

Statement by the Partnership for Urban South Hampshire

Economic Forecasts and the Jobs-Housing Alignment in South Hampshire

This Paper explains the methodology use the Partnership for Urban South Hampshire (PUSH) to calculate job growth and commensurate dwelling provision for the South Hampshire sub-region; which is now incorporated in the Draft South East Plan.

Introduction

1. Within the overall strategy for the South Hampshire Sub-region, that development will be led by economic growth and urban regeneration, lies the PUSH objective to deliver sufficient new homes to ensure that housing availability does not constrain the economic growth targets. The requirement for new housing in South Hampshire, therefore, reflects not only demographic change, the need to cater for more one and two person households and longer life expectancy, but also the economic aspirations of the sub-regional strategy, the need to provide sufficient new homes for workers helping the local economy to grow.

Model outline

2. The means of deriving this housing requirement relies on both demographic and economic forecasts, ensuring that both sets of forecasts are consistent with each other as well as with the sub-regional strategy. The jobs-housing alignment between the economic forecasts, provided by DTZ Pieda Consulting, and the demographic/housing forecasts, provided by Anglia Ruskin University, was achieved using the model illustrated in Annexe 1, Figure 1. The essential relationship that achieves the alignment between the economic growth targets on the one hand and the housing requirement on the other lies at the heart of this model, the = sign that ensures that employment growth from the economic model is matched by labour supply growth from the demographic/housing model.

PUSH / DTZ economic forecasts

3. The DTZ economic model forecasts employment and productivity on the basis of Gross Value Added (GVA) following a target growth trajectory provided by PUSH¹. Analysis of past trends in South Hampshire reveals a complex set of relationships between GVA, employment and productivity and demonstrates that changes in GVA can be driven either by employment change or productivity change or by a combination of the two. For the forecasts, DTZ made the assumption that GVA growth in South Hampshire would come about through increases in both employment and productivity, with employment the main driver of GVA growth over the short to medium term and productivity becoming increasingly more important for driving GVA growth in the medium to long term.
4. The PUSH aspiration for a step-change in economic performance, expressed as a series of stepped GVA growth targets for South Hampshire (2.75%pa 2006-11, 3.0%pa 2011-16, 3.25%pa 2016-21, and 3.5%pa 2021-26), was converted by DTZ to a gradual straight-line trajectory rising from 2.75%pa in 2006 to 3.33%pa in 2026 that produces an average annual growth rate over the period of 3.1%. The DTZ model also forecast productivity growth for South Hampshire increasing from 1.7%pa in 2006 to 2.7%pa by 2026 and averaging 2.4%pa overall, and employment growth of 59,000 or 13% over the 2006 to 2026 period.

¹ Refer to 'South Hampshire Economic Drivers and Growth, Phase 3' by DTZ, 2005 for further information

Anglia demographic/housing forecasts

5. A particular feature of the Chelmer Population and Housing Model, developed by Anglia Ruskin University, is that it can calculate the future population based on expectations of future net migration flows as well as future household or dwelling totals (see Annex 2). Using this feature to adjust migration flows, and by applying economic activity rates (see paragraphs 6 and 7 below), it was possible to produce a future labour supply change that matched the employment growth forecast from the DTZ model. The projection sequence then followed the migration led projection process of the Chelmer model with population projections leading to household projections then on to dwelling projections.
6. The economic activity rates available when this work was done did not include the ONS projections published in January 2006. Instead Anglia offered a low variant, derived from the Department of Employment 1997 based national projections, a high variant, which reflected the shift in activity rates which might be expected to result from the official retirement age having become 70 by 2021, a mid variant, broadly consistent with similar projections produced at the time (2003) by other providers such as Experian Business Strategies and Cambridge Econometrics, and an extra high variant, equivalent to a retirement age of 70 by 2011.
7. The PUSH labour supply projections that match the DTZ employment forecasts were derived using the Chelmer high variant economic activity rates. These projections suggest that the overall activity rate in for the 16 to 74 age group in South Hampshire will increase from 69% in 2006 to 74% in 2026². While the Chelmer high variant might now seem implausible in the light of the Turner Report and subsequent Government proposals (pension age increasing to 68 by 2046) nonetheless the trend towards more older workers seems likely to continue given the rapidly worsening returns from pension schemes together with evidence that many people in their 60s are both able and willing to work on and recent changes in the law to enable them to do so. Subsequent work (September 2006) has shown that the outcomes derived from the most recent ONS economic activity rate projections applied in South Hampshire are broadly consistent with the outcomes derived from the Chelmer mid variant activity rates.

Dwelling requirement

8. The dwelling requirement arising from the PUSH preferred scenario modelled by DTZ and Anglia, by matching labour supply to labour demand, amounts to 74,000 between 2006 and 2026. Adding in the housing backlog requirement of 6,000 dwellings, estimated by the DTZ Housing Market Assessment for PUSH³, produces the 80,000 dwelling requirement that is incorporated in the Draft South East Plan (Policy H1 and Policy SH 12).
9. In summary the broad components of the South Hampshire dwelling requirement over the 2006 to 2026 period can be disaggregated as shown in Annexe 1, Figure 2. The local population component, derived from a zero net migration assumption in the Chelmer model, refers to the dwellings required to accommodate the households formed from within the local population. And the economic growth component is derived by increasing net in-migration to a level where labour supply change matches the DTZ employment growth forecast over the 2006 to 2026 period thereby ensuring the jobs-housing alignment.

² derived from September 2006 work.

³ See South Hampshire Housing Market Assessment, Stage 1, DTZ 2005

Statement by the Partnership for Urban South Hampshire

Annexe 1

Economic Forecasts and the Jobs-Housing Alignment in South Hampshire

Figure 1. Achieving the jobs-housing alignment in South Hampshire

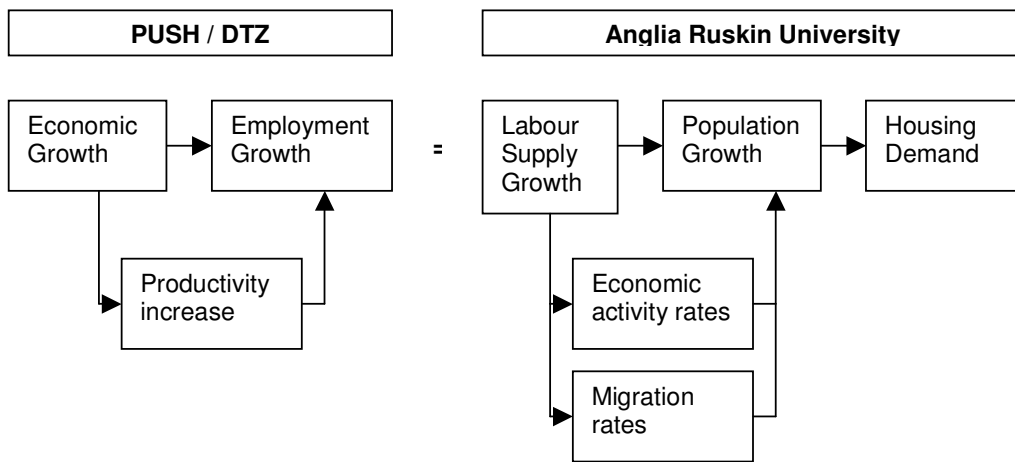


Figure 2. South Hampshire Dwelling Requirement

Components of change	Dwelling requirement 2006 to 2026	
	dwellings	%
Local population	54,900	68.6%
Housing backlog	6,000	7.5%
Economic growth	19,100	23.9%
Total	80,000	100.0%

Statement by the Partnership for Urban South Hampshire

Annex 2

TECHNICAL NOTE

Assessment of Housing Need – Economic and Demographic Forecasts 2006-2026

CHELMER POPULATION & HOUSING MODEL FORECASTING METHODOLOGY AND ASSUMPTIONS

The Chelmer Population and Housing Model (the Chelmer Model) has been developed by the Population and Housing Research Group at Anglia Polytechnic University in Chelmsford, and has been in use since 1985. The Model has been used by a number of agencies, including regional assemblies, county and district councils, planning consultancies and the House Builders Federation. Results from the Model have been used to discuss population and housing issues at Examinations in Public of Structure Plans.

FORECASTING METHODOLOGY

The Chelmer Model is a computerised model which has been designed to replicate the process of population change. This means that the model forecasts population by calculating future levels of each of the components of population change - births, deaths, outmigrants and inmigrants. As a result the change in total population between two dates can be described by:

	Base Population
plus	Births
minus	Deaths
minus	Outmigrants
plus	Inmigrants
equals	Forecast Population

The model operates through a series of five year periods from a base date of 2001. In addition to forecasts of total population the model produces forecasts of the population by five year age and gender groups, and of households. By the application of economic activity (or 'participation') rates to the forecast population, the model is also able to produce forecasts of the economically active population by five year age and gender groups.

A particular feature of the model is that it can calculate the population which will arise at a future date through expectations of future net migration flows, of future dwelling totals or of future household totals. This means that the model uses data on sharing, vacancy, and household representative rates as well as the demographic components.

Elements of forecasting

- 1) **Population in base year:** the projection base year is 2001 and the population age structure used for this is the ONS 2001 mid-year population estimate (using September 2004 revisions).
- 2) **Projecting natural change:** the natural change of the population (births and deaths) is projected using cohort-survival methodology and national rates drawn from the GAD 2003-based projections of fertility and mortality rates, corrected to local registrations of births and deaths for an appropriate period.

- 3) **Projecting migration:** the population migration into and out of the area has an age structure taken from the 1991⁴ Census of Population for internal migrants. The international migrant structure uses a combination of Census 2001 and ONS population projection data.
- 4) **Projecting population:** projected migration when combined with projected natural change population provides the projected population as a whole.
- 5) **Projecting communal establishment and private household populations:** the resultant population projections are converted into projections of private household population by the removal of projected communal establishment population. The latter is projected largely based on the 2001 Census, assuming that numbers remain constant under the age of 75 and that proportions remain constant for 75 and over.
- 6) **Projecting households:** the resultant private household population forecasts are converted into forecasts of household projections using projected age/gender-specific headship rates
- 7) **Projecting dwellings:** household forecasts are converted to dwelling forecasts via projected sharing rates and vacancy rates. These are assumed to be held constant at 2001 Census levels. Allowing for sharing households in shared dwellings adjusts the household projection to provide a projection of “occupied dwellings”. Applying a vacancy rate to “occupied dwellings” gives a projection of total dwellings (occupied and vacant).
- 8) **Dwelling-led projections:** the above projection sequence is one of population projection leading to household projection, then dwelling projections. Given that the key variable is likely to be net migration in these circumstances, this is often known as a *migration-led* projection. Mechanically the process can be reversed. Such a reversed sequence is known as a *dwelling-led* projection. This gives the implied level of total net migration, of which an assumed level of international net migration remains fixed.

SOURCES AND ASSUMPTIONS

The assumptions employed by the Chelmer Model are generally taken from published material produced by the Office of National Statistics (ONS), the Government Actuary's Department (GAD), and the Office of the Deputy Prime Minister (ODPM/formerly DTLR/DETR).

Base population

The base population of these forecasts is the revised 2001 ONS mid-year population estimate⁵ (Sept 2004), split by five year age/gender groups for the population aged 0-84 years and by gender for the population aged 85 years and over. The base population is divided into a household population and a non-household population. The non-household population is derived from 2001 Census Table S01. The private household population at 2001 is derived by subtraction of this non-household population from the 2001 mid-year population estimate.

The treatment of the future non-household population aged under 75 is the same as the 1996-based HPS⁶ household projections. At future dates the non-household population aged below 75 years is taken to remain unchanged from the actual values recorded by the 2001 Census data. For the population aged over 75 years the ratio of the non-household population to the total resident population is taken to remain unchanged from that exhibited by

⁴ The equivalent data from 2001 Census had not been fully incorporated into the Chelmer dataset when the first forecasts were produced

⁵ Data for each cohort is rounded to nearest 100, and may show differences when district totals are compared to ONS MYE district figures.

⁶ The HPS household projections are produced by the Household Projection Service at APU and are consistent with the DETR household projections

the 2001 base data. This is broadly, but not precisely, equivalent to the assumptions in the HPS 1996-based household projections.

Fertility

Fertility rates are expressed as the number of births per 10,000 women in the relevant five year age groups and differentiate between male births and female births. The rates, which vary over time, are derived from the ONS/GAD 2003-based population projections for England. To allow for the variation of local fertility rates from the national average, births are corrected by comparing those generated using national rates with locally registered births for the period 1998-2003. The correction is held constant through all forecast periods, from 2006. (Local correction, once applied in projections has the effect of adjusting the projected number of births to match the recorded number of births).

Mortality

Mortality rates are expressed as the number of deaths per 10,000 persons of each five year age group and differentiate between males and females. The rates, which vary over time, are taken from the ONS/GAD 2003-based population projections for England. To allow for the variation of local mortality rates around the national average, deaths are corrected by comparing those generated using national rates with locally registered deaths for the period 1998-2003. The correction is held constant through all forecast periods, from 2006. Infant mortality rates are similarly calculated and applied to births occurring during each forecast period.

Migration modelling assumptions

Outmigrants

Internal migration data is derived from the 1991⁷ Census Special Migration Statistics; international data is derived from combination of 2001 Census Special Migration Statistics (international immigrant cohorts) and ONS 2003-based population projections (international net migrant cohorts). Data is grossed up to five year period equivalence, and expressed as a proportion of the total number of outmigrants by five year age and gender groups. The proportions are held constant through all forecast periods and this determines the age/gender structure of the outmigrants. The overall scale of gross outmigration is projected to be a constant ratio relative to the size of the population at the start of each projection period.

Inmigrants

Internal migration data is derived from the 1991⁸; Census Special Migration Statistics international migration data is derived from the 2001 Census Special Migration Statistics. Data is grossed up to five year period equivalence, and each five year age/gender group is expressed as a proportion of the total number of inmigrants. The proportions are held constant through all forecast periods. The scale of gross immigration is the difference between the scale of outmigration and the level of net migration resulting from the assumptions of net migration flows set for each area for each forecasting period for both internal and international elements.

Census Migration age/sex data

The data is compiled from the question regarding change of address within the year prior to the Census and is regarded as one year 'snapshot' information. In order to make this data suitable for use with the Chelmer Model, the 5-year age band cohorts must be processed to represent equivalent migration movement over a 5 year period and births must be calculated and added to the first ageband of 1-4 years to estimate those aged 0-4. Internal 'within area'

⁷ The equivalent data from 2001 Census had not fully been incorporated into the Chelmer dataset when the first forecasts were produced

⁸ The equivalent data from 2001 Census had not fully been incorporated into the Chelmer dataset when the first forecasts were produced

migrants are added to immigrants and to outmigrants to allow consistency between different spatial levels.

Total net migration control

Employment-led net migration controls⁹, derived from iterative matchings of forecast labour supply with forecast labour demand, were produced by DTZ Pieda and the PUSH Technical Group. Variants were based on combinations of “low”, “mid”, “high”, and “extra high” economic activity with Gross Value Added (GVA) levels of 2.5%, 3% and 3.5%.

International net migration control (1998/03-based)

A short term trend is calculated as the difference between total net migration (the difference between mid-year estimates of population at 1998 and 2003 minus natural change) and (NHSCR) internal net migration between 1998 and 2003, constrained to ONS regional international net migration estimates for 1998 to 2001, and constrained to ONS international UK total estimates disaggregated by regional averaging over 1998-01 for 2001 to 2003. This includes the setting of international net migration to zero where the total net migration control is negative.

Dwelling-led controls

Assumed numbers of dwelling completions for the period 2001-2006, based on housing development phasing assumptions, were supplied by PUSH.

Household Representative Rates

Household representative rates are expressed as the proportion of any age, gender, and marital status group who represent (head) a household. The rates are formulated such that one person in each household is taken to be the representative of the household, with the number of household representatives equal to the number of households in an area.

Projected household representative rates for local authority districts are provided by the official Household Projection and Estimation Service (HPS) run by the Population and Housing Research Group at APU on behalf of ODPM. It supplies projections of household representatives consistent with the DETR 1996-based household projections for individual districts. They are produced for four aggregated age groups. For districts, 1996-based projections by 5-year age/gender group household representative rates were produced from these “aggregated age group” projections, using county ratios and iterative proportioning. Rates are held constant from 2021.

A correcting factor is applied to the rates to modify the numbers of households to match approximately at mid 2001, using Census 2001 households adjusted by differencing between residents in private households as at Census 2001 and at mid-2001. This correcting factor is then applied to forecast years.

Participation Rates (economic activity rates)

Labour supply can be generated by applying the participation rates to the forecast population. Four variants of participation rates have been used in these forecasts

The 2001 Census is the source of economic activity rates for each district at 2001, and rates are age and gender specific. The rates are projected to change in line with nationally projected rates of change.

The “mid” projections of economically active population are broadly consistent (in terms of national rates of change) with similar projections of economic activity rates produced by other providers of equivalent projections for the region, such as Experian Business Strategies Ltd and Cambridge Econometrics. These forecast ratios are available to 2021; 2021 is then held constant.

⁹ Three sets were provided by PUSH

The “low” variant is derived from the Department of Employment 1997-based national projections from 2001 to 2011; 2011 is then held constant.

The “high” variant has been constructed to reflect the shift in economic activity rates for those aged over 55, which might be expected to result from the official retirement age having become 70 by the year 2021. This ratio incorporates

- a) the decline in male economic activity is halted under age 55;
- b) male ratios are cohort-adjusted over 55 to give economic activity behaviour equivalent to retirement at 70 in 2021;
- c) female/male ratios are assumed to continue generalised trend increase under age 55;
- d) female/male ratios are cohort-adjusted over 55 to give economic activity behaviour equivalent to retirement at 70 in 2021;
- e) female economic activity ratios are constructed by applying f/m ratios to male economic activity ratios.

Ratios differ until 2021, which is then held constant.

The “extra high” variant is similar to the “high” variant except that it reflects the shift in economic activity which might be expected to result from official retirement age having become 70 by the 2011, i.e. the rate of change occurs over 10 years, as opposed to 20 years. Ratios differ until 2021, which is then held constant.

Sharing Rates

Sharing rates (the proportion of households who share a dwelling) are derived from the 2001 Census. The sharing factor (the average number of sharing households in a shared dwelling) is also derived from the same source. Sharing rates and sharing factors are held constant.

Vacancy Rates

Vacancy rates (the proportion of dwellings that are vacant) are derived from the 2001 Census. The definition used here includes all vacancies as defined by the Census, including second homes and holiday accommodation. Vacancy rates are held constant.

BASIS OF FORECASTS

Four sets of forecasts giving population, households, dwellings and labour supply were produced, covering the period 2001 to 2026.

Set 1: The equivalent of a 2006 base was produced by assuming a dwelling stock increase for the period 2001 to 2006. Thereafter zero net migration controls were applied to give an estimate of indigenous housing demand. With these base assumptions, economic activity forecasts were produced using each of the four economic activity variants.

Set 2: Employment-led net migration controls, derived from matching forecast labour supply from Set 1 with forecast labour demands, were used to produce standard population, households and dwellings output, and economic activity forecasts based on all the combinations of economic activity variants and GVA levels.

Set 3: Similar to Set 2, with employment-led net migration based on comparison of forecast labour supply from Set 1 with forecast labour demands.

Set 4: Similar to Set 3, with employment-led net migration based on comparison of forecast labour supply from Set 2 with forecast labour demands.

Population and Housing Research Group at APU
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