Plymouth Housing Market Area Population & Housing Projections

2014 to 2034

Local modelling report

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1 Introduction

1.1 Purpose of this report

1.1.1 Devon County Council (DCC) has produced population and dwelling projections for the Plymouth Housing Market Area (the HMA). These projections have fed into the wider Strategic Housing Market Assessment (SHMA) undertaken by Peter Brett Associates (PBA) as part of the evidence base for the joint Local Plan covering the HMA. Based on the DCC projections, the PBA work provides the most up to date SHMA for the HMA as a whole and includes potential housing requirements for the constituent Local Authority areas. The Local Authorities covered by the HMA are:

- Plymouth;
- South Hams; and
- West Devon.

1.1.2 The figures included in the report also include the areas within Dartmoor National Park which lie within South Hams and West Devon, although the Local Plan does not cover the Park.

1.1.3 It should also be noted that previous work on the Plymouth HMA had included a consideration of housing requirements in east Cornwall. However, the Cornwall Local Plan adopted in November 2016 was based on demographic evidence which specifically covered the whole of Cornwall. As such, in order to be consistent with this approach, the assessments undertaken and documented in this report does not consider Cornwall.

1.1.4 This report provides a detailed description of the methodology used by DCC in undertaking the trend-based population and dwelling projections for the HMA and sets out the outcome of the assessment. In particular, this report:

- Provides an overview of the modelling methodology used to undertake the population and dwellings projections;
- Provides details of the assumptions and inputs made in respect of the projections;
- Specifically relates the methodology used to the requirements of the National Planning Policy Framework (NPPF)[1] and National Planning Practice Guidance (NPPG)[2]; and
- Illustrates how the methodology adopted develops that used to produce population and household projections undertaken by the Office for National Statistics and the Department for Communities and Local Government respectively. A summary of this analysis is included in Appendix A.

[1] The National Planning Policy Framework is available at: https://www.gov.uk/government/publications/national-planning-policy-framework--2

[2] National Planning Policy Guidance is available at: http://planningguidance.planningportal.gov.uk/

1.2 Associated work

1.2.1 Building on the Office for National Statistics (ONS) and Department for Communities and Local Government (DCLG) methodologies, the projections undertaken by DCC provide the 'starting point' dwelling requirement for the Plymouth HMA as referred to in paragraph 15 of the NPPG. The DCC projections are a robust assessment of trend-based housing requirements founded on sound data and trends.

1.2.2 Moving on from this 'starting point', there are wider methodological requirements of SHMAs, which are set out within the NPPG, including consideration of additional factors such as employment projections and market signals. Only once all these additional factors have been considered can the Objectively Assessed Housing Need (OAN) for an area be identified, as required under paragraph 47 of the NPPF. These additional factors and final conclusions regarding the OAN for the area are not considered in this report; they are considered within the accompanying reports prepared by PBA. Other related work also includes more detail on affordable housing and requirements on specific house types.

1.3 Background

1.3.1 Population projections based on short term migration trends (5 years) are available from the Office for National Statistics (ONS). The latest data set is the 2014 based sub-national population projections which are developed from the population estimates from 25 June 2014[3] (the 2014 Mid Year estimate). These projections cover the period up to 2039. These projections and the 2015 Mid Year estimate for the Plymouth HMA, and Local Authority areas within it, are available in Appendix B.

1.3.2 Household projections for Local Authority areas are available from the Department for Communities and Local Government (DCLG). At the time of producing the trend-based Plymouth HMA population and housing projections, the latest dataset available were the 2014-based household projections, covering the period up to 2039. These projections are based upon the 2014 sub-national population projections. The projections undertaken by DCC and therefore included in this report use the 2014 headship rates as these were the most up to date at the time of the assessment. The 2014 national household projections are available in Appendix C.

1.3.3 In addition to the ONS and DCLG projections outlined above, DCC produces its own, population and dwelling projections for the Plymouth HMA that reflect actual data for factors such as local fertility, mortality and migration. The application of this local level data means that the DCC projections will differ from those produced by the ONS and CLG. It should be noted, however, that the DCC projections are based on nationally produced datasets and therefore are robust.

1.4 The Devon County Council projection model

1.4.1 DCC uses the Popgroup model to produce population and housing projections. The Popgroup model is widely used by Local Authorities in England.

1.4.2 The DCC model essentially uses a two-stage process:

[3] Source: https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationprojections/bulletins/subnationalpopulationprojectionsforengland/2014basedprojections

- First, the model estimates future population change based on fertility, mortality and migration assumptions. These assumptions are made by using trends from historical data, which is input to the model. Specifically, the DCC Popgroup model incorporates a cohort component methodology for population projections.

1.4.3 The cohort component model is a method of estimating or projecting the population by updating the size of each age-sex group in the base population for deaths and migration within each age-sex group during the period between the base date and a given date. New birth cohorts result from births between the base date and the given date. In deriving population projections, the base population is projected forward by calculating the effect of deaths and migration within each age-sex group according to specified mortality and migration assumptions. New birth cohorts are generated by applying specified fertility assumptions to the female population of childbearing age. In deriving population estimates, records of actual births, deaths are generally used instead of assumptions.

- Second, the population forecasts are inputted to a household projection module. This applies household and housing profiles to the projected population's age-sex composition to produce a dwelling projection. Specifically, the DCC approach uses a headship rate model for *household* projections. The model also takes account of vacancy rates to project *dwellings*.

1.4.4 The headship rate model is based on the assumption that the number of households is equivalent to the number of householders. The following formula describes the relationship between this and headship rate:

(no. of households) = (no. of householders) = (no. of population) * (headship rate)

The headship rate can be defined as the proportion of members of a population (defined by age gender and marital status) who act as heads of specific types of households.

1.4.5 In summary, the dwellings requirement is calculated directly from the population projection. This is consistent with the approach used by the ONS and DCLG, whereby the population projections are produced by ONS and then the DCLG apply household and housing profiles to the population to create a dwelling projection. The DCC approach produces the population projections based on data from the ONS and uses the same household and housing profiles as the DCLG do in their assessment.

2 Population projections

2.1 Introduction

2.1.1 This section of the report sets out the DCC model methodology for undertaking trend-based population projections. This is based upon the following key data inputs:

- Known population (mid-year estimates) - ONS
- Projected number of births - ONS
- Projected number of deaths - ONS
- Migration – calculated using published ONS data

2.1.2 The DCC population analysis for the Plymouth HMA covers the years 2014 to 2034 inclusive. The 2015 mid-year estimate is the starting point in the projection from which future populations are derived. The main components and calculation for undertaking the projections are set out in the formula below:

Future year population (t+1) = Population (t) + Births - Deaths + Net Migration *(t=year)*

2.1.3 Projections are made by taking a population estimate for the initial year (t) adding the births, subtracting the deaths and then adding in net migration (which may be a positive or negative number) to project the population for the following year (t+1). The population is presented in single year cohorts by sex. This is the same key calculation in principle used by ONS when projecting future populations[4].

2.1.4 The approach used by DCC as set out above is consistent with the NPPF. Paragraph 159 of the NPPF states that Strategic Housing Market Assessments should specify housing requirements to meet household and population projections, taking account of migration and demographic change. In addition, the DCC projection methodology is in accordance with paragraph 16 and 17 of the NPPG which identify the need to take account of the latest information and ONS population estimates. The DCC approach refines the methodology used by ONS in preparing their population projections.

2.1.5 As stated above, paragraph 17 of the NPPG[5] sets out that account should be taken of the most recent demographic evidence, including the ONS population estimates. This paragraph goes on to suggest that local circumstances and alternative assumptions are appropriate if they can be clearly explained and justified. The DCC refinements relate to migration, and not 'controlling' the population to fit in with a national projection. This report sets out in more detail where adjustments have been made and explains why this is the case.

[4] Source: https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationprojections/bulletins/nationalpopulationprojections/2015-10-29

[5] Source: http://planningguidance.planningportal.gov.uk/blog/guidance/housing-and-economic-development-needs-assessments/methodology-assessing-housing-need/

2.2 Initial population figures

2.2.1 The current population estimates for the local planning authority areas in the Plymouth HMA are the 2015 Mid Year Estimates published by ONS (the official set of population estimates for the UK). The 2015 Mid Year Estimates build on the 2011 Census taking account of population change in the intervening years. The population projections are produced by projecting forward from the 2015 data. Beyond 2015 (i.e. starting in 2016), the population figures in the DCC model are projections. As they are based on the 2015 Mid Year Estimate, the DCC population projections are founded on more up to date data than the most recent ONS sub-national populations; these are based on the 2014 Mid Year Estimates.

2.2.2 The background population data included in the DCC model (for example, the data for the years 2001 to 2011) uses the previous ONS mid-year estimates for the relevant years. These have been updated by ONS following the publication of the Census 2011 to calibrate the previous estimates against the actual population recorded in 2011. This was necessary because previous mid-year estimates had overestimated the population on an annual basis. ONS published these revised mid-year estimates, which are those used to inform both the ONS and DCC population projection models.

Summary

2.2.3 The commentary provided in this section of the report explains that the data used in establishing the baseline estimated population for the demographic projections undertaken by DCC is that published by ONS. This approach of using the mid-year estimates is consistent with the methodology used by ONS in developing their population projections.

2.2.4 The DCC approach is also in accordance with paragraphs 15 and 17 of the NPPG which identify that account should be taken of the most recent demographic evidence, including the ONS population estimates (the Mid Year Estimates).

2.3 Births

2.3.1 The DCC population projection model uses births and deaths data as a key component. Together, population change resulting from births and deaths is referred to as natural change.

2.3.2 The DCC population forecasting methodology directly uses the latest ONS data for births for the local planning authority areas in the Plymouth HMA. This data is published annually and reflects the actual births data which are collected at birth registration. This information is provided on the birth of a child by the healthcare professional present at the birth[6]. The methodology for using this dataset in the DCC projections methodology is broadly the same as the approach taken by ONS in developing the national population projections.

2.3.3 Both the DCC model and the 2014 ONS projections[7] use births data obtained from the

[6] Source: http://www.ons.gov.uk/ons/guide-method/method-quality/quality/quality-information/health-and-social-care/quality-and-methodology-information-for-conception-statistics.pdf

[7] Source: https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationprojections/bulletins/nationalpopulationprojections/2015-10-29

General Register Officer for the years 2001 to 2014. In addition, the DCC model uses births data covering 2015, released in 2016. As the registration of births is a legal requirement, the data is very robust.

2.3.4 In addition to using known births, the model used by DCC also requires the application of projected fertility rates to the projected year population. The fertility rates are age-specific.

2.3.5 Births are calculated by taking the population "at risk" of giving birth (i.e. women aged 15 – 49) and applying the Age Specific Fertility Rate which yields the number of births. Then the gender ratio is applied to give an estimate of births of males or females. The five year average ratio of males to females has been used in the DCC projection.

2.3.6 The age specific fertility rates used in the DCC model are derived from national data sets at a Local Authority level from ONS.

2.3.7 With respect to the future trends in fertility rates, a standard ONS factor is applied from 2011 onwards which scales future rates in line with ONS fertility assumptions.

Summary

2.3.8 As can be seen from the discussion in this section of the report, the births and fertility data applied in the DCC demographic projections are based on data sets which are also used in the ONS projections. As such, the DCC methodology reflects that applied by ONS but use more locally specific fertility rates.

2.3.9 The DCC approach is also in accordance with paragraph 16 and 17 of the NPPG which identify that account should be taken of the most recent demographic evidence and information.

2.4 Deaths

2.4.1 The DCC population projections and the associated model require an estimate of future mortality rates. Up to date data on deaths is vital to this element of the projections. Mortality statistics for England and Wales are based on the information collected when a death is registered by the Local Registration Service and the General Register Officer[8]. As the registration of deaths is a legal requirement, the data is very robust.

2.4.2 Both the DCC model and the 2014 ONS projections use age-specific annual mortality statistics obtained from the General Register Officer for 2001 – 2014. In addition, DCC uses data covering 2015, released in 2016.

2.4.3 Deaths in the projected future years are calculated by applying the Age Specific Mortality Rates calculated from national data sets from ONS.

Summary

2.4.4 As can be seen from the discussion in this section of the report deaths and mortality rate data applied in the DCC population projections are based on data sets which are also

[8] Source: http://www.ons.gov.uk/ons/guide-method/method-quality/quality/quality-information/quality-and-methodology-information-reports-by-theme/population/quality-and-methodology-information-for-mortality-statistics-in-england-and-wales.pdf

used in the ONS projections. As such, the DCC methodology reflects that applied by ONS.

2.4.5 The DCC approach is also in accordance with paragraph 16 and 17 of the NPPG which identify that account should be taken of the most recent demographic evidence and information.

2.5 Migration

2.5.1 A fundamental component of population projections in the Plymouth HMA is migration. This is particularly relevant here where in some areas, natural increases resulting from the difference between births and deaths are limited.

2.5.2 The principles behind the use of migration data are common between the DCC and ONS methodologies. However, the DCC approach provides a more appropriate basis for assessing future population change in the local area because it uses a robust calculation to determine migration trends for the HMA using actual published data sets from ONS on population, births and deaths. This also allows a longer migration trend period to be used which reduces the volatility of the figures.

2.5.3 To put the adjusted DCC methodology into context, the following paragraphs set out how the ONS predict migration compared to the DCC methodology. The ONS uses six separate flows which are:

- National in-migration (between council areas within England and Wales);
- National out-migration (between council areas within England and Wales);
- International in-migration (from outside of England and Wales);
- International out-migration (to outside England and Wales);
- Cross-border in migration (to England from the rest of the UK); and
- Cross-border out migration (from England to the rest of the UK).

2.5.4 The ONS methodology separately assesses national, cross-border and international migration. For national migration, ONS uses a combination of three administrative data sources as a proxy:

- The National Health Service Central Register (NHSCR);
- The Patient Register Data Service (PRDS); and
- Higher Education Statistics Agency (HESA) data.

2.5.5 The rate of national out-migration (people leaving a council area for another area within England and Wales) is calculated by ONS by comparing the number of people moving out of that council area by the number of people living there. This is calculated separately for males and females by single year of age for each of the trend years individually and then an average is calculated to produce rates of out-migration. In-migration to council areas is calculated by adding outflows from all the other district authorities.

2.5.6 ONS population projections use a five year migration trend to inform the population forecast. Currently the trend years considered in the 2014 sub-national population projections are 2009 to 2014.

2.5.7 The ONS recognises potential weaknesses in the way that it predicts migration and is ‘currently researching to improvements to the methods and intent to introduce them in

June 2017'[9]. Specifically, the data sets used by ONS to represent national migration can be unreliable because they do not catch all potential migrants. For example, the data sets which include registration at GP surgeries will only collect data for those migrants who register at a new surgery when they move home. There is a recognised lag time for people registering with a GP and therefore the data is likely to be incomplete. This issue is more pronounced if the people move a short distance, but between Local Authority areas as they may not change the surgery with whom they are registered.

2.5.8 In addition, ONS migration data is controlled (or adjusted) to the fit national migration data which can distort local patterns. This process is not applied in the DCC approach because the area of interest is limited to the Plymouth HMA.

2.5.9 Cross-border migration between England and the rest of the UK is calculated in a similar way to national migration flows.

2.5.10 ONS calculates international migration using a variety of sources of data because there is no single system in place to capture all movements in and out of the UK[10]. A short term trend period of five years is also used, which can be highly volatile. International migration estimates are based on three sources (which are not specifically designed to capture information solely on international migration). These are the:

- International Passenger Survey;
- Labour Force Survey; and
- Home Office immigration administrative systems.

2.5.11 As with the data for national migration, there are some challenges in the ONS approach to estimating international migration due to the fact that there is no one 'record' of international movements.

2.5.12 The DCC methodology for projecting migration largely follows the trend-based approach applied by ONS using national ONS data for base populations, births and deaths. However, the DCC approach is a refinement of the methodology in terms of:

- How migration is calculated using robust, nationally published data sets;
- The use of a longer, and therefore less volatile, migration trend period;
- The calculation of migration figures from up-to-date data which implicitly incorporates all migration flows; and
- The use of four migration flows which in aggregate equate to a single, net migration figure calculated using mid year estimates, birth rates and death rates.

2.5.13 For the Plymouth HMA, the assumption made in respect of net migration is important to the overall population projection. Through the DCC methodology, net migration is *calculated* for the Plymouth HMA using robust ONS data and not based upon the proxy data that ONS use to represent migration. The calculation used by the County Council is set out below.

[9] Source: https://www.ons.gov.uk/file?uri=/peoplepopulationandcommunity/populationandmigration/migrationwithintheuk/methodologies/interalmigrationmethodology/internalmigrationmethodology2016.pdf

[10] Source: https://www.ons.gov.uk/file?uri=/peoplepopulationandcommunity/populationandmigration/internationalmigration/methodologies/internationalmigrationmethodology/ltimmethodologydecember2016v1.0.pdf

Net migration = (Population in year 2 – Population in year 1) – (Births in year 1 - Deaths in year 1)

2.5.14 This calculation is a sound basis for assessment because it uses observed and robust data sets published by ONS. The ONS data sets used in this calculation are:

- ONS Mid Year estimates (used as the population figure);
- ONS births data; and
- ONS deaths data.

2.5.15 This approach results in the production of a single net migration figure for each year, which takes into account four of the flows that the ONS apply. The single, robust migration figure is divided into four migration flows as stipulated by the model. This is done by splitting the overall migration figure into four different flows, based on the proportions in the ONS migration data. The four migration flows input into the model are:

- National in-migration;
- National out-migration;
- International in-migration; and
- International out-migration.

2.5.16 For an area like Plymouth and South West Devon which experiences significant and volatile migration, using a particularly short term migration trend period would mean that future projections could be unduly and inappropriately influenced by short term economic factors affecting migration flows.

2.5.17 The comparative, annual net-migration averages calculated using different trend periods are shown in Table 1. This data is calculated by DCC. The table does not compare DCC migration trend data to that from ONS.

Area	5 Year trend	10 Year trend
Plymouth	783	672
South Hams	395	412
West Devon	351	497
Plymouth HMA	1,528	1,582

Table 1: Average annual net migration over different trend periods (DCC migration calculation using national data sets)

2.5.18 As is shown by the data in the table, the length of the trend period has an impact on average, annual net migration rate. As the aggregate data for the whole HMA shows, the prevailing, longer term migration trend periods currently result in higher average net migration.

2.5.19 This pattern is broadly the same for the two, more rural Districts within the HMA and the HMA as a whole. Plymouth follows an inverse pattern. This is potentially because, as an urban area, it has significantly different characteristics compared to the other, more rural areas.

2.5.20 A 10 year trend period better takes account of economic cycles than a 5 year trend,

and therefore has a smoothing effect on economic patterns and therefore offers a robust economic scenario which is likely to be experienced in future.

2.5.21 Considering the volatility of migration into the area, the DCC model for the Plymouth HMA currently projects future net migration patterns based on the average yearly net migration experienced over the past 10 years, between 2005 and 2015. The 10 year average net migration flow is an overall migration rate calculated on the basis of 10 years of Mid Year Estimates and natural change divided by 10. The migration data used in the model, together with a brief explanation, is included in Appendix D.

Unattributable population change

2.5.22 ONS population estimates are based on the census. Additional estimates (the Mid Year Estimates) are released each year between the censuses and are based on birth rates, fertility rates and migration. At the end of the ten year period between censuses there is generally a difference between the population recorded by the census and the mid year estimate for that year. Some of this difference is as result of methodological changes in the population projections. The remaining difference is the unattributable population change. For England as a whole, the unattributable population change in 2011 was 103,700[11]- a small figure in the context of the national population.

2.5.23 Like the ONS methodology, the County Council approach includes an element of unattributable population change because of the way in which it considers migration using the mid year estimates. However, given that on a national level the latest figures for unattributable population change only total 103,000, it is considered that at a local level for the Plymouth HMA unattributable population change will be minimal. For example, if this is calculated on proportional basis 2011 population figures, the unattributable population change for the area would only be approximately 800 people. This equates to around 0.2 % of the total population for the area. As such, no adjustments have been made for unattributable population change in the local modelling. This is consistent with the national approach which makes no adjustment.

Summary

2.5.24 In general terms, the DCC approach recognises that migration is a significant component of population change within the HMA and the use of more robust data reflects the latest national government guidance relating to housing assessment which is included in the National Planning Practice Guidance (NPPG)[12]. Paragraph 17 of the NPPG states that estimates of housing need may require adjustment to reflect factors affecting local demography (in this case, migration). DCC's approach reflects this concept as it is effectively a more local adaptation to the principles of ONS trend-based methodology using national data sets.

2.5.25 The DCC approach regarding the length of the migration trend period is appropriate as over the HMA as a whole it smooths out migration patterns and bases the forward projection on more stable economic performance likely to be replicated in future than the short term recession of recent years.

[11] Source: https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationprojections/methodologies/2012basedsubnationalpopulationprojectionsquestionsandanswers

[12] Source: http://planningguidance.planningportal.gov.uk/blog/guidance/housing-and-economic-development-needs-assessments/

2.5.26 The DCC approach also applies more up to date data than the ONS migration methodology as it is based upon mid-year estimates, births and deaths information up to 2015. ONS use a five year migration trend period ending in 2014.

2.6 Characteristics of the migrant population

2.6.1 The characteristics of migrants and the impact these will have on future birth and death rates are taken account of in the model. ONS data which is available for each district is used to determine the age-sex profile of the migrant population. This is from the ONS components of population change reports / datasets. This means that whilst the overall number of migrants is derived distinctly from the ONS methodology the population structure of the migrants is consistent with the ONS approach.

2.7 Other considerations – Special populations

2.7.1 'Special populations' are people who will only live in the Plymouth HMA for a relatively short proportion of their lives and the ages and numbers of these groups are generally fixed. When they leave they are replaced by people of a similar age/sex profile. Special populations vary in proportions across different districts. In the population projection model, these populations are generally removed from the population initially and added back in after the natural change and migration trends have been applied. This prevents them from 'ageing' with the underlying population, which could distort the figures. This approach is taken for armed forces personnel and is consistent with the ONS methodology.

Armed Forces personnel

2.7.2 Age-sex information on army personnel from the Defence Analytical Services Agency (DASA) was received by DCC through an ONS special request. The approach is to remove the armed forces personnel from the population before projecting to the next year, then add the armed forces population back in. This is consistent with the ONS methodology for calculating population projections.

2.8 Students

2.8.1 Understanding the demand on the housing market from students is an important factor for Plymouth and Plymouth City Council. An issue to consider is the growth in the student population against the amount of accommodation available to meet their housing needs. This will have specific implications for the number of purpose-built student units delivered and the private rented sector and therefore the availability of homes in the city.

2.8.2 DCC has not investigated student population projections in any detail as this work is being considered elsewhere.

2.9 Controlling the local projection to the national projection

2.9.1 ONS projections are undertaken at Local Authority level, however these sit within a wider national projection. In order to allow regional and national comparisons to take place, a controlling mechanism is applied when producing the ONS projections. This process ensures that there is consistency between the projections so that the sub-regional projections fit in with the more strategic national projections.

2.9.2 To achieve this, the district level projections are 'controlled' to match up with projections

that are undertaken at a higher level for all of England and Wales. This essentially results in either reducing or increasing the population projection for each district (depending on region) to match the national projection. The DCC methodology does not apply any such control.

2.9.3 Omitting the control process ensures that the local projections undertaken by DCC are not adjusted unnecessarily. This approach reflects paragraph 17 of the NPPG as the DCC projections are considered to be more representative of the local circumstances.

2.10 Population projection results

2.10.1 Using the methodology identified in this report, DCC has produced a set of population projections for the Plymouth HMA up to 2034. These are shown in Table 2. These projections show significant growth of between 12% and 16% for all Districts, with growth for the HMA as a whole being 15%.

DCC population projections				
Area	**2014 (MYE)**	**2034**	**Growth**	**Growth %**
Plymouth	261,500	295,300	33,700	12.9
South Hams	84,100	87,300	3,200	3.7
West Devon	54,300	60,200	5,900	10.9
Plymouth HMA	399,900	442,700	42,800	10.7

Table 2: DCC population projections to 2034.

2.10.2 The DCC projections have been compared to the latest population projections produced by the ONS. The projections are set out in Table 3.

Area	**ONS 2014 Projections**				**DCC Projections**			
	2014 (MYE)	**2034**	**Growth**	**Growth %**	**2014 (MYE)**	**2034**	**Growth**	**Growth %**
Plymouth	261,500	282,700	21,200	8.1	261,500	295,300	33,700	12.9
South Hams	84,100	90,600	6,500	7.7	84,100	87,300	3,200	3.7
West Devon	54,300	61,600	7,300	13.4	54,300	60,200	5,900	10.9
Plymouth HMA	399,900	434,900	35,000	8.8	399,900	442,700	42,800	10.7

Table 3: DCC and ONS population projections comparison (up to 2034)

2.10.3 As can be seen from the population projections listed in Table 4, the DCC and ONS subnational projections vary across the HMA. This reflects the different migration trend periods applied in the different approaches. The DCC approach uses a more robust, 10 year migration trend period which smooths out the volatility of the ONS projections which are based on a short term 5 year migration period. It should be noted that the 2014 figures for both approaches are the same as these are Mid Year Estimates.

2.10.4 The DCC projections also include more up-to-date evidence on the baseline population – the ONS projection takes account of Mid Year Estimates for 2014 whereas the DCC

projection takes account of the 2015 mid-year estimates.

2.11 Summary

2.11.1 This chapter has identified and explained the methodology and data sets used by DCC in undertaking demographic projections for the Plymouth HMA. It has been demonstrated that the County Council methodology includes two key refinements in approach. These are:

- Migration (trend period and data sources); and
- 'Controlling' overall results.

2.11.2 In terms of migration, future projections are based on ten years' worth of trend data, compared to only five years as is the case with the ONS. The trend data is also based on more recent years. This approach has been undertaken to produce a more robust long-range projection than the ONS can provide looking back over a five year period.

2.11.3 With regards to controlling the overall population projection, this is not undertaken by DCC as there is no need to fit in with a wider demographic projection when only considering the HMA.

2.11.4 The DCC population projection approach is undertaken in accordance with the principles, requirements and approaches included within the NPPF and NPPG, specifically that the ONS projections are the 'starting point' for projection. Paragraph 17 of the NPPG[13] specifically advises that local planning authorities may adjust projections to take account of matters such as migration.

[13] Source: http://planningguidance.planningportal.gov.uk/blog/guidance/housing-and-economic-development-needs-assessments/methodology-assessing-housing-need/#paragraph_017

3 Dwelling projections

3.1 Introduction

3.1.1 Following the completion of detailed population projections, dwelling projections can be undertaken to demonstrate the overall housing requirement for an area. Whilst the whole of the future population will require housing, the majority of that housing is already in place in the form of the existing housing stock. In the context of formulating planning policy, therefore, the key output required from dwelling projections is the requirement for *new* dwellings.

3.1.2 Paragraph 15 of the NPPG states that the DCLG *household* projections should form the starting point for estimating overall housing need. These are produced by taking the ONS population projections and applying various assumptions to determine the number of households which will form based on the future population.

3.1.3 For the Plymouth HMA, Devon County Council has produced its own set of local *dwelling* projections covering the period between 2014 and 2034 based on DCC population projections and national data sets. This assessment includes an initial assessment of household requirements then translates this into dwelling requirements by applying census-based vacancy rates.

3.2 The dwelling forecast procedure

3.2.1 The procedure used by DCC for forecasting the potential number of households resulting from the future population is broadly the same as that used by DCLG in their projections.

3.2.2 The general approach taken by DCC is to calculate the number of dwellings required to house the increased population year by year throughout the projection period. These annual, additional housing requirements are then added together to provide the total additional new housing needed throughout the projection period.

3.2.3 One important aspect of the dwelling forecast is to remove the population that already have homes provided for them as part of 'institutions'. That is, people that do not require a house because one is provided for them. The 'institutional' population is removed from the underlying population to enable an assessment of how many dwellings are actually required. The broad methodology employed in the DCC model is the same as that for the DCLG model.

3.2.4 Following the removal of the institutional population, a series of headship rates are applied to convert the population structure into households. The DCC approach uses headships rates provided by DCLG.

3.2.5 Following the calculation of households, the DCC methodology then takes account of the potential for some of the housing stock to be empty, through the application of census vacancy rates produced by ONS. This then generates a dwelling requirement. This process is not undertaken in generating the DCLG *household* projections.

3.2.6 Figure 1 explains the broad stages of undertaking the dwelling projections undertaken by the County Council.

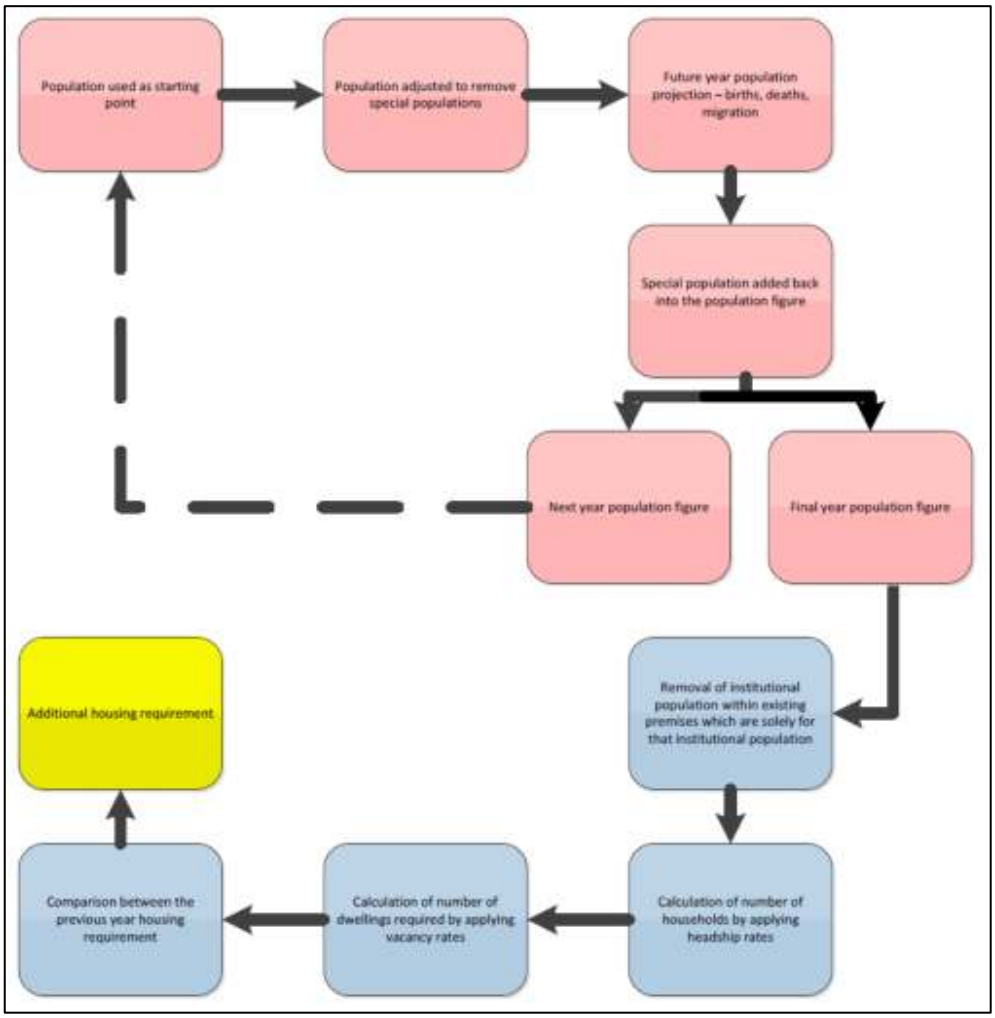

Figure 1: Methodology for calculating additional dwellings requirements

3.2.7 The following sections detail the methodology used in undertaking the dwelling projections for the Plymouth HMA. The process undertaken through the DCC dwelling projection methodology broadly reflects that undertaken by DCLG in the national projections.

3.3 Institutional population[14]

3.3.1 In order to assess the future housing requirements the number of people in institutions (such as army barracks, catered halls of residence, care homes and prisons) are removed from the future population as they do not become heads of households and do not specifically need regular housing. Following this, headship rates are applied to translate the data into future household numbers.

3.3.2 Removing the institutional population at this stage means that those currently occupying existing spaces in the institutions are not allowed by the projection model to form a household.

[14] Source: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/536705/Household_Projections_2014-based_Methdology_Report.pdf

3.3.3 The 2011 Census provides the detail for incorporating the age, gender and marital status of the institutional population into the model. As a result the inputs to the model in relation to the institutional population are the same as those used in the DCLG projection methodology.

3.3.4 In summary, the DCC dwelling projection process uses the same approach and datasets for the institutional population as used by DCLG in their assessment. This is considered to be robust due to the assertion in paragraph 17 of the NPPG that the approach used by DCLG is 'statistically robust' – the DCC approach therefore complies with the NPPG in regard to this part of the methodology.

3.4 Headship rates

3.4.1 The total number of additional households which will form from the future population is based upon the application of headship rates (sometimes called the household representative rate or household formation rates) to the population. Headship rates can be defined as the number of people per unit of population who are counted as heads of households. Headship rates differ according to age, sex and marital status for each Local Authority. The higher the headship rate, the more people have their own household and the smaller the average household size.

3.4.2 To accompany each set of household projections DCLG provide yearly historical estimates and future projections of the headship rates by 10 year age bandings and household type (e.g. the rate per 1000 population of 45-54 year olds who are deemed head of a single parent family with 3 children). There are eight individual household types. The 2014 headship rates include variable rates for each year of the projection up to 2038. The rates are then kept constant from 2039 onwards.

3.4.3 The County Council has undertaken dwellings projections based on the direct application of headship rates from the 2014 DCLG household projections – the most up to date available. As such the model inputs are in accordance with the DCLG methodology and follow the approach advocated in paragraph 15 of the NPPG; to use the DCLG projections and the underlying data as the starting point for dwellings projections.

3.5 Vacancy rates

3.5.1 Vacancy rates are an important factor to consider when estimating the number of dwellings that will be required over time. This is because the numbers of dwellings required to house the additional population and the projected number of future households will be partly dependent on the number of vacant units which will be within the housing stock (the vacancy rate). Vacancy rates can have a significant impact on the calculated housing requirement. For example, if the vacancy rate were to be overestimated (i.e. the number of vacant units was overestimated) the resulting dwelling requirement may be too high.

3.5.2 The vacancy rates used in the assessment are:

- Plymouth: 3.3%;
- South Hams: 14.8%; and
- West Devon: 7.9 %.

3.5.3 In the Plymouth HMA the reasons for vacancy rates vary across the area, however where the rates are particularly high such as in South Hams, this is likely to be as a result of the numbers of second/holiday homes in the area.

3.5.4 The household numbers within the DCLG household projections do not take account of vacancy rates. As such, the DCLG projections do not actually project dwellings requirements directly; they are a projection of households. The DCC methodology projects dwelling requirements taking into consideration the potential number of vacant units using 2011 census vacancy rates. The DCC projection is robust because it assumes that not the whole of the housing stock will be occupied all the time and therefore has built some flexibility into the outputs of housing numbers required. The use of national data sets from the census ensures that the assumptions used are robust.

3.6 The local projection and the national projection

3.6.1 The County Council dwelling projection methodology is based upon DCLG methodological principles and datasets, however the projections derived do not sit directly as part of the wider, regional and national dwelling projections. As such, the projections are not controlled directly to wider, national projections. This is because the County Council and the organisations which use the projections are specifically interested in the local context.

3.7 Dwellings projection results

3.7.1 Using the methodology identified in this report, DCC has produced a set of demographic-based *dwellings* projections for the Plymouth HMA up to 2034. These are included later in this chapter. The CLG projections are for *households*.

3.7.2 As previously discussed, the DCLG *household* projections do not consistently set out an annual figure for a consistent time period. Table 4 includes the DCC and DCLG household projections (as opposed to dwelling projection, which take account of vacancy rates) for the period 2014 to 2034.

Area	Additional households 2014 – 2034	
	DCLG 2014 household projections Uses 2014 headship rates	**DCC Household Projections** Uses 2014 headship rates
Plymouth	11,700	16,000
South Hams	4,400	2,700
West Devon	4,400	4,000
Plymouth HMA	**20,500**	22,700

Table 4: Household projections for the Plymouth HMA.

3.7.3 It should be noted that it is challenging to directly compare the DCLG and DCC household projections without acknowledging a series of points. Firstly, the methodologies for considering migration vary; DCC has used a 10 migration trend period and the DCLG projections are based on figures from ONS which use a 5 year trend period. Secondly, the way in which the migration figures are derived varies; DCC uses nationally published data sets to calculate migration whereas the DCLG uses the ONS data from other sources. Thirdly, the base year of the projections is slightly different; DCC uses 2015 as the most up to date Mid Year Estimate available whereas the DCLG projections are based on 2014 Mid Year Estimates. Fourthly, related to the previous point, the first actual projection year is different; 2016 is the first projection year in the

DCC methodology (though the population growth figures include growth in 2015), 2015 is the first projection year in the DCLG projections.

3.7.4 The constituent Local Authority areas within the HMA show different patterns when comparing the sets of projections. The DCC projections for Plymouth are significantly higher than the DCLG figures whilst the projections for South Hams and West Devon are lower.

3.7.5 For the HMA as a whole, the DCC projections are higher than the equivalent DCLG projections.

3.7.6 As previously outlined, DCC also produces specific *dwelling* projections as opposed to *household* projections. This further stage of the work is taken forward by applying vacancy rates. Table 5 shows the DCC dwellings projection covering the period up to 2034 using both 2014 headship rates. These form the trend based, starting point projections for the Plymouth area housing market assessment.

Area	Additional Dwellings 2014 - 2034	
	DCC Dwelling Projections Uses 2014 headship rates	**Annual Average**
Plymouth	16,600	830
South Hams	3,100	160
West Devon	4,300	220
Plymouth HMA	**24,000**	**1210**

Table 5: DCC Dwelling projections for the Plymouth HMA.

3.8 Further work: economic performance and market signals

3.8.1 The County Council methodology provides a 'baseline' or 'starting point' number for the housing requirement, as referenced in paragraph 19 of the NPPG. It is acknowledged that it does not specifically include reference to how economic performance or different employment projections would affect dwelling requirements in future. Consideration of the dwelling requirements associated with different economic and employment scenarios and market signals has taken place through further assessments detailed in the wider housing needs assessment work being undertaken by PBA.

3.8.2 Paragraph 19 of The NPPG specifically states that the starting point should be adjusted to reflect appropriate market signals, as well as other market indicators of the balance between the demand for and supply of dwellings. Although the methodology identified in this report does not specifically adjust for market signals, it does implicitly consider past economic trends through the application of migration rates.

3.9 Student housing requirements

3.9.1 As previously discussed earlier in the report in relation to projections of the student population, DCC has not investigated student housing projections as this work is being undertaken elsewhere.

3.10 Summary

3.10.1 This chapter has identified and explained the methodology and data sets employed in calculating the future housing requirement for the Plymouth HMA. It has been demonstrated that the County Council methodology is in accordance with the principles and approaches included within the NPPF and NPPG, although there are some refinements made to ensure the approach is more locally robust over and above the DCLG projections.

3.10.2 The County Council uses the same methodological principles and datasets for household projections as those used by DCLG, with a few local variations, which again serve to make the projection more reliable. This is because:

- DCC undertakes a more robust local population projections to inform the household forecast;
- DCC generates a specific dwelling projection from the calculated number of households whilst the DCLG projections are of households;
- DCC uses the most up to date headship rates from 2014; and
- DCC uses the most to date Mid Year Estimate (2015).

4 Conclusion

4.1 The Devon County Council modelling approach

4.1.1 Devon County Council has prepared population and dwelling projections for the Plymouth HMA which includes the Local Planning Authority areas of Plymouth, South Hams and West Devon (including part of Dartmoor National Park).

4.1.2 This report has been prepared to explain the methodology used by the County Council in developing these projections. It has provided a detailed description of the methodology used, the data sets applied and the assumptions made.

4.1.3 In covering these points, the report has identified that the broad methodology applied and the data sets directly reflect and build on those employed by ONS and DCLG in the provision of population and dwelling projections respectively.

4.1.4 The report has also identified that the DCC projections are consistent with the policies of the National Planning Policy Framework and the National Planning Practice Guidance.

4.1.5 These discussions have specifically demonstrated that the DCC methodology for undertaking the projections are in accordance with national policy and guidance and, as such, provide a robust starting point to which further work can be applied covering issues such as affordable housing, dwelling tenure and market signals. This further work is undertaken as part of the wider housing needs assessment.

APPENDIX A: Comparison between the DCC and national approaches to population and dwelling projections:

Comparison between the DCC and the ONS approaches to population projections

ONS methodology	DCC methodology
Resident population	Resident population
⇩	⇩
Remove static population (armed forces)	Remove static population (armed forces)
⇩	⇩
Age-on civilian population	Age-on civilian population
⇩	⇩
Adjust for natural change (add births, subtract deaths)	Adjust for natural change (add births, subtract deaths)
⇩	⇩
Adjust for migration (internal, cross-border and international) based on proxy datasets	Adjust for migration (all types) based on trends observed in actual migration over time (The age-sex structure and origin / destination of the migrating population is based on ONS proxy datasets)
⇩	⇩
Add back static population (armed forces)	Add back static population (armed forces)
⇩	⇩
Control to National Population Projections	No need to control to national population projections

Comparison of DCC and DCLG approaches to household and dwelling forecasts

DCLG methodology for 2014 household projections	DCC methodology for dwelling projections
Based on 2014 based population projections published by ONS	Based on 2015 based population projections from DCC
⇩	⇩
Remove institutional population	Remove institutional population
⇩	⇩
Calculate change in population between 2014-2034	Calculate change in population between 2014-2034
⇩	⇩
Apply DCLG headship rates from 2014	Apply DCLG headship rates from 2014
⇩	⇩
No vacancies accounted for	Account for potential vacancies in housing stock
⇩	⇩
Result	**Result**
⇩	⇩
Final Result - households	**Final Result - dwellings**

APPENDIX B: 2015 Mid Year Estimates and 2014 sub-national ONS population projections

2015 Mid Year estimates:

Area	Population (2015 MYE)
Plymouth	262,712
South Hams	84,470
West Devon	54,385
Plymouth HMA total	401,567

Source:
ONS:
https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/datasets/populationestimatesforukenglandandwalesscotlandandnorthernireland

2014-based sub-national projections:

Area	2014	2034
Plymouth	261,500	282,700
South Hams	84,100	90,600
West Devon	54,300	61,600
Plymouth HMA total	399,900	434,900

Source:
ONS:
https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationprojections/bulletins/subnationalpopulationprojectionsforengland/2014basedprojections/relateddata

APPENDIX C: DCLG 2014-based sub-national household projections to 2034

Area	2034 projection
Plymouth	123,646
South Hams	42,076
West Devon	27,809
Plymouth HMA total	193,531

Source:
DCLG:
https://www.gov.uk/government/statistical-data-sets/live-tables-on-household-projections

APPENDIX D: Migration data used in the DCC model for the Plymouth HMA (2005-2015)

District	Natural change (Births Minus Deaths) ONS Data	Population Increase (Mid Year Estimates)	Calculated Total Net Migration	Average Migration Per Annum
Plymouth	8,479	15,196	6,718	672
South Hams	-2,144	1,981	4,125	412
West Devon	-1,070	3,904	4,974	497
Plymouth HMA total	5,266	21,081	15,816	1,582

- 'Natural change' is the term which describes the change in local population which would take place if no migration were to take place. This is calculated by subtracting the total number of deaths from the total number of births.
- Population increases are the recorded increases according to the historic Mid Year Estimates.
- Total net migration has been calculated as the difference between the population increases and the natural change.
- Average migration per annum has been calculated by dividing the calculated net migration by 10 (representing the 10 year migration trend period).