



GL Hearn

Science Vale Housing and Employment Study

**South Oxfordshire District Council
and Vale of White Horse District
Council**

Final Report: October 2014

Prepared by

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Quality Standards Control

The signatories below verify that this document has been prepared in accordance with our quality control requirements. These procedures do not affect the content and views expressed by the originator.

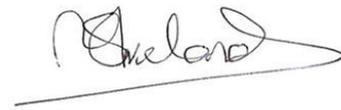
This document must only be treated as a draft unless it has been signed by the Originators and approved by a Business or Associate Director.

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October 2014

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Limitations

This document has been prepared for the stated objective and should not be used for any other purpose without the prior written authority of GL Hearn; we accept no responsibility or liability for the consequences of this document being used for a purpose other than for which it was commissioned.

1 INTRODUCTION

- 1.1 GL Hearn was commissioned by South Oxfordshire District Council and Vale of White Horse District Council in April 2014 to carry out a study quantifying housing and employment growth within the Science Vale area. This follows on from GL Hearn's work in undertaking a Strategic Housing Market Assessment and Cambridge Econometrics work on employment projections for the Oxfordshire Spatial Planning and Infrastructure Partnership (SPIP).
- 1.2 The Science Vale is a designated growth area which spans part of both South Oxfordshire and the Vale of White Horse local authorities.
- 1.3 The aim of this Study is to consider the interaction between future job and housing growth in the Science Vale area as a whole and the parts of it which fall in each of the two local authority areas, with a view to informing future planning policy. The Councils wish to understand the balance between growth in homes and jobs in the Science Vale area to help inform future policy in order to help support local living and working.
- 1.4 It should be recognised that people exercise choice in where they live and work. However seeking to achieve an integrated strategy for job growth and housing provision within the area would be consistent with Paragraph 158 in the NPPF which promotes integration of evidence and strategies for homes and jobs.
- 1.5 Detailed demographic information (particularly on migration) is not available below local authority level. The Study's starting point is therefore the employment growth projections as set out in the Oxfordshire SHMA and CE/SQW Economic Projections Reports for each of the two districts which relates to the Science Vale Area.
- 1.6 In line with the SHMA we have provided an economic led assessment of population growth in each of the four areas, those being:
 - Vale of White Horse within the Science Vale (Vale SV);
 - Remainder of Vale of White Horse (Vale Rest);
 - South Oxfordshire within the Science Vale (SO SV); and
 - the remainder of South Oxfordshire (SO Rest).
- 1.7 We then consider the amount of housing needed to service the forecast level of jobs and population.
- 1.8 The detailed components of demographic change and assumptions used are consistent with those used in the development of the Oxfordshire SHMA.

- 1.9 As part of this Study we have considered the dynamics of the area, and the potential distribution of jobs and homes between the two districts given the proximity of the key employment sites to the district boundary and the allocated sites in South Oxfordshire's Core Strategy.
- 1.10 For those parts of the Vale of White Horse and South Oxfordshire which fall within the Science Vale area, we have worked through a process of:
- Developing a demographic model;
 - Considering potential employment growth; and
 - Assessing the level of homes necessary to support this employment growth.
- 1.11 This report makes an assessment of housing need distribution on the basis of servicing additional job distribution. In reality the distribution of both jobs and population/homes will be influenced in part by the availability of appropriate land.
- 1.12 This report has not considered in detail environmental or infrastructure constraints which may influence the appropriate locations for future housing provision. These factors will be relevant in taking forward the findings of this report and may ultimately influence the appropriate distribution of housing within the four study areas identified above. The figures set out in this report should be interpreted in this light.
- 1.13 Following this introduction the remainder of this report is structured as follows:
- **Section 2:** Provides a brief overview of previous work looking at job and housing growth in the county;
 - **Section 3:** Contains a disaggregation of the job projections for each of the four areas in the study ;
 - **Section 4:** Provides a projection of housing need based on employment growth in each of the four areas; and
 - **Section 5:** Draws the analysis together and provides a brief summary of the previous sections.

2 POLICY REVIEW

2.1 There are a number of documents which are relevant to this Study, comprising:

- South East Plan 2009;
- South Oxfordshire Core Strategy 2012;
- Vale of White Horse Draft Local Plan: Strategic Sites and Policies, February 2013;
- Vale of White Horse Draft Local Plan: Strategic Sites and Policies, Housing Delivery Update, Feb 2014;
- Oxfordshire LEP Strategic Economic Plan 2014; and
- Oxfordshire Strategic Housing Market Assessment 2014.

2.2 We review these in this section to provide a context to this Study.

South East Plan (Regional Spatial Strategy) (May 2009)

2.3 The South East Plan or Regional Spatial Strategy set the housing and jobs targets for each local authority in the Region. It also included targets for a number of sub-regional strategy areas including Central Oxfordshire. The Central Oxfordshire area ranged from Bicester in the North to Grove and Wantage in the South, encompassing all of Oxford City and the Science Vale.

2.4 Overall the Central Oxfordshire area was expected to deliver 40,680 additional homes between 2006 and 2026 of which 10,240 dwellings were to be delivered in Vale of White Horse and 8,240 dwellings in South Oxfordshire. The figure for South Oxfordshire included 6,000 homes to be delivered at Didcot. The figure for Vale of White Horse included 2,750 homes to be delivered at Didcot.

2.5 As a guide figure, the sub-region was given an employment target of 18,000 additional jobs between 2006 and 2016. This was to be achieved by prioritising sectoral growth allowing the area to become a world leader in education, science and technology and by delivering improved transport links.

South Oxfordshire Core Strategy (Dec 2012)

2.6 The South Oxfordshire Core Strategy sets out the vision for the District to 2027. This includes a plan to deliver almost 11,500 homes, of which 6,300 are to be delivered at Didcot (55%). This figure is comprised of the 6,000 target identified in the Regional Spatial Strategy (2006-2026) being carried forward, with an additional 300 homes to account for an additional year to 2027.

2.7 When completions are taken into account, along with the strategic site allocations, a capacity for 6,313 homes in and around Didcot is identified. The Core Strategy also outlines the town's strengths and opportunities, providing justification for further housing development. These include:

- The successful completion of a new shopping centre with an arts centre and multi-screen cinema, with opportunities to further improve the town centre with a retail-led scheme and regeneration of the station and Broadway areas;
- Being part of the 'Science Vale UK' which is at the forefront of global scientific enterprise and innovation and offer significant potential for future growth;
- Being a housing growth point [at the time of preparation of the strategy] giving the opportunity to bid for government funding to support growth;
- Strong transport links with a railway station on the main Paddington to Bristol line, and a branch line to Oxford and beyond and access to the A34 and M4 road links;
- The planned transport-interchange facility at the station forecourt which will encourage access to the station by walking, cycling and public transport;
- The opportunity for further improvements to improve east-west movement, access to the town centre and to enhance links between Didcot and the key employment sites in the area to encourage more people to live and work locally;
- The opportunity to provide the type of housing needed with good local facilities and services; and
- The opportunity to provide new facilities which will be required for education and to improve the environment and image of Didcot.

2.8 The Core Strategy also planned for an additional 5,000 B use jobs in the District, which require the equivalent of 13.5 Ha of additional employment land to be delivered. The equivalent of 5.5Ha is to be delivered by increasing jobs at the Culham Science Centre within the Science Vale.

2.9 In addition, 6.5 Ha are to be delivered adjoining Didcot but in the Vale of White Horse, again within the Science Vale. This has been agreed by both Councils.

Vale of White Horse Draft Local Plan 2029 (now updated to 2031) Part 1 (Feb 2013)

2.10 The draft local plan sets out the council's proposed strategy and policy to guide development across the district throughout the plan period. It set out a housing target of 13,294 dwellings that was based on the South East Plan, as the new SHMA was not available at the time of publication (it has since been updated by the *Housing Delivery Update* - see below).

2.11 The plan sets out a spatial strategy that focuses growth in the Science Vale area that includes the two Enterprise Zone sites at Milton Park and Harwell Campus and where the focus of new jobs will be created and new infrastructure provided.

2.12 The plan makes provision for 143 ha of land for employment development including 132ha within the Science Vale area.

Vale of White Horse Local Plan 2031 Part 1 - Housing Delivery Update (Feb 2014)

2.13 This document updates the Vale Draft Local Plan published in Feb 2013 to reflect the up to date objectively assessed housing need identified in the Oxfordshire SHMA and the employment

forecasts prepared by Cambridge Econometrics. It sets out a housing requirement for 2011 to 2031 of 20,560 new homes and forecasts that 23,000 jobs will be created over the same period.

- 2.14 To meet the new housing requirement, the *Housing Delivery Update* proposed a number of new strategic site allocations. For the South East Vale sub-area, the plan identifies growth of at least 8,200 additional homes for the 2011 - 2031 period to be delivered at 8 specific sites. This equates to approximately 40 % of the district target just in relation to these sites (the total planned housing in this area equates to around 60 %).

Strategic Housing Market Assessment (April 2014)

- 2.15 The Strategic Housing Market Assessment (SHMA), prepared by GL Hearn, provides an objective assessment of housing need for the county as well as providing guidance on the mix and tenure of housing across the county and for each local authority.
- 2.16 Following the approach set out in the NPPG, the SHMA identifies a need for 725 – 825 homes per annum in South Oxfordshire and 1,028 homes per annum in the Vale of White Horse between 2011-31.
- 2.17 The SHMA considers demographic trends, affordable housing need, market signals, delivery against past housing targets as well as the interaction between housing need and economic growth.
- 2.18 To support and inform the development of the SHMA, together with the Oxfordshire Local Enterprise Partnership's (LEP) Strategic Economic Plan, the local authorities commissioned Cambridge Econometrics (CE) and SQW to prepare economic forecasts for the County. For the purposes of this report, two relevant forecasts were developed, these were:
- **A Baseline Scenario**, assuming that historical trends in relative growth in Oxfordshire compared with the wider South East (or UK) economy (on an industry-by-industry basis) seen over the past 15 years or so continue into the future; and
 - **A Committed Economic Growth Scenario**, which reflects policy influences on economic growth such as planned development and initiatives relating to (among others) the Science Vale Enterprise Zone and other planned infrastructure investment.
- 2.19 The Committed Economic Growth scenario results in job growth of around 11,500 jobs in South Oxfordshire and almost 23,000 additional jobs in The Vale of White Horse. This takes account of delivery of planned growth at Culham, Milton Park and Harwell as well as the wider economic growth potential of the local economies. This was derived from the *Economic Forecasting to inform the Oxfordshire Strategic Economic Plan and Strategic Housing Market Assessment* (Cambridge Econometrics and SQW, Feb 2014).

Strategic Economic Plan

2.20 The Strategic Economic Plan (SEP) for Oxfordshire was produced by the Local Enterprise Partnership. The purpose of the SEP is to set out the economic priorities for the area and to ensure job retention and creation.

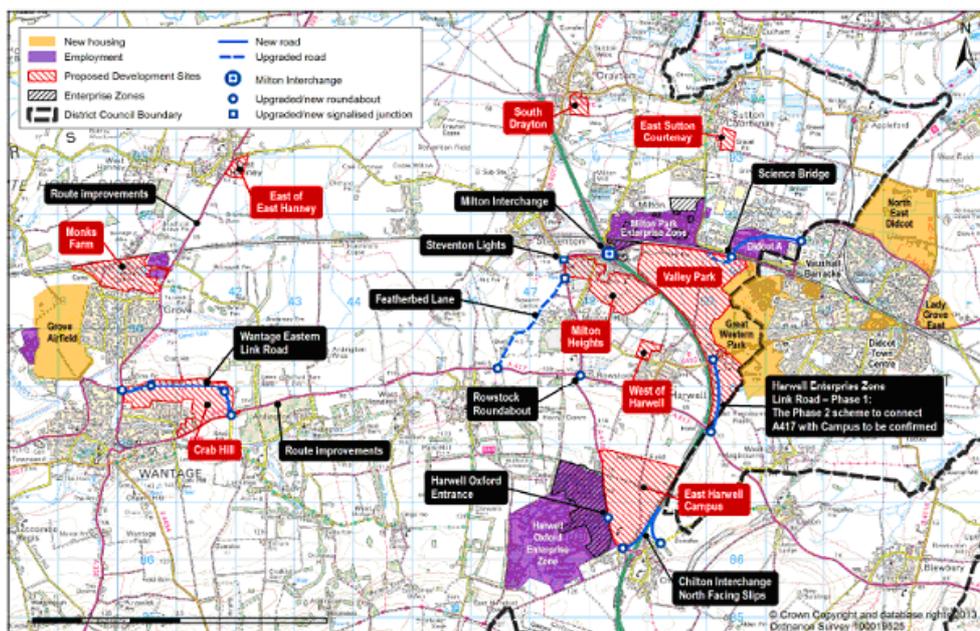
2.21 The document outlined a high level of planned growth for the Science Vale of over 20,000 additional homes and jobs in the area. The SEP also identified a number of key attributes which will help with the outlined level of growth being met, those being:

- The largest concentration of R&D activity in western Europe;
- Sufficiently skilled labour force;
- High value industries;
- Enterprise zone status; and
- An abundance of available space.

2.22 The SEP also outlines the key requirements to facilitate this level of growth. These include:

- Improvements to connectivity;
- Acceleration of house building; and
- The regeneration of Didcot, including:
 - improvements to the public realm, Town Centre, Train Station; and
 - diversifying the housing offer.

Figure 1: Growth Locations within the Science Vale



Source: Oxfordshire LEP, 2014

2.23 The SEP also identified a number of key employment and housing growth locations within the Science Vale area. Most growth locations identified so far are found to be close to Didcot.

3 EMPLOYMENT GROWTH PROJECTIONS

- 3.1 This section of the report provides an assessment of the likely level and distribution of employment growth in Science Vale in each of the two local authorities.
- 3.2 These employment growth forecasts reflect the level of growth set out in the Cambridge Econometrics (CE) “Planned Economic Growth” Projections for the two local authorities (termed ‘Committed Economic Growth’ in the SHMA).
- 3.3 Forecasts for employment growth come with an increasing error margin for smaller areas, as for instance, future employment trends can be affected to a greater degree by the locational or investment decisions of individual businesses.

Employment Projections

- 3.4 Cambridge Econometrics developed baseline employment projections within the report, *Economic Forecasting to inform the Oxfordshire Strategic Economic Plan and Strategic Housing Market Assessment* (Cambridge Econometrics and SQW, Feb 2014). These projections provide historic job numbers and future projection for all the Oxfordshire local authorities from 1981 to 2031. The projections are provided across 45 different sectors or employment. For the purposes of this Study, we focused on reviewing total employment in the 2011 to 2031 period.
- 3.5 The baseline projections calculated a growth of 19,700 additional jobs in the two districts between 2011 and 2031. The projections split the baseline growth fairly evenly between the two authorities with slightly more 54% (10,600 jobs) projected to be in Vale of White Horse and 46% (9,100) expected in South Oxfordshire.
- 3.6 The Planned Economic Growth (PEG) forecasts took account of adjustments within the model to underlying population assumptions and growth potential in the education sector. It also took account a number of planned investments, including:
- **Growth in Research Activities in Oxfordshire** –5,400 additional jobs at Harwell and Milton Park associated with new development as part of the Science Vale Enterprise Zone and growth in research at Harwell linked to greater University of Oxford involvement. In addition 500 additional jobs are modelled at Culham Science Centre.
 - **Space Science and Satellite Technologies** –4,000 jobs in these sectors across the county, focused particularly in and around the existing facilities, agencies and research based at Harwell.
 - **Advanced Manufacturing** – 500 in Vale of White Horse associated with growth opportunities in the automotive sector, motorsports, instrument engineering, magnet technology and cryogenics. In the automotive sector this reflects the presence of key employers such Williams with opportunities for both research and development, and repatriation of the supply chain.

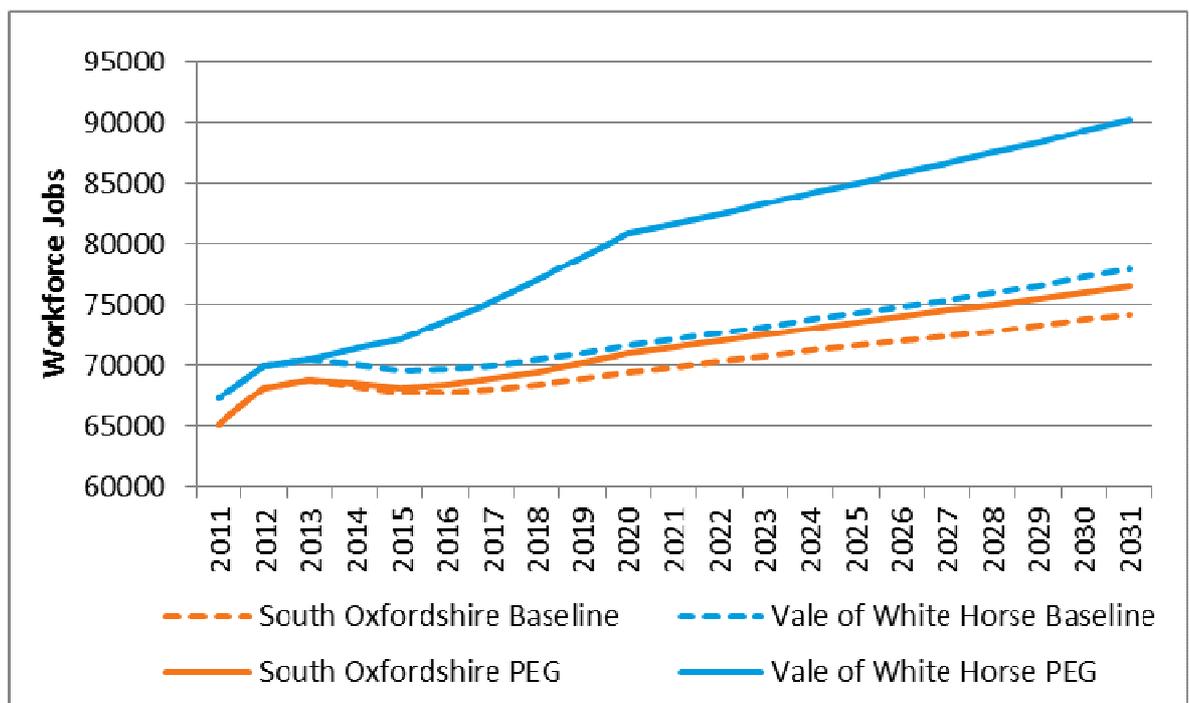
- **Environmental Technologies and Green Construction** – potential 150 jobs in construction and 1,000 in environmental goods and services across Oxfordshire including some in South Oxfordshire and Vale of White Horse, although the focus of the growth will be associated with delivery of the eco-development at North West Bicester.

3.7 Through this Study we have sought to distribute the jobs growth to the four areas across the two Districts, namely:

- Vale of White Horse within the Science Vale (Vale SV);
- Remainder of Vale of White Horse (Vale Rest);
- South Oxfordshire within the Science Vale (SO SV); and
- Remainder of South Oxfordshire (SO Rest).

3.8 Our approach to distributing the jobs growth has been structured in three stages of which more information can be found in the remainder of this section. Broadly, the first stage is to distribute the baseline forecasts based on the current sectoral representation in each area. The second is to distribute the planned uplift (i.e. the difference between the baseline and Planned Economic Growth forecasts) based primarily on the location of planned interventions. Finally we merge the growth associated in the first two stages the assessment to provide an overall distribution of employment by each of the four areas and by each sector. The final job total equates to the Planned Economic Growth Scenario for each local authority.

Figure 2: CE Employment Projections for South and Vale (2011-2031)

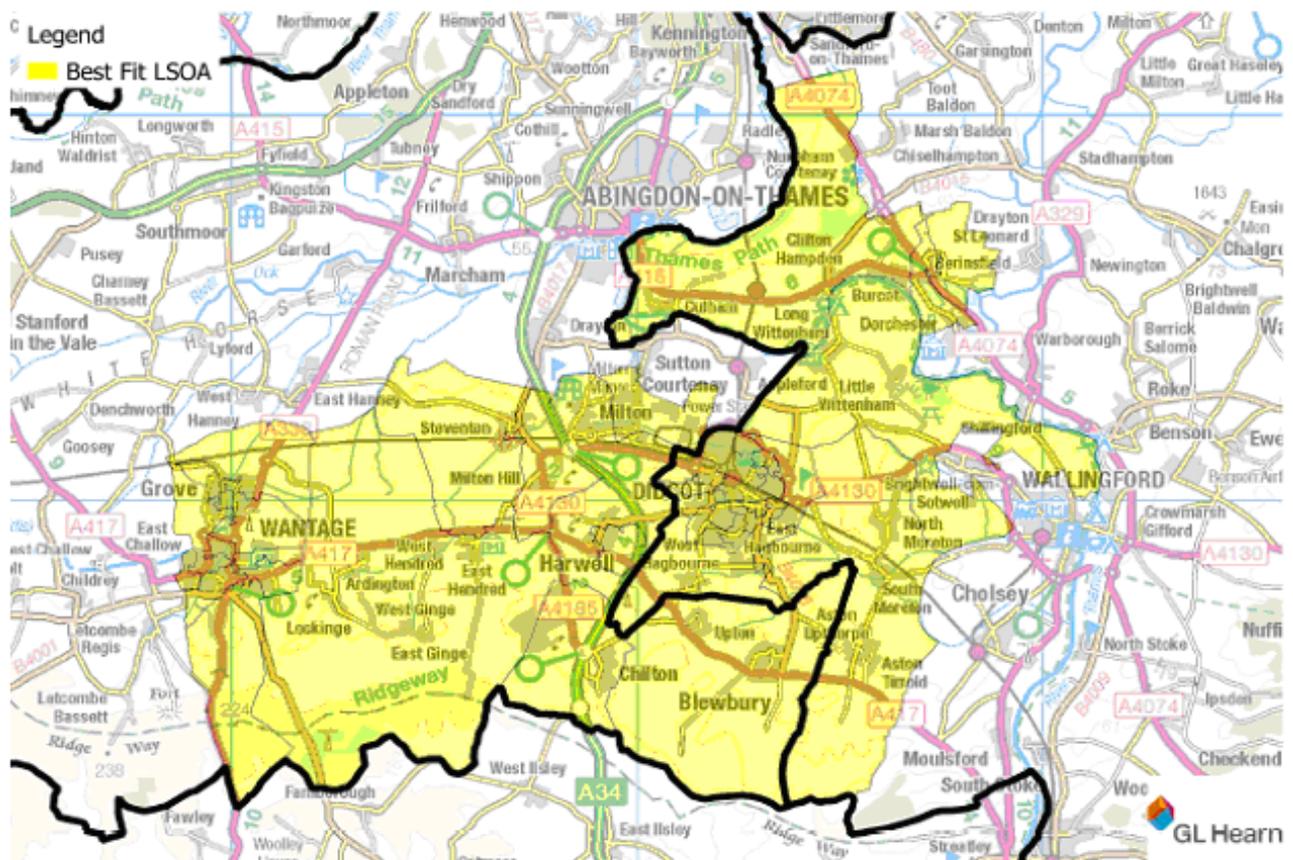


Source: Cambridge Econometrics (2013)

Baseline Growth Distribution

- 3.9 We have firstly reviewed the current distribution of the jobs within the two districts. To do this we have used work-place based employment data from the Business Register and Employment Survey (BRES). This data is provided for each sector, of which there are 99, and at a Lower Super Output Area Level (LSOA) level. The current employment distribution (in 2012) shows employment in the Vale of White Horse at almost 67,000 (50.8%) and 65,000 jobs in South Oxfordshire (49.2%). This includes the self-employed.
- 3.10 In order to understand how this relates to the Science Vale we have aggregated the data for those lower super output areas that were a best fit with the Science Vale. Unfortunately the data is not available for a more exact boundary. We have also related the BRES sectors to the baseline projections for each of the 45 sectors as shown in the CE/SQW report. This indicates that approximately 42,900 jobs are currently located within the Science Vale of which 40% are in South Oxfordshire (17,200) and 60% in the Vale of White Horse (25,700 jobs).

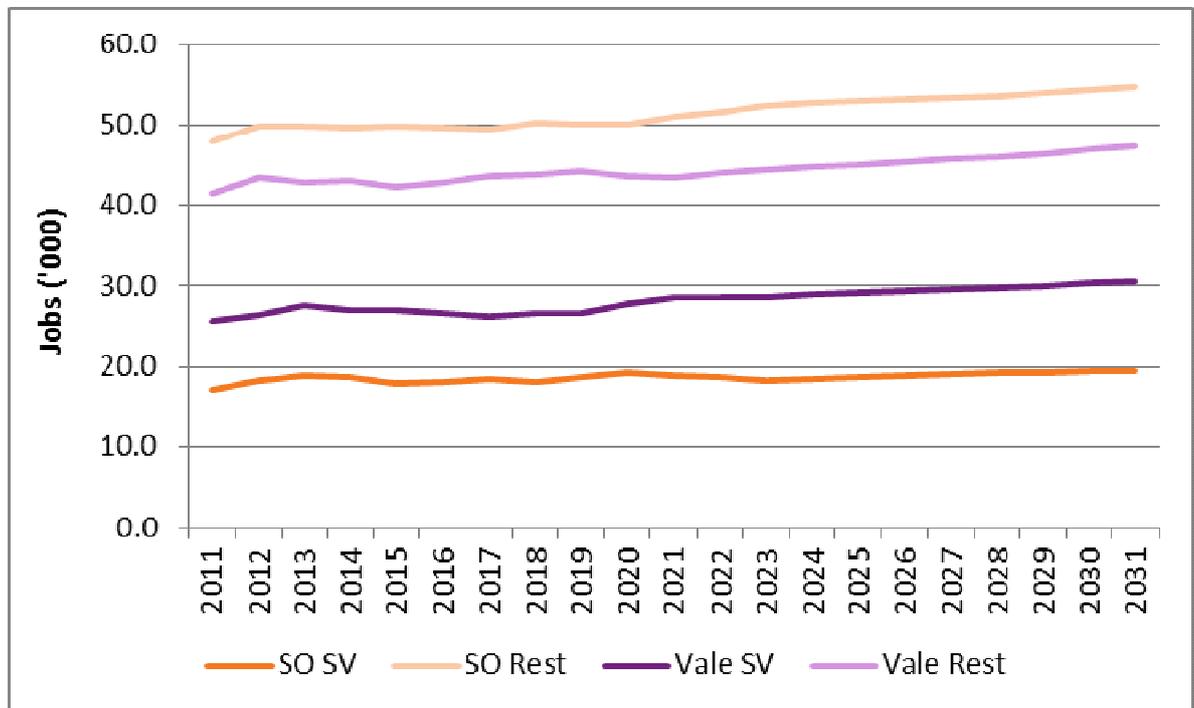
Figure 3: Best fit of LSOA to Science Vale Area



Source: GL Hearn based on OS and ONS data (2013)

- 3.11 The percentage of forecast employment growth in the baseline scenario for each sector in the CE projections which is expected to arise in each of the four areas has initially been established based on the current (2012) distribution of employment by sector. This growth is considered to be the indigenous growth within the local economy in each area.
- 3.12 However due to the impact that the Science Vale proposals will have on housing and employment in the area, we have made an adjustment to the baseline growth. This adjustment directs a greater proportion of baseline growth to the Science Vale area as this part of each district is expected to see stronger growth in population, housing and employment growth from inward investment. This is on the basis that new employment stock will attract more of the existing occupiers, particularly service industries to relocate or grow their businesses to service the new employment locations.
- 3.13 There is a slightly higher adjustment in South Oxfordshire as there will be higher longer term demand as a result of a growing business services sector. This sector tends to prefer ready established locations and sites, which are highly accessible. Therefore consideration to future requirements should include the expansion of existing sites and establishment of sites in highly accessible locations such as Didcot rather than elsewhere in the district. Didcot is a key location to consider in terms of new allocations given its growth potential, accessibility and reasonable levels of market demand. It is therefore likely that baseline growth will be drawn to the town as opposed to elsewhere in the district.

Figure 4: Baseline Growth Distribution (2011-2031)



Source: CE and GL Hearn, 2014

- 3.14 There is also some outstanding development potential on Milton Park and given its accessible location, on-site facilities and existing occupiers, it is likely to provide a more attractive location for office occupiers in comparison to alternative parks within the district. Therefore more of the baseline growth will be at existing locations.
- 3.15 The baseline growth projections indicate an additional 20,000 jobs will be created in the two districts by 2031, one third of which will be located within the Science Vale. The Science Vale figure can be disaggregated further. Based on the areas current profile and the expected growth in each sector, a third of the baseline growth within the Science Vale area is expected in South Oxfordshire and two thirds in the Vale of White Horse.

Uplift Distribution

- 3.16 Next, the uplift from the Baseline Projection to the Planned Economic Growth Forecasts has been disaggregated on a sector by sector basis. We have reviewed the planned interventions and what sectors are being targeted. This information is outlined in the SQW/CE report where the sector specific interventions are outlined. We have apportioned all of the additional growth to the location of the planned intervention. This assumes that any other growth within the sector will be picked up by the baseline growth.

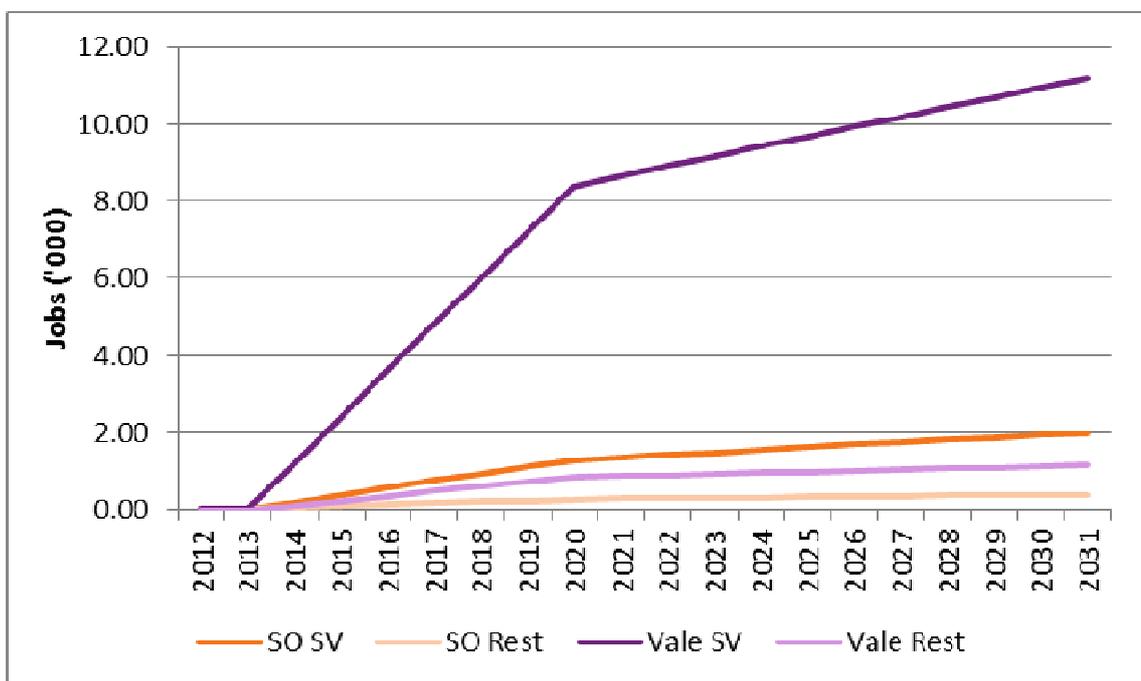
3.17 Where no specific location is identified for a sector we have apportioned any growth to one of the four areas on the following basis:

- Current distribution within each district;
- Where overall growth is expected to be less than 10 jobs in total, that growth apportioned to the nearest 50% of the current distribution i.e. the area is given either 0%, 50% or 100% based on the current distribution;
- For service sectors influenced by consumer demand, growth distribution influence by population base i.e. towards the larger population centre; and
- For service sectors which serve the wider economy, growth distributed based on anticipated wider distribution of employment growth within the area.

3.18 The expected distribution of the additional employment growth in the Planned Economic Growth Forecasts over and above the Baseline is shown in Figure 5. This also shows the assumed phasing of jobs growth (based on the CE forecasts).

3.19 This approach to assessing the distribution of employment growth not only reflects the major locations of growth, including Culham and Harwell, but also the location of current need.

Figure 5: Uplift Jobs Distribution (2011-2031)



Source: CE and GL Hearn, 2014

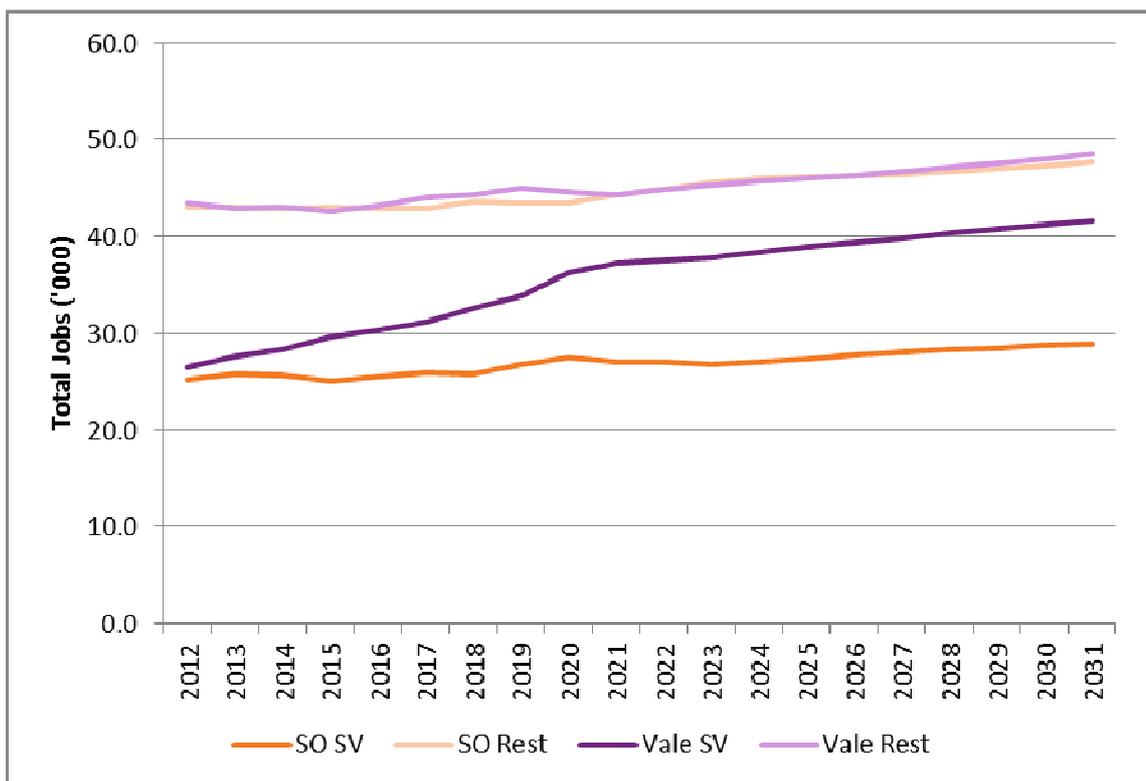
3.20 This approach to assessing the distribution of employment growth not only reflects the major locations of growth, including Culham and Harwell, but also the location of current need.

3.21 We have apportioned the year on year growth for each sector on the basis outlined above. This then aggregated up to each of the four areas. The results show an additional 14,700 jobs in total (over and above the Baseline) with approximately 90% (approx. 13,230 jobs) of additional jobs located within the Science Vale of which 76% in Vale of White Horse Science Vale (11,172 jobs) and 14% in South Oxfordshire Science Vale (2,058 jobs).

Total Job Growth Distribution

3.22 The final step was to add the uplift growth to the baseline growth for each of the areas. This then provides an overall distribution of jobs equivalent to the Planned Economic Growth Scenario. As shown in the figure overleaf, the major structural change within the two districts is the level of employment/growth identified for the Vale of White Horse part of the Science Vale.

Figure 6: Total Jobs Growth in South and Vale (2011-2013)



Source: CE and GL Hearn, 2014

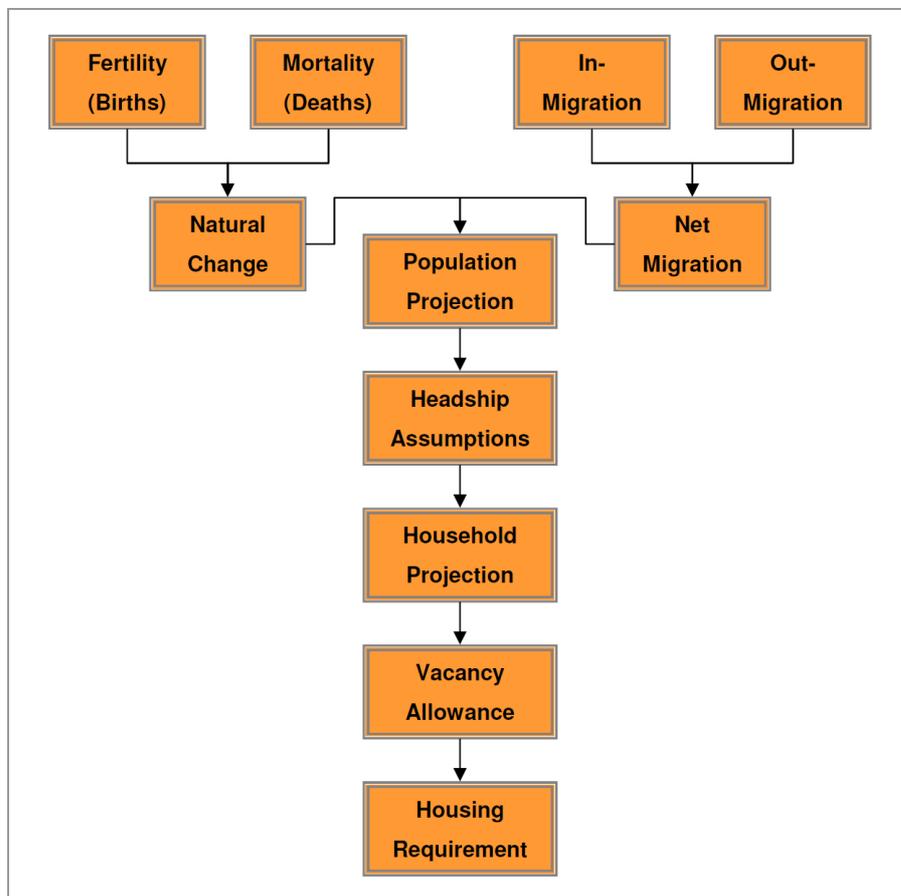
3.23 Overall the two districts are expected to see an increase of around 34,500 jobs, of which approximately 21,000 are likely to occur within the Science Vale. These figures have been used to calculate the population, households and subsequently the housing need for each of the four areas.

4 EMPLOYMENT LED POPULATION PROJECTIONS

4.1 The methodology used to determine population and household growth and hence housing need is based on a standard population projection methodology (a cohort component projection approach) which is consistent with the methodology used by ONS and the CLG in their population and household projections respectively. Essentially the method establishes the current population and how will this change in the period from 2011 to 2031. This requires us to calculate how likely it is that women will give birth (the fertility rate); how likely it is that people will die (the death rate) and how likely it is that people will move into or out of each local authority. These are the principal components of population change and are used to construct our population projections. Household formation rates are then applied to different age groups to project households, and an allowance for vacant and second homes included to calculate growth in dwellings (overall housing need).

4.2 The figure below shows the key stages of the projection analysis through to the assessment of housing need.

Figure 7: Overview of Methodology



- 4.3 The remainder of this section studies some of the key inputs to the analysis which uses district-wide data for the core analysis assumptions. The section does however begin with a brief description of the methodology to look at projections for the four component areas of the two districts. The district-wide methodology used is consistent with that in the 2013/14 Strategic Housing Market Assessment.

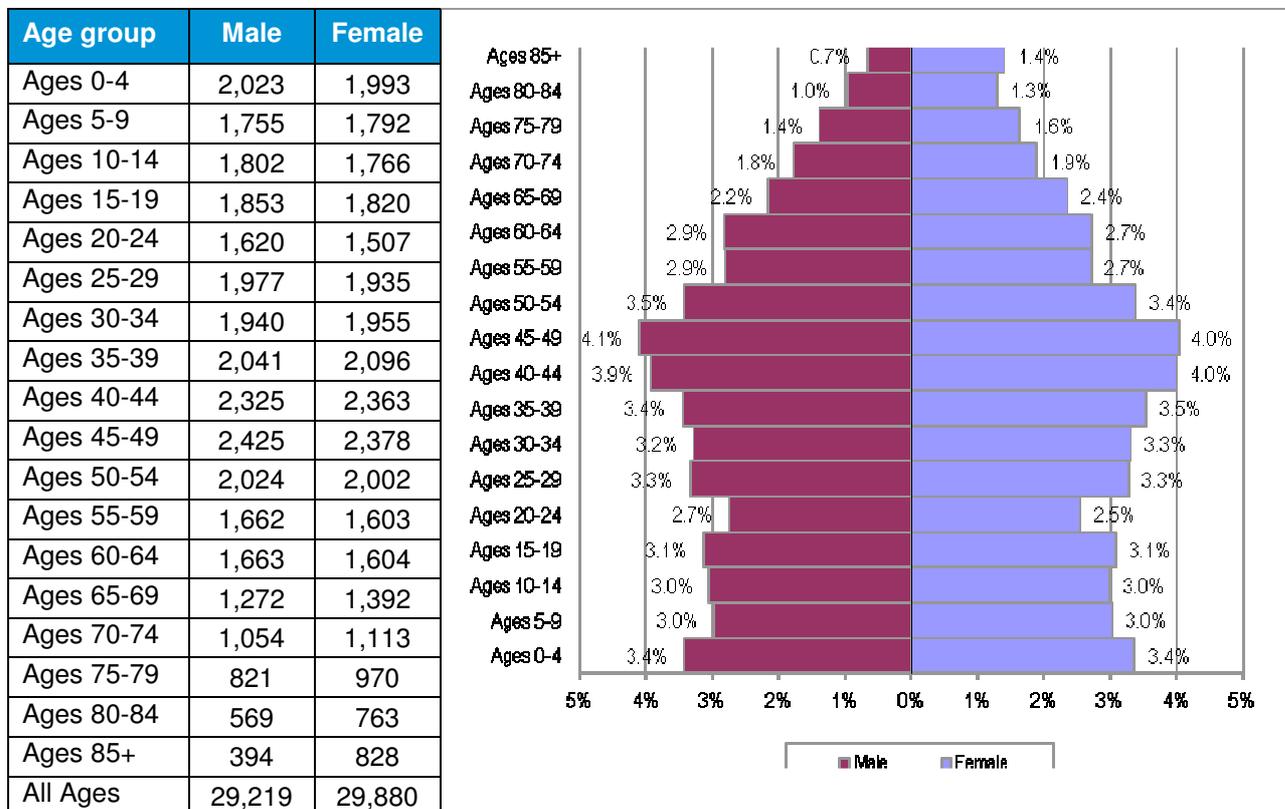
Projections at a Small Area Level – Methodological Considerations

- 4.4 It is difficult to develop small area projections using the standard methodology involving birth rates, death rates and migration patterns due to the relative lack of up-to-date and robust data at this level. For example, ward level data about life expectancy is available but error margins associated with these are quite large whilst the most recent data about migration at the time of writing was from the 2001 Census which is now quite dated and only based on data for a single year.
- 4.5 The methodology used to assign the population change figures to smaller areas is therefore based on overall change District-wide (by age and sex) applied to the demographic profile of the local population. This methodology takes account of past trends in fertility, mortality and migration to the extent that these will have shaped the current population profile (with such trends likely to shape the future population).
- 4.6 Essentially the methodology works initially by looking at incremental changes in each age and sex band (for each year of each projection) and applies this to the local population. For example, if a particular age/sex group is projected to increase by 10% District-wide then the methodology will assume a similar level of population growth for that particular group at a smaller area level.
- 4.7 To study the implications of different levels of employment growth (growth in the working population) in different locations, the methodology is then adapted to make changes to district-wide migration levels such that changes to the local working population at a smaller-area level are achieved (based on the requirements of the job growth projections as considered in Section 3).
- 4.8 Specific local data about employment and headship rates have been used to ensure that the outputs about the number of people working and the number of households properly reflect any local differences.

Baseline Population

- 4.9 The baseline for our projections is taken to be 2011 with the projection run for each year over the period up to 2031. The estimated population profile as of 2011 has been taken from ONS mid-year population estimates. The overall population in the best fit Science Vale area in 2011 was calculated as approximately 60,000 with slightly more females than males.

Figure 8: Population of Science Vale area (5 year age bands) – 2011



Source: Derived from 2011-based mid-year population estimates and 2011 Census

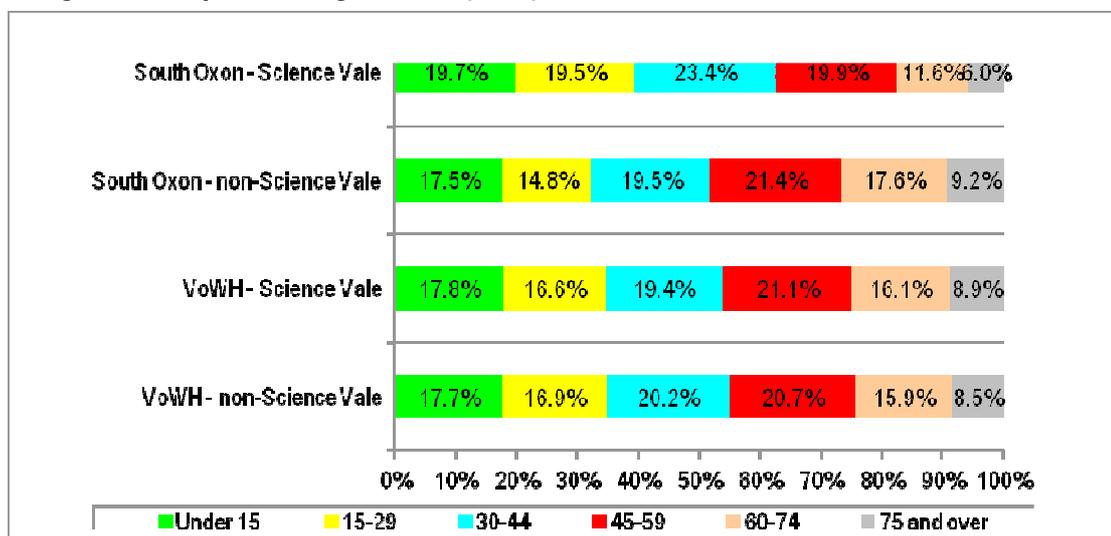
4.10 The table and figure below show the population distribution in each sub-area in broad 15-year age categories. The data shows that the Science Vale area makes up around 23% of the population of South Oxfordshire, with the same figure (23%) in the Vale of White Horse. The population profiles across the areas are quite similar – the one exception being the Science Vale area of South Oxfordshire which has a slightly younger population.

Table 1: Comparison of Population Profile in Different Locations (2011)

Age group	South Oxon – Science Vale	South Oxon – non-Science Vale	VoWH – Science Vale	VoWH – non-Science Vale
Under 15	6,235	18,113	4,895	16,696
15-29	6,160	15,273	4,552	16,004
30-44	7,408	20,127	5,312	19,108
45-59	6,292	22,111	5,802	19,561
60-74	3,673	18,142	4,425	15,049
75+	1,893	9,534	2,452	8,035
Total	31,661	103,300	27,438	94,453

Source: Derived from 2011-based mid-year population estimates and 2011 Census

Figure 9: Population Age Profile (2011)



Source: Derived from 2011-based mid-year population estimates and 2011 Census

Fertility and Mortality Rate Assumptions

- 4.11 For modelling of fertility we have used the rates contained within the ONS 2010-based Population Projections (with very small adjustments to ensure consistency with the 2011-based SNPP). In all areas fertility rates are expected to drop during the projection period. We also interrogated the ONS 2010-based Projections with regard to death rates which suggested that life expectancy is expected to increase over time for both males and females.
- 4.12 The table below shows figures for the Fertility Rate (TFR) and life expectancy (e0) in each area for key dates at the start and towards the end of the projection period. The data suggests broadly similar fertility and mortality rates in both areas. We have no evidence to suggest that either the fertility or mortality estimates used by ONS are unreasonable and note that the expected figures and changes in the area are consistent with past trend data and future expected patterns as published by ONS on a national basis.

Table 2: Fertility and Mortality Assumptions (key periods)

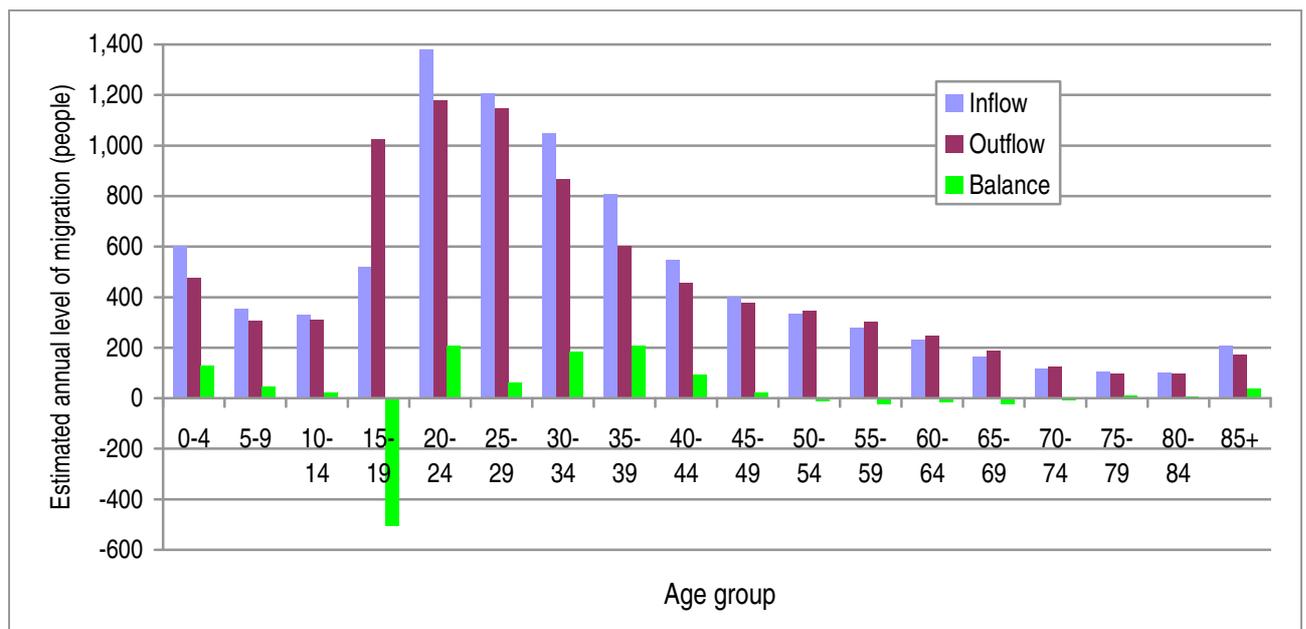
	South Oxfordshire	Vale of White Horse
TFR – 2011/12	2.29	2.21
TFR – 2030/31	2.10	2.02
Male e0 – 2011/12	80.4	80.8
Male e0 – 2030/31	84.0	84.4
Female e0 – 2011/12	84.1	84.6
Female e0 – 2030/31	87.3	87.8

Source: Derived from ONS 2010-based SNPP

Migration Assumptions

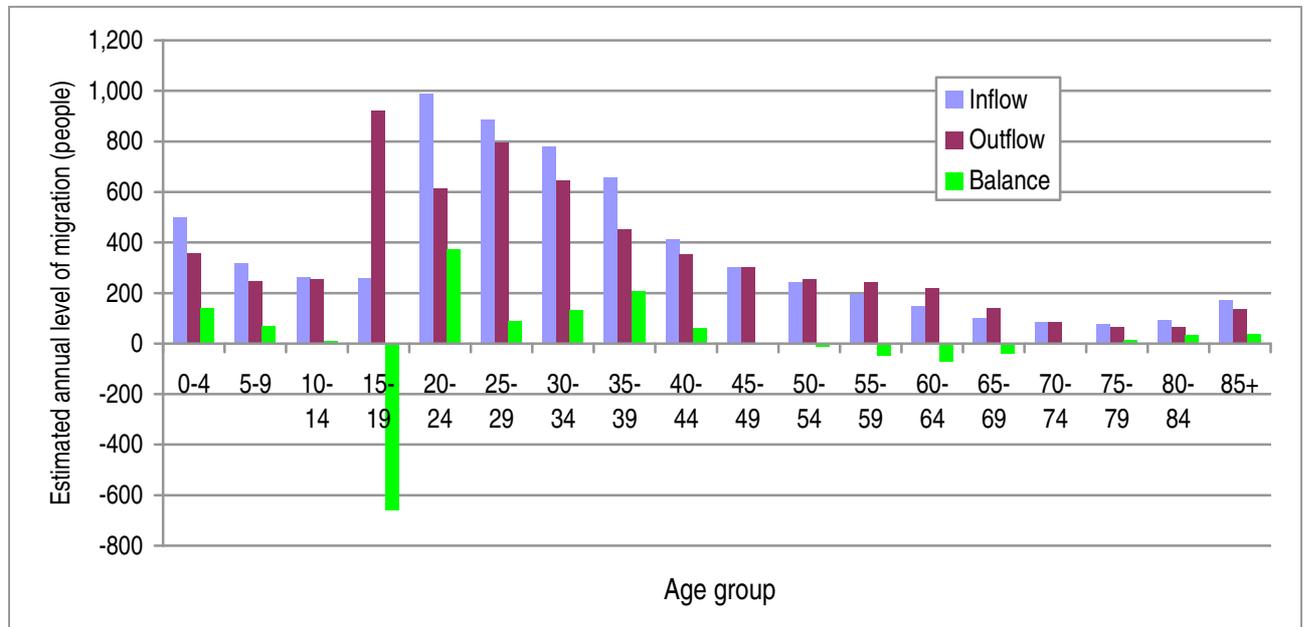
- 4.13 For the purposes of understanding the age profile of migrants we have again drawn on the ONS 2010-and 2011-based Sub-National Population Projections. The data in the figures below shows District-wide profiles of in- and out-migration based on the SHMA projection which updated the Sub-National Population Projections. The data shows that the most important age groups are younger people of working-age. This is important when studying projections linked to particular levels of employment growth.
- 4.14 When projecting migration patterns for employment scenarios we have adjusted levels of net migration to support the scale of workforce growth needed in the Planned Economic Growth Scenario. Because the migration data is at a district-level the methodology looks at what uplift in migration would be required across each district for individual sub-area increases in the workforce to be met (with different levels of migration therefore being appropriate for different sub-areas). At a smaller-area level it is essentially assumed that the profile of migrants is the same as at a district level but with adjustments made to reflect different age profiles in each location.
- 4.15 Generally, a higher level of migration sees a greater number of people of working-age moving to an area – as can be seen from the figures below migration is concentrated in those age groups who are particularly likely to be of working-age (along with children who are most likely to be associated with working-age households).

Figure 10: Estimated Annual Profile of Net Migration by five-year Age Band (2011-2031) – South Oxfordshire



Source: Derived from ONS 2010- and 2011-based population projections

Figure 11: Estimated Annual Profile of Net Migration by five-year Age Band (2011-2031) – Vale of White Horse

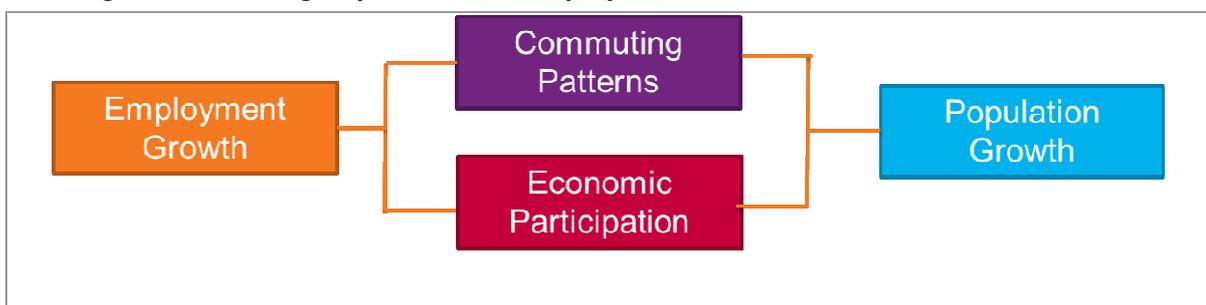


Source: Derived from ONS 2010- and 2011-based population projections

Employment Rate Assumptions

4.16 With the change in demographic structure come changes in the number of people who are working (as the population of people of working age changes). In relating population and employment growth there are two key issues: what changes we may see in commuting patterns and in employment rates.

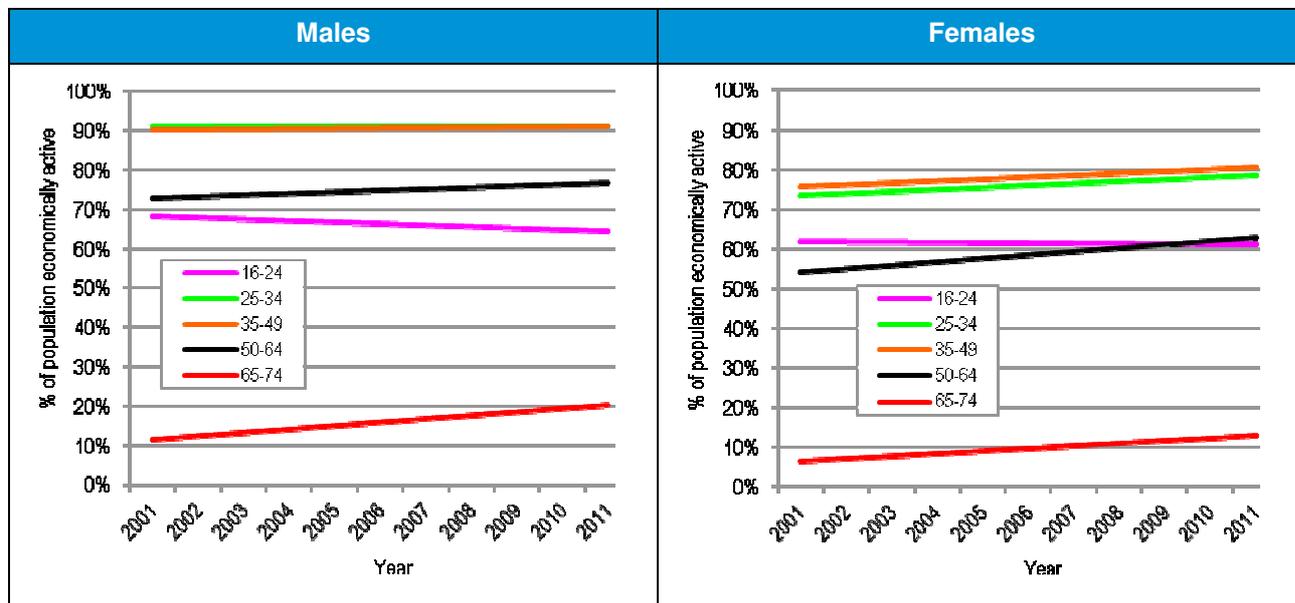
Figure 12: Relating Population and Employment Growth



4.17 It should be recognised that the relationship between overall economic growth, growth in employment and population growth will also be influenced by changes to productivity and to the balance between full- and part-time working. The projections are sensitive to these factors. The demographic projections in this report have assumed that a similar scale of growth in the workforce to projected growth in total jobs would be necessary.

- 4.18 Changes in the demographic structure result in alterations in the number of people who are working (as the population of people of working age changes). The next stage of the projection process estimates how employment levels change under each of the projections and to consider the demographic implications of different levels of employment growth.
- 4.19 The methodology applied here includes consideration of recent trends in economic activity rates along with the likelihood that some people will work longer due to changes in the pensionable age. Although not specifically modelled, the methodology used also inherently assumes that there will be some reduction in unemployment (due to increases in employment rates). Profiles for the proportion of people working were developed for a series of broad age groups (by sex) from 16 to 74.
- 4.20 The figure below shows past trends in economic activity rates (nationally) based on Census data. A similar analysis using Labour Force Survey data shows almost exactly the same pattern. The data shows that there have been some notable increases in activity rates for older age groups over the past decade.
- 4.21 To project these rates forward, it has been assumed that there will be some continuation of the trends shown below although these have been tempered slightly. The overall assumption is that rates will change moving forward at a rate which is around half of the rate seen over the past decade. We have therefore tempered the future rates on this basis. This sees older age groups (and females for most age groups) showing some increase in employment rates. Our calculations also make provisions for increasing numbers of retired population (as well as employed elderly population) within Science Vale. For those aged 16-24 the rates are assumed to continue declining, but at a lesser rate to that observed over the 2001-11 decade.
- 4.22 The assumptions made on employment rates are consistent to those in the Oxfordshire SHMA 2014.

Figure 13: Past Trends in Economic Activity Rates (National)



Source Census (2001 and 2011)

4.23 The table below shows the employment rates used for modelling from 2011 to 2031 by sex and broad age group.

Table 3: Employment Rates by Age and Sex

			Aged 16 to 24	Aged 25 to 34	Aged 35 to 49	Aged 50 to 64	Aged 65 to 74
South Oxfordshire (Science Vale)	Male	2011	63.7%	92.1%	92.7%	80.2%	31.7%
		2031	60.1%	92.3%	93.6%	84.4%	40.5%
	Female	2011	69.0%	78.9%	80.7%	66.9%	29.0%
		2031	68.3%	84.2%	85.7%	75.8%	35.7%
South Oxfordshire (non-Science Vale)	Male	2011	62.9%	91.0%	91.7%	79.3%	31.4%
		2031	59.4%	91.2%	92.6%	83.4%	40.0%
	Female	2011	67.5%	77.4%	79.1%	65.6%	28.4%
		2031	66.9%	82.5%	84.0%	74.3%	35.0%
Vale of White Horse (Science Vale)	Male	2011	58.8%	92.0%	92.9%	81.1%	28.0%
		2031	54.7%	92.2%	93.8%	85.3%	36.8%
	Female	2011	58.4%	79.2%	76.6%	74.7%	24.4%
		2031	57.1%	84.4%	81.7%	83.4%	31.1%
Vale of White Horse (non-Science Vale)	Male	2011	58.5%	91.5%	92.4%	80.7%	27.9%
		2031	54.3%	91.7%	93.3%	84.8%	36.6%
	Female	2011	58.1%	78.8%	76.2%	74.3%	24.3%
		2031	56.8%	84.0%	81.2%	83.0%	30.9%

Source: Derived from Census data

- 4.24 The data above can also be used in conjunction with the population data to calculate overall employment rates. This is shown in the table below. Figures have been provided to look at both the 16-64 and 16-74 age groups.
- 4.25 All areas are expected to see an increase in employment rates in the region of 2%-4% over time. The Science Vale area of Vale of White Horse looks to have particularly high increases. This reflects a higher modelled increase in jobs which is expected to attract a higher proportion of in-migrants of working age.

Table 4: Overall Employment Rates (key periods)

		South Oxfordshire (Science Vale)	South Oxfordshire (non-Science Vale)	Vale of White Horse (Science Vale)	Vale of White Horse (non-Science Vale)
16-64	Male – 2011	84.7%	82.9%	83.6%	82.9%
	Male – 2031	85.3%	83.7%	85.0%	83.5%
	Female – 2011	75.1%	72.8%	73.7%	73.5%
	Female – 2031	79.9%	77.8%	78.9%	78.5%
	Total – 2011	79.9%	77.8%	78.7%	78.2%
	Total – 2031	82.6%	80.8%	81.8%	81.0%
16-74	Male – 2011	79.9%	75.6%	76.4%	76.1%
	Male – 2031	80.4%	75.9%	79.2%	76.1%
	Female – 2011	70.5%	66.0%	66.9%	66.9%
	Female – 2031	74.8%	69.7%	73.1%	70.7%
	Total – 2011	75.2%	70.7%	71.6%	71.5%
	Total – 2031	77.6%	72.8%	76.1%	73.4%

Source: Derived from Census data

Commuting Patterns

- 4.26 The commuting ratio describes the relationship between the number of people working in an area and the residents in employment. A number over 1 suggests some net out-commuting (and visa-versa).
- 4.27 In this assessment (where commuting ratios are applied) we have used the commuting ratios set out in Table 5 (based on figures from the 2001 Census). It indicates net out-commuting from both South Oxfordshire and Vale of White Horse; although in the latter case the figures are broadly in balance. Separate commuting figures have not been derived for the Science Vale and non-Science Vale parts of each District with the figure in the table below assumed to apply for all locations in each area.

Table 5: Commuting Ratios

	South Oxfordshire	Vale of White Horse
Live in area and are working	66,493	59,658
Work in area	55,604	57,513
Commuting Ratio	1.20	1.04

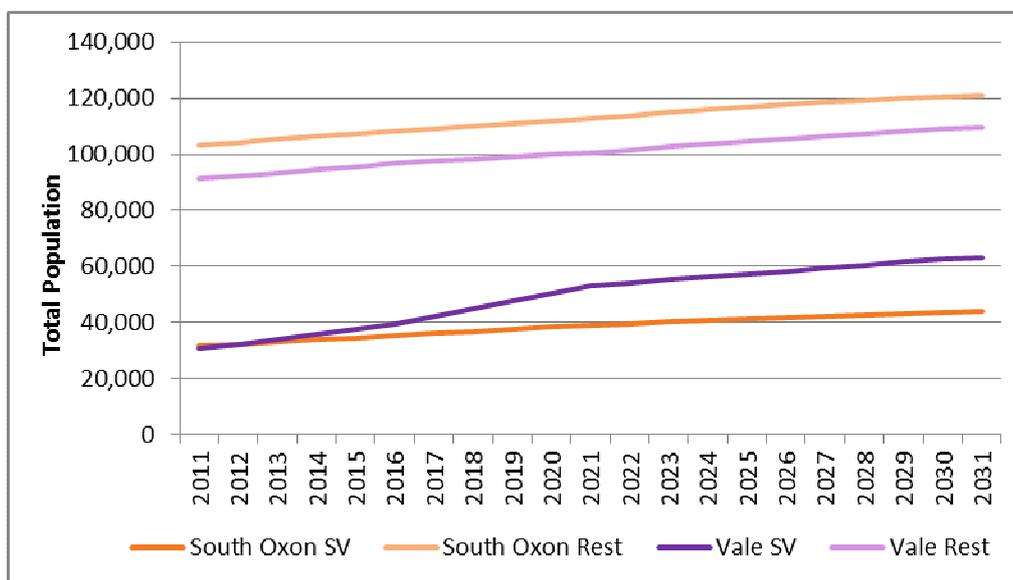
Source: 2001 Census

4.28 With both areas seeing a degree of out-commuting the expected growth in the resident workforce will be in excess of the number of additional jobs to be created. In housing need terms this means a higher level of housing provision than would be the case if the data was analysed on the basis of a 1:1 relationship between jobs and residents in employment.

Population Growth

4.29 Taking the employment growth, employment rates and commuting patterns into account the resultant population growth to service the previously identified job growth is outlined below. This illustrates that the total population grows by over 81,200 people between 2001 and 2031. Of this, the Science Vale grows by around 45,000 people.

Figure 14: Population Growth (2011-2031)



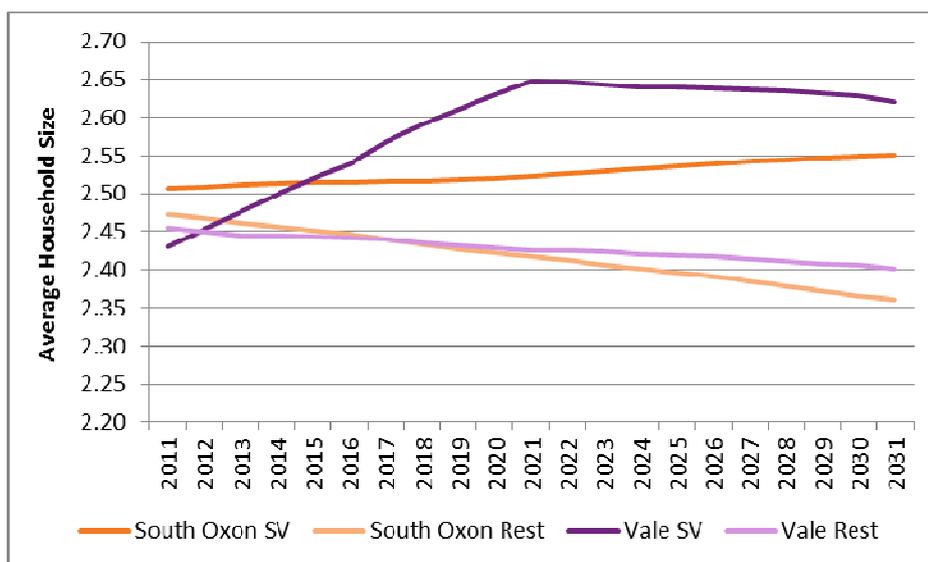
Source: JGC and GL Hearn, 2014

4.30 As part of this growth the working age population grows by an additional 37,700 people, almost 22,700 of which would be located within the Science Vale. The Vale of White Horse part of the Science Vale contributes an additional 16,500 working people to this level of growth.

Household Growth Projections

- 4.31 Having estimated the population size and the age/sex profile of the population, the next step in the process is to convert this information into estimates of the number of households in the area. To do this the concept of headship rates is used. Headship rates can be described in their most simple terms as the number of people who are counted as heads of households (or in this case the more widely used Household Reference Person (HRP)).
- 4.32 For the purposes of this analysis, the start point is data used in the 2013/14 SHMA. The method used started with the 2011-based CLG Household Projections relationship between the total population in an age group and the number of household reference persons (HRPs) in that age group. This is calculated and moved on to consider the extent to which household formation could be seen to have been constrained in the past or is expected to be constrained in the future. From this analysis a bespoke set of headship rates were developed to ensure that the projections were not planning for further suppression of household formation moving forward.
- 4.33 The figure below shows how average household sizes are expected to develop in the future in each of the four areas. It is notable that in the two Science Vale areas we are expecting the average household sizes to increase in the future whilst the other areas are expected to see a notable decline. The reason for these patterns is that in the Science Vale area a higher level of migration is assumed (to meet job growth) and the profile of in-migrants is heavily skewed towards people of working age who are more likely to live in larger households (e.g. family households with children). As a result household sizes increase.

Figure 15: Projected trends in Average Household Size (2011-2031)

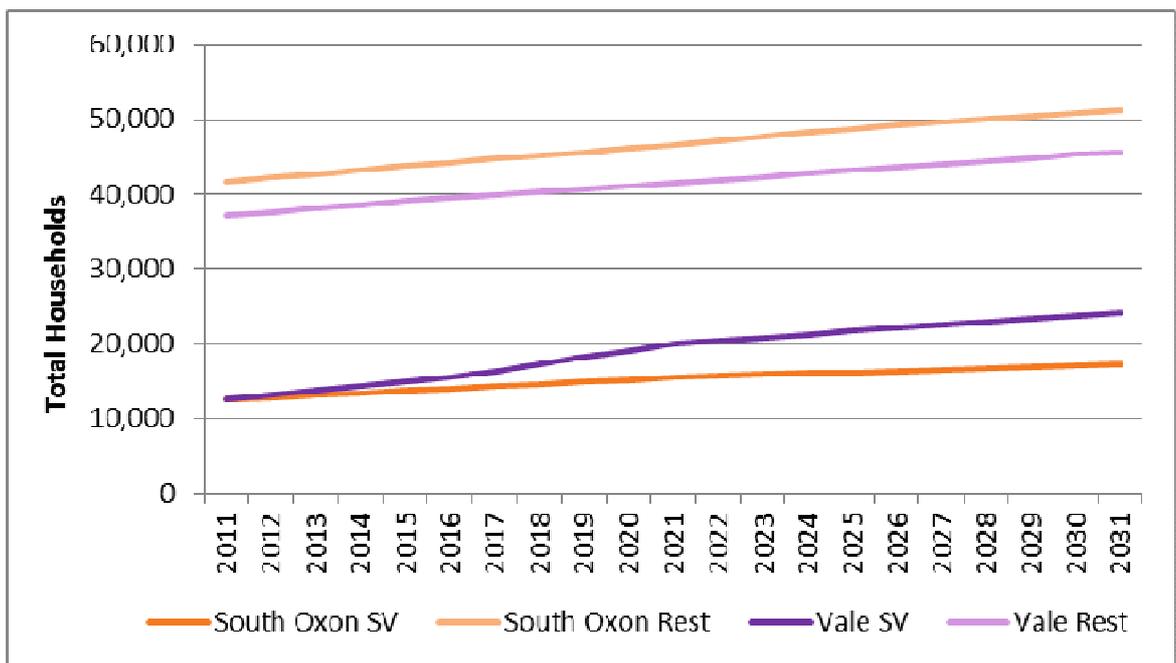


Source: Derived from ONS and CLG data

4.34 The trend shown also indicates that there is not a simple relationship between overall population and the number of households - the link between the two is strongly influenced by the age structure.

4.35 Using these average household sizes we can calculate the number of households in the districts and within the Science Vale. The figure below illustrates an additional 34,200 households are generated from the outlined population growth.

Figure 16: Household Growth (2011-2031)



Source: JGC and GL Hearn, 2014

4.36 The total household growth in South Oxfordshire and Science Vale is expected to be around 34,200 of which approximately 16,200 will be located in the Science Vale. This takes the overall number of households up to a total of 138,500 with just under 41,500 in the Science Vale of which approximately 17,300 are in South Oxfordshire and 24,100 are in Vale of White Horse.

Dwelling Growth

4.37 In converting, an estimated number of households into a requirement for additional dwellings, we have also factored in a small allowance for vacant and second homes. A level of frictional vacancy is normal to allow for movement of households between properties. For the analysis we have taken information from the 2011 Census about the number of unoccupied household spaces to derive the vacancy figure. This source suggests a vacancy rate of 4.5% in South Oxfordshire and 3.2% for Vale of White Horse.

4.38 It is assumed that these figures will be reflective of what can be achieved in new housing stock and includes an allowance for second homes. When this is added to the household growth outlined above the overall housing need can be calculated.

4.39 This results in the following rounded overall housing need by 2031:

- South Oxfordshire Science Vale – 18,100 dwellings (+4,900 dwellings);
- South Oxfordshire Rest – 53,600 dwellings (+10,000 dwellings);
- Vale of White Horse Science Vale – 24,900 dwellings (+11,850 dwellings); and
- Vale of White Horse Rest – 47,100 dwellings (+8,800 dwellings).

5 CONCLUSIONS AND SUMMARY

5.1 In summary, substantial growth is expected across the two districts, including within the Science Vale area. Due to differences in the population, structure the level of population growth differs between those areas within and outside of the Science Vale.

5.2 Over the period from 2011-31, the analysis indicates housing need and job growth for:

- 4,895 homes and 5,215 jobs within the South Oxfordshire part of the Science Vale; and
- 11,850 homes and 15,850 jobs within the Vale of White Horse part of the Science Vale; giving
- A total housing need for 16,745 homes and 21,070 jobs in the Science Vale between 2011-31.

5.3 This level of need represents 47% of the total housing need identified across the two Districts.

Table 6: Summary of Growth by Area (2011-2031)

	Jobs Change	Population Change	Dwellings Change
South SV	5,216	12,490	4,895
South Rest	6,268	17,842	9,993
Vale SV	15,851	32,511	11,851
Vale Rest	7,131	18,370	8,755
Total	34,466	81,213	35,494
Total SV	21,067	45,001	16,746
Total Rest	13,399	36,212	18,748

Source: Cambridge Econometrics, JGC and GL Hearn, 2014

5.4 The exact location of employment and housing growth will however, be dependent on the availability of housing and employment land as well as demand for housing and employment land growing as predicted. It is likely given current allocations and availability, that the majority of the B-class employment growth will be located within the Science Vale (see figure 2).

5.5 Within the Science Vale, the focus of development is within the Vale of White Horse. This includes almost 80% of the Science Vale's job growth and 74% of the dwellings growth located within the Vale of White Horse. This difference between the two reflects the current working age population in each area.

Table 7: Distribution within the Science Vale

	Jobs Change	Population Change	Dwellings Change
South SV	21%	25%	26%
Vale SV	79%	75%	74%
Total SV	100%	100%	100%

Source: Cambridge Econometrics, JGC and GL Hearn, 2014

- 5.6 However, these estimates are based on a number of assumptions and the actual locations of growth may largely be determined by the location of suitable, available land. This is particularly the case with housing land, as while we have taken into account the location of planned employment land interventions we have not examined the location of housing capacity.
- 5.7 The figures for housing need set out herein are based on the where job growth is expected to occur. They assume historical commuting patterns continue. An alternative distribution of jobs could be supported by changes in net commuting dynamics.
- 5.8 The job growth set out herein is predicated on the delivery of planned major investments and employment sites. These are committed in policy terms.