AMION Consulting

South Worcestershire Councils

South Worcestershire Development Plan

Objective Assessment of Housing Need

January 2014

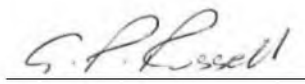
AMION Consulting Limited
Customs House, 7 Union Street, Liverpool L3 9QX

South Worcestershire Councils

South Worcestershire Development Plan

Objective Assessment of Housing Need

January 2014

Reviewed and approved by: Signature(s):	
Name(s):	Graham Russell
Job Title(s):	Partner Director
Date:	31st h January 2014

AMION Consulting is the trading name of AMION Consulting Limited
Registered Office: Langtons, The Plaza, 100 Old Hall Street, Liverpool L3 9QJ
Company No: 3909897
Tel: 0151 227 5563
This document including appendices contains 165 pages
Ref: K:\CLIENTS\Worcestershire LEP\South Worcestershire forecasting documents\Deliverables\SWDP Objective Assessment of Housing Need 310114 with Appendix B.docx

Contents

Executive summary

ES1 This report sets out the results of new work undertaken in late 2013 and early 2014 to derive an objective assessment of housing need for the South Worcestershire area and its three component local authorities (Malvern Hills, Worcester and Wychavon).

ES2 The assessment has been undertaken in response to the Inspector's Interim Conclusions (28 October 2013) on the housing need matters considered at the Stage 1 hearings of the Examination of the South Worcestershire Development Plan (SWDP). In particular, the Inspector asked that additional work be undertaken to address two specific issues:

(i) use of the latest official population projections in the demographic modelling work; and

(ii) the preparation of more than one employment–based scenario using up-to-date, realistic and representative employment forecasts from more than one source.

ES3 The SWCs have obtained employment forecasts produced by Cambridge Econometrics, Experian and Oxford Economics. The employment forecasts have been reviewed to assess and ensure that they are up-to-date, realistic and representative. The SWCs also commissioned Edge Analytics Limited (Edge) to provide new demographic and employment-based scenarios – using the latest official population data.

ES4 In order to complete this work, the South Worcestershire Councils (SWCs) appointed AMION Consulting to critically assess this new evidence and prepare a summary technical report. When published by the SWCs the South Worcestershire report will become part of the SWDP evidence base.

ES5 This assessment has comprised, in brief:

- The preparation of **population** forecasts for the period up to 2030.
- Translation of these forecasts, taking into account headship rates, into forecasts of the numbers of **households.**
- Interpretation of the household forecasts into projections for future **dwelling requirements** – taking into account vacancies, second homes and developments already undertaken during the forecasting period.

ES6 A number of scenarios have been explored including:

- Scenario 1 - an ONS Sub-National forecast 'benchmark'.
- Scenario 2 - a 'Natural Change' scenario – with zero migration.
- Scenario 3 - trend-based migration-led scenarios – assuming a continuation of recent migration patterns.
- Scenario 4 – 'employment-constrained' scenarios based on projections of the levels of population (and therefore migration if these projections exceed forecast natural change) that will be required to sustain forecast jobs in the area.

ES7 Scenario 4 incorporates both demographic and economic factors and begins to respond to the Inspector's request for forecasts that take account of anticipated employment growth. Three new employment forecasts were commissioned. While the results of these vary, each is considered to be up to date, realistic and representative. A 'central' case and an 'average' case scenario have been presented, which are considered to provide a range that encompasses the most likely number of future jobs.

ES8 The extent to which future jobs growth will require population growth will be influenced by future economic activity, unemployment rates and commuting rates. The 'core' Scenario 4 assumes that all of these factors will be constant over the forecasting period. In reality they will change and as a consequence so will the relationship between jobs growth and population growth (and therefore housing demand).

ES9 Accordingly, two further sets of 'Sensitivity Scenario' projections were produced using modified assumptions regarding economic activity and unemployment rates in order to provide more realistic forecasts. The second of these projections (Sensitivity Scenario 3) is considered to be the most realistic as it uses new labour market research to derive assumptions about the degree to which overall labour market conditions (i.e. tightening or loosening) will impact upon future activity and employment rates and, therefore, the supply of local labour.

ES10 It is considered therefore that Sensitivity Scenario 3 incorporates the most realistic assumptions currently available and, using the 'central case' and 'average case' jobs estimates, provides the most robust basis for forecasting future population and household numbers. Consequently, it is recommended that this should be considered to be the best estimate of housing need for the South Worcestershire Local Authorities to consider when setting their housing targets.

ES11 The results of the analysis are set out in the table below. The forecast dwelling requirement over the period 2006-2030 of between 26,700 and 27,300 can be compared with the 23,200 dwellings requirement previously proposed by the SWCs.

Table ES1: Net Dwelling Requirements – 2006 – 2030: Sensitivity Scenarios 3

Scenario	Forecast Household-Change (2006-2030) (a)	Forecast Dwelling Requirement – factoring in vacancy and second home rates (2006-2030) (b)	Housing Delivered Net 2006 – 2012 (6 years)[1] (C)	Dwelling requirements 2012 - 2030 (18 years)	
				Net Dwelling requirement (Rounded) (d) = (b) – (c)	Net Annual Average Dwelling Requirement (Rounded) (d) / 18
Malvern Hills					
Sensitivity Scenario 3 Central case	8,120	8,537	1,326	7,211	401
Sensitivity Scenario 3 Average case	8,018	8,430	1,326	7,104	395
Worcester City					
Sensitivity Scenario 3 Central case	9,029	9,918	2,184	7,734	430
Sensitivity Scenario 3 Average case	8,508	9,378	2,184	7,194	400
Wychavon					
Sensitivity Scenario 3 Central case	8,381	8,888	1,399	7,489	416
Sensitivity Scenario 3 Average case	8,385	8,891	1,399	7,492	416
Total South Worcestershire					
Sensitivity Scenario 3 Central case	25,530	27,343	4,909	22,434	1,246
Sensitivity Scenario 3 Average case	24,912	26,700	4,909	21,791	1,211

Source: Experian, 2013, Oxford Economics 2013, Cambridge Econometrics 2013, SWC 2012.

[1] South Worcestershire Development Plan, Housing Background Paper (Provision and Supply) – Appendix 9, 30th November 2012

Note: the calculation the net requirement is made with respect to the total dwelling requirement in column (b). It is not a 'policy—on' spatial approach.

1 Introduction

1.1 This report sets out the results of new work undertaken in late 2013 and early 2014 to derive an objective assessment of housing need for the South Worcestershire area and its three component local authorities (Malvern Hills, Worcester and Wychavon).

1.2 The assessment has been undertaken in response to the Inspector's Interim Conclusions (28 October 2013) on the housing need matters considered at the Stage 1 hearings of the Examination of the South Worcestershire Development Plan (SWDP). In particular, the Inspector has asked that additional work be undertaken to address two specific issues:

(i) use of the latest official population projections in the demographic modelling work; and

(ii) the preparation of more than one employment–based scenario using up-to-date, realistic and representative employment forecasts from more than one source.

1.3 In order to complete this work, the South Worcestershire Councils (SWCs) have appointed AMION Consulting to critically assess this new evidence and prepare a summary technical report. In line with the Inspector's views, the work takes as its starting point trend-based demographic scenarios and then focuses in particular on the implications of forecast jobs growth and likely consequences for the local labour market. When published by the SWCs the South Worcestershire report will become part of the SWDP evidence base.

1.4 The SWCs have obtained employment forecasts produced by Cambridge Econometrics, Experian and Oxford Economics. These forecast workplace jobs in South Worcestershire by district by year and by sector. The employment forecasts have been reviewed to assess and ensure that they are up-to-date, realistic and representative. They have then been used to model employment-based housing need scenarios and sensitivity tests. Summary results from the employment forecasts for each district and the South Worcestershire area as a whole are set out at Appendix A. The SWCs will publish the spreadsheets with the detailed employment forecasts for Malvern Hills, Worcester City and Wychavon at the same time as this report, and they will become part of the SWDP evidence base. Separate briefing notes will also be provided on the methodologies from each of the forecasters

1.5 The SWCs have commissioned Edge Analytics Limited (Edge) to provide new demographic and employment-based scenarios. Edge has modelled these using the POPGROUP model and produced a draft Demographic Forecasts report. A copy of its report is included at Appendix B. It should be noted that a key issue with any housing forecasts are the assumptions to be used regarding Household Representative Rates (i.e. to translate population forecasts into households). The Inspector a t the Stage 1 hearings indicated that an 'index approach' should be adopted. It has not been necessary therefore to appoint specialist consultants to explore this issue further.

1.6 In compliance with their Duty to Co-operate, and consistent with the extent of the Worcestershire Housing Market Area, the SWCs have worked closely with the three North Worcestershire Districts (Bromsgrove District Council, Redditich Borough Council, and Wyre Forest District Council) during the commissioning and production of this new evidence. This has involved:

- gaining agreement by the Worcestershire Planning Officers Group in November 2013 to obtain new evidence to support an objective assessment of housing need for all six Worcestershire Districts;
- preparation of the project brief to encompass the six Worcestershire Districts;
- participation by officers from each of the six Worcestershire Districts on the evidence project working group;
- obtaining the new employment forecasts for all six Worcestershire Districts from the three forecasting organisations and sharing the results;
- commissioning the suite of demographic-led and employment-led scenarios for all six Worcestershire Districts and sharing the results; and
- commissioning the work to critically assess the new evidence and prepare two summary technical reports - one for South Worcestershire and one for North Worcestershire. The former is to be published and shared with the Northern districts once it has been submitted to the SWDP examination. The latter will be published at a future date.

1.7 The SWCs will update their Duty to Co-operate evidence documentation to reflect and record this recent evidence gathering activity.

1.8 This summary technical report continues in three sections as follows:

- Section 2 - critically reviews and summarises the economic forecasts.
- Section 3 - summarises the demographic, household and housing need forecasts. A more detailed review of these forecasts is included at Appendix C; and
- Section 4 - sets out the conclusions of the assessment.

1.9 Appendix C sets out further detail and updates and follows the format of Chapter 6 of the February 2012 Strategic Housing Market Assessment (SHMA) Main Report that presented findings on the future housing market in Worcestershire. Appendix D presents summary tables for each of the forecast population and dwelling scenarios and employment-led sensitivity analyses.

2 Economic forecasts

2.1 Introduction

2.1.1 This section provides summary details of the employment growth forecasts for South Worcestershire. It covers the period from 2006 to 2030. The forecasts reviewed have been obtained from:

- Cambridge Econometrics (March 2013 – commissioned originally by and provided to the SWCs with the agreement of the Worcestershire Local Enterprise Partnership[1]);
- Experian (September 2013 – as submitted to the Examination in October 2013 by Barton Willmore on behalf of their clients Taylor Wimpey); and
- Oxford Economics (November 2013 - directly commissioned by the SWCs).

2.1.2 In relation to the latest national economic forecasts context for the study is provided by HM Treasury 'Forecasts for the UK Economy – A Comparison of Independent Forecasts' (November 2013). This identifies, using an average across all forecasts, an average UK Gross Domestic Product (GDP) growth of 1.4% in 2013, rising to 2.3% in 2014 and 2.4% in 2015 and 2016, before a fall to 2.2% in 2017. Over the period 2013 to 2017, claimant count unemployment is forecast to fall from 1.46 million to 1.07 million. The SWCs will add this document together with the editions contemporary with the employment forecasts above as part of the SWDP evidence base.

2.2 Forecasting methodologies

2.2.1 The methodologies used by the different forecasting models are, in brief, as follows:

- Cambridge Econometrics – baseline scenario projections are provided through the Local Economy Forecasting Model (LEFM) and are based on the historical relationship between growth in the local area relative to the region or UK (depending on which area it has the strongest relationship with), on an industry-by-industry basis. The projections assume that these relationships will continue to hold in the future. Thus, if growth in an industry in the local area (district) outperformed the industry in the West Midlands (or UK) as a whole in the past, then it will be assumed to do so in the future. Similarly, if it underperformed the region (or UK) in the past then it will be assumed to underperform the region (or UK) in the future. The projections for some sectors, in which growth is more closely related to changes in population, are based on historical relationships between growth in output per capita in the local area and output per capita in the region or UK as a whole. These industries are: retail, public administration, education, health, and miscellaneous services (which include leisure services).

[1] Note: Cambridge Econometrics also produced a Smart Efficiency and Growth Scenario, which has been informing the Worcestershire Local Enterprise Partnerships' Strategic Economic Plan (SEP) and Local Growth Deal. It is, however, aspirational and dependent upon the allocation of very substantial amounts of additional government funding, which is uncertain. In addition, the draft SEP aims to significantly increase participation rates through a range of proposed training and labour market measures.

- Oxford Economics – this is based on the Oxford Economics Local Authority District Forecasting Model and takes into consideration global and national factors (such as developments in the Eurozone and UK Government fiscal policy) and their potential impact at local authority level. It also factors in historical trends in the area. The variables taken into consideration in the model are:
  - employment – both residence-based and workplace-based;
  - population, migration and households;
  - wages – both residence-based and workplace-based;
  - unemployment and inactivity;
  - house prices;
  - Commuting by occupation; and
  - Gross Value Added.
- Experian – the overall forecasting approach is based on a methodology that combines long-term supply and demand influences with short-term demand side factors. Population projections are a key driver in the regional and local forecasts. These help to determine hours worked, which feed into output, compensation, employment in all its forms, income and finally spending. In each case Experian forecast shares of the corresponding UK variable, from their national forecasts, for the region and local area.

2.2.2 Briefing notes on the projection methodologies for each of the forecasters are provided separately.

2.3 Forecasting results

2.3.1 Malvern Hills

2.3.1.1 Table 2.1 sets out the employment forecasts for Malvern Hills for the period 2006 to 2030.

Table 2.1: Overall forecasts for employment change for Malvern Hills, 2006 to 2030

Experian	**2006**	**2012**[2]	**2030**
Total employment (thousand)	30.5	28.7	31.3
Total employment growth to 2030 (thousand)[1]	0.8	2.6	n/a
Total percentage growth to 2030[1]	2.6%	9.1%	n/a
Oxford Economics	**2006**	**2012**	**2030**
Total employment (thousand)	34.6	31.8	33.5
Total employment growth to 2030 (thousand)[1]	-1.1	1.7	n/a
Total percentage growth to 2030[1]	-3.2%	5.3%	n/a
Cambridge Econometrics	**2006**	**2012**	**2030**
Total employment (thousand)	29.9	27.9	32.2
Total employment growth to 2030 (thousand) [1]	2.3	4.3	n/a
Total percentage growth to 2030[1]	7.7%	15.4%	n/a

Source: Experian, 2013, Oxford Economics 2013, Cambridge Econometrics 2013

[1] Note: Change from column year to 2030

[2] Note: 2012 is the baseline year for the demographic, household and housing need forecasts.

2.3.1.2 The forecasts for Malvern Hills vary, with Oxford Economics forecasting a fall in employment over the period from 2006 to 2030 and Experian and Cambridge Econometrics both forecasting an increase in employment. However, Oxford Economics, despite forecasting a decrease in employment, have the highest overall employment figure in 2030, with the fall being attributable to the high figure for employment in 2006, which is significantly greater than either the Experian or Cambridge Econometrics totals. All three forecasts project an increase in employment between 2012 and 2030 – ranging from 1,700 (Oxford) to 4,300 (Cambridge)

2.3.2 Worcester

2.3.2.1 The employment forecasts for Worcester for the period 2006 to 2030 are set out in Table 2.2.

Table 2.2: Overall forecasts for employment change for Worcester, 2006 to 2030

Experian	**2006**	**2012**	**2030**
Total employment (thousand)	57.5	58.6	62.1
Total employment growth to 2030 (thousand)[1]	4.6	3.5	n/a
Total percentage growth to 2030[1]	8.0%	6.0%	n/a
Oxford Economics	**2006**	**2012**	**2030**
Total employment (thousand)	56.5	57.2	62.1
Total employment growth to 2030 (thousand)[1]	5.6	4.9	n/a
Total percentage growth to 2030[1]	9.9%	8.6%	n/a
Cambridge Econometrics	**2006**	**2012**	**2030**
Total employment (thousand)	56.4	58.3	65.7
Total employment growth to 2030 (thousand)[1]	9.3	7.4	n/a
Total percentage growth to 2030[1]	16.5%	12.7%	n/a

Source: Experian, 2013, Oxford Economics 2013, Cambridge Econometrics 2013
[1] Note: Change from column year to 2030

2.3.2.2 Forecasts for Worcester again vary, with the 2006 to 2030 growth rate forecast by Cambridge Econometrics being more than double that produced by Experian and also significantly above the rate forecast by Oxford Economics. Experian and Oxford Economics have very similar employment forecasts for 2030.

2.3.3 Wychavon

2.3.3.1 Table 2.3 shows the employment forecasts for Wychavon for the period 2006 to 2030.

Table 2.3: Overall forecasts for employment change for Wychavon, 2006 to 2030			
Experian	**2006**	**2012**	**2030**
Total employment (thousand)	54.7	55.0	57.6
Total employment growth to 2030 (thousand)[1]	2.9	2.6	n/a
Total percentage growth to 2030[1]	5.3%	4.7%	n/a
Oxford Economics	**2006**	**2012**	**2030**
Total employment (thousand)	56.6	57.0	59.0
Total employment growth to 2030 (thousand)[1]	2.4	2.0	n/a
Total percentage growth to 2030[1]	4.2%	3.5%	n/a
Cambridge Econometrics	**2006**	**2012**	**2030**
Total employment (thousand)	52.8	54.1	57.3
Total employment growth to 2030 (thousand)[1]	4.5	3.2	n/a
Total percentage growth to 2030[1]	8.5%	5.9%	n/a

Source: Experian, 2013, Oxford Economics 2013, Cambridge Econometrics 2013
[1] Note: Change from column year to 2030

2.3.3.2 The forecasts for Wychavon also vary, with Cambridge Econometrics again having the highest growth rate between 2006 and 2030, but also the lowest 2006 baseline figure. Oxford Economics have the lowest growth rate but this is based on the highest baseline figure.

2.3.4 South Worcestershire Total

2.3.4.1 Table 2.4 shows the overall forecasts for employment change for South Worcestershire for the period from 2006 to 2030.

Table 2.4: Overall forecasts for employment change for South Worcestershire, 2006 to 2030			
Experian	**2006**	**2012**	**2030**
Total employment (thousand)	142.7	142.3	151.0
Total employment growth to 2030 (thousand)[1]	8.3	8.7	n/a
Total percentage growth to 2030[1]	5.8%	6.1%	n/a
Oxford Economics	**2006**	**2012**	**2030**
Total employment (thousand)	147.7	146.0	154.6
Total employment growth to 2030 (thousand)[1]	6.9	8.6	n/a
Total percentage growth to 2030[1]	4.7%	5.9%	n/a
Cambridge Econometrics	**2006**	**2012**	**2030**
Total employment (thousand)	139.1	140.3	155.2
Total employment growth to 2030 (thousand)[1]	16.1	14.9	n/a
Total percentage growth to 2030[1]	11.6%	10.6	n/a

Source: Experian, 2013, Oxford Economics 2013, Cambridge Econometrics 2013
[1] Note: Change from column year to 2030

2.3.4.2 The projections produced by Cambridge Econometrics show the highest employment increase, with employment increasing by nearly 12% between 2006 and 2030 and by nearly 10% between 2012 and 2030. Oxford Economics, with a growth rate of less than 5% between 2006 and 2030, have the lowest rate but broadly in line with the Experian forecasts.

2.3.4.3 Table 2.5 below provides summary details of the three forecasts, showing total employment and absolute and percentage change in employment from the column year to 2030.

Table 2.5: Summary of forecasts

Experian	**2006**	**2012**	**2030**
Total employment (thousand)			
Malvern Hills	30.5	28.7	31.3
Worcester	57.5	58.6	62.1
Wychavon	54.7	55.0	57.6
South Worcestershire	142.7	142.3	151.0
Total employment growth to 2030 (thousand) [1]			
Malvern Hills	0.8	2.6	n/a
Worcester	4.6	3.5	n/a
Wychavon	2.9	2.6	n/a
South Worcestershire	8.3	8.7	n/a
Total percentage growth to 2030[1]			
Malvern Hills	2.6%	9.1%	n/a
Worcester	8.0%	6.0%	n/a
Wychavon	5.3%	4.7%	n/a
South Worcestershire	5.8%	6.1%	n/a
Oxford Economics	**2006**	**2012**	**2030**
Total employment (thousand)			
Malvern Hills	34.6	31.8	33.5
Worcester	56.5	57.2	62.1
Wychavon	56.6	57.0	59.0
South Worcestershire	147.7	146.0	154.6
Total employment growth to 2030 (thousand) [1]			
Malvern Hills	-1.1	1.7	n/a
Worcester	5.6	4.9	n/a
Wychavon	2.4	2.0	n/a
South Worcestershire	6.9	8.6	n/a

Total percentage growth to 2030[1]			
Malvern Hills	-3.2%	5.3%	n/a
Worcester	9.9%	8.6%	n/a
Wychavon	4.2%	3.5%	n/a
South Worcestershire	4.7%	5.9%	n/a
Cambridge Econometrics	**2006**	**2012**	**2030**
Total employment (thousand)			
Malvern Hills	29.9	27.9	32.2
Worcester	56.4	58.3	65.7
Wychavon	52.8	54.1	57.3
South Worcestershire	139.1	140.3	155.2
Total employment growth to 2030 (thousand) [1]			
Malvern Hills	2.3	4.3	n/a
Worcester	9.3	7.4	n/a
Wychavon	4.5	3.2	n/a
South Worcestershire	16.1	14.9	n/a
Total percentage growth to 2030[1]			
Malvern Hills	7.7%	15.4%	n/a
Worcester	16.5%	12.7%	n/a
Wychavon	8.5%	5.9%	n/a
South Worcestershire	11.6%	10.6%	n/a

Source: Experian, 2013, Oxford Economics 2013, Cambridge Econometrics 2013
[1] Note: Change from column year to 2030

2.3.4.4 In relation to sectoral change there are some similarities and differences between the forecasts. All of the forecasts project a decline in manufacturing employment between 2006 and 2030, ranging from a decrease of 14% projected by Experian to a decrease of 25% projected by Oxford Economics. They also all project increases in accommodation & food services, information & communication, real estate activities, professional, scientific & technical activities, health and arts & entertainment. Furthermore, all forecasts project a decline in public sector employment.

2.3.4.5 In terms of differences, both Experian and Oxford Economics project a decline in agricultural employment, whereas Cambridge Econometrics project an increase[2]. Other sectors in which differences are evident include: finance and insurance; education; transport and storage; wholesale and retail; and construction.

2.3.4.6 Table 2.6 shows the sectoral changes in employment between 2006 and 2030 projected through the three forecasts. At a district level, there is also significant sectoral variation.

[2] Cambridge Econometrics project a growth in 790 jobs in agriculture in Worcester City between 2006 and 2030, which, given the nature of the district, would seem unlikely. Furthermore, between 2009 and 2010, it indicates that employment in the sector grew by 1,990, but then fell back.

Table 2.6: Sectoral forecasts (Employment) – South Worcestershire				
Experian	**2006**	**2030**	**Change**	**% change**
Agriculture, forestry and fishing	2.3	2.2	-0.1	-5%
Mining and quarrying	0.0	0.0	0.0	0%
Manufacturing	18.7	16.1	-2.6	-14%
Utilities	1.7	1.9	0.2	14%
Construction	9.0	8.2	-0.9	-10%
Wholesale and retail trade; repair of motor vehicles and motorcycles	24.7	24.1	-0.6	-2%
Transportation and storage	6.3	5.7	-0.7	-11%
Accommodation and food service activities	8.4	9.5	1.0	12%
Information and communication	3.8	5.0	1.2	31%
Financial and insurance activities	2.4	2.8	0.4	18%
Real estate activities	2.5	4.0	1.5	62%
Professional, scientific and technical activities	9.4	11.1	1.8	19%
Administrative and support service activities	9.5	12.2	2.7	29%
Public administration and defence; compulsory social security	7.5	3.9	-3.6	-48%
Education	12.0	12.0	0.1	1%
Human health and social work activities	15.6	21.8	6.2	40%
Arts, entertainment and recreation	4.2	4.9	0.7	18%
Other service activities	4.5	5.4	0.9	19%
Total	**142.7**	**150.8**	**8.3**	**6%**
Oxford Economics	**2006**	**2030**	**Change**	**% change**
Agriculture, forestry and fishing	4.2	3.0	-1.2	-28%
Mining and quarrying	0.1	0.0	0.0	0%
Manufacturing	20.6	15.5	-5.1	-25%
Utilities	2.5	1.7	-0.8	-31%
Construction	7.7	9.3	1.6	21%
Wholesale and retail trade; repair of motor vehicles and motorcycles	25.1	26.2	1.1	5%
Transportation and storage	5.6	6.7	1.1	20%
Accommodation and food service activities	8.9	9.5	0.6	6%
Information and communication	4.0	5.4	1.4	35%
Financial and insurance activities	2.8	2.3	-0.5	-18%
Real estate activities	2.8	5.0	2.2	79%
Professional, scientific and technical activities	10.0	11.7	1.7	18%
Administrative and support service activities	8.6	11.7	3.1	36%
Public administration and defence; compulsory social security	6.7	4.1	-2.6	-39%
Education	13.1	12.9	-0.2	-2%
Human health and social work activities	15.1	20.0	4.9	33%
Arts, entertainment and recreation	3.8	5.4	1.6	43%
Other service activities	6.3	4.1	-2.2	-35%

Total	**147.7**	**154.5**	**6.6**	**4%**
Cambridge Econometrics	**2006**	**2030**	**Change**	**% change**
Agriculture, forestry and fishing	1.5	2.6	1.1	74%
Mining and quarrying	0.1	0.1	0.0	-9%
Manufacturing	20.1	15.6	-4.5	-22%
Utilities	2.3	2.2	-0.1	-3%
Construction	6.9	8.7	1.8	26%
Wholesale and retail trade; repair of motor vehicles and motorcycles	23.8	23.1	-0.8	-3%
Transportation and storage	6.2	7.5	1.3	21%
Accommodation and food service activities	8.5	11.5	3.0	36%
Information and communication	3.6	5.0	1.4	38%
Financial and insurance activities	2.7	2.3	-0.4	-15%
Real estate activities	1.8	5.9	4.1	230%
Professional, scientific and technical activities	9.0	11.8	2.9	32%
Administrative and support service activities	8.5	12.1	3.6	42%
Public administration and defence; compulsory social security	7.4	4.2	-3.2	-43%
Education	13.1	10.0	-3.1	-24%
Human health and social work activities	15.3	23.3	8.0	53%
Arts, entertainment and recreation	4.2	4.9	0.7	18%
Other service activities	4.2	4.4	0.1	3%
Total	**139.1**	**155.2**	**16.0**	**11%**

Source: Experian, 2013, Oxford Economics 2013, Cambridge Econometrics 2013
Note: Total may not sum due to rounding

2.3.4.7 Cambridge Econometrics project a growth in 790 jobs in agriculture in Worcester City between 2006 and 2030, which, given the nature of the district, would seem unlikely. Furthermore, between 2009 and 2010, it indicates that employment in the sector grew by 1,990, but then fell back. However, the employment-led scenarios are driven by the job growth forecast between 2012 and 2030, not the historic data for 2006 to 2012. The Cambridge Econometrics forecast growth in agriculture is only 70 jobs between 2012 and 2030, so has only a minor impact on the robustness of the related scenario results.

2.3.4.8 Each of the national forecasts takes account of Government expenditure plans. However, the SWCs have noted that the projected scale of reduction in the public administration sector appears more limited than they would anticipate.

2.3.4.9 Comparisons have been made with previous employment forecasts used to inform the preparation of the SWDP - the Advantage West Midlands (AWM) public sector austerity forecasts of 2010 and the South Worcestershire Employment Land Review forecasts of 2008. Compared to the Advantage West Midlands (AWM) forecasts to 2020, all three forecasts have more positive projections. The AWM forecasts projected employment to decline in all three local authority areas, as shown in Table 2.7.

Table 2.7:Comparison with AWM public sector austerity forecast, 2010				
AWM public sector austerity forecast	**2006**	**2020**	**Change**	**% change**
Malvern Hills	32.0	30.2	-1.8	-5.6%
Worcester	55.0	54.6	-0.4	-0.7%
Wychavon	54.9	52.4	-2.5	-4.6%
South Worcestershire total	141.9	137.2	-4.7	-3.3%
Experian	**2006**	**2020**	**Change**	**% change**
Malvern Hills	30.5	30.3	-0.2	-0.7%
Worcester	57.5	60.9	3.4	5.9%
Wychavon	54.7	56.8	2.1	3.8%
South Worcestershire total	142.7	148	5.3	3.7%
Oxford Economics	**2006**	**2020**	**Change**	**% change**
Malvern Hills	34.6	32.4	-2.2	-6.4%
Worcester	56.5	60.9	4.4	7.8%
Wychavon	56.6	58.4	1.8	3.2%
South Worcestershire total	147.7	151.7	4	2.7%
Cambridge Econometrics	**2006**	**2020**	**Change**	**% change**
Malvern Hills	29.9	30.1	0.2	0.7%
Worcester	56.4	61.2	4.8	8.5%
Wychavon	52.8	55.6	2.8	5.3%
South Worcestershire total	139.1	146.9	7.8	5.6%

Source: Experian, 2013, Oxford Economics 2013, Cambridge Econometrics 2013, AWM

2.3.4.10 The Employment Land Review forecasts substantially greater jobs growth than the three recent forecasts over the period 2006 to 2026, as shown in Table 2.8.

Table 2.8:Comparison with Employment land Review forecasts, 2008				
Employment Land Review forecast	**2006**	**2026**	**Change**	**% change**
Malvern Hills	26.6	30.9	4.3	16.2%
Worcester	49	61.7	12.7	25.9%
Wychavon	45.7	54	8.3	18.2%
South Worcestershire total	121.3	146.6	25.3	20.9%
Experian	**2006**	**2026**	**Change**	**% change**
Malvern Hills	30.5	30.9	0.4	1.3%
Worcester	57.5	61.6	4.1	7.1%
Wychavon	54.7	57.2	2.5	4.6%
South Worcestershire total	142.7	149.7	7.0	4.9%
Oxford Economics	**2006**	**2026**	**Change**	**% change**
Malvern Hills	34.6	33.1	-1.5	-4.3%
Worcester	56.5	61.7	5.2	9.2%
Wychavon	56.6	58.9	2.3	4.1%
South Worcestershire total	147.7	153.7	6.0	4.1%

Cambridge Econometrics	2006	2026	Change	% change
Malvern Hills	29.9	31.3	1.4	4.7%
Worcester	56.4	63.8	7.4	13.1%
Wychavon	52.8	56.6	3.8	7.2%
South Worcestershire total	139.1	151.7	12.6	9.1%

Source: Experian, 2013, Oxford Economics 2013, Cambridge Econometrics 2013

2.4 Assessment of forecasts

2.4.1 Overview

2.4.1.1 The forecasts have been assessed using the following two criteria:

- are they up-to-date – based on the forecast publication date; and
- are they realistic and representative – based on consideration of whether: they are a product of an established and recognised forecasting model, comparison with other medium-term economic forecasts; baseline (2006 and 2011) employment data; total employment growth; rate of employment growth (compound annual growth rate); and sectoral variations.

2.4.1.2 Table 2.9 summarises the analysis of whether or not the forecasts are up-to-date. Each of the three forecasts is assessed as meeting this criterion.

Table 2.9: Up-to-date criteria

Criteria for assessment	Cambridge Econometrics	Experian	Oxford Economics
Forecast publication date	March 2013	December 2013	November 2013
Is this the most recent?	No – latest national forecasts are November 2013[3]	Yes	Yes
If not, why is it not used?	Local economic forecasts produced after the November national projections were not available in time for the study	n/a	n/a

2.4.1.3 A summary of the data used to assess the extent to which the forecasts are considered to be realistic and representative is set out in Table 2.10.

[3] The November 2013 Cambridge Econometric forecasts project stronger economic growth than those produced in March 2013.

Table 2.10: Realistic and representative			
	Cambridge Econometrics	**Experian**	**Oxford Economics**
Methodology	LEFM model	Experian forecasting model	LAD forecasting model
Comparison of national GDP forecast with other medium-term economic forecasts	Low end	Average	High end
South Worcestershire - Total			
Baseline employment (000s) 2006 2011	 139.1 133.9	 142.7 139.3	 147.7 141.3
Total employment growth (2006 to 2030)	16,100	8,300	6,900
Growth rate (2006 to 2030) – CAGR (%)	0.46	0.24	0.19
Sectoral variations – key sectors where forecasts vary	Health services Real estate	Transport and storage Education	Health services
Malvern Hills			
Baseline employment (000s) 2006 2011	 29.9 26.3	 30.5 28.4	 34.6 29.7
Total employment growth (2006 to 2030)	2,300	800	-1,100
Growth rate (2006 to 2030) – CAGR (%)	0.31	0.11	-0.13
Worcester			
Baseline employment (000s) 2006 2011	 56.4 55.7	 57.5 57.0	 56.5 55.7
Total employment growth (2006 to 2030)	9,300	4,600	5,600
Growth rate (2006 to 2030) – CAGR (%)	0.64	0.32	0.39
Wychavon			
Baseline employment (000s) 2006 2011	 52.8 51.9	 54.7 53.4	 56.6 55.9
Total employment growth (2006 to 2030)	4,500	2,900	2,400
Growth rate (2006 to 2030) – CAGR (%)	0.34	0.22	0.17

2.4.1.4 The compound annual growth rate (CAGR) figures for the period 2006 to 2030 are relatively low compared to historic growth figures. For example, in the Cambridge Econometrics' historic data, an analysis of the CAGR for every 24 year period from 1981 – 2005 to 2006 – 2030 has

been carried out and shows that only the 24 year period from 2003 to 2027 has a lower CAGR than the 2006 to 2030 period. In addition, the CAGR forecast for 2012 to 2030 by Cambridge Econometrics is below that achieved in over two-thirds of the 18 year forecast periods starting between 1981 and 2011 and is, therefore, the current forecasts are considered to be credible.

2.4.2 National forecasts

2.4.2.1 Each of the forecasts has been produced using an established forecasting model. At the national level, the HM Treasury comparison of independent forecasts' (November 2013) indicates that GDP is forecast to grow by 1.3% in 2013, rising to 2.2% in 2014 and 2.4% in 2015 and 2016, before a fall to 2.3% in 2017. The Experian national forecasts for 2016 and 2017 are the same as these independent forecast averages, with those for 2013 and 2014 being lower at 2.1% for each year. In comparison, the national Oxford Economics forecasts are higher than the average for four of the five years, at 1.4% in 2013, 2.5% in 2014, 2.4% in 2015, and 2.6% in 2016 and 2017. The Cambridge Econometric national GDP forecasts are lower than the independent averages. The national forecasts of all three forecasts are considered to be credible.

2.4.3 Local historic information

2.4.3.1 Somewhat surprisingly, the forecasts vary significantly in terms of the estimated actual employment levels in 2006 and 2011. Table 2.11 shows how the actual number of jobs as determined by the Annual Business Inquiry (ABI) for 2006 and the Business Register and Employment Survey (BRES) for 2011 compares with the baseline figures for those years provided in the three forecasts. It sets out the percentage difference between the forecasts and the published statistics and shows that each of the forecasts has higher baseline figures than the ABI and BRES figures.

Table 2.11: Number of jobs in each area

	2006				2011			
	ABI	**Exp**	**OE**	**CE**	**BRES**	**Exp**	**OE**	**CE**
Malvern Hills	27,970	+9.0%	+23.7%	+6.9%	24,902	+14.0%	+19.3%	+5.6%
Worcester	50,018	+14.0%	+13.0%	+12.8%	52,618	+8.3%	+5.9%	+5.9%
Wychavon	48,021	+13.9%	+17.9%	+10.0%	48,084	+11.1%	+16.3%	+7.9%
South Worcestershire	126,009	+13.2%	+17.2%	+10.4%	125,604	+10.5%	+12.5%	+6.6%

2.4.3.2 In terms of historic growth, all of the forecasts are similar in their 'estimates' of employment growth rates in South Worcestershire between 1997 and 2006, with figures ranging from 12% (Experian) to 14% (Oxford Economics). Both Oxford Economics and Cambridge Econometrics estimate that Malvern Hills had the highest rate of growth over the period. All three forecasts estimate that professional services grew significantly over the period. Public services, including health and education also grew strongly. Table 2.12 shows growth figures for the period 1997 to 2006.

Table 2.12: Historic jobs growth figures, 1997 to 2006				
Experian	**1997**	**2006**	**Change**	**% change**
Malvern Hills	26.6	30.5	3.9	15%
Worcester	49.2	57.5	8.3	17%
Wychavon	52.0	54.7	2.7	5%
South Worcestershire total	127.9	142.7	14.9	12%
Main growth sectors				
Professional and other private services	17.9	25.9	8.0	44%
Public services	29.3	35.1	5.8	20%
Accommodation, food services and recreation	9.4	12.6	3.2	34%
Oxford Economics	**1997**	**2006**	**Change**	**% change**
Malvern Hills	25.4	34.6	9.3	36%
Worcester	49.0	56.5	7.5	15%
Wychavon	55.7	56.6	1.0	2%
South Worcestershire total	130.1	147.8	17.7	14%
Main growth sectors				
Professional, scientific and technical	5.6	10.0	4.3	76%
Health and social work	10.9	15.1	4.2	39%
Administration and support services	4.9	8.6	3.7	77%
Education	9.7	13.1	3.4	35%
Cambridge Econometrics	**2006**	**2011**	**2012**	**2013**
Malvern Hills	24.1	29.9	5.8	24%
Worcester	48.9	56.4	7.5	15%
Wychavon	49.9	52.8	3.0	6%
South Worcestershire total	122.9	139.1	16.2	13%
Main growth sectors				
Education	9.7	13.1	3.4	35%
Business support services	4.6	8.5	3.9	85%
Other professional services	1.6	4.2	2.6	168%

2.4.4 Local forecasts 2012 - 2030

2.4.4.1 The change in the number of jobs forecast each year between 20112 and 2030 are used to drive the POPGROPU model to produce jobs-led scenarios and the related sensitivity Scenarios 2 and 3 produced by Edge.

2.4.4.2 As noted above, in terms of the 2006 to 2030 forecasts, the level and rate of employment change varies significantly, with Cambridge Econometrics forecasting much stronger employment growth than both Experian and Oxford Economics in South Worcestershire as a whole. In addition, there are sectoral variations in the forecasts. However, varying results are not unexpected given the different forecasting models and methodologies.

2..4.4.3 Table 2.13 summarises the forecast jobs for 2012 and 2030 by each forecaster by District and aggregated for South Worcestershire.

Table 2.13: Forecast jobs growth (000's)

Experian	**2012**	**2030**	**Change**	**% change**
Malvern Hills	28.7	31.3	2.6	9.1%
Worcester	58.6	62.1	3.5	6.0%
Wychavon	55.0	57.6	2.6	4.7%
South Worcestershire total	142.3	151.0	8.7	6.1%
Oxford Economics	**2012**	**2030**	**Change**	**% change**
Malvern Hills	31.8	33.5	1.7	5.3%
Worcester	57.2	62.1	4.9	8.6%
Wychavon	57.0	59.0	2.0	3.5%
South Worcestershire total	146.0	154.6	8.6	5.9%
Cambridge Econometrics	**2012**	**2030**	**2012**	**2013**
Malvern Hills	27.9	32.2	4.3	15.4%
Worcester	58.3	65.7	7.4	12.7%
Wychavon	54.1	57.3	3.2	5.9%
South Worcestershire total	140.3	155.2	14.9	10.6%

2.4.4.4 At a district level, Cambridge Econometrics again has the highest growth rate for all three local authority areas. Oxford Economics have the lowest rate of growth for both Malvern Hills (where they forecast employment to fall between 2006 and 2030) and Wychavon, whereas Experian have the smallest growth projection for Worcester.However the differential between the Cambridge forecast and the others is less than that for the 2006 – 2030 period.

2.4.5 Employment forecast conclusions

2.4.5.1 Each forecast is considered to be:

- up-to-date because they are the latest available at the local level; and
- realistic and representative because:
  - despite the variations between the three forecasts, each is based on an established and recognised economic forecasting model;
  - at the national level, all three forecasts are credible; and

- Cambridge Econometrics' forecast significantly greater employment growth than Experian and Oxford. However, the CAGR forecast for 2012 to 2030 by Cambridge Econometrics is below that achieved in over two-thirds of the 18 year forecast periods starting between 1981 and 2011 and is, therefore, considered to be credible.

2.4.4.6 **Consequently, at the South Worcestershire and district level, all three projections are considered to provide up-to-date, representative and realistic forecast scenarios for planning purposes.**

3 Demographic, household and housing need forecasts

3.1 Introduction

3.1.1 This section reports on the further demographic, household and housing analysis that has been undertaken to support the objective assessment of future housing need in the South Worcestershire area and its three component districts for the period to 2030. It is based on the work that has been undertaken by Edge in January 2014 in response to the observations of the Inspector at the SWDP examination. Their report, together with a separate sensitivity note, which contain a full description of the methodologies used and the underpinning assumptions, are attached as Appendix B. Appendix C sets out further detail and updates and follows the format of Chapter 6 of the February 2012 Strategic Housing Market Assessment (SHMA) Main Report that presented findings on the future housing market in Worcestershire.

3.2 The methodology

3.2.1 Housing requirements are intrinsically linked to the size and structure of the population. Projections of future population and households (as set out in the Edge report) were produced using four broad approaches, namely:

A. Use of the 2010-based official ONS projections to produce a SNPP-2010 core scenario. These are used primarily to serve as a benchmark for the other scenarios. Age-specific migration rates for internal and international migration are drawn from the ONS 2010-based assumptions.

B. A 'Natural Change' scenario in which no in- or out- migration to/from the area is assumed to occur from 2012

C. New trend-based demographic 'core' scenarios based on the latest evidence regarding existing population composition and preceding trends. Two 'migration-led' scenario alternatives have been developed, based upon the latest demographic evidence:

- Migration-led 5 year: Age-specific rates for internal and international migration assumptions for 2012 to 2030 are based on the last five years of historical evidence (2007/08 to 2011/12); and
- Migration-led 10 year: internal and international migration assumptions for 2012 to 2030 are based on the last 10 years of historical evidence (2002/03 to 2011/12).

D. Employment-led 'core' scenarios using the new economic forecasts for each district produced by Cambridge Econometrics, Oxford Economics and Experian. The demographic implications of each scenario have been examined. Prior to 2012 these scenarios are constrained to the level of population growth according to the ONS Mid-Year Population Estimates to 2012. From 2012 to 2030 they are constrained by the growth in employment forecast for the period by each of the three economic forecasts. Three key parameters

determine the balance of migration that is required to match the size of the labour force and the anticipated jobs growth[4]:

- economic activity rates;
- unemployment rate; and
- commuting ratio.

The 'core' scenarios produced by Edge have assumed that economic activity rates, unemployment rates and community ratio are constant over the forecasting period. In reality they will change and as a consequence so will the relationship between jobs growth and population growth (and therefore housing demand).

Accordingly, two further set of projections were produced using modified assumptions regarding activity and unemployment rates in order to provide more realistic forecasts. Detail on the modified assumptions is provided in Appendix C but in brief they comprise:

(i) variation of the unemployment rate post-recovery and of the economic activity rate in older people; and

(ii) variation in unemployment rates to reflect the economic forecasts, in economic activity rates in older people and in economic activity rates across age-bands to reflect tightening labour markets, based on labour market research.

The Experian and Oxford Economics projections produce very similar household projections for South Worcestershire as a whole, albeit with some variation between the component districts. The Cambridge Econometrics projections are higher and could be argued to be an outlier. However, since each local economic forecast is considered to be up-to-date and realistic and representative, two further calculations have been produced that are considered to provide a reasonable employment-led estimate range – a central case[5] and an average (the mean of the three forecasts).

3.2.2 The household and dwelling implications of each population forecast scenario have then been estimated through the application of a communal population adjustment (based on 2011 Census data), household headship rates and a dwelling vacancy rate.

3.2.3 Household headship rates were taken from the CLG 2008-based and 2011-based household projections. For the 'core' scenarios presented here, the CLG 2011-based headship rates were applied for the period to 2021, reverting to the 2008-based rate of change in headship rates thereafter. Additional sensitivity analysis was also conducted applying the original 2008-based and 2011-based headship rate assumptions over the full period.

3.2.4 The subsequent conversion of households to dwellings was based on a 'vacancy rate', taking account of both vacant properties and second homes, drawing on latest information from the 2011 Census.

4 Further details are set out in the Edge report at Appendix B.

5 This is defined as the mid-point between the Cambridge Econometrics and Oxford Economic forecasts. These were respectively the highest and lowest forecasts for South Worcestershire in 2030.

3.2.5 The Edge Analytics Ltd report and paper at Appendix B to this document presents further information on the methodology used.

3.3 The scenario forecasts and sensitivities

3.3.1 Core scenarios

3.3.1.1 The trend-based demographic scenarios suggest that the bulk of projected future additional housing demand in South Worcestershire as a whole will be driven by migration into the area. The historical period from which migration assumptions have been derived has virtually zero impact upon the forecasts of population growth – 11.1% under both the prior 5 year and 10 year trend scenarios. These 'migration-led' forecasts are also broadly comparable with the 'benchmark' SNPP 2010 forecast of 12.1%. The growth in number of households suggested by these trend scenarios is between 800 and 877 per year over the period 2006 to 2030.

3.3.1.2 By way of contrast, the 'Natural Change' scenario, where net migration is set to zero for each year of the forecast period, results in only 4.1% population growth, driven solely by the excess of births over deaths. The associated growth in number of households expected is 418 per year between 2012 and 2030. It should be emphasised that a 'Natural Change' scenario is not a realistic forecast of the future and is included only as a simple means to compare the impact of the migration associated with each of the other scenarios relative to a net nil migration position.

3.3.1.3 The three jobs-led forecasts result in much higher population growth (20.8% – 25.1%) with a correspondingly higher growth in number of households anticipated (1,234 – 1,424 households per year over the period 2006 to 2030). The population growth is driven by the higher net in-migration that would be required to sustain the labour force in line with the forecast growth in job numbers (assuming no adjustments in activity rates, unemployment and commuting patterns).

3.3.1.4 The headline results of the core analysis for each scenario are presented in Table 3.1.

Table 3.1: South Worcestershire Forecast Summary 2006-2030 (ranked in order of population change)

Core scenario	Change 2006 - 2030				Total (Average per year)	
	Population change	Population change %	Households change	Households change %	Net Migration	Households
Jobs-led Cambridge	71,252	25.1	34,168	28.5	62,115 (2,588)	34,168 (1,424)
Jobs-led Experian	59,980	21.1	29,862	24.9	51,979 (2,166)	29,862 (1,244)
Jobs-led Oxford	59,234	20.8	29,613	24.7	50,969 (2,124)	29,613 (1,234)
SNPP-2010	34,360	12.1	21,060	17.6	32,629 (1,360)	21,060 (877)
Migration-led 10 year	31,566	11.1	19,267	16.1	26,269 (1,0950	19,267 (803)

Migration-led 5 year	31,452	11.1	19,188	16.0	26,143 (1,089)	19,188 (800)
Natural Change	11,668	4.1	10,034	8.4	6,505 (271)[6]	10,034 (418)

Source: Edge Analytics 2013, Experian, 2013, Oxford Economics 2013, Cambridge Econometrics 2013

3.3.1.5 The overall household growth forecasts for South Worcestershire conceal variations in the three district areas under each scenario (see Table 3.2). These variations largely reflect differences in the principal drivers of future housing needs within the districts.

3.3.1.6 A significant proportion of the requirement for Worcester is accounted for by natural change (i.e. a surplus of births over deaths reflecting the relatively younger age structure of the area's population). Indeed without migration, Malvern Hills would experience a decline in households and Wychavon's needs to accommodate additional households would be minimal. Even under the migration-led trend analyses, Worcester accounts for about half the area's future household growth.

3.3.1.7 By way of contrast, however, the 'jobs-led' scenarios (with an additional annual need to accommodate some 400 to 600 additional households between 2012 and 2030 over the migration-led forecasts) result in a distribution of future household growth across the three districts that is much more proportionate to their current size – with Wychavon taking the largest share under each scenario.

Table 3.2: South Worcestershire districts - household growth

Scenario	Total (average annual) growth in household numbers 2006 - 2030			
	Malvern Hills	Worcester	Wychavon	Total
Jobs-led Cambridge	10,454 (436)	11,555 (481)	12,160 (507)	34,168 (1,424)
Jobs-led Experian	8,997 (375)	9,156 (382)	11,709 (488)	29,862 (1,244)
Jobs-led Oxford	8,189 (341)	10,171 (424)	11,252 (469)	29,613 (1,234)
SNPP-2010	5,528 (230)	7,866 (328)	7,665 (319)	21,060 (877)
Migration-led 10 year	3,823 (159)	9,699 (404)	5,746 (239)	19,267 (803)
Migration-led 5 year	3,773 (157)	10,249 (427)	5,166 (215)	19,188 (800)
Natural Change	-421 (-18)	8,477 (353)	1,978 (82)	10,034 (418)

Source: Edge Analytics 2013, Experian, 2013, Oxford Economics 2013, Cambridge Econometrics 2013

3.3.2 Sensitivity scenarios

3.3.2.1 Table 3.3 summarises the sensitivity of the above results for future household growth to the assumptions made concerning future headship rates (Sensitivity Scenarios 1). Option A is based on CLG 2011 headship rates and Option B on 2008 rates. Option B results in higher household growth than under Option A. As can be seen the results for the core analysis (Option C, which is in line with the approach proposed by the Inspector) sit closer to the bottom end of this resultant range.

[6] Covers period up to July 2012. Migration assumed to be zero thereafter under this Scenario.

Table 3.3: South Worcestershire - household growth (ranked by preferred 'Option C')			
Scenario	**Average annual growth in household numbers 2006 - 2030**		
	Option A	**Option B**	**Core (Option C)**
Jobs-led Cambridge	1,413	1,582	1,424
Jobs-led Experian	1,234	1,391	1,244
Jobs-led Oxford	1,222	1,383	1,234
SNPP-2010	870	1,005	877
Migration-led 10 year	790	929	803
Migration-led 5 year	786	926	800
Natural Change	403	536	418

Source: Edge Analytics 2013, Experian, 2013, Oxford Economics 2013, Cambridge Econometrics 2013

3.3.2.2 With regard specifically to the 'jobs-led' scenarios, the results are also sensitive to a number of other assumptions used to translate jobs growth into population and household growth. The Edge report provides an initial assessment (Sensitivity Scenario 2) of the 'sensitivity' of the jobs-led 'core' scenario results to changes in the assumptions underpinning two key parameters - economic activity rates (which have been modified to take account of planned changes to State Pension Age) and unemployment rates (modified to account for a period of recovery post-2013 based on previous rates).

3.3.2.3 In addition further detailed research and analysis have been undertaken into how the above labour market variables adjust to economic conditions and, in particular, to increasing (and decreasing) supply of jobs. On the basis of this, a further Sensitivity Scenario (3) has been produced which makes three modifications: economic activity rates are adjusted to reflect planned changes to State Pension Age; unemployment is adjusted in line with the Experian Economic forecast; and activity rates by age cohort are increased in response to the tightening labour market, based on econometric analysis of Annual Population Survey data. This latter scenario is considered to provide the most reasonable and robust set of jobs-led forecasts.

3.3.2.4 As each local economic forecast is considered to be up-to-date and realistic and representative, two further calculations have been made that are considered to provide a reasonable employment-led estimate range – a central case[7] and an average (the mean of the three forecasts).

3.3.2.5 The results are summarised in Table 3.4. They show a reduction in the dwelling requirement of some 9% -10% under Sensitivity Scenario 2 and 19% - 21% under Sensitivity Scenario 3.

Table 3.4: South Worcestershire - household growth sensitivity (Scenarios 2 and 3)			
Scenario	**Total (average annual) growth in household numbers requirement 2006 - 2030**		
	Core scenarios	**Sensitivity 2 scenario**	**Sensitivity 3 scenario**
Jobs-led Cambridge	34,168 (1,424)	31,070 (1,295)	27,670 (1,153)

[7] This is defined as the mid-point between the Cambridge Econometrics and Oxford Economic forecasts. These were respectively the highest and lowest forecasts for South Worcestershire in 2030.

Jobs-led Experian	29,862 (1,244)	26,802 (1,117)	23,673 (987)
Jobs-led Oxford	29,613 (1,234)	26,557 (1,107)	23,389 (975)
Jobs-led Central	31,891 (1,329)	28,814 (1,201)	25,530 (1,064)
Jobs-led Average	31,214 (1,301)	28,143 (1,173)	24,911 (1,038)

Source: Edge Analytics 2013, Experian, 2013, Oxford Economics 2013, Cambridge Econometrics 2013

3.3.2.6 The household forecasts derived from the Sensitivity Scenario 3 for both the 'central' and 'average' case scenarios have been translated into draft hypothetical net dwelling requirement figures. Uplifts have been applied to allow for 'churn' based on vacant dwelling and second homes rate. The results of this analysis are set out in Table 3.5. The overall forecast dwelling requirement for South Worcestershire is between 26,700 and 27,300 over the period 2006 – 2030. After allowing for the net housing delivered between 2006 and 2012, the net dwelling requirement for South Worcestershire 2012 – 2030 is forecast to be between 21,800 and 22,400 equivalent to 1,210 to 1,250 per annum.

Table 3.5: Net Dwelling Requirements – 2006 – 2030: Sensitivity Scenarios 3

Scenario	Forecast Household-Change (2006-2030) (a)	Forecast Dwelling Requirement – factoring in vacancy and second home rates (2006-2030) (b)	Housing Delivered Net 2006 – 2012 (6 years)[1] (C)	Dwelling requirements 2012 - 2030 (18 years)	
				Net Dwelling requirement (Rounded) (d) = (b) – (c)	Net Annual Average Dwelling Requirement (Rounded) (d) / 18
Malvern Hills					
Sensitivity Scenario 3 Central case	8,120	8,537	1,326	7,211	401
Sensitivity Scenario 3 Average case	8,018	8,430	1,326	7,104	395
Worcester City					
Sensitivity Scenario 3 Central case	9,029	9,918	2,184	7,734	430
Sensitivity Scenario 3 Average case	8,508	9,378	2,184	7,194	400
Wychavon					
Sensitivity Scenario 3 Central case	8,381	8,888	1,399	7,489	416
Sensitivity Scenario 3 Average case	8,385	8,891	1,399	7,492	416
Total South Worcestershire					
Sensitivity Scenario 3 Central case	25,530	27,343	4,909	22,434	1,246
Sensitivity Scenario 3 Average case	24,912	26,700	4,909	21,791	1,211

Source: Experian, 2013, Oxford Economics 2013, Cambridge Econometrics 2013, SWC 2012.
[1] South Worcestershire Development Plan, Housing Background Paper (Provision and Supply) – Appendix 9, 30th November 2012
Note: the calculation the net requirement is made with respect to the total dwelling requirement in column (b). It is not a 'policy—on' spatial approach.

4 Conclusions

4.1 In response to the requirements of the Inspector an up-to-date, objective assessment of housing need has been undertaken for the South Worcestershire area and its component local authorities.

4.2 The assessment, based on forecasts prepared by Edge Analytics Ltd, has used the latest official population estimates and three new employment forecasts. It has comprised:

- The preparation of **population** forecasts for the period up to 2030.
- Translation of these forecasts, taking into account headship rates, into forecasts of the numbers of **households.**
- Interpretation of the household forecasts into projections for future **dwelling requirements** – taking into account vacancies, second homes and developments already undertaken during the forecasting period.

4.3 A number of scenarios have been explored including:

- Scenario 1 - an ONS Sub-National forecast 'benchmark'.
- Scenario 2 - a 'Natural Change' scenario – with zero migration.
- Scenario 3 - trend-based migration-led scenarios – assuming a continuation of recent migration patterns.
- Scenario 4 – 'employment-constrained' scenarios based on projections of the levels of population (and therefore migration if these projections exceed forecast natural change) that will be required to sustain forecast jobs in the area.

4.4 Scenario 4 incorporates both demographic and economic factors and begins to respond to the Inspector's request for forecasts that take account of anticipated employment growth. Three new employment forecasts were commissioned. While the results of these vary, each is considered to be up to date, realistic and representative. A 'central' case and an 'average' case scenario have been presented, which are considered to provide a range that encompasses the most likely number of future jobs.

4.5 The extent to which future jobs growth will require population growth will be influenced by future economic activity, unemployment rates and commuting rates. The 'core' Scenario 4 assumes that all of these factors will be constant over the forecasting period. In reality they will change and as a consequence so will the relationship between jobs growth and population growth (and therefore housing demand).

4.6 Accordingly, two further sets of 'Sensitivity Scenario' projections were produced using modified assumptions regarding economic activity and unemployment rates in order to provide more realistic forecasts. The second of these projections (Sensitivity Scenario 3) is considered to be the most realistic as it uses new labour market research to derive assumptions about the degree to which overall labour market conditions (i.e. tightening or

loosening) will impact upon future activity and employment rates and, therefore, the supply of local labour.

4.7 It is considered therefore that Sensitivity Scenario 3 incorporates the most realistic assumptions currently available and, using the 'central case' and 'average case' jobs estimates, provides the most robust basis for future population and household numbers. Consequently, it is recommended that this should be considered to be the best estimate of housing need for the South Worcestershire Local Authorities to consider when setting their housing targets.

4.8 On this basis, the overall forecast dwelling requirement for South Worcestershire is between 26,700 and 27,300 over the period 2006 – 2030 can be compared with the 23,200 dwellings requirement previously proposed by the SWCs (see Table 4.1).

Table 4.1: Net Dwelling Requirements – 2006 – 2030: Sensitivity Scenarios 3

Scenario	Forecast Dwelling Requirement – factoring in vacancy and second home rates 2006-2030
Malvern Hills	
Sensitivity Scenario 3 Central case	8,537
Sensitivity Scenario 3 Average case	8,430
Worcester City	
Sensitivity Scenario 3 Central case	9,918
Sensitivity Scenario 3 Average case	9,378
Wychavon	
Sensitivity Scenario 3 Central case	8,888
Sensitivity Scenario 3 Average case	8,891
Total South Worcestershire	
Sensitivity Scenario 3 Central case	27,343
Sensitivity Scenario 3 Average case	26,700

Source: Experian, 2013, Oxford Economics 2013, Cambridge Econometrics 2013.

Appendix A – Economic forecasts

SWDP: COMPARISON OF EMPLOYMENT FORECASTS - ordered by scale of increase in employment 2006 to 2030

Oxford Economics Baseline Projection November 2013	2006	2010	2011	2020	2026	2030		2006 to 2020	2006 to 2026		2006 to 2011	2011 to 2030	2006 to 2030
Malvern Hills	34,600	31,700	29,700	32,400	33,100	33,500		-2,200	-1,500		-4,900	3,800	-1,100
Worcester City	56,500	56,200	55,700	60,900	61,700	61,700		4,400	5,200		-800	6,000	5,200
Wychavon	56,600	56,100	55,900	58,400	58,900	58,900		1,800	2,300		-700	3,000	2,300
South Worcestershire	**147,700**	**144,000**	**141,300**	**151,700**	**153,700**	**154,100**		**4,000**	**6,000**		**-6,400**	**12,800**	**6,400**

Experian Baseline Projection September 2013	2006	2010	2011	2020	2026	2030		2006 to 2020	2006 to 2026		2006 to 2011	2011 to 2030	2006 to 2030
Malvern Hills	30,630	28,570	28,470	30,260	30,890	31,300		-370	260		-2,160	2,830	670
Worcester City	57,860	56,470	57,200	61,150	61,790	62,340		3,290	3,930		-660	5,140	4,480
Wychavon	55,010	53,490	53,640	57,000	57,430	57,740		1,990	2,420		-1,370	4,100	2,730
South Worcestershire	**143,500**	**138,530**	**139,310**	**148,410**	**150,110**	**151,380**		**4,910**	**6,610**		**-4,190**	**12,070**	**7,880**

Cambridge Econometrics Baseline Projection March 2013	2006	2010	2011	2020	2026	2030		2006 to 2020	2006 to 2026		2006 to 2011	2011 to 2030	2006 to 2030
Malvern Hills	29,870	29,110	26,290	30,090	31,340	32,200		220	1,470		-3,580	5,910	2,330
Worcester City	56,420	58,250	55,700	61,180	63,780	65,670		4,760	7,360		-720	9,970	9,250
Wychavon	52,840	52,050	51,880	55,640	56,590	57,300		2,800	3,750		-960	5,420	4,460
South Worcestershire	**139,130**	**139,410**	**133,870**	**146,910**	**151,710**	**155,170**		**7,780**	**12,580**		**-5,260**	**21,300**	**16,040**

Appendix B – Edge Analytics Limited's report

South Worcestershire

Demographic Forecasts

January 2014

edge analytics

www.edgeanalytics.co.uk

Contact Details

Edge Analytics Ltd.
Leeds Innovation Centre
103 Clarendon Road
Leeds
LS2 9DF
0113 384 6087
www.edgeanalytics.co.uk

Acknowledgements

Demographic statistics used in this report have been derived from data from the Office for National Statistics licensed under the Open Government Licence v.1.0.

Table of Contents

1. Introduction

Context

1.1 In 2013, the South Worcestershire Councils (Malvern Hills District Council, Worcester City Council and Wychavon District Council) published their draft South Worcestershire Development Plan (SWDP). The overall housing provision requirement target set out in Policy SWDP 3 reflected the recommendation set out in the evidence in the Worcestershire Strategic Housing Market Assessment (SHMA) February 2012, based on Sensitivity Scenario 2.

1.2 Following the submission and Stage 1 hearings of the SWDP examination, the Inspector concluded in his Interim Conclusions (28 October 2013) that the February 2012 SHMA did not provide "a sound basis for the planning of housing provision in the Plan area". The Inspector requested that further analysis was undertaken to support the derivation of an objective assessment of the housing need.

1.3 In direct response to the Inspector's comments and request for further analysis, the South Worcestershire Councils commissioned additional work to support the derivation of an objective assessment of the housing need. Edge Analytics was commissioned to produce new demographics-led and jobs-led scenarios, including sensitivity scenarios. The forecasting analysis presented in this report constitutes part of the additional work requested.

Requirements

1.4 The Inspector requested that a new trend-based demographic scenario should be developed for each of the three districts and aggregated for South Worcestershire. It was specified that this new scenario should be based on the latest demographic evidence to provide a reliable, up-to-date basis for identifying housing requirements in South Worcestershire.

1.5 The Inspector also directed the South Worcestershire Councils to obtain up-to-date, realistic and representative employment forecasts for each district and to examine the demographic implications of these. He further requested that the Councils provide more than one employment-based (i.e. jobs-led) scenario to illustrate the implications of different levels of employment growth, provided that each scenario was based on up to date and representative forecasts. The Inspector indicated that it would be helpful for sensitivity tests to be carried out on any significant assumptions made in this stage of the analysis. Forecasts of employment (workplace based jobs) together with supporting information and explanation have been provided by three organisations: Cambridge Econometrics, Oxford Economics and Experian, which the South Worcestershire Councils made available to Edge

Analytics Ltd for use in preparing the new employment-led scenarios.

Approach & Methodology

1.6 Housing requirements are intrinsically linked to the size and structure of the population and, in turn, population growth can be constrained by housing availability. Any consideration of future housing development requires robust demographic information and analysis of the possible impact of demographic change on the demand and supply of housing, jobs, services, infrastructure and facilities.

1.7 The National Planning Policy Framework (NPPF) and the emerging National Planning Practice Guidance (NPPG) provide guidance on the development of a robust evidence base to support the objective assessment of housing need. The guidance makes it clear that data inputs, assumptions and methodology should be robust and should consider future growth potential from a number of perspectives.

1.8 A suite of demographic forecasts has been developed for the South Worcestershire districts. Trend-based forecasts have been developed using the latest demographic evidence and are benchmarked against the most recent official population projections from the Office for National Statistics (ONS).

1.9 Using economic forecasts from Cambridge Econometrics, Oxford Economics and Experian, employment-led scenarios have also been developed to test the demographic implications of jobs-growth trajectories.

1.10 Additional analysis has also been conducted to evaluate the sensitivity of the forecasts to (1) household headship rate variations; and (2) economic activity rate and unemployment variations.

1.11 To ensure transparency of the analysis presented here, all data inputs and assumptions are detailed in the Appendix and the output presented in a consistent format that allows comparison between scenarios.

Forecasting Methodology

1.12 Evidence is often challenged on the basis of the 'appropriateness' of the methodology that has been employed to develop growth forecasts. The use of a recognised forecasting product which incorporates an industry-standard methodology (a cohort component model) removes this obstacle and enables a focus on assumptions and output, rather than methods.

1.13 Demographic forecasts have been developed for the South Worcestershire districts using the

POPGROUP suite of products. POPGROUP is a family of demographic models that enables forecasts to be derived for population, households and the labour force, for areas and social groups. The main POPGROUP model (Figure 1) is a cohort component model, which enables the development of population forecasts based on births, deaths and migration inputs and assumptions.

1.14 The Derived Forecast (DF) model (Figure 2) sits alongside the population model, providing a headship rate model for household projections and an economic activity rate model for labour-force projections.

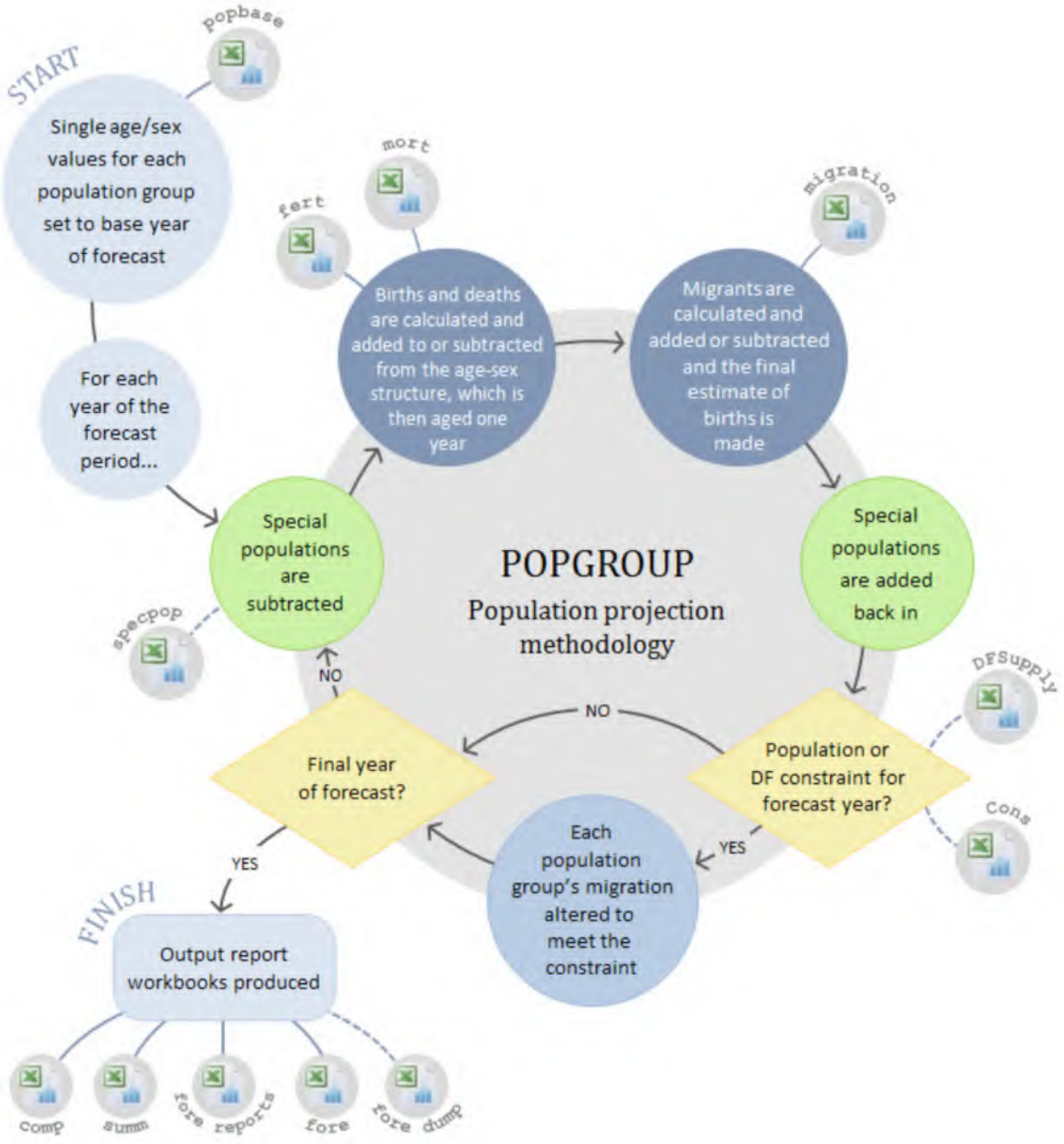
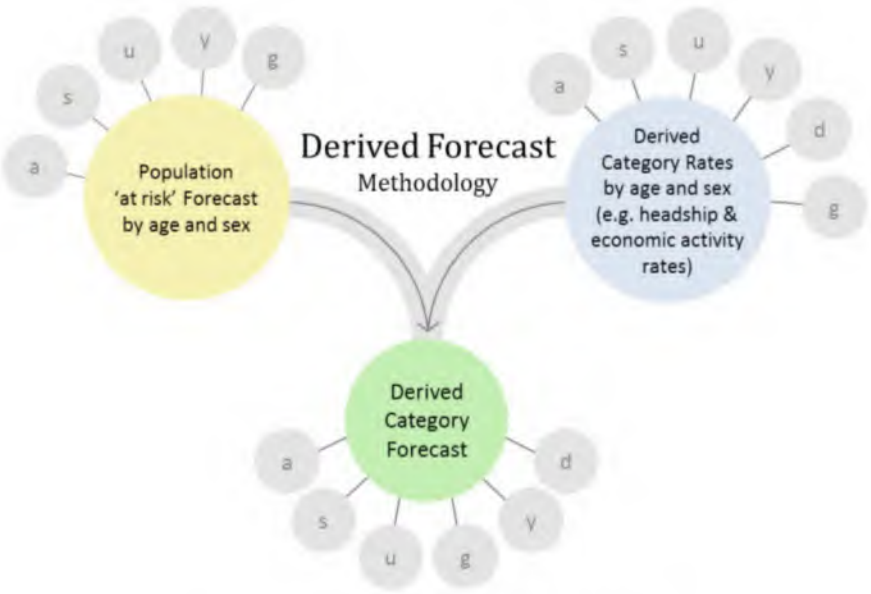


Figure 1: POPGROUP population projection methodology



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

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

Figure 2: Derived Forecast (DF) methodology

Report Structure

1.15 Section 2 provides a short commentary on demographic change in South Worcestershire since 2001 and presents new demographic evidence available from the Office for National Statistics (ONS) and the Department for Communities and Local Government (CLG).

1.16 Section 3 describes the suite of scenario alternatives, developed to evaluate trend and employment growth trajectories.

1.17 Section 4 summarises the outcomes of each of these scenarios, presenting growth in terms of population, households, dwellings, labour force and jobs impacts. In Section 5, the results of the sensitivity analysis are presented.

1.18 The Appendix (Section 6) to this document contains guidance on the data inputs and assumptions used in the development of the scenarios.

2. The Latest Demographic Evidence

2.1 The development of Local Plans is made considerably more challenging by the dynamic nature of key data inputs. Economic and demographic factors, coupled with the continuous release of new statistics, often undermine the robustness of underpinning evidence. This has been a particular issue during 2013, with the release of 2011 Census statistics, revisions to historical population estimates and updated household projections.

2.2 In his letter of 31 October 2013 to the South Worcestershire Councils, the Inspector for the SWDP Examination wrote:

> "You are seeking clarification on the most appropriate source for deriving growth trends to be used in the further demographic modelling work. Paragraph 7.7 of Edge Analytics' South Worcestershire Demographic Trends paper (CD.220) recommends that consideration be given to using the ONS 2012 mid-year population estimates (MYE) and revised MYE for 2002-2010 to update the SHMA's demographic growth trajectories. I understand that a similar procedure was followed by NLP in producing Scenario 5 in their Updated Assessment of Housing Requirements to Inform Examination Matter 1 (M1/27b). This method would seem likely to generate the most up-to-date and robust projections of future demographic change, given that the 2012 MYE now provide consistency in the components of change between the Census points in 2001 and 2011."

2.3 The ONS 2011 and 2012 mid-year population estimates, and the revised MYE 2002–2010 (reflecting the results of the 2011 Census) have therefore been used to prepare the new demographic-led and jobs-led scenarios presented in this report, including the sensitivity scenarios. This data about the historic period provides the principal demographic driver used in the POPGROUP model for the period 2006 to 2012.

Headlines 2001–2011

2.4 The 2011 Census recorded a resident population of 290,343 within South Worcestershire, a 4.3% increase over the 2001–2011 decade (Table 1).

Table 1: South Worcestershire, population change 2001–2011. Source: ONS

District	2001 Pop	2011 Pop	Change	%
Malvern Hills	72,155	74,631	2,476	3.4%
Worcester	93,300	98,768	5,468	5.9%
Wychavon	112,961	116,944	3,983	3.5%
South Worcestershire	278,416	290,343	11,927	4.3%

2.5 Population growth has been most substantial in Worcester, with a 5.9% increase since 2011. This has been balanced with smaller percentage increases of 3.4% and 3.5% in Malvern Hills and Wychavon respectively.

2.6 Within each South Worcestershire district, population change has been driven by a mixture of natural change (the difference between births and deaths) and net migration (the overall balance of growth resulting from in-migration, out-migration, immigration and emigration). The balance differs substantially between districts (Figure 3).

2.7 With an excess of deaths over births, natural change has had a negative impact upon growth in Malvern Hills since 2001. This has been counter-balanced by a substantial, larger net in-migration component, resulting in population growth.

2.8 In contrast, Worcester's growth has been dominated by positive natural change with a relatively small net in-migration component.

2.9 Wychavon's population change has been almost exclusively due to net in-migration but with a small, positive natural change impact.

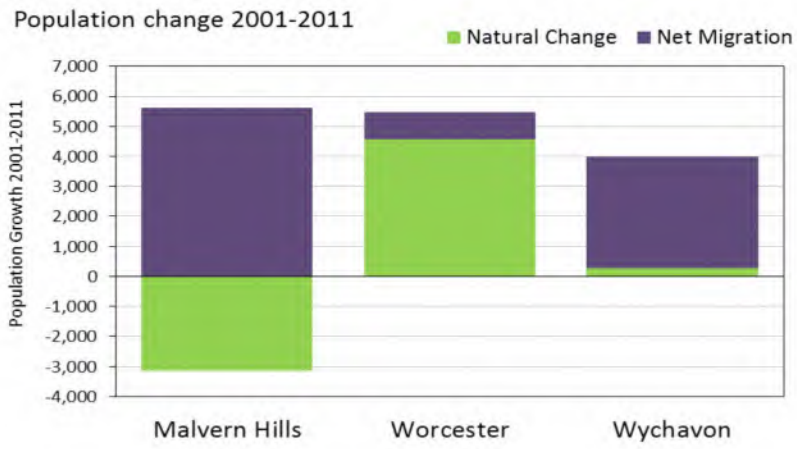


Figure 3: South Worcestershire, components of population change 2001–2011. Source: ONS

Population Estimates

2.10 The 2011 Census has provided a timely and definitive update on local population statistics. However, it has also resulted in the 'recalibration' of previous mid-year population estimates. This has important implications for both the interpretation of historical evidence on demographic change in local authority areas and on the derivation of projections of future growth based upon this evidence[8].

2.11 For the South Worcestershire districts, the 2011 Census has suggested that previous mid-year populations under-estimated the scale of growth in Worcester but over-estimated growth in both Malvern Hills and Wychavon (Figure 4).

2.12 Given that births and deaths are robustly recorded through vital statistics registers, the 'error' in the mid-year population totals is due to the difficulty associated with the estimation of migration. Internal migration is adequately measured through the process of GP registration although data robustness may be lower where there is non-registration or delay in registering. It is most likely that the 'error' in the mid-year population totals is due to the difficulty associated with the estimation of international migration impacts (i.e. immigration and emigration) at a local level.

[8] All the scenarios presented in this report include the ONS revised population mid-year estimates for 2002 to 2010.

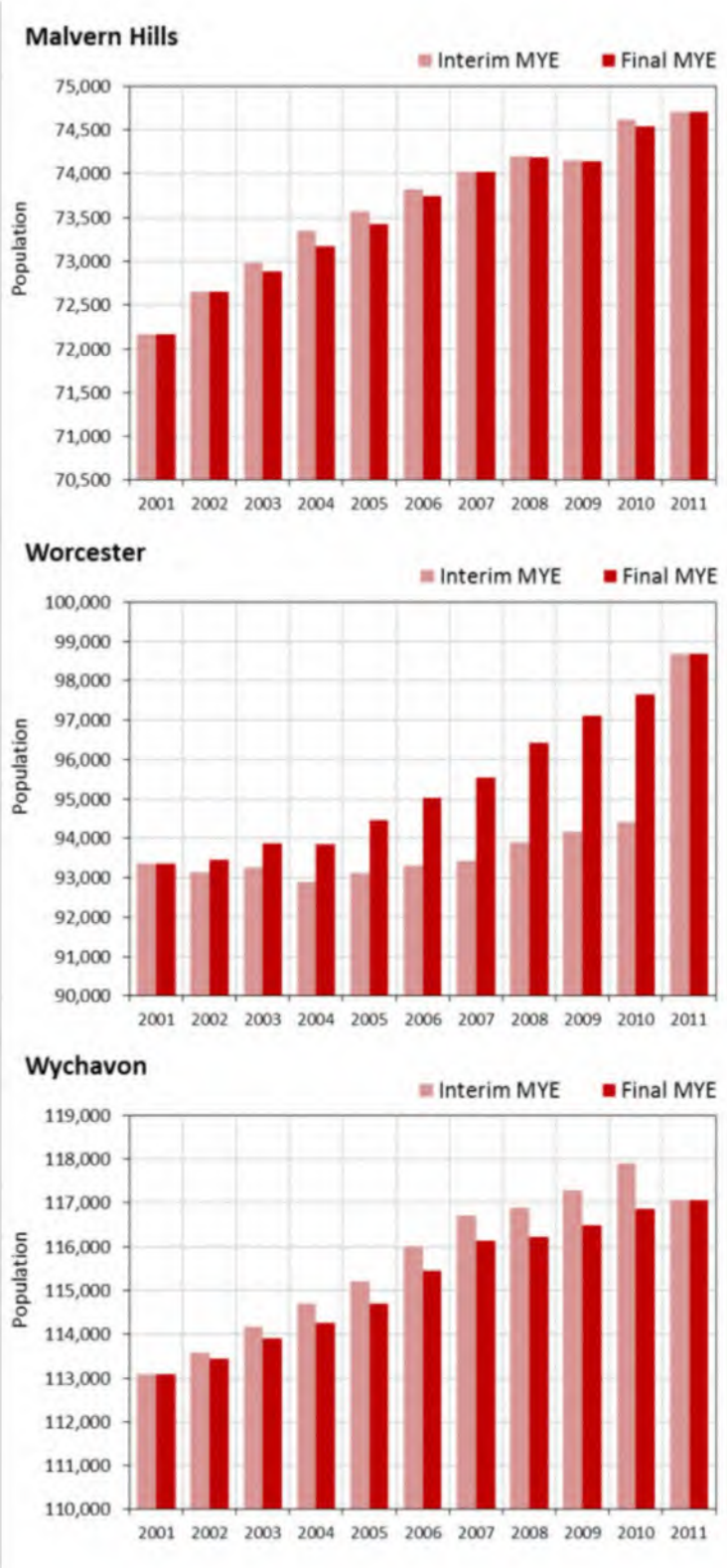


Figure 4: South Worcestershire, population counts 2001–2011. Source: ONS

Components of Change

2.13 On the assumption that births, deaths and internal migration have been robustly measured (and that the 2001 Census provided a robust population count for South Worcestershire districts), the 'adjustment' that resulted from the mid-year population estimate revisions is predominantly associated with the mis-estimation of international migration; the balance between immigration and emigration flows to and from South Worcestershire.

2.14 The result of the mid-year population estimate recalibration for South Worcestershire districts is that birth and death totals (and therefore natural change) remain largely unchanged. Small changes to internal migration may be evident but not substantial. With regard to international migration, ONS has not explicitly assigned the mid-year estimate adjustment to international migration. Instead it has identified an additional 'other unattributable' component, suggesting it has not been able to accurately identify the source of the 2001–2011 over-count (Figure 5).

2.15 For demographic analysis, the classification of this 'other unattributable' is unhelpful, but given the robustness of births, deaths and internal migration statistics compared to international migration estimates, it is assumed that it is most likely to be associated with the latter.

2.16 For the individual districts of South Worcestershire, the effect of the 'other unattributable' adjustment has varied depending upon the scale of population 'recalibration' that has been required following the 2011 Census results (Figure 5). No change has been made to the 2011/12 statistics as these relate to the 2012 mid-year estimate which followed the 2011 Census results.

2.17 In Malvern Hills, a small downward adjustment is evident in each year of the 2001/02–2011/12 decade. A similar downward adjustment is associated with the Wychavon mid-year population estimates. In contrast, the population estimates for Worcester have been subject to a consistent annual uplift due to the undercount experienced over the 2001-2011 decade.

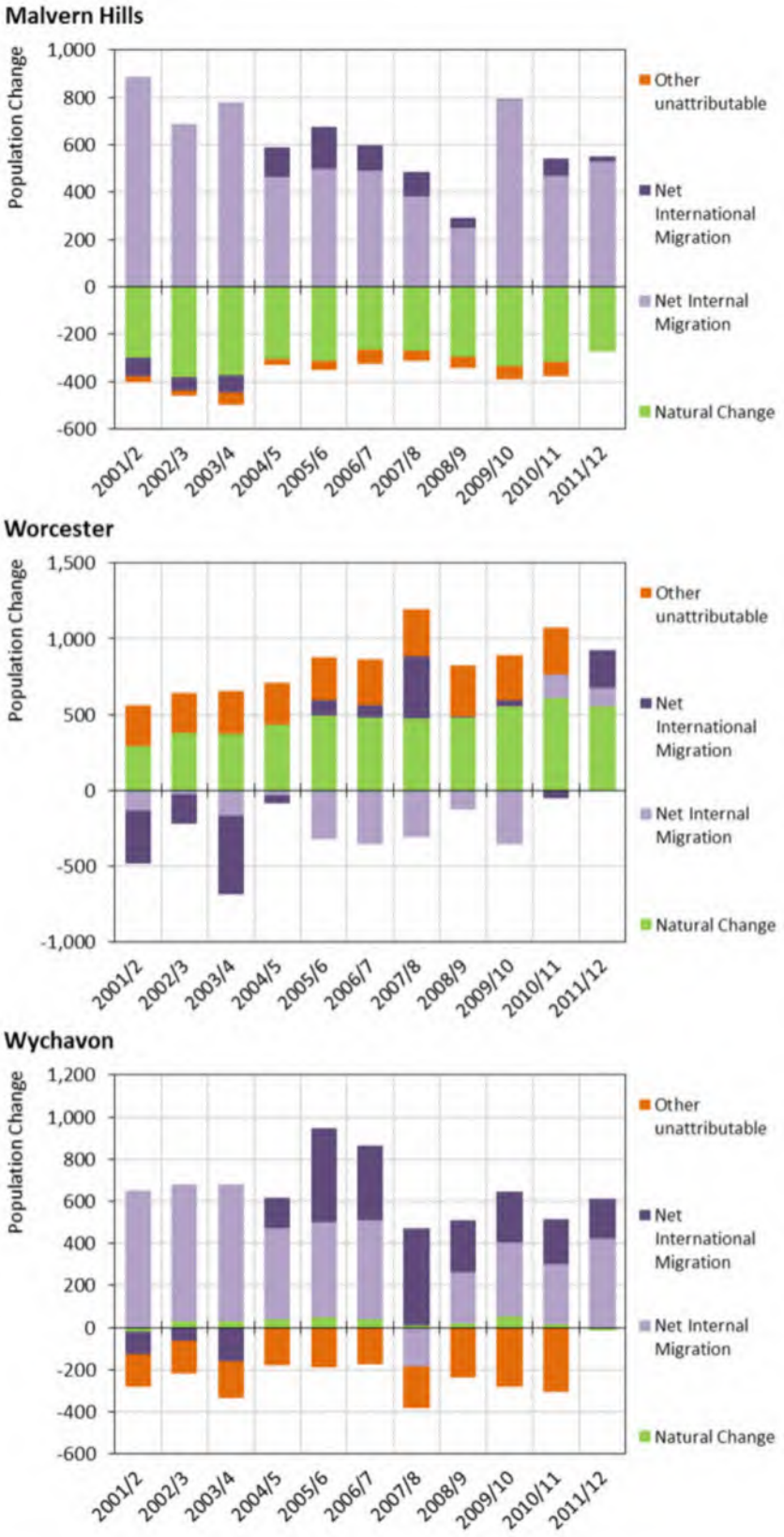


Figure 5: South Worcestershire, components of population change 2001/02–2011/12. Source: ONS

2.18 With an assumption that the 'other unattributable' element is assigned to international migration (for estimates to 2011) and with the inclusion of statistics from the 2012 mid-year estimate from ONS, an eleven-year profile of the 'components of change' for South Worcestershire districts is presented (Figure 6).

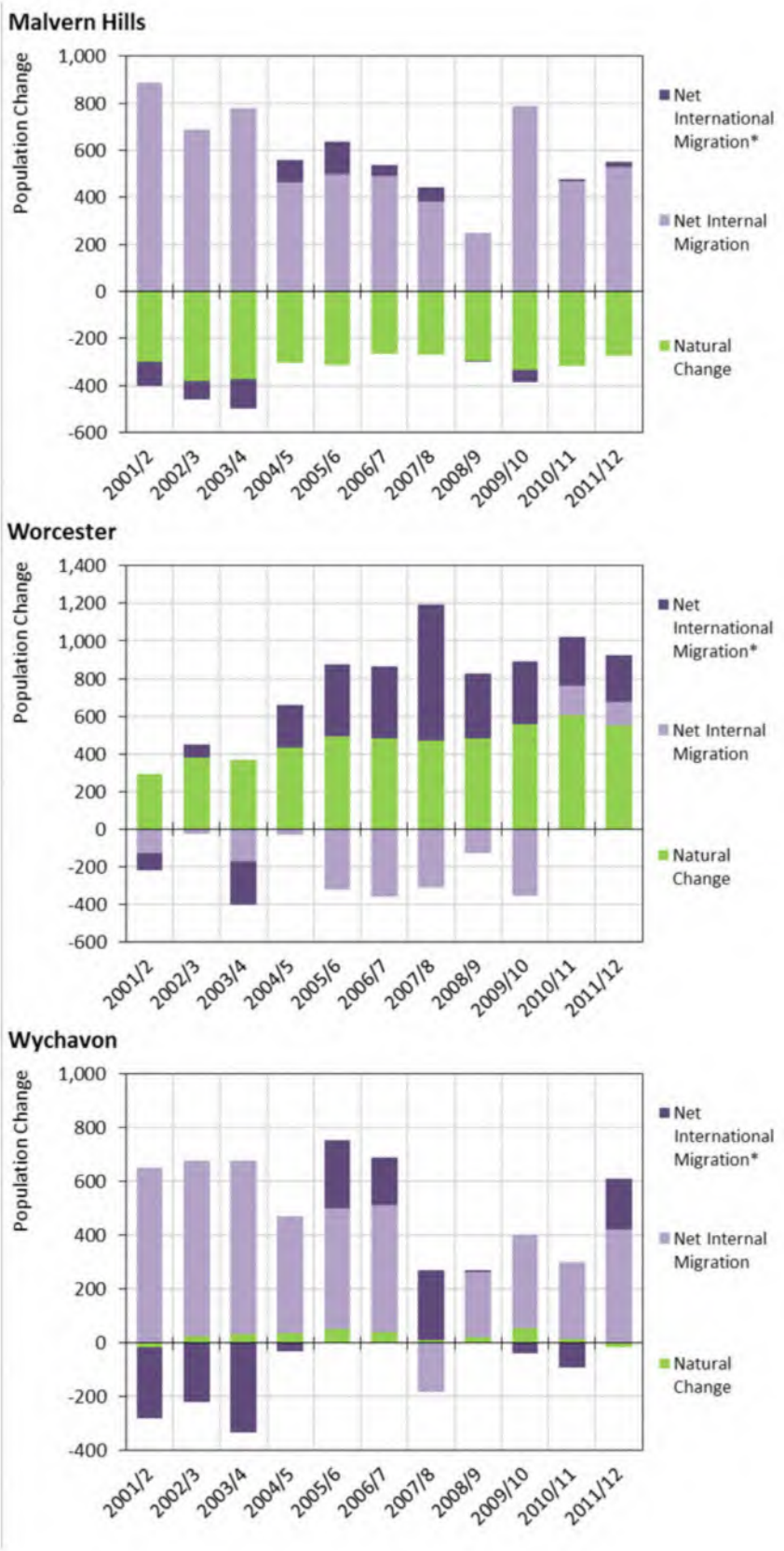
2.19 These components of change illustrations provide an annualised perspective on the profiles presented in Figure 3, with the additional disaggregation of migration into 'net internal' and 'net international' migration components.

2.20 Malvern Hills has experienced a consistent population decline due to natural change, balanced by a relatively high level of net internal migration (which was generally higher in the first half of the decade) and a very small impact due to international migration.

2.21 Worcester has experienced an increasingly positive contribution from natural change and a generally positive contribution from net international migration. The impact of net internal migration has been negative in all but the last two years of the time-series.

2.22 In Wychavon, natural change has had little impact upon population growth, with births balancing deaths in each year of the time-series. Net internal migration has had a positive impact upon growth in all but 2007/08 with net growth being highest in the first half of the 2001–2011 decade. Net international migration has varied between positive and negative contributions to annual population change.

2.23 The profile and trend in these components of change are important in the derivation of trend forecasts, with historical evidence used to derive future assumptions on migration. Scenarios presented in this analysis use both a 5-year (2007/08 to 2011/12) and a 10-year history (2002/03 to 2011/12) to set migration assumptions in the trend forecasts.



*Includes the 'other unattributable' component

Figure 6: South Worcestershire, components of population change 2001/02–2011/12. Source: ONS

Using the Latest Official Projections

2.24 The National Planning Policy Framework (NPPF) suggests that objectively assessed need should be measured by household and population projections, but does not point to any specific projections. This issue was clarified in a government Written Answer:

> "When assessing their housing requirements in future years… authorities should use the most recently released sub-national population projections (published by the Office for National Statistics) and household projections (published by the Department for Communities and Local Government)." (House of Lords, 25th October 2012)"

2.25 This suggests that the official projections may provide a starting point in assessing need, rather than the definitive answer. The implication is that authorities may test and revise these projections in the light of additional evidence.

2.26 No additional guidance has to date been formally issued by the Government on the definition or calculation of Objectively Assessed Housing need. Guidance was published in March 2013 as a part of the How Many Homes/What Homes Where toolkits (howmanyhomes.org website). Two documents were published with the toolkit. The first was "How Many Homes? A Companion Guide", published by the Local Housing Requirements Assessment Working Group, and the second was "Choice of Assumptions in Forecasting Housing Requirements. Methodological Notes", published by the Cambridge Centre for Housing and Planning Research.

2.27 In relation to the CLG household projection, the guidance indicated that:

> "The temptation to jump to the conclusion that this is "the answer" for the number of homes that need to be built each year should be resisted. It is the figure that would be needed to house new households if recent trends were to continue. This is a starting point for further analysis and discussion, not an answer."
>
> "[The ONS / CLG projections] won't provide you with housing numbers. What they will do is provide you with a baseline of evidence which, together with your understanding of your local area, should enable you to form your own view of the number and type of homes that should be planned for - or at the very least identify specific aspects where further work is needed."

2.28 Subsequently, the government has issued draft planning guidance for consultation. It supports local planning authorities in objectively assessing and evidencing development needs for housing (both market and affordable). This currently remains in draft form, and has not been issued by the Secretary of State.

2.29 The RTPI Research Report no.1 January 2014 - Planning for Housing in England: Understanding recent changes in household formation rates and their implications for planning for housing in England, provides similar advice:

> *"Department for Communities and Local Government's (DCLG) 2011 based household projections (published in April 2013) are the latest official household projections for England and take account of the 2011 census results. As suggested in planning guidance, they are the starting point estimates for looking at household growth and housing requirements."*

2.30 This Edge Analytics report provides additional evidence to test and revise projections, which will enable the objective assessment of housing need in South Worcestershire.

Household Projections

2.31 During the 2001–2011 decade the household projection methodology has been subject to substantial review, with a new approach adopted between the 2006-based and 2008-based outputs. In April 2013, CLG released its 2011-based household projections for local authorities in England, replacing the 2008-based projections.

2.32 The 2011-based projections provide an update on likely household growth trajectories (albeit to 2021 only), taking into account the unprecedented economic conditions that have affected local communities since 2008 and the substantial impact of population growth (particularly international migration) upon average household size.

2.33 **The general trend of the 2011-based projections suggests a reduction in the anticipated rate of household growth from 2011 to 2021, compared to the 2008-based projections.**[9]

2.34 Identifying the 'most likely' speed and scale of future household formation presents a challenge to planners.

2.35 In providing its evidence on demographic change, Edge Analytics has typically used 'headship rate' assumptions from both the 2008-based and 2011-based household models. Household headship rates define the likelihood of a particular household type being formed in a particular year, given the age-sex profile of the population in that year. Household-types are modelled within a 17-fold classification (see Appendix,

2.36 *Table 15*).

2.37 The use of assumptions from both the 2008-based and 2011-based models is in recognition of the uncertainty associated with future rates of household growth, given economic and demographic

[9] The South Worcestershire Demographic Forecasts (Edge Analytics) August 2013 (CD220) previously considered the CLG 2011 household projections.

conditions. This approach presents a 'range' of household growth outcomes for each population forecast.

2.38 Alternative approaches to estimating household growth have sought to forecast a likely 'recovery' in household formation rates (reverting from 2011-based to 2008-based assumptions). Following the SWDP Stage 1 hearings, the Inspector has requested that the South Worcestershire evaluate the household growth outcomes using the 2011-based headship rate assumptions to 2021 but, thereafter, applying rates of change in household formation that are consistent with the previous 2008-based household model (the 'index' approach).

2.39 For the forecasting analysis presented in this report, three alternative headship rate assumptions have been applied:

- Option A: CLG 2011-based headship rates, with the 2011-21 trend continued after 2021.
- Option B: CLG 2008-based headship rates, scaled to be consistent with the 2011 Census household total, but following the original trend thereafter.
- Option C: CLG 2011-based headship rates applied to 2021, reverting to the 2008-based rate of change in headship rates thereafter. This option reflects the 'index' approach which the Inspector, in his Interim Conclusions, considered should be used in combination with the latest available official population projections.

2.40 Reflecting the views of the Inspector regarding the 'index' approach, and as consequently requested by the South Worcestershire Councils, the Option C alternative is used in the main presentation of the forecast outcomes (i.e. the 'core' scenarios). The Option A and Option B alternatives are used to present the range of dwelling growth outcomes associated with 2011-based and 2008-based household formation rate assumptions as part of a sensitivity analysis (see 'Sensitivity Scenario 1', page 30).

3. Scenario Development

Introduction

3.1 There is no single, definitive view on the likely level of growth expected in South Worcestershire; a mix of economic, demographic and national/local policy issues ultimately determines the speed and scale of change. For local planning purposes, it is necessary to evaluate a range of growth alternatives to establish the most 'appropriate' basis for determining future housing provision.

3.2 A range of scenario alternatives has been developed for the South Worcestershire Councils. These include:

- The 2010-based and 2011-based official projections from the ONS;
- Updated 'migration-led' trend forecasts based on the latest demographic evidence;
- Jobs-led scenarios based on employment forecasts from Cambridge Econometrics, Oxford Economics and Experian.

3.3 Scenarios have been produced for each of the three South Worcestershire districts and for South Worcestershire in aggregate. The forecasts have been produced with a base year of 2012 and a forecast horizon of 2030. Historical population data are included from 2001 to 2012[10].

3.4 Seven 'core' scenarios and three sensitivity scenario alternatives have been developed. Information on the assumptions underpinning each of the scenarios can be found in the Appendix to this document.

3.5 Analysis of the core scenarios is presented in Section 4 of this report and the sensitivity scenarios in Section 5. In the following sections, an overview of the scenario alternatives is provided.

[10] Note that in the detailed scenario output (supplied separately to the South Worcestershire Councils), the historical population totals and the components of change (migration, births and deaths) are sourced directly from the ONS revised mid-year estimates. Historical data on households/dwellings and labour force/jobs are derived from the population totals (using the derived forecast assumptions outlined in this document, see page 21). Therefore, it is not appropriate for the Plan to rely on any modelled estimates of jobs or dwellings for the period 2006 to 2012.

Core Scenarios

Official Projections

3.6 In the development and analysis of population forecasts, it is important to 'benchmark' any growth alternatives against the latest 'official' population projection.

3.7 The most recent official projection is the ONS 'interim' 2011-based population projection (SNPP-2011), released following the publication of the 2011 Census. Despite being the most recent official projection, it is considered inappropriate as a growth benchmark as the normally robust rules on the calculation of long-term migration, fertility and mortality assumptions were not followed. Instead, ONS applied the assumptions from the previous official forecast, the 2010-based sub-national population projection (SNPP-2010), to a 2011 Census base population. This is unsuitable for two key reasons.

- Firstly, the revisions to the historical mid-year populations and the subsequent change in the historical impact of migration have not been taken into account.
- Secondly, the 2011 Census population has a different age structure to the previous 2010-based population.

3.8 Both of these issues mean that the 2011-based projection is not sufficiently robust to underpin any analysis of long-term housing requirements. Therefore, the **SNPP-2010** is used here to benchmark against the other scenario alternatives. The scenario is rescaled to the 2011 Census population total, thereby enabling comparison with the other scenario alternatives. From 2011, the SNPP-2010 growth trend is continued. This scenario uses historical evidence from the period 2006–2010 and incorporates the long-term assumptions on fertility, mortality and international migration that were defined in the SNPP-2010.

3.9 The SNPP-2011 scenario is included for comparison on the output charts; for the reasons outlined above (and as this projection does not extend beyond 2021) it is not included within the analysis of demographic change from 2012 to 2030.

Alternative Trend Scenarios

3.10 In determining the migration assumptions for a new '2012-based' trend projection, historical data on the components of demographic change during the 2001–2012 time-period are a key consideration.

3.11 A five year historical period is a typical time-frame from which migration 'trend' assumptions are derived (this is consistent with the ONS official methodology). However, given the unprecedented

economic change that has occurred since 2008, it is important to give due consideration to an extended historical time period for assumption derivation.

3.12 Three 'migration-led' scenario alternatives have been developed, based upon the latest demographic evidence:

- **Migration-led 5yr:** Internal and international migration assumptions are based on the last five years of historical evidence (2007/08 to 2011/12).
- **Migration-led 10yr:** internal and international migration assumptions are based on the last 10 years of historical evidence (2002/03 to 2011/12).
- **Natural Change:** in-migration, out-migration, immigration and emigration are set to zero.

Jobs-led Scenarios

3.13 In a 'jobs-led' scenario, population growth is determined by the number of jobs available within an area. POPGROUP evaluates the impact of a particular jobs growth trajectory by measuring the relationship between the number of jobs in an area, the size of the labour force and the size of the resident population.

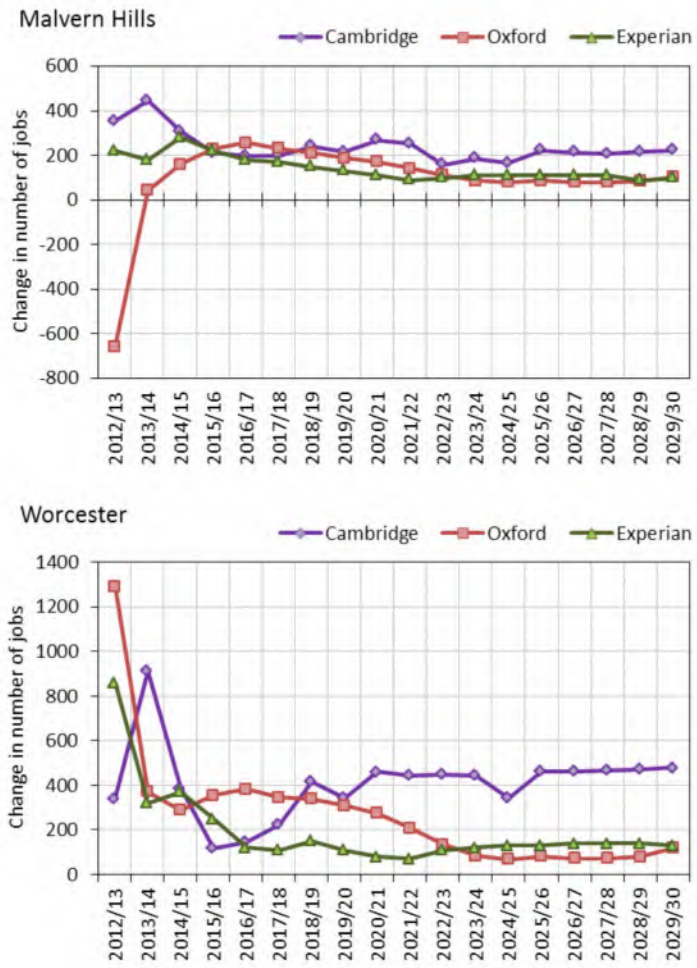
3.14 Migration is used to balance the relationship between the size of the population's labour force and the forecast number of jobs. A higher level of net in-migration will occur if there is insufficient population and resident labour force to meet the forecast number of jobs. A higher level of net out-migration will occur if the population is too high relative to the forecast number of jobs.

3.15 The following jobs-led scenarios have been developed:

- **Jobs-led (Cambridge Econometrics)**
  Population growth is constrained by an annual net change in jobs numbers as defined in the 'Cambridge Econometrics' employment forecast for the South Worcestershire districts.
- **Jobs-led (Oxford Economics)**
  Population growth is constrained by an annual net change in jobs numbers as defined in the 'Oxford Economics' employment forecast for the South Worcestershire districts.
- **Jobs-led (Experian)**
  Population growth is constrained by an annual net change in jobs numbers as defined in the 'Experian' employment forecast for the South Worcestershire districts.

3.16 The jobs growth figures used in each of these scenarios for the forecast period (2012 to 2030) are shown in Figure 7[11]. These graphs show the annual change in the number of jobs as specified in the employment forecasts from Cambridge Econometrics, Oxford Economics and Experian. Further detail on the employment forecasts is presented in the 'South Worcestershire Development Plan Objective Assessment of Housing Need January 2014' report (Amion Consulting).

3.17 Three key data items are required to run jobs-led scenarios. Economic activity rates provide the basis for calculating the size of the labour force within the population. A commuting ratio and an unemployment rate control the balance between the size of the labour force and the number of jobs within an area. Further detail on these items is provided in the Appendix.



[11] Jobs constraints have not been applied before 2012. Prior to 2012, the mid-year population estimates constrain the POPGROUP model outcomes. Therefore, it is not appropriate for the Plan to rely on any modelled estimates of jobs for the period 2006 to 2012.

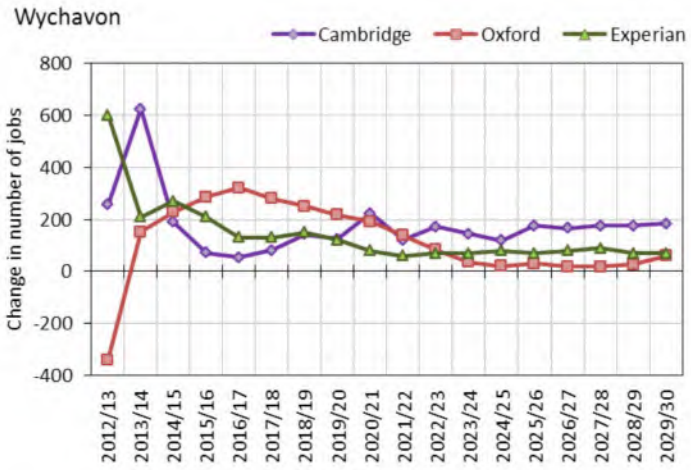


Figure 7: Jobs growth trajectories used in the POPGROUP model for each of the three South Worcestershire districts. Data source: Cambridge Econometrics, Oxford Economics, Experian.

Derived Forecast Implications: Households and Dwellings

3.18 In all of the scenarios presented in this report, the household and dwelling implications of each population growth trajectory were evaluated through the application of a communal population adjustment, household headship rates and a dwelling vacancy rate.

3.19 Communal population statistics have been derived from 2011 Census data. Household headship rates are taken from the CLG's 2008-based and 2011-based household projections. In the 'core' scenarios, the 'Option C' combination of headship rates has been applied:

- Option C: CLG 2011-based headship rates applied to 2021, reverting to the 2008-based rate of change in headship rates thereafter. This option reflects the 'index' approach which the Inspector, in his Interim Conclusions, considered should be used.

3.20 Additional sensitivity analysis has been conducted using the original 2008-based and 2011-based headship rate assumptions, as follows:

- Option A: CLG 2011-based headship rates, with the 2011–2021 trend continued after 2021.
- Option B: CLG 2008-based headship rates, scaled to be consistent with the 2011 Census household total, but following the original trend thereafter.

3.21 Each of the seven 'core' scenarios has been produced using the Option A and the Option B rates, for comparison with the Option C ('index') approach. These results are presented under the 'Sensitivity Scenario 1' results.

3.22 The conversion of households to dwellings is based on a 'vacancy rate', taking account of both vacant properties and second homes in measuring the relationship between households and

dwellings.

3.23 The Appendix to this document presents further information on the household model assumptions and the vacancy rates used.

Derived Forecast Implications: Labour Force and Jobs

3.24 The labour force and jobs implications of each scenario are evaluated through the application of a commuting ratio, an unemployment rate and economic activity rates to the population projection.

3.25 In the 'jobs-led' scenarios, the commuting ratio, an unemployment rate and economic activity rates are used to determine population growth from a specified number of jobs (see page 20).

3.26 In all the 'core' scenarios, the commuting ratio, an unemployment rate and the economic activity rate are fixed throughout the forecast period (2012–2030).

3.27 Two additional sensitivity scenario alternatives ('Sensitivity Scenarios 2 and 3') have been produced to evaluate the sensitivity of the jobs-led scenarios to changes in the unemployment rate and the economic activity rates.

3.28 The Appendix to this document presents further information on the underlying employment assumptions used.

Scenario Summary

3.29 *Seven 'core' scenarios have been produced and three sensitivity scenario alternatives.*

Table 2: Scenario definition summary

Scenario Type		Scenario Name
Core Scenarios	'Official' projections	SNPP-2010 (SNPP-2011 included on charts for comparison)
	Alternative trend scenarios	Migration-led 5yr Migration-led 10yr Natural Change
	Jobs-led scenarios	Jobs-led (Cambridge Econometrics) Jobs-led (Oxford Economics) Jobs-led (Experian)
Sensitivity Scenarios	Sensitivity Scenario 1 *(Headship Rate Sensitivity)*	All core scenarios
	Sensitivity Scenario 2 *(Employment Sensitivity)*	Jobs-led Cambridge (SENS2) Jobs-led Oxford (SENS2) Jobs-led (SENS2)
	Sensitivity Scenario 3 *(Employment Sensitivity)*	Jobs-led Cambridge (SENS3) Jobs-led Oxford (SENS3) Jobs-led (SENS3)

4. Scenario Forecasts

Core Scenario Summaries

4.1 A summary of the results for each core scenario is provided in the form of a chart and an accompanying table of statistics. The chart illustrates the trajectory of population change resulting from each scenario. The table summarises the change in population and household numbers from 2012–2030 that results from each scenario.

4.2 The scenarios are 'ranked' (high to low) according to the expected average annual dwelling growth throughout the projection period, based on the assumptions used in each scenario. The table also shows the estimated level of population change throughout the projection period, the average annual net migration associated with the population change and the expected average annual jobs growth.

Scenario Commentary

4.3 Comments are provided here on the South Worcestershire aggregate picture, with additional scenario illustrations provided for the three individual districts.

4.4 The trend scenarios all suggest a similar level of growth over the forecast period, 8–9% population change in the 'SNPP-2010', 'Migration-led 10yr' and 'Migration-led 5yr' scenarios. The historical period from which migration assumptions have been derived has little impact upon the scale of growth at this aggregate, South Worcestershire scale.

4.5 Dwelling growth suggested by the trend scenarios is 821–914 dwellings per year.

4.6 The 'Natural Change' scenario, where net migration is set to zero for each year of the forecast period, results in 1.2% population growth, driven solely by the excess of births over deaths. The dwelling growth expectation is 292 per year.

4.7 The three jobs-led forecasts result in much higher population growth (17.5–21.6%) compared to the demographic 'trend' scenarios, with a correspondingly high dwelling growth anticipated (1,423–1,686 dwellings per year). The population growth is driven by higher annual net migration, required to sustain the labour force in line with the forecast growth in job numbers.

(i) South Worcestershire

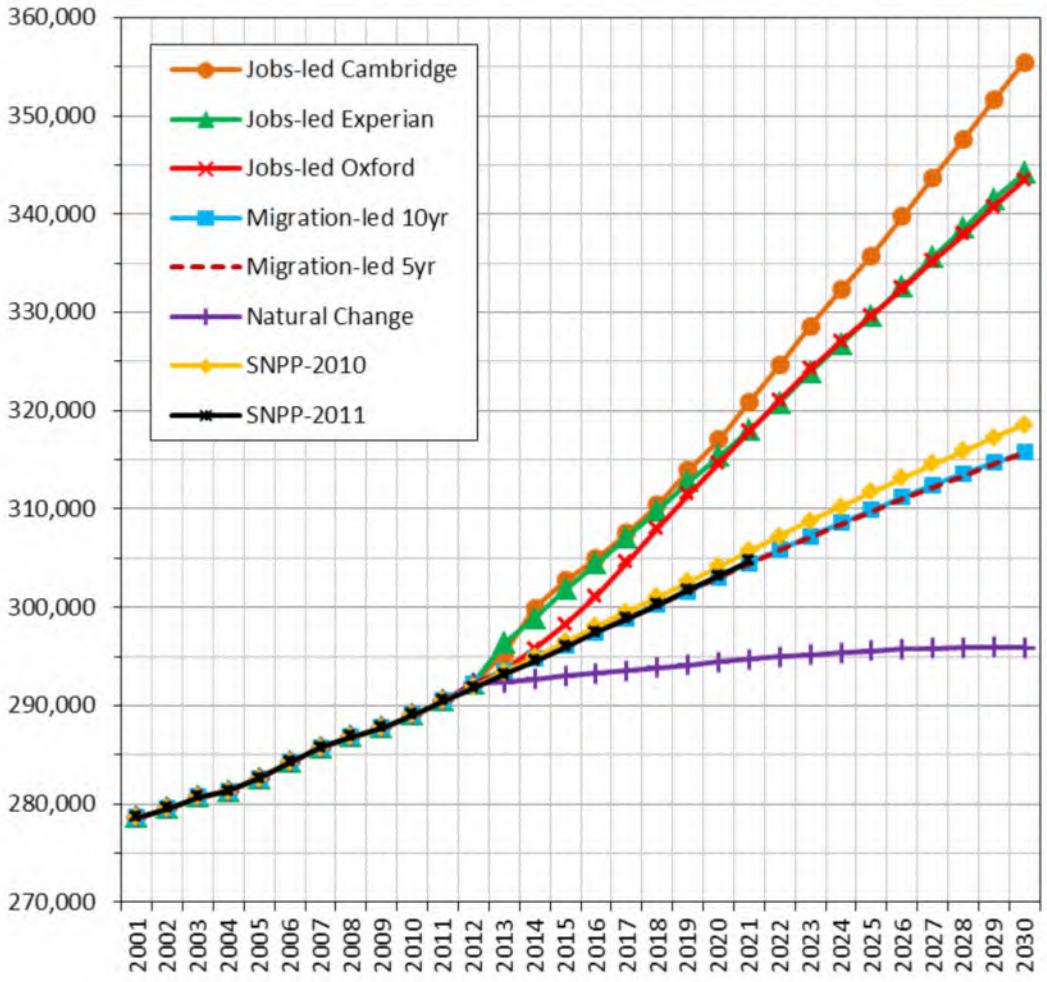


Figure 8: South Worcestershire scenario forecasts population growth 2012-2030

Scenario	Change 2012 - 2030				Average per year		
	Population Change	Population Change %	Households Change	Households Change %	Net Migration	Dwellings	Jobs
Jobs-led Cambridge	63,221	21.6%	29,219	23.4%	3,089	1,686	826
Jobs-led Experian	51,949	17.8%	24,913	20.0%	2,526	1,437	478
Jobs-led Oxford	51,203	17.5%	24,663	19.8%	2,470	1,423	477
SNPP-2010	26,660	9.1%	15,838	12.7%	1,470	914	-28
Migration-led 10yr	23,535	8.1%	14,318	11.5%	1,098	826	-249
Migration-led 5yr	23,421	8.0%	14,239	11.4%	1,091	821	-219
Natural Change	3,637	1.2%	5,085	4.1%	0	292	-747

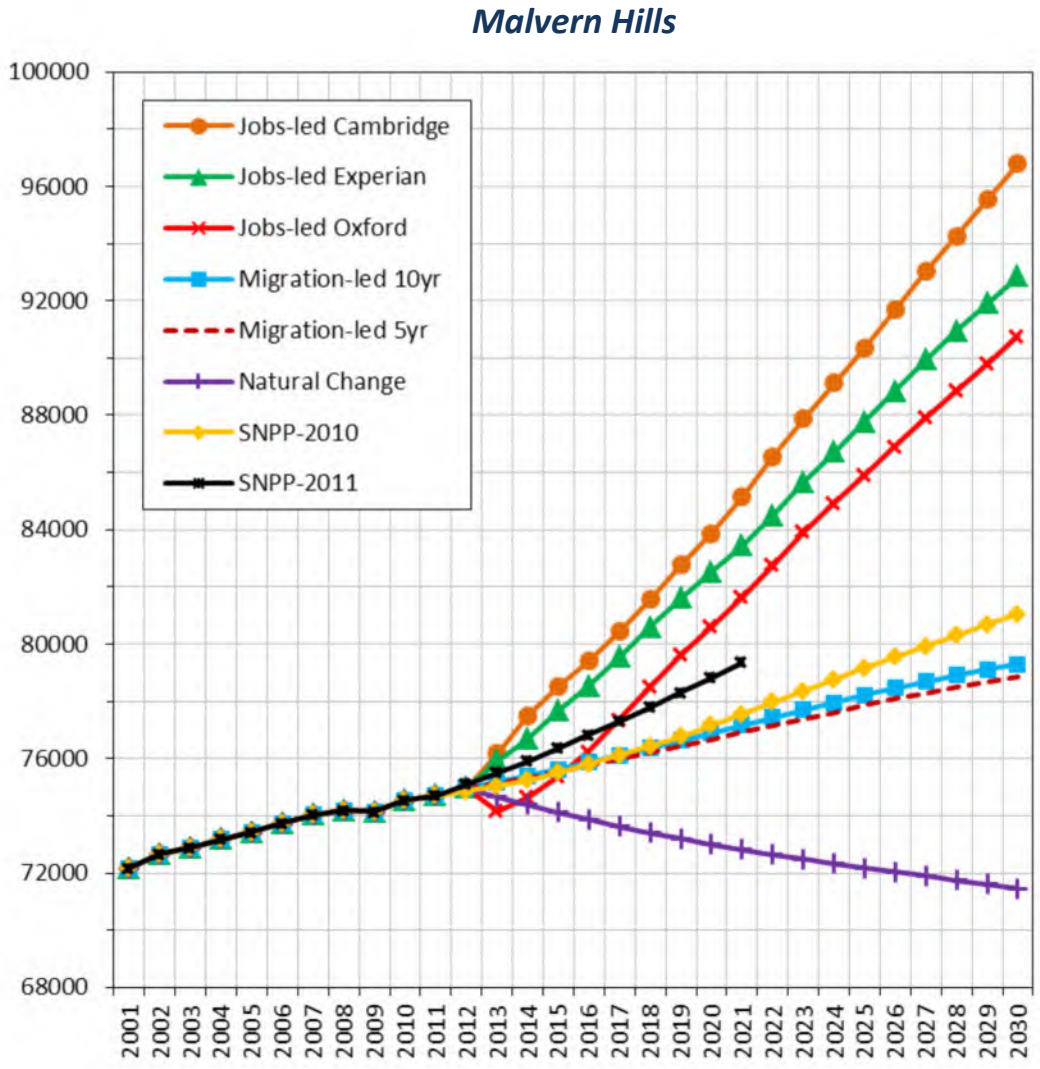


Figure 9: Malvern Hills scenario forecasts population growth 2012-2030

Scenario	Change 2012 - 2030				Average per year		
	Population Change	Population Change %	Households Change	Households Change %	Net Migration	Dwellings	Jobs
Jobs-led Cambridge	21,821	29.1%	9,126	28.1%	1,467	529	238
Jobs-led Experian	17,874	23.8%	7,669	23.6%	1,267	445	143
Jobs-led Oxford	15,794	21.1%	6,862	21.2%	1,167	398	94
SNPP-2010	6,203	8.3%	4,186	12.9%	794	243	-73
Migration-led 10yr	4,317	5.8%	2,495	7.7%	590	145	-183
Migration-led 5yr	3,866	5.2%	2,445	7.5%	557	142	-193
Natural Change	-3,527	-4.7%	-1,749	-5.4%	0	-101	-264

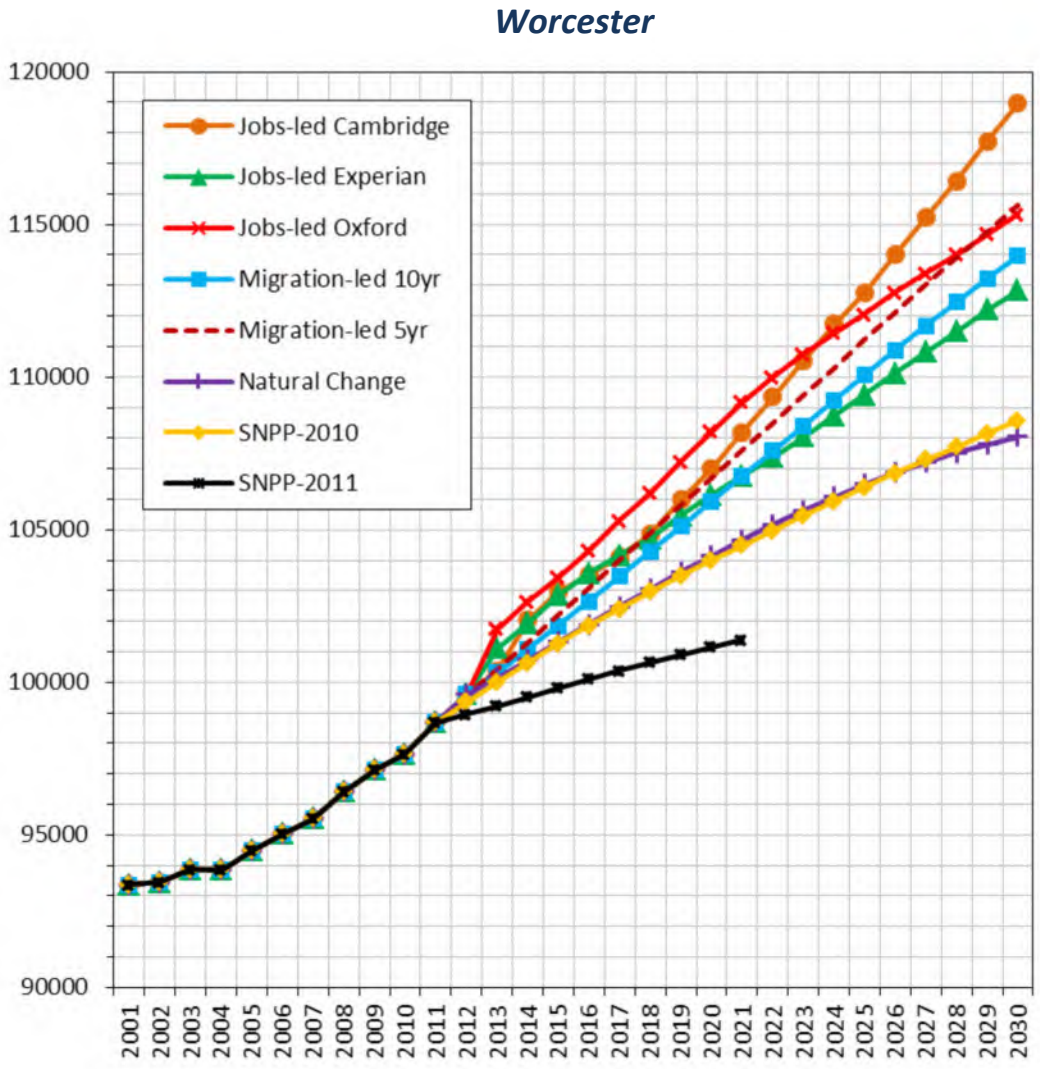


Figure 10: Worcester scenario forecasts population growth 2012-2030

Scenario	Change 2012 - 2030				Average per year		
	Population Change	Population Change %	Households Change	Households Change %	Net Migration	Dwellings	Jobs
Jobs-led Cambridge	19,359	19.4%	9,535	22.5%	414	550	410
Migration-led 5yr	16,022	16.1%	8,230	19.4%	250	474	291
Jobs-led Oxford	15,727	15.8%	8,152	19.3%	215	470	271
Migration-led 10yr	14,366	14.4%	7,680	18.1%	133	443	257
Jobs-led Experian	13,240	13.3%	7,137	16.9%	116	411	193
SNPP-2010	9,231	9.3%	5,413	12.7%	-47	312	113
Natural Change	8,435	8.5%	6,458	15.3%	0	372	-54

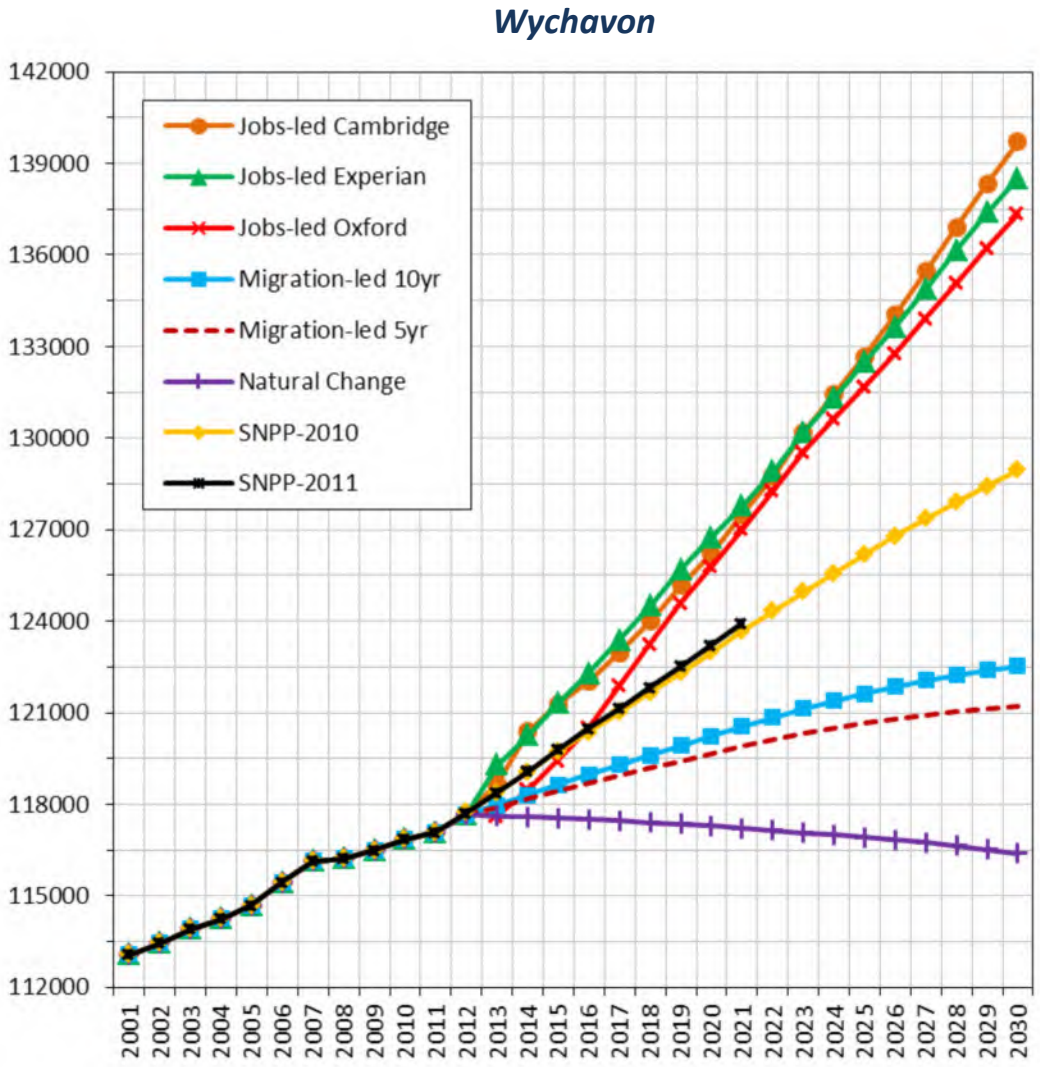


Figure 11: Wychavon scenario forecasts population growth 2012-2030

Table 6: Wychavon scenario forecast summary 2012-2030 (ranked in order of population change)

Scenario	Change 2012 - 2030				Average per year		
	Population Change	Population Change %	Households Change	Households Change %	Net Migration	Dwellings	Jobs
Jobs-led Cambridge	22,040	18.7%	10,557	21.1%	1,209	607	178
Jobs-led Experian	20,835	17.7%	10,107	20.2%	1,143	581	142
Jobs-led Oxford	19,682	16.7%	9,650	19.3%	1,088	555	112
SNPP-2010	11,227	9.5%	6,240	12.5%	723	359	-68
Migration-led 10yr	4,853	4.1%	4,144	8.3%	375	238	-323
Migration-led 5yr	3,533	3.0%	3,564	7.1%	284	205	-318
Natural Change	-1,271	-1.1%	375	0.8%	0	22	-429

5. Sensitivity Analyses

Sensitivity Scenarios: Introduction

5.1 The Inspector in his Interim Conclusions instructed that:

> "It will be helpful to me for the Councils to prepare more than one employment-based scenario to illustrate the implications of different levels of employment growth, provided that each is based on up-to-date and representative forecasts. It is also likely to be helpful for sensitivity tests to be carried out on any significant assumptions made in this stage of the analysis."

5.2 Sensitivity tests provide the means to objectively assess assumptions that have been made and to explore potential areas of uncertainty. Three sets of sensitivity scenarios have been produced as part of the additional work to support the derivation of objectively assessed housing need. In particular the additional work has assessed variations from Core Scenario assumptions with regard to the following:

- In Sensitivity Scenario 1, the implications of different household formation rates from the 2011- and 2008-based CLG models are examined.
- In Sensitivity Scenarios 2 and 3 the implications of varying economic activity rates in the older age groups and altering unemployment rates on the jobs-led scenarios are examined.

Sensitivity Scenario 1: Headship Rate Sensitivity

5.3 Identifying the 'most likely' speed and scale of future household formation presents a challenge to planners. Edge Analytics has typically used 'headship rate' assumptions from both the 2008-based and 2011-based household models.

5.4 The core scenarios presented in Section 4 have used the 'Option C' combination of headship rates:

- Option C: CLG 2011-based headship rates applied to 2021, reverting to the 2008-based rate of change in headship rates thereafter.

5.5 This combination of headship rates is the 'index' approach which the Inspector requested the South Worcestershire Councils consider. The additional work has incorporated this request. Notwithstanding this, it is still necessary to consider the impact of departing from the use of the latest national interim 2011-based household projections, mindful of the 25 October 2013 Written Answer. Until the 2012 based sub-national population projections and associated household

projections are published (due later in 2014) the uncertainty remains about if – and when – household headship rates will move back towards the previous long term trend.

5.6 This sensitivity analysis presents the range of dwelling growth outcomes that would result if the alternative Option A and Option B headship rate trajectories were applied to each of the population growth scenarios:

- Option A: CLG 2011-based headship rates, with the 2011-21 trend continued after 2021.
- Option B: CLG 2008-based headship rates, scaled to be consistent with the 2011 Census household total, but following the original trend thereafter.

5.7 Using both the 'Option A' and 'Option B' headship rates enables an evaluation of the growth outcomes that would results from both the 2008- and 2011-based CLG household projection assumptions. Using the 2011-based household projection assumptions (Option A) results in a lower dwelling requirement than the 2008-based alternative (Option B) (

5.8 *Table 7*).

5.9 For example, in the SNPP-2010 scenario, under 'Option A' the annual average dwelling requirement is 904. Under 'Option B', 1,118 dwellings per year would be required. Over the forecast period (2012–2030), this equates to 15,669 households under Option A and 19,385 under Option B, a 23% difference.

5.10 The scale of variation between Options A and B illustrates the consequences of using the different projections. *Exclusive use of the 2011-based assumptions can be criticised for being overly dependent upon a peri*od where household formation rates have been suppressed; whereas exclusive use of the 2008-based rates can be criticised as being influenced by rates of household formation associated with an 'over-heated' housing market.

5.11 The 'index' approach ('Option C') outcomes are generally positioned between the 2011-based (Option A) and 2008-based (Option B) alternatives. Appending the 2008-based headship rate changes to the 2011-based statistics from 2012 onwards results in higher household growth and a corresponding higher annual dwelling requirement than in the 'Option A' outcome, in which the trend in the 2011-based rates is continued after 2021.

Table 7: South Worcestershire dwelling requirements
(ranked in order of 'Option C' dwelling requirement

Scenario	Average annual dwelling requirement 2012 - 2030		
	Option A	Option B	Option C
Jobs-led Cambridge	1,670	1,930	1,686
Jobs-led Experian	1,423	1,667	1,437
Jobs-led Oxford	1,407	1,654	1,423
SNPP-2010	904	1,118	914
Migration-led 10yr	807	1,026	826
Migration-led 5yr	802	1,021	821
Natural Change	271	481	292

5.12 Similar sensitivity outcomes are presented for each of the three South Worcestershire districts (Table 8, Table 9,

*Table **10***).

Table 8: Malvern Hills dwelling growth sensitivity

(ranked in order of 'Option C' dwelling requirement)

Scenario	Average annual dwelling requirement 2012 - 2030		
	Option A	Option B	Option C
Jobs-led Cambridge	515	592	529
Jobs-led Experian	430	504	445
Jobs-led Oxford	383	456	398
SNPP-2010	230	289	243
Migration-led 10yr	129	191	145
Migration-led 5yr	126	189	142
Natural Change	-122	-41	-101

Table 9: Worcester dwelling growth sensitivity

(ranked in order of 'Option C' dwelling requirement)

Scenario	Average annual dwelling requirement 2012 - 2030		
	Option A	Option B	Option C
Jobs-led Cambridge	540	623	550
Migration-led 5yr	466	543	474
Jobs-led Oxford	462	537	470
Migration-led 10yr	434	513	443
Jobs-led Experian	404	476	411
Natural Change	371	418	372
SNPP-2010	304	378	312

Table 10: Wychavon dwelling growth sensitivity
(ranked in order of 'Option C' dwelling requirement)

Scenario	Average annual dwelling requirement 2012 - 2030		
	Option A	Option B	Option C
Jobs-led Cambridge	615	716	607
Jobs-led Experian	589	688	581
Jobs-led Oxford	562	660	555
SNPP-2010	370	451	359
Migration-led 10yr	244	322	238
Migration-led 5yr	211	290	205
Natural Change	21	104	22

5.13 Reflecting the views of the Inspector regarding the 'index' approach, and as consequently requested by the South Worcestershire Councils, the Option C alternative is used in the main presentation of the forecast outcomes in the Core Scenarios (and the Jobs-led Sensitivity Scenarios).

Sensitivity Scenarios 2 and 3

Aligning Economic and Demographic Forecasts

5.14 Whilst the choice of household headship rate presents an important consideration when selecting assumptions about future demographic change, an equally important consideration is the appropriate alignment of economic forecasts (from Cambridge Econometrics, Oxford Economics and Experian) and demographic forecasts.

5.15 The 'core' scenarios presented above include three 'jobs-led' scenarios which use employment forecasts from each of the three providers to determine likely rates of population, household and dwelling growth. The population growth associated with these 'jobs-led' scenarios is, in all cases, higher than the trend scenarios suggest. This is because the demographic model is seeking to align itself with the underlying assumptions from the respective economic forecasts.

5.16 To achieve this alignment, the demographic model uses migration (either in- or out-migration) to balance the size of the resident labour force to the jobs growth anticipated. If the size of the labour force is too small to accommodate the required jobs growth, in-migration results. If the labour force is too large, out-migration results.

5.17 Three key parameters determine the balance of migration (population change) that is required to match the size of the labour force and the anticipated jobs growth:

- Economic activity rates
- Unemployment rate
- Commuting ratio

5.18 In the 'core' scenarios these three assumptions have been 'fixed' throughout the forecast period (2012–2030). In reality, and in the assumptions that have been applied in the respective economic forecasts from Cambridge Econometrics, Oxford Economics and Experian, these three assumptions change over time and have an important effect upon the relationship between population growth and jobs growth (and therefore upon the derived dwelling requirement).

5.19 To provide an assessment of the 'sensitivity' of the scenarios to changes to these parameters, two sensitivity scenario alternatives have been produced: 'Sensitivity Scenario 2' and 'Sensitivity Scenario 3'. In each of these sensitivities, the three jobs-led scenarios have been reproduced with modified economic activity rates and unemployment rates. The following sections summarise the changes that have been made in each of these sensitivities.

Modifications made in Sensitivity Scenario 2

5.20 To take account of planned changes to State Pension Age (SPA), the following modifications have been made to the economic activity rates in 'Sensitivity Scenarios 2':

- Women aged 60-64: 40% increase from 2012 to 2020.
- Women aged 65-69: 20% increase from 2012 to 2020.
- Men aged 60-64: 5% increase from 2012 to 2020.
- Men aged 65-69: 10% increase from 2012 to 2020.

5.21 In addition, the unemployment rate has been modified in 'Sensitivity Scenario 2' to account for a period of recovery post-2013. The commuting ratio parameter remains consistent with the 'core' scenario assumptions. Please refer to the Appendix for detail on the modifications to the economic activity rates and the unemployment rate, and for detail on the commuting ratio.

Modifications made in Sensitivity Scenario 3

5.22 In the third sensitivity scenario alternative, the unemployment rate has been reduced over the forecast period (2012–2030). These modifications have been made using an index based on the Experian employment forecast (for information on these changes please refer to the Appendix to this document and Annex 1 of Appendix C of the 'South Worcestershire Development Plan Objective Assessment of Housing Need January 2014' report, produced by AMION Consulting).

5.23 The 2011 Census economic activity rates have been modified in the following way. Firstly, to account for planned changes to the SPA, the same uplift in economic activity rates has been applied as in 'Sensitivity Scenario 2' to the 60–69 age groups (see above, paragraph 5.20 and Appendix for further information). Secondly, additional changes been applied to the economic activity rates of the 25–74 age groups.

5.24 These changes are different for each of the Cambridge, Experian and Oxford forecasts and have been made following recommendations from AMION (for information on these changes please refer to the Appendix to this document and Annex 1 of Appendix C of the 'South Worcestershire Development Plan Objective Assessment of Housing Need January 2014' report, produced by AMION Consulting).

5.25 As in Sensitivity Scenario 2 and the 'core' scenarios, the commuting ratio is kept fixed throughout the forecast period.

Sensitivity Scenarios 2 and 3: Results

5.26 The application of the modified assumptions on economic activity rates and unemployment rates results in changes to dwelling requirement when compared to the 'core' jobs-led scenarios. This is because these jobs-led scenarios are seeking to determine demographic change based upon a definitive trajectory of jobs growth. (Note that changing the economic activity rates and unemployment rates in the trend-based scenarios would have no impact on the resulting dwelling requirement, only on the derived labour force and jobs numbers).

5.27 The dwelling growth outcomes of the jobs-led 'core', the 'Sensitivity 2' and 'Sensitivity 3' scenarios for South Worcestershire are presented below (

5.28 Table *11* to Table 14). Note that the 'Option C' headship rates are applied to derive the dwelling numbers, as requested by the Inspector.

5.29 The average annual dwelling requirement for the forecast period (2012–2030) is lower in the 'Sensitivity 3' option than in both the 'Sensitivity 2' option and the 'core' scenarios[12].

[12] Note that no jobs constraints have been applied before 2012. Prior to 2012, the mid-year population estimates constrain the POPGROUP model outcomes. Therefore, it is not appropriate for the Plan to rely on any modelled estimates of jobs for period 2006 to 2012.

Table 11: South Worcestershire – dwelling growth summary for Sensitivity Scenarios 2 and 3

Scenario	Average annual dwelling requirement 2012 - 2030		
	Core Scenario	Sensitivity Scenario 2	Sensitivity Scenario 3
Jobs-led Cambridge	1,686	1,507	1,311
Jobs-led Experian	1,437	1,261	1,081
Jobs-led Oxford	1,423	1,246	1,064

Table 12: Malvern Hills – dwelling growth summary for Sensitivity Scenarios 2 and 3

Scenario	Average annual dwelling requirement 2012 - 2030		
	Core Scenario	Sensitivity Scenario 2	Sensitivity Scenario 3
Jobs-led Cambridge	529	477	458
Jobs-led Experian	445	394	376
Jobs-led Oxford	398	347	330

Table 13: Worcester – dwelling growth summary for Sensitivity Scenarios 2 and 3

Scenario	Average annual dwelling requirement 2012 - 2030		
	Core Scenario	Sensitivity Scenario 2	Sensitivity Scenario 3
Jobs-led Cambridge	550	496	440
Jobs-led Experian	411	359	314
Jobs-led Oxford	470	417	368

Table 14: Wychavon – dwelling growth summary for Sensitivity Scenarios 2 and 3

Scenario	Average annual dwelling requirement 2012 - 2030		
	Core Scenario	Sensitivity Scenario 2	Sensitivity Scenario 3
Jobs-led Cambridge	607	534	414
Jobs-led Experian	581	508	390
Jobs-led Oxford	555	482	366

6. Appendix: Data Inputs and Assumptions

6.1 The POPGROUP model draws data from a number of sources, building an historical picture of population, households, fertility, mortality and migration on which to base its scenario forecasts. Using the historical data evidence for 2001-2012, in conjunction with information from ONS national projections, a series of assumptions have been derived which drive the scenario forecasts.

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

Population, Births & Deaths

Population

6.3 In each scenario, historical population statistics are provided by the mid-year population estimates for 2001 to 2012, with all data recorded by single-year of age and sex.

6.4 These data include the revised mid-year population estimates for 2002–2010, which were released by the Office for National Statistics (ONS) in May 2013. The revised mid-year population estimates provide consistency in the measurement of the components of change (i.e. births, deaths, internal migration and international migration) between the 2001 and 2011 Censuses.

6.5 For the 'SNPP-2010' and 'SNPP-2011' scenarios, future population counts are provided for each area by single-year of age and sex, to ensure consistency with the trajectory of the official projections.

6.6 The 'SNPP-2010' scenario is scaled to ensure consistency with the 2011 mid-year population estimate total, following its designated growth trend thereafter. This enables the different scenario alternatives to be more easily compared and does not alter the underlying assumptions or growth trajectory.

Births & Fertility

6.7 Historical mid-year to mid-year counts of births by sex from 2001/02 to 2011/12 for each district have been sourced from ONS Vital Statistics.

6.8 A 'national' age-specific fertility rate (ASFR) schedule, which measures the expected fertility rates by age and sex for England in 2013/14, is included in the POPGROUP model assumptions. This is derived

from the ONS 2012-based national population projection and is used in combination with a local (i.e. district-specific) fertility differential to produce age-specific fertility rates for each area.

6.9 Long-term assumptions on changes in age-specific fertility rates are taken from the ONS 2012-based national population projection for England.

6.10 In combination with the 'population-at-risk' these provide the basis for the calculation of births in each year of the forecast period.

Deaths & Mortality

6.11 Historical mid-year to mid-year counts of deaths by age and sex from 2001/02 to 2011/12 for each district have been sourced from ONS Vital Statistics.

6.12 A 'national' age-specific mortality rate (ASMR) schedule, which measures the expected mortality rates by age and sex for England in 2013/14, is included in the POPGROUP model assumptions. This is derived from the ONS 2012-based national population projection and is used in combination with a local (i.e. district-specific) mortality differential to produce age-specific fertility rates for each area.

6.13 Long-term assumptions on changes in age-specific mortality rates are taken from the ONS 2012-based national population projection for England.

6.14 In combination with the 'population-at-risk' these provide the basis for the calculation of deaths in each year of the forecast period.

Migration

Internal Migration

6.15 Historical mid-year to mid-year counts of in- and out-migration by five year age group and sex from 2001/02 to 2011/12 have been sourced from the 'components of change' files that underpin the ONS mid-year population estimates. The original source of these internal migration statistics is the Patient Register Data Service (PRDS), which captures the movement of patients as they register with a GP. This data provides an accurate representation of inter-area flows, albeit with some issues with regard to potential under-registration in certain age groups (young males in particular).

6.16 For future internal migration flows, a schedule of Age-Specific Migration Rates (ASMigR) is used in combination with the 'population-at-risk'.

6.17 In the 'SNPP-2010' and the 'SNPP-2011' scenarios, the ASMigR schedules are drawn directly from the

ONS 2010-based assumptions.

6.18 In the migration-led scenarios, the ASMigR schedules are derived from the historical migration data. In the 'Migration-led 5yr' a five-year history is used and in the 'Migration-led 10yr' scenario, a ten-year migration history is used.

6.19 For the 'Natural Change' scenario, the ASMigR schedule sets the internal in- and out-migration flows to zero for each year in the forecast period.

6.20 The jobs-led scenarios calculate their own migration assumptions to ensure an appropriate balance between population, households and the labour force, given the 'constraints' on jobs growth that are imposed in each scenario.

International Migration

6.21 Historical mid-year to mid-year counts of total immigration and emigration from 2001/02 to 2011/12 have been sourced from the 'components of change' files that underpin the ONS mid-year population estimates. Any 'adjustments' made to the mid-year population estimates to account for asylum cases are included in the international migration balance.

6.22 Implied within the international migration component of change is an 'other unattributable' figure, which ONS identified within its latest mid-year estimate revisions. The POPGROUP model has assigned the 'other unattributable' to international migration as it is the component with the greatest uncertainty associated with its estimation.

6.23 For future international migration flows, counts of migrants are defined.

6.24 In the 'SNPP-2010' and the 'SNPP-2011' scenarios, the international in- and out-migration counts are drawn directly from the ONS 2010-based assumptions.

6.25 For the 'Migration-led (5yrs)' and 'Migration-led (10yrs)' scenarios, the international in- and out-migration counts are derived from historical data, using a five and ten year history respectively. A schedule of ASMigRs is derived from either a 5-year or 10-year migration history and used to distribute future counts by single year of age.

6.26 In the 'Natural Change' scenario, the future migration counts set the in- and out-migration flows to zero for each year in the forecast period

6.27 The jobs-led scenarios calculate their own migration assumptions to ensure an appropriate balance

between population, households and the labour force, given the 'constraints' on housing or employment growth that are imposed in each scenario.

Household Assumptions

6.28 For each scenario, the household and dwelling implications of the population growth trajectory have been evaluated through the application of headship rate statistics, communal population statistics and a dwelling vacancy rate. These data assumptions have been sourced from the 2001 and 2011 Censuses and the 2008-based and 2011-based household projection models from the CLG.

Household Headship Rates

6.29 A household is defined as:

> "One person living alone, or a group of people (not necessarily related) living at the same address with common housekeeping - that is, sharing a living room or sitting room or at least one meal a day." [13]

6.30 Household headship rates define the likelihood of a particular household type being formed in a particular year, given the age-sex profile of the population in that year. Household-types are modelled within a 17-fold classification (

6.31 Table *15*).

Table 15: Household type classification

ONS Code	DF Label	Household Type
OPM	OPMAL	One person households: Male
OPF	OPFEM	One person households: Female
OCZZP	FAMC0	One family and no others: Couple: No dependent children
OC1P	FAMC1	One family and no others: Couple: 1 dependent child
OC2P	FAMC2	One family and no others: Couple: 2 dependent children
OC3P	FAMC3	One family and no others: Couple: 3+ dependent children
OL1P	FAML1	One family and no others: Lone parent: 1 dependent child
OL2P	FAML2	One family and no others: Lone parent: 2 dependent children
OL3P	FAML3	One family and no others: Lone parent: 3+ dependent children
MCZDP	MIX C0	A couple and one or more other adults: No dependent children
MC1P	MIX C1	A couple and one or more other adults: 1 dependent child
MC2P	MIX C2	A couple and one or more other adults: 2 dependent children
MC3P	MIX C3	A couple and one or more other adults: 3+ dependent children
ML1P	MIX L1	A lone parent and one or more other adults: 1 dependent child
ML2P	MIX L2	A lone parent and one or more other adults: 2 dependent children
ML3P	MIX L3	A lone parent and one or more other adults: 3+ dependent children

[13] CLG. *Household Projections: Notes and Definitions for Data Analysts*. https://www.gov.uk/household-projections-notes-and-definitions-for-data-analysts.

OTAP	OTHHH	Other households
TOT	TOTHH	Total

6.32 Household headship rates used in the POPGROUP modelling have been taken from the CLG 2008-based and 2011-based household projections. The 2011-based household projections were released for local authority districts in England in April 2013, superseding the 2008-based model. However, as the 2011-based household model is underpinned by the 2011-based SNPP, the headship rate assumptions have only been published for the 2011-2021 period.

6.33 For the forecasting analysis presented in this report, three alternative headship rate assumptions have been applied:

- Option A: CLG 2011-based headship rates, with the 2011-21 trend continued after 2021.
- Option B: CLG 2008-based headship rates, scaled to be consistent with the 2011 Census, but following the original trend thereafter.
- Option C: CLG 2011-based headship rates applied to 2021, reverting to the 2008-based rate of change in headship rates thereafter.

6.34 As requested by South Worcestershire, the Option C alternative is used in the main presentation of the forecast outcomes. Option A and Option B alternatives are used to present the range of dwelling growth outcomes associated with 2011-based and 2008-based household formation rate assumptions.

Communal Population

6.35 Household projections in POPGROUP take account of the 'population-not-in-households' (communal population). This data has been drawn directly from the 2011 Census.

Vacancy Rates

6.36 The relationship between households and dwellings is modelled using a 'vacancy rate'. Using Council Tax statistics provided by the South Worcestershire Councils, vacancy rates have been calculated from vacant properties and second homes (excluding holiday lets). These rates are defined as follows (remaining constant throughout the forecast period).

Table 16: Vacancy rates used in the POPGROUP model

District	2011 Vacancy Rate (%)
Malvern Hills	4.2
Worcester	3.6
Wychavon	3.4

Economic Activity Rates

6.37 For each scenario (excluding the jobs-led scenarios), the labour force and jobs implications of the population growth trajectory have been evaluated through the application of three key data items: economic activity rates, a commuting ratio and an unemployment rate. In the jobs-led scenarios, these three data items are used to determine the population growth required by a particular jobs growth trajectory.

6.38 'Economically active' refers to the population that is both employed and unemployed, i.e. the labour force. Economic activity rates determine the level of labour force participation associated with a particular age-sex category.

6.39 The economic activity rates used in all the scenarios are based on the latest statistics from the 2011 Census, published in November 2013. In the 'core' scenarios, the rates are fixed across the forecast period (2012–2030). In Sensitivity Scenarios 2 and 3, alterations are made to the economic activity rates.

6.40 This section provides evidence and rationale for the derivation of the economic activity rate statistics used in the scenario analysis.

2011 Census Economic Activity Rates

6.41 Economic activity rates provide the basis for estimating the size of the labour force. Economic activity rates by five year age group (ages 16-74) and sex have been derived from 2011 Census statistics.

6.42 The 2011 Census statistics include an open-ended 65+ age categorisation, so economic activity rates for the 65–69 and 70–74 age groups have been estimated using a combination of Census 2011 tables, disaggregated using evidence from the 2001 Census. The 2011 economic activity rates for the three South Worcestershire districts are shown in Figure 12.

6.43 In the 'core' scenarios, the economic activity rates are fixed across the forecast period at the 2011 level and, as such do not include any increase in economic activity that may arise from changes to

the State Pension Age (SPA).

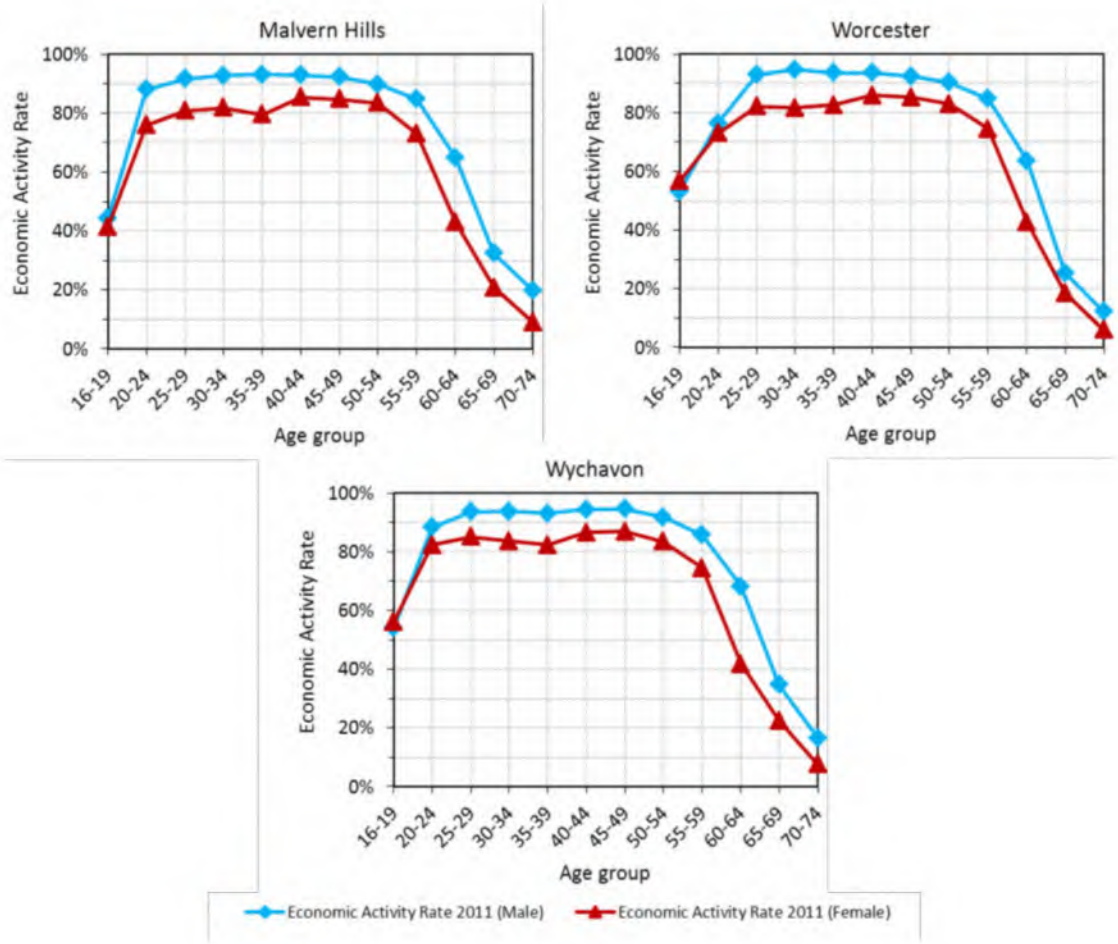


Figure 12: Economic activity rates 2011 – South Worcestershire Districts. Source: ONS

2001–2011 Economic Activity Rate Comparison

6.44 A comparison of the 2001 and 2011 economic activity rates for the three South Worcestershire districts is provided in Figure 13 and Table *17*. This comparison indicates that economic activity rates have increased in the older age groups for both males and females in each of the three districts, particularly for females, for whom rates have seen a general increase across all age-groups 20+.

6.45 In Wychavon, for example, economic activity rates increased by 93% for females aged 65-69 between 2001 and 2011 (Table *17*), compared to a 65% increase in the same age group for men. These trends in labour force participation rates are an important consideration when estimating how rates of economic activity might continue to evolve over the period of the scenario forecasts presented here.

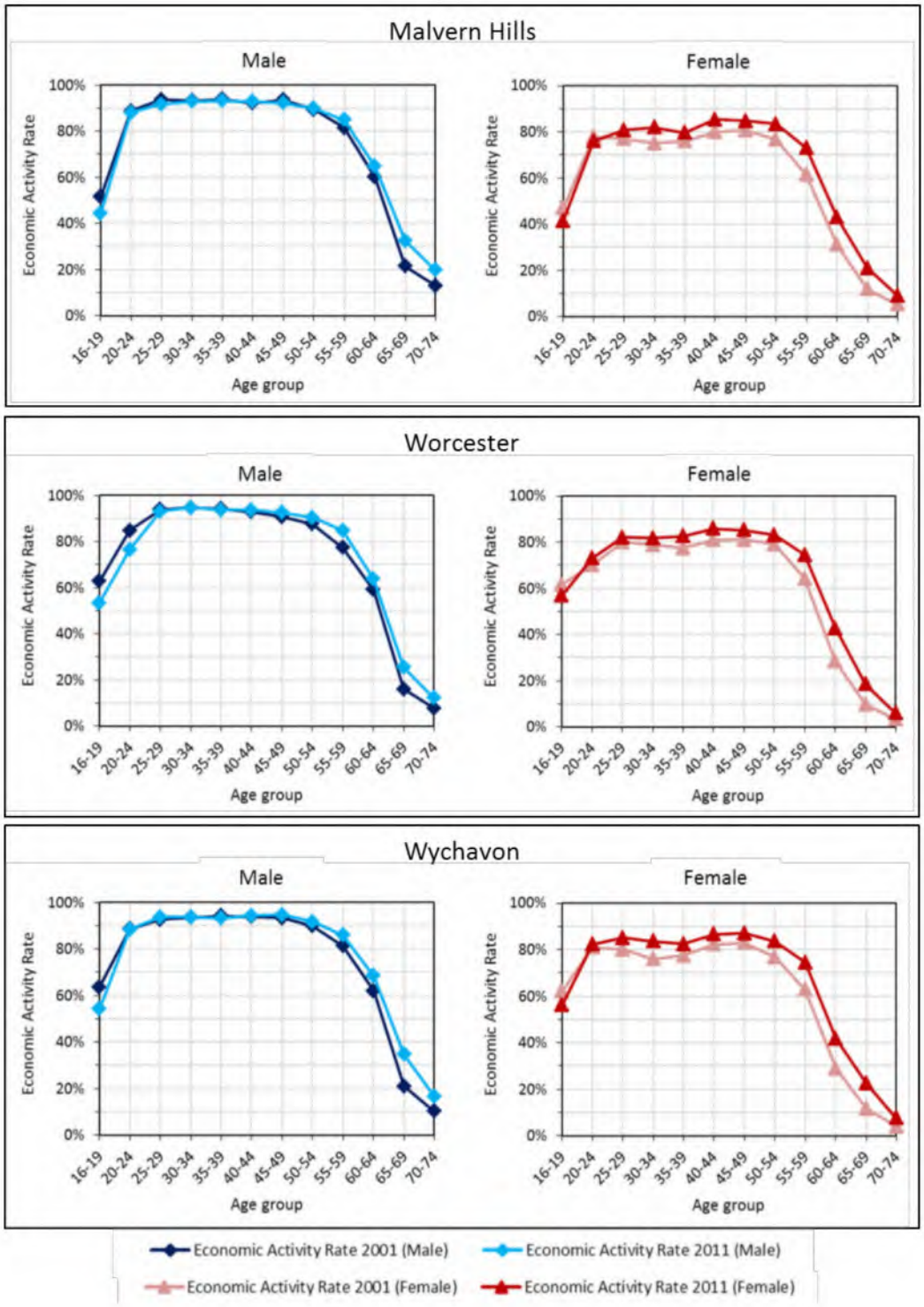


Figure 13: 2001 and 2011 Economic Activity Rate comparison

Table 17: Comparison of 2001 and 2011 Economic Activity Rates. Source: 2001 and 2011 Censuses.

Malvern Hills						
Sex	**Male**			**Female**		
Age	**2001**	**2011**	**Change 2001-2011**	**2001**	**2011**	**Change 2001-2011**
16-19	51.5%	44.4%	-14%	46.9%	41.5%	-11%
20-24	88.7%	88.1%	-1%	77.7%	76.0%	-2%
25-29	93.6%	91.7%	-2%	77.0%	80.8%	5%
30-34	93.1%	92.8%	0%	75.2%	81.9%	9%
35-39	93.8%	93.2%	-1%	76.0%	79.6%	5%
40-44	92.2%	92.9%	1%	80.0%	85.4%	7%
45-49	93.4%	92.2%	-1%	80.7%	84.7%	5%
50-54	89.4%	89.9%	1%	76.7%	83.4%	9%
55-59	81.4%	84.8%	4%	61.4%	73.1%	19%
60-64	60.2%	64.8%	8%	31.1%	42.9%	38%
65-69	21.5%	32.5%	51%	11.9%	20.9%	76%
70-74	13.1%	19.9%	52%	5.3%	9.0%	69%
Worcester						
Sex	**Male**			**Female**		
Age	**2001**	**2011**	**Change 2001-2011**	**2001**	**2011**	**Change 2001-2011**
16-19	62.7%	53.3%	-15%	61.5%	56.8%	-8%
20-24	84.7%	76.4%	-10%	70.1%	72.9%	4%
25-29	93.8%	93.0%	-1%	80.1%	82.1%	3%
30-34	94.6%	94.7%	0%	78.8%	81.7%	4%
35-39	94.2%	93.7%	-1%	77.5%	82.6%	7%
40-44	92.8%	93.7%	1%	81.0%	85.9%	6%
45-49	90.7%	92.4%	2%	81.2%	85.2%	5%
50-54	87.5%	90.4%	3%	79.1%	83.1%	5%
55-59	77.3%	84.7%	10%	64.2%	74.6%	16%
60-64	59.1%	63.8%	8%	28.4%	42.8%	51%
65-69	16.1%	25.4%	58%	9.8%	18.5%	89%
70-74	7.7%	12.2%	59%	3.3%	5.9%	81%
Wychavon						
Sex	**Male**			**Female**		
Age	**2001**	**2011**	**Change 2001-2011**	**2001**	**2011**	**Change 2001-2011**
16-19	63.7%	54.2%	-15%	62.2%	56.1%	-10%
20-24	88.6%	88.4%	0%	80.9%	82.3%	2%
25-29	92.6%	93.6%	1%	80.1%	85.1%	6%
30-34	93.5%	93.7%	0%	75.9%	83.6%	10%
35-39	94.2%	93.2%	-1%	77.4%	82.4%	6%
40-44	93.9%	94.4%	1%	82.3%	86.6%	5%
45-49	93.3%	94.6%	1%	82.9%	87.0%	5%
50-54	89.9%	91.8%	2%	76.9%	83.5%	9%
55-59	81.3%	85.8%	6%	62.8%	74.5%	19%
60-64	62.0%	68.3%	10%	28.9%	41.8%	45%
65-69	21.0%	34.7%	65%	11.7%	22.5%	93%
70-74	10.3%	16.6%	62%	4.2%	7.6%	82%

Alterations to Economic Activity Rates: Sensitivity Scenario 2

6.46 In Sensitivity Scenarios 2 and 3, changes have been made to the age-sex specific economic activity rates to take account of changes to the SPA and to accommodate potential changes in economic participation which might result from an ageing but healthier population in the older labour-force age-groups.

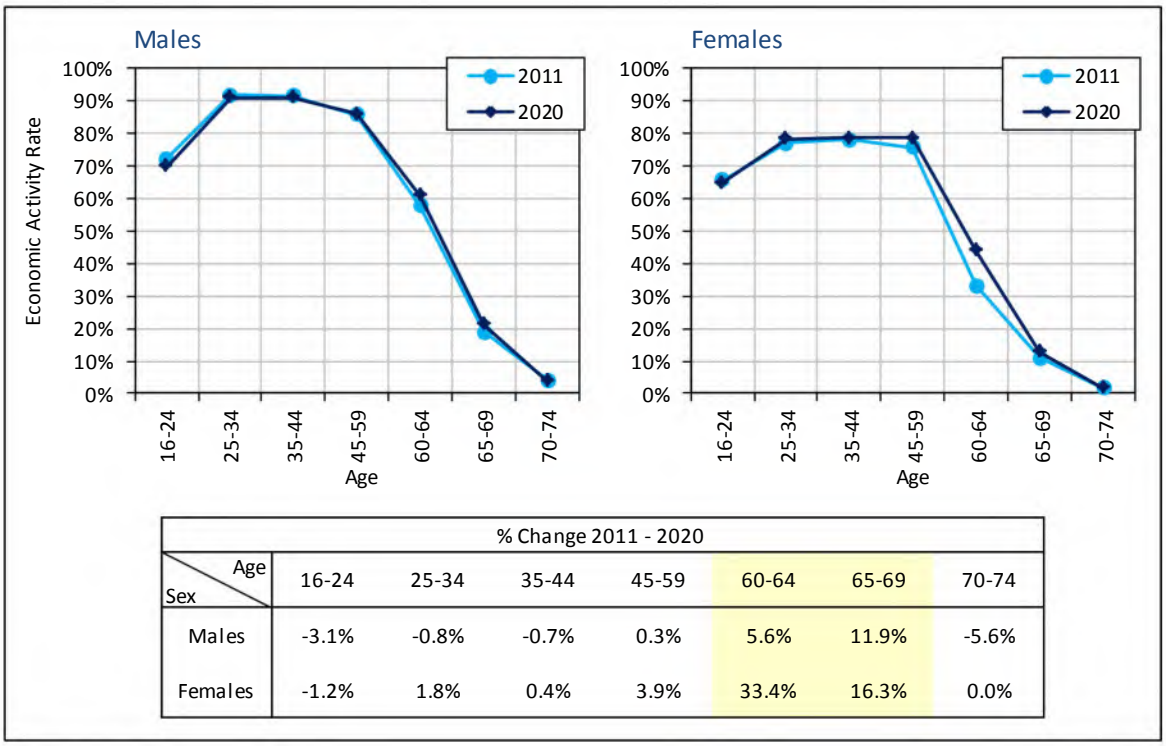
6.47 Employment forecasts (including those from Cambridge Econometrics, Oxford Economics and Experian forecasts that are used in this report) have routinely applied changes to older-age economic participation rates in the derivation of longer-term forecasts of jobs growth. It is therefore important to give these assumptions due consideration in the demographic assessment of these forecasts.

6.48 The SPA for women is increasing from 60 to 65 by 2018, bringing it in line with that for men. Between December 2018 and April 2020, the SPA for both men and women will then rise to 66. Under current legislation, the SPA will be increased to 67 between 2034 and 2036 and 68 between 2044 and 2046. It has been proposed that the rise in the SPA to 67 is brought forward to 2026–2028[14].

6.49 ONS published its last set of economic activity rate forecasts from a 2006 base[15]. These incorporated an increase in SPA for women to 65 by 2020 but this has since been altered to an accelerated transition by 2018 plus a further extension to 66 by 2020. Over the 2011–2020 period, the ONS forecasts suggested that male economic activity rates would rise by 5.6% and 11.9% in the 60-64 and 65-69 age groups respectively. Corresponding female rates would rise by 33.4% and 16.3% (Figure 14). Given the accelerated pace of change in the female SPA and the clear trends for increased female labour force participation across all age-groups in the last decade, these 2011–2020 rate increases would appear to be relatively conservative assumptions.

[14] https://www.gov.uk/changes-state-pension

[15] ONS January 2006, Projections of the UK labour force, 2006 to 2020 http://www.ons.gov.uk/ons/rel/lms/labour-market-trends--discontinued-/volume-114--no--1/projections-of-the-uk-labour-force--2006-to-2020.pdf



% Change 2011 - 2020							
Sex \ Age	16-24	25-34	35-44	45-59	60-64	65-69	70-74
Males	-3.1%	-0.8%	-0.7%	0.3%	5.6%	11.9%	-5.6%
Females	-1.2%	1.8%	0.4%	3.9%	33.4%	16.3%	0.0%

Figure 14: ONS Labour Force Projection 2006 – Economic Activity Rates 2011–2020. Data source: ONS

6.50 To take account of planned changes to the SPA, the following modifications have been made to the economic activity rates in 'Sensitivity Scenarios 2':

- Women aged 60-64: 40% increase from 2012 to 2020.
- Women aged 65-69: 20% increase from 2012 to 2020.
- Men aged 60-64: 5% increase from 2012 to 2020.
- Men aged 65-69: 10% increase from 2012 to 2020.

6.51 Changes have been applied incrementally over the 2012–2020 period. Note that the rates for women in the 60–64 age and 65–69 age-groups are higher than the original ONS figures, accounting for the accelerated pace of change in the SPA. No changes have been applied to other age-groups. In addition, no changes have been applied to economic activity rates beyond 2020. This is an appropriately prudent approach given the uncertainty associated with forecasting future rates of economic participation.

6.52 These alternative economic activity rates are presented as realistic and robust alternatives to the very unlikely scenario of 'fixed' rates over the forecast period. A detailed illustration of the changes that have been applied to the economic activity rates in each of the jobs-led scenarios in Sensitivity Scenario 2 are summarised in Table 18 and Figure 15.

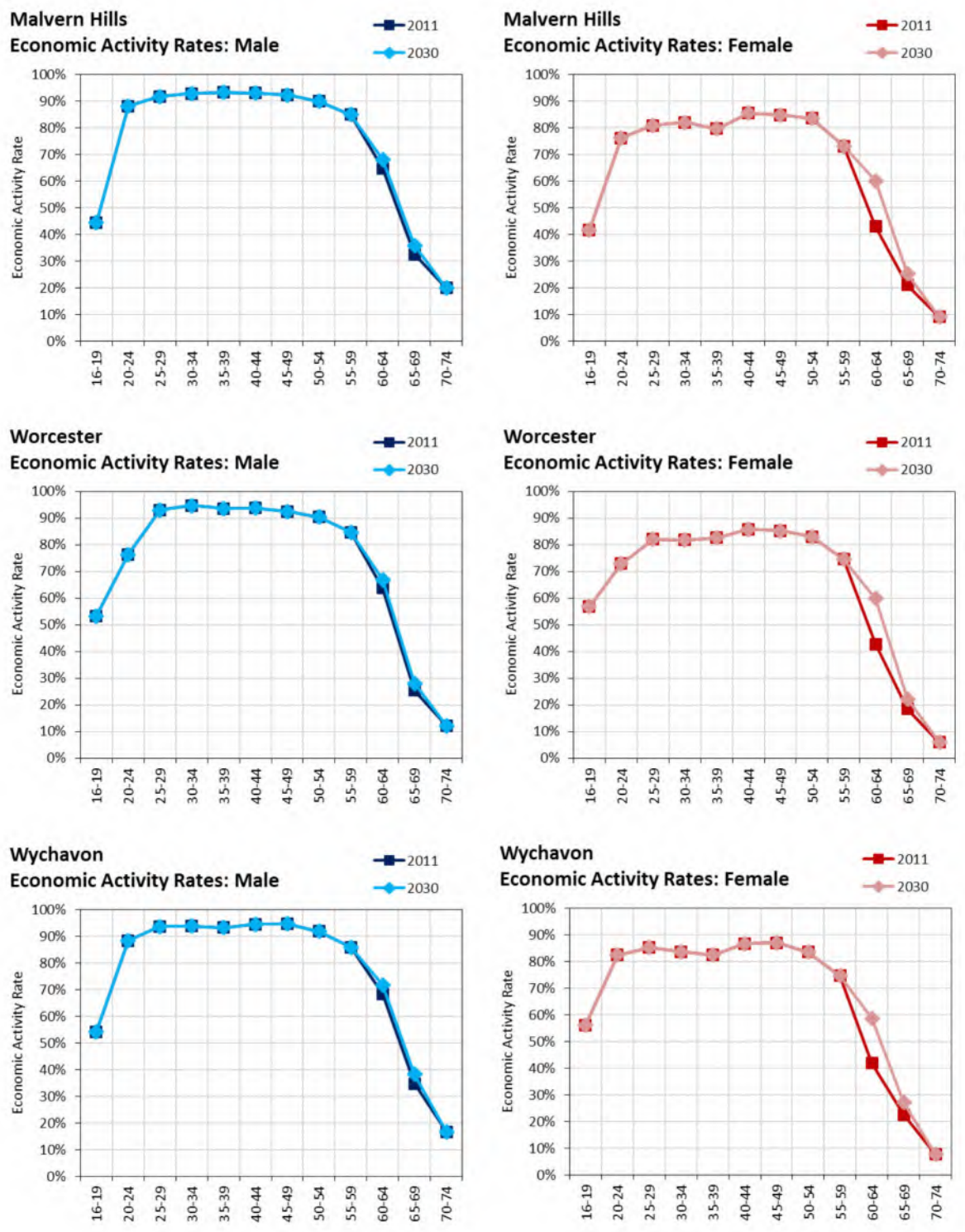


Figure 15: 'Sensitivity Scenario 2' Economic Activity Rate profiles

Table 18: 'Sensitivity Scenario 2' Economic Activity Rate alterations. Changes are highlighted in blue.

Malvern Hills (Sensitivity Scenario 2 Economic Activity Rates)						
Sex	Male			Female		
Age	2011	2030	Change 2011-2020	2011	2030	Change 2011-2030
16-19	44.4%	44.4%	0%	41.5%	41.5%	0%
20-24	88.1%	88.1%	0%	76.0%	76.0%	0%
25-29	91.7%	91.7%	0%	80.8%	80.8%	0%
30-34	92.8%	92.8%	0%	81.9%	81.9%	0%
35-39	93.2%	93.2%	0%	79.6%	79.6%	0%
40-44	92.9%	92.9%	0%	85.4%	85.4%	0%
45-49	92.2%	92.2%	0%	84.7%	84.7%	0%
50-54	89.9%	89.9%	0%	83.4%	83.4%	0%
55-59	84.8%	84.8%	0%	73.1%	73.1%	0%
60-64	64.8%	68.0%	5%	42.9%	60.1%	40%
65-69	32.5%	35.8%	10%	20.9%	25.1%	20%
70-74	19.9%	19.9%	0%	9.0%	9.0%	0%

Worcester (Sensitivity Scenario 2 Economic Activity Rates)						
Sex	Male			Female		
Age	2011	2030	Change 2011-2020	2011	2030	Change 2011-2030
16-19	53.3%	53.3%	0%	56.8%	56.8%	0%
20-24	76.4%	76.4%	0%	72.9%	72.9%	0%
25-29	93.0%	93.0%	0%	82.1%	82.1%	0%
30-34	94.7%	94.7%	0%	81.7%	81.7%	0%
35-39	93.7%	93.7%	0%	82.6%	82.6%	0%
40-44	93.7%	93.7%	0%	85.9%	85.9%	0%
45-49	92.4%	92.4%	0%	85.2%	85.2%	0%
50-54	90.4%	90.4%	0%	83.1%	83.1%	0%
55-59	84.7%	84.7%	0%	74.6%	74.6%	0%
60-64	63.8%	67.0%	5%	42.8%	59.9%	40%
65-69	25.4%	28.0%	10%	18.5%	22.2%	20%
70-74	12.2%	12.2%	0%	5.9%	5.9%	0%

Wychavon (Sensitivity Scenario 2 Economic Activity Rates)						
Sex	Male			Female		
Age	2011	2030	Change 2011-2020	2011	2030	Change 2011-2030
16-19	54.2%	54.2%	0%	56.1%	56.1%	0%
20-24	88.4%	88.4%	0%	82.3%	82.3%	0%
25-29	93.6%	93.6%	0%	85.1%	85.1%	0%
30-34	93.7%	93.7%	0%	83.6%	83.6%	0%
35-39	93.2%	93.2%	0%	82.4%	82.4%	0%
40-44	94.4%	94.4%	0%	86.6%	86.6%	0%
45-49	94.6%	94.6%	0%	87.0%	87.0%	0%
50-54	91.8%	91.8%	0%	83.5%	83.5%	0%
55-59	85.8%	85.8%	0%	74.5%	74.5%	0%
60-64	68.3%	71.7%	5%	41.8%	58.6%	40%
65-69	34.7%	38.2%	10%	22.5%	27.0%	20%
70-74	16.6%	16.6%	0%	7.6%	7.6%	0%

Alternative economic activity rate assumptions (NLP)

6.53 Alterations to economic activity rates in the older ages groups have also been made by Nathaniel Litchfield & Partners (NLP) in its SWDP 'Updated Assessment of Housing Requirements to Inform Examination Matter 1' report, published in September 2013[16]. The changes made to economic activity rates by NLP are as follows:

- For females aged 60-64, an 8% increase between 2010 and 2018
- For males and females aged 65 to 69, a 2% rise between 2018 and 2020.

6.54 These rises will have been applied to economic activity rate profiles prior to any new 2011 Census statistics being released. In addition, it is unclear whether these changes have been applied as a percentage uplift to the rates or as a percentage point increase. For example, an 8% increase to a 60-64 female economic activity rate of 30% would result in a 32.4% figure. Alternatively, a rise of 8 percentage points would results in a figure of 38%. Further clarification would be required to enable a more direct comparison of the NLP assumptions with those presented here.

Alterations to Economic Activity Rates: Sensitivity Scenario 3

6.55 In 'Sensitivity Scenario 3', the base 2011 Census economic activity rates have been modified; firstly, to account for planned changes to the SPA; and secondly to ensure consistency with the assumptions being made within the Cambridge Econometrics, Oxford Economics and Experian employment forecasts. These changes have been made following recommendations from AMION Consulting (for information on these changes please refer to Annex 1 of Appendix C of the 'South Worcestershire Development Plan Objective Assessment of Housing Need January 2014' report, produced by AMION Consulting).

6.56 The changes applied in the 'Jobs-led Experian' scenario are summarised in Table 20 and Figure 17. The changes applied in the 'Jobs-led Oxford' scenario are summarised in Table 19 and Figure 16. The changes applied in the 'Jobs-led Cambridge' scenario are summarised in Table 21 and Figure 18.

[16] South Worcestershire Development Plan, Updated Assessment of Housing Requirements to Inform Examination Matter 1. NLP, 6 September
http://www.swdevelopmentplan.org/wp-content/uploads/2013/02/Miller-Homes-M1-Appendix.pdf

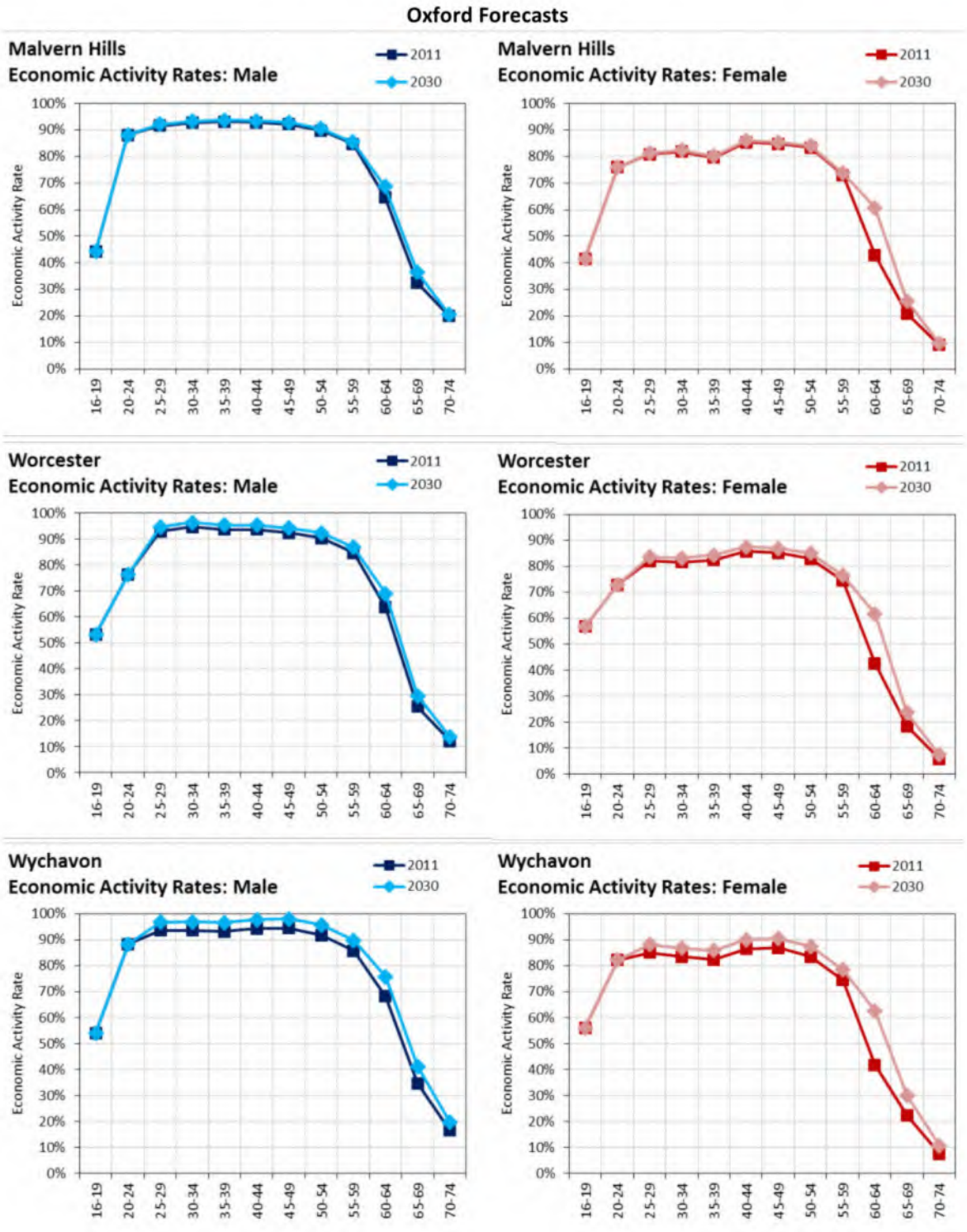


Figure 16: 'Sensitivity Scenario 3' Economic Activity Rate profiles used in the 'Jobs-led Oxford' scenario

Table 19: 'Sensitivity Scenario 3' Economic Activity Rate alterations for the 'Jobs-led Oxford' scenario

Malvern Hills (Sensitivity Scenario 3 Economic Activity Rates) Oxford						
Sex	Male			Female		
Age	2011	2030	Change 2011-2030	2011	2030	Change 2011-2030
16-19	44.4%	44.4%	0%	41.5%	41.5%	0%
20-24	88.1%	88.1%	0%	76.0%	76.0%	0%
25-29	91.7%	92.2%	1%	80.8%	81.4%	1%
30-34	92.8%	93.4%	1%	81.9%	82.4%	1%
35-39	93.2%	93.8%	1%	79.6%	80.2%	1%
40-44	92.9%	93.5%	1%	85.4%	86.0%	1%
45-49	92.2%	92.9%	1%	84.7%	85.4%	1%
50-54	89.9%	90.6%	1%	83.4%	84.1%	1%
55-59	84.8%	85.5%	1%	73.1%	73.8%	1%
60-64	64.8%	68.7%	6%	42.9%	60.8%	42%
65-69	32.5%	36.3%	12%	20.9%	25.6%	23%
70-74	19.9%	20.4%	3%	9.0%	9.6%	6%

Worcester (Sensitivity Scenario 3 Economic Activity Rates) Oxford						
Sex	Male			Female		
Age	2011	2030	Change 2011-2030	2011	2030	Change 2011-2030
16-19	53.3%	53.3%	0%	56.8%	56.8%	0%
20-24	76.4%	76.4%	0%	72.9%	72.9%	0%
25-29	93.0%	94.6%	2%	82.1%	83.7%	2%
30-34	94.7%	96.3%	2%	81.7%	83.3%	2%
35-39	93.7%	95.4%	2%	82.6%	84.4%	2%
40-44	93.7%	95.5%	2%	85.9%	87.6%	2%
45-49	92.4%	94.2%	2%	85.2%	87.0%	2%
50-54	90.4%	92.5%	2%	83.1%	85.1%	2%
55-59	84.7%	86.8%	2%	74.6%	76.6%	3%
60-64	63.8%	69.0%	8%	42.8%	61.9%	45%
65-69	25.4%	29.5%	16%	18.5%	23.8%	28%
70-74	12.2%	13.8%	13%	5.9%	7.5%	26%

Wychavon (Sensitivity Scenario 3 Economic Activity Rates) Oxford						
Sex	Male			Female		
Age	2011	2030	Change 2011-2030	2011	2030	Change 2011-2030
16-19	54.2%	54.2%	0%	56.1%	56.1%	0%
20-24	88.4%	88.4%	0%	82.3%	82.3%	0%
25-29	93.6%	96.8%	3%	85.1%	88.3%	4%
30-34	93.7%	96.9%	3%	83.6%	86.8%	4%
35-39	93.2%	96.7%	4%	82.4%	85.9%	4%
40-44	94.4%	97.9%	4%	86.6%	90.1%	4%
45-49	94.6%	98.1%	4%	87.0%	90.5%	4%
50-54	91.8%	95.8%	4%	83.5%	87.6%	5%
55-59	85.8%	89.9%	5%	74.5%	78.6%	5%
60-64	68.3%	75.8%	11%	41.8%	62.7%	50%
65-69	34.7%	41.3%	19%	22.5%	30.2%	34%
70-74	16.6%	19.7%	19%	7.6%	10.7%	41%

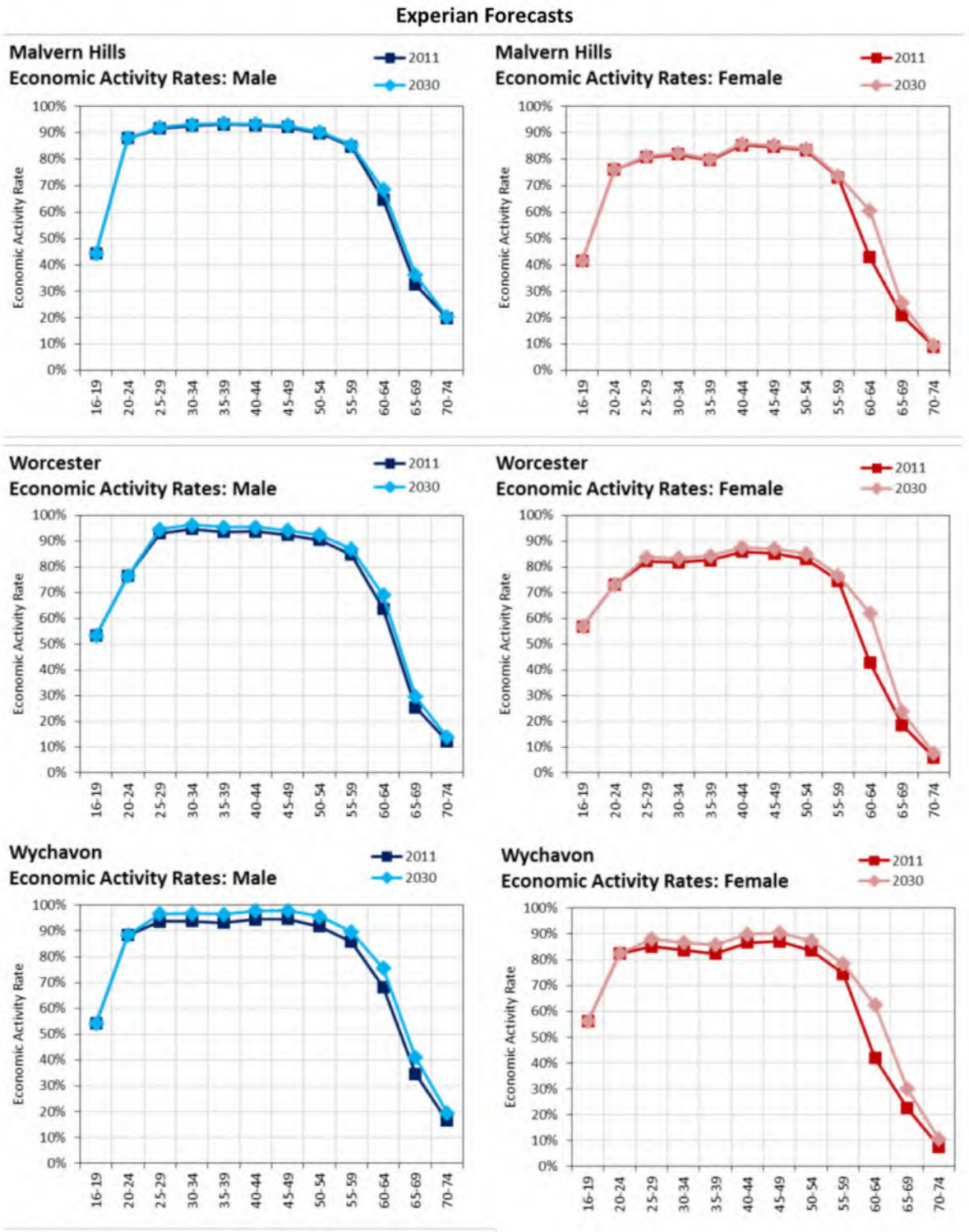


Figure 17: 'Sensitivity Scenario 3' Economic Activity Rate profiles used in the 'Jobs-led Experian' scenario

Table 20: 'Sensitivity Scenario 3' Economic Activity Rate alterations for the 'Jobs-led Experian' scenario

Malvern Hills (Sensitivity Scenario 3 Economic Activity Rates) Experian						
Sex	Male			Female		
Age	2011	2030	Change 2011-2030	2011	2030	Change 2011-2030
16-19	44.4%	44.4%	0%	41.5%	41.5%	0%
20-24	88.1%	88.1%	0%	76.0%	76.0%	0%
25-29	91.7%	92.1%	0%	80.8%	81.3%	1%
30-34	92.8%	93.2%	0%	81.9%	82.3%	1%
35-39	93.2%	93.6%	1%	79.6%	80.1%	1%
40-44	92.9%	93.4%	1%	85.4%	85.9%	1%
45-49	92.2%	92.7%	1%	84.7%	85.2%	1%
50-54	89.9%	90.4%	1%	83.4%	84.0%	1%
55-59	84.8%	85.4%	1%	73.1%	73.7%	1%
60-64	64.8%	68.6%	6%	42.9%	60.6%	41%
65-69	32.5%	36.2%	11%	20.9%	25.5%	22%
70-74	19.9%	20.3%	2%	9.0%	9.4%	5%

Worcester (Sensitivity Scenario 3 Economic Activity Rates) Experian						
Sex	Male			Female		
Age	2011	2030	Change 2011-2030	2011	2030	Change 2011-2030
16-19	53.3%	53.3%	0%	56.8%	56.8%	0%
20-24	76.4%	76.4%	0%	72.9%	72.9%	0%
25-29	93.0%	94.6%	2%	82.1%	83.7%	2%
30-34	94.7%	96.3%	2%	81.7%	83.4%	2%
35-39	93.7%	95.4%	2%	82.6%	84.4%	2%
40-44	93.7%	95.5%	2%	85.9%	87.6%	2%
45-49	92.4%	94.2%	2%	85.2%	87.0%	2%
50-54	90.4%	92.5%	2%	83.1%	85.1%	2%
55-59	84.7%	86.8%	2%	74.6%	76.6%	3%
60-64	63.8%	69.0%	8%	42.8%	61.9%	45%
65-69	25.4%	29.6%	16%	18.5%	23.8%	29%
70-74	12.2%	13.8%	13%	5.9%	7.5%	27%

Wychavon (Sensitivity Scenario 3 Economic Activity Rates) Experian						
Sex	Male			Female		
Age	2011	2030	Change 2011-2030	2011	2030	Change 2011-2030
16-19	54.2%	54.2%	0%	56.1%	56.1%	0%
20-24	88.4%	88.4%	0%	82.3%	82.3%	0%
25-29	93.6%	96.6%	3%	85.1%	88.1%	4%
30-34	93.7%	96.7%	3%	83.6%	86.6%	4%
35-39	93.2%	96.5%	4%	82.4%	85.7%	4%
40-44	94.4%	97.7%	3%	86.6%	89.9%	4%
45-49	94.6%	97.9%	3%	87.0%	90.3%	4%
50-54	91.8%	95.6%	4%	83.5%	87.3%	5%
55-59	85.8%	89.7%	4%	74.5%	78.4%	5%
60-64	68.3%	75.6%	11%	41.8%	62.4%	49%
65-69	34.7%	41.1%	18%	22.5%	30.0%	33%
70-74	16.6%	19.5%	18%	7.6%	10.5%	39%

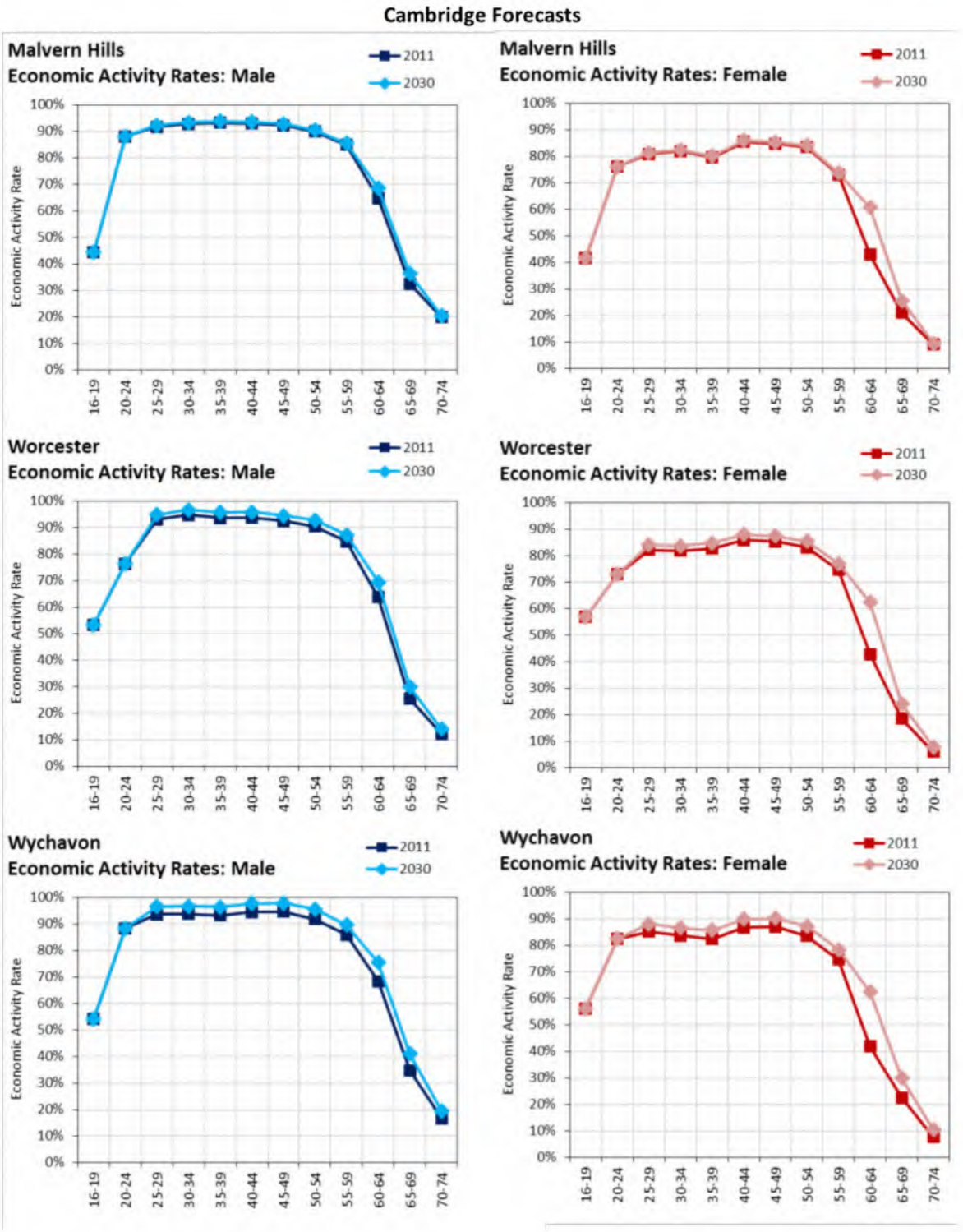


Figure 18: 'Sensitivity Scenario 3' Economic Activity Rate profiles used in the 'Jobs-led Cambridge' scenario

Table 21: 'Sensitivity Scenario 3' Economic Activity Rate alterations for the 'Jobs-led Cambridge' scenario

Malvern Hills (Sensitivity Scenario 3 Economic Activity Rates) Cambridge						
Sex	**Male**			**Female**		
Age	**2011**	**2030**	**Change 2011-2030**	**2011**	**2030**	**Change 2011-2030**
16-19	44.4%	44.4%	0%	41.5%	41.5%	0%
20-24	88.1%	88.1%	0%	76.0%	76.0%	0%
25-29	91.7%	92.2%	1%	80.8%	81.3%	1%
30-34	92.8%	93.3%	1%	81.9%	82.4%	1%
35-39	93.2%	93.7%	1%	79.6%	80.1%	1%
40-44	92.9%	93.4%	1%	85.4%	85.9%	1%
45-49	92.2%	92.8%	1%	84.7%	85.3%	1%
50-54	89.9%	90.5%	1%	83.4%	84.0%	1%
55-59	84.8%	85.5%	1%	73.1%	73.7%	1%
60-64	64.8%	68.6%	6%	42.9%	60.7%	41%
65-69	32.5%	36.3%	11%	20.9%	25.6%	22%
70-74	19.9%	20.4%	2%	9.0%	9.5%	5%

Worcester (Sensitivity Scenario 3 Economic Activity Rates) Cambridge						
Sex	**Male**			**Female**		
Age	**2011**	**2030**	**Change 2011-2030**	**2011**	**2030**	**Change 2011-2030**
16-19	53.3%	53.3%	0%	56.8%	56.8%	0%
20-24	76.4%	76.4%	0%	72.9%	72.9%	0%
25-29	93.0%	94.9%	2%	82.1%	84.0%	2%
30-34	94.7%	96.6%	2%	81.7%	83.6%	2%
35-39	93.7%	95.7%	2%	82.6%	84.7%	3%
40-44	93.7%	95.8%	2%	85.9%	87.9%	2%
45-49	92.4%	94.5%	2%	85.2%	87.3%	2%
50-54	90.4%	92.8%	3%	83.1%	85.5%	3%
55-59	84.7%	87.2%	3%	74.6%	77.0%	3%
60-64	63.8%	69.4%	9%	42.8%	62.3%	46%
65-69	25.4%	29.8%	17%	18.5%	24.1%	30%
70-74	12.2%	14.1%	15%	5.9%	7.8%	31%

Wychavon (Sensitivity Scenario 3 Economic Activity Rates) Cambridge						
Sex	**Male**			**Female**		
Age	**2011**	**2030**	**Change 2011-2030**	**2011**	**2030**	**Change 2011-2030**
16-19	54.2%	54.2%	0%	56.1%	56.1%	0%
20-24	88.4%	88.4%	0%	82.3%	82.3%	0%
25-29	93.6%	96.5%	3%	85.1%	88.0%	3%
30-34	93.7%	96.6%	3%	83.6%	86.5%	3%
35-39	93.2%	96.4%	3%	82.4%	85.6%	4%
40-44	94.4%	97.6%	3%	86.6%	89.8%	4%
45-49	94.6%	97.8%	3%	87.0%	90.2%	4%
50-54	91.8%	95.5%	4%	83.5%	87.3%	4%
55-59	85.8%	89.6%	4%	74.5%	78.3%	5%
60-64	68.3%	75.5%	10%	41.8%	62.3%	49%
65-69	34.7%	41.0%	18%	22.5%	29.9%	33%
70-74	16.6%	19.5%	17%	7.6%	10.4%	38%

Unemployment Rate

6.57 For each scenario (excluding the jobs-led scenarios), the labour force and jobs implications of the population growth trajectory have been evaluated through the application of three key data items: economic activity rates, a commuting ratio and an unemployment rate. In the jobs-led scenarios, these three data items are used to determine the population growth required by a particular jobs growth trajectory.

6.58 The unemployment rate, together with the commuting ratio, controls the balance between the size of the labour force and the number of jobs available within an area.

Historical Unemployment Rates

6.59 Unemployment statistics from NOMIS provide an indication of the variation in the unemployment rate since 2004/05. Whilst sampling issues introduce some uncertainty to the data, a 5-year and a 9-year average is presented to give an indication of how unemployment has altered during the recessionary period (Table 22).

Table 22: Historical unemployment rates for the three South Worcestershire districts. Source: Annual Population Survey, NOMIS

Date	Unemployment Rate (%)		
	Malvern Hills	Worcester	Wychavon
2004/05	2.9	2.4	0.8
2005/06	-	6.4	4.0
2006/07	2.4	2.8	3.4
2007/08	3.8	-	3.3
2008/09	3.3	3.9	4.4
2009/10	-	3.2	3.7
2010/11	5.7	5.0	2.0
2011/12	8.2	6.5	4.3
2012/13	3.0	6.7	4.6
Maximum	8.2	6.7	4.6
Minimum	2.4	2.4	2.0
9yr Average	**4.2**	**4.6**	**3.4**
5yr Average	**5.1**	**5.1**	**3.8**

Note: These figures are July to June unemployment rates. – indicates missing data

6.60 On average, the unemployment rate would need to reduce by 17% across Worcestershire if the 5-year average was to revert to its 9-year equivalent (Table 23).

Table 23: Unemployment rates for the six Worcestershire districts. Source: Annual Population Survey, NOMIS

	Unemployment Rate % (9 year average)	Unemployment Rate % (5 year average)	% change	5yr unemployment reduced by 17%
Bromsgrove	5.1	5.8	-13%	4.8
Malvern Hills	4.2	5.1	-21%	4.2
Redditch	5.3	6.5	-24%	5.4
Worcester	4.6	5.1	-10%	4.2
Wychavon	3.4	3.8	-12%	3.1
Wyre Forest	5.7	6.9	-21%	5.7
		Average	**-17%**	

Note: 9 year average from 2004/05 to 2012/13 and the 5 year average from 2008/09 to 2012/13

Core Scenarios

6.61 An average unemployment rate for ages 16+ has been calculated from the APS unemployment statistics for the nine-year period 2004/05–2012/13 (Table 22). For each of the three South Worcestershire districts, this nine-year average has been used in the core scenarios:

- Malvern Hills 4.2%
- Worcester 4.6%
- Wychavon 3.4%

6.62 For the core scenario analysis, the unemployment rate is fixed throughout the forecast period.

Sensitivity Scenario 2

6.63 In 'Sensitivity Scenario 2', the unemployment rate has been modified to account for a period of recovery post-2013. These assumptions assume that an initial unemployment rate is defined based upon the average for the last five years (2008/09–2012/13) (see Table 22). Over the 2013–2020 forecast period, these initial unemployment rates have been incrementally reduced and remain fixed thereafter (Table 24). The reduction in unemployment is equivalent to the (17%) average difference between the 9 year and 5 year unemployment rates for the six Worcestershire districts (Table 23).

Table 24: Sensitivity Scenarios 2 unemployment rates

District	Unemployment Rate 2013	Unemployment Rate 2020	Change
Malvern Hills	5.1%	4.2%	-0.9
Worcester	5.1%	4.2%	-0.9
Wychavon	3.8%	3.1%	-0.7

6.64 These improvements to unemployment rates are considered to be quite conservative but do provide an appropriate basis for what is likely to be a gradual recovery from current economic conditions.

6.65 The most recent unemployment statistics, published by ONS in January 2014, suggest that unemployment rates continue to fall; for the West Midlands, the unemployment rate was down 1.3 percentage points from June to August 2013 and down 0.8 from a year earlier[17].

Sensitivity Scenario 3

6.66 In 'Sensitivity Scenario 3', the unemployment rate has been reduced over the forecast period (2012–2030). These modifications have been made using an index based on the Experian employment forecast (for information on these changes please refer to Annex 1 of Appendix C of the 'South Worcestershire Development Plan Objective Assessment of Housing Need January 2014' report, produced by AMION Consulting). The changes to the unemployment rates are summarised in Figure 19.

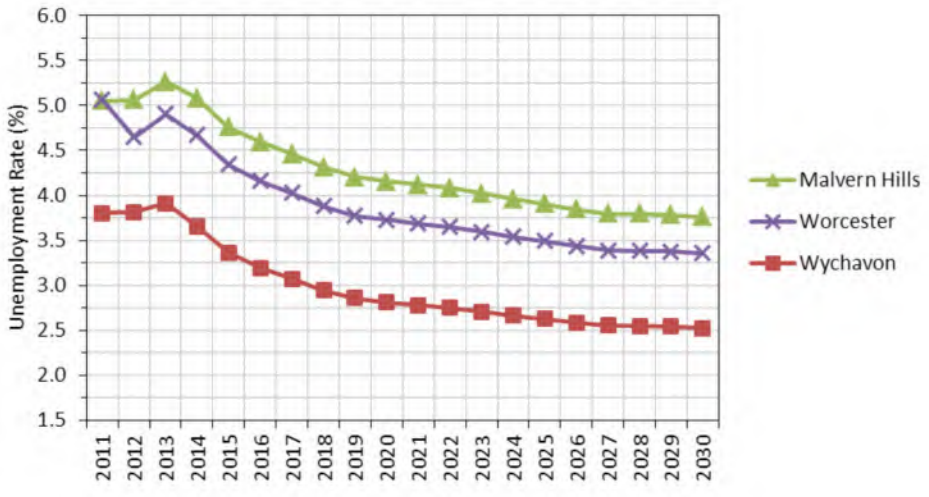


Figure 19: SENS2 unemployment rates

[17] Labour Market Statistics, January 2014. ONS Statistical Bulletin http://www.ons.gov.uk/ons/dcp171778_347785.pdf

Commuting Ratio

6.67 For each scenario (excluding the jobs-led scenarios), the labour force and jobs implications of the population growth trajectory have been evaluated through the application of three key data items: economic activity rates, a commuting ratio and an unemployment rate. In the jobs-led scenarios, these three data items are used to determine the population growth required by a particular jobs growth trajectory.

6.68 The commuting ratio, together with the unemployment rate, controls the balance between the size of the labour force and the number of jobs available within an area.

6.69 Information on commuting from the 2011 Census has not yet been published. Using a combination of statistics from the 2011 Census, commuting ratios have been derived by Edge Analytics for each of the three South Worcestershire districts. In all the scenarios (both 'core' and sensitivity) these rates are 'fixed' and held constant for the forecast period 2012 to 2030.

6.70 The commuting ratio is the balance between the number of workers living in a district (i.e. the resident labour force) and the number of jobs available in the district. The number of workers includes all economically active residents (i.e. all residents aged 16–74). The number of jobs has been calculated by subtracting the number of residents not in employment and the number of residents aged 0–15 and those aged 75+ from the district's workday population.

6.71 The derived 2011 commuting ratios for Malvern Hills, Worcester and Wychavon are shown below in Table 25. For comparison, these are presented alongside the 2001 commuting ratios, derived from 2001 Census statistics. In the case of the 2001 commuting ratio, 'workers' and 'jobs' are both derived from aggregating the travel-to-work statistics.

6.72 A commuting ratio greater than 1 indicates that the size of the resident workforce exceeds the number of jobs available in the district, resulting in a net out-commute. This is the case in both Malvern Hills and Wychavon, whereas in Worcester, the 2011 commuting ratio is 0.938, indicating a net in-commute.

Table 25: Commuting ratio comparison

Malvern Hills		2001 Census	2011 Census
Workers	*a*	34,337	33,349
WorkDay Population			71,399
minus those not in Work			*20,163*
minus 0-15 yr olds			*12,412*
minus 75+			*8,707*
Jobs	*b*	28,683	30,117
Commuting Ratio	*a/b*	**1.197**	**1.107**

Worcester		2001 Census	2011 Census
Workers	*a*	48,021	47,532
WorkDay Population			101,926
minus those not in Work			*25,850*
minus 0-15 yr olds			*18,477*
minus 75+			*6,909*
Jobs	*b*	51,759	50,690
Commuting Ratio	*a/b*	**0.928**	**0.938**

Wychavon		2001 Census	2011 Census
Workers	*a*	58,045	56,459
WorkDay Population			112,724
minus those not in Work			*29,022*
minus 0-15 yr olds			*19,905*
minus 75+			*11,558*
Jobs	*b*	50,743	52,239
Commuting Ratio	*a/b*	**1.144**	**1.081**

Appendix C – The future housing market in South Worcestershire

Introduction

C.1 This Appendix sets out further detailed evidence in respect of the assessment of housing need for the South Worcestershire area and its three component local authorities (Malvern Hills, Worcester City and Wychavon). It updates and follows the format of Chapter 6 of the February 2012 Strategic Housing Market Assessment (SHMA) Main Report that presented findings on the future housing market in Worcestershire. The results of a range of housing need forecasts produced by Edge Analytics Ltd using the POPGROUP model are reported.

C.2 Nationally the population is rising. The resultant growth in terms of demand for housing is compounded further by falling average household sizes. The result nationally is a well-documented apparent mismatch between current and future supply and demand for housing.

C.3 Under the previous Government, regionally set housing targets were an important component of the planning process in enabling levels of development which addressed this imbalance both locally and cumulatively at a national level. These regional statutory targets have been revoked. The analysis presented here represents an important part of ensuring that the South Worcestershire Councils continue to take a dynamic perspective of demand to inform future planning policy.

The Approach

C.4 Housing requirements are intrinsically linked to the size and structure of the population. Projections of future population have been produced using four broad scenarios, namely:

A. Core Scenario 1 - ONS 2010-based Sub-National Population Projections (SNPP). This dataset is presented primarily as a benchmark against which to compare alternative scenarios.

B. Core Scenario 2 - Natural Change. Under this scenario population projections are modelled based on the impact of 'no migration', where the only drivers of growth are births and deaths in an authority. While this represents a hypothetical position, it does, however, provide an important insight into the anticipated levels of population change which will occur from locally generated demographic pressures alone;

C. Core Scenario 3 – Migration-Led. This trend-based approach includes two alternative 'migration-led' scenario alternatives and draws upon 2012 data on births, deaths and migration from the mid-year estimates released by the ONS. One scenario is based on a typical time-frame of 5 years (2007/08-2011/12). The second is based on a 10 year trend analysis (2002/03 – 2011/12) and has been developed in case the major economic upheavals since 2008 have resulted in trends that in the longer term would be atypical.

D. Core Scenario 4 - Employment-constrained: Three alternative scenarios have been produced using the new economic forecasts for each district produced by Cambridge Econometrics, Oxford Economics and Experian. The demographic implications of each forecast have been examined and applied to the population forecasts produced under Core Scenario 3. Net in-migration will occur if the size of the labour force is insufficient to match the number of jobs forecast to be created. Three key parameters determine

the balance of migration (population change) that is required to match the size of the labour force and the anticipated jobs growth:

- economic activity rates;
- unemployment rate; and
- commuting ratio.

The 'core' scenarios presented have assumed that these rates are constant over the forecasting period. In reality they will change and as a consequence so will the relationship between jobs growth and population growth (and therefore housing demand). Accordingly, further sets of projections have also been produced using modified assumptions regarding activity, unemployment rates and commuting ratios in order to better reflect actual labour market dynamics.

C.6 The household and dwelling implications of each population forecast scenario have then been estimated through the application of a communal population adjustment (based on 2011 Census data), household headship rates and a dwelling vacancy rate.

C.7 Household headship rates were taken from the CLG 2008-based and 2011-based household projections. For the 'core' scenarios presented here, the CLG 2011-based headship rates was applied for the period to 2021, reverting to the 2008-based rate of change in headship rates thereafter. Additional sensitivity analysis was also conducted applying the original 2008-based and 2011-based headship rate assumptions over the full period.

C.8 The subsequent conversion of households to dwellings was based on a 'vacancy rate', taking account of both vacant properties and second homes.

The Results – Core Scenarios

C.9 Results from each of the core scenarios are considered in turn below. These are then brought together at the end of the section in a summary table comparing the differing levels of household change overall and per annum under each scenario. A number of sensitivities are then explored based on the analysis prior to the presentation of a range of net dwelling requirements, which could be used to inform policy.

(ii) Core Scenario 1 – Sub-National Population Projections (SNPP)

C.10 Table C1 shows the projected uplift in the private household population, change in household size and the resultant projected change in households between 2006 and 2030, including an average annualised figure under Core Scenario 1.

Table C1: Core Scenario 1 - Population and Household Projection data

Scenario 1 – sub-National Population Projections (SNPP)	Private Household Population			Household size			Households			
	2006	2030	Change 2006-2030	2006	2030	Change 2006 – 2030	2006	2030	Change 2006-2030	Annual change (24 yrs)
Malvern Hills	71,248	78,042	6,794	2.29	2.13	-0.16	31,105	36,633	5,528	230
Worcester City	93,663	106,289	12,626	2.32	2.21	-0.12	40,318	48,185	7,867	328
Wychavon	113,932	127,019	13,088	2.36	2.27	-0.09	48,333	55,998	7,665	319
South Worcestershire	278,842	311,350	32,508	2.33	2.21	-0.12	119,756	140,816	21,060	878

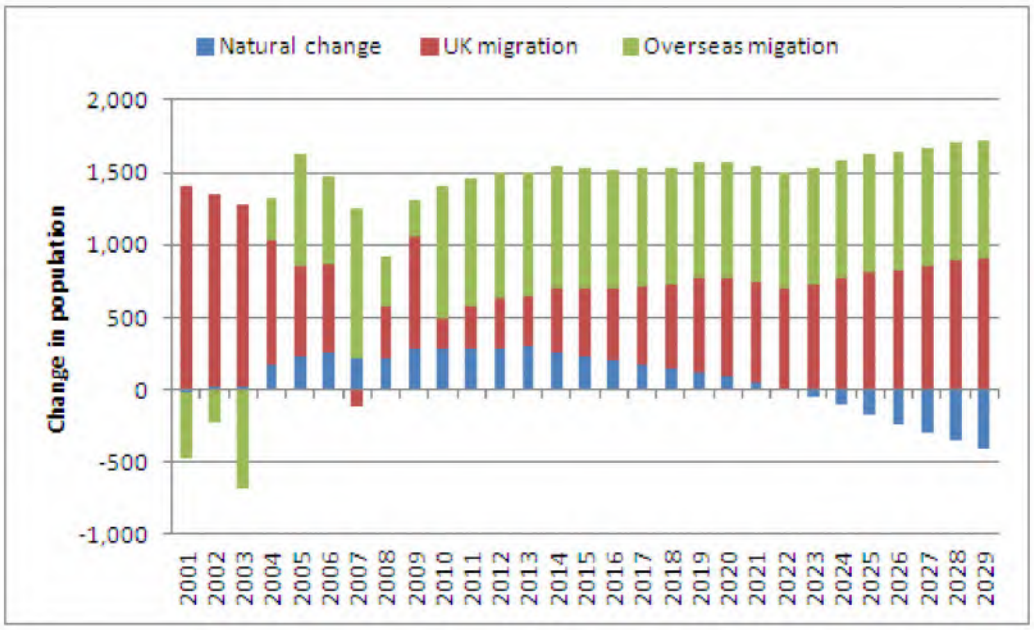
Source: Edge Analytics, 2014, AMION, 2014, ONS, 2010

C.11 The SNPP projects a growth of population in all of the authorities. Rates of projected growth range from 9.9% in Malvern Hills to 13.6% in Worcester.

C.12 The translation of population projections into household projections by Edge shows that under this scenario all of the authorities are projected to grow their household base substantially with South Worcestershire projected to grow by 21,060 households, translating into a rate of nearly 880 households per annum.

C.13 Chart C1 shows the interplay between the different components of change under this scenario.

Figure C1: Components of change - SNPP Core Scenario 1



Source: Edge Analytics, 2014

C.14 The chart shows how future population growth in the area is forecast under the SNPP scenario to be driven by migration. While net international migration into the area is forecast to be relatively constant over the period from 2010 onwards (albeit at a slightly lower level from 2016 onwards), the levels of internal UK migration are projected to increase to over 900 persons net per annum coming to live in south Worcestershire.

(iii) Core Scenario 2 – Natural Change

C.15 Edge Analytics has developed a scenario of population change which removes the impact of migration from 2012 onwards. This therefore assumes that the existing population is not changed by migratory factors and that population change is constrained only to natural change (i.e. births and deaths) from the pre-existing population. It is important to recognise that this scenario is a hypothetical scenario with the reality of the operation of the housing market meaning that migration could never be constrained to zero.

C.16 Under this Core Scenario a considerably lower level of population and household growth is suggested across south Worcestershire than under the other scenarios. There is however a marked contrast at district level with significant growth in Worcester compared with a relatively stable population in Wychavon and population decline in Malvern Hills. This

reflects the younger demographic structure of the city and its relatively lower levels of projected net in-migration under the other scenarios.

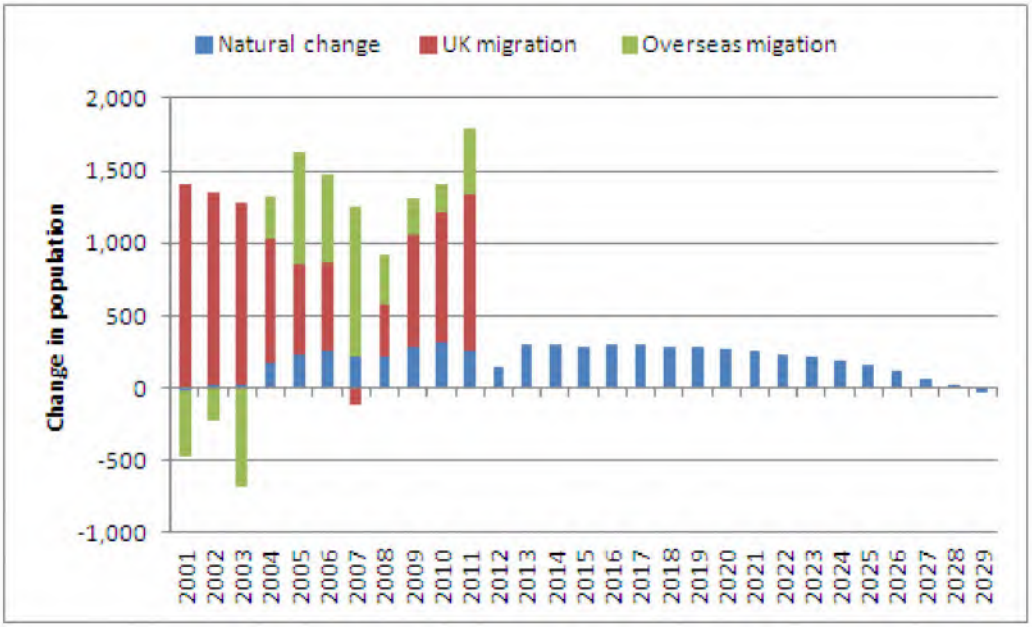
Table C2: Core Scenario 2 - Population and Household Projection data

Natural Change (zero migration)	Private Household Population			Household size			Households			
	2006	2030	Change 2006-2030	2006	2030	Change 2006 – 2030	2006	2030	Change 2006-2030	Annual change (24 yrs)
Malvern Hills	71,248	68,726	-2,522	2.29	2.24	-0.05	31,105	30,684	-421	-18
Worcester City	93,663	105,648	11,986	2.32	2.17	-0.16	40,318	48,796	8,478	353
Wychavon	113,932	114,386	454	2.36	2.27	-0.08	48,333	50,310	1,977	82
South Worcestershire	278,842	288,761	9,918	2.33	2.22	-0.10	119,756	129,790	10,034	418

Source: Edge Analytics, 2014, AMION, 2014, ONS, 2010

C.17 The following chart (Figure C2) shows the interplay between the different components of change under this scenario. It illustrates the impact of removing any projected migration post-2012, with change solely focussed around natural change factors. This shows a small positive net increase annually (resulting from a higher number of births than deaths) but declining in scale and becoming negative by the end of the period.

Figure C2: Components of change – Natural Change Core Scenario 2



Source: Edge Analytics, 2014

(iv) Core Scenario 3 – Migration-led

C.18 This is a further demographic 'trend-based' scenario. As with the SNPP (Core Scenario 1) this projection takes no account of any future levels of housing development (supply) across the authorities, but rather projects forward a continuation of recent historical demographic trends of growth or decline.

C.19 Two alternative scenarios are presented – one based on a typical time-frame of 5 years (2007/08-2011/12) and a second based on a 10 year trend analysis (2002/03 – 2011/12) developed to partly compensate for any atypical changes (particularly in migration

movements) arising from post- 2008 economic changes. In practice however the results at an overall south Worcestershire level are more or less identical although the 5 year scenario forecasts higher population growth in Worcester and slightly lower growth in the other two districts. However due to a greater projected fall in household size in Malvern Hills and Wychavon than in Worcester, the district level household forecasts are similar under both scenarios.

C.20 Table C3 sets out the results of the analysis based on the 5 year trend scenario.

Table C3: Core Scenario 3a - Population and Household Projection data

Migration-led 5-year trend scenario	Private Household Population			Household size			Households			
	2006	2030	Change 2006-2030	2006	2030	Change 2006 – 2030	2006	2030	Change 2006-2030	Annual change (24 yrs)
Malvern Hills	71,248	75,776	4,528	2.29	2.17	-0.12	31,105	34,878	3,773	157
Worcester City	93,663	113,296	19,633	2.32	2.24	-0.08	40,318	50,567	10,249	427
Wychavon	113,932	119,171	5,240	2.36	2.23	-0.13	48,333	53,499	5,166	215
South Worcestershire	278,842	308,243	29,401	2.33	2.22	-0.11	119,756	138,944	19,188	800

Source: Edge Analytics, 2014, AMION, 2014, ONS, 2010

C.21 The results of the analysis based on the 10 year trend scenario and summarised in Table C4.

Table C4: Core Scenario 3b - Population and Household Projection data

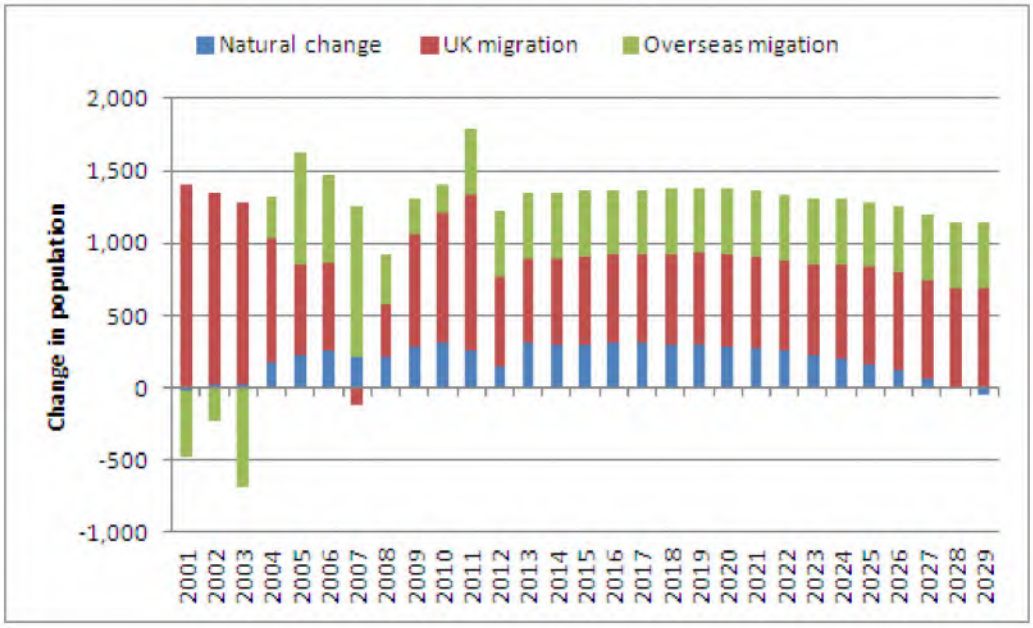
Migration-led 10-year trend scenario	Private Household Population			Household size			Households			
	2006	2030	Change 2006-2030	2006	2030	Change 2006 – 2030	2006	2030	Change 2006-2030	Annual change (24 yrs)
Malvern Hills	71,248	76,231	4,983	2.29	2.18	-0.11	31,105	34,927	3,822	159
Worcester City	93,663	111,663	18,001	2.32	2.23	-0.09	40,318	50,017	9,699	404
Wychavon	113,932	120,447	6,515	2.36	2.23	-0.13	48,333	54,078	5,745	239
South Worcestershire	278,842	308,341	29,499	2.33	2.22	-0.11	119,756	139,022	19,266	803

Source: Edge Analytics, 2014, AMION, 2014, ONS, 2010

C.22 Population and household growth within all of the authorities, with the exception of Worcester City (which is higher), are substantially lower under this Core Scenario than under the Core SNPP-based scenario.

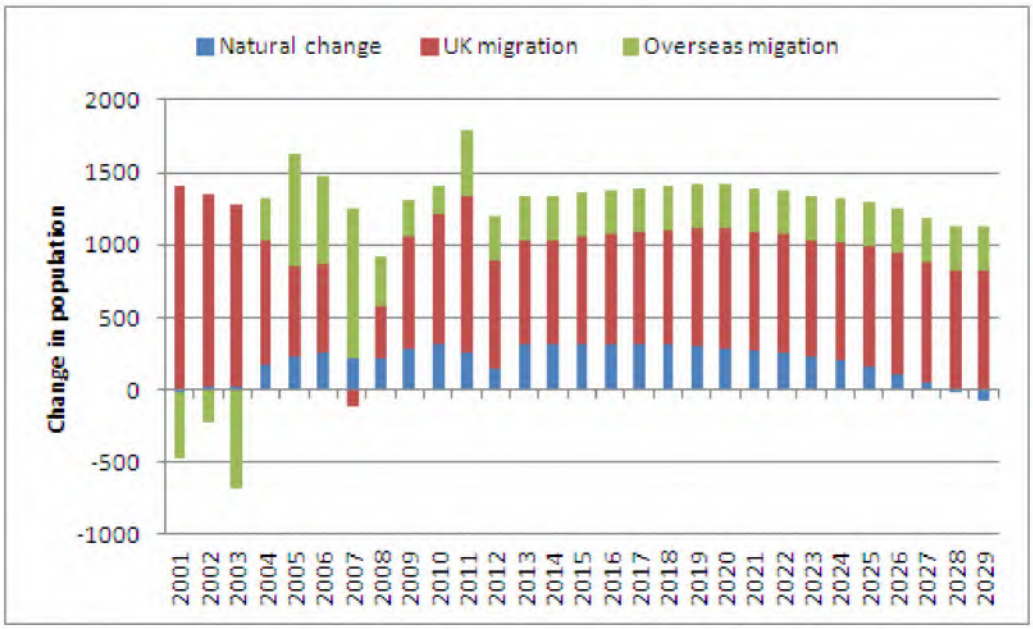
C.23 The interplay between the different components of change under this scenario at the south Worcestershire level is shown in Figures C3 (5 year trend) and C4 (10 year trend). The Chart illustrates the sustained role that internal migration plays under this scenario based on migration trends over recent years. Being trend-based projections, they also suggest a continuation of the recent levels of international net immigration (albeit at a lower level under the 10 year trend scenario) than that experienced over most of the preceding periods (the bulk of such migration being in Worcester city).

Figure C3: Components of Change – Migration-led Core Scenario 3a (5 year trend)



Source: Edge Analytics, 2014

Figure C4: Components of Change – Migration-led Core Scenario 3b (ten year trend)



Source: Edge Analytics, 2014

(v) Core Scenario 4 – Employment-constrained

C.24 Under this scenario demographic trends, driven by the migration-led scenario, are aligned with employment forecasts produced by Cambridge Econometrics, Experian and Oxford Economics.

C.25 The construction of this scenario is achieved by applying parameters which measure the relationship between the population and the labour force (economic activity rate) and between the labour force and the number of jobs in an area (labour force: jobs conversion

factor). This takes into account the level of unemployment but also the degree to which residents live and work within the area in question. In an employment constrained scenario, net in-migration will occur if the size of the labour force is insufficient to match the number of jobs forecast to be created. This assumes that commuting patterns remain constant alongside economic activity / unemployment levels. Net out-migration will occur if there are too few jobs for the labour force.

C.26 The application of the simplistic assumptions above to the demographic projections under Core Scenario 3, result in the levels of population and household change under each employment forecast set out in Tables C5 (Cambridge Econometrics), C6 (Experian) and C7(Oxford Economics).

Table C5: Core Scenario 4a - Population and Household Projection data (Cambridge Econometrics)

Employment-led scenario - Cambridge	Private Household Population			Household size			Households			
	2006	2030	Change 2006-2030	2006	2030	Change 2006 – 2030	2006	2030	Change 2006-2030	Annual change (24 yrs)
Malvern Hills	71,248	93,545	22,297	2.29	2.25	-0.04	31,105	41,559	10,454	436
Worcester City	93,663	116,622	22,960	2.32	2.25	-0.07	40,318	51,873	11,555	481
Wychavon	113,932	137,589	23,657	2.36	2.27	-0.08	48,333	60,492	12,159	507
South Worcestershire	278,842	347,757	68,914	2.33	2.26	-0.07	119,756	153,924	34,168	1,424

Table C6: Core Scenario 4b - Population and Household Projection data (Experian)

Employment-led scenario - Experian	Private Household Population			Household size			Households			
	2006	2030	Change 2006-2030	2006	2030	Change 2006 – 2030	2006	2030	Change 2006-2030	Annual change (24 yrs)
Malvern Hills	71,248	89,638	18,390	2.29	2.24	-0.06	31,105	40,102	8,997	375
Worcester City	93,663	110,522	16,860	2.32	2.23	-0.09	40,318	49,474	9,156	382
Wychavon	113,932	136,392	22,460	2.36	2.27	-0.09	48,333	60,041	11,708	488
South Worcestershire	278,842	336,552	57,709	2.33	2.25	-0.08	119,756	149,617	29,861	1,244

Table C7: Core Scenario 4c - Population and Household Projection data (Oxford Economics)

Employment-led scenario - Oxford	Private Household Population			Household size			Households			
	2006	2030	Change 2006-2030	2006	2030	Change 2006 – 2030	2006	2030	Change 2006-2030	Annual change (24 yrs)
Malvern Hills	71,248	87,571	16,323	2.29	2.23	-0.06	31,105	39,294	8,189	341
Worcester City	93,663	113,004	19,341	2.32	2.24	-0.08	40,318	50,489	10,171	424
Wychavon	113,932	135,244	21,312	2.36	2.27	-0.09	48,333	59,585	11,252	469
South Worcestershire	278,842	335,819	56,976	2.33	2.25	-0.08	119,756	149,368	29,612	1,234

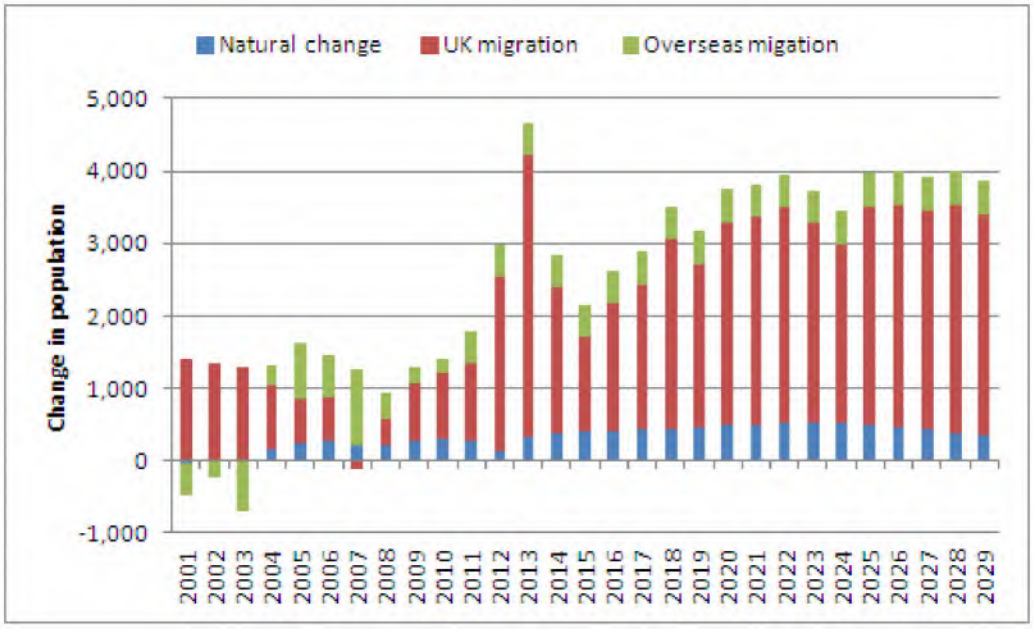
Source: Edge Analytics, 2014, AMION, 2014, ONS, 2010

C.27 Under this Core Scenario, all of the authorities see increased levels of population and household growth compared with the preceding scenarios examined. Across South Worcestershire as a whole this implies additional net in-migration (over and above the migration-led scenarios) of between 28,000 and 40,000. Almost all of this additional population growth is projected to occur in Malvern Hills and Wychavon. This largely reflects the current and projected demographic make-up of the authorities. The projected

population growth in Worcester City, which has the 'youngest' overall profile, is mainly accounted for by natural change.

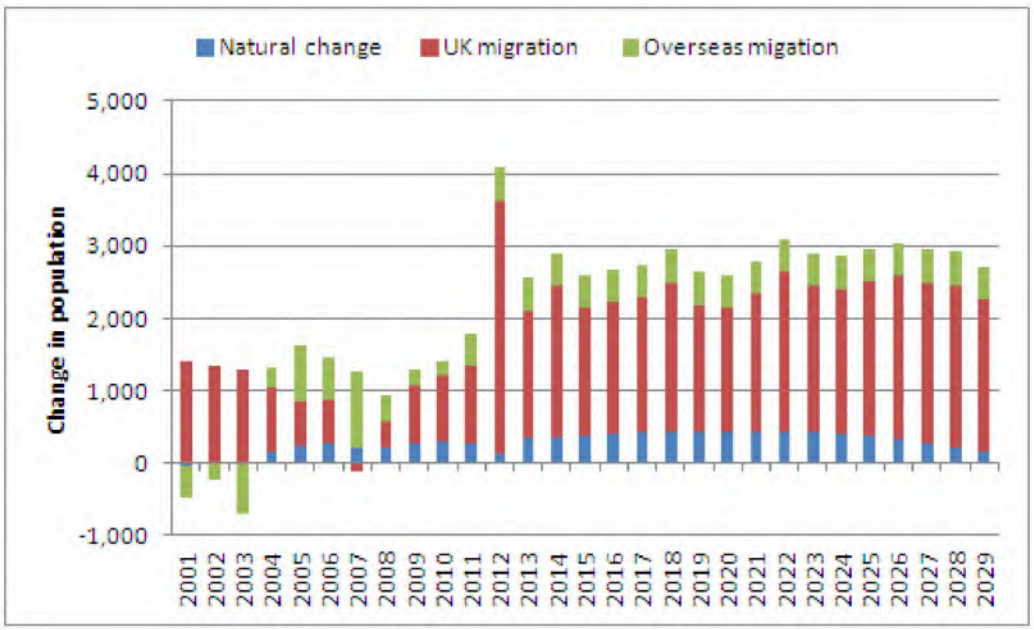
C.28 Figures C5 (Cambridge Econometrics), C6 (Experian) and C7 (Oxford Economics) show the interplay between the different components of change under this scenario for each of the economic forecasts.

Figure C5: Components of change – Employment constrained Core Scenario 4a (Cambridge)



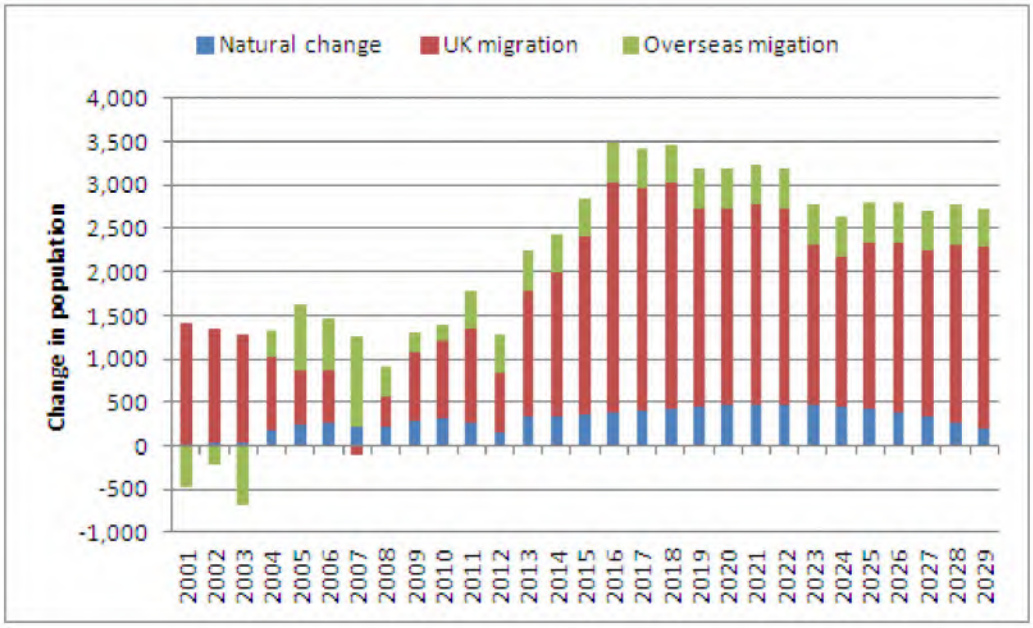
Source: Edge Analytics, 2014

Figure C6: Components of change – Employment constrained Core Scenario 4b (Experian)



Source: Edge Analytics, 2014

Figure C7: Components of change – Employment constrained Core Scenario 4c (Oxford)



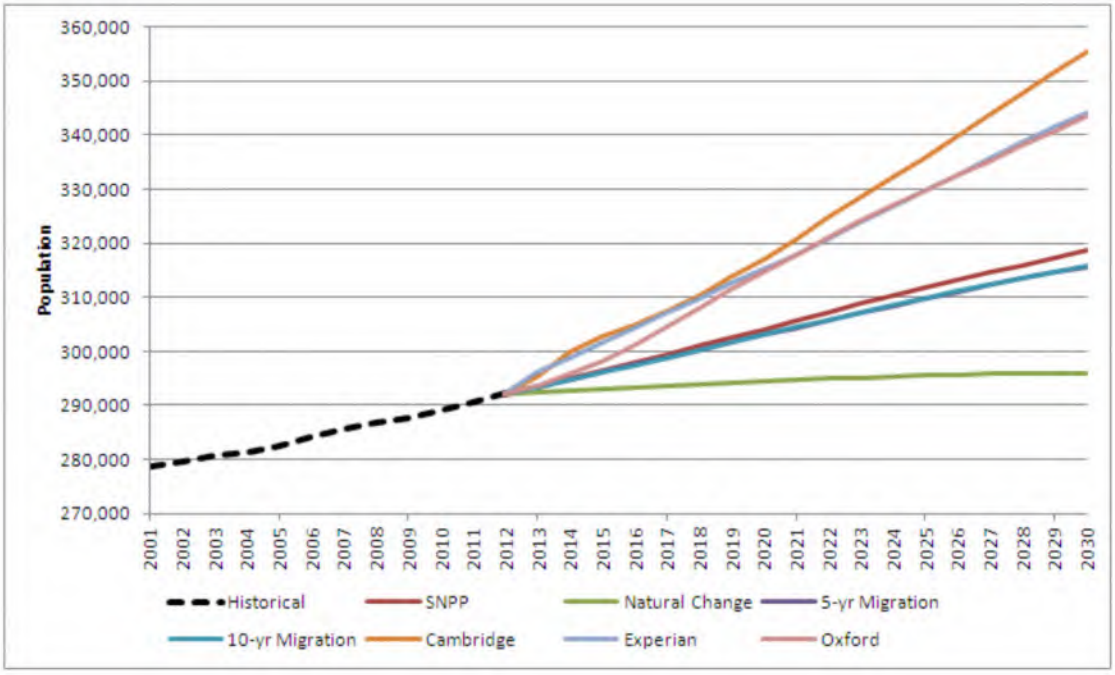
Source: Edge Analytics, 2014

C.29 The charts clearly show the uplifted levels of in-migration of people from other parts of the UK to fill the projected employment opportunities. It is important to note that this scenario uses the migration-led scenario as its base and therefore the levels of international migration are not adjusted beyond Core Scenario 3 levels. A similar trend is also shown in relation to the natural change component. Under each scenario the natural change component remains positive as the influx of new generally working-age in-migrants to take up employment opportunities model through and increases the number of children – thus offsetting the ageing of the pre-existing population. The natural change component does however fall towards the end of the period.

(vi) Contrasting the Core Scenarios

C.30 Figure C8 shows the trajectory of population change for each of the scenarios for the whole of south Worcestershire. The spectrum of projections ranges from the very low level of growth projected under the Natural Change scenario (1.9% for the period 2011 to 2030) to the considerably higher growth projected under the various Employment-constrained scenarios (between 18.2% and 22.4%). The two migration-led scenarios both project growth of 8.7% (although there is some variation at a district level) and are not dissimilar to the SNPP 'benchmark' figure (9.7%).

Figure C8: Population projections – the core scenarios



C.31 Table C10 compares the levels of projected household change under each Core Scenario for the period 2006 – 2030.

Table C10: Household Projections – Comparison of Scenarios

South Worcestershire				
Scenario	Households		Change 2006 – 2030	Annual Change (24 yrs)
	2006	2030		
Scenario 1 - Sub-National Population Projections (SNPP)	119,755	140,816	21,060	878
Scenario 2 - Natural Change (zero migration)	119,756	129,790	10,034	418
Scenario 3a - Migration – led 5 year	119,756	138,944	19,188	800
Scenario 3b - Migration – led 10 year	119,756	139,022	19,266	803
Scenario 4a - Employment Constrained (Cambridge)	119,756	153,924	34,168	1,424
Scenario 4b - Employment Constrained (Experian)	119,756	149,617	29,861	1,244
Scenario 4c - Employment Constrained (Oxford)	119,756	149,368	29,612	1,234
Scenario 4d - Employment Constrained – Central case	119,756	151,646	31,890	1,329
Scenario 4e - Employment Constrained – Average case	119,755	150,970	31,214	1,301

Source: Edge Analytics, 2014, AMION, 2014

C.32 A number of conclusions can be drawn from analysis of the Core Scenarios:

- Not surprisingly, the Natural Change scenario results in the lowest levels of projected household growth- equivalent to 418 per annum over the 2006 to 2030 period. This overall figure however camouflages significant inter-district variation with the bulk of the growth in Worcester city (353 per annum) and a negative requirement in Malvern Hills. The higher levels for Worcester reflect its comparatively high numbers of younger persons.

- Across South Worcestershire as a whole the migration-led scenarios show a slightly lower level of household growth than the 'benchmark' SNPP scenario reflecting the lower levels of migration into authorities over the last couple of years. Again, Worcester is an exception to this wider trend. Looking at the recent dynamics of the components of change in Worcester, the last few years have seen an estimated increase in the net effect of international migration and a reduced net outflow of internal migrants. This has had an impact on the projections under the migration-led scenario with recent years of data having a greater effect on the trend.

- Finally the employment-led scenarios show the highest levels of annual household growth of all the scenarios. This is true particularly in Malvern Hills and Wychavon. Both these authorities are projected, under the demographic trend based scenarios, to see a significant reduction in the working age population. If this trend is realised then even with zero growth or even a forecast loss of employment the balance between jobs and workers becomes increasingly out of balance with an insufficient labour force to take-up employment opportunities. It is important to recognise that this scenario assumes that certain key labour market factors continue, with the exception of changes in employment levels. This would not be the case in reality. The relationship between the labour force and employment is expected to change over the plan period, for example given the rise in pension ages and wider changes to pensions it is probable that people will work to an older age. Furthermore, research shows that, as labour markets tighten, activity rates, unemployment and commuting rates would all be expected to adjust, together with the in-migration of working households.

(i) Sensitivity Scenarios

C.33 This sub-section applies a number of sensitivities in order to add an element of refinement to the analysis.

C.34 This approach reflects the guidance within NPPF that suggests that each local planning authority should ensure that its Local Plan is based on adequate, up-to-date and relevant evidence about the economic, social and environmental characteristics and prospects of the area. Plan makers are advised that they should make an assessment of the likely growth in job numbers based on past trends and/or economic forecasts as appropriate and also having regard to the growth of the working age population in the housing market area. Accordingly the following 'sensitivity scenarios' have been explored:

- Sensitivity scenario 1: Headship rates – these are used to translate population projections into households;;

- Sensitivity scenario 2: Economic Activity rates of older working age groups are varied to take account of changes in the State Pension Age and Unemployment Rates are modified to account for a period of recovery post-2013. The sensitivities of the employment-constrained forecasts are reviewed with regard to these factors that inform the calculation of the balance of future labour needs that will be derived though new in-migration.

- Sensitivity scenario 3: Labour market adjustments – this scenario is based upon a review of academic evidence, the economic forecasts and econometric analysis to identify how labour market variables would be expected to adjust to a tightening labour market. Activity rates are again varied to take account of changes in the State Pension Age. They

are then also adjusted using regression coefficients to reflect responses to a tightening labour market. In addition, the unemployment rate is adjusted to reflect changes projected in the economic projections. The sensitivities of the employment-constrained forecasts are reviewed with regard to these factors that inform the calculation of the balance of future labour needs that will be derived though new in-migration

Sensitivity Scenario 1: Headship Rates

C.37 **Headship rates**: Translation of the population projections into household forecasts involves assumptions regarding headship rates. Household headship rates were taken from the CLG 2008-based and 2011-based household projections. For the 'core' scenarios presented previously and, as advised by the Inspector, the CLG 2011-based headship rates were applied for the period to 2021, reverting to the 2008-based rate of change in headship rates thereafter. Two further options have been reviewed - Option A is based on applying CLG 2011 headship rates throughout the forecast period and Option B on applying 2008 rates. Option B results in higher household growth and a corresponding higher annual dwelling requirement than in the Option A outcome. As can be seen from Table C11 the results for the core analysis (Option C) sit closer to the bottom end of this resultant range.

Table C11: Headship Rates Sensitivity Comparisons

Annual Average Change in Number of Households 2006-30												
Scenario	Malvern Hills			Worcester City			Wychavon			South Worcestershire		
	A	B	Core (C)	A	B	Core (C)	A	B	Core (C)	A	B	Core (C)
Scenario 1 - SNPP	221	262	230	322	376	328	327	367	319	870	1,005	878
Scenario 2 - Natural Change	-32	26	-18	353	387	353	82	123	82	403	536	418
Scenario 3a - 5 yr Migration – led	146	191	157	421	478	427	219	257	215	786	926	800
Scenario 3b - 10 yr Migration – led	148	193	159	398	456	404	244	280	239	790	929	803
Scenario 4a - Jobs (Cambridge)	426	481	436	475	535	481	512	566	507	1,413	1,582	1,424
Scenario 4b - Jobs (Experian)	365	417	375	376	429	382	493	545	488	1,234	1,391	1,244
Scenario 4c –Jobs (Oxford)	330	384	341	418	473	424	474	526	469	1,222	1,383	1,234
Scenario 4d - Employment Constrained – Central case	378	433	389	447	504	453	493	546	488	1,318	1,483	1,329
Scenario 4e - Employment Constrained – Average case	374	427	384	423	479	429	493	546	488	1,290	1,452	1,301

Source: Edge Analytics, 2014

Sensitivity Scenario 2: Altering Economic Activity and Unemployment Rates

C.38 Core Scenario 4 aligns employment forecasts with the projected labour force within each authority. This alignment process keeps a number of key assumptions constant, including Economic Activity Rates and Unemployment Rates

C.39 The projections under Core Scenario 4 show a significantly greater level of population growth – than under the demographic-led scenarios especially in Wychavon and Malvern Hills. This is largely driven by the assumption that each authority needs to accommodate

further in-migration of working age people to service new jobs or indeed existing jobs as the population ages and retires.

In reality it is likely that the existing labour force will expand its capacity naturally through higher levels of economic activity of those in the upper age bands of the active workforce. This reflects plans to raise pensionable ages[18] and a sustained pressure on many people to continue to supplement potential pensions with income from employment.

C.40 This Sensitivity Scenario therefore modifies the Economic Activity rates of this particular age cohort, with the following assumptions applied:

- 50 – 64 years – Economic Activity rates incrementally increased by 10% over the period between 2011 and 2030. An incremental approach is applied to reflect the gradual impact of this employment factor; and
- 65+ years – Economic Activity rates are incrementally increased by 50% over the same time period.

C.41 In addition, the unemployment rate has been modified to account for a period of recovery post-2013. This modification assumes an initial unemployment rate based on the average for the past five years (2008/09-2012/13). These are assumed to reduce over the period to 2020 to a figure equivalent to a nine-year average (2004/05 – 2012/13) and to remain fixed thereafter.

C.42 The application of these assumptions serves to expand the latent capacity of the existing labour force and therefore require lower levels of in-migration of working age people to match job forecasts. This is considered to represent more accurately the way in which the labour force will change in the future.

C.43 Aligning the population with employment forecasts lessens the reduction in the size of population of younger / working age groups, as the ageing of the local population is countered by an increase in the levels of in-migration of younger working age residents. It is important to recognise that under this scenario the older population still continues to grow, the overall impact therefore being an overall higher growth in the population.

C.44 The key outputs of the Sensitivity in terms of population and household growth are displayed in Table C12 for each of the Scenario 4 employment-constrained forecasts. The consequential reduction in annual average household change over the forecast period is just under 130 households per annum when compared with Core Scenario 4..[19]

[18] Note: Key Changes include – Gradual increase of the State Pension for women born on or after 6th April 1950 to 65 between 2010 and 2020; the State Pension age for men and women will increase from 65 to 66 between April 2024 and April 2026 (DWP, Changes to the State Pension, 2009); and from the 6th April 2020 the State Pension age will be 65 for both men and women (NI Direct, Changes to the State Pension, 2010).

[19] Both the core and the sensitivity 2 scenarios continue to use Core/Option C headship rates – as described in the preceding section.

Table C12: Sensitivity Scenario 2: Population and Household Projection Data										
	Private Household Population			Household size			Households			
	2006	2030	Change 2006-2030	2006	2030	Change 2004 – 2030	2006	2030	Change 2006-2030	Annual change (24 yrs)
Cambridge Econometrics										
Malvern Hills	71,248	91,150	19,902	2.29	2.24	-0.05	31,105	40,665	9,560	398
Worcester City	93,663	114,324	20,661	2.32	2.24	-0.08	40,318	50,944	10,626	443
Wychavon	113,932	134,203	20,271	2.36	2.27	-0.09	48,333	59,217	10,884	454
South Worcestershire	278,842	339,677	60,834	2.33	2.25	-0.08	119,756	150,826	31,070	1,295
Experian										
Malvern Hills	71,248	87,284	16,036	2.29	2.23	-0.07	31,105	39,220	8,115	338
Worcester City	93,663	108,276	14,613	2.32	2.23	-0.09	40,318	48,566	8,248	344
Wychavon	113,932	133,018	19,087	2.36	2.26	-0.09	48,333	58,771	10,438	435
South Worcestershire	278,842	328,578	49,736	2.33	2.24	-0.09	119,756	146,557	26,801	1,117
Oxford Economics										
Malvern Hills	71,248	85,244	13,997	2.29	2.22	-0.07	31,105	38,420	7,315	305
Worcester City	93,663	110,732	17,070	2.32	2.23	-0.09	40,318	49,572	9,254	386
Wychavon	113,932	131,890	17,959	2.36	2.26	-0.10	48,333	58,321	9,988	416
South Worcestershire	278,842	327,867	49,025	2.33	2.24	-0.09	119,756	146,313	26,557	1,107
Central case										
Malvern Hills	71,248	88,197	16,949	2.29	2.23	-0.06	31,105	39,543	8,438	352
Worcester City	93,663	112,528	18,865	2.32	2.24	-0.08	40,318	50,258	9,940	414
Wychavon	113,932	133,047	19,115	2.36	2.26	-0.09	48,333	58,769	10,436	435
South Worcestershire	278,843	333,772	54,930	2.33	2.25	-0.08	119,756	148,570	28,814	1,201
Average case										
Malvern Hills	71,248	87,893	16,645	2.29	2.23	-0.06	31,105	39,435	8,330	347
Worcester City	93,663	111,111	17,448	2.32	2.24	-0.09	40,318	49,694	9,376	391
Wychavon	113,932	133,037	19,106	2.36	2.26	-0.09	48,333	58,770	10,437	435
South Worcestershire	278,843	332,041	53,199	2.33	2.24	-0.08	119,756	147,899	28,143	1,173

C.45 This Sensitivity is grounded in assumptions around the changing nature of employment patterns based on more recent trends and emerging policies. This is particularly important across south Worcestershire where, with the exception of Worcester City, there is an ageing population but one which is likely to continue to contribute importantly to the economic growth of the area. The Sensitivity calculation therefore provides a refined iteration of Core Scenario 4 which balances economic and demographic factors.

Sensitivity Scenario 3: Labour market adjustments

C.46 A review has been undertaken of labour market research and labour market data has been analysed using regression techniques. The results of these analyses are included at Annex 1 of this Appendix.

C.47 These results have been used to develop a further alternative scenario again using Core Scenario 4 as the base, based upon what are considered to be more robust, evidenced-based adjustments regarding activity rates and unemployment.

C.48 In reality, further adjustments could be expected to occur, for example, in terms of community (both within the area and outwith) and a greater number of people working

beyond state pension age than within this revised Scenario. However, there is no current evidence to support adjustments in relation to these.

C.49 This Sensitivity Scenario is considered to represent more accurately the way in which the labour force will change in the future. The results of Sensitivity Scenario 3 are set out in Table C13. This shows a further reduction of some 130-140 households per annum over and above Sensitivity Scenario 2.

Table C13: Sensitivity Scenario 3: Population and Household Projection Data

	Private Household Population			Household size			Households			
	2006	2030	Change 2006-2030	2006	2030	Change 2004 – 2030	2006	2030	Change 2006-2030	Annual change (24 yrs)
Cambridge Econometrics										
Malvern Hills	71,248	90,227	18,979	2.29	2.24	-0.05	31,105	40,322	9,217	384
Worcester City	93,663	111,883	18,220	2.32	2.24	-0.08	40,318	49,969	9,651	402
Wychavon	113,932	128,704	14,772	2.36	2.25	-0.10	48,333	57,135	8,802	367
South Worcestershire	278,842	330,813	51,971	2.33	2.24	-0.08	119,756	147,426	27,670	1,153
Experian										
Malvern Hills	71,248	86,477	15,229	2.29	2.22	-0.07	31,105	38,919	7,814	326
Worcester City	93,663	106,330	12,667	2.32	2.23	-0.10	40,318	47,785	7,467	311
Wychavon	113,932	127,618	13,686	2.36	2.25	-0.11	48,333	56,725	8,392	350
South Worcestershire	278,842	320,425	41,583	2.33	2.23	-0.09	119,756	143,429	23,673	986
Oxford Econometrics										
Malvern Hills	71,248	84,462	13,214	2.29	2.22	-0.08	31,105	38,128	7,023	293
Worcester City	93,663	108,619	14,957	2.32	2.23	-0.09	40,318	48,724	8,406	350
Wychavon	113,932	126,535	12,603	2.36	2.25	-0.11	48,333	56,292	7,959	332
South Worcestershire	278,842	319,616	40,774	2.33	2.23	-0.10	119,756	143,144	23,388	974
Central Case										
Malvern Hills	71,248	87,344	16,096	2.29	2.23	-0.06	31,105	39,225	8,120	338
Worcester City	93,663	110,251	16,588	2.32	2.23	-0.09	40,318	49,347	9,029	376
Wychavon	113,932	127,619	13,688	2.36	2.25	-0.11	48,333	56,714	8,381	349
South Worcestershire	278,843	325,215	46,372	2.33	2.24	-0.09	119,756	145,285	25,529	1,064
Average case										
Malvern Hills	71,248	87,055	15,807	2.29	2.22	-0.07	31,105	39,123	8,018	334
Worcester City	93,663	108,944	15,281	2.32	2.23	-0.09	40,318	48,826	8,508	355
Wychavon	113,932	127,619	13,687	2.36	2.25	-0.11	48,333	56,717	8,384	349
South Worcestershire	278,843	323,618	44,776	2.33	2.24	-0.09	119,756	144,666	24,910	1,038

A Review of all of the Scenarios

C.50 Table C14 summarises the range of household forecasts produced for South Worcestershire as a whole, including the Sensitivity Scenarios. The table (which draws heavily on the SHMA) identifies for each scenario the key assumptions and provides a headline appraisal of the points of consideration in their application in projecting household growth over the longer-term.

Table C14: Worcestershire Range of Future Household Projections		
Scenario	**Key Assumptions**	
Core Scenario 1: SNPP	Underpinned by SNPP and SNHP data from the ONS and DCLG. Incorporates alignment of households to Council Tax occupied property data. This assumption is applied to all other scenarios	Projections use longer term trends to project forward change. The analysis of the relative influence of migration in particular has highlighted notable changes in many of the authorities, with net levels reducing - probably linked to market mobility and supply issues. These factors are likely to continue to play a role in the short-medium term impacting on levels of household formation. Over the longer-term trends may resort back to these longer-term trends, however, the overall level of absolute growth will be affected.
Core Scenario 2: Natural Change	Removal of any migration elements from the projections. This serves to illustrate levels of growth which will be driven solely from natural change in the existing local authority populations. Important to note that this is a hypothetical scenario only.	Useful benchmark to understand how the population will change based solely on births and deaths of the current population. Scenario cannot be realised in reality and is therefore not considered a valid basis from which to plan policy.
Core Scenario 3: Migration led	Modelled using ONS MYE data. Two scenarios modelled using 5 year and 10 year trends.	The two scenarios used provide comparable results and give confidence that they represent a robust demographic-led trend projection. This therefore represents an improved evidence basis from which to consider setting current policy.
Core Scenario 4: Employment constrained	Alignment of the migration-led trend projections modelled under CS 2 with three sets of economic forecast data. Other economic assumptions are held constant e.g. commuting ratios, economic activity rates, unemployment.	The alignment of economic change with demographic factors is important in terms of joining these two drivers together in policy development. The impact is significant in many of the authorities as a result of a projected ageing of the population. In reality while this is likely to occur, employment habits in turn are likely to respond with an increasing proportion of older cohorts in the labour force working for longer to supplement incomes - linked to the planned rise in pension age.
Sensitivity Scenario 1: Household headship rates adjustment	Use of alternative trends to underpin household headship rate assumptions.	Results suggest that original core assumptions (Option C) are reasonable. It reflects the approach advised by the Inspector.
Sensitivity Scenario 2: Economic Activity Rates of Older Persons and Unemployment Rate	Economic activity rates have been modified for the age cohorts 50 – 64 and 65+ on the basis of the appraisal of CS4. CS4 has been rerun applying these assumptions. Unemployment rate assumptions have also been adjusted.	This sensitivity is considered to provide a refined analysis of the assumptions underpinning CS4 to provide a more robust projection aligning demographic and economic factors.
Sensitivity Scenario 3: Labour market adjustments	This scenario makes alternative evidence-based adjustments in relation to activity rates and unemployment.	Sensitivity Scenario 3 is considered to represent the most realistic assumptions regarding future demographic and economic trends.

Source: AMION, 2014, Edge Analytics, 2014

Bringing the Analysis of Population and Household Growth Together – Considering Housing Requirements

C.51 Based upon the analysis within this Appendix and assuming that the focus is on employment-led scenarios, **Sensitivity Scenario 3** is viewed as representing the projection which most effectively takes account of potential economic drivers and evidence-based labour market adjustments. Importantly, this incorporates important potential drivers of change in the relationship between employment and the labour force in terms of economic activity rates and future trends in unemployment rates.

C.52 The levels of household growth from these projections are shown in Table C15. The Central case and Average case scenarios are considered to provide a range that constitutes the most realistic and robust estimate of future household growth.

Table C15: Annual Change in Households 2006-30

Authority	Totals (annual average) Sensitivity Scenarios 3				
	Cambridge	Experian	Oxford	Central case	Average case
Malvern Hills	384	326	293	338	334
Worcester City	402	311	350	376	355
Wychavon	367	350	332	349	349
South Worcestershire	1,153	986	974	1,064	1,038

Source: AMION, 2014, Edge Analytics, 2014

C.53 The household projections derived from these two scenarios have been translated into draft net dwelling requirement figures to help inform policy development. In calculating dwelling requirements from household projections, uplifts have been applied to allow for 'churn' based on vacant dwelling and also for second homes rates. The results of this analysis are set out in Table C16.

C.54 The recent supply of completions is factored into the overall requirement recognising that these can be netted off the level of household growth projected from 2006. The results of this analysis are set out in Table C16.

C.55 The household forecasts derived from the Sensitivity Scenario 3 have been translated into net dwelling requirement figures. The overall forecast dwelling requirement for South Worcestershire is between 25,389 and 26,481 over the period 2006 – 2030.

Table C16: Net Dwelling Requirements – 2006 – 2030: Sensitivity Scenarios 3					
Scenario	Forecast Household-Change (2006-2030) (a)	Forecast Dwelling Requirement – factoring in vacancy and second home rates (2006-2030) (b)	Housing Delivered Net 2006 – 2012 (6 years)[1] (C)	Dwelling requirements 2012 - 2030 (18 years)	
				Net Dwelling requirement (Rounded) (d) = (b) – (c)	Net Annual Average Dwelling Requirement (Rounded) (d) / 18
Malvern Hills					
Sensitivity Scenario 3 Central case	8,120	8,537	1,326	7,211	401
Sensitivity Scenario 3 Average case	8,018	8,430	1,326	7,104	395
Worcester City					
Sensitivity Scenario 3 Central case	9,029	9,918	2,184	7,734	430
Sensitivity Scenario 3 Average case	8,508	9,378	2,184	7,194	400
Wychavon					
Sensitivity Scenario 3 Central case	8,381	8,888	1,399	7,489	416
Sensitivity Scenario 3 Average case	8,385	8,891	1,399	7,492	416
Total South Worcestershire					
Sensitivity Scenario 3 Central case	25,530	27,343	4,909	22,434	1,246
Sensitivity Scenario 3 Average case	24,912	26,700	4,909	21,791	1,211

Source: Experian, 2013, Oxford Economics 2013, Cambridge Econometrics 2013, SWC 2012.

[1] South Worcestershire Development Plan, Housing Background Paper (Provision and Supply) – Appendix 9, 30th November 2012

Note: the calculation the net requirement is made with respect to the total dwelling requirement in column (b). It is not a 'policy—on' spatial approach.

Annex 1 to Appendix C

Alternative Labour Market Assumptions

C.A.1 One of the key issues in the South Worcestershire context is the extent to which account is taken of labour market dynamics in examining future scenarios. Labour markets are invariably complex in nature and minor changes in incentive frameworks can result in significant adjustments to primary decisions such as participation. In this context it makes sense to stand back and examine whether any alternative labour market assumptions are viable and whether it is of value to consider any additional scenarios.

C.A.2 It is clear, for example, that structural changes are taking place in the UK in the wake of adjustments to life expectancy, pension age, and projected retirement incomes. A 2011 Bank of England Quarterly Bulletin points to many of these features as reasons for increasing labour market participation among older age cohorts[20]. To the extent that these trends continue, they need to be reflected in future participation profiles. The Edge Analytics framework allows for such features in older age groups.

C.A.3 Another issue is the potential for cyclical determinants of participation. This is important in the sense that if participation rates are shown to vary with the business cycle, then there exists an evidentiary basis for adjusting future South Worcestershire participation in line with projected economic development patterns.

C.A.4 In practice, the issue of how labour markets adjust across the business cycle – particularly unemployment and participation - has long been of interest to researchers. Economic theory suggests that participation should generally increase in growth periods as wages and wage expectations are high with the scale of any aggregate adjustment in the economy reflecting the 'participation margin' or thresholds of different individuals and groups.

C.A.5 UK Studies dating back to the early 1990s show that participation rates tend to be procyclical (move directly in line with the economic cycle) - Briscoe and Wilson (1992)[21] and Cutler and Turnbull (2001)[22] find UK participation rates to be procyclical across a range of age cohorts. Schweitzer M and Tinsley D (2004)[23] also show that there exists a significant cyclical component to the participation rate alongside other trend influences and Elsby, Smith and Wadsworth (2010) use 35 years of UK data to demonstrate how flows in and out of participation contribute to the cyclicality of unemployment[24].

C.A.6 Internationally, Haefke, C and Ritter, M (2006)[25] show that endogenous participation helps to explain variation in employment over the US business cycle and Elsby M, et al (2013)[26] suggest that transitions between unemployment and non-participation can account for as much as one third of the cyclical variation in US unemployment. This latter paper suggests

[20] BEQB (2011), Volume 51 No. 1: Benito, A & Bunn, P, 'Understanding labour force participation in the United Kingdom'

[21] Briscoe, G and Wilson, R (1992), 'Forecasting economic activity rates', *International Journal of Forecasting*, Vol. 8(2), pages 201-17.

[22] Cutler, J and Turnbull, K (2001)**,** 'A disaggregated approach to modelling UK labour force participation', *MPC Unit Discussion Papers (Bank of England) no. 4*.

[23] Schweitzer M and Tinsley D, (2004) 'The UK labour force participation rate: business cycle and trend influences' Bank of England Working paper series No 228.

[24] Elsby, M, Smith, J and Wadsworth, J (2010) 'The Role of Worker Flows in the Distribution of UK Unemployment', CEP Discussion Paper No 1058.

[25] Haefke, C and Ritter, M, (2006) 'Endogenous Labour Market Participation and the Business Cycle IZA Discussion Paper Series No 2029

[26] Elsby M, Hobijn, B and Sahin, A (2013) 'On The Importance of the Participation Margin for Labour Market Fluctuations', Federal Reserve Bank of San Francisco, Working Paper, 2013-05

that care should be taken not to misinterpret the sometimes moderate cyclicality of aggregate participation rates as they can mask substantive cyclicality between unemployment and inactivity.

C.A.7 As such, there is a credible evidence base to support considering introducing a cyclical component into future projections of labour force participation. In other words, there is a case for examining the extent to which the labour market conditions projected in the economic forecasts are likely to influence participation decisions in South Worcestershire.

C.A.8 To address this issue, we construct a measure of labour market tightness using data on vacancies and unemployment. More specifically, we construct a vacancy to unemployment ratio across all English local authority districts (LADs)using 2011 data to match the Census base used by Edge Analytics in their housing need framework.

C.A.9 Vacancy data is taken from the Job Centre database while unemployment is extracted from the Annual Population Survey (APS). The ratio is constructed so that higher values indicate more extensive demand relative to supply and vice versa. A simple regression framework is used to examine the relationship between economic activity rates and the vacancy ratio across English LADs. A series of regional binary variables are also employed to account for broad spatial differences in the relationship. The results of the analysis show:

- Models 1 & 2:
  - both the 16plus and 16-64 age groups have a significant positive relationship with the vacancy ratio[27];
- Models 3 & 4:
  - neither the 16-19 or 20-24 age groups are defined as having a significant relationship with the vacancy ratio;
- Models 5 & 6:
  - both the 25-34 and 35-49 age groups are defined as having a significant relationship with the vacancy ratio; and
- Models 7 & 8:
  - both the 50-64 and 65 plus age groups are defined as having a significant relationship with the vacancy ratio.

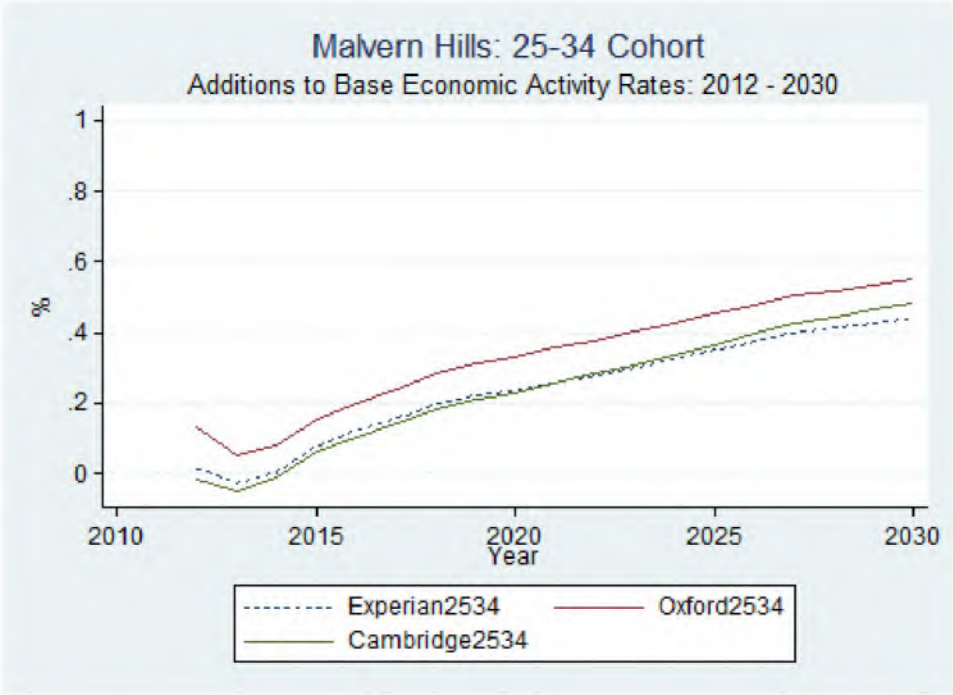
C.A.10 The results suggest that we should seek to accommodate a measure of labour market tightness in the South Worcestershire labour market projections for all cohorts above 25 years. To do this we need to take each of the projections and introduce a new indicator that projects a 'view' of the likely vacancy ratio over the course of the forecast period to 2030.

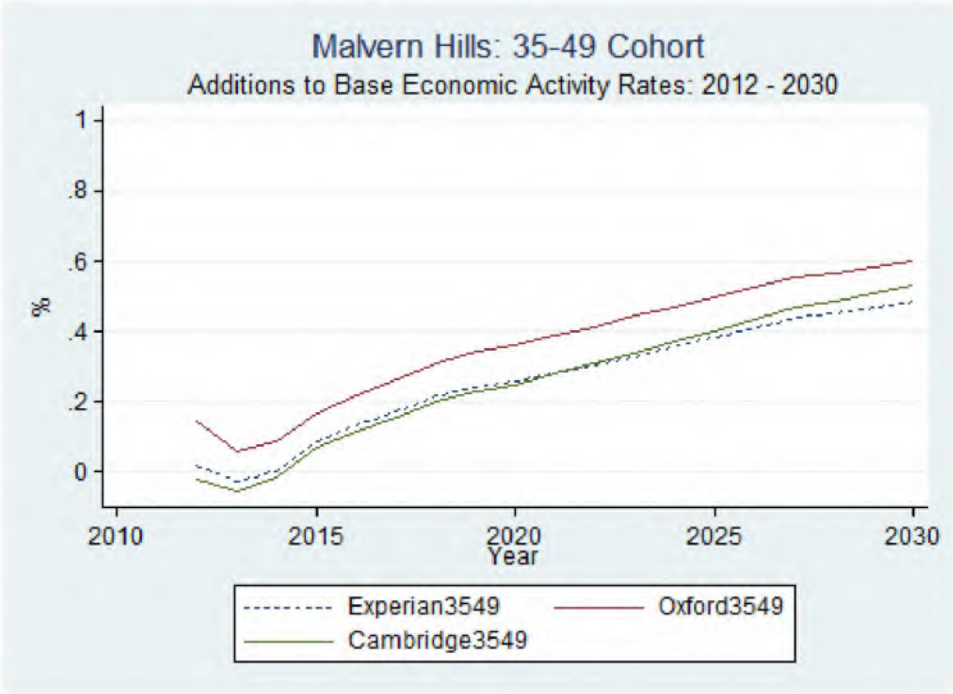
C.A.11 As far as unemployment is concerned, we have access to just one projected unemployment series to 2030, associated with the Experian forecast. We are required to impose this perspective on each of the other forecasts to facilitate construction of a ratio.

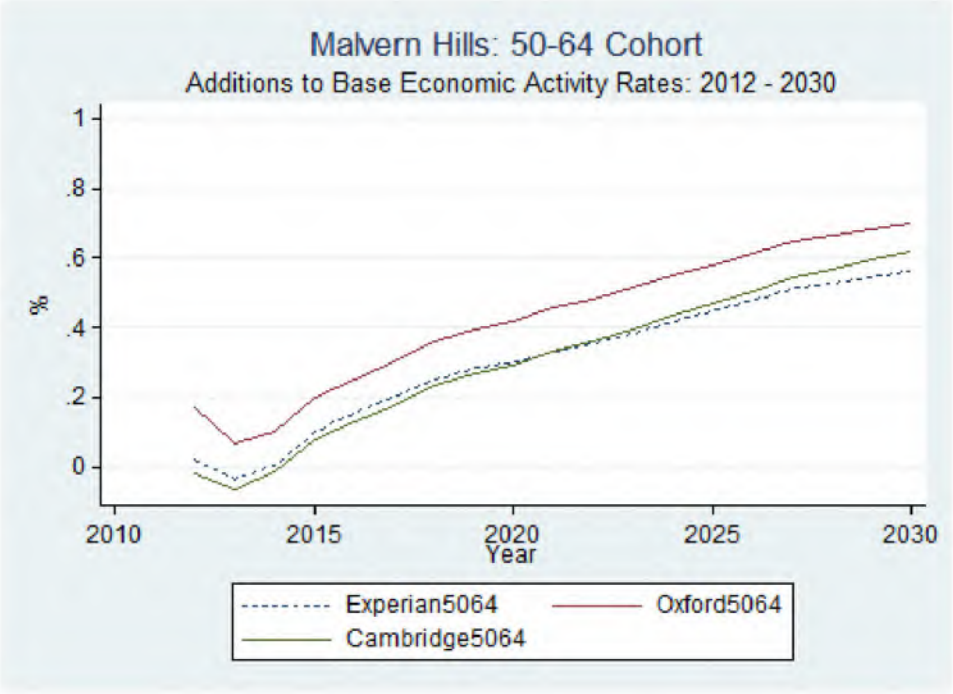
C.A.12 In terms of vacancies, we take the actual 2011 vacancy ratio data for Malvern Hills, Worcester and Wychavon and impose these on the forecast models (at 2011) to define an estimate of the vacancies associated with the number of jobs in each area.

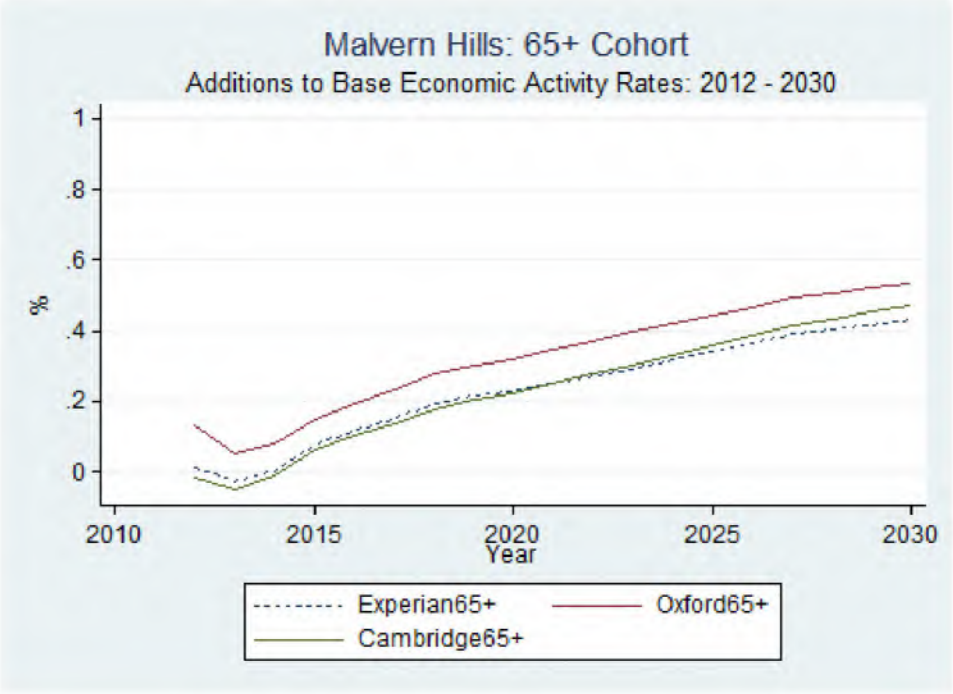
[27] Not all LADs have economic activity, unemployment and vacancy data available. These areas are omitted from analysis and this accounts for variations in the number of observations between models.

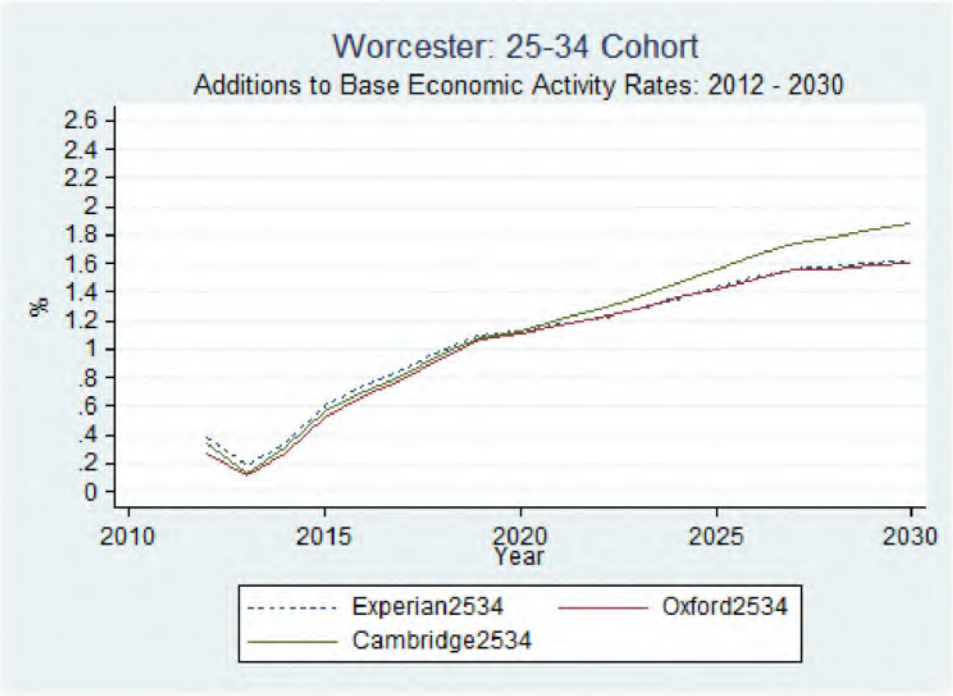
C.A.13 This vacancy per job ratio is then fixed and used to construct an estimate of the number of vacancies available as job profiles move forward to 2030. Contrasting the vacancy and unemployment series delivers a projected vacancy ratio to 2030 and it is this that is used, in conjunction with the relevant regression parameters, to produce estimates of changing participation. The results profiles are illustrated over the following pages.

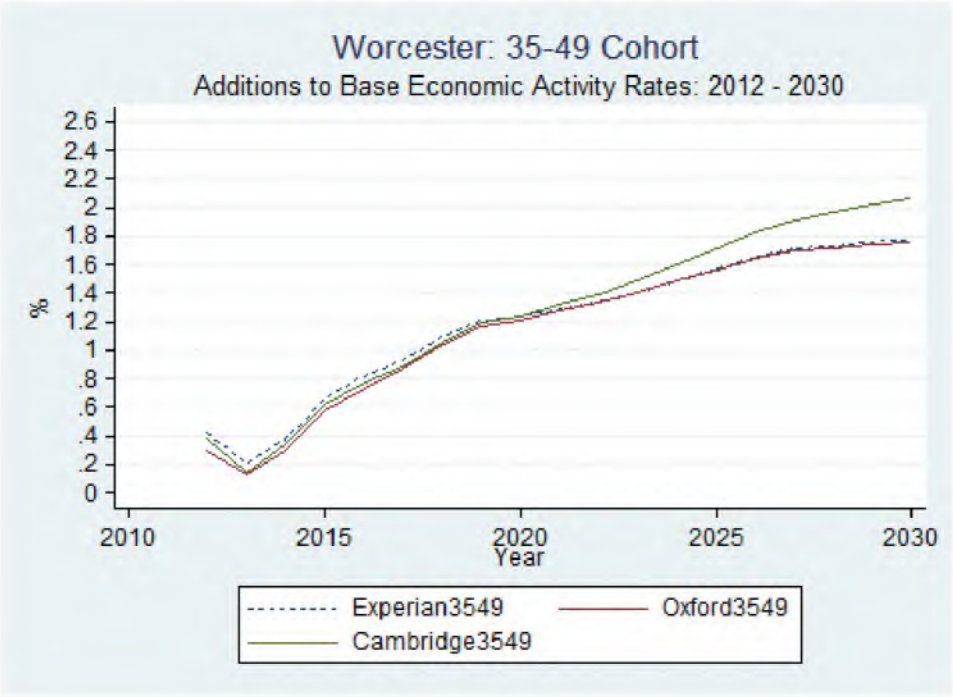


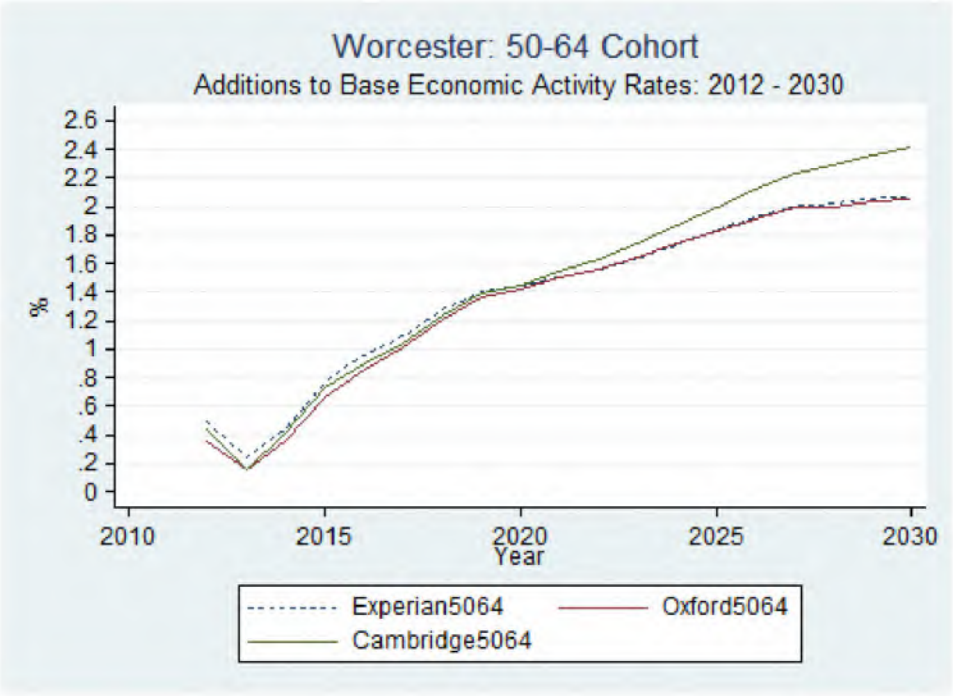


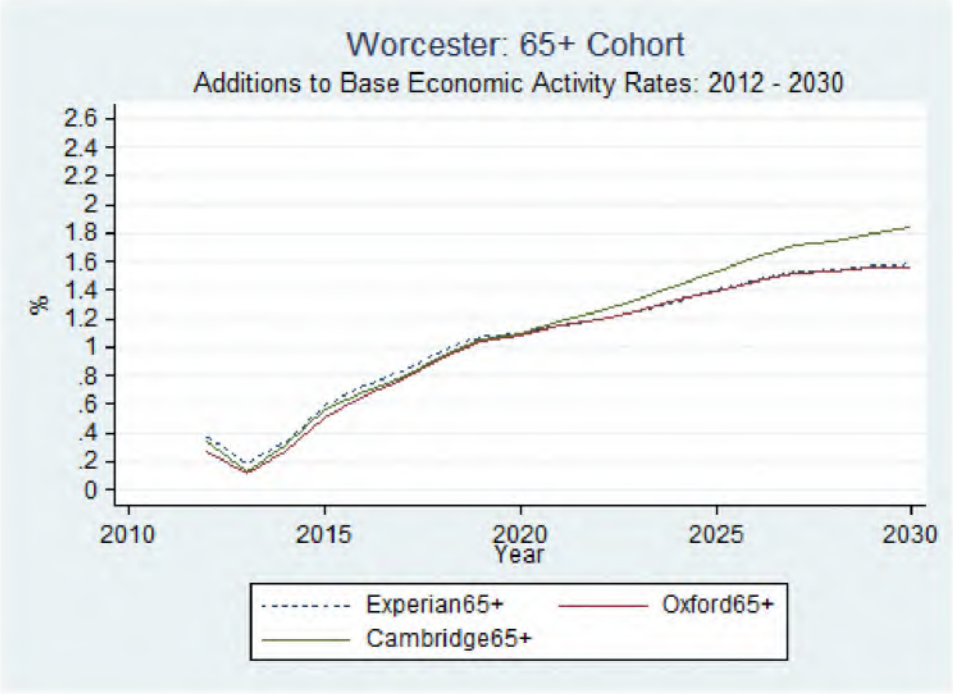

Malvern Hills: 50-64 Cohort
Additions to Base Economic Activity Rates: 2012 - 2030
%
1
.8
.6
.4
.2
0
2010
2015
2020
2025
2030
Year
Experian5064
Oxford5064
Cambridge5064

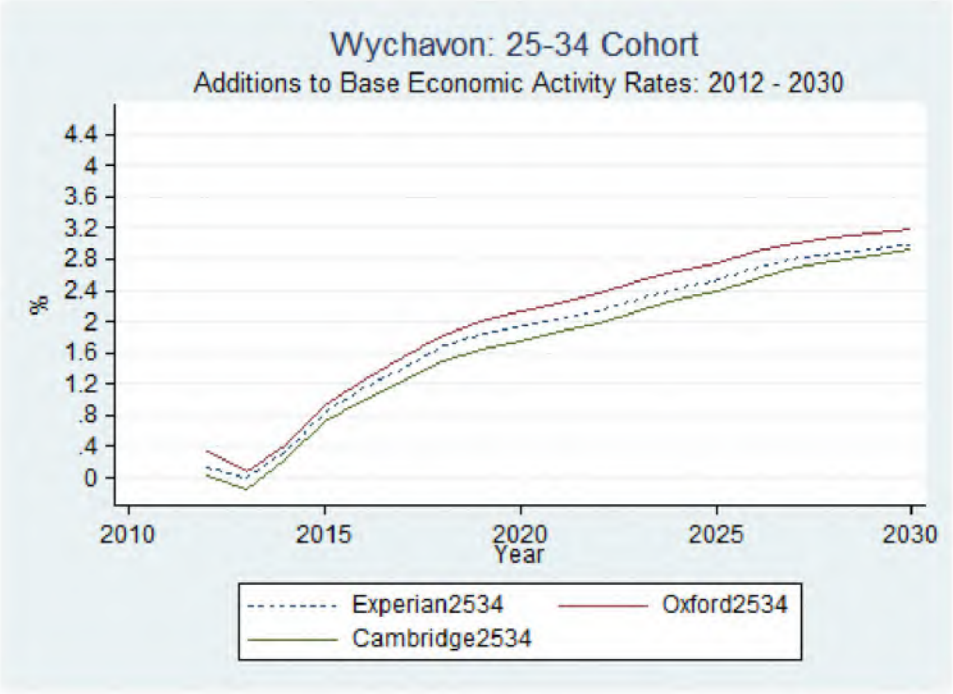

Malvern Hills: 65+ Cohort
Additions to Base Economic Activity Rates: 2012 - 2030
%
1
.8
.6
.4
.2
0
2010
2015
2020
2025
2030
Year
Experian65+
Oxford65+
Cambridge65+

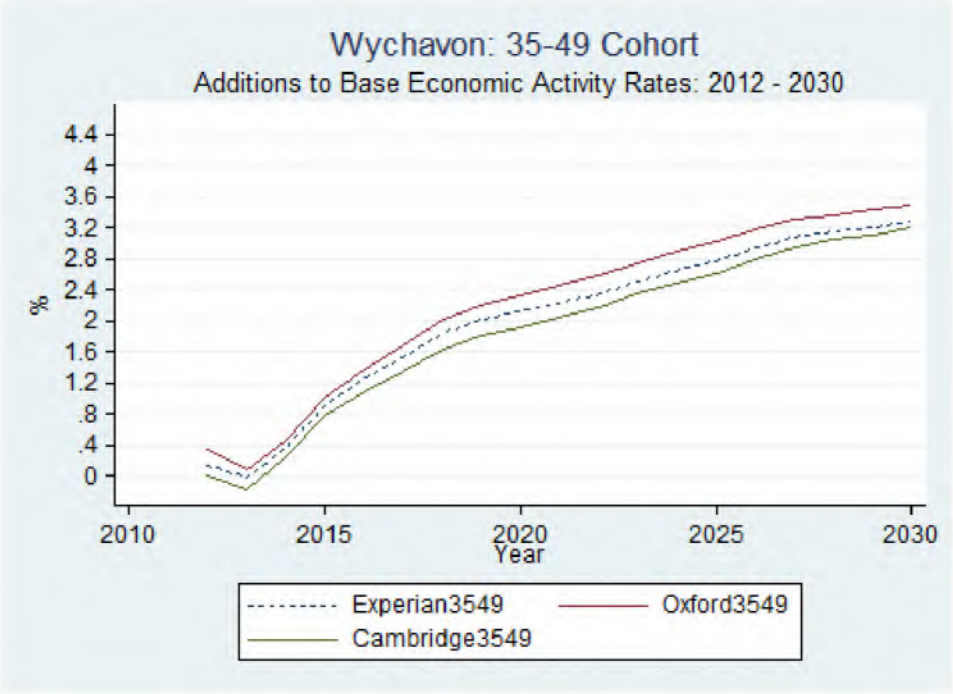

Worcester: 25-34 Cohort
Additions to Base Economic Activity Rates: 2012 - 2030
%
2.6
2.4
2.2
2
1.8
1.6
1.4
1.2
1
.8
.6
.4
.2
0
2010
2015
2020
2025
2030
Year
Experian2534
Oxford2534
Cambridge2534

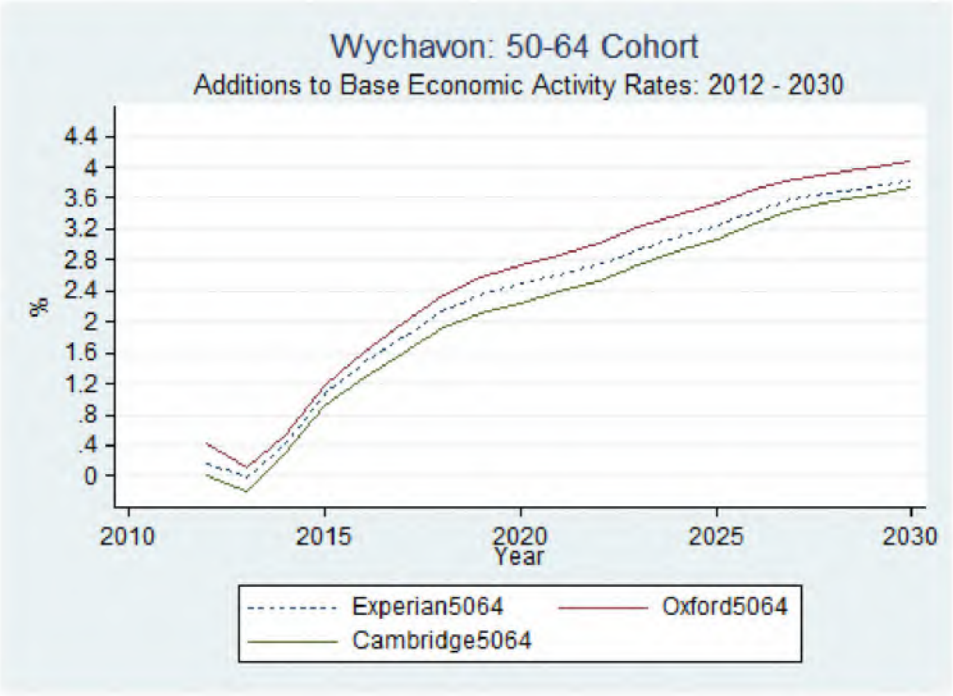

Worcester: 35-49 Cohort
Additions to Base Economic Activity Rates: 2012 - 2030
%
2.6
2.4
2.2
2
1.8
1.6
1.4
1.2
1
.8
.6
.4
.2
0
2010
2015
2020
2025
2030
Year
Experian3549
Oxford3549
Cambridge3549

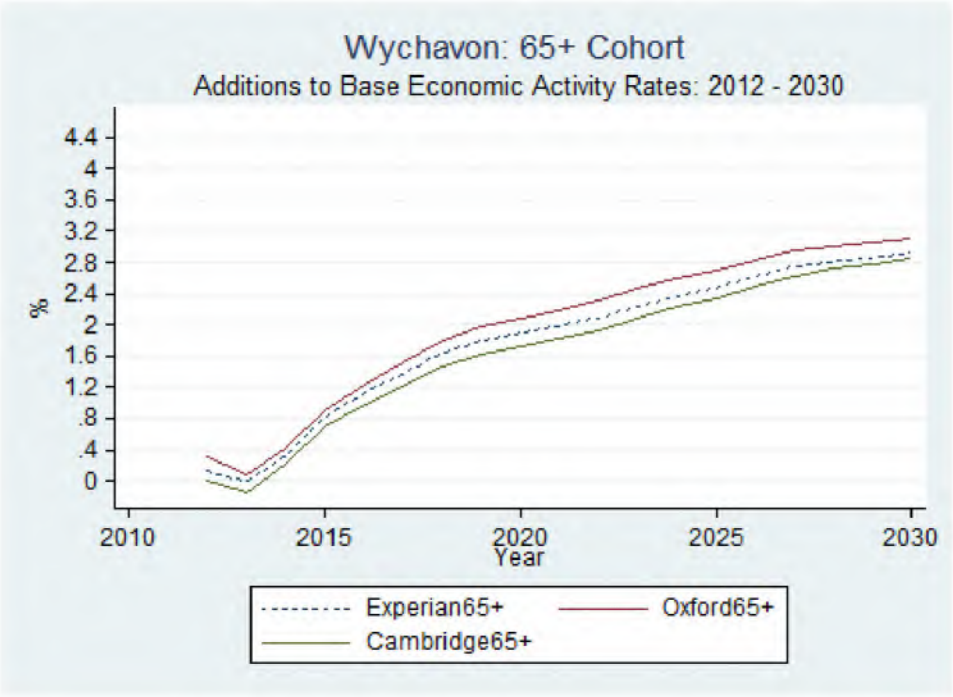

Worcester: 50-64 Cohort
Additions to Base Economic Activity Rates: 2012 - 2030
%
2.6
2.4
2.2
2
1.8
1.6
1.4
1.2
1
.8
.6
.4
.2
0
2010
2015
2020
2025
2030
Year
Experian5064
Oxford5064
Cambridge5064


Worcester: 65+ Cohort
Additions to Base Economic Activity Rates: 2012 - 2030
%
2.6
2.4
2.2
2
1.8
1.6
1.4
1.2
1
.8
.6
.4
.2
0
2010
2015
2020
2025
2030
Year
Experian65+
Oxford65+
Cambridge65+


Wychavon: 25-34 Cohort
Additions to Base Economic Activity Rates: 2012 - 2030
%
4.4
4
3.6
3.2
2.8
2.4
2
1.6
1.2
.8
.4
0
2010
2015
2020
2025
2030
Year
Experian2534
Oxford2534
Cambridge2534


Wychavon: 35-49 Cohort
Additions to Base Economic Activity Rates: 2012 - 2030
%
4.4
4
3.6
3.2
2.8
2.4
2
1.6
1.2
.8
.4
0
2010
2015
2020
2025
2030
Year
Experian3549
Oxford3549
Cambridge3549


Wychavon: 50-64 Cohort
Additions to Base Economic Activity Rates: 2012 - 2030
%
4.4
4
3.6
3.2
2.8
2.4
2
1.6
1.2
.8
.4
0
2010
2015
2020
2025
2030
Year
Experian5064
Oxford5064
Cambridge5064


Wychavon: 65+ Cohort
Additions to Base Economic Activity Rates: 2012 - 2030
%
4.4
4
3.6
3.2
2.8
2.4
2
1.6
1.2
.8
.4
0
2010
2015
2020
2025
2030
Year
Experian65+
Oxford65+
Cambridge65+

Appendix D – Scenario summary tables

Table A1: Table list	
Core Scenarios	
Table D1	Core Scenarios – DWELLINGS PROJECTIONS by DISTRICTS
Table D2	Core Scenarios – DWELLINGS PROJECTIONS by SCENARIO
Table D3	Core Scenarios - Summary Statistics: MALVERN HILLS
Table D4	Core Scenarios - Summary Statistics : WORCESTER
Table D5	Core Scenarios - Summary Statistics : WYCHAVON
Table D6	Core Scenarios - Summary Statistics : SOUTH WORCESTERSHIRE
Job Sensitivity Scenario 2	
Table D7	JOB Sensitivity Scenario 2 – DWELLINGS PROJECTIONS by DISTRICTS
Table D8	JOB Sensitivity Scenario 2 – DWELLINGS PROJECTIONS by SCENARIO
Table D9	JOB Sensitivity Scenario 2 - Summary Statistics : MALVERN HILLS
Table D10	JOB Sensitivity Scenario 2 - Summary Statistics : WORCESTER
Table D11	JOB Sensitivity Scenario 2 - Summary Statistics : WYCHAVON
Table D12	JOB Sensitivity Scenario 2 - Summary Statistics : SOUTH WORCESTERSHIRE
Job Sensitivity Scenario 3	
Table D13	JOB Sensitivity Scenario 3 – DWELLINGS PROJECTIONS by DISTRICTS
Table D14	JOB Sensitivity Scenario 3 – DWELLINGS PROJECTIONS by SCENARIO
Table D15	JOB Sensitivity Scenario 3 - Summary Statistics : MALVERN HILLS
Table D16	JOB Sensitivity Scenario 3 - Summary Statistics : WORCESTER
Table D17	JOB Sensitivity Scenario 3 - Summary Statistics : WYCHAVON
Table D18	JOB Sensitivity Scenario 3- Summary Statistics : SOUTH WORCESTERSHIRE

Table D1: Core Scenarios – DWELLINGS PROJECTIONS BY DISTRICTS
Totals: 2006, 2012 and 2030; and Changes: 2006 to 2012, 2012 to 2030, 2006 to 2030

	TOTALS				CHANGE		
MALVERN HILLS	**2006**	**2012**	**2030**		**2006-12**	**2012-30**	**2006-30**
Jobs Led Cambridge	32,408	33,854	43,381		1,447	9,526	10,973
Jobs Led Experian	32,408	33,854	41,860		1,447	8,006	9,453
Jobs Led Oxford	32,408	33,854	41,017		1,447	7,162	8,609
SNPP-2010	32,408	33,869	38,239		1,462	4,369	5,831
Migration-led 10 yr	32,408	33,854	36,458		1,447	2,604	4,051
Migration-led 5 yr	32,408	33,854	36,407		1,447	2,552	3,999
WORCESTER CITY	**2006**	**2012**	**2030**		**2006-12**	**2012-30**	**2006-30**
Jobs Led Cambridge	41,271	43,918	53,810		2,647	9,891	12,538
Jobs Led Experian	41,271	43,918	51,322		2,647	7,404	10,050
Jobs Led Oxford	41,271	43,918	52,374		2,647	8,456	11,103
SNPP-2010	41,271	44,369	49,984		3,098	5,615	8,712
Migration-led 10 yr	41,271	43,918	51,885		2,647	7,967	10,613
Migration-led 5 yr	41,271	43,918	52,455		2,647	8,537	11,184
WYCHAVON	**2006**	**2012**	**2030**		**2006-12**	**2012-30**	**2006-30**
Jobs Led Cambridge	49,822	51,692	62,621		1,870	10,929	12,799
Jobs Led Experian	49,822	51,692	62,155		1,870	10,462	12,332
Jobs Led Oxford	49,822	51,692	61,682		1,870	9,990	11,860
SNPP-2010	49,822	51,509	57,969		1,687	6,459	8,146
Migration-led 10 yr	49,822	51,692	55,982		1,870	4,289	6,159
Migration-led 5 yr	49,822	51,692	55,382		1,870	3,689	5,559
SOUTH WORCESTERSHIRE	**2006**	**2012**	**2030**		**2006-12**	**2012-30**	**2006-30**
Jobs Led Cambridge	123,501	129,465	159,812		5,964	30,347	36,311
Jobs Led Experian	123,501	129,465	155,337		5,964	25,871	31,836
Jobs Led Oxford	123,501	129,465	155,073		5,964	25,608	31,572
SNPP-2010	123,501	129,747	146,191		6,246	16,444	22,690
Migration-led 10 yr	123,501	129,465	144,325		5,964	14,860	20,824
Migration-led 5 yr	123,501	129,465	144,244		5,964	14,779	20,743

Note: Figures may not sum due to rounding

The following information is provided with OAHN core and sensitivity scenarios' datasets:

The participation rates were provided by using the POPGROUP model. This is a family of demographic models developed to forecast population, households and the labour force for areas and social groups. POPGROUP incorporates a cohort component methodology for its population projection model, a headship rate model for its household projection model and an economic activity rate model for its labour-force projection model. The household and labour force projections were delivered using the Derived Forecast model, a new module in the POPGROUP suite. Unemployment rates and commuting ratios by district are taken from NOMIS.

Table D2: Core Scenarios – DWELLINGS PROJECTIONS by SCENARIO
Totals: 2006, 2012 and 2030; and Changes: 2006 to 2012, 2012 to 2030, 2006 to 2030

	TOTALS			CHANGE		
Jobs Led Cambridge	**2006**	**2012**	**2030**	**2006-12**	**2012-30**	**2006-30**
Malvern Hills	32,408	33,854	43,381	1,447	9,526	10,973
Worcester City	41,271	43,918	53,810	2,647	9,891	12,538
Wychavon	49,822	51,692	62,621	1,870	10,929	12,799
SOUTH WORCESTERSHIRE	123,501	129,465	159,812	**5,964**	**30,347**	**36,311**
Jobs Led Experian	**2006**	**2012**	**2030**	**2006-12**	**2012-30**	**2006-30**
Malvern Hills	32,408	33,854	41,860	1,447	8,006	9,453
Worcester City	41,271	43,918	51,322	2,647	7,404	10,050
Wychavon	49,822	51,692	62,155	1,870	10,462	12,332
SOUTH WORCESTERSHIRE	123,501	129,465	155,337	**5,964**	**25,871**	**31,836**
Jobs Led Oxford	**2006**	**2012**	**2030**	**2006-12**	**2012-30**	**2006-30**
Malvern Hills	32,408	33,854	41,017	1,447	7,162	8,609
Worcester City	41,271	43,918	52,374	2,647	8,456	11,103
Wychavon	49,822	51,692	61,682	1,870	9,990	11,860
SOUTH WORCESTERSHIRE	123,501	129,465	155,073	**5,964**	**25,608**	**31,572**
SNPP-2010	**2006**	**2012**	**2030**	**2006-12**	**2012-30**	**2006-30**
Malvern Hills	32,408	33,869	38,239	1,462	4,369	5,831
Worcester City	41,271	44,369	49,984	3,098	5,615	8,712
Wychavon	49,822	51,509	57,969	1,687	6,459	8,146
SOUTH WORCESTERSHIRE	123,501	129,747	146,191	**6,246**	**16,444**	**22,690**
Migration-led 10 yr	**2006**	**2012**	**2030**	**2006-12**	**2012-30**	**2006-30**
Malvern Hills	32,408	33,854	36,458	1,447	2,604	4,051
Worcester City	41,271	43,918	51,885	2,647	7,967	10,613
Wychavon	49,822	51,692	55,982	1,870	4,289	6,159
SOUTH WORCESTERSHIRE	123,501	129,465	144,325	**5,964**	**14,860**	**20,824**
Migration-led 5 yr	**2006**	**2012**	**2030**	**2006-12**	**2012-30**	**2006-30**
Malvern Hills	32,408	33,854	36,407	1,447	2,552	3,999
Worcester City	41,271	43,918	52,455	2,647	8,537	11,184
Wychavon	49,822	51,692	55,382	1,870	3,689	5,559
SOUTH WORCESTERSHIRE	123,501	129,465	144,244	**5,964**	**14,779**	**20,743**

Note: Figures may not sum due to rounding

The following information is provided with OAHN core and sensitivity scenarios' datasets:

The participation rates were provided by using the POPGROUP model. This is a family of demographic models developed to forecast population, households and the labour force for areas and social groups. POPGROUP incorporates a cohort component methodology for its population projection model, a headship rate model for its household projection model and an economic activity rate model for its labour-force projection model. The household and labour force projections were delivered using the Derived Forecast model, a new module in the POPGROUP suite. Unemployment rates and commuting ratios by district are taken from NOMIS.

Table D3: Core Scenarios - Summary Statistics : MALVERN HILLS Totals: 2006, 2012 and 2030; and Changes: 2006 to 2012, 2012 to 2030, 2006 to 2030						
	TOTALS				CHANGE	
Jobs Led Cambridge	**2006**	**2012**	**2030**	**2006-12**	**2012-30**	**2006-30**
Total population	73,748	74,980	96,801	1,232	21,821	23,053
Natural Change				*-1,754*	*-4,585*	*-6,339*
Net Migration				*2,986*	*26,406*	*29,392*
Number of Labour Force	35,487	36,144	41,102	657	4,958	5,615
Average pa change				*110*	*275*	*234*
Number of Jobs#					4,291	
Average pa change					*238*	
Number of Households	31,105	32,433	41,559	1,328	9,126	10,454
Average pa change				*221*	*507*	*436*
Number of Dwellings	32,408	33,854	43,381	1,447	9,526	10,973
Average pa change				*242*	*529*	*457*
Jobs Led Experian	**2006**	**2012**	**2030**	**2006-12**	**2012-30**	**2006-30**
Total Population	73,748	74,980	92,854	1,232	17,874	19,106
Natural Change				*-1,754*	*-4,935*	*-6,689*
Net Migration				*2,986*	*22,809*	*25,795*
Number of Labour Force	35,487	36,144	39,113	657	2,969	3,627
Average pa change				*110*	*165*	*151*
Number of Jobs#					2,570	
Average pa change					*143*	
Number of Households	31,105	32,433	40,102	1,328	7,669	8,997
Average pa change				*221*	*426*	*375*
Number of Dwellings	32,408	33,854	41,860	1,447	8,006	9,453
Average pa change				*242*	*445*	*394*
Jobs Led Oxford	**2006**	**2012**	**2030**	**2006-12**	**2012-30**	**2006-30**
Total Population	73,748	74,980	90,774	1,232	15,794	17,026
Natural Change				*-1,754*	*-5,221*	*-6,975*
Net Migration				*2,986*	*21,014*	*24,000*
Number of Labour Force	35,487	36,144	38,105	657	1,961	2,618
Average pa change				*110*	*109*	*109*
Number of Jobs#					1,697	
Average pa change					*94*	
Number of Households	31,105	32,433	39,294	1,328	6,862	8,189
Average pa change				*221*	*381*	*341*
Number of Dwellings	32,408	33,854	41,017	1,447	7,162	8,609
Average pa change				*241*	*398*	*359*

Jobs led scenarios are constrained to the level of forecast jobs growth 2012 to 2030 Note: Figures may not sum due to rounding

	TOTALS				CHANGE		
SNPP-2010	**2006**	**2012**	**2030**		**2006-12**	**2012-30**	**2006-30**
Total population	73,748	74,847	81,050		1,099	6,203	7,302
Natural Change					*-1,748*	*-8,089*	*-9,837*
Net Migration					*2,848*	*14,292*	*17,139*
Number of Labour Force	35,487	35,552	34,035		65	-1,517	-1,452
Average pa change					*11*	*-84*	*-61*
Number of Jobs	30,714	30,770	29,457		56	-1,313	-1,256
Average pa change					*9*	*-73*	*-52*
Number of Households	31,105	32,447	36,633		1,342	4,186	5,528
Average pa change					*224*	*233*	*230*
Number of Dwellings	32,408	33,869	38,239		1,462	4,369	5,831
Average pa change					*244*	*243*	*243*
Migration-led 10 yr	**2006**	**2012**	**2030**		**2006-12**	**2012-30**	**2006-30**
Total Population	73,748	74,980	79,297		1,232	4,317	5,549
Natural Change					*-1,754*	*-6,299*	*-8,053*
Net Migration					*2,986*	*10,616*	*13,602*
Number of Labour Force	35,487	36,144	32,335		657	-3,809	-3,152
Average pa change					*110*	*-212*	*-131*
Number of Jobs	30,714	31,282	27,986		569	-3,297	-2,728
Average pa change					*95*	*-183*	*-114*
Number of Households	31,105	32,433	34,927		1,328	2,495	3,823
Average pa change					*221*	*139*	*159*
Number of Dwellings	32,408	33,854	36,458		1,447	2,604	4,051
Average pa change					*241*	*145*	*169*
Migration-led 5 yr	**2006**	**2012**	**2030**		**2006-12**	**2012-30**	**2006-30**
Total Population	73,748	74,980	78,846		1,232	3,866	5,098
Natural Change					*-1,754*	*-6,155*	*-7,909*
Net Migration					*2,986*	*10,021*	*13,007*
Number of Labour Force	35,487	36,144	32,140		657	-4,004	-3,346
Average pa change					*110*	*-222*	*-139*
Number of Jobs	30,714	31,282	27,817		569	-3,465	-2,896
Average pa change					*95*	*-193*	*-121*
Number of Households	31,105	32,433	34,878		1,328	2,445	3,773

Average pa change					*221*	*136*	*157*
Number of Dwellings	32,408	33,854	36,407		1,447	2,552	3,999
Average pa change					*241*	*142*	*167*

The following information is provided with OAHN core and sensitivity scenarios' datasets:

The participation rates were provided by using the POPGROUP model. This is a family of demographic models developed to forecast population, households and the labour force for areas and social groups. POPGROUP incorporates a cohort component methodology for its population projection model, a headship rate model for its household projection model and an economic activity rate model for its labour-force projection model. The household and labour force projections were delivered using the Derived Forecast model, a new module in the POPGROUP suite. Unemployment rates and commuting ratios by district are taken from NOMIS.

Table D4: Core Scenarios - Summary Statistics : WORCESTER Totals: 2006, 2012 and 2030; and Changes: 2006 to 2012, 2012 to 2030, 2006 to 2030						
	TOTALS				CHANGE	
Jobs Led Cambridge	**2006**	**2012**	**2030**	**2006-12**	**2012-30**	**2006-30**
Total population	95,024	99,604	118,963	4,580	19,359	23,939
Natural Change				*3,156*	*11,912*	*15,068*
Net Migration				*1,424*	*7,448*	*8,872*
Number of Labour Force	51,042	54,143	61,399	3,100	7,257	10,357
Average pa change				*517*	*403*	*432*
Number of Jobs#					7,380	
Average pa change					*410*	
Number of Households	40,318	42,337	51,873	2,019	9,535	11,555
Average pa change				*337*	*530*	*481*
Number of Dwellings	41,271	43,918	53,810	2,647	9,891	12,538
Average pa change				*441*	*550*	*522*
Jobs Led Experian	**2006**	**2012**	**2030**	**2006-12**	**2012-30**	**2006-30**
Total Population	95,024	99,604	112,844	4,580	13,240	17,820
Natural Change				*3,156*	*11,150*	*14,306*
Net Migration				*1,424*	*2,090*	*3,514*
Number of Labour Force	51,042	54,143	57,565	3,100	3,422	6,522
Average pa change				*517*	*190*	*272*
Number of Jobs#					3,480	
Average pa change					*193*	
Number of Households	40,318	42,337	49,474	2,019	7,137	9,156
Average pa change				*337*	*397*	*382*
Number of Dwellings	41,271	43,918	51,322	2,647	7,404	10,050
Average pa change				*441*	*411*	*419*
Jobs Led Oxford	**2006**	**2012**	**2030**	**2006-12**	**2012-30**	**2006-30**
Total Population	95,024	99,604	115,331	4,580	15,727	20,307
Natural Change				*3,156*	*11,859*	*15,015*
Net Migration				*1,424*	*3,869*	*5,293*
Number of Labour Force	51,042	54,143	58,935	3,100	4,793	7,893
Average pa change				*517*	*266*	*329*
Number of Jobs#					4,874	
Average pa change					*271*	
Number of Households	40,318	42,337	50,489	2,019	8,152	10,171
Average pa change				*337*	*453*	*424*
Number of Dwellings	41,271	43,918	52,374	2,647	8,456	11,103
Average pa change				*441*	*470*	*463*

Jobs led scenarios are constrained to the level of forecast jobs growth 2012 to 2030
Note: Figures may not sum due to rounding

	TOTALS				CHANGE		
SNPP-2010	**2006**	**2012**	**2030**		**2006-12**	**2012-30**	**2006-30**
Total population	95,024	99,349	108,580		4,325	9,231	13,556
Natural Change					*3,109*	*10,085*	*13,194*
Net Migration					*1,216*	*-854*	*362*
Number of Labour Force	51,042	53,980	55,978		2,937	1,998	4,935
Average pa change					*490*	*111*	*206*
Number of Jobs	51,907	54,895	56,926		2,987	2,032	5,019
Average pa change					*498*	*113*	*209*
Number of Households	40,318	42,772	48,185		2,454	5,413	7,866
Average pa change					*409*	*301*	*328*
Number of Dwellings	41,271	44,369	49,984		3,098	5,615	8,712
Average pa change					*516*	*312*	*36*
Migration-led 10 yr	**2006**	**2012**	**2030**		**2006-12**	**2012-30**	**2006-30**
Total Population	95,024	99,604	113,970		4,580	14,366	18,946
Natural Change					*3,156*	*11,967*	*15,123*
Net Migration					*1,424*	*2,399*	*3,823*
Number of Labour Force	51,042	54,143	58,685		3,100	4,543	7,643
Average pa change					*517*	*252*	*318*
Number of Jobs	51,907	55,060	59,680		3,153	4,620	7,773
Average pa change					*526*	*257*	*324*
Number of Households	40,318	42,337	50,017		2,019	7,680	9,699
Average pa change					*337*	*427*	*404*
Number of Dwellings	41,271	43,918	51,885		2,647	7,967	10,613
Average pa change					*441*	*443*	*442*
Migration-led 5 yr	**2006**	**2012**	**2030**		**2006-12**	**2012-30**	**2006-30**
Total Population	95,024	99,604	115,626		4,580	16,022	20,602
Natural Change					*3,156*	*11,520*	*14,676*
Net Migration					*1,424*	*4,502*	*5,926*
Number of Labour Force	51,042	54,143	59,295		3,100	5,153	8,253
Average pa change					*517*	*286*	*344*
Number of Jobs	51,907	55,060	60,300		3,153	5,240	8,393
Average pa change					*526*	*291*	*350*
Number of Households	40,318	42,337	50,567		2,019	8,230	10,249
Average pa change					*337*	*457*	*427*
Number of Dwellings	41,271	43,918	52,455		2,647	8,537	11,184
Average pa change					*441*	*474*	*466*

The following information is provided with OAHN core and sensitivity scenarios' datasets:

The participation rates were provided by using the POPGROUP model. This is a family of demographic models developed to forecast population, households and the labour force for areas and social groups. POPGROUP incorporates a cohort component methodology for its population projection model, a headship rate model for its household projection model and an economic activity rate model for its labour-force projection model. The household and labour force projections were delivered using the Derived Forecast model, a new module in the POPGROUP suite. Unemployment rates and commuting ratios by district are taken from NOMIS.

Table D5: Core Scenarios - Summary Statistics : WYCHAVON Totals: 2006, 2012 and 2030; and Changes: 2006 to 2012, 2012 to 2030, 2006 to 2030							
	TOTALS				CHANGE		
Jobs Led Cambridge	**2006**	**2012**	**2030**		**2006-12**	**2012-30**	**2006-30**
Total population	115,451	117,670	139,710		2,219	22,040	24,259
Natural Change					*124*	*284*	*408*
Net Migration					*2,095*	*21,757*	*23,852*
Number of Labour Force	59,709	61,219	64,796		1,510	3,577	5,087
Average pa change					*252*	*199*	*212*
Number of Jobs#						3,197	
Average pa change						*178*	
Number of Households	48,333	49,935	60,492		1,602	10,557	12,160
Average pa change					*267*	*587*	*507*
Number of Dwellings	49,822	51,692	62,621		1,870	10,929	12,799
Average pa change					*312*	*607*	*533*
Jobs Led Experian	**2006**	**2012**	**2030**		**2006-12**	**2012-30**	**2006-30**
Total Population	115,451	117,670	138,505		2,219	20,835	23,054
Natural Change					*124*	*325*	*385*
Net Migration					*2,095*	*18,894*	*22,669*
Number of Labour Force	59,709	61,219	64,083		1,510	2,864	4,374
Average pa change					*252*	*159*	*182*
Number of Jobs#						2,560	
Average pa change						*142*	
Number of Households	48,333	49,935	60,041		1,602	10,107	11,709
Average pa change					*267*	*562*	*488*
Number of Dwellings	49,822	51,692	62,155		1,870	10,462	12,332
Average pa change					*312*	*581*	*514*
Jobs Led Oxford	**2006**	**2012**	**2030**		**2006-12**	**2012-30**	**2006-30**
Total Population	115,451	117,670	137,352		2,219	19,682	21,901
Natural Change					*124*	*100*	*224*
Net Migration					*2,095*	*19,581*	*21,676*
Number of Labour Force	59,709	61,219	63,473		1,510	2,254	3,764
Average pa change					*252*	*125*	*157*
Number of Jobs#						2,015	
Average pa change						*112*	
Number of Households	48,333	49,935	59,585		1,602	9,650	11,252
Average pa change					*267*	*536*	*469*
Number of Dwellings	49,822	51,692	61,682		1,870	9,990	11,860
Average pa change					*312*	*555*	*494*

Jobs led scenarios are constrained to the level of forecast jobs growth 2012 to 2030Note: Figures may not sum due to rounding

	TOTALS				CHANGE		
SNPP-2010	**2006**	**2012**	**2030**		**2006-12**	**2012-30**	**2006-30**
Total population	115,451	117,726	128,953		2,275	11,227	13,502
Natural Change					*163*	*-1,788*	*-1,625*
Net Migration					*2,113*	*13,015*	*15,127*
Number of Labour Force	59,709	61,196	59,826		1,487	-1,370	117
Average pa change					*248*	*-76*	*5*
Number of Jobs	53,362	54,691	53,467		1,329	-1,224	105
Average pa change					*222*	*-68*	*4*
Number of Households	48,333	49,758	55,998		1,425	6,240	7,665
Average pa change					*238*	*347*	*319*
Number of Dwellings	49,822	51,509	57,969		1,687	6,459	8,146
Average pa change					*282*	*359*	*339*
Migration-led 10 yr	**2006**	**2012**	**2030**		**2006-12**	**2012-30**	**2006-30**
Total Population	115,451	117,670	122,523		2,219	4,853	7,072
Natural Change					*124*	*-1,897*	*-1,773*
Net Migration					*2,095*	*6,749*	*8,844*
Number of Labour Force	59,709	61,219	54,721		1,510	-6,498	-4,988
Average pa change					*252*	*-361*	*-208*
Number of Jobs	53,362	54,712	48,905		1,349	-5,807	-4,458
Average pa change					*225*	*-323*	*-186*
Number of Households	48,333	49,935	54,078		1,602	4,144	5,746
Average pa change					*267*	*230*	*239*
Number of Dwellings	49,822	51,692	55,982		1,870	4,289	6,159
Average pa change					*312*	*238*	*257*
Migration-led 5 yr	**2006**	**2012**	**2030**		**2006-12**	**2012-30**	**2006-30**
Total Population	115,451	117,670	121,203		2,219	3,533	5,752
Natural Change					*124*	*-1,582*	*-1,458*
Net Migration					*2,095*	*5,115*	*7,210*
Number of Labour Force	59,709	61,219	54,813		1,510	-6,406	-4,896
Average pa change					*252*	*-356*	*-204*
Number of Jobs	53,362	54,712	48,987		1,349	-5,725	-4,375
Average pa change					*225*	*-318*	*-182*
Number of Households	48,333	49,935	53,499		1,602	3,564	5,166
Average pa change					*267*	*198*	*215*
Number of Dwellings	49,822	51,692	55,382		1,870	3,689	5,559
Average pa change					*312*	*205*	*232*

The following information is provided with OAHN core and sensitivity scenarios' datasets:

The participation rates were provided by using the POPGROUP model. This is a family of demographic models developed to forecast population, households and the labour force for areas and social groups.

POPGROUP incorporates a cohort component methodology for its population projection model, a headship rate model for its household projection model and an economic activity rate model for its labour-force projection model. The household and labour force projections were delivered using the Derived Forecast model, a new module in the POPGROUP suite. Unemployment rates and commuting ratios by district are taken from NOMIS.

Table D6: Core Scenarios - Summary Statistics : SOUTH WORCESTERSHIRE
Totals: 2006, 2012 and 2030; and Changes: 2006 to 2012, 2012 to 2030, 2006 to 2030

	TOTALS				CHANGE		
Jobs Led Cambridge	**2006**	**2012**	**2030**		**2006-12**	**2012-30**	**2006-30**
Total population	284,223	292,254	355,475		8,031	63,221	71,252
Natural Change					*1,526*	*7,611*	*9,137*
Net Migration					*6,505*	*55,610*	*62,115*
Number of Labour Force	146,238	151,505	167,297		5,268	15,792	21,059
Average pa change					*878*	*877*	*877*
Number of Jobs#						14,868	
Average pa change						*826*	
Number of Households	119,755	124,705	153,924		4,949	29,219	34,168
Average pa change					*825*	*1,623*	*1,424*
Number of Dwellings	123,501	129,465	159,812		5,964	30,347	36,311
Average pa change					*994*	*1,686*	*1,513*
Jobs Led Experian	**2006**	**2012**	**2030**		**2006-12**	**2012-30**	**2006-30**
Total Population	284,223	292,254	344,203		8,031	51,949	59,980
Natural Change					*1,526*	*6,476*	*8,002*
Net Migration					*6,505*	*45,474*	*51,979*
Number of Labour Force	146,238	151,505	160,761		5,268	9,256	14,523
Average pa change					*878*	*514*	*605*
Number of Jobs#						8,610	
Average pa change						*478*	
Number of Households	119,755	124,705	149,618		4,949	24,913	29,862
Average pa change					*825*	*1,384*	*1,244*
Number of Dwellings	123,501	129,465	155,337		5,964	25,871	31,836
Average pa change					*994*	*1,437*	*1,327*
Jobs Led Oxford	**2006**	**2012**	**2030**		**2006-12**	**2012-30**	**2006-30**
Total Population	284,223	292,254	343,457		8,031	51,203	59,234
Natural Change					*1,526*	*6,739*	*8,265*
Net Migration					*6,505*	*44,464*	*50,969*
Number of Labour Force	146,238	151,505	160,513		5,268	9,008	14,276
Average pa change					*878*	*500*	*595*
Number of Jobs#						8,586	
Average pa change						*477*	
Number of Households	119,755	124,705	149,368		4,949	24,663	29,613
Average pa change					*825*	*1,370*	*1,234*
Number of Dwellings	123,501	129,465	155,073		5,964	25,608	31,572
Average pa change					*994*	*1,423*	*1,316*

Jobs led scenarios are constrained to the level of forecast jobs growth 2012 to 2030
Note: Figures may not sum due to rounding

	TOTALS				CHANGE		
SNPP-2010	**2006**	**2012**	**2030**		**2006-12**	**2012-30**	**2006-30**
Total population	284,223	291,923	318,583		7,700	26,660	34,360
Natural Change					*1,523*	*208*	*1,732*
Net Migration					*6,177*	*26,452*	*32,629*
Number of Labour Force	146,238	150,727	149,838		4,489	-889	3,601
Average pa change					*749*	*-49*	*150*
Number of Jobs	135,983	140,356	139,850		4,372	-505	3,867
Average pa change					*729*	*-28*	*161*
Number of Households	119,755	124,976	140,815		5,221	15,838	21,059
Average pa change					*870*	*880*	*877*
Number of Dwellings	123,501	129,747	146,191		6,246	16,444	22,690
Average pa change					*1041*	*914*	*945*
Migration-led 10 yr	**2006**	**2012**	**2030**		**2006-12**	**2012-30**	**2006-30**
Total Population	284,223	292,254	315,789		8,031	23,535	31,566
Natural Change					*1,526*	*3,771*	*5,297*
Net Migration					*6,505*	*19,764*	*26,269*
Number of Labour Force	146,238	151,505	145,741		5,268	-5,764	-496
Average pa change					*878*	*-320*	*-21*
Number of Jobs	135,983	141,054	136,571		5,071	-4,484	587
Average pa change					*845*	*-249*	*24*
Number of Households	119,755	124,705	139,023		4,949	14,318	19,267
Average pa change					*825*	*795*	*803*
Number of Dwellings	123,501	129,465	144,325		5,964	14,860	20,824
Average pa change					*994*	*826*	*868*
Migration-led 5 yr	**2006**	**2012**	**2030**		**2006-12**	**2012-30**	**2006-30**
Total Population	284,223	292,254	315,675		8,031	23,421	31,452
Natural Change					*1,526*	*3,783*	*5,309*
Net Migration					*6,505*	*19,638*	*26,143*
Number of Labour Force	146,238	151,505	146,249		5,268	-5,257	11
Average pa change					*878*	*-292*	*0.5*
Number of Jobs	135,983	141,054	137,104		5,071	-3,950	1,121
Average pa change					*845*	*-219*	*47*
Number of Households	119,755	124,705	138,943		4,949	14,239	19,188
Average pa change					*825*	*791*	*800*
Number of Dwellings	123,501	129,465	144,244		5,964	14,779	20,743
Average pa change					*975*	*820*	*859*

The following information is provided with OAHN core and sensitivity scenarios' datasets:

The participation rates were provided by using the POPGROUP model. This is a family of demographic models developed to forecast population, households and the labour force for areas and social groups. POPGROUP incorporates a cohort component methodology for its population projection model, a headship rate model for its household projection model and an economic activity rate model for its labour-force projection model. The household and labour force projections were delivered using the Derived Forecast model, a new module in the POPGROUP suite. Unemployment rates and commuting ratios by district are taken from NOMIS.

Table D7: JOB Sensitivity Scenario 2 – DWELLINGS PROJECTIONS BY DISTRICTS Totals: 2006, 2012 and 2030; and Changes: 2006 to 2012, 2012 to 2030, 2006 to 2030						
	TOTALS			CHANGE		
MALVERN HILLS	**2006**	**2012**	**2030**	**2006-12**	**2012-30**	**2006-30**
Jobs Led Cambridge	32,408	33,854	42,448	1,447	8,593	10,040
Jobs Led Experian	32,408	33,854	40,939	1,447	7,085	8,532
Jobs Led Oxford	32,408	33,854	40,104	1,447	6,250	7,697
Jobs Led Central	32,408	33,854	41,276	1,447	7,422	8,869
Jobs Led Average	32,408	33,854	41,164	1,447	7,309	8,756
SNPP-2010	32,408	33,869	38,239	1,462	4,369	5,831
Migration-led 10 yr	32,408	33,854	36,458	1,447	2,604	4,051
Migration-led 5 yr	32,408	33,854	36,407	1,447	2,552	3,999
WORCESTER CITY	**2006**	**2012**	**2030**	**2006-12**	**2012-30**	**2006-30**
Jobs Led Cambridge	41,271	43,918	52,846	2,647	8,928	11,575
Jobs Led Experian	41,271	43,918	50,379	2,647	6,461	9,108
Jobs Led Oxford	41,271	43,918	51,423	2,647	7,504	10,151
Jobs Led Central	41,271	43,918	52,135	2,647	8,216	10,863
Jobs Led Average	41,271	43,918	51,549	2,647	7,631	10,278
SNPP-2010	41,271	44,369	49,984	3,098	5,615	8,712
Migration-led 10 yr	41,271	43,918	51,885	2,647	7,967	10,613
Migration-led 5 yr	41,271	43,918	52,455	2,647	8,537	11,184
WYCHAVON	**2006**	**2012**	**2030**	**2006-12**	**2012-30**	**2006-30**
Jobs Led Cambridge	49,822	51,692	61,301	1,870	9,609	11,479
Jobs Led Experian	49,822	51,692	60,840	1,870	9,147	11,017
Jobs Led Oxford	49,822	51,692	60,374	1,870	8,682	10,552
Jobs Led Central	49,822	51,692	60,838	1,870	9,146	11,016
Jobs Led Average	49,822	51,692	60,838	1,870	9,146	11,016
SNPP-2010	49,822	51,509	57,969	1,687	6,459	8,146
Migration-led 10 yr	49,822	51,692	55,982	1,870	4,289	6,159
Migration-led 5 yr	49,822	51,692	55,382	1,870	3,689	5,559
SOUTH WORCESTERSHIRE	**2006**	**2012**	**2030**	**2006-12**	**2012-30**	**2006-30**
Jobs Led Cambridge	123,501	129,465	156,595	5,964	27,130	33,094
Jobs Led Experian	123,501	129,465	152,158	5,964	22,693	28,657
Jobs Led Oxford	123,501	129,465	151,901	5,964	22,436	28,400
Jobs Led Central	123,501	129,465	154,248	5,964	24,783	30,747
Jobs Led Average	123,501	129,465	153,551	5,964	24,086	30,050
SNPP-2010	123,501	129,747	146,191	6,246	16,444	22,690
Migration-led 10 yr	123,501	129,465	144,325	5,964	14,860	20,824
Migration-led 5 yr	123,501	129,465	144,244	5,964	14,779	20,743

Note: Figures may not sum due to rounding

Table D8: JOB Sensitivity Scenario 2 – DWELLINGS PROJECTIONS by SCENARIO
Totals: 2006, 2012 and 2030; and Changes: 2006 to 2012, 2012 to 2030, 2006 to 2030

	TOTALS			CHANGE		
Jobs Led Cambridge	**2006**	**2012**	**2030**	**2006-12**	**2012-30**	**2006-30**
Malvern Hills	32,408	33,854	42,448	1,447	8,593	10,040
Worcester City	41,271	43,918	52,846	2,647	8,928	11,575
Wychavon	49,822	51,692	61,301	1,870	9,609	11,479
SOUTH WORCESTERSHIRE	123,501	129,465	156,595	**5,964**	**27,130**	**33,094**
Jobs Led Experian	**2006**	**2012**	**2030**	**2006-12**	**2012-30**	**2006-30**
Malvern Hills	32,408	33,854	40,939	1,447	7,085	8,532
Worcester City	41,271	43,918	50,379	2,647	6,461	9,108
Wychavon	49,822	51,692	60,840	1,870	9,147	11,017
SOUTH WORCESTERSHIRE	123,501	129,465	152,158	**5,964**	**22,693**	**28,657**
Jobs Led Oxford	**2006**	**2012**	**2030**	**2006-12**	**2012-30**	**2006-30**
Malvern Hills	32,408	33,854	40,104	1,447	6,250	7,697
Worcester City	41,271	43,918	51,423	2,647	7,504	10,151
Wychavon	49,822	51,692	60,374	1,870	8,682	10,552
SOUTH WORCESTERSHIRE	123,501	129,465	151,901	**5,964**	**22,436**	**28,400**
Jobs Led Central	**2006**	**2012**	**2030**	**2006-12**	**2012-30**	**2006-30**
Malvern Hills	32,408	33,854	41,276	1,447	7,422	8,869
Worcester City	41,271	43,918	52,135	2,647	8,216	10,863
Wychavon	49,822	51,692	60,838	1,870	9,146	11,016
SOUTH WORCESTERSHIRE	123,501	129,465	154,248	**5,964**	**24,783**	**30,747**
Jobs Led Average	**2006**	**2012**	**2030**	**2006-12**	**2012-30**	**2006-30**
Malvern Hills	32,408	33,854	41,164	1,447	7,309	8,756
Worcester City	41,271	43,918	51,549	2,647	7,631	10,278
Wychavon	49,822	51,692	60,838	1,870	9,146	11,016
SOUTH WORCESTERSHIRE	123,501	129,465	153,551	**5,964**	**24,086**	**30,050**
SNPP-2010	**2006**	**2012**	**2030**	**2006-12**	**2012-30**	**2006-30**
Malvern Hills	32,408	33,869	38,239	1,462	4,369	5,831
Worcester City	41,271	44,369	49,984	3,098	5,615	8,712
Wychavon	49,822	51,509	57,969	1,687	6,459	8,146
SOUTH WORCESTERSHIRE	123,501	129,747	146,191	**6,246**	**16,444**	22,690
Migration-led 10 yr	**2006**	**2012**	**2030**	**2006-12**	**2012-30**	**2006-30**
Malvern Hills	32,408	33,854	36,458	1,447	2,604	4,051
Worcester City	41,271	43,918	51,885	2,647	7,967	10,613
Wychavon	49,822	51,692	55,982	1,870	4,289	6,159
SOUTH WORCESTERSHIRE	123,501	129,465	144,325	**5,964**	**14,860**	**20,824**
Migration-led 5 yr	**2006**	**2012**	**2030**	**2006-12**	**2012-30**	**2006-30**
Malvern Hills	32,408	33,854	36,407	1,447	2,552	3,999
Worcester City	41,271	43,918	52,455	2,647	8,537	11,184
Wychavon	49,822	51,692	55,382	1,870	3,689	5,559
SOUTH WORCESTERSHIRE	123,501	129,465	144,244	**5,964**	**14,779**	**20,743**

Note: Figures may not sum due to rounding

Table D9: JOB Sensitivity Scenario 2 - Summary Statistics : MALVERN HILLS Totals: 2006, 2012 and 2030; and Changes: 2006 to 2012, 2012 to 2030, 2006 to 2030						
	TOTALS				CHANGE	
Jobs Led Cambridge	**2006**	**2012**	**2030**	**2006-12**	**2012-30**	**2006-30**
Total population	73,748	74,980	94,389	1,232	19,409	20,641
Natural Change				*-1,754*	*-4,895*	*-6,649*
Net Migration				*2,986*	*24,304*	*27,290*
Number of Labour Force	35,487	36,234	40,861	747	4,627	5,374
Average pa change				*125*	*257*	*224*
Number of Jobs					4,291	
Average pa change					*238*	
Number of Households	31,105	32,433	40,665	1,328	8,233	9,560
Average pa change				*221*	*457*	*398*
Number of Dwellings	32,408	33,854	42,448	1,447	8,593	10,040
Average pa change				*241*	*477*	*418*
Jobs Led Experian	**2006**	**2012**	**2030**	**2006-12**	**2012-30**	**2006-30**
Total Population	73,748	74,980	90,483	1,232	15,503	16,735
Natural Change				*-1,754*	*-5,233*	*-6,987*
Net Migration				*2,986*	*20,736*	*23,722*
Number of Labour Force	35,487	36,234	38,873	747	2,639	3,386
Average pa change				*125*	*147*	*141*
Number of Jobs					2,570	
Average pa change					*143*	
Number of Households	31,105	32,433	39,220	1,328	6,787	8,115
Average pa change				*221*	*377*	*338*
Number of Dwellings	32,408	33,854	40,939	1,447	7,085	8,532
Average pa change				*242*	*394*	*356*
Jobs Led Oxford	**2006**	**2012**	**2030**	**2006-12**	**2012-30**	**2006-30**
Total Population	73,748	74,980	88,430	1,232	13,450	14,682
Natural Change				*-1,754*	*-5,509*	*-7,263*
Net Migration				*2,986*	*18,959*	*21,945*
Number of Labour Force	35,487	36,234	37,865	747	1,631	2,378
Average pa change				*125*	*91*	*99*
Number of Jobs					1,697	
Average pa change					*94*	
Number of Households	31,105	32,433	38,420	1,328	5,987	7,315
Average pa change				*221*	*333*	*305*
Number of Dwellings	32,408	33,854	40,104	1,447	6,250	7,697
Average pa change				*242*	*347*	*321*

Note: Figures may not sum due to rounding

	TOTALS				CHANGE		
Jobs Led Central	**2006**	**2012**	**2030**		**2006-12**	**2012-30**	**2006-30**
Total population	73,748	74,980	91,410		1,232	16,430	17,662
Natural Change					-1,754	-5,202	-6,956
Net Migration					2,986	21,632	24,618
Number of Labour Force	35,487	36,234	39,363		747	3,129	3,876
Average pa change					125	174	162
Number of Jobs						2,994	
Average pa change						166	
Number of Households	31,105	32,433	39,543		1,328	7,110	8,438
Average pa change					221	395	352
Number of Dwellings	32,408	33,854	41,276		1,447	7,422	8,869
Average pa change					242	412	370
Jobs Led Average	**2006**	**2012**	**2030**		**2006-12**	**2012-30**	**2006-30**
Total population	73,748	74,980	91,101		1,232	16,121	17,353
Natural Change					-1,754	-5,212	-6,966
Net Migration					2,986	21,333	24,319
Number of Labour Force	35,487	36,234	39,200		747	2,966	3,713
Average pa change					125	165	155
Number of Jobs						2,853	
Average pa change						158	
Number of Households	31,105	32,433	39,435		1,328	7,002	8,330
Average pa change					221	389	347
Number of Dwellings	32,408	33,854	41,164		1,447	7,309	8,756
Average pa change					242	406	365
SNPP-2010	**2006**	**2012**	**2030**		**2006-12**	**2012-30**	**2006-30**
Total population	73,748	74,847	81,050		1,099	6,203	7,302
Natural Change					*-1,748*	*-8,089*	*-9,837*
Net Migration					*2,848*	*14,292*	*17,139*
Number of Labour Force	35,487	35,552	34,035		65	-1,517	-1,452
Average pa change					*11*	*-84*	*-61*
Number of Jobs	30,714	30,770	29,457		56	-1,313	-1,256
Average pa change					*9*	*-73*	*-52*
Number of Households	31,105	32,447	36,633		1,342	4,186	5,528
Average pa change					*224*	*233*	*230*
Number of Dwellings	32,408	33,869	38,239		1,462	4,369	5,831
Average pa change					*244*	*243*	*243*

Migration-led 10 yr	2006	2012	2030		2006-12	2012-30	2006-30
Total Population	73,748	74,980	79,297		1,232	4,317	5,549
Natural Change					*-1,754*	*-6,299*	*-8,053*
Net Migration					*2,986*	*10,616*	*13,602*
Number of Labour Force	35,487	36,144	32,335		657	-3,809	-3,152
Average pa change					*110*	*-212*	*-131*
Number of Jobs	30,714	31,282	27,986		569	-3,297	-2,728
Average pa change					*95*	*-183*	*-114*
Number of Households	31,105	32,433	34,927		1,328	2,495	3,823
Average pa change					*221*	*139*	*159*
Number of Dwellings	32,408	33,854	36,458		1,447	2,604	4,051
Average pa change					*241*	*145*	*169*
Migration-led 5 yr	**2006**	**2012**	**2030**		**2006-12**	**2012-30**	**2006-30**
Total Population	73,748	74,980	78,846		1,232	3,866	5,098
Natural Change					*-1,754*	*-6,155*	*-7,909*
Net Migration					*2,986*	*10,021*	*13,007*
Number of Labour Force	35,487	36,144	32,140		657	-4,004	-3,346
Average pa change					*110*	*-222*	*-139*
Number of Jobs	30,714	31,282	27,817		569	-3,465	-2,896
Average pa change					*95*	*-193*	*-121*
Number of Households	31,105	32,433	34,878		1,328	2,445	3,773
Average pa change					*221*	*136*	*157*
Number of Dwellings	32,408	33,854	36,407		1,447	2,552	3,999
Average pa change					*241*	*142*	*167*

Note: In terms of 'dwelling growth' sensitivity, the application of the modified assumptions on economic activity rates and the unemployment rate only has an impact upon the 'jobs-led' scenarios. This is because these scenarios are seeking to determine demographic change based upon a definitive trajectory of jobs growth. (The sensitivity analysis is not applied to the Demography scenarios, so the 3 tables above for the SNPP 2010 and the 2 migration-led scenarios are the same as the Core Scenarios)

Table D10: JOB Sensitivity Scenario 2 - Summary Statistics : WORCESTER
Totals: 2006, 2012 and 2030; and Changes: 2006 to 2012, 2012 to 2030, 2006 to 2030

	TOTALS				CHANGE		
Jobs Led Cambridge	**2006**	**2012**	**2030**		**2006-12**	**2012-30**	**2006-30**
Total population	95,024	99,604	116,659		4,580	17,055	21,635
Natural Change					*3,156*	*11,349*	*14,505*
Net Migration					*1,424*	*5,705*	*7,129*
Number of Labour Force	51,042	54,219	60,949		3,176	6,730	9,906
Average pa change					*529*	*374*	*413*
Number of Jobs						7,380	
Average pa change						*410*	
Number of Households	40,318	42,337	50,944		2,019	8,606	10,625
Average pa change					*337*	*478*	*443*
Number of Dwellings	41,271	43,918	52,846		2,647	8,928	11,575
Average pa change					*441*	*496*	*482*
Jobs Led Experian	**2006**	**2012**	**2030**		**2006-12**	**2012-30**	**2006-30**
Total Population	95,024	99,604	110,592		4,580	10,988	15,568
Natural Change					*3,156*	*10,601*	*13,757*
Net Migration					*1,424*	*387*	*1,811*
Number of Labour Force	51,042	54,219	57,131		3,176	2,912	6,089
Average pa change					*529*	*162*	*254*
Number of Jobs						3,480	
Average pa change						*193*	
Number of Households	40,318	42,337	48,566		2,019	6,228	8,248
Average pa change					*337*	*346*	*344*
Number of Dwellings	41,271	43,918	50,379		2,647	6,461	9,108
Average pa change					*441*	*359*	*380*
Jobs Led Oxford	**2006**	**2012**	**2030**		**2006-12**	**2012-30**	**2006-30**
Total Population	95,024	99,604	113,054		4,580	13,450	18,030
Natural Change					*3,156*	*11,298*	*14,454*
Net Migration					*1,424*	*2,152*	*3,576*
Number of Labour Force	51,042	54,219	58,496		3,176	4,277	7,453
Average pa change					*529*	*238*	*311*
Number of Jobs						4,874	
Average pa change						*271*	
Number of Households	40,318	42,337	49,572		2,019	7,234	9,253
Average pa change					*337*	*402*	*386*
Number of Dwellings	41,271	43,918	51,423		2,647	7,504	10,151
Average pa change					*441*	*417*	*423*

Note: Figures may not sum due to rounding

	TOTALS				CHANGE		
Jobs Led Central	**2006**	**2012**	**2030**		**2006-12**	**2012-30**	**2006-30**
Total population	95,024	99,604	114,857		4,580	15,253	19,833
Natural Change					3,156	11,324	14,480
Net Migration					1,424	3,929	5,353
Number of Labour Force	51,042	54,219	59,723		3,176	5,504	8,680
Average pa change					529	306	362
Number of Jobs						6,127	
Average pa change						341	
Number of Households	40,318	42,337	50,258		2,019	7,920	9,939
Average pa change					337	440	415
Number of Dwellings	41,271	43,918	52,135		2,647	8,216	10,863
Average pa change					441	457	453
Jobs Led Average	**2006**	**2012**	**2030**		**2006-12**	**2012-30**	**2006-30**
Total population	95,024	99,604	113,435		4,580	13,831	18,411
Natural Change					3,156	11,083	14,239
Net Migration					1,424	2,748	4,172
Number of Labour Force	51,042	54,219	58,859		3,176	4,640	7,816
Average pa change					529	258	326
Number of Jobs						5,245	
Average pa change						291	
Number of Households	40,318	42,337	49,694		2,019	7,356	9,375
Average pa change					337	409	391
Number of Dwellings	41,271	43,918	51,549		2,647	7,631	10,278
Average pa change					441	424	428
SNPP-2010	**2006**	**2012**	**2030**		**2006-12**	**2012-30**	**2006-30**
Total population	95,024	99,349	108,580		4,325	9,231	13,556
Natural Change					*3,109*	*10,085*	*13,194*
Net Migration					*1,216*	*-854*	*362*
Number of Labour Force	51,042	53,980	55,978		2,937	1,998	4,935
Average pa change					*490*	*111*	*206*
Number of Jobs	51,907	54,895	56,926		2,987	2,032	5,019
Average pa change					*498*	*113*	*209*
Number of Households	40,318	42,772	48,185		2,454	5,413	7,866
Average pa change					*409*	*301*	*328*
Number of Dwellings	41,271	44,369	49,984		3,098	5,615	8,712
Average pa change					*516*	*312*	*363*

Migration-led 10 yr	2006	2012	2030		2006-12	2012-30	2006-30
Total Population	95,024	99,604	113,970		4,580	14,366	18,946
Natural Change					*3,156*	*11,967*	*15,123*
Net Migration					*1,424*	*2,399*	*3,823*
Number of Labour Force	51,042	54,143	58,685		3,100	4,543	7,643
Average pa change					*517*	*252*	*318*
Number of Jobs	51,907	55,060	59,680		3,153	4,620	7,773
Average pa change					*526*	*257*	*324*
Number of Households	40,318	42,337	50,017		2,019	7,680	9,699
Average pa change					*337*	*427*	*404*
Number of Dwellings	41,271	43,918	51,885		2,647	7,967	10,613
Average pa change					*441*	*443*	*442*
Migration-led 5 yr	**2006**	**2012**	**2030**		**2006-12**	**2012-30**	**2006-30**
Total Population	95,024	99,604	115,626		4,580	16,022	20,602
Natural Change					*3,156*	*11,520*	*14,676*
Net Migration					*1,424*	*4,502*	*5,926*
Number of Labour Force	51,042	54,143	59,295		3,100	5,153	8,253
Average pa change					*517*	*286*	*344*
Number of Jobs	51,907	55,060	60,300		3,153	5,240	8,393
Average pa change					*526*	*291*	*350*
Number of Households	40,318	42,337	50,567		2,019	8,230	10,249
Average pa change					*337*	*457*	*427*
Number of Dwellings	41,271	43,918	52,455		2,647	8,537	11,184
Average pa change					*441*	*474*	*466*

Note:In terms of 'dwelling growth' sensitivity, the application of the modified assumptions on economic activity rates and the unemployment rate only has an impact upon the 'jobs-led' scenarios. This is because these scenarios are seeking to determine demographic change based upon a definitive trajectory of jobs growth. (The sensitivity analysis is not applied to the Demography scenarios, so the 3 tables above for the SNPP 2010 and the 2 migration led scenarios are the same as the Core Scenarios).

Table D11: JOB Sensitivity Scenario 2 - Summary Statistics : WYCHAVON Totals: 2006, 2012 and 2030; and Changes: 2006 to 2012, 2012 to 2030, 2006 to 2030						
	TOTALS				CHANGE	
Jobs Led Cambridge	**2006**	**2012**	**2030**	**2006-12**	**2012-30**	**2006-30**
Total population	115,451	117,670	136,311	2,219	18,641	20,860
Natural Change				*124*	*-209*	*-85*
Net Migration				*2,095*	*18,850*	*20,945*
Number of Labour Force	59,709	61,352	64,505	1,644	3,152	4,796
Average pa change				*274*	*175*	*200*
Number of Jobs					3,197	
Average pa change					*178*	
Number of Households	48,333	49,935	59,217	1,602	9,282	10,885
Average pa change				*267*	*516*	*454*
Number of Dwellings	49,822	51,692	61,301	1,870	9,609	11,479
Average pa change				*312*	*534*	*478*
Jobs Led Experian	**2006**	**2012**	**2030**	**2006-12**	**2012-30**	**2006-30**
Total Population	115,451	117,670	135,119	2,219	17,449	19,668
Natural Change				*124*	*-232*	*-108*
Net Migration				*2,095*	*17,681*	*19,776*
Number of Labour Force	59,709	61,352	63,794	1,644	2,441	4,085
Average pa change				*274*	*136*	*170*
Number of Jobs					2,560	
Average pa change					*142*	
Number of Households	48,333	49,935	58,771	1,602	8,836	10,439
Average pa change				*267*	*491*	*435*
Number of Dwellings	49,822	51,692	60,840	1,870	9,147	11,017
Average pa change				*312*	*508*	*459*
Jobs Led Oxford	**2006**	**2012**	**2030**	**2006-12**	**2012-30**	**2006-30**
Total Population	115,451	117,670	133,986	2,219	16,316	18,535
Natural Change				*124*	*-389*	*-265*
Net Migration				*2,095*	*16,704*	*18,799*
Number of Labour Force	59,709	61,352	63,185	1,644	1,833	3,477
Average pa change				*274*	*102*	*145*
Number of Jobs					2,015	
Average pa change					*112*	
Number of Households	48,333	49,935	58,321	1,602	8,386	9,989
Average pa change				*267*	*466*	*416*
Number of Dwellings	49,822	51,692	60,374	1,870	8,682	10,552
Average pa change				*312*	*482*	*440*

Note: Figures may not sum due to rounding

	TOTALS				CHANGE		
Jobs Led Central	**2006**	**2012**	**2030**		**2006-12**	**2012-30**	**2006-30**
Total population	115,451	117,670	135,149		2,219	17,479	19,698
Natural Change					124	-299	-175
Net Migration					2,095	17,777	19,872
Number of Labour Force	59,709	61,352	63,845		1,644	2,493	4,137
Average pa change					274	139	173
Number of Jobs						2,606	
Average pa change						145	
Number of Households	48,333	49,935	58,769		1,602	8,834	10,437
Average pa change					267	491	435
Number of Dwellings	49,822	51,692	60,838		1,870	9,146	11,016
Average pa change					312	508	459
Jobs Led Average	**2006**	**2012**	**2030**		**2006-12**	**2012-30**	**2006-30**
Total population	115,451	117,670	135,139		2,219	17,469	19,688
Natural Change					124	-277	-153
Net Migration					2,095	17,745	19,840
Number of Labour Force	59,709	61,352	63,828		1,644	2,475	4,119
Average pa change					274	138	172
Number of Jobs						2,591	
Average pa change						144	
Number of Households	48,333	49,935	58,770		1,602	8,835	10,438
Average pa change					267	491	435
Number of Dwellings	49,822	51,692	60,838		1,870	9,146	11,016
Average pa change					312	508	459
SNPP-2010	**2006**	**2012**	**2030**		**2006-12**	**2012-30**	**2006-30**
Total population	115,451	117,726	128,953		2,275	11,227	13,502
Natural Change					*163*	*-1,788*	*-1,625*
Net Migration					*2,113*	*13,015*	*15,127*
Number of Labour Force	59,709	61,196	59,826		1,487	-1,370	117
Average pa change					*248*	*-76*	*5*
Number of Jobs	53,362	54,691	53,467		1,329	-1,224	105
Average pa change					*222*	*-68*	*4*
Number of Households	48,333	49,758	55,998		1,425	6,240	7,665
Average pa change					*238*	*347*	*319*
Number of Dwellings	49,822	51,509	57,969		1,687	6,459	8,146
Average pa change					*282*	*359*	*339*

Migration-led 10 yr	2006	2012	2030		2006-12	2012-30	2006-30
Total Population	115,451	117,670	122,523		2,219	4,853	7,072
Natural Change					*124*	*-1,897*	*-1,773*
Net Migration					*2,095*	*6,749*	*8,844*
Number of Labour Force	59,709	61,219	54,721		1,510	-6,498	-4,988
Average pa change					*252*	*-361*	*-208*
Number of Jobs	53,362	54,712	48,905		1,349	-5,807	-4,458
Average pa change					*225*	*-323*	*-186*
Number of Households	48,333	49,935	54,078		1,602	4,144	5,746
Average pa change					*267*	*230*	*239*
Number of Dwellings	49,822	51,692	55,982		1,870	4,289	6,159
Average pa change					*312*	*238*	*257*
Migration-led 5 yr	**2006**	**2012**	**2030**		**2006-12**	**2012-30**	**2006-30**
Total Population	115,451	117,670	121,203		2,219	3,533	5,752
Natural Change					*124*	*-1,582*	*-1,458*
Net Migration					*2,095*	*5,115*	*7,210*
Number of Labour Force	59,709	61,219	54,813		1,510	-6,406	-4,896
Average pa change					*252*	*-356*	*-204*
Number of Jobs	53,362	54,712	48,987		1,349	-5,725	-4,375
Average pa change					*225*	*-318*	*-182*
Number of Households	48,333	49,935	53,499		1,602	3,564	5,166
Average pa change					*267*	*198*	*215*
Number of Dwellings	49,822	51,692	55,382		1,870	3,689	5,559
Average pa change					*312*	*205*	*232*

Note: In terms of 'dwelling growth' sensitivity, the application of the modified assumptions on economic activity rates and the unemployment rate only has an impact upon the 'jobs-led' scenarios. This is because these scenarios are seeking to determine demographic change based upon a definitive trajectory of jobs growth. (The sensitivity analysis is not applied to the Demography scenarios, so the 3 tables above for the SNPP 2010 and the 2 migration led scenarios are the same as the Core Scenarios)

Table D12: JOB Sensitivity Scenario 2 - Summary Statistics : SOUTH WORCESTERSHIRE Totals: 2006, 2012 and 2030; and Changes: 2006 to 2012, 2012 to 2030, 2006 to 2030							
	TOTALS				CHANGE		
Jobs Led Cambridge	**2006**	**2012**	**2030**		**2006-12**	**2012-30**	**2006-30**
Total population	284,223	292,254	347,358		8,031	55,104	63,135
Natural Change					*1,526*	*6,245*	*7,771*
Net Migration					*6,505*	*48,859*	*55,364*
Number of Labour Force	146,238	151,805	166,314		5,567	14,509	20,077
Average pa change					*928*	*806*	*837*
Number of Jobs						14,868	
Average pa change						*826*	
Number of Households	119,755	124,705	150,826		4,949	26,121	31,070
Average pa change					*825*	*1,451*	*1,295*
Number of Dwellings	123,501	129,465	156,595		5,964	27,130	33,094
Average pa change					*994*	*1,507*	*1,379*
Jobs Led Experian	**2006**	**2012**	**2030**		**2006-12**	**2012-30**	**2006-30**
Total Population	284,223	292,254	336,194		8,031	43,940	51,971
Natural Change					*1,526*	*5,136*	*6,662*
Net Migration					*6,505*	*38,804*	*45,309*
Number of Labour Force	146,238	151,805	159,798		5,567	7,993	13,560
Average pa change					*928*	*444*	*565*
Number of Jobs						8,610	
Average pa change						*478*	
Number of Households	119,755	124,705	146,557		4,949	21,852	26,801
Average pa change					*825*	*1,214*	*1,117*
Number of Dwellings	123,501	129,465	152,158		5,964	22,693	28,657
Average pa change					*994*	*1,261*	*1,194*
Jobs Led Oxford	**2006**	**2012**	**2030**		**2006-12**	**2012-30**	**2006-30**
Total Population	284,223	292,254	335,469		8,031	43,215	51,246
Natural Change					*1,526*	*5,400*	*6,926*
Net Migration					*6,505*	*37,815*	*44,320*
Number of Labour Force	146,238	151,805	159,546		5,567	7,741	13,308
Average pa change					*928*	*430*	*555*
Number of Jobs						8,586	
Average pa change						*477*	
Number of Households	119,755	124,705	146,313		4,949	21,608	26,557
Average pa change					*825*	*1,200*	*1,107*
Number of Dwellings	123,501	129,465	151,901		5,964	22,436	28,400
Average pa change					*994*	*1,246*	*1,183*

Note: Figures may not sum due to rounding

	TOTALS				CHANGE		
Jobs Led Central	**2006**	**2012**	**2030**		**2006-12**	**2012-30**	**2006-30**
Total population	284,223	292,254	341,414		8,031	49,160	57,191
Natural Change					1,526	5,823	7,349
Net Migration					6,505	43,337	49,842
Number of Labour Force	146,238	151,805	162,930		5,567	11,125	16,693
Average pa change					928	618	696
Number of Jobs						11,727	
Average pa change						652	
Number of Households	119,755	124,705	148,570		4,949	23,865	28,814
Average pa change					825	1,326	1,201
Number of Dwellings	123,501	129,465	154,248		5,964	24,783	30,747
Average pa change					994	1,377	1,281
Jobs Led Average	**2006**	**2012**	**2030**		**2006-12**	**2012-30**	**2006-30**
Total population	284,223	292,254	339,674		8,031	47,420	55,451
Natural Change					1,526	5,594	7,120
Net Migration					6,505	41,826	48,331
Number of Labour Force	146,238	151,805	161,886		5,567	10,081	15,648
Average pa change					928	560	652
Number of Jobs						10,688	
Average pa change						594	
Number of Households	119,755	124,705	147,899		4,949	23,194	28,143
Average pa change					825	1,288	1,173
Number of Dwellings	123,501	129,465	153,551		5,964	24,086	30,050
Average pa change					994	1,338	1,252
SNPP-2010	**2006**	**2012**	**2030**		**2006-12**	**2012-30**	**2006-30**
Total population	284,223	291,923	318,583		7,700	26,660	34,360
Natural Change					*1,523*	*208*	*1,732*
Net Migration					*6,177*	*26,452*	*32,629*
Number of Labour Force	146,238	150,727	149,838		4,489	-889	3,601
Average pa change					*749*	*-49*	*150*
Number of Jobs	135,983	140,356	139,850		4,372	-505	3,867
Average pa change					*729*	*-28*	*161*
Number of Households	119,755	124,976	140,815		5,221	15,838	21,059
Average pa change					*870*	*880*	*877*
Number of Dwellings	123,501	129,747	146,191		6,246	16,444	22,690
Average pa change					*1041*	*914*	*945*

Migration-led 10 yr	2006	2012	2030		2006-12	2012-30	2006-30
Total Population	284,223	292,254	315,789		8,031	23,535	31,566
Natural Change					*1,526*	*3,771*	*5,297*
Net Migration					*6,505*	*19,764*	*26,269*
Number of Labour Force	146,238	151,505	145,741		5,268	-5,764	-496
Average pa change					*878*	*-320*	*-21*
Number of Jobs	135,983	141,054	136,571		5,071	-4,484	587
Average pa change					*845*	*-249*	*24*
Number of Households	119,755	124,705	139,023		4,949	14,318	19,267
Average pa change					*825*	*795*	*803*
Number of Dwellings	123,501	129,465	144,325		5,964	14,860	20,824
Average pa change					*994*	*826*	*868*
Migration-led 5 yr	**2006**	**2012**	**2030**		**2006-12**	**2012-30**	**2006-30**
Total Population	284,223	292,254	315,675		8,031	23,421	31,452
Natural Change					*1,526*	*3,783*	*5,309*
Net Migration					*6,505*	*19,638*	*26,143*
Number of Labour Force	146,238	151,505	146,249		5,268	-5,257	11
Average pa change					*878*	*-292*	*0.5*
Number of Jobs	135,983	141,054	137,104		5,071	-3,950	1,121
Average pa change					*845*	*-219*	*47*
Number of Households	119,755	124,705	138,943		4,949	14,239	19,188
Average pa change					*825*	*791*	*800*
Number of Dwellings	123,501	129,465	144,244		5,964	14,779	20,743
Average pa change					*975*	*820*	*859*

Note: In terms of 'dwelling growth' sensitivity, the application of the modified assumptions on economic activity rates and the unemployment rate only has an impact upon the 'jobs-led' scenarios. This is because these scenarios are seeking to determine demographic change based upon a definitive trajectory of jobs growth. (The sensitivity analysis is not applied to the Demography scenarios, so the 3 tables above for the SNPP 2010 and the 2 migration led scenarios are the same as the Core Scenarios).

Table D13: JOB Sensitivity Scenario 3 – DWELLINGS PROJECTIONS by DISTRICTS
Totals: 2006, 2012 and 2030; and Changes: 2006 to 2012, 2012 to 2030, 2006 to 2030

	TOTALS				CHANGE		
MALVERN HILLS	**2006**	**2012**	**2030**		**2006-12**	**2012-30**	**2006-30**
Jobs Led Cambridge	32,408	33,854	42,090		1,447	8,235	9,682
Jobs Led Experian	32,408	33,854	40,625		1,447	6,770	8,217
Jobs Led Oxford	32,408	33,854	39,800		1,447	5,945	7,392
Jobs Led Central	32,408	33,854	40,945		1,447	7,090	8,537
Jobs Led Average	32,408	33,854	40,838		1,447	6,983	8,430
SNPP-2010	32,408	33,869	38,239		1,462	4,369	5,831
Migration-led 10 yr	32,408	33,854	36,458		1,447	2,604	4,051
Migration-led 5 yr	32,408	33,854	36,407		1,447	2,552	3,999
WORCESTER CITY	**2006**	**2012**	**2030**		**2006-12**	**2012-30**	**2006-30**
Jobs Led Cambridge	41,271	43,918	51,835		2,647	7,917	10,564
Jobs Led Experian	41,271	43,918	49,570		2,647	5,651	8,298
Jobs Led Oxford	41,271	43,918	50,543		2,647	6,625	9,272
Jobs Led Central	41,271	43,918	51,189		2,647	7,271	9,918
Jobs Led Average	41,271	43,918	50,649		2,647	6,731	9,378
SNPP-2010	41,271	44,369	49,984		3,098	5,615	8,712
Migration-led 10 yr	41,271	43,918	51,885		2,647	7,967	10,613
Migration-led 5 yr	41,271	43,918	52,455		2,647	8,537	11,184
WYCHAVON	**2006**	**2012**	**2030**		**2006-12**	**2012-30**	**2006-30**
Jobs Led Cambridge	49,822	51,692	59,146		1,870	7,454	9,324
Jobs Led Experian	49,822	51,692	58,721		1,870	7,029	8,899
Jobs Led Oxford	49,822	51,692	58,274		1,870	6,581	8,451
Jobs Led Central	49,822	51,692	58,710		1,870	7,018	8,888
Jobs Led Average	49,822	51,692	58,714		1,870	7,021	8,891
SNPP-2010	49,822	51,509	57,969		1,687	6,459	8,146
Migration-led 10 yr	49,822	51,692	55,982		1,870	4,289	6,159
Migration-led 5 yr	49,822	51,692	55,382		1,870	3,689	5,559
SOUTH WORCESTERSHIRE	**2006**	**2012**	**2030**		**2006-12**	**2012-30**	**2006-30**
Jobs Led Cambridge	123,501	129,465	153,071		5,964	23,606	29,570
Jobs Led Experian	123,501	129,465	148,916		5,964	19,450	25,414
Jobs Led Oxford	123,501	129,465	148,617		5,964	19,151	25,115
Jobs Led Central	123,501	129,465	150,844		5,964	21,379	27,343
Jobs Led Average	123,501	129,465	150,201		5,964	20,736	26,700
SNPP-2010	123,501	129,747	146,191		6,246	16,444	22,690
Migration-led 10 yr	123,501	129,465	144,325		5,964	14,860	20,824
Migration-led 5 yr	*123,501*	129,465	144,244		5,964	14,779	20,743

Table D14: JOB Sensitivity Scenario 3 – DWELLINGS PROJECTIONS in SCENARIOS Totals: 2006, 2012 and 2030; and Changes: 2006 to 2012, 2012 to 2030, 2006 to 2030						
	TOTALS			CHANGE		
Jobs Led Cambridge	**2006**	**2012**	**2030**	**2006-12**	**2012-30**	**2006-30**
Malvern Hills	32,408	33,854	42,090	1,447	8,235	9,682
Worcester City	41,271	43,918	51,835	2,647	7,917	10,564
Wychavon	49,822	51,692	59,146	1,870	7,454	9,324
SOUTH WORCESTERSHIRE	**123,501**	**129,465**	**153,071**	**5,964**	**23,606**	**29,570**
Jobs Led Experian	**2006**	**2012**	**2030**	**2006-12**	**2012-30**	**2006-30**
Malvern Hills	32,408	33,854	40,625	1,447	6,770	8,217
Worcester City	41,271	43,918	49,570	2,647	5,651	8,298
Wychavon	49,822	51,692	58,721	1,870	7,029	8,899
SOUTH WORCESTERSHIRE	123,501	129,465	148,916	**5,964**	**19,450**	**25,414**
Jobs Led Oxford	**2006**	**2012**	**2030**	**2006-12**	**2012-30**	**2006-30**
Malvern Hills	32,408	33,854	39,800	1,447	5,945	7,392
Worcester City	41,271	43,918	50,543	2,647	6,625	9,272
Wychavon	49,822	51,692	58,274	1,870	6,581	8,451
SOUTH WORCESTERSHIRE	**123,501**	**129,465**	**148,617**	**5,964**	**19,151**	**25,115**
Jobs Led Central	**2006**	**2012**	**2030**	**2006-12**	**2012-30**	**2006-30**
Malvern Hills	32,408	33,854	40,945	1,447	7,090	8,537
Worcester City	41,271	43,918	51,189	2,647	7,271	9,918
Wychavon	49,822	51,692	58,710	1,870	7,018	8,888
SOUTH WORCESTERSHIRE	123,501	129,465	150,844	5,964	21,379	27,343
Jobs Led Average	**2006**	**2012**	**2030**	**2006-12**	**2012-30**	**2006-30**
Malvern Hills	32,408	33,854	40,838	1,447	6,983	8,430
Worcester City	41,271	43,918	50,649	2,647	6,731	9,378
Wychavon	49,822	51,692	58,714	1,870	7,021	8,891
SOUTH WORCESTERSHIRE	123,501	129,465	150,201	5,964	20,736	26,700
SNPP-2010	**2006**	**2012**	**2030**	**2006-12**	**2012-30**	**2006-30**
Malvern Hills	32,408	33,869	38,239	1,462	4,369	5,831
Worcester City	41,271	44,369	49,984	3,098	5,615	8,712
Wychavon	49,822	51,509	57,969	1,687	6,459	8,146
SOUTH WORCESTERSHIRE	**123,501**	**129,747**	**146,191**	**6,246**	**16,444**	**22,690**
Migration-led 10 yr	**2006**	**2012**	**2030**	**2006-12**	**2012-30**	**2006-30**
Malvern Hills	32,408	33,854	36,458	1,447	2,604	4,051
Worcester City	41,271	43,918	51,885	2,647	7,967	10,613
Wychavon	49,822	51,692	55,982	1,870	4,289	6,159

SOUTH WORCESTERSHIRE	**123,501**	**129,465**	**144,325**		**5,964**	**14,860**	**20,824**
Migration-led 5 yr	**2006**	**2012**	**2030**		**2006-12**	**2012-30**	**2006-30**
Malvern Hills	32,408	33,854	36,407		1,447	2,552	3,999
Worcester City	41,271	43,918	52,455		2,647	8,537	11,184
Wychavon	49,822	51,692	55,382		1,870	3,689	5,559
SOUTH WORCESTERSHIRE	***123,501***	**129,465**	**144,244**		**5,964**	**14,779**	**20,743**

Table D15: JOB Sensitivity Scenario 3 - Summary Statistics : MALVERN HILLS
Totals: 2006, 2012 and 2030; and Changes: 2006 to 2012, 2012 to 2030, 2006 to 2030

	TOTALS				CHANGE		
Jobs Led Cambridge	**2006**	**2012**	**2030**		**2006-12**	**2012-30**	**2006-30**
Total population	73,748	74,980	93,456		1,232	18,476	19,708
Natural Change					*-1,754*	*-4,978*	*-6,732*
Net Migration					*2,986*	*23,454*	*26,440*
Number of Labour Force	35,487	36,225	40,672		738	4,447	5,185
Average pa change					*123*	*247*	*216*
Number of Jobs	30,438	31,068	35,358		630	4,291	4,921
Average pa change					*105*	*238*	*205*
Number of Households	31,105	32,433	40,322		1,328	7,890	9,217
Average pa change					*221*	*438*	*384*
Number of Dwellings	32,408	33,854	42,090		1,447	8,235	9,682
Average pa change					*241*	*457*	*403*
Jobs Led Experian	**2006**	**2012**	**2030**		**2006-12**	**2012-30**	**2006-30**
Total Population	73,748	74,980	89,668		1,232	14,688	15,920
Natural Change					*-1,754*	*-5,304*	*-7,058*
Net Migration					*2,986*	*19,992*	*22,978*
Number of Labour Force	35,487	36,241	38,709		755	2,467	3,222
Average pa change					*126*	*137*	*134*
Number of Jobs	30,438	31,082	33,652		644	2,570	3,214
Average pa change					*107*	*143*	*134*
Number of Households	31,105	32,433	38,919		1,328	6,486	7,814
Average pa change					*221*	*360*	*326*
Number of Dwellings	32,408	33,854	40,625		1,447	6,770	8,217
Average pa change					*241*	*376*	*342*
Jobs Led Oxford	**2006**	**2012**	**2030**		**2006-12**	**2012-30**	**2006-30**
Total Population	73,748	74,980	87,639		1,232	12,659	13,891
Natural Change					*-1,754*	*-5,574*	*-7,328*
Net Migration					*2,986*	*18,233*	*21,219*
Number of Labour Force	35,487	36,303	37,766		816	1,463	2,279
Average pa change					*136*	*81*	*95*
Number of Jobs	30,438	31,135	32,832		697	1,697	2,394
Average pa change					*116*	*94*	*100*
Number of Households	31,105	32,433	38,128		1,328	5,695	7,023
Average pa change					*221*	*316*	*293*
Number of Dwellings	32,408	33,854	39,800		1,447	5,945	7,392
Average pa change					*241*	*330*	*308*

Note: Figures may not sum due to rounding

	TOTALS				CHANGE		
Jobs Led Central	**2006**	**2012**	**2030**		**2006-12**	**2012-30**	**2006-30**
Total population	73,748	74,980	90,548		1,232	15,568	16,800
Natural Change					-1,754	-5,276	-7,030
Net Migration					2,986	20,844	23,830
Number of Labour Force	35,487	36,264	39,219		777	2,955	3,732
Average pa change					130	164	156
Number of Jobs	30,438	31,102	34,095		664	2,994	3,658
Average pa change					111	166	153
Number of Households	31,105	32,433	39,225		1,328	6,793	8,120
Average pa change					221	377	339
Number of Dwellings	32,408	33,854	40,945		1,447	7,090	8,537
Average pa change					241	394	356
Jobs Led Average	**2006**	**2012**	**2030**		**2006-12**	**2012-30**	**2006-30**
Total population	73,748	74,980	90,254		1,232	15,274	16,506
Natural Change					-1,754	-5,285	-7,039
Net Migration					2,986	20,560	23,546
Number of Labour Force	35,487	36,256	39,049		770	2,792	3,562
Average pa change					128	155	148
Number of Jobs	30,438	31,095	33,947		657	2,853	3,510
Average pa change					109	158	146
Number of Households	31,105	32,433	39,123		1,328	6,690	8,018
Average pa change					221	371	334
Number of Dwellings	32,408	33,854	40,838		1,447	6,983	8,430
Average pa change					241	388	351
SNPP-2010	**2006**	**2012**	**2030**		**2006-12**	**2012-30**	**2006-30**
Total population	73,748	74,847	81,050		1,099	6,203	7,302
Natural Change					*-1,748*	*-8,089*	*-9,837*
Net Migration					*2,848*	*14,292*	*17,139*
Number of Labour Force	35,487	35,552	34,035		65	-1,517	-1,452
Average pa change					*11*	*-84*	*-61*
Number of Jobs	30,714	30,770	29,457		56	-1,313	-1,256
Average pa change					*9*	*-73*	*-52*
Number of Households	31,105	32,447	36,633		1,342	4,186	5,528
Average pa change					*224*	*233*	*230*
Number of Dwellings	32,408	33,869	38,239		1,462	4,369	5,831
Average pa change					*244*	*243*	*243*

Migration-led 10 yr	2006	2012	2030		2006-12	2012-30	2006-30
Total Population	73,748	74,980	79,297		1,232	4,317	5,549
Natural Change					*-1,754*	*-6,299*	*-8,053*
Net Migration					*2,986*	*10,616*	*13,602*
Number of Labour Force	35,487	36,144	32,335		657	-3,809	-3,152
Average pa change					*110*	*-212*	*-131*
Number of Jobs	30,714	31,282	27,986		569	-3,297	-2,728
Average pa change					*95*	*-183*	*-114*
Number of Households	31,105	32,433	34,927		1,328	2,495	3,823
Average pa change					*221*	*139*	*159*
Number of Dwellings	32,408	33,854	36,458		1,447	2,604	4,051
Average pa change					*241*	*145*	*169*
Migration-led 5 yr	**2006**	**2012**	**2030**		**2006-12**	**2012-30**	**2006-30**
Total Population	73,748	74,980	78,846		1,232	3,866	5,098
Natural Change					*-1,754*	*-6,155*	*-7,909*
Net Migration					*2,986*	*10,021*	*13,007*
Number of Labour Force	35,487	36,144	32,140		657	-4,004	-3,346
Average pa change					*110*	*-222*	*-139*
Number of Jobs	30,714	31,282	27,817		569	-3,465	-2,896
Average pa change					*95*	*-193*	*-121*
Number of Households	31,105	32,433	34,878		1,328	2,445	3,773
Average pa change					*221*	*136*	*157*
Number of Dwellings	32,408	33,854	36,407		1,447	2,552	3,999
Average pa change					*241*	*142*	*167*

Note: In terms of 'dwelling growth' sensitivity, the application of the modified assumptions on economic activity rates and the unemployment rate only has an impact upon the 'jobs-led' scenarios. This is because these scenarios are seeking to determine demographic change based upon a definitive trajectory of jobs growth. (The sensitivity analysis is not applied to the Demography scenarios, so the 3 tables above for the SNPP 2010 and the 2 migration led scenarios are the same as the Core Scenarios).

Table D16: JOB Sensitivity Scenario 3 - Summary Statistics : WORCESTER
Totals: 2006, 2012 and 2030; and Changes: 2006 to 2012, 2012 to 2030, 2006 to 2030

	TOTALS				CHANGE		
Jobs Led Cambridge	**2006**	**2012**	**2030**		**2006-12**	**2012-30**	**2006-30**
Total population	95,024	99,604	114,211		4,580	14,607	19,187
Natural Change					*3,156*	*10,916*	*14,072*
Net Migration					*1,424*	*3,691*	*5,115*
Number of Labour Force	51,042	54,450	60,886		3,408	6,436	9,843
Average pa change					*568*	*358*	*410*
Number of Jobs	51,663	55,350	62,729		3,687	7,380	11,067
Average pa change					*615*	*410*	*461*
Number of Households	40,318	42,337	49,969		2,019	7,632	9,651
Average pa change					*337*	*424*	*402*
Number of Dwellings	41,271	43,918	51,835		2,647	7,917	10,564
Average pa change					*441*	*440*	*440*
Jobs Led Experian	**2006**	**2012**	**2030**		**2006-12**	**2012-30**	**2006-30**
Total Population	95,024	99,604	108,640		4,580	9,036	13,616
Natural Change					*3,156*	*10,229*	*13,385*
Net Migration					*1,424*	*-1,193*	*231*
Number of Labour Force	51,042	54,475	57,125		3,432	2,650	6,083
Average pa change					*572*	*147*	*253*
Number of Jobs	51,663	55,375	58,855		3,712	3,480	7,192
Average pa change					*619*	*193*	*300*
Number of Households	40,318	42,337	47,785		2,019	5,448	7,467
Average pa change					*337*	*303*	*311*
Number of Dwellings	41,271	43,918	49,570		2,647	5,651	8,298
Average pa change					*441*	*314*	*346*
Jobs Led Oxford	**2006**	**2012**	**2030**		**2006-12**	**2012-30**	**2006-30**
Total Population	95,024	99,604	110,935		4,580	11,331	15,911
Natural Change					*3,156*	*10,876*	*14,032*
Net Migration					*1,424*	*454*	*1,878*
Number of Labour Force	51,042	54,403	58,408		3,361	4,004	7,365
Average pa change					*560*	*222*	*307*
Number of Jobs	51,663	55,302	60,176		3,640	4,874	8,514
Average pa change					*607*	*271*	*355*
Number of Households	40,318	42,337	48,724		2,019	6,387	8,406
Average pa change					*337*	*355*	*350*
Number of Dwellings	41,271	43,918	50,543		2,647	6,625	9,272
Average pa change					*441*	*368*	*386*

Note: Figures may not sum due to rounding

	TOTALS				CHANGE		
Jobs Led Central	**2006**	**2012**	**2030**		**2006-12**	**2012-30**	**2006-30**
Total population	95,024	99,604	112,573		4,580	12,969	17,549
Natural Change					3,156	10,896	14,052
Net Migration					1,424	2,073	3,497
Number of Labour Force	51,042	54,427	59,647		3,385	5,220	8,604
Average pa change					564	290	359
Number of Jobs	51,663	55,326	61,453		3,664	6,127	9,791
Average pa change					611	341	408
Number of Households	40,318	42,337	49,347		2,019	7,010	9,029
Average pa change					337	390	376
Number of Dwellings	41,271	43,918	51,189		2,647	7,271	9,918
Average pa change					441	404	413
Jobs Led Average	**2006**	**2012**	**2030**		**2006-12**	**2012-30**	**2006-30**
Total population	95,024	99,604	111,262		4,580	11,658	16,238
Natural Change					3,156	10,674	13,830
Net Migration					1,424	984	2,408
Number of Labour Force	51,042	54,443	58,806		3,400	4,363	7,764
Average pa change					567	242	323
Number of Jobs	51,663	55,342	60,587		3,680	5,245	8,924
Average pa change					614	291	372
Number of Households	40,318	42,337	48,826		2,019	6,489	8,508
Average pa change					337	361	354
Number of Dwellings	41,271	43,918	50,649		2,647	6,731	9,378
Average pa change					441	374	391
SNPP-2010	**2006**	**2012**	**2030**		**2006-12**	**2012-30**	**2006-30**
Total population	95,024	99,349	108,580		4,325	9,231	13,556
Natural Change					*3,109*	*10,085*	*13,194*
Net Migration					*1,216*	*-854*	*362*
Number of Labour Force	51,042	53,980	55,978		2,937	1,998	4,935
Average pa change					*490*	*111*	*206*
Number of Jobs	51,907	54,895	56,926		2,987	2,032	5,019
Average pa change					*498*	*113*	*209*
Number of Households	40,318	42,772	48,185		2,454	5,413	7,866
Average pa change					*409*	*301*	*328*
Number of Dwellings	41,271	44,369	49,984		3,098	5,615	8,712
Average pa change					*516*	*312*	*363*

Migration-led 10 yr	2006	2012	2030		2006-12	2012-30	2006-30
Total Population	95,024	99,604	113,970		4,580	14,366	18,946
Natural Change					*3,156*	*11,967*	*15,123*
Net Migration					*1,424*	*2,399*	*3,823*
Number of Labour Force	51,042	54,143	58,685		3,100	4,543	7,643
Average pa change					*517*	*252*	*318*
Number of Jobs	51,907	55,060	59,680		3,153	4,620	7,773
Average pa change					*526*	*257*	*324*
Number of Households	40,318	42,337	50,017		2,019	7,680	9,699
Average pa change					*337*	*427*	*404*
Number of Dwellings	41,271	43,918	51,885		2,647	7,967	10,613
Average pa change					*441*	*443*	*442*
Migration-led 5 yr	**2006**	**2012**	**2030**		**2006-12**	**2012-30**	**2006-30**
Total Population	95,024	99,604	115,626		4,580	16,022	20,602
Natural Change					*3,156*	*11,520*	*14,676*
Net Migration					*1,424*	*4,502*	*5,926*
Number of Labour Force	51,042	54,143	59,295		3,100	5,153	8,253
Average pa change					*517*	*286*	*344*
Number of Jobs	51,907	55,060	60,300		3,153	5,240	8,393
Average pa change					*526*	*291*	*350*
Number of Households	40,318	42,337	50,567		2,019	8,230	10,249
Average pa change					*337*	*457*	*427*
Number of Dwellings	41,271	43,918	52,455		2,647	8,537	11,184
Average pa change					*441*	*474*	*466*

Note: In terms of 'dwelling growth' sensitivity, the application of the modified assumptions on economic activity rates and the unemployment rate only has an impact upon the 'jobs-led' scenarios. This is because these scenarios are seeking to determine demographic change based upon a definitive trajectory of jobs growth. (The sensitivity analysis is not applied to the Demography scenarios, so the 3 tables above for the SNPP 2010 and the 2 migration led scenarios are the same as the Core Scenarios).

Note: Figures may not sum due to rounding

Table D17: JOB Sensitivity Scenario 3 - Summary Statistics : WYCHAVON Totals: 2006, 2012 and 2030; and Changes: 2006 to 2012, 2012 to 2030, 2006 to 2030						
	TOTALS			CHANGE		
Jobs Led Cambridge	**2006**	**2012**	**2030**	**2006-12**	**2012-30**	**2006-30**
Total population	115,451	117,670	130,789	2,219	13,119	15,338
Natural Change				*124*	*-890*	*-766*
Net Migration				*2,095*	*14,010*	*16,105*
Number of Labour Force	59,709	61,365	64,099	1,656	2,735	4,391
Average pa change				*276*	*152*	*183*
Number of Jobs#	53,136	54,601	57,798	1,465	3,197	4,662
Average pa change				*244*	*178*	*194*
Number of Households	48,333	49,935	57,135	1,602	7,200	8,802
Average pa change				*267*	*400*	*367*
Number of Dwellings	49,822	51,692	59,146	1,870	7,454	9,324
Average pa change				*312*	*414*	*389*
Jobs Led Experian	**2006**	**2012**	**2030**	**2006-12**	**2012-30**	**2006-30**
Total Population	115,451	117,670	129,696	2,219	12,026	14,245
Natural Change				*124*	*-921*	*-797*
Net Migration				*2,095*	*12,946*	*15,041*
Number of Labour Force	59,709	61,463	63,490	1,754	2,027	3,781
Average pa change				*292*	*118*	*158*
Number of Jobs#	53,136	54,688	57,248	1,553	2,560	4,113
Average pa change				*259*	*142*	*171*
Number of Households	48,333	49,935	56,725	1,602	6,790	8,392
Average pa change				*267*	*377*	*350*
Number of Dwellings	49,822	51,692	58,721	1,870	7,029	8,899
Average pa change				*312*	*391*	*371*
Jobs Led Oxford	**2006**	**2012**	**2030**	**2006-12**	**2012-30**	**2006-30**
Total Population	115,451	117,670	128,608	2,219	10,938	13,157
Natural Change				*124*	*-1,070*	*-946*
Net Migration				*2,095*	*12,007*	*14,102*
Number of Labour Force	59,709	61,629	63,049	1,920	1,420	3,340
Average pa change				*320*	*79*	*139*
Number of Jobs#	53,136	54,836	56,851	1,700	2,015	3,715
Average pa change				*283*	*112*	*155*
Number of Households	*48,333*	*49,935*	*56,292*	*1,602*	*6,357*	*7,960*
Average pa change				267	353	332
Number of Dwellings	*49,822*	*51,692*	58,274	*1,870*	*6,581*	*8,451*
Average pa change				312	366	352

Jobs led scenarios are constrained to the level of forecast jobs growth 2012 to 2030 Note: Figures may not sum due to rounding

	TOTALS				CHANGE		
Jobs Led Central	**2006**	**2012**	**2030**		**2006-12**	**2012-30**	**2006-30**
Total population	115,451	117,670	129,699		2,219	12,029	14,248
Natural Change					124	-980	-856
Net Migration					2,095	13,009	15,104
Number of Labour Force	59,709	61,497	63,574		1,788	2,078	3,866
Average pa change					298	116	161
Number of Jobs	53,136	54,719	57,325		1,583	2,606	4,189
Average pa change					264	145	175
Number of Households	48,333	49,935	56,714		1,602	6,779	8,381
Average pa change					267	377	350
Number of Dwellings	49,822	51,692	58,710		1,870	7,018	8,888
Average pa change					312	390	371
Jobs Led Average	**2006**	**2012**	**2030**		**2006-12**	**2012-30**	**2006-30**
Total population	115,451	117,670	129,698		2,219	12,028	14,247
Natural Change					124	-960	-836
Net Migration					2,095	12,988	15,083
Number of Labour Force	59,709	61,486	63,546		1,777	2,061	3,837
Average pa change					296	116	160
Number of Jobs	53,136	54,708	57,299		1,573	2,591	4,163
Average pa change					262	144	173
Number of Households	48,333	49,935	56,717		1,602	6,782	8,385
Average pa change					267	377	350
Number of Dwellings	49,822	51,692	58,714		1,870	7,021	8,891
Average pa change					312	390	371
SNPP-2010	**2006**	**2012**	**2030**		**2006-12**	**2012-30**	**2006-30**
Total population	115,451	117,726	128,953		2,275	11,227	13,502
Natural Change					*163*	*-1,788*	*-1,625*
Net Migration					*2,113*	*13,015*	*15,127*
Number of Labour Force	59,709	61,196	59,826		1,487	-1,370	117
Average pa change					*248*	*-76*	*5*
Number of Jobs	53,362	54,691	53,467		1,329	-1,224	105
Average pa change					*222*	*-68*	*4*
Number of Households	48,333	49,758	55,998		1,425	6,240	7,665
Average pa change					*238*	*347*	*319*
Number of Dwellings	49,822	51,509	57,969		1,687	6,459	8,146
Average pa change					*282*	*359*	*339*

Migration-led 10 yr	2006	2012	2030		2006-12	2012-30	2006-30
Total Population	115,451	117,670	122,523		2,219	4,853	7,072
Natural Change					*124*	*-1,897*	*-1,773*
Net Migration					*2,095*	*6,749*	*8,844*
Number of Labour Force	59,709	61,219	54,721		1,510	-6,498	-4,988
Average pa change					*252*	*-361*	*-208*
Number of Jobs	53,362	54,712	48,905		1,349	-5,807	-4,458
Average pa change					*225*	*-323*	*-186*
Number of Households	48,333	49,935	54,078		1,602	4,144	5,746
Average pa change					*267*	*230*	*239*
Number of Dwellings	49,822	51,692	55,982		1,870	4,289	6,159
Average pa change					*312*	*238*	*257*
Migration-led 5 yr	**2006**	**2012**	**2030**		**2006-12**	**2012-30**	**2006-30**
Total Population	115,451	117,670	121,203		2,219	3,533	5,752
Natural Change					*124*	*-1,582*	*-1,458*
Net Migration					*2,095*	*5,115*	*7,210*
Number of Labour Force	59,709	61,219	54,813		1,510	-6,406	-4,896
Average pa change					*252*	*-356*	*-204*
Number of Jobs	53,362	54,712	48,987		1,349	-5,725	-4,375
Average pa change					*225*	*-318*	*-182*
Number of Households	48,333	49,935	53,499		1,602	3,564	5,166
Average pa change					*267*	*198*	*215*
Number of Dwellings	49,822	51,692	55,382		1,870	3,689	5,559
Average pa change					*312*	*205*	*232*

Note: In terms of 'dwelling growth' sensitivity, the application of the modified assumptions on economic activity rates and the unemployment rate only has an impact upon the 'jobs-led' scenarios. This is because these scenarios are seeking to determine demographic change based upon a definitive trajectory of jobs growth. (The sensitivity analysis is not applied to the Demography scenarios, so the 3 tables above for the SNPP 2010 and the 2 migration led scenarios are the same as the Core Scenarios).

Table D18: JOB Sensitivity Scenario 3 - Summary Statistics : SOUTH WORCESTERSHIRE Totals: 2006, 2012 and 2030; and Changes: 2006 to 2012, 2012 to 2030, 2006 to 2030							
	TOTALS				CHANGE		
Jobs Led Cambridge	**2006**	**2012**	**2030**		**2006-12**	**2012-30**	**2006-30**
Total population	284,223	292,254	338,457		8,031	46,203	54,234
Natural Change					*1,526*	*5,048*	*6,574*
Net Migration					*6,505*	*41,155*	*47,660*
Number of Labour Force	146,238	152,040	165,657		5,802	13,617	19,419
Average pa change					*967*	*757*	*809*
Number of Jobs	135,236	141,018	155,886		5,782	14,868	20,649
Average pa change					*964*	*826*	*860*
Number of Households	119,755	124,705	147,426		4,949	22,722	27,671
Average pa change					*825*	*1,262*	*1,153*
Number of Dwellings	123,501	129,465	153,071		5,964	23,606	29,570
Average pa change					*994*	*1,311*	*1,232*
Jobs Led Experian	**2006**	**2012**	**2030**		**2006-12**	**2012-30**	**2006-30**
Total Population	284,223	292,254	328,004		8,031	35,750	43,781
Natural Change					*1,526*	*4,004*	*5,530*
Net Migration					*6,505*	*31,745*	*38,250*
Number of Labour Force	146,238	152,179	159,324		5,941	7,145	13,086
Average pa change					*991*	*397*	*545*
Number of Jobs	135,236	141,145	149,755		5,909	8,610	14,519
Average pa change					*985*	*478*	*605*
Number of Households	119,755	124,705	143,428		4,949	18,723	23,673
Average pa change					*825*	*1,040*	*987*
Number of Dwellings	123,501	129,465	148,916		5,964	19,450	25,414
Average pa change					*994*	*1,081*	*1,059*
Jobs Led Oxford	**2006**	**2012**	**2030**		**2006-12**	**2012-30**	**2006-30**
Total Population	284,223	292,254	327,181		8,031	34,927	42,958
Natural Change					*1,526*	*4,233*	*5,759*
Net Migration					*6,505*	*30,694*	*37,199*
Number of Labour Force	146,238	152,335	159,223		6,098	6,887	12,985
Average pa change					*1,016*	*383*	*541*
Number of Jobs	135,236	141,273	149,859		6,037	8,586	14,623
Average pa change					*1006*	*477*	*609*
Number of Households	119,755	124,705	143,144		4,949	18,439	23,389
Average pa change					*825*	*1,024*	*975*
Number of Dwellings	123,501	129,465	148,617		5,964	19,151	25,115
Average pa change					*994*	*1,064*	*1,046*

	TOTALS				CHANGE		
Jobs Led Central	**2006**	**2012**	**2030**		**2006-12**	**2012-30**	**2006-30**
Total population	284,223	292,254	332,819		8,031	40,565	48,596
Natural Change					1,526	4,641	6,167
Net Migration					6,505	35,925	42,430
Number of Labour Force	146,238	152,188	162,440		5,950	10,252	16,202
Average pa change					992	570	675
Number of Jobs	135,236	141,146	152,873		5,910	11,727	17,636
Average pa change					985	652	735
Number of Households	119,755	124,705	145,285		4,949	20,581	25,530
Average pa change					825	1,143	1,064
Number of Dwellings	123,501	129,465	150,844		5,964	21,379	27,343
Average pa change					994	1,188	1,139
Jobs Led Average	**2006**	**2012**	**2030**		**2006-12**	**2012-30**	**2006-30**
Total population	284,223	292,254	331,214		8,031	38,960	46,991
Natural Change					1,526	4,428	5,954
Net Migration					6,505	34,531	41,036
Number of Labour Force	146,238	152,185	161,401		5,947	9,216	15,163
Average pa change					991	512	632
Number of Jobs	135,236	141,145	151,833		5,909	10,688	16,597
Average pa change					985	594	691
Number of Households	119,755	124,705	144,666		4,949	19,961	24,911
Average pa change					825	1,109	1,038
Number of Dwellings	123,501	129,465	150,201		5,964	20,736	26,700
Average pa change					994	1,152	1,112
SNPP-2010	**2006**	**2012**	**2030**		**2006-12**	**2012-30**	**2006-30**
Total population	284,223	291,923	318,583		7,700	26,660	34,360
Natural Change					*1,523*	*208*	*1,732*
Net Migration					*6,177*	*26,452*	*32,629*
Number of Labour Force	146,238	150,727	149,838		4,489	-889	3,601
Average pa change					*749*	*-49*	*150*
Number of Jobs	135,983	140,356	139,850		4,372	-505	3,867
Average pa change					*729*	*-28*	*161*
Number of Households	119,755	124,976	140,815		5,221	15,838	21,059
Average pa change					*870*	*880*	*877*
Number of Dwellings	123,501	129,747	146,191		6,246	16,444	22,690
Average pa change					*1041*	*914*	*945*

Migration-led 10 yr	2006	2012	2030		2006-12	2012-30	2006-30
Total Population	284,223	292,254	315,789		8,031	23,535	31,566
Natural Change					*1,526*	*3,771*	*5,297*
Net Migration					*6,505*	*19,764*	*26,269*
Number of Labour Force	146,238	151,505	145,741		5,268	-5,764	-496
Average pa change					*878*	*-320*	*-21*
Number of Jobs	135,983	141,054	136,571		5,071	-4,484	587
Average pa change					*845*	*-249*	*24*
Number of Households	119,755	124,705	139,023		4,949	14,318	19,267
Average pa change					*825*	*795*	*803*
Number of Dwellings	123,501	129,465	144,325		5,964	14,860	20,824
Average pa change					*994*	*826*	*868*
Migration-led 5 yr	**2006**	**2012**	**2030**		**2006-12**	**2012-30**	**2006-30**
Total Population	284,223	292,254	315,675		8,031	23,421	31,452
Natural Change					*1,526*	*3,783*	*5,309*
Net Migration					*6,505*	*19,638*	*26,143*
Number of Labour Force	146,238	151,505	146,249		5,268	-5,257	11
Average pa change					*878*	*-292*	*0.5*
Number of Jobs	135,983	141,054	137,104		5,071	-3,950	1,121
Average pa change					*845*	*-219*	*47*
Number of Households	119,755	124,705	138,943		4,949	14,239	19,188
Average pa change					*825*	*791*	*800*
Number of Dwellings	123,501	129,465	144,244		5,964	14,779	20,743
Average pa change					*975*	*820*	*859*

Note: In terms of 'dwelling growth' sensitivity, the application of the modified assumptions on economic activity rates and the unemployment rate only has an impact upon the 'jobs-led' scenarios. This is because these scenarios are seeking to determine demographic change based upon a definitive trajectory of jobs growth. (The sensitivity analysis is not applied to the Demography scenarios, so the 3 tables above for the SNPP 2010 and the 2 migration led scenarios are the same as the Core Scenarios).

Note: Figures may not sum due to rounding