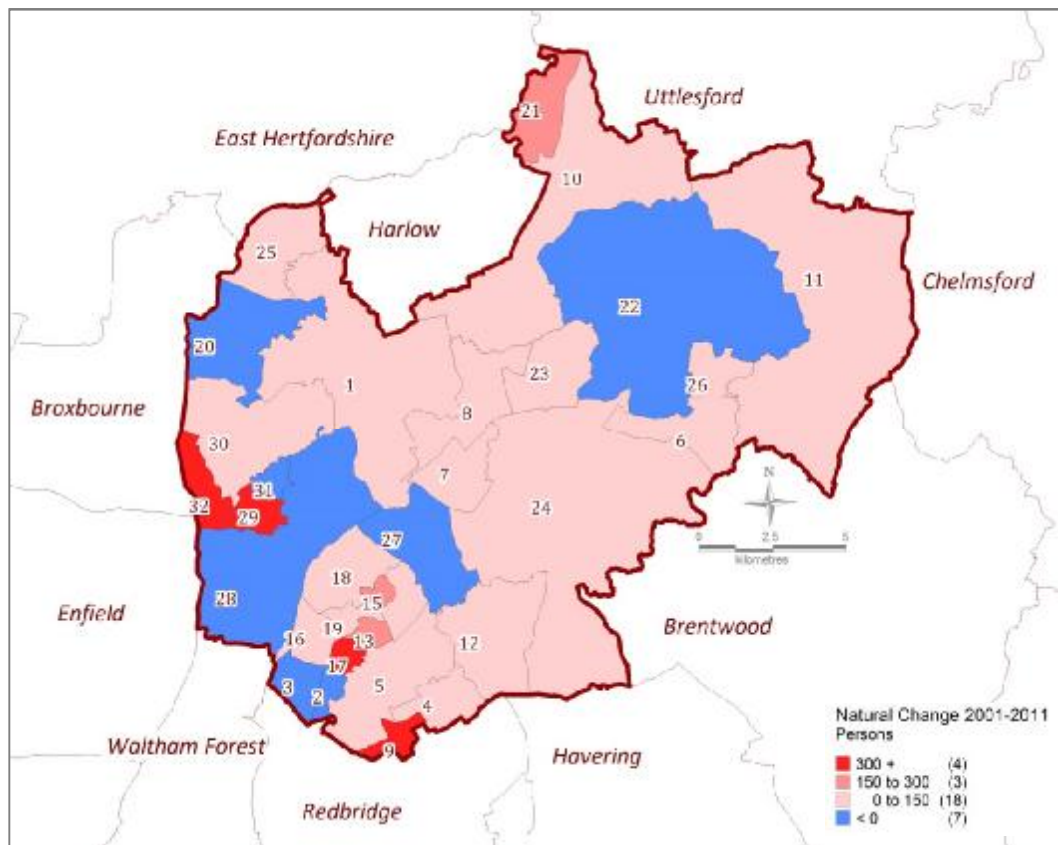
Figure 17: Epping Forest District: Components of population change, 2001 – 2011

5.11 There is variation between wards with respect to the relative importance of net migration and natural change as drivers of population change over the ten-year period. In Loughton St Mary's for example, the large growth in population is almost exclusively a result of net migration, whereas in Buckhurst Hill East and Buckhurst Hill West growth due to net migration has offset a small net loss resulting from natural change to give a high population growth overall.

5.12 In Waltham Abbey South West, where population growth has been particularly strong, both

natural change and net migration have made significant contributions to the changing profile of the area.

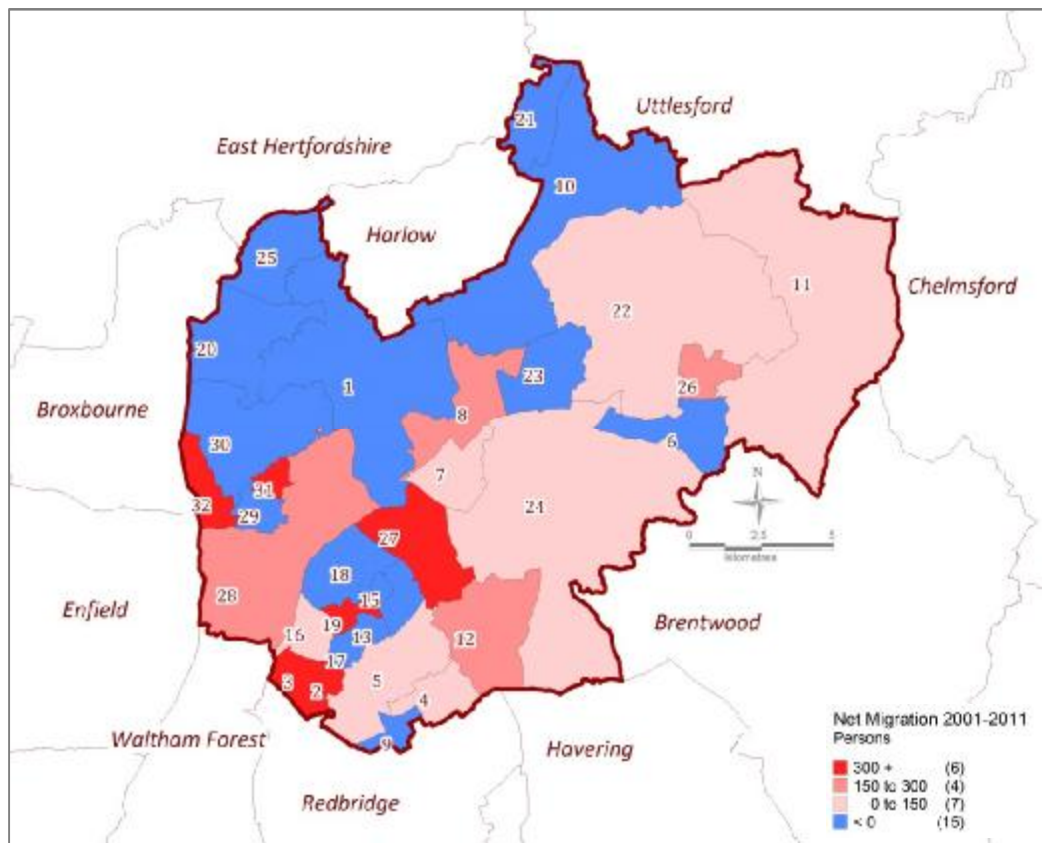
- 5.13 In a number of areas (e.g. Grange Hill, Waltham Abbey Honey Lane), natural change has been the significant driver of growth, offset by a net outflow of population due to migration.
- 5.14 The geographical presentation of the natural change and net migration statistics reveals the pattern of variation across the district. In the majority of wards the impact of natural change is small (0-150 over the decade) but Waltham Abbey, Loughton and Grange Hill have been the hotspots where natural growth has exceeded +300 over the 2001-2011 period (Figure 18).
- 5.15 The distribution of net migration reveals the general pattern of 'net loss' of population in the northernmost wards bordering Harlow, Uttlesford and Broxbourne (Figure 19).



Reference	Ward Name	Reference	Ward Name
1	Broadley Common, Epping Upland and Nazeing	17	Loughton Roding
2	Buckhurst Hill East	18	Loughton St John's
3	Buckhurst Hill West	19	Loughton St Mary's
4	Chigwell Row	20	Lower Nazeing
5	Chigwell Village	21	Lower Sheering
6	Chipping Ongar, Greensted and Marden Ash	22	Moreton and Fyfield
7	Epping Hemnall	23	North Weald Bassett
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9	Grange Hill	25	Roydon
10	Hastingwood, Matching and Sheering Village	26	Shelley
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12	Lambourne	28	Waltham Abbey High Beach
13	Loughton Alderton	29	Waltham Abbey Honey Lane
14	Loughton Broadway	30	Waltham Abbey North East
15	Loughton Fairmead	31	Waltham Abbey Paternoster
16	Loughton Forest	32	Waltham Abbey South West

Source: ONS; 2001 and 2011 Census

Figure 18: Epping Forest District: Natural change 2001 - 2011



Reference	Ward Name	Reference	Ward Name
1	Broadley Common, Epping Upland and Nazeing	17	Loughton Roding
2	Buckhurst Hill East	18	Loughton St John's
3	Buckhurst Hill West	19	Loughton St Mary's
4	Chigwell Row	20	Lower Nazeing
5	Chigwell Village	21	Lower Sheering
6	Chipping Ongar, Greensted and Marden Ash	22	Moreton and Fyfield
7	Epping Hemnall	23	North Weald Bassett
8	Epping Lindsey and Thornwood Common	24	Passingford
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13	Loughton Alderton	29	Waltham Abbey Honey Lane
14	Loughton Broadway	30	Waltham Abbey North East
15	Loughton Fairmead	31	Waltham Abbey Paternoster
16	Loughton Forest	32	Waltham Abbey South West

Source: ONS; 2001 and 2011 Census

Figure 19: Epping Forest District: Net migration, 2001 – 2011

6. Scenario Definition

Scenario context

- 6.1 The NPPF provides guidance on the development of a robust evidence base to support the formulation of local housing plans. The guidance makes it clear that data inputs, assumptions and methodology should be robust and should consider future growth potential from a number of perspectives.
- 6.2 There is no single, definitive view on the likely level of growth expected in Epping Forest District, with a mix of economic, demographic and national/local policy issues ultimately determining 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 (and other service) provision.
- 6.3 The development of Local Plans is made considerably more challenging by the dynamic nature of key data inputs. Economic and demographic factors, coupled with the continuous release of new statistics, often undermine the robustness of underpinning evidence. This has been a particular issue during 2013, with the release of new 2011 Census statistics, updated household projections and revisions to historical population estimates.
- 6.4 Evidence presented in Local Plans 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 (POPGROUP), which incorporates an industry-standard methodology (cohort component model), removes this obstacle and enables a focus on assumptions and output, rather than methods.
- 6.5 Transparency is an important component of any forecasting analysis. It is necessary to ensure that all data inputs and assumptions are clearly documented and that outcomes are benchmarked against the latest 'official' forecasts, wherever possible.
- 6.6 A number of alternative growth scenarios have been tested for Epping Forest District. These scenarios have been developed using POPGROUP technology; they use the latest available statistics from both ONS and CLG; they evaluate trend, policy and economic considerations; they are accompanied by a transparent definition of key assumptions; and they are presented in a

consistent format that contrasts the impact of scenario assumptions upon changes to population, households, dwellings, labour force and jobs. All scenarios are run from a 2011 base year, with both a 2026 and a 2033 horizon. For context, historical data are included for 2001–2011.

Official projections (ONS)

- 6.7 In all scenario analysis it is important to 'benchmark' any growth alternatives against the latest 'official' population projection. Although ONS has released an 'interim' 2011-based population projection, it has used assumptions from the 2010-based population projection to define its fertility, mortality and migration components of change. For this reason, the 2011-based population projections do not provide a suitably robust benchmark trend projection.
- 6.8 The 2010-based sub-national projection (SNPP-2010) from ONS is used in this analysis as the trend benchmark. This scenario has been developed using historical evidence from the period 2006-10 and incorporates long-term assumptions on fertility, mortality and international migration that were defined in the 2010-based national projection for England.
- 6.9 The SNPP-2010 scenario has been scaled to ensure consistency with the 2011 Census population, following its designated growth trend thereafter.

Alternative trend scenarios

- 6.10 During 2012-13, ONS has released detailed statistics from the 2011 Census and has followed this with a release of the revised mid-year population estimates for 2002-10. These new data provide the basis for the derivation of a number of alternative 'trend' scenarios to complement the most recent official projection (SNPP-2010).
- 6.11 In determining the migration assumptions for a new '2011-based' trend projection, historical data on the components of demographic change during the 2001–2011 time period are a key consideration (see Section 3).
- 6.12 A five year historical period is a typical time-frame from which migration 'trend' assumptions are derived (this is consistent with the ONS official methodology). However, given the unprecedented economic changes that have occurred since 2008, it is important to give due consideration to an extended historical time period for assumption derivation. In addition, the

government has made its intentions on immigration control clear. The current ONS national long-term assumption of an annual +183,000 net increase due to international migration is high compared to current statistics (approximately +155,000) and government targets (< +100,000 per year). Taking due account of these differences is also an important consideration in the calculation of alternative trend assumptions.

- 6.13 A range of 'migration-led' scenario alternatives have been developed and tested, as follows:
- 'Mig-led 5yr': internal and international migration assumptions are based on five years of historical evidence (2006/7 – 2010/11).
 - 'Mig-led 10yr': internal and international migration assumptions are based on 10 years of historical evidence (2001/2 – 2010/11).
 - 'Mig-led 10yr 5yr': internal migration assumptions are based on 10 years, international migration assumptions are based on five years of historical evidence.
 - 'Mig-led 10yr Zero Int Mig': internal migration assumptions are based on 10 years of historical evidence, international migration is assumed to be zero over the projection period.
 - 'NetNil': in-migration, out-migration, immigration and emigration are maintained, but the net migration balance is set at zero.

Dwelling-led scenarios

- 6.14 Previous analysis undertaken by Edge Analytics for the Essex Planning Officers Association (EPOA) tested a range of Regional Spatial Strategy (or RSS, for Epping Forest District this was formerly the East of England Plan) dwelling completion trajectories, and the implications which these have for population growth within Epping Forest District.
- 6.15 The impact of dwelling growth targets upon likely demographic change is evaluated with a 'dwelling-led' formulation of the POPGROUP model, which uses in- and out-migration to balance the relationship between population size and housing provision.
- 6.16 Dwelling-led scenarios have been developed using four RSS housing growth trajectories (Figure 20). The 'Draft' and 'Approved' label refers to the review stages of the RSS targets. The 'Realistic' version of each of these has been derived following Epping Forest District's final review of the 'Pure' statistics from the RSS process. The scenarios are defined as follows:

- 'Approved RSS Pure': population growth is constrained to a dwelling completion rate of 10,000 dwellings over the projection period (455 dpa).
- 'Approved RSS Realistic': population growth is constrained to a dwelling completion rate of 9,990 dwellings over the projection period (454 dpa).
- 'Draft Review RSS Pure': population growth is constrained to a dwelling completion rate of 7,920 dwellings over the projection period (360 dpa).
- 'Draft Review RSS Realistic': population growth is constrained to a dwelling completion rate of 8,020 dwellings over the projection period (365 dpa).

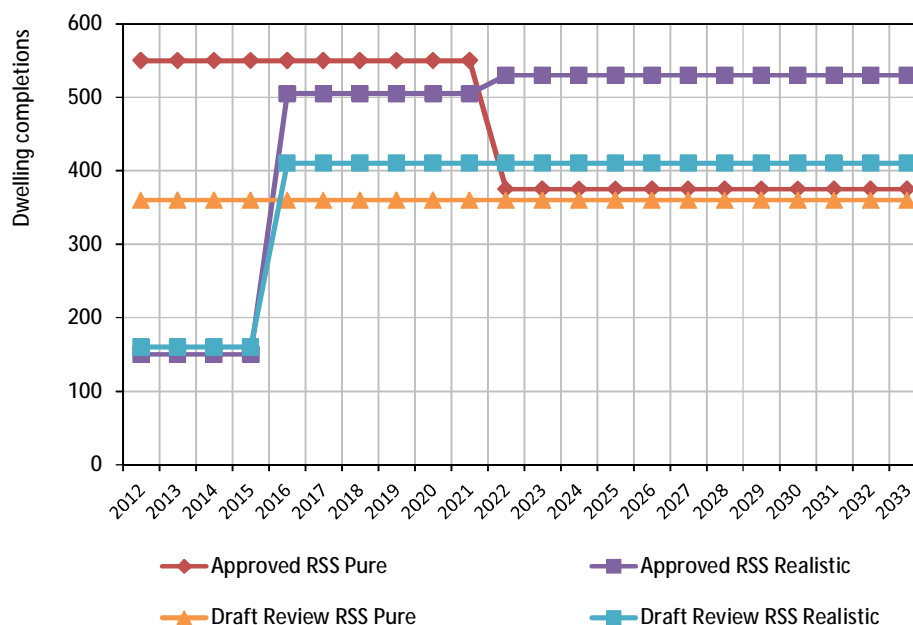


Figure 20: Epping Forest District: RSS housing growth trajectories 2012-33

- 6.17 POPGROUP is able to evaluate the impact of a particular dwelling trajectory by measuring the relationship between the number of homes in an area, the number of households and the size of the resident population.
- 6.18 If there is an 'imbalance' between the 'target' number of new homes and the resident population, then migration is used to redress the imbalance. A higher level of net in-migration will occur if there is insufficient population to meet dwelling targets. A higher level of net out-migration will occur if the population is too high relative to dwelling targets.

Employment-led scenarios

- 6.19 The impact of an anticipated growth in employment can also be evaluated using an 'employment-led' formulation of the model, which uses in- and out-migration to balance the relationship between the size of the labour force and the number of new jobs anticipated.
- 6.20 In modelling the potential impact of jobs growth upon demographic change, three key parameters are used: economic activity rates by age and sex; an unemployment rate for the District; and a commuting ratio for the District. Further detail on these assumptions is provided in the Appendix to this document.
- 6.21 Two employment-led scenarios have been developed using growth trajectories provided by EFDC:
- 'Economic-led Historical Trend': Population growth is constrained to a growth in employment of 5,617 over the projection period (255 per year).
 - 'Economic-led Historical Trend Plus 10%': Population growth is constrained to a growth in employment of 6,179 over the projection period (281 per year).
- 6.22 The employment trajectories have been developed through analysis of historical employment change. They are assumed to relate to a change in the size of the labour force, not in the number of jobs and the growth impact is evaluated on the basis of a fixed commuting and unemployment assumption, plus economic activity rates which vary to account for mandatory changes to the state pension age. Anticipated labour force growth is applied at a constant rate between 2011 and 2033.
- 6.23 POPGROUP is able to evaluate the impact of a particular employment growth trajectory by measuring the relationship between the number of jobs in an area, the size of its labour force and the size of the resident population. Economic activity rates control the relationship between the size of the population and the size of the labour force. The unemployment rate and the commuting ratio determine the relationship between the size of the labour force and the number of jobs available (see Appendix B for more detail on key assumptions).
- 6.24 If there is an 'imbalance' between the 'target' employment growth and the resident population, then migration is used to redress the imbalance. A higher level of net in-migration will occur if there is insufficient population to meet employment targets. A higher level of net out-migration will occur if the population is too high relative to employment targets

Household forecasts

- 6.25 Section 4 has provided a summary of the impact of the CLG's latest household projection model. Using evidence from the 2011 Census, this has introduced new 'headship rates' (the proportion of a population who 'head' or 'represent' a household of a particular type, e.g. single persons) which determine the scale and profile of future household formation.
- 6.26 For the analysis presented here, two alternative headship rate assumptions are used, reflecting the uncertainty associated with future rates of household formation and accommodating the fact that the latest 2011-based data only run to 2021.
- Option A: CLG 2011-based headship rates, with the 2011-21 trend continued after 2021.
 - Option B: CLG 2008-based headship rates, scaled to be consistent with the 2011 Census but following the original trend thereafter.
- 6.27 The household impact of the population growth scenarios is modelled using each of the two headship rate alternatives.
- 6.28 The relationship between households and dwellings is modelled using a 'vacancy rate' based on the ratio between households (occupied, second homes and vacant) and dwellings (shared and unshared) from the 2011 Census. The vacancy rate for Epping Forest District is 4.4%. This value remains constant throughout the forecast period.

Scenario definition summary

6.29 To summarise, the following suite of scenarios was evaluated as part of this analysis (Table 4):

Table 4: Epping Forest District: Scenario definition summary

Scenario Type	Household Headship Rates	
	CLG 2011-trend	CLG 2008
Official	SNPP-2010_A	SNPP-2010_B
Trend	Mig-led5yrs_A Mig-led10yrs_A Mig-led10yrs-5yrs_A Mig-led 10yrs Zero Int Migration_A NetNil_A	Mig-led5yrs_B Mig-led10yrs_B Mig-led10yrs-5yrs_B Mig-led 10yrs Zero Int Migration_B NetNil_B
Dwelling-led	Approved RSS Pure - R_A Approved RSS Realistic - R_A Draft Review RSS Pure - R_A Draft Review RSS Realistic - R_A	Approved RSS Pure - R_B Approved RSS Realistic - R_B Draft Review RSS Pure - R_B Draft Review RSS Realistic - R_B
Jobs-led	Employment_Historical Trend_A Employment_Historical Trend Plus 10%_A	Employment_Historical Trend_B Employment_Historical Trend Plus 10%_B

7. Scenario Results

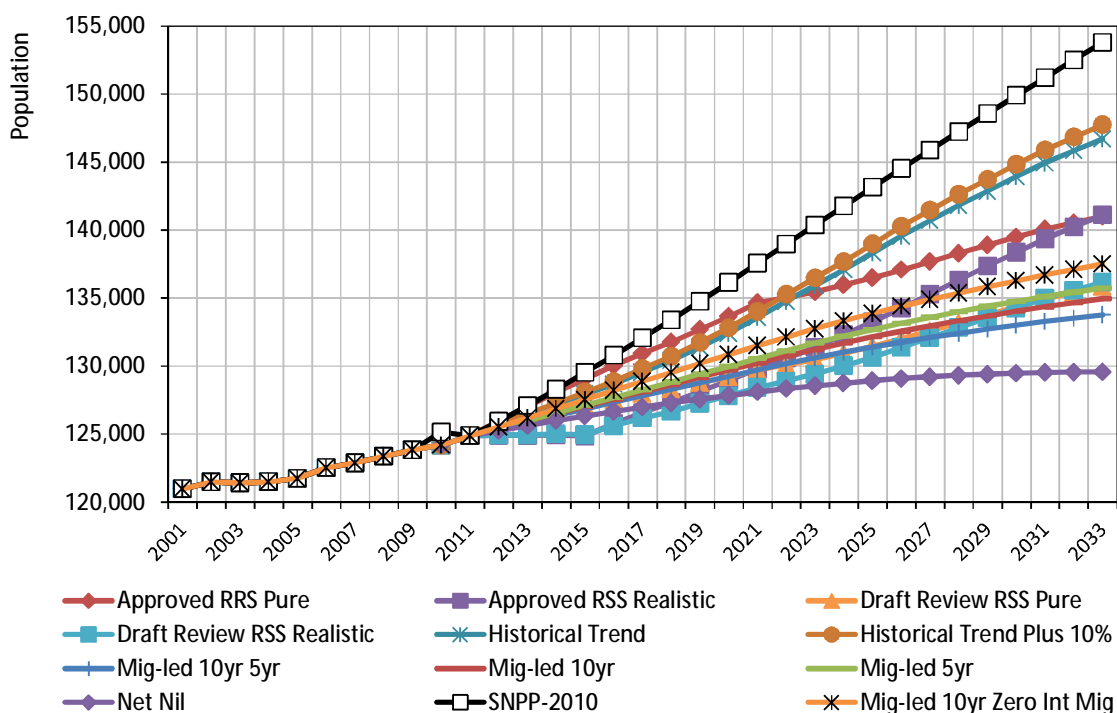
Scenario summary

- 7.1 A summary of the results of each scenario is provided in the form of a chart and an accompanying table of statistics. The chart illustrates the trajectory of population change resulting from each scenario. The table summarises the change in population and household numbers from 2011-33 that result from each scenario. The scenarios are 'ranked' (high to low) according to the estimated level of population change throughout 2011-33. The table also shows the average annual net migration associated with the population change; plus the expected average annual dwelling and jobs growth based on the assumptions used in each scenario.
- 7.2 Scenario results are presented in two separate illustrations, each one relating to the application of different household headship rates:
- Option A: CLG 2011-based headship rates, with the 2011–2021 trend continued after 2021;
 - Option B: CLG 2008-based headship rates, scaled to be consistent with the 2011 Census but following the original trend thereafter.

Scenario outcomes (A)

- 7.3 This first set of scenarios has been run using CLG's 2011-based household headship rates, trended after 2021. The scenario outcomes suggest a range of growth trajectories depending upon the key assumptions that have been applied. Population growth ranges from 3.8 to 23.2%, with estimated dwelling growth from 240 to 698 units per year (Figure 21).
- 7.4 All scenarios, with the exception of 'SNPP-2010', use the same historical data to generate a forecast. The SNPP-2010 projection was developed by ONS using the, now out-dated, mid-year estimates. It does not include 2011 Census information, although the forecast presented here has rescaled the 2010 trajectory to the 2011 Census population total, continuing its trend thereafter.
- 7.5 As it uses 'old' data, the age profile of the 'SNPP-2010' scenario will differ from that of the other scenarios, all of which are based on the latest mid-year estimates but more importantly on the 2011 Census single year population age profile for Epping Forest District.

Option A: CLG 2011-based headship rates



Scenario	Change 2011 - 2033				Average per year		
	Population Change	Population Change %	Households Change	Households Change %	Net Migration	Dwellings	Jobs
SNPP-2010	28,913	23.2%	14,683	28.3%	940	698	295
Historical Trend Plus 10%	22,860	18.3%	12,095	23.2%	678	575	174
Historical Trend	21,816	17.5%	11,697	22.5%	638	556	158
Approved RSS Realistic	16,236	13.0%	9,546	18.3%	441	454	75
Approved RRS Pure	16,116	12.9%	9,556	18.3%	403	455	70
Mig-led 10yr Zero Int Mig	12,634	10.1%	7,568	14.5%	301	360	23
Draft Review RSS Realistic	11,286	9.0%	7,664	14.7%	248	365	0
Draft Review RSS Pure	10,977	8.8%	7,568	14.5%	226	360	-5
Mig-led 5yr	10,845	8.7%	7,519	14.4%	211	358	-9
Mig-led 10yr	10,068	8.1%	6,529	12.5%	169	311	-16
Mig-led 10yr 5yr	8,890	7.1%	6,356	12.2%	133	302	-29
Net Nil	4,689	3.8%	5,048	9.7%	0	240	-67

Figure 21: Epping Forest District: Scenario forecasts 2011-2033 (A - CLG 2011-based headship rates)

- 7.6 The highest growth trajectory is suggested by the 'SNPP-2010' scenario. This scenario suggests a 23.2% increase in population between 2011 and 2033, which is considerably in excess of the growth estimates resulting from the updated trend scenarios. The high population growth results in a high household growth (28.3%) and annual dwelling requirement (698 per year).
- 7.7 The 'Net Nil' scenario suggests that, in the *hypothetical* absence of migration, population growth would be approximately 3.8% between 2011 and 2033, with a household growth of 9.7% and an annual dwelling requirement of 240 units per year. An artificial absence of migration results in a gradual 'ageing' of the resident population, which in turn has implications for job requirements which are estimated to decline by -67 units per year over the forecast period.
- 7.8 The updated trend scenarios ('Mig-led 5yrs', 'Mig-led 10yrs' and 'Mig-led 10yrs-5yrs'), which have used the revised mid-year estimates to establish new migration assumptions, each results in considerably lower growth than the SNPP2010 alternative. The 'Mig-led 5yr' scenario suggests the highest population growth of the three, reflecting a higher overall migration impact in the five years to 2011 compared to the 2001-2011 decade in total. Population growth under this scenario is estimated at 8.7% to 2033; a dwelling requirement of +358 per year.
- 7.9 Under each of these three 'core' trend scenarios, the job requirement is estimated to reduce over the forecast period, reflecting a decline in the size of the resident labour force.
- 7.10 To test the *hypothetical* situation of no international migration, the removal of this more 'uncertain' component of change, results in slightly higher growth ('Mig-led 10yr Zero Int Migration') as its effect on population change is 'negative' in other trend scenarios. It suggests 10.1% population growth to 2033; a dwelling requirement of +360 per year. The estimated job requirement is positive under this scenario; +23 per year to 2033.
- 7.11 The dwelling-led scenarios produce a range of growth options, higher than the three core trend scenarios but lower than the jobs-led alternatives and the SNPP2010. The two 'Approved RSS' scenarios have similar dwelling growth totals but they follow very different trajectories, the 'Realistic' alternative having lower growth in the short-term, rising in later years to mimic anticipated economic recovery. Population growth estimated to result from the 'Realistic' dwelling-led scenario is approximately 13% over the forecast period, matched to jobs growth of approximately +75 new jobs per year to 2033.
- 7.12 The employment-led scenarios ('Employment Historical Trend', 'Employment Historical Trend

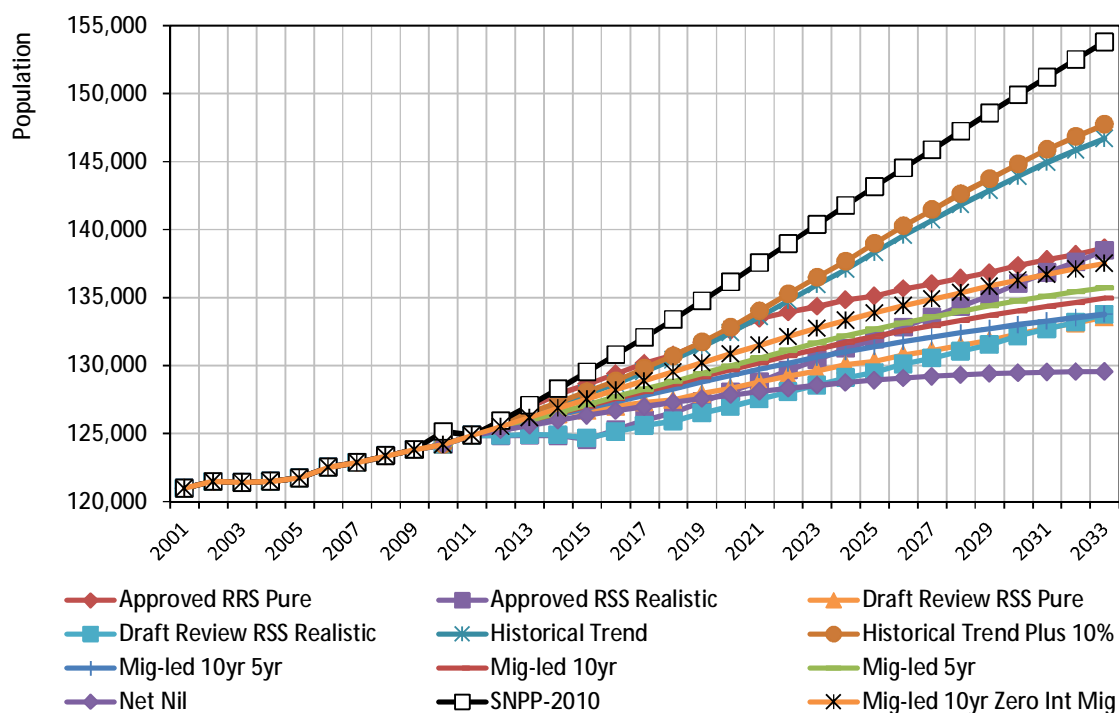
Plus 10%') present two final growth alternatives, options that are more difficult to interpret given the interaction of the different model assumptions that determine the outcomes.

- 7.13 The growth in 'employment' is modelled as a change in the size of the labour force, taking into account a fixed unemployment rate (7.5%), a fixed commuting ratio (1.49) and economic activity rates which increase over time (in older age groups) to accommodate changes in the State Pension age. To achieve the targeted increase in the size of the labour force under these conditions, migration is used as a balancing factor. Higher net in-migration results when the targeted increase in the labour force is not matched by that resulting from Epping Forest District's resident population.
- 7.14 The resulting outcome of the employment-led scenarios is a dwelling requirement of 550-575 units per year over the forecast period, with anticipated population growth of 17.5 – 18.3% to match these conditions. This population growth is fuelled by an average annual net migration of 638-678 to 2033.
- 7.15 The potential sensitivity of the key assumptions upon scenario outcomes is important. For example, higher economic activity rates and/or a lower unemployment rate would reduce the requirement for higher net in-migration and thus dampen the annual dwelling requirement.

Scenario outcomes (B)

- 7.16 The second set of scenarios has been run using CLG's 2008-based household headship rates (Figure 22). The rates have been scaled to ensure that they reproduce the 2011 Census household totals but follow their original trend for the remainder of the projection period.
- 7.17 Section 4 provided context to the alternative use of 2011-based and 2008-based headship rates. The latter have higher rates of household formation for single-person and two-person-no-children households, resulting in a sharper decline in occupancy rates. This is reflected in the Option B scenario outcomes which generate the highest household growth forecasts of the two A & B alternatives.
- 7.18 For the trend forecasts, the Option B scenarios result in higher dwelling requirements; the 2008-based headship rates applying a lower average household size resulting in more households per head of population. For example, the 'Mig-led_10yr' scenario suggests a dwelling requirement of 311 per year in Option A, rising to 353 per year in Option B.

Option B: CLG 2008-based headship rates



Scenario	Change 2011 - 2033				Average per year		
	Population Change	Population Change %	Households Change	Households Change %	Net Migration	Dwellings	Jobs
SNPP-2010	28,913	23.2%	15,568	30.0%	940	741	295
Historical Trend Plus 10%	22,860	18.3%	13,206	25.4%	678	628	174
Historical Trend	21,816	17.5%	12,792	24.6%	638	609	158
Approved RRS Pure	13,770	11.0%	9,556	18.4%	315	455	35
Approved RSS Realistic	13,595	10.9%	9,546	18.3%	339	454	35
Mig-led 10yr Zero Int Mig	12,634	10.1%	8,433	16.2%	301	401	23
Mig-led 5yr	10,845	8.7%	8,410	16.2%	211	400	-9
Mig-led 10yr	10,068	8.1%	7,416	14.2%	169	353	-16
Mig-led 10yr 5yr	8,890	7.1%	7,238	13.9%	133	344	-29
Draft Review RSS Realistic	8,885	7.1%	7,664	14.7%	155	365	-37
Draft Review RSS Pure	8,684	7.0%	7,568	14.5%	137	360	-40
Net Nil	4,689	3.8%	5,741	11.0%	0	273	-67

Figure 22: Epping Forest District: Scenario forecasts 2011-2033 (B - CLG 2008-based headship rates)

- 7.19 Headship rate differences again affect the relationship between the annual dwelling constraint and the population growth associated with the dwelling-led scenario. Population growth is lower in the (B) scenario due to the headship rate trajectory resulting in a lower average household size; the same number of dwellings is associated with a smaller population size.
- 7.20 With a more significant reduction in average household occupancy, population growth associated with the dwelling-led scenarios reduces further to 11.0% ('Approved RSS Pure') and 12.9% ('Approved RSS Realistic'), with similar reduction witnessed in the 'Draft Review' dwelling-led scenarios. The same number of dwellings is accommodating a smaller population given the effect of the 2008-based headship rates.
- 7.21 For the employment-led scenario, household growth is again higher in Option B; the 2008-based headship rates applying a lower average household size resulting in more households per head of population.

A changing age profile

- 7.22 Underpinning the growth scenarios are some fundamental changes to the age structure of Epping Forest District's population. These changes affect the profile of household formation and the relative size of the District's labour force.

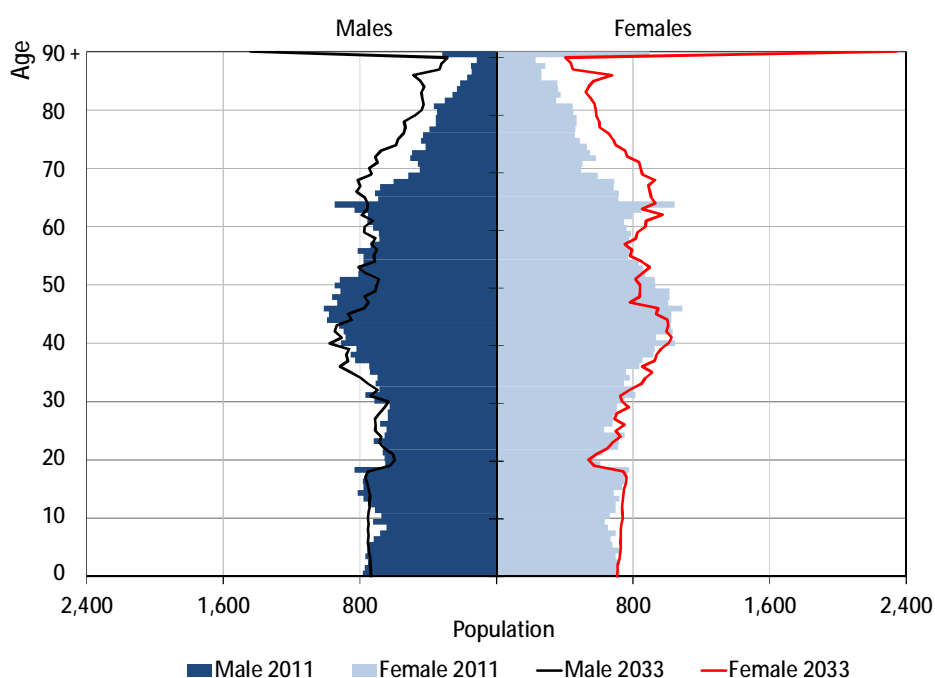
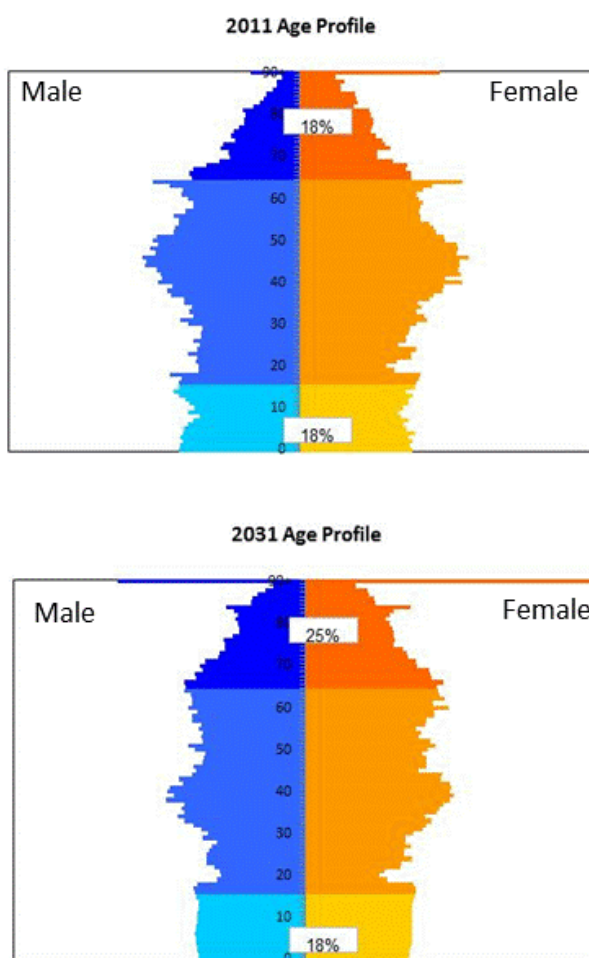


Figure 23: Epping Forest District scenario age profile 2011–2033 ('Mig-led-5yrs')

- 7.23 Using the 'Mig-led5Yrs' scenario as an example, Epping Forest District's 2011 population is compared with its 2033 outcome. Over the projection period, there is an increase in the population of the older age-groups, with the 'inevitable' process of population ageing producing a substantial increase in the old-age dependency balance for the district (Figure 23).
- 7.24 Whilst the number of 0–16 year-olds is maintained at a similar proportion of the total population in 2033, the 65+ age-group increases its share to 25%, from 32% in 2033. Overall, this results in a reduction in the relative size of the labour-force; 57% in 2011 but only 51% in 2033 (Figure 24).



Profiles are cut at ages 16 and 65

Figure 24: Epping Forest District scenario age profile 2011 & 2033 ('Mig-led5Yrs')

8. Summary & Recommendations

Requirements summary

- 8.1 As it formulates its Local Plan, Epping Forest District Council has sought to update the supporting demographic evidence, with the development of a suite of population, household and housing forecasts which incorporate the latest demographic data from:
- 2011 Census statistics on population and households;
 - Revised mid-year population estimates for the period 2002–2010 (ONS);
 - 2011-based household projections for 2011–2021 (CLG).
- 8.2 This report has presented the suite of alternative growth scenarios using POPGROUP technology. They evaluate trend, policy and economic considerations; they are accompanied by a transparent definition of key assumptions; and they are presented in a consistent format that contrasts the impact of scenario assumptions upon changes to population, households, dwellings, labour force and jobs. All scenarios have been run from a 2011 base year, with a 2033 horizon. Historical data has been included for 2001–2011.

Scenario outcomes

- 8.3 The latest demographic evidence has provided a timely update to Epping Forest District's population profile, aligning the new 2011 Census total with an historical time series back to 2001. But the 're-calibration' of Epping Forest District's population estimates has presented uncertainty with regard to the factors that have driven the downward adjustment in the district's 2011 population.
- 8.4 On the assumption that both the 2001 and 2011 Censuses provided a robust enumeration of Epping Forest District's population, it is the mis-estimation of international migration that is most likely to have resulted in the over-estimation of mid-year population totals between the two Censuses. However, ONS does not attribute the population adjustment to international migration, classifying the required change as 'other unattributable' factors. This is unhelpful when determining assumptions for trend projections but the analysis presented here has assumed that the 'unattributable' is allocated to an adjustment to international migration estimates.

- 8.5 The new demographic evidence has enabled the development of alternative 2011-based trend projections that consider the potential future impact of migration. These provide an important update to ONS' 2010-based and 2011-based projections, the former suggesting very high (23.2%) population growth driven by high internal migration assumptions that depart significantly from historical trends.
- 8.6 The profile of internal migrants presented in this analysis has demonstrated the importance of the migration exchange between neighbouring local authorities. A net inward movement from Greater London Boroughs has to some extent been countered by a net outward movement to Uttlesford and East Herts plus other Essex local authorities.
- 8.7 Five-year and ten-year historical perspectives have been used to set migration assumptions in the updated trend scenarios, resulting in forecast population growth of 7.1-8.7%. The 5-year alternative suggests a higher growth forecast than the 10-year, reflecting an increase in net in-migration to Epping Forest District in the five years prior to 2011, compared to the ten-year period 2001-2011.
- 8.8 The robust estimation of the past and future impact of international migration remains an issue. The re-calibration of Epping Forest District's mid-year populations, estimates a consistent net loss due to international migration during 2001-2011, although the latest mid-year population estimate implies a small net gain in 2012. Existing government policy suggests that net immigration to the UK will continue to be targeted for reduction; a factor that will have particular impact upon localities with historically high international migration but should be given due consideration in all local authority areas when evaluating trend forecasts.
- 8.9 A final trend scenario has been presented here, which 'removes' the international migration component of change completely, assuming a zero net balance in the future. This results in higher forecast growth than the 'core' trend scenarios; 10% over the 2011-2033 period.
- 8.10 All trend scenarios suggest growth below that defined by the Approved RSS trajectories and considerably below that suggested by the employment-led scenarios tested here. The latter are particularly sensitive to the assumptions used to generate the scenario outcomes and careful consideration should be given, not only to the employment targets, but also to long-term economic activity and unemployment rates and the commuting balance which determines the movement of workers to and from Epping Forest District.

- 8.11 The analysis of scenario outcomes is complicated by the 'choice' of appropriate headship rates with which household (and dwelling) growth is estimated. The latest 2011-based rates have been calibrated after a period of unprecedented economic change and stagnation in the housing market and thus suggest a slower rate of household formation than the previous 2008-based rates, calibrated from data collected in a time period with very different market characteristics.
- 8.12 Deciding which is the most 'appropriate' trajectory of household growth is difficult. The 2011-based rates have been trended to 2033 for direct comparison with the 2008-based rates. Dwelling growth suggested by the 2011-based (A) scenarios is lower than the 2008-based (B) scenarios. An indication of the dwelling growth that would result if an 'average' of the two extremes were applied is provided (Table 5).

Table 5: Scenario dwelling growth summary

Scenario	Dwellings per year 2011-2033		
	Option A CLG 2011-trend	Option B CLG 2008	Average
SNPP-2010	698	741	719
Employment_Historical Trend Plus 10%	575	628	602
Employment_Historical Trend	556	609	582
Approved RSS Pure - R	455	455	455
Approved RSS Realistic - R	454	454	454
Mig-led 10yrs Zero Int Migration	360	401	381
Mig-led 5yrs	358	400	379
Draft Review RSS Realistic - R	365	365	365
Draft Review RSS Pure - R	360	360	360
Mig-led 10yrs	311	353	332
Mig-led 10yrs-5yrs	302	344	323
NetNil	240	273	257

Option A: CLG 2011-based headship rates, with the 2011-21 trend continued after 2021

Option B: CLG 2008-based headship rates, scaled to be consistent with the 2011 Census but following the original trend thereafter.

Recommendations

- 8.13 The scenario evidence presented here has provided an important update to Epping Forest District's demographic intelligence. The District Council should give particular consideration to the longer-term impacts of migration, both internal and international and its influence upon

future housing growth.

- 8.14 It is recommended that Epping Forest District Council evaluates the robustness of its underlying economic forecast, which suggests consistent employment growth in conjunction with an ageing population and a shrinking labour force. Higher net in-migration and a higher housing requirement is the consequence of this scenario.
- 8.15 In relation to future household formation, due consideration should be given to both Option A and Option B scenarios. The Option A scenarios may be driven by assumptions calibrated from a period of slower rates of household formation, but these conditions are likely to continue, certainly in the short term.
- 8.16 As it formulates its Local Plan using the new evidence presented here, Epping Forest District Council should continue to cooperate with its neighbouring authorities, to consider the important migration and economic exchanges between these areas and the likely impact upon housing growth in the district.

Glossary

Abbreviation	Definition
ASFR	Age-specific fertility rate
ASMR	Age-specific mortality rate
CLG	Department for Communities and Local Government
EFDC	Epping Forest District Council
IPS	International Passenger Survey
LGA	Local Government Association
MYE	Mid-year population estimates
NPPF	National Planning Policy Framework
ONS	Office for National Statistics
PRDS	Patient Register Data Service
RSS	Regional Spatial Strategy
SNPP	Sub-national population projections

Appendix A: Forecasting Methodology

- 8.17 The POPGROUP suite of models is used extensively by local authorities across the UK, providing a desktop utility for the evaluation of alternative growth scenarios to support local planning. Under licence to the Local Government Association (LGA), Edge Analytics provides product development and technical support to the product suite and its user base.
- 8.18 For a more complete review of the functionality and methodology which underpin POPGROUP and the Derived Forecast model, users are referred to the respective user manuals, available from the POPGROUP website: <http://www.popgroup.org.uk/>.
- 8.19 The main POPGROUP model (Figure 25) is a cohort component model which enables the development of population forecasts based on births, deaths and migration inputs and assumptions. The Derived Forecast model (Figure 26) sits alongside the population model, providing a headship rate model for household projections and an economic activity rate model for labour-force projections.

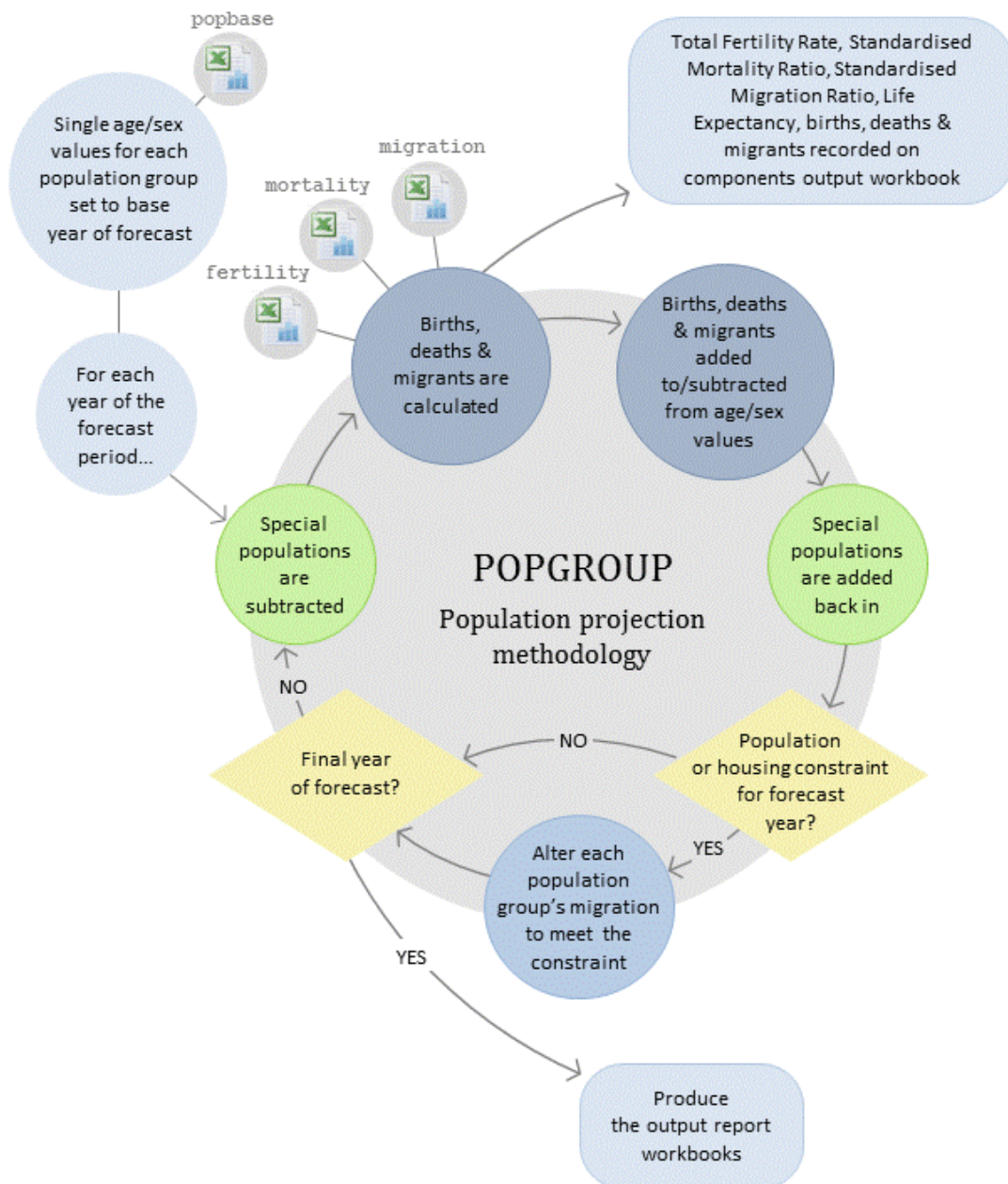
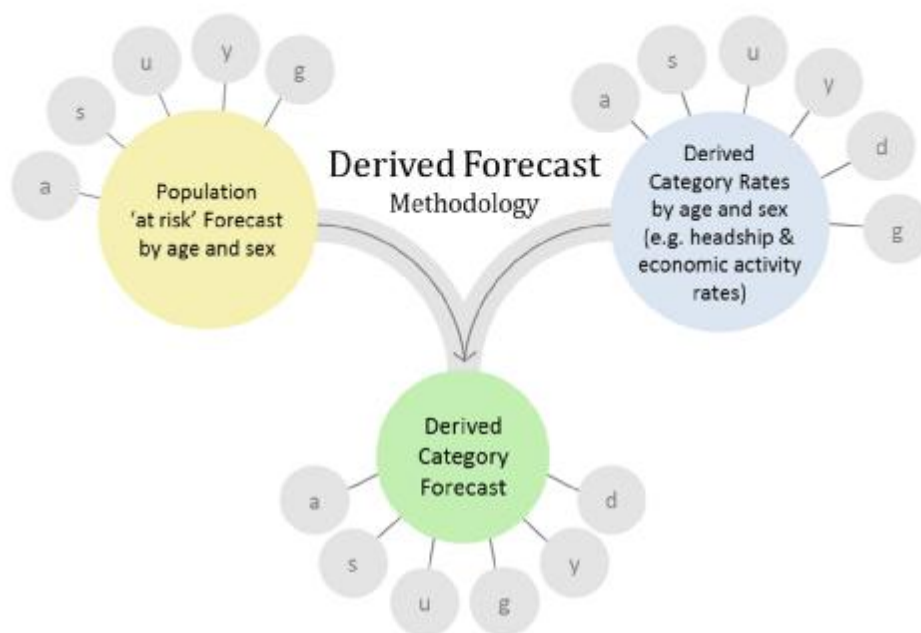


Figure 25: POPGROUP population projection methodology

Note: Special populations include Armed Forces, Prisoners and school boarders.



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

- 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 26: Derived Forecast (DF) methodology

Appendix B: Data Input, Assumptions & Methodology

- 8.20 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 2001-2010, in conjunction with information from ONS national projections, a series of assumptions have been derived which drive the scenario forecasts.

Population

- 8.21 Historical population statistics are provided by the mid-year population estimates for 2001 to 2011. All data are recorded by single-year of age and sex. These data include the revised mid-year population estimates for 2002–2010, released by ONS in May 2013, providing consistency in the measurement of the components of change (births, deaths, internal migration and international migration) between the 2001 and 2011 Censuses.

Births and fertility

- 8.22 Historical mid-year to mid-year counts of births by sex from 2001/2 to 2010/11 have been sourced from ONS Vital Statistics.
- 8.23 A 'national' age-specific fertility rate (ASFR) schedule, which measures the expected fertility rates by age and sex for England in 2011/12, is included in the POPGROUP model assumptions. Local birth statistics are combined with this ONS 2010-based standard fertility schedule to produce age-specific fertility rates for the district.
- 8.24 Long-term assumptions on change in age-specific fertility rates are taken from the ONS 2010-based national population projection for England.

Deaths and mortality

- 8.25 Historical mid-year to mid-year counts of deaths by age and sex from 2001/2 to 2010/11 have been sourced from ONS Vital Statistics.
- 8.26 A 'national' age-specific mortality rate (ASMR) schedule, which measures the expected mortality

rates by age and sex for England in 2011/12, is included in the POPGROUP model assumptions. Local death statistics are combined with this ONS 2010-based standard mortality schedule to produce age-specific mortality rates for the district.

- 8.27 Long-term assumptions on change in age-specific mortality rates are taken from ONS 2010-based national population projection for England.

Migration

- 8.28 In determining the migration assumptions for a new '2011-based' trend projection, historical data on the components of demographic change during the 2001–2011 time-period are a key consideration.
- 8.29 Since 2001, the population of Epping Forest District has increased by 3.1% from 121,000 to reach 124,700 in 2011. This population change has been driven by a mixture of (a) natural change (the difference between the number of births and deaths); (b) net internal migration (the difference between in-migration and out-migration from and to other locations within the UK); and (c) net international migration (the difference between immigration and emigration). There has been variation in the relative importance of these components over the 2001–2011 decade.
- 8.30 Implied within the international migration component of change is an 'other unattributable' figure, which ONS identified within its latest mid-year estimate revisions. The POPGROUP model has assigned the 'other unattributable' to international migration as it is the component with the greatest uncertainty associated with its estimation.
- 8.31 A five-year historical period is a typical time-frame from which migration 'trend' assumptions are derived. However, given the unprecedented economic changes that have occurred since 2008, it is important to give due consideration to an extended historical time-period for assumption derivation. For this reason, migration assumptions have been derived from a 5-year and a 10-year historical period, with scenarios configured accordingly.

Household formation rates

- 8.32 The most recent household projections come from the 2011-based CLG model, released for local authority areas in 2013. The headship rate statistics and the communal household populations which underpin this model are used as the basis for the development of the household forecasts presented here.
- 8.33 To assess the impact of the newly-available household statistics, the 2008-based CLG statistics have been used in conjunction with the 2011-based rates in each scenario. Each of the scenarios has been run with the 2011-based (Option A) and the 2008-based (Option B) CLG headship rates and communal household population.
- 8.34 There is a 17-fold classification of household types used in both the 2008-based and 2011-based household forecasts (Table 6). This classification underpins the calculation of total household numbers in each scenario.

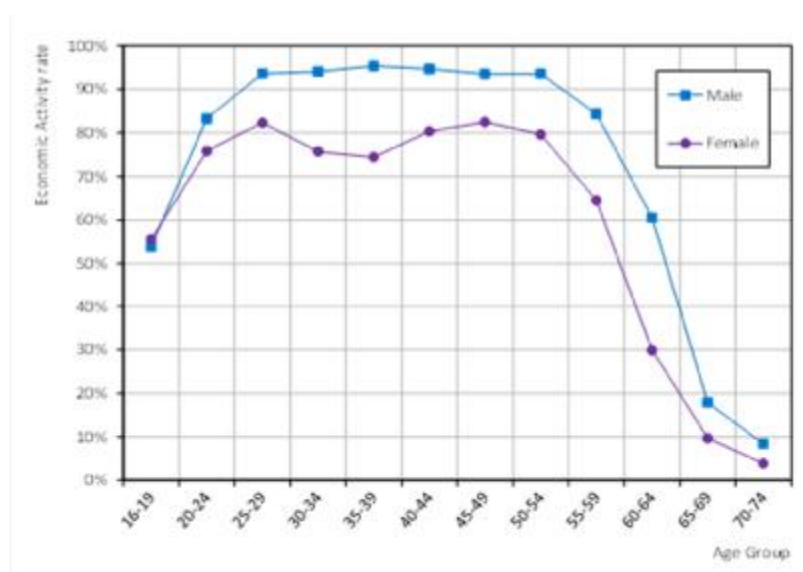
Table 6: Household category descriptions

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

- 8.35 The relationship between households and dwellings is modelled using a 'vacancy rate' based on the ratio between households (occupied, second homes and vacant) and dwellings (shared and unshared) from the 2011 Census. The vacancy rate for Epping Forest District is 4.4%. This value remains constant throughout the forecast period.

Economic activity rates

- 8.36 Economic activity rates have been derived from a combination of 2001 Census statistics for Epping Forest District and the latest evidence from the Labour Force Survey (via NOMIS). NOMIS data provide an average economic activity rate for the period 2007–2011 by broad age-group for the County of Essex; sample data for Epping Forest District was insufficiently robust to enable its direct use. Using the 2001 Census data, these activity rates have been disaggregated to provide an economic activity rate by five year age-group and sex for all labour-force ages to age 74 (Figure 27).



Source: NOMIS; ONS

Figure 27: Economic Activity Rates – Epping Forest District

- 8.37 To account for an expected increase in the rate of labour force participation in the older age groups resulting from changes to stage pension age, economic activity rates have been increased in the following way:

- Women aged 60–64: 40% increase by 2020;
- Women aged 65–69: 20% increase by 2020;

- Men aged 60–64: 5% increase by 2020;
- Women aged 65–69: 10% increase by 2020.

8.38 From 2020, economic activity rates are kept constant.

Unemployment rate

8.39 An average unemployment rate of 7.5% (aged 16+) has been calculated from Epping Forest District unemployment statistics for the period 2007–2012 (sourced from NOMIS). This value remains constant throughout the forecast period.

Commuting ratio

8.40 Using 2001 Census statistics (2011 data is not yet available) a commuting ratio has been derived as the balance between the size of the resident labour force and the number of jobs available in Epping Forest District. The derived ratio of 1.49 for Epping Forest District indicates that there is a net outflow of commuters from surrounding districts. This value remains constant throughout the forecast period.