

Update 2017-07

GLA 2016-based population projections

Explanatory note and results for the Wider South East

July 2017

Introduction

The GLA 2016-based population and household projections are the first GLA projections to include data for all local authorities in England and national data for Wales, Scotland and Northern Ireland. This expansion of the GLA model allows users outside London to better understand the implications of the GLA variant projections in their area, and helps to inform and facilitate joint working across the wider region.

This explanatory note provides a brief overview of the rationale for the expansion of the GLA model beyond the London boundary, and a comparison of some model results for the South East and East of England regions. The document provides no local authority-specific information, but detailed local authority-level data are available in the model outputs available on the London Datastore:

<https://data.london.gov.uk/dataset/projections>

This document does not contain methodological information. A methodology paper outlining, in detail, the operation of the GLA population projection model can be downloaded here:

<https://data.london.gov.uk/dataset/projections-documentation>.

Rationale

The GLA model has recently been redeveloped so that it now operates as a multi-region model incorporating migration flows between all 329 model areas (326 English LAs, Wales, Scotland and Northern Ireland). This development has been driven by two parallel factors: the greater availability of model input data and technology, and; a requirement from a range of stakeholders to better understand the implications of GLA projections for the wider region.

Projections for areas beyond the GLA boundary are of particular use in strategic transport planning, school place planning and long-term infrastructure planning. There is also an established demand from London's neighbouring authorities to understand the implications of GLA projections for their areas. The latter being raised by both the authorities themselves and during the examination in public for the Further Alterations to the London Plan in 2015.

Independent Review

In September 2016 the Centre for Population Change at the University of Southampton were commissioned to undertake an independent review of the GLA model. Their report can be downloaded here: <https://data.london.gov.uk/dataset/projection-methodology-independent-review>.

The GLA household projections are produced using an implementation of the DCLG 2014 household projection model. The GLA household projections differ from the DCLG household projections in the input population; GLA population projections are used in place of the 2014-based ONS sub-national population projections. In addition, the GLA projection has a projection horizon of 2050 while the DCLG projection has a horizon of 2039. For the years 2040 to 2050 the GLA projection uses the household formation rates from the year 2039 in the DCLG model.

Variant Migration Scenarios

The GLA believes that for strategic longer-term planning purposes a projection which uses migration rates based on an average of ten years' past data is more realistic and robust than one based on a shorter five-year period (as is the case with the ONS SNPP). This view is consistent with the wider expert consensus and is supported by Planning Advisory Service guidance contained in the document 'Planning on the Doorstep: Population'¹ which states:

"Understanding the components of change and particularly the migration data going back as far as possible is very helpful and allows you to compare longer term rates with the more recent five or six-year trend."

"It might be legitimate to vary the migration assumptions within the official projections if there is evidence to do so. However, any change in assumptions must be justified and set out as part of a transparent methodology."

Planning on the Doorstep: Population, PAS

Net domestic migration between London and the rest of the UK has varied significantly in recent years. There are a range of factors which impact migration, however recent patterns have shown that the relationship between outmigration and wider national economic growth is particularly strong.

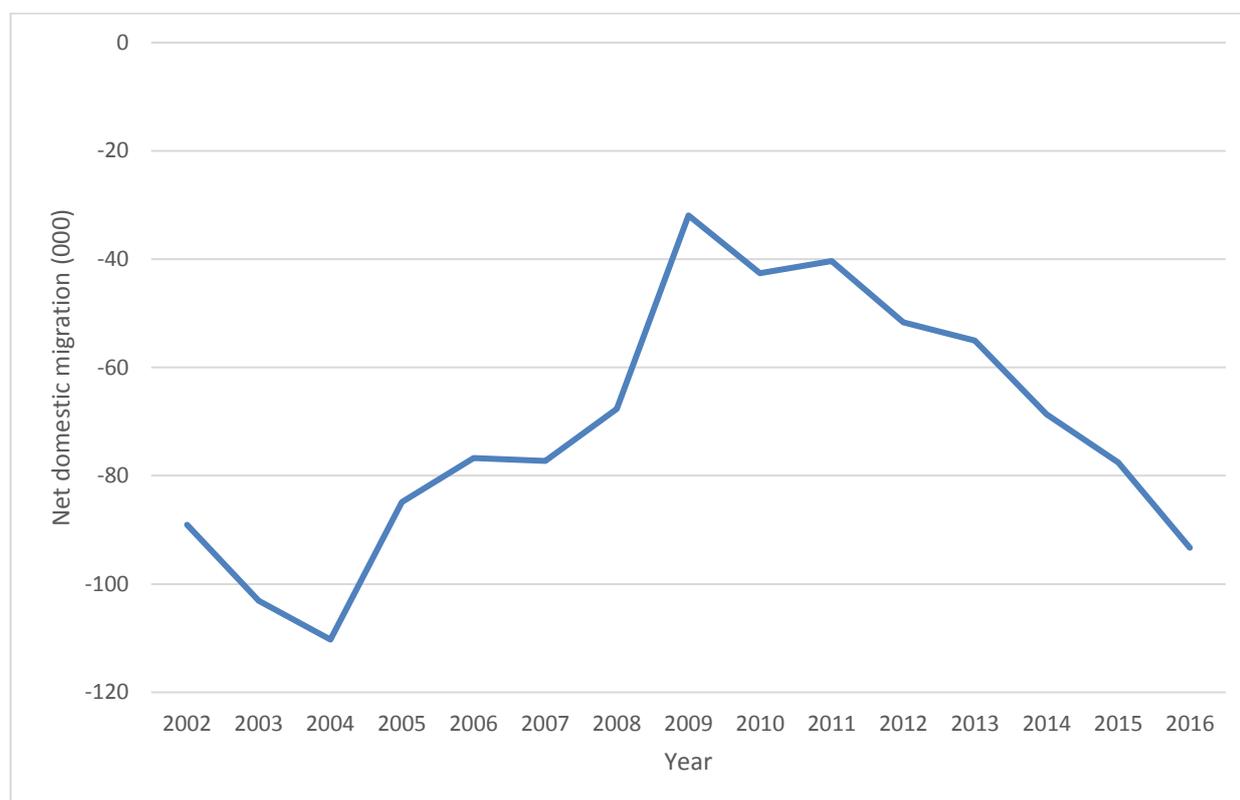
Domestic outmigration was impacted by the 2007 financial crisis, with outflows falling by 15 per cent in its aftermath. This fall is likely to have been the result of a slowing of the housing market as mortgage availability fell, and in part due to London's job market proving relatively resilient compared to those in other parts of the UK. The financial recovery seen in recent years has been marked by an uplift in outmigration from London which continues.

The nature of this cycle means that selecting a longer backseries captures a range of data points that are more representative of the reality of migration and so produces a more robust projection. The SNPP uses a five-year backseries for domestic migration based on flows between 2010 and 2014 inclusive. The average net migration out of London during this period was 51,700 persons. The GLA central trend projection takes

¹ <http://www.local.gov.uk/pas/leadership/guides/planning-doorstep-big-issues>

ten years of data between 2007 and 2016 inclusive. The average net outflow over this period was 60,600, 17 per cent higher. For a long-term projection informing strategic planning, a migration rate which is representative of the character of migration across a full economic cycle is, more robust than one which captures only part of that cycle.

Figure 1: Net migration from London to the rest of the UK, 2002-2016



Mid-Year Estimates, ONS

Consistency of projections

In the past the GLA has successfully argued that using a longer trend projection variant provides a more realistic projection of London's population than the ONS sub-national population projections (SNPP). However, as authorities outside London are using the SNPP populations and DCLG household projections there has been some concern about the potential lack of continuity across the wider region. To mitigate this the GLA has worked with local authorities in the wider south east over a number of years to provide additional outputs from its models to facilitate local variant projections and scenario testing. This has allowed authorities to indirectly assess the impact of the GLA's migration assumptions on their own populations. However, such analysis has been based on data provided at the regional level. Users requiring local authority level data were required to derive population and flow estimates from the regional data by applying their own assumptions about distribution.

Following the expansion of the GLA model beyond the London boundary this type of inferred modelling is no longer necessary. The GLA is now able to provide a consistent set of projections for authorities across the wider region, and indeed nationally. Authorities are able to directly assess the impact of longer-term migration trends on population and household change, and are better able to unpick the migration relationships between areas, both within and outside London.

GLA 2016-based projections

The 2016-based projection round comprises a suite of population and household projections for London boroughs, wards and MSOAs. In addition, and for the first time, projections of populations and households for all English local authorities and UK countries are available in the GLA Trend model outputs.

There are three variants of the trend model:

- Short-term: Uses a 5-year average of past migration data
- Central: Uses a 10-year average of past migration data
- Long-term: Uses a 15-year average of past migration data

The household projections included in the GLA release use the 2014 DCLG household model to arrive at numbers of households disaggregated by type. The only difference between the 2014 DCLG household projections and the 2016-based GLA household projections is the input population (the DCLG projections use the 2014 SNPP).

Data for the three trend projections are available to download from the London Datastore:

<https://data.london.gov.uk/dataset/projections>

Methodological Differences

The ONS produce sub-national population projections (SNPP), which form the population base for the sub-national household projections. The methods and data employed by ONS and the GLA are broadly similar, but deviations in methodology and assumptions lead to differences in the results.

The main differences between the projection methodologies are:

1. Top-down vs bottom-up model hierarchies
2. Length of migration trend used
3. Rates-based approach to international outmigration
4. Back series used and accounting for unattributable population change

Top-down vs bottom-up

The ONS approach is to first produce national-level projections for the home countries and then to produce sub-national projections that are consistent with these. This is often referred to as a top-down approach. At each step of the subnational projection process, the sums of births, deaths, and international migration for all districts are forced to match the totals from the national projection. The rationale for using a top-down approach is generally that the higher-level projection is more robust and so imposing consistency on projections for lower-geographies lends them strength.

In the GLA model, the primary geographic unit is the local authority. Results for higher level geographies are produced by aggregating results for the constituent local authorities. This approach is known as bottom-up and many national statistical bodies prefer this approach for producing national and sub-national population projections.

Length of migration trend

In both the ONS and GLA models migration rates for projection years are calculated by averaging observed migration rates in past years. The models vary in the number of years' data used to calculate the averages.

The GLA short-term variant is closest to the ONS SNPP in setup – the SNPP uses a five-year domestic and a six-year international migration average (see Table 1). The projection which will inform the next London Plan is the Central trend, ten-year migration average, projection. The GLA believes the Central variant provides a more robust basis for assumed migration for projection over the longer term.

Table 1: Years of migration rates to average

Model	Domestic	International
ONS	5	6
GLA Short-term	5	5
GLA Central	10	10
GLA Long-term	15	15

In addition to the number of years' data used the period of data is also different. For example, the five-year period used in the GLA short-term projection is 2012-2016 while in the SNPP projection the five-year period is 2010-2014.

Rates based approach to international outmigration

In the ONS model international outmigration is calculated as an average of six years' migration outflows. In the GLA model international outmigration is calculated dynamically within the model using probabilities based on past outmigration rates (in the same way as domestic migration). This means that international outflows respond to changing population size and structure in the GLA model in a way in which the exogenous static flow approach adopted by ONS does not.

Backseries and accounting for UPC

The GLA and ONS have taken different approaches to accounting for differences between annual migration estimates and population change measured between the 2001 and 2011 censuses.

When ONS revised the inter-censal mid-year estimate series, they elected to leave migration estimates largely unchanged; taking the view that there was insufficient information to attribute the difference to error in individual components. It was instead accounted for by introducing a new component labelled 'unattributable population change' (UPC), applied evenly across the decade. For many London boroughs this adjustment was quite substantial (e.g. a reduction of 3,000 persons per year in the case of Westminster).

The GLA made the judgement that the majority of the disparity was most likely to be the result of errors in international inflow estimates for years prior to the introduction of the migration statistics improvement programme (MSIP) methodology. When the GLA produced its population backseries, the difference was accounted for by directly modifying the assumed international inflows for mid-2001 to mid-2005.

The MSIP amendments have significantly improved the estimation of international migration. However, the GLA believes that there remain issues with the current methodology and specifically that it significantly over-estimates flows into the City of London. Over the period 2002-2011 there was an annual UPC adjustment made to the population of City of London of around -400 people. The GLA has opted to maintain this adjustment in its projections adding a UPC reduction to the City of London population of 400 persons in each year of the projection.

In addition, Mid-Year Estimates for London boroughs are amended slightly to account for an undercount of 0-3 year olds in the 2011 census².

Projection Period Differences

An additional point of divergence between the ONS and GLA projections is the input data available to the projections. The GLA projections are 2016-based meaning that they take as their starting point the 2016 mid-year estimates produced by ONS. They then project forward from 2017 to a final projection year of 2050. The 2014 SNPP is a 2014-based projection which takes as its starting point the 2014 mid-year estimate and projects from 2015 through to 2039. The 2014-based DCLG household projections take as their input the 2014 SNPP and therefore have the same projection horizon.

The 2016-based ONS SNPP projections of population and households are scheduled for release in May/June 2018.

Model Results & Comparison

The following results section provides a brief overview of some region-level outputs from the GLA model and comparisons to the ONS and DCLG projections for the wider south east region. It is not intended to be an exhaustive analysis and attempts only to provide summary and high-level contextual information.

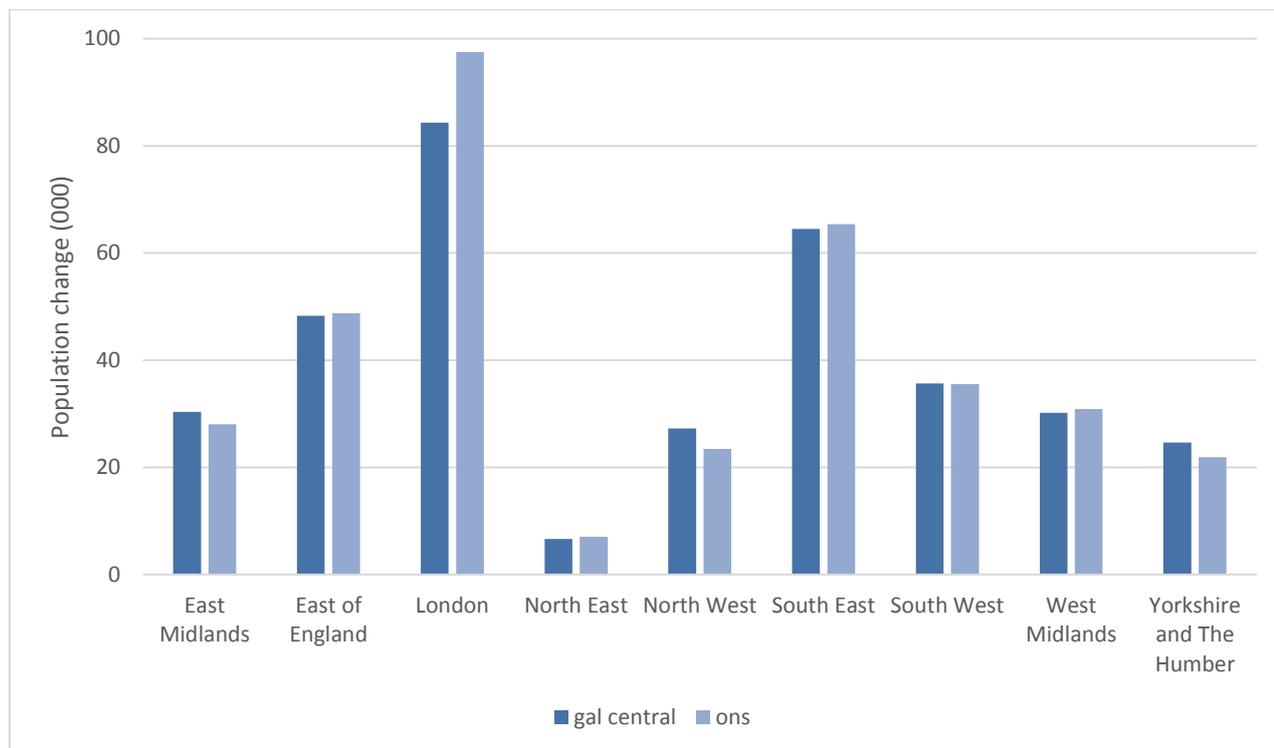
The data presented here show annualised change in population and households over the 25-year period 2014-2039. This is in line with the projection period of the SNPP and is therefore the best basis for comparison across the projections. The London Plan horizon is 2041 while the GLA projections themselves project out to 2050 in order that they can be used in longer-term strategic and infrastructure planning.

The difference between the annualised growth for London between the GLA Central projection and the official projections is 13,126 persons and 5,123 households with the GLA projection providing the lower figure. Both the East of England region and the South East region show little difference between the GLA preferred scenario and the official projection. The GLA projects 454 fewer persons and 182 fewer households in the East, and 878 fewer persons and 228 more households in the South East. The apparent discontinuity between a lower population and a household figure seen in the data for the South East is a function of the different age structures of the projected populations. In the GLA projection the population is smaller but is concentrated in age groups which tend to form households and so the resulting household growth is greater.

London is the only region which sees a significant difference in population change between the ONS and GLA central projections. The lower population in London under the GLA scenario is not counterbalanced by larger populations in other regions.

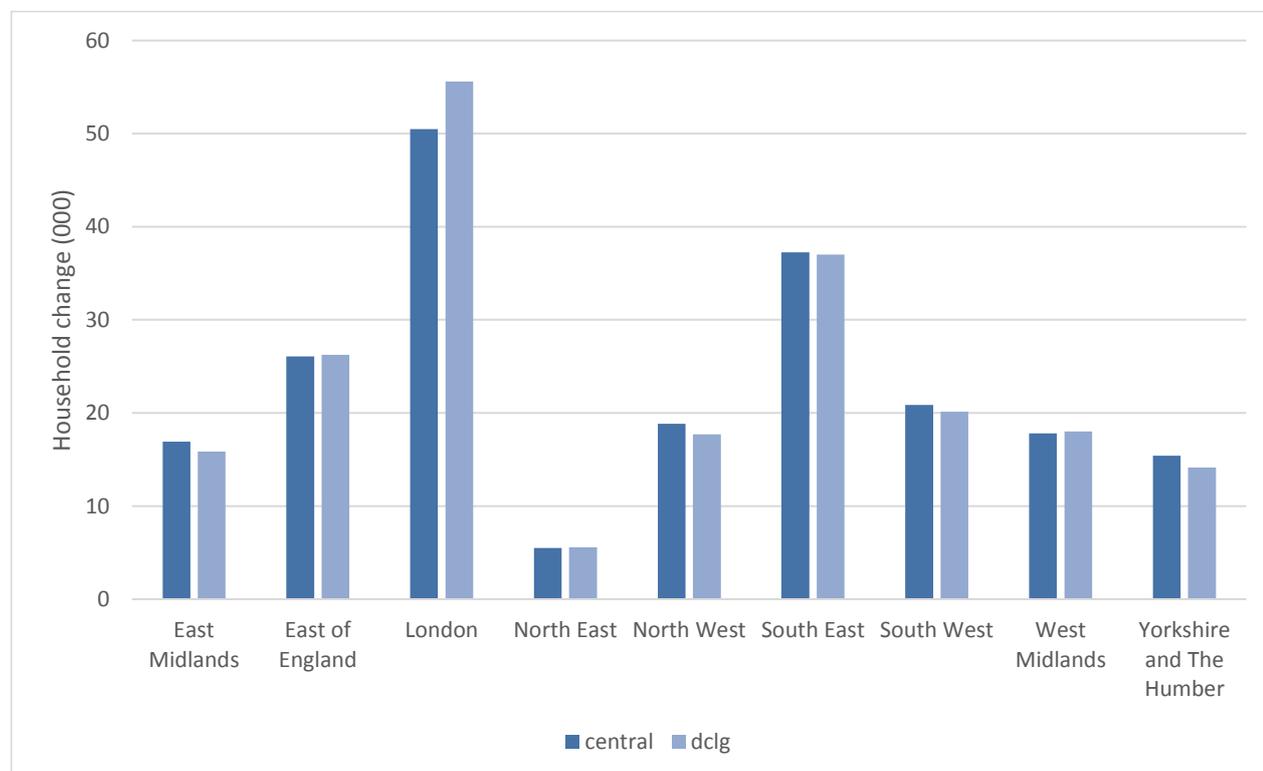
² See the trend model methodology document for full details

Figure 2: 25-year annualised population growth 2014-2039, all UK regions

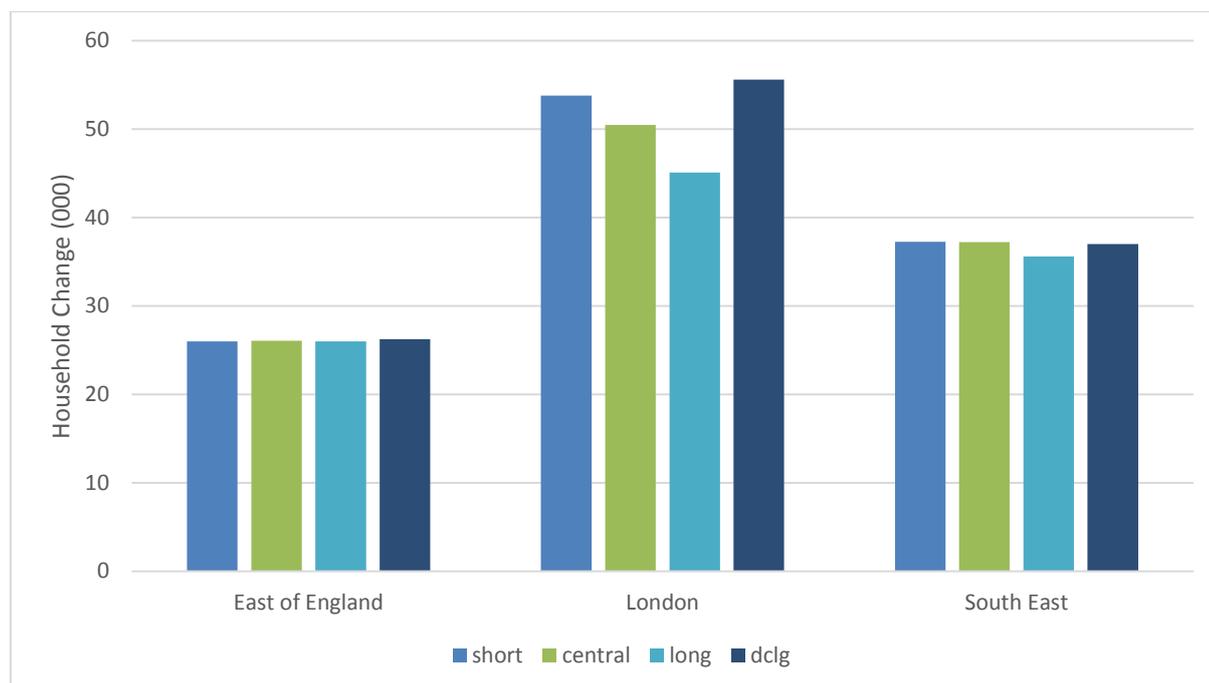


2016-based GLA projections, 2014-based ONS SNPP

Figure 3: 25-year annualised household growth 2014-2039, all UK regions



2016-based GLA projections, 2014-based ONS SNPP

Figure 4: GLA variant and DCLG projections, 25-year annualised household growth

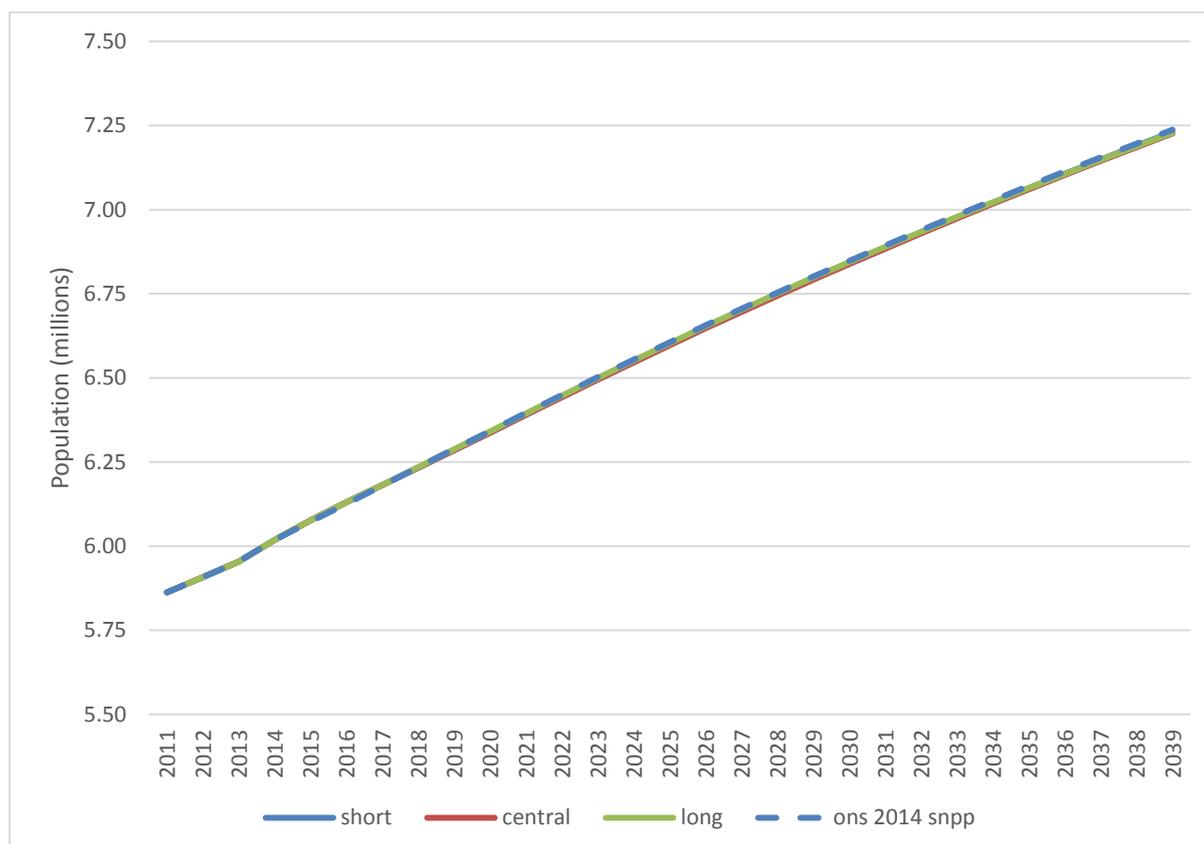
2016-based GLA projections, 2014-based ONS SNPP

Figures 3 and 4 show the same annualised household growth data. Figure 3 provides the GLA Central and DCLG averages for each region in the UK while Figure 4 shows only the Wider South East regions but adds data for the GLA Short-term and Long-term projections.

East of England Region

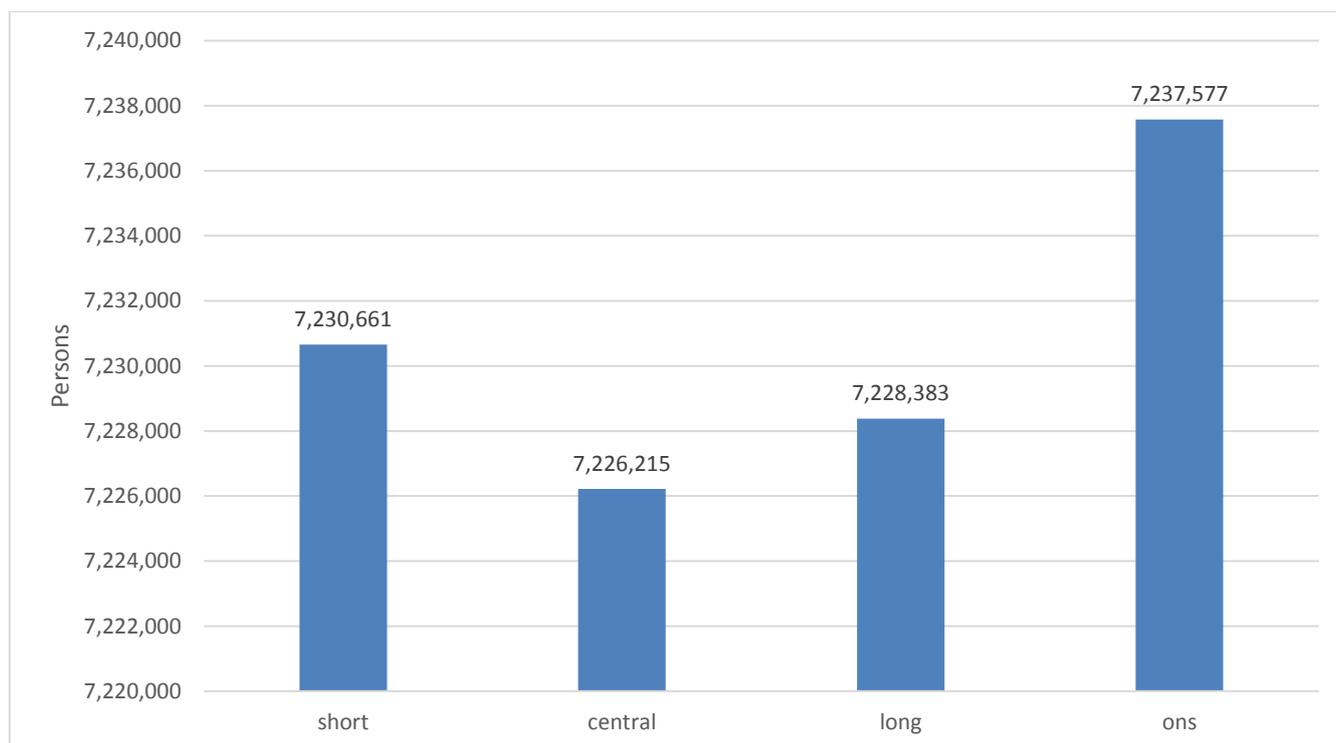
The following section provides an overview of the GLA projection data for the East of England region. There is no local authority level data presented. There are likely to be significant differences in the impact of using a variant scenario at the local authority level and interested users should undertake their own analysis. The information below will help to contextualised any such analysis.

Figure 5: Projected population, East of England region (2014-2039)



2016-based GLA projections, 2014-based ONS SNPP

Figure 5 shows the trajectory of four population projections for the East of England: the ONS SNPP and the three GLA variant projections. There is little difference between the populations of each, the ONS projection is the higher of the four trajectories. Figure 6 shows the total population of the region in 2039 for each of the four projections. The ONS projection provides the highest value at 7.24 million while the GLA Central gives the lowest at 7.23 million. The difference between the highest and lowest figures is only 11,362 persons (0.2 per cent of the current population).

Figure 6: Projected population of East of England region, 2039

2016-based GLA projections, 2014-based ONS SNPP

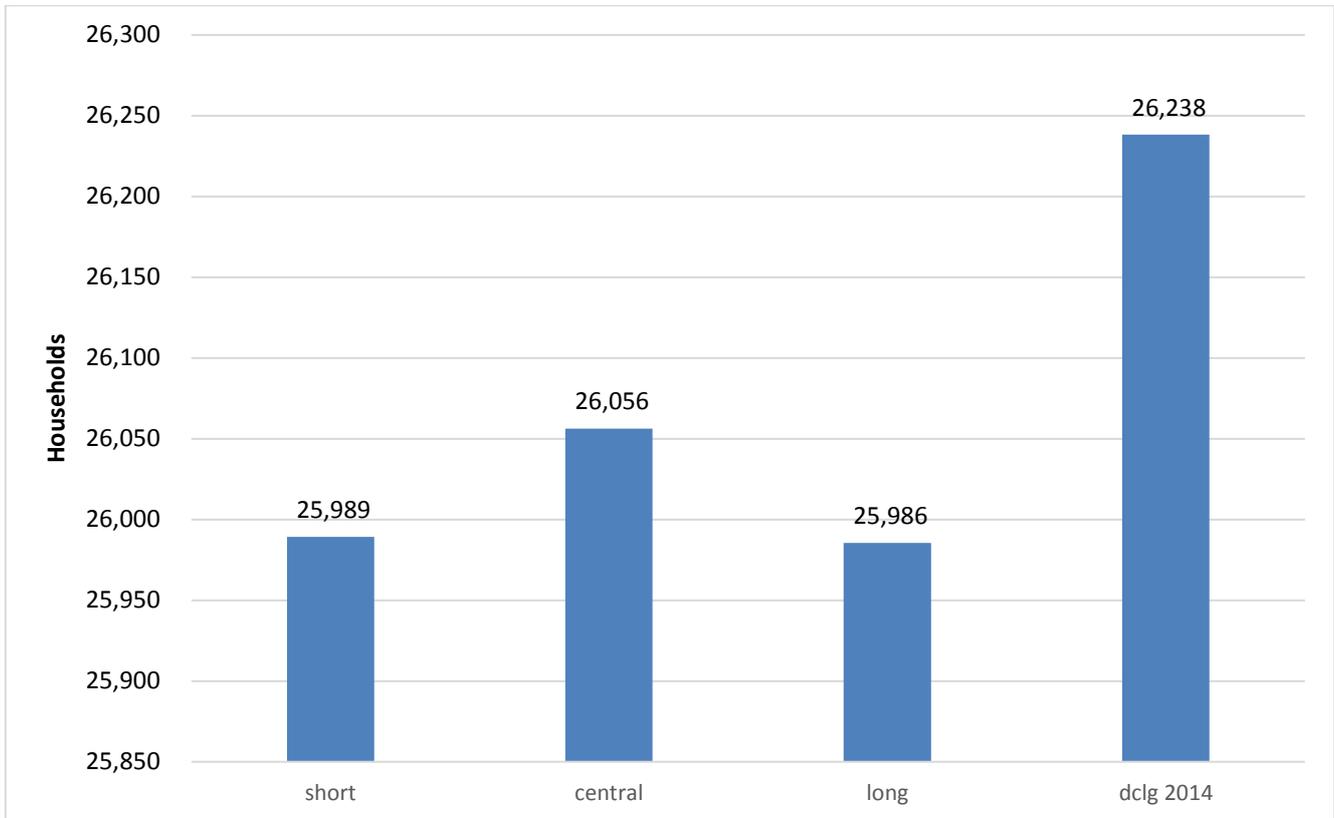
Figure 7 converts the population growth shown in figure 6 into annualised household growth over the 25-year period 2014-2039. The DCLG model (using the SNPP population) projects annualised growth of 26,238. The GLA Central projects a figure of 26,056, 182 households lower.

The relationship between population and households is a function not only of the size of the population but also of the age structure. The age structure in the central projection is such that although it provides the lowest population of the three GLA variants it yields a highest number of households.

Figure 8 shows the age structure of the population in 2039 for both the ONS and the Central trend projections. The ONS projection has a higher child population (ages 0-17). Children do not form households and therefore this section of the population does not contribute to household growth. Most households are formed in early adulthood (20-45) and in this part of the population the ONS projection has a lower population than the GLA. As a result of these factors the lower GLA population translates into more households per capita than the ONS projection. That being said, all three of the GLA scenarios result in lower household growth than the DCLG/ONS projection (see figure 7).

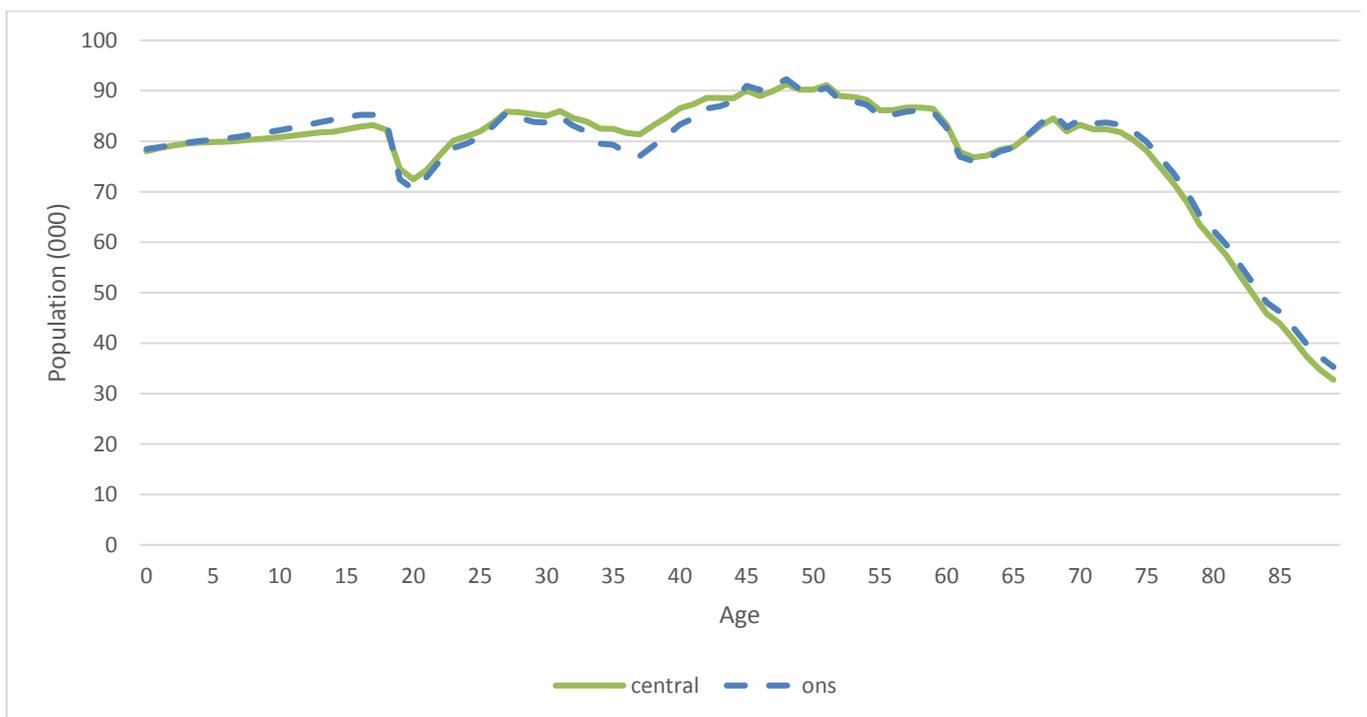
Figure 8 does not include those aged 90 and over as the size of this population skews the scale of the chart.

Figure 7: 25-year annualised household growth, East of England region, 2014-2039



2016-based GLA projections, 2014-based ONS SNPP

Figure 8: Age structure, East of England, 2039

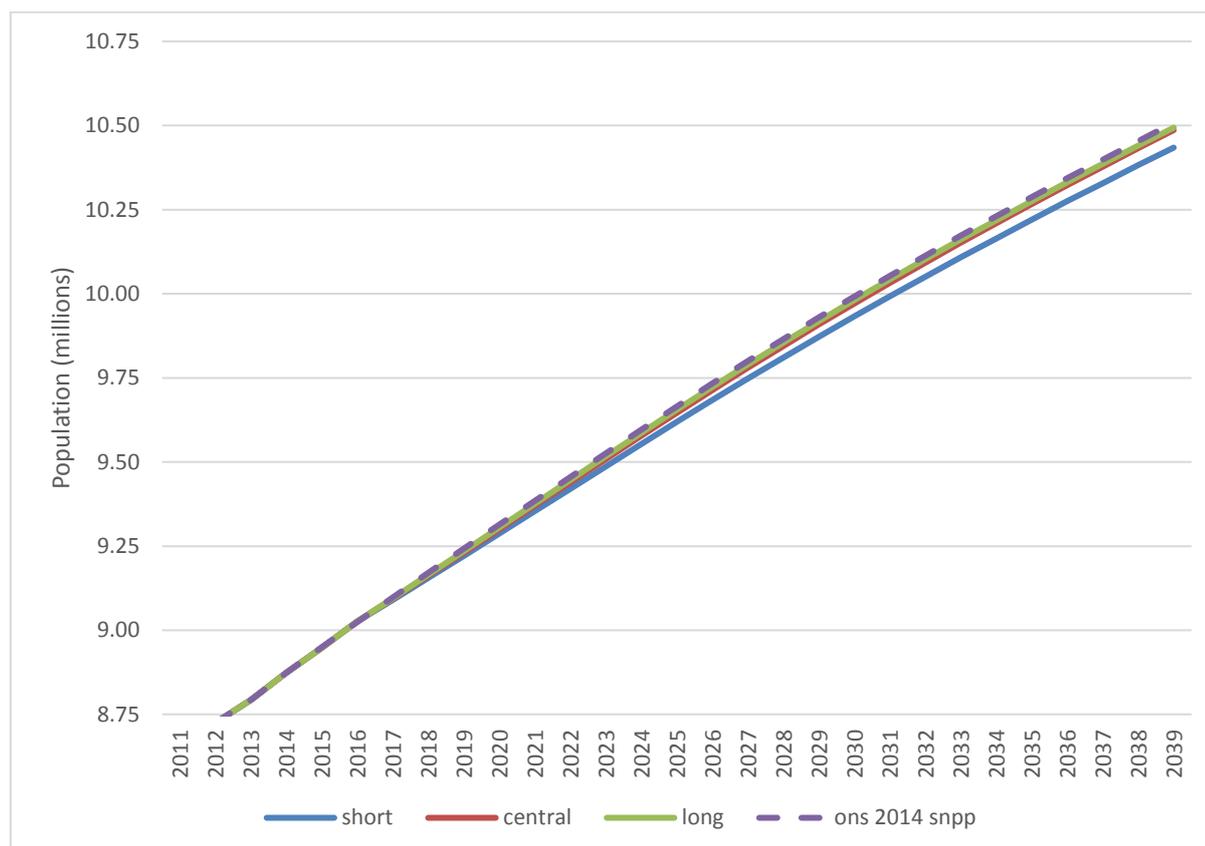


2016-based GLA projections, 2014-based ONS SNPP

South East Region

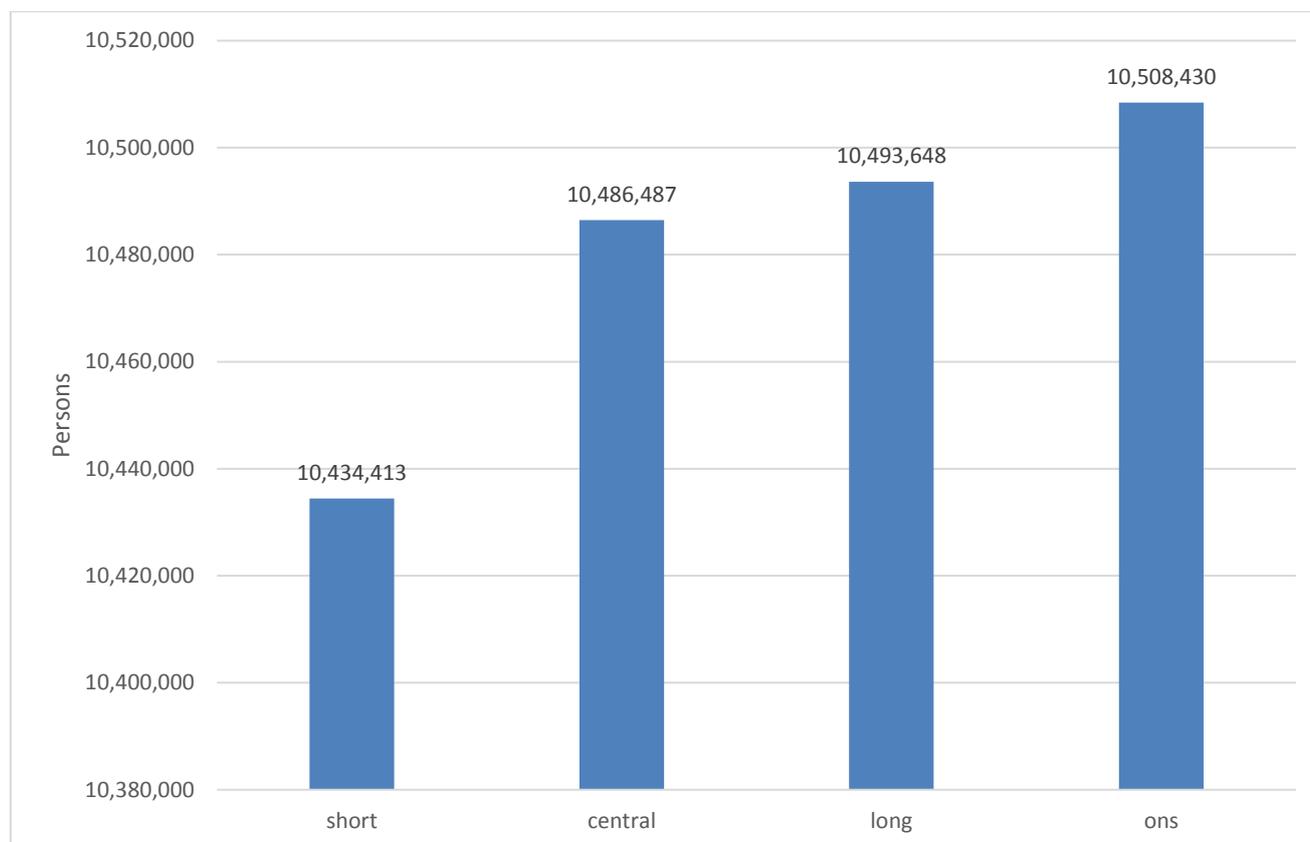
The following section provides an overview of the GLA projection data for the South East region. There is no local authority level data presented. There are likely to be significant differences in the impact of using a variant scenario at the local authority level and interested users should undertake their own analysis. The information below will help to contextualise any such analysis.

Figure 9: Projected population, South East region (2014-2039)



2016-based GLA projections, 2014-based ONS SNPP

Figure 9 shows the trajectory of four population projections for the South East region: the ONS SNPP and the three GLA variant projections. There is little difference between the populations of each, the ONS projection is the higher of the four trajectories. Figure 10 shows the total population of the region in 2039 for each of the four projections. The ONS projection provides the highest value at 10.51 million while the GLA Short-term projection gives the lowest at 10.43 million. The difference between the highest and lowest figures is 74,017 persons (0.8 per cent of the current population).

Figure 10: Projected population of South East region, 2039

2016-based GLA projections, 2014-based ONS SNPP

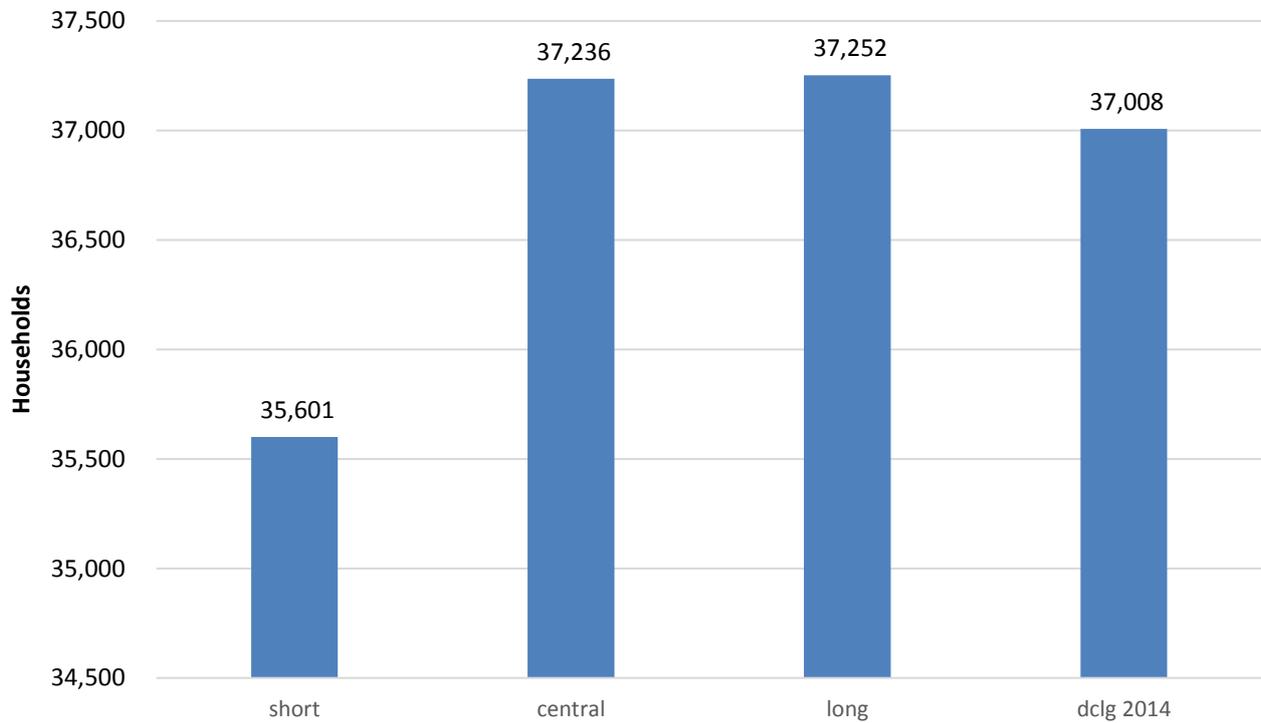
Figure 11 converts the population growth shown in figure 10 into annualised household growth over the 25-year period 2014-2039. The DCLG model (using the SNPP population) projects annualised growth of 37,008. The GLA Central projects a figure of 37,236 which is 228 per annum households higher.

The relationship between population and households is a function not only of the size of the population but also of the age structure. The age structure of in the GLA central projection is such that although the central projection provides a lower population than the official projections it yields a higher number of households.

Figure 12 shows the age structure of the population in 2039 for both the ONS and the central trend projections. The ONS projection has a higher child population (ages 0-17). Children do not form households and therefore this section of the population does not contribute to household growth. Most households are formed in early adulthood (20-45) and in this part of the population the ONS projection has a lower population than the GLA. As a result of these factors the lower GLA population translates into more households per capita than the ONS projection. That being said, all three of the GLA scenarios result in lower household growth than the DCLG/ONS projection (see figure 7).

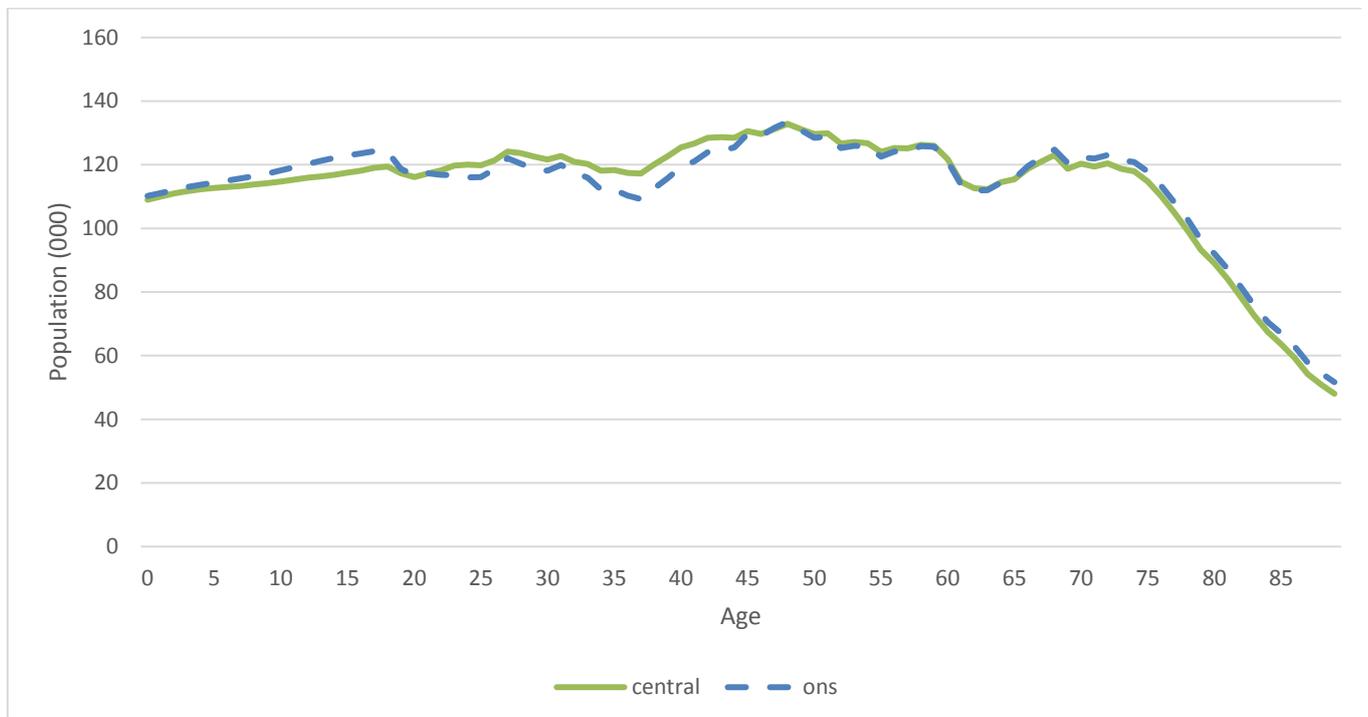
Figure 8 does not include those aged 90 and over as the size of this population skews the scale of the chart.

Figure 11: 25-year annualised household growth, South East region, 2014-2039



2016-based GLA projections, 2014-based ONS SNPP

Figure 12: Age structure, South East, 2039



2016-based GLA projections, 2014-based ONS SNPP

Further Information

For more information on the GLA projections please see the GLA demography pages of the London Datastore (<https://data.london.gov.uk/demography/>) or contact the demography team: demography@london.gov.uk.

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