APPENDIX A
DESCRIPTION OF DEMOGRAPHIC MODELS

The projection scenarios presented in this report use our in-house suite of demographic models, designed by John Hollis. These are fully-fledged cohort progression models and mirror the data, methods and assumptions used in the official ONS / CLG projections , except of course for the alternative assumptions we are testing - which are described below.

Inputs

Population

Base Population (gender and single years 0 to 90+): ONS 2013 mid-year estimate. Model will move to 2014 MYE later in 2015.

Other Populations: ONS MYE 2001-2012.

Births: latest mid-year to mid-year (2012-13) consistent with MYE change analysis.

Age-specific Fertility Rates and Total Fertility Rate Assumption: as ONS 2012 national and subnational projections.

Deaths: latest mid-year to mid-year (2012-13) consistent with MYE change analysis.

Survival/Mortality Assumptions: as ONS 2012 national and subnational projections.

Migration: Age/gender probabilities linked to annual average migration changes over a recent minimum five-year period between 2001 and 2013 (eg 2003-13 or 2008-13) using data from ONS MYE and ONS MYE change analyses.

Households

Household Representative Rates: Stage 1 rates from CLG 2012 projection for year 2011 to 2037. The model uses the CLG Stage 1 rates that are specific to 5-year age groups (15-19 … 85+), gender and relationship status.

Communal Population: as CLG 2012 assumptions.

Relationship Status (in a couple, formerly in a couple, single): as CLG 2012 assumptions.

Processes

Population

1. Survive base populations (single years of age and gender) by one year.
2. Calculate and add net migration by single years of age and gender for the survivors. This gives the population of persons aged 1+ at the end of first projection year.
3. Calculate births by single years of age of mother (15 .. 49) using the average female population at each age group throughout the projection year.
4. Split total births by gender using most recent 5-year average.
5. Survive births by gender to the end of projection year.
6. Calculate and add net migration of those surviving infants by gender born in the projection year. This gives the population of 0 year old boys and girls at the end of the first projection year.
7. Repeat cycle until the final projection year.

Households

1. Separate total population (by gender and five-year age groups) into the three relationship statuses by following CLG assumptions of the proportions in each status.
2. Calculate communal establishment population by gender, age and relationship status by following CLG assumptions (constant numbers by gender, relationship status and age groups to 74 by and then constant proportions).
3. Calculate private household population by gender, age and relationship status by difference between total population and communal population.
4. Apply CLG Stage 1 household representative rates to the private household population by age, gender and relationship status. This gives total households.
5. Apply 2011 Census net vacancy rates, or other agreed rates, to convert households to homes.
6. For the supply-led (750 dpa) scenario, we build a population projection from the assumed number of net new dwellings by a process of iteration. A migration led population projection is converted to households. A revised population total is estimated by comparison of the projected households with the required households each year using the projected average household size. The population projection is then run to the revised total by adjusting the migration. The revised population projection is converted to households and the iteration continues until a static situation is reached.

Outputs

Total **population** by single years of age (0-90+) and gender for all projection years to 2031.

Annual births, total fertility rates, deaths and net migration to 2030-31.

Total population, private household population and communal establishment population by age (0-4 … 85+), gender and relationship status every year 2011 to 2031.

Households by age (15-19 … 85+), gender and relationship status of household representative every year 2011 to 2031.

Households are converted to **homes** every year 2011 to 2031.