

LOCAL DEVELOPMENT PLAN: POPULATION AND HOUSEHOLD PROJECTIONS

PREFACE

This report was prepared by the Policy and Core Division of Regeneration and Leisure of Carmarthenshire County Council, to contribute to the evidence base of the emerging Carmarthenshire Local Development Plan. It explains the methodology used to produce the projections and focuses firstly on the population projections side, by referring to assumptions included in the Technical Paper on the 2006 based population projections produced by the Welsh Assembly Government.

The second element is the household projection and this is explained in the report. For Development Plan purposes these household figures will need to be amended to reflect, which will need to be adjusted by Development Plans in order to convert the household projection to an equivalent dwellings figure.

LOCAL DEVELOPMENT PLAN: POPULATION AND HOUSEHOLD PROJECTIONS : CARMARTHENSHIRE

1. INTRODUCTION

The Projections

1.1 Population and household projections have become increasingly important as a planning tool for local government services. They are used to provide an insight into what the demography of an area “might be like” in the future. At a strategic level, changes in population and housing requirements need to be considered to make decisions and formulate policy to provide for future service need.

1.2 Information on population underpins any attempt at strategic or local planning in that many of the key issues that need to be addressed at these levels stem directly or indirectly from the size and distribution of an area’s population or will impact upon it. Most of the policies that will form the central core of the Local Development Plan for Carmarthenshire will relate to new land uses, changes in land use, or provision of services, which are all closely influenced by the level of population, together with its age, sex and socio-economic characteristics. For example the demand for housing, the provision of health, education, transport, recreational and shopping facilities, are all closely related to the County’s future population, its composition and distribution.

1.3 Decisions about land uses and the provision of roads, houses, schools and many other basic facilities will need to be informed by some view of the future, despite the inevitable uncertainties. Estimates of future population are therefore fundamental for LDP purposes in assessing how much additional land must be made available for housing, employment and other significant uses.

1.4 However, all projections must be treated with caution and provided with caveats highlighting the assumptions used in their production and limitations for their use. Population projections are only a 'best guess' at what may happen given the data and information available at the time. At best they provide us with an indication of the likely direction of growth by age group over the coming years. It

is also important to remember that these projections do not reflect potential constraints to population growth over the next 15 years such as the size of the housing stock.

1.5 In June 2008 the Welsh Assembly Government released 2006 based population projections for unitary authorities in Wales. The principal projection focused on a continuation of past trends experienced over the previous 5 year period, together with sensitivity testing of the projections reflected in 3 variants including zero based migration, a high variant based on a higher life expectancy and a low variant based on a lower life expectancy.

1.6 Trend based assumptions assume that past patterns will continue indefinitely into the future. Whilst there is inevitable uncertainty related to trends, at a time of economic recession it is important to create the conditions necessary for recovery and that could include having an available labour supply, or making available an adequate supply of housing for both local and general needs. The County's economy over the 5 year period 2001-2006 was particularly strong with a successful 5 year Masterplan in place and a housing market that was able to sustain the needs of the County.

1.7 Following examination of the Welsh Assembly Government's range of population projections it was decided that the principal projection offered the best fit in terms of supporting a recovery from the current economic recession. However, it was recognised that these population projections needed to be revisited at least every 5 years to reflect actual changes in migration, fertility and mortality trends. This is a fundamental requirement as the 2011 Census results will be released in 2012-2013, and will provide a benchmark against which we will be able to measure some of the assumptions we have made.

2. PURPOSE OF TECHNICAL PAPER

2.1 The purpose of this paper is to set out the background to the preparation of population and household projections for Carmarthenshire. This paper relates, to a description of the methodology for these projections that are trend based taken directly from the technical report on the 2006-based sub-national population projections for Wales release in March 2009.

<http://wales.gov.uk/topics/statistics/headlines/pop2009/hdw20090324/?lang=en>

2.2 The population projections do not take into account the effects of local or central government policies on future population distribution and change. The results have to be used and interpreted with particular care, recognising that they are merely illustrative of what the future level of population would be if past trends were to be maintained and not reflective of policy aspirations.

2.3 The projections, which cover the fifteen year period to 2021, use the POPGROUP family of models. are based on various assumptions about fertility, mortality and migration A particular difficulty in population projection work is making reasonable estimates of migration. This is especially significant since net migration is a key component of population change generally and particularly so in Carmarthenshire.

2.4 This paper is divided into two parts, each one being a description of a distinct part of the projection process. Firstly there is a detailed description of the components of the population projection and the part they play in the process. This is followed by a section devoted to showing how the population projections were translated into the number and types of households which will make up the County during the period 2006 - 2021.

3. THE RESULTS

3.1 This section of the report gives a detailed commentary of the population, and household projections for the County. This section firstly outlines the assumptions used for the population projection followed by the summary results (Detailed statistical output is contained in the Appendices) and then translates the population projections into household figures to 2021.

A. POPULATION PROJECTIONS

A1. ASSUMPTIONS

3.2 Please note that fuller details of assumptions are available from

<http://wales.gov.uk/topics/statistics/headlines/pop2009/hdw20090324/?lang=en>

Base population

The 2006 mid year estimate of population was used as this was the most recent available at the time.

Fertility

3.3 In order to project the number of births in Carmarthenshire during each year of the projection period, calculations were made of assumed age specific fertility rates (ASFRs). In other words, ASFRs were calculated by dividing the number of live births to females aged X by the total number of females aged X and multiplying by 1,000. Assumed fertility rates were derived from a 5-year average ASFR (adjusted to 2005-2006 local authority birth levels) in order to reduce data volatility. The data source was the Vital Statistics Registration Online System which is run by the ONS.

3.4 The long term fertility rate assumptions for the County were based on 5-year average ASFRs adjusted to recent birth levels, together with fertility data from the Walestrend in fertility rates in recent years, and so the early years of the 5-year average were pulling the projected fertility rates downward.

Mortality

3.5 In order to project the number of deaths in each local authority during each year of the projection period, mortality assumptions were produced for each local authority. This involved calculating assumed age specific mortality rates for Carmarthenshire. In other words, ASMRs were calculated for each single year of age and gender by dividing the number of deaths for age X and gender Y by the population for age X gender Y and multiplying by 1,000. by the ONS. Assumed mortality rates were derived from a 5-year average ASMR (adjusted to 2005-2006 local authority death levels) in order to reduce data volatility. The data source was the Vital Statistics Registration Online System which is run.

3.6 Differentials were used to predict the pattern of mortality by age groups and gender over the projection period (i.e. predicted increases to expectation of life for both males and females). The differentials were calculated from mortality data from the Wales national population projections. These Wales differentials were used to predict future mortality trends for all local authorities in Wales. The initial estimate of deaths for projected years was calculated by multiplying the ASMRs by the Wales differentials.

Migration

Internal

3.7 Internal migration refers to migration moves from one local authority in the UK to another. It does not include moves within a local authority. Internal migration estimates at a local authority level are based on data from the Patient Register Data System (PRDS). In order to project the number of migration moves during each year of the projection period, internal migration assumptions were produced for Carmarthenshire. For the projection period it was assumed that the 5-year average historic data would be projected forward (static migration flows for inflows and outflows), with 5-year average age specific migration rates (ASMigRs) for internal migration by gender and by single year of age up to age 90+.

International

3.8 International migration refers to migration moves between a local authority in Wales and overseas (outside the UK). It does not include moves within the UK. However, a person is only classified as an international migrant if they intend to migrate for a period of 12 months or more. Migrants who, at the time of migration, do not intend to stay for 12 months or more are classified as short-term migrants and are not included in the migration figures. International migration refers to migration moves between a local authority in Wales and overseas (outside the UK). It does not include moves within the UK. However, a person is only classified as an international migrant if they intend to migrate for a period of 12 months or more. Migrants who, at the time of migration, do not intend to stay for 12 months or more are classified as short-term migrants and are not included in the migration figures. For the projection period it was assumed that the 5-year average data projected forward (static migration flows for inflows and outflows) with 5-year average age specific migration rates (ASMigRs) for international migration were calculated for each local authority by gender and by single year of age up to age 90+.

Special Population Groups

3.9 Special population groups are sub-sets of the population that have specific age structures, which are fairly constant over time. Special population groups are not usually captured within migration (both internal and international) estimates. Such populations are also known as 'static populations'.

Armed Forces Data

3.10 Information on UK (or Home) armed forces is collected via the Defence Analytical Services Agency (DASA). These figures include the numbers of home armed forces and their dependants living in barracks and army quarters. The data was input into the model by single year of age and gender for the home armed forces.

School Boarders Data

3.11 Data on boarding school pupils are obtained from the Welsh Assembly Government for Wales.

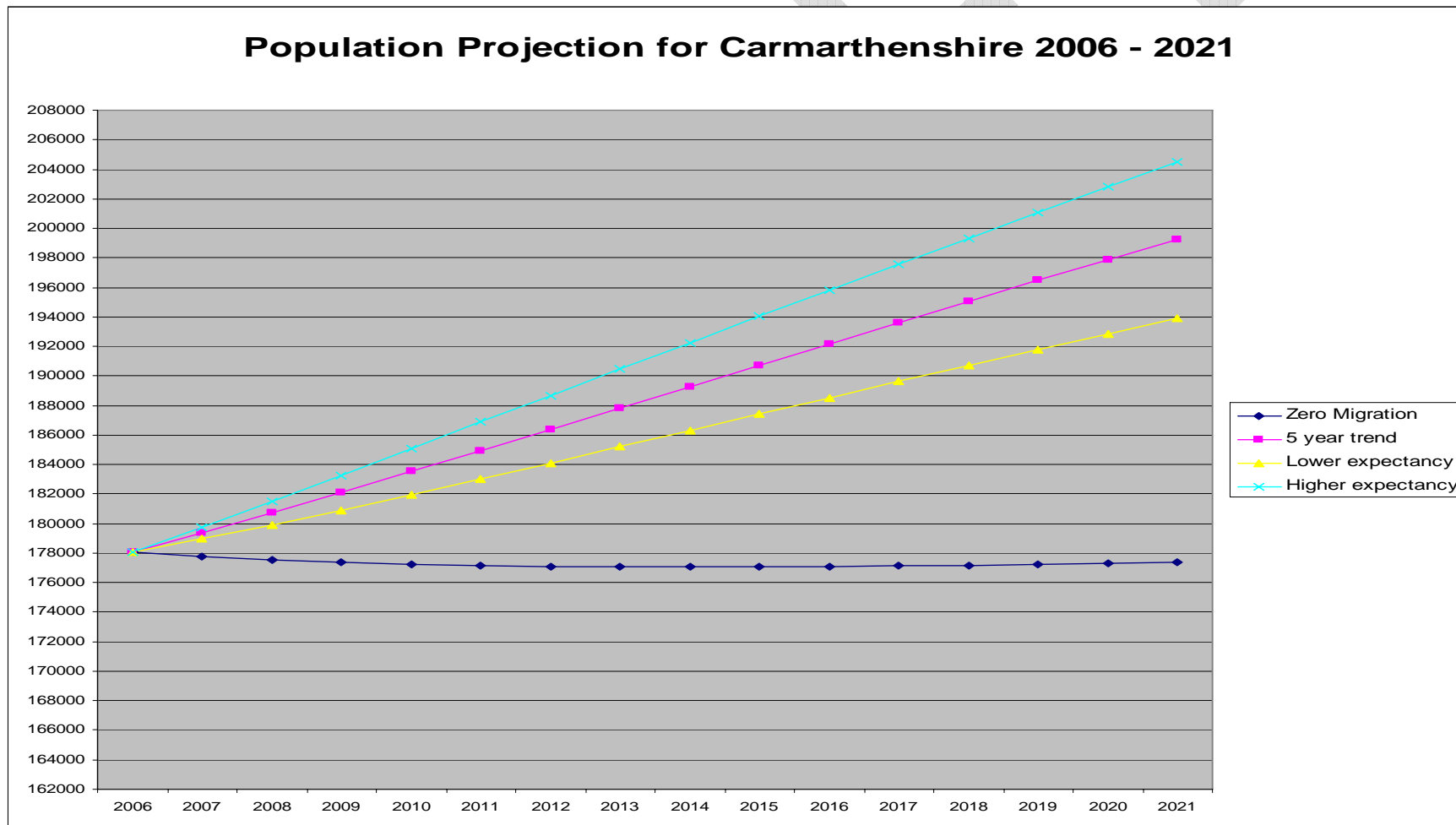
3.12 For all the above special populations, 2005-06 data was used as this was the most up to date data available. This data was projected forward as static counts throughout the projection period

A2. RESULTS

Total Population

3.13 Figure 1 shows the various projection scenarios included in the Assembly Government's 2006 based population projections work. Net migration, is a major component of population change and based on the principal projection i.e. trend-based scenario the population growth is forecast to be significant. The total population of Carmarthenshire could increase by 21,200 or an average annual growth of 0.8% over the period 2006-21. This compares with the 0.5% increase per annum that was experienced in the previous 5 year period (2001-2006).

Fig 1 Trend Based and Variant Projections: Carmarthenshire



3.14 The trend-based projection is based on the assumption that migration will continue in a similar trend to the immediate past (mid 2001-mid 06). It is important to note the patterns in migration are considered to be cyclical and have a close relationship with the local economy. The variant assumptions are intended to illustrate the impact of changes which may occur in part or in total, but should not be taken as upper or lower limits for what might occur in the future.

Population Projections by Age

3.15 The effect of migration and the age structure of migrants both into and out of the County will significantly change the make-up of the population in the fifteen year period of the Local Development Plan as Table 1 clearly illustrates.

Table 1: Projected Carmarthenshire Population to 2021, by Broad Age Group

Age	2006	2011	2016	2021
0-4	9,200	10,100	10,300	10,250
5-10	12,200	12,000	12,900	13,300
11-15	11,600	11,000	10,800	11,500
16-17	4,700	4,700	4,300	4,400
18-59Female, 64Male	99,100	100,700	101,700	102,000
60/65 -74	24,200	28,400	32,100	33,600
75-84	12,700	12,900	14,300	17,300
85+	4,300	5,200	5,800	6,800
Total	178,000	185,00	192,200	199,200

Source: POPGROUP

Note : Figures may not add up due to rounding

3.16 For the County as a whole:

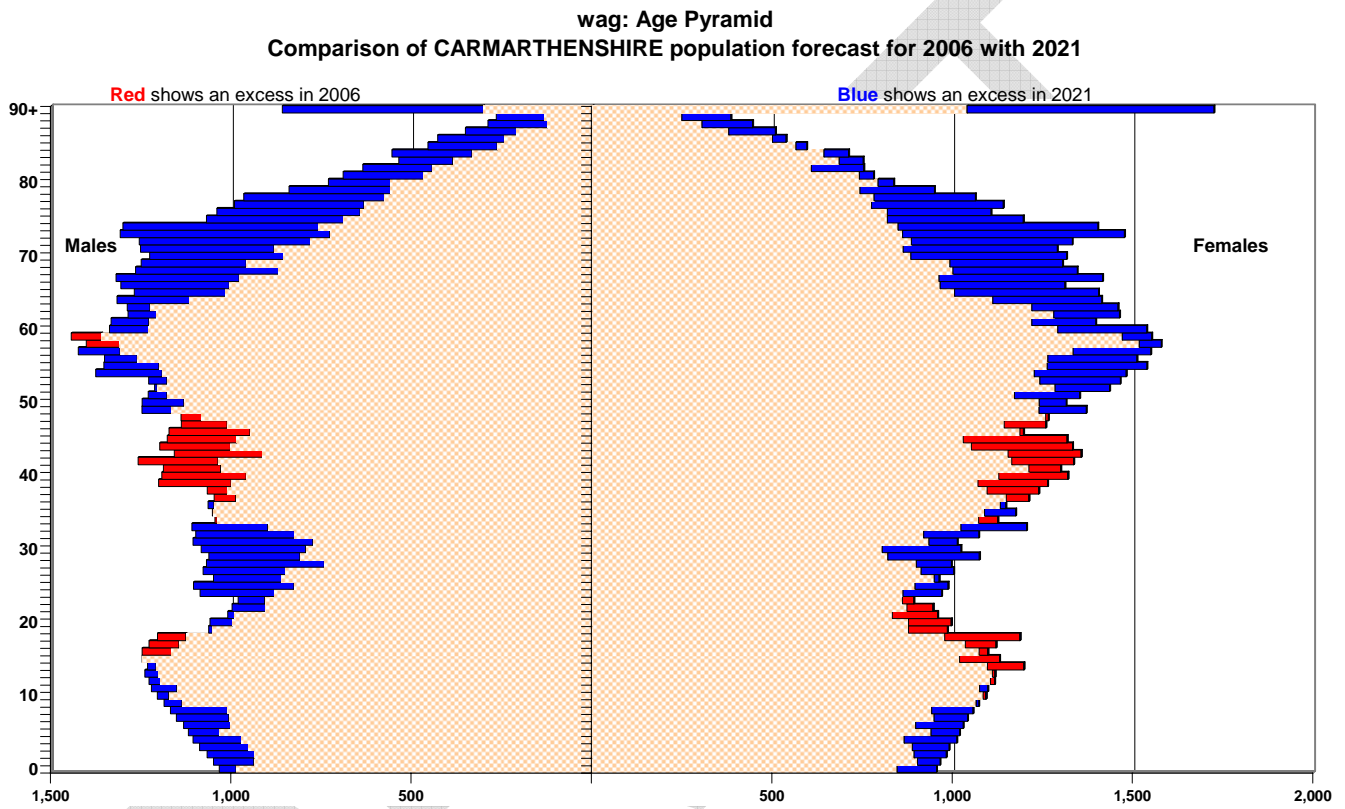
- The overall children population (0-15years) in Carmarthenshire is projected to increase by around 2,000 between 2006 and 2021, which amounts to an increase of 6% over the fifteen year period;
- The projections suggest that the County's working age population based on the current definition of working age will increase by about 2.5% over the next fifteen years, but this will result from a rise in the numbers of older age groups (45- 64) at the expense of a decrease in younger age groups (16-44);
- The number of older people aged 60+females/65+ males (current pensionable age) in Carmarthenshire is projected to continue to increase from 41,200 in 2006 to 57,800 by 2021 under the trend-based scenario, representing a rise of 40% over the period;
- The combined effect of a growing number of people reaching retirement age and improved longevity is also predicted to result in a sharp increase in the number of elderly people (aged 75+) in the long term. Between 2006 and 2021, the number of people aged 75+ will rise by 7,200 to reach 24,200, a growth of 43% in the trend-based scenario.

Population Pyramid

3.17 Perhaps the most illustrative way to show the forecast change of the age structure of the County is by a population pyramid as depicted in Fig 2. It shows that on the basis of the trend-based assumptions the demographic shape of the population will become exceedingly 'top heavy' by 2021.

3.18 The dependency ratio within the County in 2006 was around 716 per 1,000 people of working age. By 2021 this will rise to 753 per 1,000 people of working age as a result of the increase in people of pensionable age and changes in the state pension age.

Fig 2 Carmarthenshire Population Pyramid 2006-2021



Source: POPGROUP

B. HOUSEHOLD PROJECTIONS

B1. ASSUMPTIONS

Household Population

3.19 The HOUSEGROUP module of the software creates the estimated households for the period of the projections by utilising the results from the POPGROUP scenario and incorporating a number of additional datasets. The household populations for each area were calculated by subtracting the population not in households, which were taken as those residents in communal establishments as defined by the 2001 Census from the principal population projection for the County. This data was abstracted from 2001 Census output Table ST001 – Age by Sex and Resident Type for each of the five year age cohorts for both males and females. Without any data about likely future levels of residents in communal establishments the 2001 figures were used as standard throughout the projection period.

Household Categories

3.20 Household projection results were required broken down into specific household types. The maximum set-up that HOUSEGROUP will allow by individual five year age cohorts for males/females as follows:

Household Types:

- Married couple
- Cohabiting couple
- Lone parent
- Other multi-person
- One person

Concealed family types:

- Concealed couple
- Concealed lone parent

3.21 This information was abstracted from tables provided by the Welsh Assembly Government outlining household types in Carmarthenshire in 2004. No changes were made to the 2004 household type proportions for the period up to 2021

B2. RESULTS

Households

3.22 The number of households in Carmarthenshire is projected to increase at a much faster rate than that for population as household formation rates increase, especially in respect of single person households. Based on the trend-based scenario this projects a growth of 13,400 in the number of new households between 2006 and 2021, bringing the total number to almost 90,000 by 2021. This is an equivalent growth rate of 17.5% and an annual increase of 890 households each year over the next fifteen years.

Table 2: Carmarthenshire Trend Based Household Projections 2006-2021

ALL HOUSEHOLDS					
Household Types	2006	2011	2016	2021	
Married couple	37,100	39,000	41,000	42,900	
Cohabiting couple	5,300	5,500	5,700	5,800	
Lone parent	5,800	5,800	5,800	5,800	
Other multi-person	4,600	5,000	5,300	5,700	
One person	23,700	25,300	27,300	29,700	
All Households	76,600	80,500	85,100	90,00	
Private household population	175,400	182,400	189,600	196,600	
Average household size	2.29	2.26	2.23	2.19	
Concealed married couple	141	142	150	157	
Concealed cohabiting couple	130	138	144	145	
Concealed lone parent	212	215	219	218	
<i>All concealed families</i>	483	495	512	521	

Source: HOUSEPOP

Note : Figures may not add up due to rounding

Household Type

3.19 Key projection results for household types in the County for the period of the Local Development Plan are the continued rise in married couple (+5,800) and other multi-person households (+1,100) and a rapid upward trend in one-person households. The two other types of household are forecast to remain around current levels.

3.20 Between 2006 and 2021 the number of one-person households is forecast to increase by a quarter (25%), married couple households will rise by 15%, whilst other multi-person households will increase by 23%. There will also be an increase in the number of cohabiting couple households, which are forecast to grow by 11%. The number of lone parent household is predicted to remain broadly the same over the fifteen year period

Projected Household Size

3.21 Average household size is projected to decline from 2.29 in 2006 to 2.19 by 2021. The main reason for the accelerated rise in the number of households over the Local Development Plan period is the projected continual decrease in the average household size, caused predominantly by the increase in one-person households

APPENDICES

Appendix 1 : Population Projections : Carmarthenshire : 2006-2021

	Age Group	2006	2011	2016	2021
Persons	0-4	9,179	10,110	10,298	10,250
	5-9	9,983	9,842	10,795	10,979
	10-14	11,530	10,802	10,653	11,622
	15-19	11,501	11,605	10,888	10,729
	20-24	9,334	10,165	10,263	9,550
	25-29	8,565	9,453	10,286	10,389
	30-34	9,143	9,102	9,991	10,823
	35-39	11,350	9,886	9,862	10,748
	40-44	12,640	12,121	10,659	10,649
	45-49	12,071	13,231	12,716	11,262
	50-54	12,051	12,687	13,856	13,344
	55-59	13,465	12,710	13,353	14,529
	60-64	12,130	13,892	13,185	13,834
	65-69	9,755	12,059	13,821	13,192
	70-74	8,345	9,208	11,436	13,161
	75-79	7,035	7,323	8,270	10,363
	80-84	5,657	5,535	6,012	6,981
	85-89	2,968	3,595	3,712	4,260
	90+	1,341	1,626	2,136	2,583
	Total	178,043	184,955	192,191	199,246

Appendix 2 : Population Estimates and Forecasts

Components of Population Change

CARMARTHENSHIRE

	Year beginning July 1st														
	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Births															
Male	975	998	1,010	1,020	1,026	1,027	1,027	1,026	1,025	1,026	1,026	1,025	1,022	1,019	1,014
Female	897	919	930	939	944	946	945	944	944	944	944	943	941	938	934
<i>All Births</i>	1,872	1,917	1,940	1,958	1,970	1,973	1,972	1,970	1,969	1,970	1,970	1,968	1,964	1,957	1,948
TFR	1.94	1.98	1.99	2.00	2.00	2.00	1.98	1.97	1.96	1.95	1.95	1.94	1.94	1.94	1.94
Deaths															
Male	1,038	1,035	1,028	1,022	1,020	1,020	1,022	1,029	1,034	1,039	1,049	1,058	1,070	1,082	1,095
Female	1,089	1,114	1,105	1,097	1,090	1,083	1,078	1,075	1,068	1,063	1,058	1,056	1,057	1,059	1,062
<i>All deaths</i>	2,127	2,149	2,133	2,120	2,110	2,103	2,100	2,104	2,103	2,102	2,107	2,113	2,126	2,141	2,157
SMR: males	96.5	93.9	90.9	87.9	85.2	82.7	80.5	78.4	76.4	74.6	72.8	71.2	69.7	68.3	67.0
SMR: females	96.8	97.6	95.4	93.1	90.8	88.7	86.8	85.0	83.1	81.1	79.2	77.3	75.7	74.0	72.4
<i>SMR: male & female</i>	96.6	95.8	93.2	90.5	88.0	85.7	83.6	81.7	79.7	77.7	75.9	74.2	72.6	71.0	69.5
Expectation of life	79.8	79.9	80.1	80.4	80.6	80.8	81.0	81.2	81.4	81.6	81.7	81.9	82.0	82.2	82.3
In-migration from the UK															
Male	3,094	3,094	3,094	3,094	3,094	3,094	3,094	3,094	3,094	3,094	3,094	3,094	3,094	3,094	3,094
Female	3,326	3,326	3,326	3,326	3,326	3,326	3,326	3,326	3,326	3,326	3,326	3,326	3,326	3,326	3,326
<i>All</i>	6,420	6,420	6,420	6,420	6,420	6,420	6,420	6,420	6,420	6,420	6,420	6,420	6,420	6,420	6,420
SMigR: males	98.7	97.9	97.2	96.3	95.5	94.8	94.0	93.4	92.8	92.2	91.6	91.0	90.5	90.1	89.6
SMigR: females	98.6	98.1	97.6	97.1	96.6	96.0	95.6	95.2	94.8	94.4	94.2	93.9	93.8	93.6	93.6
Out-migration to the UK															
Male	2,272	2,272	2,272	2,272	2,272	2,272	2,272	2,272	2,272	2,272	2,272	2,272	2,272	2,272	2,272
Female	2,496	2,496	2,496	2,496	2,496	2,496	2,496	2,496	2,496	2,496	2,496	2,496	2,496	2,496	2,496
<i>All</i>	4,768	4,768	4,768	4,768	4,768	4,768	4,768	4,768	4,768	4,768	4,768	4,768	4,768	4,768	4,768

SMigR: males	27.1	26.8	26.5	26.2	26.0	25.7	25.5	25.3	25.1	24.9	24.8	24.7	24.6	24.5	24.4
SMigR: females	28.2	28.0	27.9	27.8	27.6	27.5	27.4	27.3	27.2	27.1	27.1	27.1	27.1	27.1	27.1
In-migration from Overseas															
Male	177	177	177	177	177	177	177	177	177	177	177	177	177	177	177
Female	159	159	159	159	159	159	159	159	159	159	159	159	159	159	159
All	336	336	336	336	336	336	336	336	336	336	336	336	336	336	336
SMigR: males	98.0	96.8	95.5	94.3	93.1	92.0	90.8	89.8	88.9	88.1	87.6	87.3	87.0	86.9	86.9
SMigR: females	97.7	96.7	95.8	95.3	94.4	93.5	92.8	92.6	92.6	92.4	92.4	92.6	93.0	93.4	94.0
Out-migration to Overseas															
Male	222	222	222	222	222	222	222	222	222	222	222	222	222	222	222
Female	187	187	187	187	187	187	187	187	187	187	187	187	187	187	187
All	409	409	409	409	409	409	409	409	409	409	409	409	409	409	409
SMigR: males	98.3	97.3	96.1	95.1	94.0	92.9	91.9	91.0	90.3	89.6	89.1	88.6	88.3	88.0	87.9
SMigR: females	98.7	97.9	97.1	96.4	95.5	94.8	94.4	93.9	93.4	92.9	92.6	93.0	93.0	93.2	93.6
Migration - Net Flows															
UK	+1,651	+1,651	+1,651	+1,651	+1,651	+1,651	+1,651	+1,651	+1,651	+1,651	+1,651	+1,651	+1,651	+1,651	+1,651
Overseas	-73	-73	-73	-73	-73	-73	-73	-73	-73	-73	-73	-73	-73	-73	-73
Summary of population change															
Natural change	-255	-231	-193	-161	-140	-130	-128	-134	-133	-133	-137	-145	-163	-185	-209
Net migration	+1,578	+1,578	+1,578	+1,578	+1,578	+1,578	+1,578	+1,578	+1,578	+1,578	+1,578	+1,578	+1,578	+1,578	+1,578
Net change	+1,324	+1,347	+1,385	+1,417	+1,439	+1,449	+1,451	+1,445	+1,445	+1,446	+1,441	+1,433	+1,416	+1,394	+1,369

Appendix 3 : Household Projections : Carmarthenshire : 2006-2021

ALL HOUSEHOLDS					
Household Types	2006	2011	2016	2021	
Married couple	37,106	38,976	40,963	42,868	
Cohabiting couple	5,282	5,453	5,701	5,848	
Lone parent	5,825	5,824	5,832	5,844	
Other multi-person	4,632	4,959	5,311	5,692	
One person	23,729	25,338	27,346	29,727	
All Households	76,574	80,550	85,154	89,979	
Private household population	175,450	182,362	189,595	196,649	
Average household size	2.29	2.26	2.23	2.19	
Concealed married couple	141	142	150	157	
Concealed cohabiting couple	130	138	144	145	
Concealed lone parent	212	215	219	218	
<i>All concealed families</i>	483	495	512	521	

Source: HOUSEPOP

Appendix 4 : POPGROUP MODEL

The projections have been produced using the suite of POPGROUP software developed by Bradford City Council and Andelin Associates (POPGROUP is now managed by the Cathie Marsh Centre for Census and Survey Research (CCSR) at the University of Manchester¹). The suite includes POPGROUP, HOUSEGROUP and LABGROUP software and is used widely in the UK by local authorities and has recently been used by Welsh Assembly Government to produce their 2006 based population projections. It uses an established forecasting method known as the 'Cohort Component Model'. This methodology uses a reliable base population at a fixed time, broken down by age and gender for each of the areas to be projected.

The projection software is provided in a series of Excel data sheets in which the user can enter past information, and their assumptions about the future, for births and fertility, deaths and mortality and migration. It then ages the population on for one year (for example, all the children aged 4, will become aged 5), and considers components of change (fertility, mortality and migration).

The forecasts project data for the mid year i.e. 30th June and are therefore consistent with data published from ONS. The results in Excel sheets format also include data extraction and chart routines that provide flexible access to detailed and broad summary statistics.