Cheshire East Local Plan

Background Paper:

Population Projections and Forecasts

September 2013
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1. **Introduction**

1.1 This Paper supersedes the previous background paper on population projections and forecasts published in January 2013. The previous set of forecasts have been revised to take account of a number of key datasets produced by the Office for National Statistics (ONS) and the Department for Communities and Local Government, that have been released over recent months. These include some 2011 Census tables, mid-year population estimates revised in light of the 2011 Census and interim 2011-based subnational population and household projections.

1.2 The previous set of forecasts were based on the indicative mid-2010 population estimates produced by ONS. These were the most up to date estimates available at the time. In light of the 2011 Census results, ONS revised all mid-year population estimates for 2002 to 2010. ONS had underestimated the population in Cheshire East and the previous indicative mid-2010 population estimates (365,700) were around 3,400 lower than the revised mid-2010 population estimates (369,100). Appendix 1 has more detail on the differences between the two different mid-2010 population estimates used as the base population in the previous and revised forecasts.

1.3 Determining how much new housing should be provided and where it should be located is an important element of the Local Plan. This paper is intended to give background information on the work done to date on the revised population projections and forecasts. Some of these projections also incorporate information from past economic trends and baseline projections of expected future economic growth.

1.4 It needs to be acknowledged at the outset that forecasting is not an exact science and it will not result in a definitive ‘right’ answer. For example, the forecasts and projections outlined below are based on a judgement of what is most likely to occur under a specific scenario, but it is of course possible for actual outcomes to differ from what was predicted, because of unlikely or unforeseen circumstances, or because of limitations with the available data (or possibly with the forecasting/ projection method).

1.5 The National Planning Policy Framework (NPPF) requires Local Plans to identify sufficient land to meet the full, objectively assessed need for housing. This must, therefore, as a minimum, be met by the amount of land that is identified for housing in the Local Plan. The draft National Planning Practice Guidance makes it clear for the first time in Government guidance that: “Household projections published by the Department for Communities and
Local Government should provide the starting point estimate of overall housing need”.

1.6 Understanding the housing requirement involves considering a range of relevant information and making a judgement about the weight that should be given to each of these elements. Ultimately, it will result in a figure which feels right for the Borough taking account of wider policy aspirations and constraints. This explains why it is an area of planning policy that can be much debated during a Local Plan’s preparation and approval process.

1.7 The elements which have been considered in the Cheshire East Housing Requirement identified in the Development Strategy include the following:
- The outputs from a variety of population projections and forecasts;
- Past economic trends and baseline projections of expected future economic growth (particularly growth in employment and economic output);
- The context provided by past housing policy and levels of housing completion;
- The conclusions from relevant studies such as the Strategic Housing Market Assessment and the Strategic Housing Land Availability Assessment, including the current housing supply situation; and
- The influence of wider policy considerations such as national planning guidance, the Council’s economic aspirations, the regeneration aspirations of neighbouring authorities, environmental capacity including impact on the Green Belt and countryside, the capacity of current infrastructure and any other significant constraints on growth.
2. **Projections and Forecasts**

2.1 The number of people living in Cheshire East has, in general, shown a steady growth over the last 30 years i.e. the mid-year estimate figures show the population has increased by approximately 13% from around 328,500 in 1981 to around 370,700 in 2011\(^1\). This compares with a 13% growth in England & Wales and 2% growth in North West England over the same period. To help understand how this may change in the future, the Council commissioned a range of forecasts to be produced, based on the revised (in light of the 2011 Census) mid-2010 population estimates. The forecasts produced included a mixture of population led, economic led and dwelling led forecasts, and key inputs included a variety of national and local level demographic and economic data (for example, on births, deaths, migration, household formation, jobs, unemployment and the proportion of people in different age / gender groups who are economically active). Further details on the methodology and assumptions involved in this work are provided in Appendix 1.

2.2 This led to fourteen demographic scenarios being considered. These are outlined below and summarised in Table 1. They provide important information about the likely future population in Cheshire East, under a range of different scenarios, which have implications for determining the housing requirement in the Local Plan. These are highlighted in the subsequent analysis.

2.3 The scenarios considered comprise a mixture of projections and forecasts. It is perhaps worth appreciating the difference between projections and forecasts. Briefly, the ONS 2011 subnational population projection assumes that past recent trends in fertility, mortality and migration will continue into the future. They do not always include local information on births and deaths and do not take account of expectations of future house building i.e. they are policy neutral. Population forecasts differ from projections in that they take some account of the expected future impact of development projects (e.g. future house-building), policies and initiatives (whether under way, in the pipeline or simply a proposal) as well as past trends. Alternatively they can forecast the result of economic policy (for example, how a particular job creation scheme or employment-generating project would affect the population). Therefore, forecasts are perhaps a more useful tool in estimating the future housing requirement as they are based on more locally specific information and aspirations.

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\(^1\) Source: 1981 and 2011 mid-year population estimates, © Crown Copyright 2013. Office for National Statistics licensed under the Open Government Licence v.1.0
Table 1 – Summary of the Demographic Scenarios Modelled for Cheshire East for the Plan Period (i.e. 2010 to 2030).

<table>
<thead>
<tr>
<th>Scenario Number</th>
<th>Modelling Type</th>
<th>Population Change</th>
<th>Dwelling Change</th>
<th>Labour Supply Change</th>
<th>Job Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Natural Change Forecast</td>
<td>2,500</td>
<td>7,200</td>
<td>-3,600</td>
<td>-4,700</td>
</tr>
<tr>
<td>2</td>
<td>Migration Rates Forecast</td>
<td>14,800</td>
<td>16,900</td>
<td>1,800</td>
<td>300</td>
</tr>
<tr>
<td>3</td>
<td>Nil Net Migration Forecast</td>
<td>-7,700</td>
<td>8,500</td>
<td>-11,800</td>
<td>-12,300</td>
</tr>
<tr>
<td>4</td>
<td>Net Increase of 1,150 Dwellings per annum (p.a.)</td>
<td>29,900</td>
<td>23,000</td>
<td>10,700</td>
<td>8,600</td>
</tr>
<tr>
<td>5</td>
<td>Net Increase of 1,250 Dwellings p.a.</td>
<td>34,900</td>
<td>25,000</td>
<td>13,600</td>
<td>11,300</td>
</tr>
<tr>
<td>6</td>
<td>Net Increase of 1,350 Dwellings p.a.</td>
<td>39,800</td>
<td>27,000</td>
<td>16,400</td>
<td>13,900</td>
</tr>
<tr>
<td>7</td>
<td>Net Increase of 1,600 Dwellings p.a.</td>
<td>52,300</td>
<td>32,000</td>
<td>23,600</td>
<td>20,600</td>
</tr>
<tr>
<td>8</td>
<td>Net Increase of 1,800 Dwellings p.a.</td>
<td>62,200</td>
<td>36,000</td>
<td>29,300</td>
<td>25,900</td>
</tr>
<tr>
<td>9</td>
<td>Zero Jobs Growth Forecast</td>
<td>13,700</td>
<td>16,500</td>
<td>1,400</td>
<td>0</td>
</tr>
<tr>
<td>10</td>
<td>CHWEM Baseline Data (0.2% Jobs Growth)</td>
<td>24,200</td>
<td>20,700</td>
<td>7,900</td>
<td>6,000</td>
</tr>
<tr>
<td>11</td>
<td>0.4% Jobs Growth</td>
<td>40,500</td>
<td>27,300</td>
<td>17,300</td>
<td>14,800</td>
</tr>
<tr>
<td>12</td>
<td>0.7% Jobs Growth</td>
<td>62,200</td>
<td>35,900</td>
<td>30,100</td>
<td>26,600</td>
</tr>
<tr>
<td>13</td>
<td>1.2% Jobs Growth</td>
<td>100,900</td>
<td>51,400</td>
<td>53,000</td>
<td>47,900</td>
</tr>
<tr>
<td>14</td>
<td>2011-Based Interim Subnational Projections</td>
<td>41,100</td>
<td>23,600</td>
<td>16,400</td>
<td>13,900</td>
</tr>
</tbody>
</table>
Table 1 Source: 2011 – 2030 Population Forecasts produced by Cheshire West & Chester Council in cooperation with Cheshire East Council.

Table 1 Notes:

1. All numbers are rounded to the nearest 100;
2. The labour supply – the economically active population - consists of people who are either unemployed (available for and actively seeking work) or in employment. The labour supply estimates presented here relate only to people aged 16 to 74 inclusive. In other words, the calculations implicitly assume that the number of economically active people aged 75 and above is zero or negligible. Labour can of course be supplied by local (Cheshire East) residents or by people who live outside Cheshire East. However, the figures quoted in this paper are for the local (Cheshire East) labour supply only;
3. The CHWEM is an economic forecasting model that Cheshire East Council maintains and operates on behalf of Cheshire, Halton and Warrington partner organisations (see Appendix 3); and
4. The ONS projections run to 2021. After this date, the modelling software has continued the trends in the factors affecting population, dwellings and economic change to produce projections up to 2030.

Scenario 1 – Natural Change Forecast

2.4 This scenario involved forecasting how the existing population would change assuming that there was no movement (or migration) of people in or out of Cheshire East during the plan period. This meant forecasting the future population based on the likely level of births and deaths and then determining the number of dwellings the resultant population would require. It represents a standard baseline position and is provided for comparison purposes only, as it is unrealistic to expect there to be zero migration in reality.

2.5 The findings were that the existing population of Cheshire East would increase by around 1% or 2,500 people, which would require the provision of an annual average of 360 additional dwellings (around 7,200 dwellings overall) to meet the needs of the Borough during the Plan period, i.e. between 2010 and 2030. There are a number of reasons for this increase including the fact that the age structure of the population is changing, resulting in more pensioner households containing one or two people and less households headed by people of working age in the future (as these people have lower household formation rates2 than older people).

2.6 Under this scenario, the age structure of the population is forecast to change significantly with a 11% reduction in young people (0-15), 12% reduction in working age people (16-59 Female, 16-64 Male) and 44% increase in people of

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2 The household formation rate is the proportion of household residents in an age group (or another sub-group) who ‘represent’ (i.e. head) a household. See section 6 of Appendix 1 for further details.
retirement age (60/65+), with the number of older people (85+) increasing by around 103% - which would have implications for education, social care / health and public sector service provision. As a result of these changes in the age structure, the figure for local labour supply (i.e. for economically active Cheshire East residents) is forecast to fall by an average of 180 people per annum (3,600 over the Plan period). Because of the limited additional dwellings provision and the fall in labour supply, the number of jobs is also forecast to decline: by an average of 235 per annum, or 4,700 over the Plan period; in percentage terms, this equates to an average annual fall of about 0.1%.

2.7 A summary of the age structure breakdown for this and all the other scenarios is shown in Table 2.

2.8 Further work was undertaken on the Natural Change Forecast to identify how the population of Cheshire East’s 11 largest settlements, referred to as Principal Towns (in the case of Crewe and Macclesfield) and Key Service Centres (for the next nine largest settlements), is likely to change over the Plan period. While Natural Change forecasts were also produced for the Local Service Centres (thirteen in total) and the remaining rural area, these have been summarised³. The findings are shown in Table 3 and indicate that only four of the largest settlements (Crewe, Macclesfield, Middlewich and Wilmslow) would see any growth in population. The remaining settlements would be unable to sustain their current level of population without migration. Poynton (-7%) and Knutsford (-4%) have the largest reduction in population in terms of percentage change, as do the Local Service Centres (particularly Chelford, Prestbury, Mobberley, Goostrey, Audlem, Shavington, Alderley Edge, Holmes Chapel, Disley and Wrenbury – ten of the thirteen Local Service Centres) and the remaining rural area.

Scenario 2 – Migration Rates Forecast

2.9 This scenario is the same as scenario 1 except that likely migration movements in and out of the Borough were factored into the forecast based on recent migration data for Cheshire East. The findings of the modelling were that the population of the Borough would increase by 14,800 people over the period of the Plan and that the housing requirement would also increase by around 16,900 dwellings or an average of around 845 dwellings per annum. There would be a slight rise in the local labour supply under this scenario by an annual average of 90 people (1,800 over the Plan Period) and an average increase of 15 jobs per annum (300 over the Plan Period). This equates to an average annual jobs growth rate of less than 0.05%.

³ The background paper “Determining the Settlement Hierarchy” gives more information on how the hierarchy used in the Local Plan has been determined.
Table 2 – Summary of Forecasted Change to the Population Age Structure for Each Modelled Scenario between 2010 and 2030

<table>
<thead>
<tr>
<th>Population Structure</th>
<th>Population 2010</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-4</td>
<td>20,100</td>
<td>-10%</td>
<td>-16%</td>
<td>-27%</td>
<td>-10%</td>
<td>-8%</td>
<td>-6%</td>
<td>-1%</td>
<td>3%</td>
<td>-17%</td>
<td>-10%</td>
<td>-4%</td>
<td>6%</td>
<td>24%</td>
<td>3%</td>
</tr>
<tr>
<td>5-10</td>
<td>23,700</td>
<td>-8%</td>
<td>-6%</td>
<td>-14%</td>
<td>0%</td>
<td>2%</td>
<td>4%</td>
<td>9%</td>
<td>13%</td>
<td>-8%</td>
<td>-4%</td>
<td>2%</td>
<td>11%</td>
<td>26%</td>
<td>15%</td>
</tr>
<tr>
<td>11-15</td>
<td>22,000</td>
<td>-15%</td>
<td>-8%</td>
<td>-13%</td>
<td>-4%</td>
<td>-3%</td>
<td>-1%</td>
<td>3%</td>
<td>6%</td>
<td>-8%</td>
<td>-8%</td>
<td>-3%</td>
<td>1%</td>
<td>10%</td>
<td>7%</td>
</tr>
<tr>
<td>16-17</td>
<td>9,500</td>
<td>-17%</td>
<td>-9%</td>
<td>-13%</td>
<td>-7%</td>
<td>-6%</td>
<td>-5%</td>
<td>-2%</td>
<td>0%</td>
<td>-11%</td>
<td>-10%</td>
<td>-8%</td>
<td>-4%</td>
<td>1%</td>
<td>2%</td>
</tr>
<tr>
<td>18-59</td>
<td>210,200</td>
<td>-12%</td>
<td>-10%</td>
<td>-17%</td>
<td>-6%</td>
<td>-4%</td>
<td>-3%</td>
<td>1%</td>
<td>4%</td>
<td>-10%</td>
<td>-7%</td>
<td>-2%</td>
<td>4%</td>
<td>16%</td>
<td>-2%</td>
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<tr>
<td>Female, 18-64 Male</td>
<td></td>
<td>26%</td>
<td>31%</td>
<td>28%</td>
<td>32%</td>
<td>33%</td>
<td>34%</td>
<td>36%</td>
<td>30%</td>
<td>32%</td>
<td>34%</td>
<td>36%</td>
<td>40%</td>
<td>28%</td>
<td></td>
</tr>
<tr>
<td>60/65 -74</td>
<td>50,700</td>
<td>61%</td>
<td>68%</td>
<td>66%</td>
<td>70%</td>
<td>71%</td>
<td>72%</td>
<td>73%</td>
<td>74%</td>
<td>68%</td>
<td>70%</td>
<td>72%</td>
<td>74%</td>
<td>78%</td>
<td>63%</td>
</tr>
<tr>
<td>75-84</td>
<td>23,300</td>
<td>61%</td>
<td>68%</td>
<td>66%</td>
<td>70%</td>
<td>71%</td>
<td>72%</td>
<td>73%</td>
<td>74%</td>
<td>68%</td>
<td>70%</td>
<td>72%</td>
<td>74%</td>
<td>78%</td>
<td>63%</td>
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<td>85+</td>
<td>9,500</td>
<td>103%</td>
<td>130%</td>
<td>129%</td>
<td>134%</td>
<td>136%</td>
<td>137%</td>
<td>139%</td>
<td>141%</td>
<td>131%</td>
<td>135%</td>
<td>139%</td>
<td>144%</td>
<td>152%</td>
<td>121%</td>
</tr>
<tr>
<td>Total</td>
<td>369,100</td>
<td>1%</td>
<td>4%</td>
<td>-2%</td>
<td>8%</td>
<td>9%</td>
<td>11%</td>
<td>14%</td>
<td>17%</td>
<td>4%</td>
<td>7%</td>
<td>11%</td>
<td>17%</td>
<td>27%</td>
<td>11%</td>
</tr>
</tbody>
</table>

Table 3 – Breakdown of Natural Change Forecast for the Largest Cheshire East Settlements, Local Service Centres and Remaining Rural Area between 2010 and 2030

<table>
<thead>
<tr>
<th>Settlement</th>
<th>Population at 2010</th>
<th>Population at 2030</th>
<th>Population Change</th>
<th>% Change</th>
<th>Dwelling Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alsager</td>
<td>11,700</td>
<td>11,400</td>
<td>-400</td>
<td>-3</td>
<td>0</td>
</tr>
<tr>
<td>Congleton</td>
<td>26,400</td>
<td>26,000</td>
<td>-400</td>
<td>-1</td>
<td>200</td>
</tr>
<tr>
<td>Crewe</td>
<td>72,700</td>
<td>79,500</td>
<td>6,800</td>
<td>9</td>
<td>5,200</td>
</tr>
<tr>
<td>Handforth</td>
<td>6,500</td>
<td>6,500</td>
<td>-100</td>
<td>-1</td>
<td>0</td>
</tr>
<tr>
<td>Knutsford</td>
<td>13,200</td>
<td>12,700</td>
<td>-500</td>
<td>-4</td>
<td>-100</td>
</tr>
<tr>
<td>Macclesfield</td>
<td>52,100</td>
<td>54,300</td>
<td>2,200</td>
<td>4</td>
<td>2,000</td>
</tr>
<tr>
<td>Middlewich</td>
<td>13,600</td>
<td>14,300</td>
<td>700</td>
<td>5</td>
<td>700</td>
</tr>
<tr>
<td>Nantwich</td>
<td>17,800</td>
<td>17,800</td>
<td>0</td>
<td>0</td>
<td>100</td>
</tr>
<tr>
<td>Poynton</td>
<td>12,900</td>
<td>12,000</td>
<td>-900</td>
<td>-7</td>
<td>-300</td>
</tr>
<tr>
<td>Sandbach</td>
<td>17,900</td>
<td>17,800</td>
<td>-100</td>
<td>0</td>
<td>300</td>
</tr>
<tr>
<td>Wilmslow</td>
<td>23,600</td>
<td>23,700</td>
<td>100</td>
<td>0</td>
<td>500</td>
</tr>
<tr>
<td>Local Service Centres</td>
<td>50,800</td>
<td>47,900</td>
<td>-2,800</td>
<td>-6</td>
<td>-900</td>
</tr>
<tr>
<td>Rural (Remaining Areas)</td>
<td>49,800</td>
<td>47,600</td>
<td>-2,200</td>
<td>-4</td>
<td>-400</td>
</tr>
<tr>
<td>Total</td>
<td>369,100</td>
<td>371,500</td>
<td>2,500</td>
<td>1</td>
<td>7,200</td>
</tr>
</tbody>
</table>

Note: All figures have been independently rounded with population and dwelling requirement figures rounded to the nearest 100 and % change figures to nearest whole number.
Scenario 3 – Nil Net Migration Forecast

2.10 This scenario is similar to the previous model in that it factors in births, deaths and migration, except it assumes that the net level of migration will be zero. This allows us to consider how those people who migrate into Cheshire East would impact on the age structure of the Borough over the Plan period when compared with the Natural Change Forecast (i.e. scenario 1).

2.11 The findings suggest that the population of Cheshire East would fall by 7,700 people by 2030. The impact of the migration rates on the age structure is to make the population age at a faster rate i.e. the number of older people increases more rapidly and the number of younger people decreases more rapidly than in the Natural Change model. The age structure impacts on the numbers of births and deaths that the model forecasts. This forecast is lower than the Natural Change model (which actually forecasts an increase) because there are more older people (and so more deaths forecast) and fewer younger people (and so less births forecast). Despite the fall in the population there would still be a requirement for around an additional 8,500 dwellings or an average of 425 dwellings per annum, 65 more than under the Natural Change Forecast (scenario 1), as the trends (of an ageing population) are more pronounced in this model and the household size of older people tends to be smaller. In addition, the lower number of younger people than under the Natural Change model means that the figure for local labour supply is forecast to reduce by an average of 590 people per annum (11,800 over the Plan period). The number of jobs is forecast to decline by an average of 615 per annum, or 12,300 during the Plan period (which equates to an average decline of about 0.4% per annum). These represent much greater reductions than in scenario 1 and highlight the underlying impact that migration has on age structure, labour supply and jobs within the Borough.

Scenario 4 – Net Increase of 1,150 Dwellings per Annum

2.12 The Council consulted on three strategic options for growth for the Local Plan in its Issues and Options Paper in November 2010. This scenario represents the low growth strategy identified in that paper. It also represented the annual average rate of net housing provision for the Borough identified in the North West of England Regional Spatial Strategy (RSS) to 2021. The RSS was revoked by the Government on 20th May 2013 and therefore is no longer part of the Statutory Development Plan, however before that date that was the housing requirement figure to 2021. Modelling was used to forecast the population required to fill a net increase of 1,150 dwellings per annum (23,000 over the Plan period). The findings forecast that this level of housing would result in an increase in population of around 29,900 people in Cheshire East by 2030 and an average annual increase of 535 people (10,700 overall) in the local labour supply figure over the same period. Under this scenario, the number of jobs is predicted to rise by an average
of 430 per annum, or 8,600 in total (which equates to average annual jobs growth of around 0.2%).

2.13 Modelling was also undertaken using a similar annual net dwelling increase figure of 1,195, which represents the average number of housing completions in the Borough over the last fifteen years (1996 to 2011). The findings forecast that this level of housing would result in an increase in population of around 32,200 people in Cheshire East by 2030, an average annual increase of 600 people in the local labour supply figure and an average annual increase of 490 jobs over the same period.

Scenario 5 – Net Increase of 1,250 Dwellings per A

2.14 This scenario represents a mid point between the low and medium growth strategy identified in the Council’s Issues and Options Paper. Modelling was used to forecast the population required to fill a net increase of 1,250 dwellings per annum over the Plan period. The findings forecast that this level of housing would result in an increase in population of around 34,900 people in Cheshire East by 2030 and an average annual increase of 680 people (13,600 overall) in the local labour supply figure over the same period. Under this scenario, the number of jobs is predicted to rise by an average of 565 per annum, or 11,300 in total (which equates to average annual jobs growth of around 0.3%).

Scenario 6 – Net Increase of 1,350 Dwellings per A

2.15 This scenario represents the medium growth strategy identified in the Council’s Issues and Options Paper. Modelling was used to forecast the population required to fill a net increase of 1,350 dwellings per annum over the Plan period. The findings forecast that this level of housing would result in an increase in population of around 39,800 people in Cheshire East by 2030 and an average annual increase of 820 people (16,400 overall) in the local labour supply figure over the same period. Under this scenario, the number of jobs is predicted to rise by an average of 695 per annum, or 13,900 in total (which equates to average annual jobs growth of around 0.4%).

Scenario 7 – Net Increase of 1,600 Dwellings per A

2.16 This scenario represents the high growth strategy identified in the Council’s Issues and Options Paper. Modelling was used to forecast the population required to fill a net increase of 1,600 dwellings per annum over the Plan period. The findings forecast that this level of housing would result in an increase in population of around 52,300 people in Cheshire East by 2030 and an average annual increase of 1,180 people (23,600 overall) in the local labour supply figure over the same period. Under this scenario, the number of jobs is predicted to rise by an average of 1,030 per annum, or 20,600 in total (which equates to average annual jobs growth of around 0.5%).
Scenario 8 – Net Increase of 1,800 Dwellings per Annum

2.17 This scenario represents the recommended level of housing development for Cheshire East identified in the Barton Wilmore ‘Cheshire & Warrington Sub-Regional Housing Study’ produced in November 2012 and submitted as part of their response to the Council’s Development Strategy consultation in January 2013. Modelling was used to forecast the population required to fill a net increase of 1,800 dwellings per annum over the Plan period. The findings forecast that this level of housing would result in an increase in population of around 62,200 people in Cheshire East by 2030 and an average annual increase of 1,465 people (29,300 overall) in the local labour supply figure over the same period. Under this scenario, the number of jobs is predicted to rise by an average of 1,295 per annum, or 25,900 in total (which equates to average annual jobs growth of around 0.7%).

Scenario 9 – Zero Jobs Growth Forecast

2.18 This scenario assumes that there will be no jobs growth throughout the 20 year forecast period. This means that the employment level at the end of the Plan period in 2030 will be the same as it was at the start in 2010 i.e. around 177,600 employees. This is a useful baseline model as it forecasts the change in population and housing provision that will be required to maintain the status quo in terms of job provision in the Borough. (This model requires zero job growth year on year – whereas for the preceding scenarios, the change in jobs varies from year to year.)

2.19 The findings suggest that the population would have to increase by around 13,700 people if the employment level is to remain the same. It may seem surprising that, in future, a larger population will be needed to sustain an unchanged number of jobs, but this partly reflects the impact of an ageing population i.e. the population of working age is generally forecast to decrease and so to maintain the current level of jobs (and the level of people of working age needed to fill those jobs) the forecast adds an inflow of migrants (of all ages) which increases the total population. A further 825 dwellings would need to be provided each year (16,500 over the Plan period) to accommodate the population and household changes that are forecast under this scenario.

2.20 As might be expected, this scenario results in relatively little change in the local labour supply, with an average increase of 70 people per annum (1,400 overall). In other words, if all other things stay equal, low / zero jobs growth means that people will be less inclined to migrate to Cheshire East (to look for or take up jobs) and therefore inward migration is likely to contribute less to the local labour supply than it would in a more buoyant local jobs market.

2.21 However, it should be stressed that the level of employment and the local labour supply figure do not necessarily (and do not usually) equal each other, or follow
the same trend. In particular, some of those who make up the local labour supply commute to jobs outside Cheshire East. Conversely, some of the jobs at Cheshire East sites are occupied by people who live outside the Borough and commute inwards. In addition, some of those who make up the local labour supply are unemployed. Therefore commuting patterns and economic conditions in general affect the relationship between employment and the local labour supply.

2.22 It is also important to note that economic output – the value of the goods and services that the economy produces – can grow, even if the number of jobs does not. This is because productivity (the economic output generated per hour of work) improves over time: for example, technological improvements make it possible to produce particular goods and services more quickly than before. More specifically, even with zero employment growth, economic output is likely to grow by an average of about 1% to 2% a year over the long term, because of productivity growth.4

Scenario 10 – CHWEM (Local Economic Forecasting Model) Baseline Data for Jobs Growth

2.23 This scenario uses the Cheshire, Halton and Warrington economic forecasting model’s (the CHWEM’s) baseline projection for jobs growth of about 0.2% a year for 2010-25 and assumes that this growth rate will continue over the rest of the Plan period (i.e. 2025-30).5 This rate of jobs growth is forecast to require an average annual increase in the local labour supply of 395 people (7,900 overall) and an overall increase of around 24,200 in the Borough’s population during the Plan period. It also implies an average annual housing requirement of around 1,035 additional dwellings to 2030 (20,700 overall). Under this scenario, the number of jobs grows by an average of 300 per annum, or 6,000 over the whole Plan period.

2.24 The 0.2% average yearly jobs growth figure is relatively modest when compared with past levels of growth in Cheshire East, for example 1.2% per annum during 1991-98 (which includes part of a recession) and 1.3% during 1995-2008 (the longest recent period for which a continuous data series is available, but not one that includes any major economic downturns). However, it is a rate of growth which is considered more achievable for the Plan period, considering the current challenging global and national economic climate.

2.25 Three further modelling scenarios were undertaken: for job growth averaging 0.4%, 0.7% and 1.2% per annum – these are Scenarios 11 to 13.

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4 This is after allowing for the effects of inflation. The 1% to 2% range is consistent with local baseline projections (from the “CHWEM” economic forecasting model) and with the views of some nationally renowned economic forecasting organisations.

5 At present, the CHWEM does not produce projections beyond 2025.
Scenario 11 – 0.4% Jobs Growth

2.26 This scenario represents moderate employment growth: approximately midway between the rates of the CHWEM baseline scenario (annual average growth of 0.2%) and the high growth scenario (annual average growth of 0.7%). This scenario produced credible forecasts: the rate of jobs growth is forecast to require an average annual increase in the labour supply of 865 people (17,300 overall) and an overall increase of around 40,500 in the Borough’s population during the Plan period. This scenario’s average annual housing requirement of 1,365 additional dwellings to 2030 (27,300 overall therefore is fairly similar to scenario 6 (medium growth strategy) and gives a similar increase in population as both scenario 6 and the interim 2011-based subnational population projections (scenario 14). Under this scenario, the number of jobs grows by an average of 740 per annum, or 14,800 over the whole Plan period, which is also similar to jobs growth under scenarios 6 and 14.

Scenario 12 – 0.7% Jobs Growth and Scenario 13 - 1.2% Jobs Growth

2.27 These scenarios represent high employment and very high employment growth rates. The very high average annual employment growth rate of 1.2% is based on the Great Britain average for 1995-2008 (the longest recent period for which a continuous data series is available at national and local authority level). The 0.7% scenario equates to average annual jobs growth of 1,330 per annum (26,600 over the Plan period). For the 1.2% scenario, average annual jobs growth would be 2,395 (47,900 over the Plan period).

2.28 However, the 0.7% and 1.2% modelling scenarios both produced rather high population forecasts. Particular consideration would need to be given to the likely impact that accommodating this level of development would have on the environment of Cheshire East if either scenario is to be considered appropriate. The forecasts for these scenarios suggest that job growth averaging 1.2% per annum would require an increase in the Borough's population of around 100,900 people and an average annual housing requirement of 2,570 additional dwellings to 2030 (51,400 overall), while job growth averaging 0.7% per annum would require a population increase of around 62,200 people and an average annual housing requirement of 1,795 additional dwellings (35,900 overall) during the Plan period. The 0.7% employment growth scenario gives similar results to the high growth strategy of 1,800 dwellings per annum (scenario 8) in terms of population, dwellings, labour supply and jobs. These (scenarios 12 and 13) represent implausible scenarios and therefore should be discounted from serious consideration.
Scenario 14 – Interim 2011-Based Subnational Population Projections

2.29 Up until 2021, this scenario's population and household figures are constrained to the interim 2011-based subnational population projections produced by ONS and the interim 2011-based subnational household projections produced by the Department for Communities and Local Government (CLG). It then projects to 2030, using a continuation of the population assumptions in the ONS projections and the 2021 household formation rates from the CLG projections. Scenario 14 projects that the population of Cheshire East will increase by around 41,100 people during the Plan period. This would produce a requirement for an average additional 1,180 dwellings per annum (23,600 over the Plan period), whilst increasing the local labour supply by an average of 820 people per year (16,400 overall) and the total number of jobs by 13,900 (an average of 695 per annum, or average annual growth of about 0.4%).

2.30 This scenario is similar to scenario 6 (net increase of 1,350 dwellings per annum) in terms of population, labour supply and jobs growth, however there are differences. The main difference between the two models relates to the forecasts for older people and children. This is due to the use of different fertility, mortality and migration rates for the two models and also the implications of the resulting age structures, combined with household formation rates, on the number of households. So although the 2011 subnational projections indicate a higher total population in 2030 than scenario 6 does, the number of people aged 18+ (i.e. the people who can head up a household) is lower (than in the 1,350 model). However, ONS warns that caution should be used when using these projections for planning purposes at the younger ages. The projections are known to overproject the number of births at a national level. This particularly affects some areas where the 2011 population estimates have higher numbers of women aged 16-44 than in the 2010 estimates.
3. **Conclusion**

3.1 There is a wide range in the outputs from the fourteen scenarios that have been modelled, depending on whether a narrow view is taken that provides for the likely needs of the existing population only, or a wider view is taken that allows for continued economic growth in the area and takes account of underlying demographic trends. The national trend of an ageing population is particularly marked in Cheshire East, with all the scenarios forecasting a significant increase in older people during the Plan period (Table 2) and older people have higher household formation rates than those adults of working age. Hence, a higher level of housing growth is needed than would be required if the population were not ageing.

3.2 A number of the forecasts tested provide useful baseline information about the local population and how it may change in the future. The Natural Change Forecast (scenario 1) indicates that the existing population is forecast to grow by 2,500 people over the Plan period, requiring around 7,200 new dwellings but that the labour supply would fall by around 3,600 people (with jobs falling by 4,700) over the same period. When recent migration data for Cheshire East is factored in (scenario 2), it is forecast that the population will increase by around 14,800 and require around 16,900 dwellings over the Plan period. This is forecast to provide a modest increase, of 1,800 people, in the overall labour supply to 2030 and jobs growth over the Plan period of just 300 - insufficient to meet the growth aspirations of the Council for its area. The Nil Net Migration Forecast (scenario 3) indicates that migration has an underlying impact on the age structure in Cheshire East by making the population age at a faster rate than would be the case through natural change, with labour supply forecast to fall by some 11,800 people over the Plan period and the jobs total declining by 12,300. The Zero Jobs Growth Forecast (scenario 9) indicates that a population increase of more than 13,700 people and a dwelling increase of more than 16,500 dwellings is required during the Plan period, for there to be any increase in the Borough’s jobs total.

3.3 The draft National Planning Practice Guidance makes it clear for the first time in Government guidance that:

> “Household projections published by the Department for Communities and Local Government should provide the starting point estimate of overall housing need.”

The interim 2011-based subnational population projections produced by ONS and the interim 2011-based subnational household projections produced by CLG represent the most recent population and household projections. These have been incorporated into scenario 14 which indicates that the Council should be planning to provide for a population increase to 2030 of around 41,100, a net housing increase of 23,600 dwellings, an increase in labour supply of 16,400
people, and an increase of around 13,900 jobs (equating to average annual jobs growth of 0.4%).

3.4 The Council also modelled five dwelling led forecasts. These provided for an average net increase per annum of 1,150 (scenario 4), 1,250 (scenario 5), 1,350 (scenario 6), 1,600 (scenario 7) and 1,800 (scenario 8) dwellings for the Plan period. For these scenarios, the forecasted average annual jobs growth rates are (to the nearest tenth of a percentage point) 0.2%, 0.3%, 0.4%, 0.5% and 0.7% respectively. Scenario 6 provided the closest match to scenario 14 (the scenario which, as noted earlier, is constrained to ONS’ interim 2011-21 population projections and CLG’s interim 2011-21 household projections and which uses these ONS and CLG figures to inform its 2022-30 projections). It forecast that providing an average of 1,350 dwellings per annum or 27,000 dwellings over the Plan period would provide for a population increase of around 39,800 people, a labour supply increase of around 16,400 people and an increase of around 13,900 jobs to 2030.

3.5 The Council also modelled four economic led forecasts. These provided for average annual jobs growth of around 0.2% (scenario 10), 0.4% (scenario 11), 0.7% (scenario 12) and 1.2% (scenario 13) over the Plan period. Scenario 11 provided the closest match to scenario 14 (the scenario which is constrained to the ONS and CLG interim 2011-21 population and household projections). It forecast that a 0.4% increase in jobs over the Plan period would provide for a population increase of around 40,500 people, a net average increase of 1,365 dwellings per annum or around 27,300 overall, a labour supply increase of around 17,300 people and an increase of around 14,800 jobs to 2030.

3.6 As noted in Appendices 1 and 2, the CHWEM data indicate a differential of roughly 2% between the long-term growth rate for economic output (Gross Value Added) and that for employment – and this 2% differential accords with the views of nationally-renowned economic forecasters. Therefore an average annual jobs growth rate of 0.2%, for example, implies Gross Value Added (GVA) growth of around 2.2% per annum. As Appendix 2 notes, many economic forecasters regard a long-term GVA growth rate of about 2.5% as being strong yet achievable. However, the UK’s recent performance is a little short of this: for example, for 1997 Quarter 1 to 2013 Quarter 2, the economic output growth rate averaged 1.9% per annum.⁶

3.7 Bearing in mind the 2% output-employment differential, a 1.9% GVA growth “target” for Cheshire East could result in zero or negative employment growth and would therefore be inconsistent with the Council’s desire for significant long-term employment growth. Conversely, if Cheshire East aimed for a very high GVA growth rate (above 2.5%), there would be a much greater risk that the growth

⁶ See Appendix 2 for details of the data source for this figure.
proves to be economically and environmentally unsustainable over the long term: there is a strong likelihood that the additional growth would be reliant on, for example, increased carbon emissions, unsustainable rates of greenfield development or asset bubbles.

3.8 Bearing all this in mind, the Council’s view is that an economically challenging but sustainable GVA growth rate would be within the upper part of the 2.0% to 2.5% range. The 1,250, 1,350 and 1,600 dwellings scenarios are forecast to produce employment growth rates of 0.3% to 0.5% and therefore equate to average annual GVA growth of about 2.3% to 2.5%. However, the 1,600 scenario’s employment growth forecast is nearly 0.55% and is therefore less easy to achieve and probably less sustainable than a more modest employment growth rate. In addition, the 1,600 scenario results in population growth of 52,300: this is slightly closer to the implausible 62,200 population increase associated with the 0.7% jobs growth scenario than to the plausible 40,500 population increase associated with the 0.4% jobs growth scenario.

3.9 Taking account of all these factors, the medium growth strategy of providing around an additional 1,350 dwellings per annum (scenario 6), identified in the Council’s Issues and Options Paper, is still, from a demographic, economic and broad environmental perspective, the most appropriate housing requirement.

3.10 As indicated in the introduction, the outputs from modelling work represent only some of the elements that have been considered by the Council in determining the level of housing growth shown in the Local Plan and considered appropriate for Cheshire East until 2030. The implications for the environment, Green Belt and existing infrastructure of providing for higher levels of housing and jobs than the medium growth strategy need to be carefully considered if development is to be sustainable in the longer term.
Appendix 1 – Forecasting Methodology

1 Introduction

1.1 This paper details the methodology used to produce the updated 2010 based population forecasts\(^7\) requested by Cheshire East planners. The forecasts will be one element of supporting evidence to be considered for the authority’s Local Plan.

1.2 This paper includes sections on:

- The POPGROUP software (used to produce the forecasts)
- The forecasting methodology
- The assumptions (the data the forecasts are based on)
- The subnational population and household projections.

2 Why have the Forecasts been updated?

2.1 When new data becomes available then the quality of a previous forecast decreases. Since the original 2010 based population forecasts were produced for the Background Paper – Population Projections and Forecasts published in January 2013, several key datasets have been released which have enabled the previous forecasts to be updated. These datasets include:

- The 2011 MYE (mid-year estimate of population) produced by the Office for National Statistics (ONS) which is based on the results of the 2011 Census
- Rebased MYEs 2002-2010 (revised in light of the 2011 Census) produced by ONS
- Census 2011 tables produced by ONS detailing economic activity rates and numbers of households and dwellings
- 2011 interim subnational household projections produced by the Department for Communities and Local Government (CLG) which take into account the recent 2011 interim subnational population projections and 2011 Census results (to an extent)
- Projections from the 2012 update of the Cheshire, Halton & Warrington (CHWEM), the local economic forecasting model used by the Cheshire, Halton & Warrington Local Authorities
- ONS’ recent (2011 and 2012) model-based estimates of broad unemployment (a measure of unemployment that includes all who are available for and actively seeking work)
- ONS’ 2011 Business Register and Employment Survey (BRES) data, which provides information on the number (and type) of jobs located within Cheshire East and other Local Authorities.

\(^7\)The forecasts were produced by Lee Huxley (Demographic Analyst, Cheshire West and Chester Council) with support from Eleanor Spencer (Demography and Research Officer). Expertise and guidance on the economic aspects of the forecasts was provided by Nick Billington (Senior Research Analyst, Cheshire East).
Over the coming months more results from the 2011 Census will be published. It will be important to keep these under review and to take account of emerging information as it arises.

### The POPGROUP software

POPGROUP is a suite of demographic models that enable population, household and labour force forecasts to be produced.

POPGROUP uses MS Excel to manage its data inputs and outputs and enables users to experiment and analyse alternative forecasts of demographic change. The forecasting model estimates future population change based on fertility, mortality and migration assumptions which the user builds and can model with the help of the software.

Population forecasts can be used to derive likely dwelling and household numbers consistent with the population’s size and age-sex composition. Likewise the forecast can be used to derive the changing size and shape of the labour force. Alternatively, policy-constrained scenarios may be evaluated, linking the future size and profile of a local population to the provision of new dwellings and/or to an economic growth projection or target.

POPGROUP is used by a large number of local and regional organisations in the UK and has been subject to extensive enhancement and development over the last ten years. The POPGROUP model suite is owned by the Local Government Association.

Edge Analytics, the company currently responsible for developing the software state “Its robustness and transparency are ideally suited to the rigorous nature of public scrutiny that accompanies the production of local development plans”.

### The forecasting methodology

POPGROUP uses a cohort component methodology to produce population projections or forecasts. This is a standard approach that is applied by most national statistical agencies. A population in a base period is projected forward taking account of the impact of births, deaths and migration. The number of births, deaths and migrants is based on assumptions of fertility, mortality and migration built by the user of the model.

The household formation rate methodology is the current standard for producing household projections. This approach is used by CLG for its household projections and is replicated in the POPGROUP derived forecast methodology. Household formation rates measure the proportions of household residents in an age/sex

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8 POPGROUP has over 90 users including academic and public service staff in housing, planning, health, policy, research, economic development, and social services.

9 [http://www.edgeanalytics.co.uk/](http://www.edgeanalytics.co.uk/)
group that 'represent' a household of a particular type (couple, lone-parent, other multi-person, one-person, for example). The forecast number of households is calculated as the product of the population resident in households multiplied by the household formation rate (for each age, sex, household type combination).

4.3 The derived forecast methodology can also be used along with economic activity rates and population forecasts to forecast the size of the labour force.

4.4 The user also has the option of running policy led forecasts and can constrain the model to either the number of new dwellings or new jobs; the model then adjusts the forecast population to meet this constraint.

4.5 The forecasts give the population on 30th June, i.e. mid-year for each year from 2010 (the base year) to 2030.

4.6 Producing a population forecast is a complex process. The following table gives an overview of:

- The factors used to produce the population forecasts
- What each factor was used to calculate.
### Table 1: Factors in the population forecasts

<table>
<thead>
<tr>
<th>Factors</th>
<th>Used to calculate</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Population factors</strong></td>
<td><strong>Factors</strong></td>
</tr>
<tr>
<td>Population by single years of age and sex for 2010</td>
<td><strong>Base population</strong></td>
</tr>
<tr>
<td>Fertility rates</td>
<td>The number of births</td>
</tr>
<tr>
<td>Mortality rates</td>
<td>The number of deaths</td>
</tr>
<tr>
<td>Migration (age structure)</td>
<td>The number of in and out migrants (and age structure of all migrants). In models constrained to new dwellings or new jobs, the number of migrants is adjusted so the model meets the constraint.</td>
</tr>
<tr>
<td><strong>Factors needed to produce dwelling impact (or constrain a forecast to the number of new dwellings)</strong></td>
<td><strong>Factors</strong></td>
</tr>
<tr>
<td>Population in communal establishments</td>
<td>Households = (population – population in communal establishments) * household formation rates</td>
</tr>
<tr>
<td>Household formation rates</td>
<td><strong>Households</strong></td>
</tr>
<tr>
<td>Household to dwellings conversion information</td>
<td>Dwellings = households / household to dwellings conversion</td>
</tr>
<tr>
<td>Number of new dwellings</td>
<td>Total number of dwellings = dwellings in previous year + new dwellings</td>
</tr>
<tr>
<td><strong>Factors needed to produce economic impact (or constrain a forecast to the number of new jobs)</strong></td>
<td><strong>Factors</strong></td>
</tr>
<tr>
<td>Labour force to jobs conversion information (unemployment and commuting rates)</td>
<td>Jobs = labour force / labour force to jobs conversion</td>
</tr>
<tr>
<td>Economic activity rate</td>
<td>Labour force = population * economic activity rate</td>
</tr>
<tr>
<td>Number of new jobs</td>
<td>Total number of jobs = jobs in previous year + new jobs</td>
</tr>
</tbody>
</table>

4.7 Each factor is explained in more detail in the sections on assumptions.

4.8 The following diagram is a very basic outline of the processes (calculations) the software follows to produce the population each year (constrained to a number of dwellings).
4.9 Part of the process of producing forecasts is to validate the results. Validation helps build confidence that forecasts will stand scrutiny from those who will use them or challenge them. The validation process included:

- Ensuring the assumptions are based on the latest and most robust statistics available and are well documented and convincing.
- Ensuring the results are plausible by following cohorts through the model and also looking at past demographic trends.
- Ensuring the results are consistent with other evidence; comparing them with the latest subnational population projections and understanding the differences.
- Investigating how sensitive the results are to plausible alternative assumptions.
5 The forecasts produced

5.1 A number of forecasts were produced at the request of the planners:

### Table 2: Forecasts produced

<table>
<thead>
<tr>
<th>Population led forecasts</th>
<th></th>
</tr>
</thead>
</table>
| Natural change forecast                       | • Ages on the 2010 resident population  
|                                               | • Factors in births and deaths  
|                                               | • No migration  
|                                               | • Forecasts the population and the number of dwellings this population would require.  |
| Migration rates forecast                      | • Ages on the 2010 resident population  
|                                               | • Factors in births, deaths and migrants  
|                                               | • Forecasts the population and the number of dwellings this population would require.  |
| Nil net migration forecast                    | • Ages on the 2010 resident population  
|                                               | • Factors in births and deaths  
|                                               | • Allows for in and out migration (total number in and out based on average in over past 4 years (i.e. net migration = 0)  
|                                               | • When compared to the natural change model, it shows how the age structure of migrants impacts on forecast  
|                                               | • Forecasts the population and the number of dwellings this population would require.  |
| Dwelling led forecasts                        | • Calculates a provisional population by:  
| New dwellings per annum:                      | o Ageing on the 2010 resident population  
|                                               | o Factoring in births and deaths  
|                                               | o Calculating provisional migrants  
|                                               | • Calculates number of households (subject to number of new dwellings, household formation rates and household to dwelling conversion rates)  
|                                               | • Calculates numbers of households the provisional population fills  
|                                               | • Calculates number of remaining households to be filled  
|                                               | • Calculates population needed to fill these extra households (using migration rates)  
|                                               | • Calculates forecast population  
|                                               | • Forecasts the population required to fill a given number of dwellings.  |
### Economic led forecasts (for more detail see section 7)

- Zero jobs growth
- Cheshire, Halton and Warrington Econometric Model (CHWEM) baseline projections for jobs growth
- Very high employment growth (averaging 1.2% a year)
- High employment growth (averaging 0.7% a year)
- Moderate employment growth (averaging 0.4% a year)
- Calculates a provisional population by:
  - Ageing on the 2010 resident population
  - Factoring in births and deaths
  - Calculating provisional migrants
- Calculates required labour force (subject to number of new jobs, economic activity rates, unemployment rates and commuting rates)
- Evaluates how the provisional population fills the required labour force (by applying economic activity rates to provisional population)
- Adjusts the provisional population (using migration rates) until the provisional labour force fills the required labour force
- Forecasts the population required to fill a given number of jobs.

### Others (subnational projections for comparison)

<table>
<thead>
<tr>
<th>2011 interim subnational population projections</th>
<th>The model is constrained to ONS’ 2011 interim subnational population projections and to CLG’s 2011 interim subnational household projections, both of which run to 2021. From 2022 onwards the model continues the assumptions of fertility, mortality and migration from the projections up to 2030 but is not constrained to a population. For 2022 to 2030, the household formation rates are kept constant (equal to the 2021 rates projected by CLG). The dwelling constrained models use the assumptions from the projections but the models are also constrained to a set number of new dwellings. This forecasts the population required to fill the given number of dwellings.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011 interim subnational population projections constrained to a set number of new dwellings per annum:</td>
<td></td>
</tr>
<tr>
<td>1,150</td>
<td></td>
</tr>
<tr>
<td>1,350</td>
<td></td>
</tr>
<tr>
<td>1,600</td>
<td></td>
</tr>
<tr>
<td>1,800</td>
<td></td>
</tr>
</tbody>
</table>

### Settlements

<table>
<thead>
<tr>
<th>Natural change forecast</th>
<th>Ages on the 2010 resident population (for Settlements, calculated using 2011 small area MYEs constrained to Cheshire East (CE) 2010 MYE (ONS))</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Factors in births and deaths (calculated using CE rates)</td>
</tr>
<tr>
<td></td>
<td>No migration</td>
</tr>
<tr>
<td></td>
<td>Forecasts the population and the number of dwellings this population would require.</td>
</tr>
</tbody>
</table>
6 The population assumptions

6.1 The forecasting process involves using demographic expertise to form assumptions on the many factors affecting the future population. Forecasting is an iterative process, assumptions are developed and refined several times before arriving at final forecasts.

6.2 When new data becomes available then the quality of a previous forecast decreases therefore: it is important to keep under review and to take account of emerging information. Key datasets are due to be released as follows:

- The 2012 MYE (mid-year estimate of population) was released on 26th June 2013 and has not been taken into consideration in these forecasts as it was published too late in the forecasting update work to be fed into the analysis
- Census 2011 tables providing some detail on age of household reference person and age of people living in communal establishments were published on 28th June 2013 but were not taken into consideration in these forecasts (for the same reason as above)
- 2012 based national population projections are due Oct – Nov 2013 and subnational population and household projections are expected to be published at some point in 2014. These will take into account fully the results of the 2011 Census in that all assumptions will be reviewed in light of the Census and revised MYEs
- Further 2011 Census tables on commuting and migration are due, possibly in 2014.

6.3 In addition, there are plans to update the CHWEM model again in late 2013. However, this proposed update is provisional and is still subject to funding and other uncertainties.

6.4 To produce the 2010 based forecasts, assumptions were made about what would happen over the next twenty years (2010 to 2030) to a variety of factors. The assumptions are generally based on past trends, local policy and assumptions of future trends from the national projections published by the Office for National Statistics.

6.5 Most of the figures in this paper are rounded. However, all the calculations run by the forecasting software and the assumptions the model used were built using unrounded data where possible.

Starting (base) population

6.6 The starting (base) population of the forecasts is the mid-year estimate of population (MYE) for June 30th 2010 produced by ONS. The model uses the 2010 estimate that has been revised in light of the 2011 Census. The original 2010 based population forecasts used the indicative 2010 MYEs, which at the time were the most up to date population estimates available. However, in light of the 2011 Census results, we now know that the 2010 indicative MYEs (365,700) were too low for Cheshire East compared to the revised MYE (369,100). The population pyramid chart below shows how the differences between the indicative and revised
estimates are larger for some age groups (for example 15-39 year olds) than others. These differences for individual age groups are extremely important as they affect every assumption made in the model and also obviously the forecasts themselves.

**Figure B: Population pyramid of the 2010 MYE**

![Population Pyramid](image)

**Fertility**

6.7 The number of births in an area depends on two things, the number of women of childbearing age and the likelihood that these women will give birth within the next year (fertility rates). There was a general trend throughout the 1990s for the number of births to fall, whilst throughout the 2000s the number of births generally increased in Cheshire East.

6.8 There were around 4,100 live births in Cheshire East in 1991 compared with around 3,500 in 2001 and around 4,000 in 2010.

6.9 Fertility rates are the probability that a woman of a stated age will give birth within the next year. The fertility rates used at the start of the forecasts (2010) were...
calculated at a unitary level for 2010 using the number of births to women by single year of age which we obtained from ONS. Using a three year average (i.e. 2009-11) was considered, as this technique theoretically would smooth out any anomalies in the data. However, fertility rates were quite different over the three year period and to take an average would have assumed a slightly lower fertility rate than the 2010 rates themselves.

**Fertility rate** = **Number of live births in 2010 (ONS) / Number of females (revised 2010 MYE, ONS) * 1,000.**

**Figure C: Age specific fertility rates**

![Age specific fertility rates (2010)](image)

**Table 3: Age specific fertility rates**

<table>
<thead>
<tr>
<th>Age of mother</th>
<th>15-19</th>
<th>20-24</th>
<th>25-29</th>
<th>30-34</th>
<th>35-39</th>
<th>40-44</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cheshire East</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>20</td>
<td>74</td>
<td>99</td>
<td>121</td>
<td>61</td>
<td>9</td>
</tr>
</tbody>
</table>

6.10 The age specific fertility rates set the baseline fertility in the forecast model but an assumption also had to be made on future levels of fertility. The 2010-based national population projections\(^{10}\) are the latest national population projections currently available. They assume that the long-term total fertility rate (TFR)\(^{11}\) for England and Wales will be around 1.85. These assumptions are based on family building patterns to date and other relevant evidence. Although these are the latest national projections available, they do not take into account the results of the 2011 Census and ONS state:

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\(^{10}\) Office for National Statistics. For more detail on the 2010-based national population projections please see Section 8.

\(^{11}\) The TFR is the average number of live children a group of women would have if they experienced the age-specific fertility rates for the calendar year in question throughout their childbearing lifespan.
“The fertility rates used to set the assumptions are based on birth registrations and population estimates up to 2010. However population estimates for women of childbearing age are likely to have been too low over the decade to mid-2010, as the 2011 Census showed more women aged 16 to 44 than estimates rolled forward from the 2001 Census. This means the fertility rates used to set the assumptions are likely to have been too high, leading to an over-projection of births at the national level.” (ONS Statistical Bulletin: Interim 2011-based subnational population projections for England, 28 September 2012)\textsuperscript{12}

6.11 These national trends have been used because they are the most robust assumptions to make: they use the latest national trend analysis data available and even though ONS state they may be too high, they reflect current high levels of fertility and show a gradual slowing down in long term total fertility. National trends of changes in fertility (for each age of mother) from the national projections were applied to the local authority level age specific fertility rates throughout the model (by applying a differential to the 2010 rates).

6.12 The following graph shows the TFRs for Cheshire East and England and Wales for 1991 to 2010 and illustrates the TFRs that are assumed over the forecast period.

6.13 A ratio of male to female births was entered into the model. Using this ratio, total births each year were apportioned to males and females. The number of boys per 1,000 girls was entered as 1,062 for Cheshire East. This represented the ratio of male to female births seen in the local authority from 1991 to 2010.

\textsuperscript{12} Taken from the 2011 interim subnational population projections but refers to assumptions made in the 2010 national population projections \url{http://www.ons.gov.uk/ons/rel/snpp/sub-national-population-projections/Interim-2011-based/stb-2011-based-snpp.html}
Mortality

6.14 Mortality rates are the likelihood that a person of a given age and sex will die within a given year. Mortality rates have been falling in recent years due to improved social conditions and medical care. It is assumed mortality rates will continue to decrease during the forecast period.

6.15 The mortality rates used in the forecasts were calculated at unitary level. Rates were calculated by single year of age and sex for a three year period of 2009-2011. A three year average was used to smooth out any anomalies in the single year mortality data. This was an appropriate technique to use for the mortality data as mortality rates overall were very similar throughout this period. Mortality rates have not seen the same rate of change as fertility rates (where this method was discounted).

**Mortality rate = Number of deaths in 2009-2011 (ONS) / Population (2009-2011 revised MYEs, ONS) * 1,000.**
Figure E: Age specific mortality rates

![Age specific mortality rates (2009-11)](image)

### Table 4: Age specific mortality rates

<table>
<thead>
<tr>
<th>Age</th>
<th>Cheshire East</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Males (CE)</td>
<td>Females (CE)</td>
</tr>
<tr>
<td>0-4</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>5-14</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>15-24</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>25-34</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>35-44</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>45-54</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>55-64</td>
<td>7</td>
<td>5</td>
</tr>
<tr>
<td>65-74</td>
<td>18</td>
<td>12</td>
</tr>
<tr>
<td>75-84</td>
<td>54</td>
<td>40</td>
</tr>
<tr>
<td>85+</td>
<td>153</td>
<td>138</td>
</tr>
</tbody>
</table>

6.16 The 2010-based national population projections\(^{13}\) are the latest national population projections currently available. The 2010-based national population projections assume that mortality rates will continue to decrease. These assumptions are based on mortality and life expectancy patterns to date and other relevant evidence. The national trends of changes in mortality (for each age group and gender) were applied to the local authority mortality rates throughout the model (by applying a differential to the local authority rates).

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\(^{13}\) Office for National Statistics. For more detail on the 2010-based national population projections please see Section 8.
Migration

6.17 Migration rates indicate the likelihood that a person of a certain age and sex will move in to or out of an area within the next year.

6.18 In the previous 2010 based forecasts only internal migration (which is migration within the UK) was accounted for, and it was decided for a variety of reasons that robust assumptions on international migration would be impossible to build. This included the fact that local authority level international migration estimates by age are not available and that the net estimated number of international migrants in Cheshire East was relatively small and variant.

6.19 In light of the 2011 Census (and the resulting revised 2002 to 2010 MYEs published by ONS) we now know the previous estimates of internal migration published by ONS (and used in the original 2010 based forecasts) are not accurate. ONS have not published revised estimates of migration alongside the revised MYEs.

6.20 A separate POPGROUP model was set up with a base year of 2001 and constrained to match the revised MYEs by single year of age and gender for 2002 to 2010. The number of births by gender and the number of deaths by age and gender was also entered for each year of the model. One of the output files from this model provided detail on the number of net migrants by single year of age and gender each year. These net migration numbers give a robust update to the previous inaccurate estimates provided by ONS (pre 2011 Census results); they also automatically give a net migration figure which includes internal and international migration. However, the forecasting model requires an input file for in migration and a separate input file for out migration.

6.21 In lieu of having no robust estimates of in and out migrants, the previous estimates (based on the original MYE) of in and out migrants by single year of age and gender at local authority level provided by ONS were used as a base for in and out migrants. The in and out migration estimates were then equally adjusted to match the net migration produced by the 2001 based model constrained to the 2002 to 2010 MYEs described above. This modelling was by single year of age and gender and for an average of the years 2006/07 to 2009/10. A four year period of migration was used to smooth out any anomalies in the single year data. Four years were chosen as ONS issue migration estimates for local authorities by single year of age and gender as pooled three year estimates. The 2006-09 pooled data was used and as it was important the most recent years to the 2010 base of the model were used. The 2009/10 estimates were modelled from 2007-10 pooled estimates.

6.22 From the data available, it was concluded that the age and sex structure of migrants has remained similar over recent years and so the same rates were used throughout the forecast. Thus, the model assumes that the proportion of total migrants from each age group and gender would remain the same throughout the forecast period.

\[ \text{Migration rate} = \frac{\text{Sum of modelled migrants (2006/07 to 2009/10) (ONS and 2001 based forecasts constrained to 2002 to 2010 MYEs)}}{\text{Sum of revised MYEs (2007 to 2010) (ONS)}} \times 1,000 \]
Figure F: Migration rates

6.23 The key age groups affected by migration (unsurprisingly) are the late teens and the early to mid twenties. The 2011 Census and resulting revised MYEs have shown that in the past these tend to be the age groups (again unsurprisingly) that ONS have produced inaccurate estimates of migration for. This is reflected in the fact that the revised 2010 MYEs are most different to the original 2010 MYE for the 30-39 age group (i.e. those who have at some point been in the early to mid twenties age groups in the past ten years, since the 2001 Census). The method detailed above constrains the improved migration rates to meet (when taken into consideration alongside births and deaths) the revised MYEs and so provides a more robust assumption on migration than the original migration assumptions used in the original 2010 forecasts.

6.24 For the dwelling led population forecasts the forecasting model assumes the number of migrants each year is very heavily influenced by the number of new dwellings built each year. The migration rates are used to assign the proportion of total migrants needed to make households to fill dwellings, to people from each age group and gender.

Population in communal establishments

6.25 The percentage of people of a given age and gender who were not living in households (living in communal establishments) was taken from the ‘institutional population’ component of the 2011 interim sub national household projections. At the time the updated 2010 forecasts were produced, there was no information from the 2011 Census on age structure of communal establishment residents. However, the total number of communal establishment residents in Cheshire East, 5,062\textsuperscript{14},

had been published in one of the 2011 Census key statistics tables. This figure was close to the figure used in the 2011 interim subnational household projections.

6.26 Using the 2011 interim subnational household projections is more robust than the alternative option of using 2001 Census figures (which had been used in the original 2010 based forecasts) for reasons detailed below. The model uses the ‘institutional population’ component from the 2011 interim subnational household projections in its entirety. The assumption is made that the institutional population stays constant at 2001 levels by age, sex and marital status for the under 75s and that the share of the institutional population stays at 2001 levels by age, sex and marital status for the over 75s. The estimates of institutional population are controlled to the 2011 Census in 2011 and the levels for the under 75s are then held constant for 2012 to 2030 whilst the 2011 shares are held constant for the over 75s. The rationale here is that the ageing population has led and will lead to a greater level of population aged over 75 in residential care homes that would not be picked up if levels were held fixed. For the forecasts all 2010 numbers and shares are the same as those in 2011.

6.27 Just over 1% of the population in Cheshire East were living in communal establishments at the time of the 2011 Census. People aged 85 or above were most likely to live in a communal establishment. As explained above, it was assumed that there will be no change in the number (for those aged under 75) or percentage (for those aged 75 or above) of people living in communal establishments throughout the forecast period.
Table 5: Population living in communal establishments 
(from 2011 interim sub national household projections)

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-4</td>
<td>11</td>
<td>5</td>
</tr>
<tr>
<td>5-9</td>
<td>9</td>
<td>0</td>
</tr>
<tr>
<td>10-14</td>
<td>33</td>
<td>9</td>
</tr>
<tr>
<td>15-19</td>
<td>214</td>
<td>246</td>
</tr>
<tr>
<td>20-24</td>
<td>188</td>
<td>218</td>
</tr>
<tr>
<td>25-29</td>
<td>84</td>
<td>107</td>
</tr>
<tr>
<td>30-34</td>
<td>68</td>
<td>71</td>
</tr>
<tr>
<td>35-39</td>
<td>63</td>
<td>78</td>
</tr>
<tr>
<td>40-44</td>
<td>44</td>
<td>35</td>
</tr>
<tr>
<td>45-49</td>
<td>40</td>
<td>35</td>
</tr>
<tr>
<td>50-54</td>
<td>49</td>
<td>30</td>
</tr>
<tr>
<td>55-59</td>
<td>47</td>
<td>60</td>
</tr>
<tr>
<td>60-64</td>
<td>39</td>
<td>40</td>
</tr>
<tr>
<td>65-69</td>
<td>57</td>
<td>69</td>
</tr>
<tr>
<td>70-74</td>
<td>78</td>
<td>104</td>
</tr>
<tr>
<td>75-79</td>
<td>2.0%</td>
<td>3.1%</td>
</tr>
<tr>
<td>80-84</td>
<td>5.0%</td>
<td>7.8%</td>
</tr>
<tr>
<td>85+</td>
<td>11.5%</td>
<td>25.9%</td>
</tr>
</tbody>
</table>

Cheshire East
Household formation rates

6.28 Household formation rates are the likelihood that a person of a given age will be the head of a household. These rates are also known as headship rates and alternatively household representative rates.

6.29 The model uses household formation rates (at a local authority level) from the Department for Communities and Local Governments' interim 2011-based subnational household projections. These were projected from historical data derived from past censuses and Labour Force Surveys. The interim 2011-based subnational household projections run from 2011 to 2021 so the 2011 rates were also used for the 2010 base year of the forecasts and for 2022 to 2030 the 2021 rates were kept constant.

6.30 The chart and table below illustrate the household formation rates used in the forecasts. So for example, in the forecasts, around 44% of people aged 25-34 living in households were the head of their household in 2010 and 2011 and 43% were the head of their household in 2021 to 2030.

Figure G: Household formation rates

Table 6: Household formation rates

<table>
<thead>
<tr>
<th>Age</th>
<th>2010 and 2011</th>
<th>2021 to 2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-24</td>
<td>9%</td>
<td>9%</td>
</tr>
<tr>
<td>25-34</td>
<td>44%</td>
<td>43%</td>
</tr>
<tr>
<td>35-44</td>
<td>55%</td>
<td>58%</td>
</tr>
<tr>
<td>45-54</td>
<td>58%</td>
<td>60%</td>
</tr>
<tr>
<td>55-59</td>
<td>59%</td>
<td>59%</td>
</tr>
<tr>
<td>60-64</td>
<td>61%</td>
<td>59%</td>
</tr>
<tr>
<td>65-74</td>
<td>65%</td>
<td>61%</td>
</tr>
<tr>
<td>75-84</td>
<td>76%</td>
<td>71%</td>
</tr>
<tr>
<td>85+</td>
<td>87%</td>
<td>84%</td>
</tr>
</tbody>
</table>

6.31 The 2011 interim household projections have generally lower household representative rates (household formation rates) compared with the previous (2008 based) household projections.
6.32 The 2011 Census showed that average household size had not decreased at as fast a rate as projected in previous sets of household projections. At this point in time the 2011 projections provide the only source of household formation which takes into account in some form the results of the 2011 Census and are the most robust source of data to use when producing dwelling led population forecasts. However there are limitations to the interim household projections. One of the main limitations is that ONS had not released 2011 Census tables on household formation by age when the projections were produced and so CLG was not able to include these statistics in their calculations. Other limitations are discussed in section 8.

6.33 A 2011 Census table detailing household representation by age was released at the end of June 2013. This was too late to be used in this set of forecasts but these tables should be considered when the forecasts are next reviewed (as should any other new datasets released).

Household to dwellings conversion information

6.34 The ratio of households to dwellings in Cheshire East was taken from the 2011 Census.

The ratio was calculated using Key Statistics Tables 105 and 401:

- Households (159,441)\(^{16}\) / Dwellings (166,236)\(^{10}\) \(\times\) 100 = 95.9

6.35 It was assumed that there will be no change in this ratio throughout the forecast.

6.36 The conversion factor of households to dwellings inherently takes full account of the fact that at the time of the 2011 Census, 4.1% of household spaces\(^{17}\) were vacant and a small number of dwellings were shared by more than one household.

7 The economic assumptions

Rounding of data

7.1 For convenience, most of the figures quoted in this section of the methodology paper are rounded. However, all the economic modelling calculations and assumptions use unrounded data where possible.

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\(^{17}\) A household space is the accommodation used or available for use by an individual household. A household is defined as one person living alone, or a group of people (not necessarily related) living at the same address who share cooking facilities and share a living room or sitting room or dining area. More than one household may share a dwelling. There were 34 shared dwellings at the time of the 2011 Census.
Definition of employment

7.2 Any housing requirement study has to take account of employment levels and how these might change in future. “Employment” therefore needs to be clearly defined, as it can be measured in various ways.

7.3 Firstly, there is the issue of how to allocate jobs or employed people to a particular geographical area. The allocation can be based on either:
   a) where employed people live (residence-based employment); or
   b) where employed people work or where jobs are located (workplace-based employment). This in turn can be measured as either:
      i. the number of jobs located in that geographical area; or
      ii. the number of employed people working in that area.

7.4 The number of jobs can of course differ from the number of employed people working in the area, because an employed person can have two or more jobs.\(^{18}\)

7.5 Secondly, there are different forms of employment status. For example, people can:
   a) work full-time or part-time;
   b) be employees or self-employed;
   c) be employed in a permanent post, on a fixed term contract or employed as casual labour.

7.6 Thirdly, employment can be defined as filled jobs only, or it can be defined so that it includes vacant posts.

7.7 The forecasts require the input of workplace-based “jobs” data into POPGROUP software. In other words, they require workplace-based employment data and ideally a measure of jobs, rather than employed people. If the impact on housing is to be accurately assessed, it needs to be based on as broad a definition of “employment” as possible. Therefore it requires a definition that includes part-timers as well as full-timers, self-employed people as well as employees and non-permanent as well as permanent staff. However, vacant posts, at least while they remain vacant, do not affect people’s housing needs or their commuting patterns. Therefore housing requirements are perhaps best based on a measurement of employment that includes all filled jobs.

7.8 Workplace-based employment forecasts are available from the Cheshire, Halton and Warrington Econometric Model (CHWEM), an economic forecasting model that Cheshire East Council maintains and operates on behalf of Cheshire, Halton and Warrington partner organisations. (For more details on the CHWEM and its capabilities, see Appendix 3.) These employment forecasts include self-employment and they are a measure of jobs, rather than employed people. They include all filled jobs, but exclude vacancies. Furthermore, these forecasts were produced by the nationally-renowned forecasters Cambridge Econometrics and as such they are robust, credible estimates of future employment.

\(^{18}\) Conversely, two people can share the same job.
7.9 The employment scenarios therefore draw heavily on the CHWEM employment (jobs) forecasts, but also take account of past employment trends and strategic documents. These employment scenarios are described in more detail on the following pages.

Scenarios and input data

Employment scenarios

7.10 The CHWEM’s baseline projection\(^{19}\) points to very modest employment growth (averaging 0.2% a year) during 2010-25\(^{20}\). Given the UK’s generally weak economic growth since 2010 and the prospect of economic conditions remaining difficult over the next few years, this forecast still seems plausible. However, an analysis of past trends suggests that a significantly faster long-term growth rate is very possible. Conversely, it is also conceivable that employment growth will actually fall short of that predicted by the CHWEM. It is therefore prudent to model a number of employment growth rates, so that the impacts of all these scenarios can be assessed.

7.11 Table 7 provides full details of the employment growth scenarios that were modelled in POPGROUP, and their rationale.

7.12 In summary, the chosen scenarios are as follows:

- **Zero employment growth.** Employment remains at its 2010 level throughout the 20-year forecast period
- **CHWEM baseline projection (which is for very modest employment growth).** Under this baseline projection, employment growth averages 0.2% a year.\(^{21}\)
- **Very high employment growth.** Growth averages 1.2% a year. This is based on the Great Britain average for 1995-2008 (the longest recent period for which a continuous data series is available at national and local authority level). Cheshire East did achieve a slightly higher rate (1.3%) for the same thirteen-year period, but local level figures are subject to larger error margins. Furthermore, this period was significantly shorter than the current 20-year forecasting period and (unlike the post-2008 period) 1995-2008 was a period of relatively robust economic growth. Hence even an average growth rate of 1.2% over two decades is a

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\(^{19}\) As noted in Appendix 3, the CHWEM’s baseline predictions take account of local population forecasts and locally-developed expectations about future house building, but they do not otherwise allow for the impact that incomplete or future development projects, policies or initiatives may have. As such, they are largely projections of past trends, rather than “forecasts” in the strict sense of the word.

\(^{20}\) The CHWEM does not (yet) produce projections beyond 2025.

\(^{21}\) The rate is 0.17% if less rounded.
significant challenge and probably represents the upper limit of what can be achieved.

- **High employment growth.** Growth averages 0.7% a year, i.e. approximately midway between the rates for the CHWEM baseline scenario (0.2%) and the very high growth scenario (1.2%).

- **Moderate employment growth.** Growth averages 0.4% a year, i.e. approximately midway between the rates for the CHWEM baseline scenario (0.2%) and the high growth scenario (0.7%).

7.13 Hence, apart from the zero employment growth scenario, each of these modelled scenarios is based on a particular average growth rate (%) per annum (p.a.). As such, it can either be assumed that the growth rate varies from year to year, or that it remains constant throughout 2010-30. The first of these assumptions is a better reflection of real economic change. Firstly, national and local economies experience significant variations in growth over the long term. Secondly, the current economic climate is still relatively weak, so there is a strong likelihood that employment growth will be weak in the short to medium term and more robust in the longer term.

7.14 Given this, the previous population forecasting work (undertaken in 2012) allowed for year-on-year variations in employment growth. These year-on-year variations were constrained so that year-on-year growth followed the same 2010-25 trajectory as the CHWEM baseline scenario, but the figures were scaled up so that the average annual growth rate matched that implied by the scenario in question.

7.15 However, the CHWEM has been updated since the 2012 population forecasting work was undertaken. If the previous methodology for calculating year-on-year employment change is applied to the updated CHWEM, it produces implausible results for some scenarios. For example, the 2012 CHWEM update’s baseline projection suggests that Cheshire East’s 2015 employment total will be about 2% below its 2010 level, but that the Borough’s 2030 employment total will be about 3% above its 2010 level. These figures are in themselves plausible, but if the very high employment growth scenario (average annual growth of 1.2%) is constrained to follow the 2012 CHWEM update’s baseline projection’s trajectory, the implication is that the cumulative percentage increase in employment during 2010-30 (26.9%) will be about the same as the cumulative percentage fall in employment during 2010-15. Given what we already know about post-2010 economic performance, it is simply not plausible for the Borough’s employment total to fall by more than 26.9% - a huge contraction - during 2010-15.

7.16 For the updated population forecasting work, therefore, the methodology was revised for the moderate, high and very high employment growth scenarios (i.e. the 0.4%, 0.7% and 1.2% average annual employment growth rate scenarios). Firstly, it was assumed that, during 2010-13, the cumulative percentage change in

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22 If the (unrounded) CHWEM baseline projection figure and the 1.2% rate are averaged, the resulting figure comes to 0.68%, or 0.7% if rounded to one decimal place.

23 If the (unrounded) CHWEM baseline projection figure and the high employment growth scenario figure (0.7%) are averaged, the resulting figure comes to 0.42%, or 0.4% if rounded to one decimal place.
employment growth would match that projected by the CHWEM’s baseline figures (i.e. there would be year-on-year variations in the growth rate during these 3 years). Secondly, it was assumed that the year-on-year growth rate would remain constant during 2013-30, and that this constant rate of growth would be sufficient to ensure that the 2030 employment total equalled that implied by the scenario in question. The rationale for this is that (a) the key economic evidence available so far for 2010-13 is broadly consistent with the CHWEM’s baseline projection for employment change during those years\(^{24}\) and (b) the rates of employment growth implied by the high and very high employment growth scenarios will be achieved only if significant employment growth resumes in the near future (i.e. in 2014 or 2015). Similarly, the longer it takes for significant employment growth to return, the less likelihood there also is of the moderate employment growth scenario being achieved.\(^{25}\)

7.17 As mentioned in an earlier footnote, the CHWEM does not produce forecasts for 2026 onwards and there is no alternative source for local employment forecasts (for either the post-2025 period or earlier). Consequently it was assumed for the CHWEM baseline scenario (0.2% average employment growth p.a.) that the annual percentage employment growth for 2025-30 would be constant and equal to the 2010-25 average.

7.18 For each of the five scenarios, the base year (2010) employment levels were taken from POPGROUP (which generates employment estimates for the base year only) and then projected for future years (2011-30) by applying the scenario’s cumulative rate of growth (or decline) for each year. For example, POPGROUP estimates Cheshire East’s employment to be 177,600 in 2010. Under the CHWEM baseline scenario, employment in 2015 will be 98.2% of its 2010 level, or 98.2 if indexed (with 2010=100). Hence the 2015 employment level will be 177,600 * 98.2/100, or 174,400. To take another example, the very high employment growth scenario implies that employment in 2015 will be 101.6% of its 2010 level, so the employment level under that scenario is 177,600 * 101.6/100, or 180,500.

7.19 Figure H shows the resulting growth paths for the CHWEM baseline scenario and the moderate, high and very high employment growth scenarios. (The other

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\(^{24}\) The CHWEM baseline projections suggest the Borough’s employment level will decline slightly – by about 1% - during 2010-13 and this is broadly consistent with some of the key evidence available so far. For example, Annual Population Survey (APS) data suggest that the workplace-based employment total (the number of employees and self-employed people working in Cheshire East) fell by 1.0% between 2010 and 2012. Business Register and Employment Survey (BRES) data suggest growth (of 1.4%) during 2010-11 (as does the APS), but, at the time of writing, BRES data were not yet available for 2012. (Sources: BRES 2010 & 2011 and Annual Population Survey Workplace Analysis Jan-Dec 2010 to Jan-Dec 2012, ONS, NOMIS. Crown Copyright. Note: the APS data include only people aged 16-64.)

\(^{25}\) If significant employment growth resumes later than this, then the average annual growth rate for the latter part of the forecasting period will need to be even higher, in order for the 2030 employment totals for the moderate, high and very high employment growth scenarios to be achieved. (Even if, as the modelling for these three scenarios assumes, growth resumes as early as 2014, it would need to average 1.5% per annum during 2013-30 in order to produce the 1.2% per annum average rate that the very high employment growth scenario “requires” for 2010-30.)
scenario, the zero employment growth scenario, assumes zero net change in employment and would therefore just be a horizontal line.)

7.20 All five scenarios were modelled within POPGROUP, to see what population forecasts they generated. The zero employment growth and CHWEM baseline scenarios produced credible population forecasts; the implications that these scenarios have for net inward migration were also credible. However, the high and very high employment growth scenarios resulted in rates of population growth and levels of net inward migration that were too high to be plausible. The population and inward migration figures from the moderate employment growth scenario were also on the high side, but they were considered to be achievable. Consequently, it was decided that the housing requirement decision should focus on the implications of the more plausible employment scenarios, i.e. the zero growth, CHWEM baseline and moderate growth scenarios. These three scenarios may involve moderate employment growth at best, but they are likely to generate significant growth in economic output (GVA, or Gross Value Added). For example, for the CHWEM baseline scenario of 0.2% average employment growth p.a., the CHWEM projection is for 2010-25 GVA growth to average 2.5% p.a. in Cheshire East. Even under the zero employment growth scenario, GVA growth p.a. is likely to be between 1% and 2%, because of increases in productivity (the output per hour worked)\(^{26}\). (For the moderate employment growth scenario, GVA growth p.a. would, all other things being equal, exceed that for the CHWEM baseline scenario.)

7.21 Apart from the zero employment growth scenario, all these scenarios assume that 2010-13 employment change will match that projected by the CHWEM baseline scenario. This baseline scenario projects a net decline in employment during 2010-13 – which in turn leads POPGROUP to forecast a (slight) net decline in population during this period. For example, the four positive (as opposed to zero) employment growth scenarios result in a population forecast for 2012 of 366,900 (down from the 2010 base year figure of 369,100), whereas ONS’ 2012 mid-year population estimate for Cheshire East is 372,100. Given this divergence from the mid-year estimate, a net population decline during 2010-13 is perhaps unlikely. Therefore POPGROUP was run for an alternative scenario, under which (a) total 2010-30 employment growth matches that for the CHWEM baseline scenario, but (b) employment growth p.a. is constant (0.2% for each year of the 2010-30 period). However, this had a negligible impact on long term (2010-30) changes in population, net migration and dwellings: total population growth stayed at 7%, net migration fell by a fraction (from 1,420 to 1,400 p.a.), and the required number of net new dwellings increased marginally (from 1,035 to 1,050 p.a.)\(^{27}\) Hence it was

\(^{26}\) The CHWEM does not recalculate GVA growth for alternative (non-baseline) employment scenarios, so it is not possible to quote specific GVA growth rates for the zero employment growth scenario. However, analysis of the relationship between the CHWEM baseline scenario’s employment forecasts and its GVA forecasts (for other time periods and for the UK as well as the local authority) suggests that GVA is expected to expand by 1% to 2% a year during some spells of zero or negative net change in employment. For example, the CHWEM baseline figures suggest that, between 2010 and 2015, the UK will see 0.0% employment growth p.a., but 1.7% GVA growth p.a.. Furthermore, at least some national economic forecasting organisations take the view that GVA has to grow by around 2% if employment is to grow at all.

\(^{27}\) The migration and dwellings figures quoted here are rounded to the nearest 5 (but the underlying calculations involved unrounded data).
decided that the 2010-13 employment constraint did not have a significant impact on the POPGROUP results and will not therefore have a significant impact on the Council’s house-building decisions.

7.22 Another scenario was also considered, but not modelled in POPGROUP: one in which employment growth rates match those set out in Cheshire & Warrington’s “Unleashing the Potential” Sub-Regional Strategy. 28 “Unleashing the Potential” was intended, amongst other things, to be a measure of Cheshire & Warrington’s aspirations for demographic, housing and economic growth. In terms of employment, it aspires to cumulative employment growth of 5% in Cheshire East over the next two decades. 29 This cumulative growth rate implies an average annual employment growth rate of 0.2% for Cheshire East. 30 Therefore the “Unleashing the Potential” growth could be modelled as a separate scenario. However, “Unleashing the Potential” was produced in 2010 and therefore does not take account of evidence that has become available since then. In any case, its implied 0.2% employment growth rate matches the CHWEM baseline scenario (at least to the nearest 0.1 percentage point), so the implications for population and net inward migration would be similar to those for this scenario.

Figure H: Employment index values (2010 = 100) for the scenarios involving positive employment growth

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29 The document mentions 2030 as the target date for these aspirations; it does not specify a date for the base year, but its text suggests the intended base year is either 2010, or slightly earlier.

30 In less rounded form, this rate is 0.24%.
<table>
<thead>
<tr>
<th>Scenario title</th>
<th>Description</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zero employment growth</td>
<td>Employment level in final year (2030) is the same as it was in 2010. (177,600 employees in Cheshire East.)</td>
<td>Economy still relatively weak in 2010 (and 2011-12), so no long-term change from 2010 is a relatively pessimistic scenario. Analysis of Cheshire East’s past (1984-2010) employment trends suggest that the worst average for a period of 7+ years is 0.5% (the average for 2001-8). Therefore zero long-term growth would be worse than the weakest periods of past performance.</td>
</tr>
<tr>
<td>CHWEM (Cheshire, Halton and Warrington Econometric Model) baseline projection</td>
<td>During the forecast period (2010-30), employment grows at the rate implied by the CHWEM baseline projection. (CHWEM baseline figures suggest average annual growth of 0.2% for 2010-25).</td>
<td></td>
</tr>
<tr>
<td>Very high employment growth.</td>
<td>During the forecast period (2010-30), employment grows at an average of 1.2% per annum (the Great Britain average for 1995-2008).</td>
<td>In Cheshire East, the rate was 1.2% p.a. during 1991-8 (which includes part of a recession) and 1.3% during 1995-2008 (the longest period for which a continuous data series is available, but not one that includes any major economic downturns). For Great Britain, the equivalent rates are 1.1% (1991-8) and 1.2% (1995-2008). The Great Britain figures are much more robust (i.e. they have smaller error margins) than the local authority level data and are therefore a more reliable indicator of realistic long-term growth rates. Since 1984, employment growth p.a. has never exceeded 1.5% in Great Britain over any 10 to 13 year period (there is no recent, continuous employment series of more than 13 years that includes local authority level as well as national level data). As the forecast period is longer still (20 years) and as the current global and national economic climate is challenging, 1.2% seems to be a more reasonable upper limit (than 1.5% is) for 2010-30 growth p.a.</td>
</tr>
<tr>
<td>High employment growth.</td>
<td>During the study period (2010-30), employment grows at an average of 0.7% p.a.</td>
<td>0.7% p.a. chosen because it is approximately midway between CHWEM baseline projection of 0.2% p.a. and the 1.2% p.a. very high employment growth scenario.</td>
</tr>
<tr>
<td>Moderate employment growth.</td>
<td>During the study period (2010-30), employment grows at an average of 0.4% p.a.</td>
<td>0.4% p.a. chosen because it is approximately midway between CHWEM baseline projection of 0.2% p.a. and the 0.7% p.a. high employment growth scenario.</td>
</tr>
</tbody>
</table>

Unemployment rates

7.23 There are two widely-used measures of unemployment. One is the claimant count, which includes only those people claiming Jobseeker’s Allowance (JSA). The other is a broader measure, which covers all those who are available for and actively seeking work. Consequently, there are also two widely-used unemployment rates, one based on the claimant count and one on broad unemployment.

7.24 It is the latter rate which is used as an input into POPGROUP. This broad unemployment rate measures broad unemployment as a proportion of the labour force (employment plus broad unemployment).

7.25 Given the frequency and fluctuations of past economic cycles, it is likely that any future 20-year period will see major changes in economic performance, with weak growth or recessions, as well as spells of robust growth. This is particularly likely for 2010-30, given that the current UK economic climate is difficult - with GDP still below its pre-recession peak (as of 2013 Q1). Therefore it is unrealistic to assume that the unemployment rate will stay constant over the whole of the next 20 years.

7.26 That begs the question of what trajectory the unemployment rate will actually follow. With the national and global economies currently in a relatively weak position, it is likely that local unemployment rates will remain relatively static or even rise in the short to medium term: unemployment tends to lag behind GDP growth anyway. In the longer term, once there is evidence of a return to sustained economic growth, the unemployment rate is likely to fall.

7.27 The CHWEM, which was last updated in 2012, does not produce forecasts for broad unemployment per se, but it does generate figures for claimant unemployment. For Cheshire East, its baseline projection shows the claimant unemployment count generally rising between 2010 and 2016, then falling over the following 5 years. In the absence of alternative forecasts for unemployment, this trajectory appears plausible. The CHWEM projection shows claimant unemployment starting to rise again (slightly) in the early 2020s – and this shift is more questionable, given:

a) the absence of an obvious reason for economic conditions to deteriorate at this particular time point;

b) the fact that the current CHWEM’s default population inputs (old 2009-based forecasts) show little change in the working-age population during the early 2020s; and

c) these projections are further into the future and therefore less reliable than the figures for earlier years.


32 The CHWEM does exclude an adjustment for non-claimant unemployment, but it was felt that this adjustment significantly understates the actual number of non-claimant jobseekers.
7.28 Given all these factors, the unemployment input parameters for the new 2010-based population forecasts were therefore calculated as follows:

- The CHWEM baseline claimant count forecasts were converted to an index (with the 2012 counts set equal to 100). For example, the CHWEM forecasts put Cheshire East’s claimant count at 5,958 for 2012 and 6,470 for 2013. Therefore the index value for 2013 = (6,470/5,958) * 100 = 108.6.
- Broad unemployment rates for the new population forecasts’ base year (2010) and the following two years (2011 and 2012) were obtained from ONS’ model-based unemployment estimates for these years.33
- Broad unemployment rates were estimated for each subsequent year (2013 onwards) up to 2020, by taking the 2012 broad unemployment rate, multiplying it by the claimant count index value for the year in question and dividing by 100. (In other words, the claimant count trend was taken as a proxy for the broad unemployment rate trend.) For example, the model-based January - December 2012 broad unemployment rate for Cheshire East was 5.8% and so the authority’s estimated broad unemployment rate for 2013 was calculated as 5.8 * 108.6/100 = 6.3%.
- It was assumed that the broad unemployment rates for Cheshire East would remain constant (equal to their 2020 rate) from 2020 onwards. As noted above, the current CHWEM projections show (claimant) unemployment rising again in the early 2020s (the CHWEM does not produce projections beyond 2025). However, the current CHWEM was updated in mid 2012 and it relies on old population forecasts (which do not reflect the demographic evidence from the 2011 Census) and on economic evidence that is now slightly dated. As also noted above, the further into the future the projections go, the less reliable they become and the more questionable any deviations from past trends become. Therefore it was felt that that the most prudent assumption is that the broad unemployment rate remains constant during 2020-30.

7.29 The resulting broad unemployment rates (which are proposed for use in the new 2010 based local population forecasting work) are shown in Table 8.

**Table 8: Projected broad unemployment rates (for input into the new 2010 based population forecasts)**

<table>
<thead>
<tr>
<th>Year(s)</th>
<th>Cheshire East</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>5.6</td>
</tr>
<tr>
<td>2011</td>
<td>5.8</td>
</tr>
<tr>
<td>2012</td>
<td>5.8</td>
</tr>
<tr>
<td>2013</td>
<td>6.3</td>
</tr>
<tr>
<td>2014</td>
<td>6.6</td>
</tr>
<tr>
<td>2015</td>
<td>6.8</td>
</tr>
<tr>
<td>2016</td>
<td>6.8</td>
</tr>
<tr>
<td>2017</td>
<td>6.8</td>
</tr>
<tr>
<td>2018</td>
<td>6.5</td>
</tr>
<tr>
<td>2019</td>
<td>6.4</td>
</tr>
<tr>
<td>2020 to 2030 inclusive</td>
<td>6.3</td>
</tr>
</tbody>
</table>

33 Model-based estimates of unemployment (for Jan-Dec 2010 to Jan-Dec 2012), ONS, NOMIS. Crown Copyright.

Commuting rates

7.30 The commuting rate is a measure of net commuting (outgoing commuter journeys offset against incoming commuter journeys). More specifically, it is calculated as R/W, where R is residence-based employment (the number of employed residents in a particular geographical area) and W is workplace-based employment (the number of employed people working in that geographical area)\(^{34}\).

7.31 Commuting rates can be easily calculated using data from the 2001 Census. For Cheshire East, R/W = 169,000/164,600, or 1.03.

7.32 More recent figures are available for R and W, most obviously from ONS’ Annual Population Survey (which contains data up to 2012). However, the APS is a national survey and its survey sample sizes for individual local authorities are relatively small. It was felt that the APS data were not precise enough to provide a robust estimate of Cheshire East’s commuting rates at a particular date, nor of how commuting rates have changed since 2001.

7.33 Commuting rates cannot yet be calculated using the 2011 Census data alone, as 2011 Census workplace-based (W) figures had not yet been published at the time of writing. However, it is possible to estimate a commuting ratio for 2011 by using a combination of 2011 Census residence-based employment figures and 2011 workplace-based employment data from the Office for National Statistics’ (ONS) Business Register and Employment Survey (BRES). This approach results in a commuting rate of 1.01 for Cheshire East (see Table 9). Whilst these results are plausible and consistent with estimates that rely on other data, it needs to be emphasised that the “R” and “W” figures come from different data sources and therefore the commuting rates will partly reflect differences in each source’s coverage and in the nature and accuracy of its measurement of employment. For example, the BRES is a survey, so its employment estimates are less precise than those from the Census.

\(^{34}\)Workplace-based employment can also be measured as a count of jobs, rather than a count of employed people. However, in calculating the commuting rate R/W, it would be inconsistent (and spurious) to use a jobs count for W when R can be measured only as a count of employed people.
Table 9: Commuting rates based on 2011 Census and BRES data

<table>
<thead>
<tr>
<th></th>
<th>R: Residence-based employment (number of employed people living in the area)</th>
<th>W: Workplace-based employment (number of people working in the area)</th>
<th>Commuting rate (R/W)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cheshire East</td>
<td>174,900</td>
<td>172,300</td>
<td>1.01</td>
</tr>
</tbody>
</table>


7.34 Commuting rates can also be derived from the CHWEM forecasts. However, the CHWEM baseline figures predict relatively little change in commuting rates over time, and relatively little divergence from the 2001 Census-based rates, or from the 2011 Census/BRES-based rates. In particular, the CHWEM baseline scenario suggests that, between 2010 and 2025, the commuting rate for Cheshire East will stay at 1.01. (The CHWEM-based figures do involve marginal year-on-year variations, but remain at 1.01 throughout the 2010-25 period if rounded to 2 decimal places.)

7.35 Therefore all three approaches – the 2001 Census-based approach, the combination of 2011 Census and BRES data, and the CHWEM-based approach – result in very similar commuting rates (ranging from 1.01 to 1.03). Given this limited range of commuting rates, all three approaches are likely to produce similar population forecasts. However, the 2011 Census/BRES calculations involve slightly more recent data than the CHWEM-based approach (which relies in any case on modelled estimates rather than actual outturns) and much more recent data than the 2001 Census-based approach. Therefore it is proposed that the 2011 Census/BRES-based rate (1.01 for Cheshire East) be used as the commuting rate for the new 2010-based local population forecasts (with the assumption being that the rate remains constant throughout the 2010-30 period).³⁵

Economic activity rate projections

7.36 People are as defined as “economically active” if they are:
- in employment (either self-employed or working as an employee); or
- unemployed (in the broad sense, i.e. available for and actively seeking work, but not necessarily claiming Jobseeker’s Allowance).

7.37 The economic activity rate is the proportion of people in a particular age group³⁶ who are economically active.

³⁵ Although the Census/BRES-based commuting rates are based on 2011 statistics, they are likely to be a good proxy for commuting patterns in the population forecasts’ base year (2010).

³⁶ Economic activity rate estimates generally exclude those below the age of 16 and those above the age of 74, given that people in these age groups are (with relatively few exceptions) not economically active.
7.38 Up until 2012, the economic activity rate projections were produced by taking local authority level population and labour force data from the 2001 Census data, using this to calculate economic activity rates and then applying year-on-year growth rates derived from ONS’ last national labour force projections (published in 2006).

7.39 However, ONS has announced that it will no longer update its labour force projections and its last projections only cover the period up to 2020.

7.40 Furthermore, since the last ONS projections were produced, central government has made some new announcements about the state pension age (SPA) and how it will change in future. In particular, it has announced that:

a) the rise in the female SPA (from 60 to 65) – previously being phased in between 2010 and 2020 – will now be completed in November 2018, with an accelerated increase between 2016 and 2018;

b) the phased rise in the SPA to 66 (for both males and females) will run from December 2018 to October 2020 (previously, it was scheduled for 2024-26).

7.41 In addition, the 2013 Queen’s Speech included a Pensions Bill\(^\text{37}\) that will bring forward the rise in the SPA to 67 (previously scheduled for 2034-36) by eight years, to 2026-28\(^\text{38}\). The Bill also includes a measure “to enable a regular review of the state pension age in the light of rising life expectancy”. At the time of writing, this Bill is going through Parliament – its second reading in the Commons took place on 17 June 2013\(^\text{39}\) and therefore it is not yet law.

7.42 Furthermore, the statutory retirement age (of 65) was abolished in 2011 and this will have some impact on the number of economically active older people.

7.43 In a 2011 paper\(^\text{40}\), Kent County Council (KCC) not only considered the SPA changes, but also considered other factors that will affect future economic activity rates, namely:

- people are living longer and remaining active for longer;
- the growth of part-time employment opportunities, which makes economic activity more attractive to older people, particularly if they wish to supplement their pensions;
- as the population grows, there is a corresponding increase in demand for goods and services, and hence a need for additional labour to produce/ provide these goods and services.


\(^{38}\) A further increase to 68 is scheduled for 2044-46.


\(^{40}\) Technical Paper: Activity Rate projections to 2036, Research and Evaluation, Business Strategy and Support, Kent County Council, October 2011.
In the same paper, KCC developed new economic activity rate projections that take account of these recent SPA announcements, the abolition of the statutory retirement age and the demographic and socioeconomic trends identified above.

For its last (2012) update, Cheshire East revised its economic activity rate projection methodology. The revised methodology was based on KCC's approach, but with some further adjustments.

Both approaches - the 2011 KCC paper and the Cheshire East economic activity rate projection methodology used in 2012 - rely heavily on ONS' 2001-20 economic activity rate projections. For example, Cheshire East's 2012 methodology assumes that, for those age/ gender groups that are not directly affected by the SPA changes (e.g. males aged 60-64), economic activity rates will grow at the pace implied by ONS' projections for 2001-20. The methodology also assumes that, during 2021-30, the economic activity rates for some of these age groups will stay constant (equal to ONS' projected figures for 2020), whilst the rates for some other age groups will grow at half the pace that ONS projected for 2010-20.

However, this reliance on ONS 2001-20 projections is no longer appropriate, as 2011 Census results generally suggest that the actual 2011 economic activity rates were significantly higher than those which Cheshire East's 2012 methodology projected for 2011 (see Table 10). In addition, the 2012 methodology projects a change in the "wrong" direction in some cases. More specifically, it projects slight falls in the economic activity rates for 25-49 year-old males and 16-24 year-old females between 2001 and 2011, whereas the 2011 Census results show that the rates for these age/ gender groups did not change. The 2012 methodology also estimated that the economic activity rate for 50-74 year-old males would not change between 2001 and 2011, whereas in fact it rose.
### Table 10: Comparison of economic activity rate projections (2012 methodology) with Census economic activity rate statistics

<table>
<thead>
<tr>
<th>Local Authority</th>
<th>Gender</th>
<th>Age group</th>
<th>2001 Census</th>
<th>2011 Census</th>
<th>Figure projected for 2011 under previous (2012) methodology</th>
<th>Notes on how the 2011 projection compares to the 2011 Census figure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cheshire East</td>
<td>Males</td>
<td>16-24</td>
<td>72%</td>
<td>67%</td>
<td>70%</td>
<td>Higher</td>
</tr>
<tr>
<td></td>
<td></td>
<td>25-49</td>
<td>94%</td>
<td>94%</td>
<td>93%</td>
<td>Lower – and has moved in the wrong direction</td>
</tr>
<tr>
<td></td>
<td></td>
<td>50-74</td>
<td>56%</td>
<td>59%</td>
<td>56%</td>
<td>Lower</td>
</tr>
<tr>
<td></td>
<td>Females</td>
<td>16-24</td>
<td>66%</td>
<td>66%</td>
<td>65%</td>
<td>Lower – and has moved in the wrong direction</td>
</tr>
<tr>
<td></td>
<td></td>
<td>25-49</td>
<td>79%</td>
<td>84%</td>
<td>81%</td>
<td>Lower</td>
</tr>
<tr>
<td></td>
<td></td>
<td>50-74</td>
<td>39%</td>
<td>46%</td>
<td>41%</td>
<td>Lower</td>
</tr>
</tbody>
</table>


7.48 Consequently Cheshire East decided to adopt a new economic activity rate projection methodology. This new approach relies on 2001 and 2011 Census economic activity rate statistics, rather than the ONS 2001-20 projections. For each gender, separate rates were projected for twelve age groups: 16-17, 18-24, 25-29, 30-34, 35-39, 40-44, 45-49, 50-54, 55-59, 60-64, 65-69 and 70-74 year-olds. A number of different assumptions were tested, to see which ones produced the most plausible results. Table 11 sets out the economic activity rate assumptions that  

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41 At the time of this analysis, 2011 Census local authority level economic activity data had been published only for three broad age groups: 16-24, 25-49 and 50-74 year-olds. However, 2011 Census economic activity rate data were available at national (England and Wales) level for the twelve narrower age groups listed above. Therefore the England and Wales rates for the narrow age groups were used to calculate initial estimates of Cheshire East’s economically active population and these estimates were then adjusted, so that they matched the 2011 Census local authority level estimates of the number of economically active people in each broad age group. For example, the 2011 Census puts the number of 30-34 year-old males in Cheshire East at 9,600; the 2011 Census data also indicate that 92% of England and Wales males in this age group were economically active. If it is initially assumed that the economic activity rate for 30-34 year-old males is the same for Cheshire East as for England and Wales, that implies there are 8,800 (9,600*92%) economically active 30-34 year-old males in Cheshire East. If the economically active numbers of Cheshire East males in the 25-29, 35-39, 40-44 and 45-49 age groups are estimated in the same way, the resulting total for Cheshire East’s 25-49 year-old economically active males is 54,000. However, the actual 2011 Census figure for Cheshire East’s 25-49 year-old economically active males is 55,700. Therefore the estimated number of economically active 30-34 year-old males in Cheshire East (8,800) was scaled up by a factor of 55,700/54,000, to give 9,100. The estimates for the other narrow age bands were scaled up by the same factor. For all other age/gender groups, the approach was the same. Finally, the adjusted economically active population estimates for each narrow age band were divided by the 2011 Census’ overall population figures for those age bands, to check that the resulting (adjusted) economic activity rates were not just mathematically logical (i.e. not in excess of 100%), but plausible as well.
were finally adopted; it also lists the alternative assumptions that were tried out, along with the reasons for rejecting these alternatives.

7.49 In calculating rates for the 65-69 age group, it was further assumed that 65 year-olds account for a fifth of the 65-69 year-old population (for each gender). An alternative approach would have been to base the 65 year-olds' share of the 65-69 population on 2011 population data (either from the 2011 Census or ONS' 2011 mid-year population estimates), but that fails to take account of how their share might change during 2011-30. (If the average age of the population continues to increase, then it is likely that 65 year-olds will make up a smaller share of the 65-69 year-old population as time goes on.) Another option would have been to base the 65 year-olds' share on population forecasts. However, the previous 2010-based forecasts would not be that suitable as they are old and do not take account of 2011 Census and later evidence, whilst the new 2010-based population forecasts cannot be used as the economic activity rate projections are being calculated for input into these new population forecasts, not vice-versa.
Table 11: Economic activity rate assumptions under the new (2013) methodology

<table>
<thead>
<tr>
<th>Period</th>
<th>Age group(s)</th>
<th>Gender(s)</th>
<th>Assumption(s)</th>
<th>Alternative assumptions that were tested</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001 and 2011</td>
<td>All</td>
<td>Both</td>
<td>N/A, as figures for these years are taken from Census data, not based on assumptions</td>
<td>N/A, as figures for these years are taken from Census data, not based on assumptions</td>
</tr>
<tr>
<td>2002-10</td>
<td>All</td>
<td>Both</td>
<td>Rate changes at constant pace during 2001-11: in other words, the 2010 rate was assumed to be equal to the 2001 Census rate plus nine tenths of the 2001-11 change. For example, Census figures suggest the rate for 65-69 males in Cheshire East rose from 17% in 2001 to 27% in 2011, so the estimated 2010 rate was 17% + (2010-2001)*(27%-17%)/10 = 26%.</td>
<td>None. There is no obvious and reliable evidence to suggest (a) that the rate of change varied during this period and, if it did, (b) how the rate of change might have varied. ONS' Annual Population Survey (APS) and pre-APS surveys provide estimates of economic activity rates for individual age/ gender groups for 2002-10, but the survey sampling errors are significant at local authority level: this means that year-on-year changes cannot be measured precisely enough to inform economic activity rate projections. For example, APS Jan-Dec 2010 data put the rate for Cheshire East 50-64 year-old females at 62.5%, but the confidence interval is +/- 8.0% - which implies the 2010 rate for this age/ gender group could be as low as 54.5% or as high as 70.5%.</td>
</tr>
<tr>
<td>Period</td>
<td>Age group(s)</td>
<td>Gender(s)</td>
<td>Assumption(s)</td>
<td>Alternative assumptions that were tested</td>
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<td>--------</td>
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</tr>
<tr>
<td>2012-30</td>
<td>16-17, 18-24, 25-29, 30-34, 35-39, 40-44, 45-49</td>
<td>Both</td>
<td>Rate stays constant (equal to 2011 Census economic activity rate)</td>
<td>None. (Significant future increases are implausible for some of these groups, as their rates were already close to 100% in 2011: e.g. 95% for 30-34 and 35-39 year-old males in Cheshire East. For some other groups, the rate fell between 2001 and 2011, but it would be hard to justify an assumption that this trend will continue during 2012-30. For example, the rate for 16-17 year-old Cheshire East males fell from 46% to 35% during 2001-11: if this pace of change continued, the rate would be around 15% by 2030, but there is no obvious explanation – e.g. a social or policy change – for why the rate for this group might fall so low.)</td>
</tr>
<tr>
<td>2012-30</td>
<td>50-54, 55-59</td>
<td>Both</td>
<td>Rate increases at half the pace it did during 2001-11. For example, Census figures suggest the rate for 50-54 year-old females in Cheshire East rose from 73% in 2001 to 81% in 2011, so the estimated 2022 rate was 81% + 0.5*(2022-2011)*(81%-73%)/10 = 85%.</td>
<td>Rate increases at the same pace it did during 2001-11. However, this resulted in implausibly high rates for some age/ gender groups (e.g. 96% for 55-59 year-old Cheshire East females by 2030) and implausible differences between the rate for one age group and those for adjacent age groups (e.g. for 2030, it produces a rate of 95% for the authority’s 50-54 year-old females, compared to 87% for its 45-49 year-old females).</td>
</tr>
<tr>
<td>Period</td>
<td>Age group(s)</td>
<td>Gender(s)</td>
<td>Assumption(s)</td>
<td>Alternative assumptions that were tested</td>
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</table>
| 2012-30 | 60-64 | Females only | 1) Rate for this age group reaches the 2010 rate for females in the next youngest age group (55-59 year-olds) by 2018 (the year that the SPA for females reaches 65). The rationale for this assumption is that the SPA for females was 60 in 2010, but will be 65 by 2018 and therefore the propensity for 2018’s 60-64 year-old females to participate in the labour market may well be similar to the propensity for 2010’s 55-59 year-old females to do so.  
2) 60% of the 2010-18 change will occur during 2010-16, with the other 40% occurring during 2016-18. The rationale for this assumption is that the original timetable for harmonising male and female SPAs (2010-20) was changed to 2010-18, by accelerating the pace of 2016-18 harmonisation.  
3) During 2019-30, the rate increases at half the pace it did during 2001-11. | Rate for this age group reaches the 2011 Census rate (i.e. the latest known rate) for females in the next youngest age group (55-59 year-olds) by 2018. This alternative makes no significant difference to the results. However, it is harder to justify, as the year 2011 does not mark the start of the SPA harmonisation period and therefore the propensity for the 2011 cohort of 55-59 year-old females to participate in the labour market cannot be equated with the propensity for the 2018 cohort of 60-64 year-old females to do so.  
During 2019-30, the rate increases at the same pace it did during 2001-11. However, this resulted in an implausibly high rate by 2030 (85% for Cheshire East, compared to 84% for the authority’s 55-59 year-old females). |
<table>
<thead>
<tr>
<th>Period</th>
<th>Age group(s)</th>
<th>Gender(s)</th>
<th>Assumption(s)</th>
<th>Alternative assumptions that were tested</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012-30</td>
<td>60-64</td>
<td>Males only</td>
<td>Rate increases at the same pace it did during 2001-11.</td>
<td>Rate increases at half the pace it did during 2001-11. However, this resulted in a rate that (by 2030) was lower than that for females of the same age (71% versus 77% in Cheshire East). The resulting 2030 rate for 60-64 year-old males was also low when compared to those for males in the 50-54 and 55-59 age bands (90% and 87% respectively) and this implies a sudden steep fall in labour market participation as men enter their 60s, even though all three groups are of working age.</td>
</tr>
</tbody>
</table>
| 2012-30 | 65-69 | Both | 1) During 2012-18, rate increases at half the pace that it did during 2001-11.  
2) During 2020-30, the rate for 65 year-olds equals that for 60-64 year-olds and the rate for 66-69 year-olds continues to increase at half the pace that the 65-69s' rate did during 2001-11.  
3) 2019 rate for the whole 65-69 age group assumed to be midway between the 2018 and 2020 rates for this group. | As for previous column, except that: (a) during 2012-18, the rate for the 65-69 age group increases at the same pace that it did during 2001-11; and (b) during 2020-30, the rate for 66-69 year-olds continues to increase at the same pace that the 65-69s' rate did during 2001-11. The resulting rates are, by 2030, roughly midway between those for 60-64 year-olds and those for 70-74 year-olds, even though the group consists largely of people above the SPA. It seems more likely that the rate would be significantly closer to that for 70-74 year-olds than to that for 60-64 year-olds. |
<table>
<thead>
<tr>
<th>Period</th>
<th>Age group(s)</th>
<th>Gender(s)</th>
<th>Assumption(s)</th>
<th>Alternative assumptions that were tested</th>
</tr>
</thead>
</table>
| 2012-30 | 70-74        | Both      | Rate increases at half the pace it did during 2001-11. | 1) Rate increases at the same pace that it did during 2001-11. However, this was felt to be less plausible than the "half the pace" assumption, as it results in a rate of 21% for males in Cheshire East by 2030 (compared to a rate of 13% in 2011): it is questionable whether such a high proportion of 70-74 year-olds would be economically active, given that they will still be well above the SPA.  
2) Rate stays constant (equal to 2011 Census economic activity rate). Although conceivable (it implies rates of 13% for Cheshire East males and 8% for its females), it is more likely that the rates will rise, due to factors such as increased life expectancy. |
8 ONS Population Projections and CLG Household Projections

ONS 2011-based interim subnational population projections

8.1 Key points:

- The ONS projections are not forecasts, they simply continue past trends in fertility, mortality and migration

- The 2011-based interim projections use a base population (2011 MYE) based on the 2011 Census, but all the assumptions (fertility, mortality and migration) are those used in the 2010 projections (i.e. they have not been updated in light of the 2011 Census). ONS have issued statements about the limitations of this set of projections

- The population forecasts detailed in this methodology paper, wherever possible, use assumptions that incorporate results of the 2011 Census.

8.2 The suite of ONS subnational population projections are not forecasts and they do not attempt to predict the impact that future government or local policies, changing economic circumstances or other factors (for example numbers of new dwellings) might have on demographic behaviour. The primary purpose of the subnational projections is to provide an estimate of the future size and age structure of the population of local authorities in England using a method that is consistent amongst all local authorities.

8.3 The 2011-based interim subnational population projections update the 2010-based projections. They are based on the latest 2011 MYEs (mid-year population estimates), which take into account results from the 2011 Census.

8.4 The projections assume a continuation of the estimated trends in fertility, mortality and migration as used in the 2010-based projections and are constrained to the assumptions made for the 2010-based national population projections. The trends from the 2010-based projections have been used because a revised historic data series was not available at the time they were produced.

8.5 The 2011-based interim subnational population projections run to 2021.

8.6 Although the projections start from an improved population base, there are some specific issues which arise from applying the trends from the 2010-based projections, since the assumptions were set using population data before the 2011 Census results were available. The base population and age structure of the base population is different to that used in the 2010 projections (and so

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different to the population estimate used to formulate the 2010-based assumptions).

8.7 The subnational projections are constrained at the national level to a set of England control totals which are based on the 2011 population estimates and the principal assumptions from the 2010-based national population projections. The 2011 population estimates for England are 452,000 higher than the previously published 2010-based projections for 2011. This has an impact on the starting point of the projection, but also when the fertility and mortality rates are applied to the population. The projections are known to over project the number of births at a national level. This particularly affects some areas where the 2011 population estimates have higher numbers of women aged 16-44 than in the 2010 estimates. ONS warn that caution should be used when using these projections for planning purposes at the younger ages. For more details on this please see the fertility section of this methodology paper. The differing base populations (and resulting 2010-based assumptions from the 2010-based model) also impact on the assumptions made about future levels of mortality and migration.

8.8 The population forecasts detailed in this methodology paper, wherever possible, use assumptions that incorporate results of the 2011 Census, for example the base fertility, mortality and migration rates have all been calculated using population estimates updated in light of the 2011 Census results.

8.9 The next set of subnational projections (which will incorporate a full revision of assumptions in light of the 2011 Census) are expected to be the 2012 based projections which are likely to be released in 2014. The subnational projections will be released at some point after the national population projections are released (due in October – November 2013).

**CLG 2011 interim subnational household projections**

8.10 Key points:

- A key limitation of the 2011-based interim subnational household projections, is that they do not fully take into account results of the 2011 Census (in the assumptions used to produce the projected population and also in the household formation rates used)

- The 2012 based household projections will be the first to fully incorporate the results of the 2011 Census and are expected to be released in 2014.

8.11 The 2011-based interim subnational household projections were produced by the Department for Communities and Local Government (CLG). The household projections are based on the 2011-based interim subnational

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population projections. The projections replace the 2008 based subnational household projections released in November 2010.

8.12 The household projections run to 2021 as do the population projections.

8.13 The household projections are calculated by applying a household formation rate (likelihood that someone from a given age group will represent / head a household) to the projected population living in households. The relationship between the population and number of households is complex as the numbers of people within each age group change, as do the numbers living in households, as do the household formation rates throughout the projections.

8.14 The latest household projections use information from the 2011 Census together with data from the Labour Force Survey to formulate assumptions on number and proportions of people not living in households and also household formation rates. The local authority data used was controlled to the 2011 Census aggregate household formation rate. At the time the household projections were produced, no information from the 2011 Census had been released on household formation rates by age. Tables detailing this were released at the end of June 2013.

8.15 The 2011 household projections use lower household formation rates than the previous (2008 based) set of household projections. This is (very generally) because decreases in average household size between the 2001 and 2011 Census were lower than previously projected.

8.16 The key driver of growth in the number of households is the growth in the population (from the interim 2011-based population projections). This is largely due to the fact that the population is ageing and household formation rates are higher for the older age groups than the younger age groups. The projected change in household formation in Cheshire East actually slightly counteracts the growth due to population (i.e. on its own if the population was static, the projected changes in household formation would lead to a decrease in households).

8.17 The two key limitations of the 2011-based interim household projections, as explained above, are that they are based on a projected population which does not fully take the 2011 Census results into account and they use household formation rates which again do not fully take into account the 2011 Census results.

8.18 The population forecasts detailed in this paper take more account of the 2011 Census and importantly the impact this has had on the estimated age structure of the population than the population projections do. They use the household formation data from the household projections as this was the most up to date and robust data to use at the time the population forecasts were produced.

8.19 As previously stated, as more 2011 Census statistics are released the forecasts should be revised (just as ONS and CLG will in due course revise their projections).
8.20 The 2012 based household projections will be the first to fully incorporate the results of the 2011 Census. They will be based on the 2012 population projections and are expected to be released sometime in 2014.
Appendix 2: Achieving a balance between housing provision, economic growth and environmental sustainability

1. There are serious risks associated with insufficient housing provision. For example, an inadequate supply of housing is likely to result in either:
   - weak, static or negative jobs growth (due to there being insufficient houses to accommodate all the people that existing businesses or would-be inward investors would otherwise choose to employ); or
   - a strong rate of jobs growth, but one which relies on increased inward migration. This in turn will put pressure on transport networks and infrastructure and on the environment: for example, it may result in more car travel and hence greater levels of pollution and climate change.

2. An inadequate housing supply will also put pressure on neighbouring local authorities to increase their own housing provision.

3. But if, conversely, housing and economic growth targets are set too high, then there is a significant risk of contributing to economic instability - and of seriously harming the environment. As noted in Appendix 1, the evidence from the CHWEM model and elsewhere is that zero employment change is associated with average annual growth in economic output (GVA) of 1% or (more probably) 2%. Table A below provides further evidence of this relationship, by presenting the CHWEM’s projections for UK GVA and employment for different periods. UK figures are quoted here, as these have a greater degree of precision than the local authority level projections. However, the CHWEM figures for Cheshire East also point to a differential of roughly 2% between the GVA and employment growth rates.

| Table A: CHWEM Projections for UK Gross Value Added (GVA) and Employment |
|---|---|---|---|
| Period | 2010-25 | 2010-15 | 2015-20 | 2020-25 |
| Average GVA growth rate per annum (p.a.) | 2.4% | 1.7% | 2.6% | 2.9% |
| Average employment growth rate per annum (p.a.) | 0.5% | 0.0% | 0.8% | 0.7% |
| Difference between the GVA and employment growth rates | 1.9% | 1.7% | 1.8% | 2.2% |

Source: Baseline projections from the Cheshire, Halton & Warrington Econometric Model (CHWEM). Projections were obtained using Cambridge Econometrics (CE)/IER LEFM software and are consistent with CE’s UK Regional Forecast, as published on CE’s Knowledge Base website in June 2012. Additional data preparation and aggregation by the Economic Development & Regeneration Team, Cheshire East Council.

4. Given this 2% differential, a 0.4% employment growth scenario implies GVA growth of around 2.4% per annum. Many economic forecasters regard a long-term GVA growth rate of 2.5% per annum as being strong (and ambitious) yet achievable – and in terms of economic growth “ambition”, the difference between 2.4% and 2.5% is not significant. If Cheshire East aimed for a much higher GVA growth rate (and by implication, an employment growth rate that significantly exceeded 0.4%), there would be a much greater risk that the
growth proves to be economically and environmentally unsustainable over the long term. For example, high growth rates are often fuelled by asset bubbles (i.e. overpriced property, shares and other assets) which by definition cannot last, or by consuming natural resources (e.g. fossil fuels or greenfield land) at an unsustainable rate. In particular, it is worth noting that:

- for the sixteen-and-a-quarter year period of Gross Domestic product (GDP) statistics covered by ONS’ recently published GDP 2013 Quarter 2 estimates (1997 Q1 to 2013 Q2), real (inflation-adjusted) GDP growth averaged 1.9% per annum. For the first ten years of this period (1997 Q1 to 2007 Q1), the average was 3.2%, but this period excludes recessions and is not therefore representative of long-term economic performance.\(^{(44)}\)
- the current CHWEM forecasts (from the 2012 model update) suggest that UK growth will average 2.4% per annum during 2010-25 (see Table A).

5. It is also important to bear in mind the fact that, whilst significant economic growth has resumed – UK GDP grew by 0.7% in the second quarter of 2013 – the Government and the Bank of England has sought to stimulate the UK economy through policies (such as a Bank Rate of 0.5%) that are highly unlikely to be sustained over the whole 20-year Local Plan period. When these policy interventions come to an end, growth may weaken.

6. Given this, Cheshire East cannot simply take recent economic evidence as a sign that robust economic growth will continue, with no break, up to 2030. Since the mid 1950s, the gap between one recession (officially defined as two consecutive quarters of GDP decline) and the next has been eight years on average. Therefore the probability of another recession before 2030 is high. In more recent decades (the 1980s onwards), the gap has been longer (16.75 years between the 1990-91 and 2008-9 recessions and 9.5 years between 1980-81 and 1990-91), but more recent recessions have been longer (5-6 quarters since the 1980s, compared to 2-3 quarters before then) and deeper. Even when the economy begins to grow again, it takes time for GDP to regain its previous peak: the last recession ended in 2009, but, as of 2013 Q2, GDP was still significantly below its 2008 peak.

7. It is also worth emphasising that housing development is, of course, just one of many factors that affect GVA and employment growth. Other factors, such as the industrial composition of an area, Central Government’s economic policies and the global economic climate, also have an impact, as do local authorities’ and other local public sector organisations’ initiatives and investments (e.g. in transport infrastructure) and demographic factors (e.g. changes in household size and in the age structure of the population). Therefore the relationship between housing and economic growth is a complex one. In other words,

\(^{(44)}\) The GDP figures quoted in this Appendix are taken from ONS’ Second Estimate of GDP, Q2 2013 (http://www.ons.gov.uk/ons/rel/naa2/second-estimate-of-gdp/q2-2013/index.html) and ONS’ Quarterly National Accounts, Q2 2013 Dataset (http://www.ons.gov.uk/ons/rel/naa2/quarterly-national-accounts/q2-2013/tsd-quarterly-national-accounts--q2-2013.html). The figures are seasonally adjusted.
housing proposals alone should not be taken as a determinant of future economic growth; nor should they be regarded in isolation as an indication of whether particular economic growth aspirations will be achieved.
Appendix 3: The Cheshire, Halton and Warrington Econometric Model

**Model location, operation and licensing**

1. Cheshire East Council’s Economic Development and Regeneration Team maintains and operates the Cheshire, Halton and Warrington Econometric Model (CHWEM), an economic forecasting model, on behalf of Cheshire, Halton and Warrington partners. The model was commissioned from Cambridge Econometrics (from whom the Council also commissions model updates).

2. The model’s software and data may be installed on several machines, but the current licence (and the hence direct access to the model) is restricted to only one organisation (i.e. Cheshire East).

**2012 update**

3. The CHWEM was last updated in 2012. The CHWEM results from this update are consistent with Cambridge Econometrics’ (the model supplier’s) UK Regional Forecast, as published on Cambridge Econometrics’ Knowledge Base website in June 2012. The forecasts from this 2012 update therefore take account of the 2008-9 UK and global economic recession and much of the subsequent (2009-12) period of modest economic growth. It is this 2012 “vintage” of the CHWEM which was used, along with other data, to inform the choice of unemployment and commuting rate input parameters for the new 2010-based local population forecasts.

**Input data**

4. Official data are a key input into the model. However, local demographic data and knowledge are also fed into each model update, to improve its accuracy. The key local inputs into the 2012 model update’s economic forecasts for the two Cheshire authorities were Cheshire West and Chester Council’s 2009-based population forecasts (which use ONS’ 2009 mid-year population estimates as the base year figures) and the Cheshire authorities’ original 2010-based economic activity rate projections for Cheshire45. (The population and economic activity rate inputs for Halton and Warrington are from different sources.) The population forecasts differ from ONS’ subnational projections, in that they take account of local intelligence, including expectations of future house building (which are based on guidance from local authority planners). These population and economic activity inputs are provided for fourteen gender/age groups (seven age bands for each gender).

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45 These were the latest available population forecasts and economic activity rate projections at the time of the 2012 update. However, they predated the publication of 2011 Census (and later) population and economic activity rate data. For details of the methodology used for the original 2010-based economic activity rate projections, see section 7 of this paper.
Allowances made for policy intervention

5. The forecasts do not take account of local, unofficial economic intelligence. Nor (apart from taking account of future house building) do they allow for the impact that incomplete or future development projects, policies or initiatives may have. They are, therefore, “policy-off” forecasts.

Accuracy of forecasts

6. The forecasts draw heavily on historic economic data, much of it from the Annual Business Inquiry (ABI), and its successor, the Business Register and Employment Survey (BRES). The ABI/BRES is a survey which covers all of Great Britain and therefore the survey sample sizes are relatively small for very disaggregated groups of businesses. The smaller the sample size, the greater the risk of the survey sample being unrepresentative. Hence the forecasts for individual local authority areas are based on smaller samples (and are therefore less accurate) than those for larger areas, such as regions or countries.

Time periods covered by the CHWEM

7. For forecasts from the 2012 CHWEM update, 2009 is the base year (with the figures for subsequent years generally being “genuine” forecasts rather than estimates of actual performance).\(^{46}\) This is because:

(a) the key local population inputs into the CHWEM’s Cheshire forecasts – the Cheshire population forecasts produced by Cheshire West and Chester Council – were 2009-based;
(b) at the time of the 2012 CHWEM update, 2009 was the most recent year for which ONS had estimated economic output (Gross Value Added) at local (sub-regional) level.

8. The CHWEM can currently produce forecasts for any years up to 2025, but cannot generate any forecasts for 2026 and beyond.

Functionality

9. The model consists of four “Areas”, namely Cheshire East, Cheshire West and Chester, Halton and Warrington. Each of these Areas is in effect a “sub-model”, in the sense that it can be operated and updated independently of the others.

10. The Cheshire Areas are in turn each broken into three “Sub-Areas”, one for each of the six former (pre-April 2009) Cheshire Districts. Sub-Area forecasts can be produced for economic output (by industry) and employment (by industry or occupation). The CHWEM can also produce comparable forecasts for the North West and the UK.

11. Areas” have additional functionality (to Sub-Areas). For example, Area-level forecasts can be produced for investment, labour demand, the qualifications

\(^{46}\) The figures for 2010-2012 are also estimates to some extent, in that they take account of evidence – albeit mainly regional and national level evidence - of actual performance in these years.
needed for specific occupations and the impact of specific businesses expanding or downsizing.

12. For Areas (but not Sub-Areas), alternative scenarios can be generated by altering some of the input values and assumptions (including population and economic activity rate projections and forecasts), and running the model again.