

# Greater Nottingham

Broxtowe Borough Council  
Erewash Borough Council  
Gedling Borough Council  
Nottingham City Council  
Rushcliffe Borough Council

## Household Projections Background Paper June 2012



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## **1. Introduction**

- 1.1 This background paper explains the population and household projections and forecasts undertaken in the preparation of the Core Strategies covering the Greater Nottingham area. The work covers the Nottingham Core Housing Market Area, which is made up of Nottingham City and Broxtowe, Erewash, Gedling and Rushcliffe Boroughs. Hucknall is not included, because the projections are not available below district-level.
- 1.2 The basis for the projections was the Office for National Statistics (ONS) 2008-based population projections and the Department for Communities and Local Government (CLG) 2008-based household projections. However, these are trend-based, taking no account of any policy implications, so cannot be the sole basis for deriving the housing provision figures for the Core Strategies. Other reasons for commissioning locally-produced projections, including the proposed abolition of Regional Plans and the increased emphasis on localism, are covered in the Housing Background Paper.
- 1.3 The results from the analysis looking at the population implications of the housing figures in the Core Strategies are described as “forecasts”, in that, unlike projections, they are based on a specific, planned outcome that is deemed to be likely. Projections are normally based upon the continuation of certain trends, or the testing of different scenarios. The figures produced earlier in the process are, therefore, more properly described as “projections”.

## **2. A brief explanation of the methodology**

- 2.1 The Derbyshire and Nottinghamshire councils use projections produced by a model called Popgroup, provided by Edge Analytics Ltd. Derbyshire County Council have use of the model and produce runs on behalf of the councils.
- 2.2 Normally a model will start with a projection of the population, e.g. the ONS 2008-based projections. Household figures are produced from these using “headship rates”, which are the proportions of people in each age/sex group who “head” a household.
- 2.3 For these purposes, a household is one person living alone or a group of people living together. It is necessary to allow for a number of other factors when converting households to dwellings, primarily vacant properties.
- 2.4 Nationally, CLG produce household projections from the ONS population projections. The headship rates used to do this are based upon the 2001 Census and are projected forward from there based upon local and national trends between the 1971, 1981, 1991 and 2001 Censuses and national trends shown in surveys since 2001. Because of the technicalities of projecting headship rates, locally produced projections normally use the headship rates produced for the area by CLG.

### **3. Projections produced for the Housing Provision Position Paper (HPPP)**

- 3.1 The population and household projections produced for the HPPP took the ONS 2008-based population projections and CLG 2008-based household projections as their basis, although the population was controlled to 2009 ONS Mid-Year Estimates, which were the latest official population estimates available at the time. The HPPP projections looked at a number of scenarios and also included a comparison with the ONS/CLG projections. Details of the methodology used in these projections and their results can be found in "Forecasts of population and households for Nottinghamshire and Derbyshire authorities – Greater Nottingham", Edge Analytics Ltd, February 2011.
- 3.2 The scenarios were not intended to be housing provision options, rather they were to inform decision-makers and interested bodies of the implications of different levels of housing provision for the level of jobs, for meeting the needs of the existing population, and for migration. The scenarios which were included were:-
- Natural change in the existing population (i.e. births and deaths with no allowance for migration)
  - Balanced migration (which allows for the different age-structures of in and out-migrants but has total in and out-migration in balance)
  - Continuation of longer term (2001-2009) migration trends
  - No increase in jobs
  - Past housebuilding rates (April 2000 to March 2010)
- 3.3 In the event, the longer term migration trends scenario was found not to be significantly different to the ONS/CLG projections, which use migration trends from 2003 to 2008, so this scenario was not included in the HPPP.
- 3.4 In each case, the scenario was used as a constraint to which to control the projections. For instance, in the case of the No Increase in Jobs scenario, the labour force figures were set as the same for each year and the model worked back to give the population, migration, households and dwellings implied by this.
- 3.5 The conclusions of the HPPP were that:-
- Given the economic aspirations of the Government, the Councils, and the Local Enterprise Partnership for Derby, Derbyshire, Nottingham and Nottinghamshire, the No Increase in Jobs scenario would provide for too few homes (44,444 between 2009 and 2026)
  - The Past House Building Rates scenario also provided insufficient homes (41,888).
  - The scale of new homes implied by the DCLG 2008-based Household Projections (71,706) was unrealistic in terms of its delivery, as it simply was not considered possible to build this number of new homes over the Aligned Core Strategy period. It would also lead to significant further greenfield development, and require the evidence base of the

draft Aligned Core Strategies to be revisited and, therefore, in turn require further consultation (effectively starting the process from scratch), which would lead to further delay in getting a planning framework into place

- The Natural Change scenario (57,717) was not realistic, as there is always bound to be some migration, and, therefore, it could not form the basis of planning for future housing requirements.
- The Balanced Migration scenario (51,021) was very close to the housing provision already included in the draft Aligned Core Strategies (52,050) and would provide sufficient new homes to allow for economic aspirations in terms of jobs growth.
- The Balanced Migration scenario was, therefore, considered to support the existing level of housing provision set out in the draft Aligned Core Strategies as an appropriate target to plan for in Greater Nottingham.

#### **4. Further work undertaken in 2012**

##### ***Why the work was undertaken***

- 4.1 The 2008-based projections produced in 2011 for the years up to 2028 used the CLG headship rates. These included projections of the numbers of households at 2008 which did not take any account of the actual numbers of households at that date.
- 4.2 The 2011 projections were produced as part of a project covering the whole of Derbyshire and Nottinghamshire. In order to check the realism of the projections for all of the districts in this area, a comparison was done between the estimated number of people per household<sup>1</sup> at 2008 and 2010 (using the ONS Mid-Year Estimates of Population, 2001 Census households and housing completions since 2001) and the number per households projected for those years by the projections. The results for the Greater Nottingham districts are shown in Table 1.
- 4.3 Some differences would always be expected due to the margins of error inherent in any projections, but a difference of plus or minus 0.05 in either of the years was thought to require further examination. In Greater Nottingham, this applies to Broxtowe, Nottingham and Rushcliffe. In all of these, the people per household is greater than was projected. This means that the number of households was less than projected and, therefore, the headship rates are lower than projected.
- 4.4 A difference of 0.05 may not seem very large, but it should be borne in mind that both the estimates and projections had the same figures at 2001, so the differences have arisen in the change since 2001, not in the overall figures.

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<sup>1</sup> This approximates to the average household size, but is not quite the same as people living in communal establishments would need to be subtracted from the population before calculating the average household size.

**Table 1: Estimated and Projected 2008 and 2010 households using 2001 Census and housing completions data  
Greater Nottingham Districts**

	2001 Census households (a)	Net dwelling increase		Household estimate		ONS Mid-Year Estimates		People per household (estimate)		People per household (projected)	
		2001 to 2008 (b)	2001 to 2010 (c)	2008 (d=a+b)	2010 (e=a+c)	2008 (f)	2010 (g)	2008 (f/d)	2010 (g/e)	2008	2010
Broxtowe	45,439	1,909	2,296	47,348	47,735	110,900	111,800	2.34	2.34	2.30	2.28
Erewash	46,229	2,294	2,901	48,523	49,130	110,500	111,300	2.28	2.27	2.32	2.30
Gedling	47,561	1,913	2,391	49,474	49,952	112,300	113,200	2.27	2.27	2.29	2.28
Nottingham	116,111	9,576	11,203	125,687	127,314	296,600	306,700	2.36	2.41	2.30	2.29
Rushcliffe	43,676	2,452	2,870	46,128	46,546	110,800	112,800	2.40	2.42	2.38	2.37

*The net dwelling increase is from the Councils' monitoring systems. Note that there are some differences from the figures shown in the Housing Background Paper, because the latter includes subsequent retrospective amendments.*

- 4.5 The implication of headship rates changing at a slower rate since 2001 than was projected is that they are likely to also change at a slower rate in the future. This will affect the dwellings requirement implied by the projections and is supported by the known problem of credit availability and ongoing changes to the benefits system.
- 4.6 For most age-groups, headship rates have increased since 1971 and nationally they are projected to continue increasing, particularly as more people live alone. The fact that some of these trends may be changing is supported in CLG's report on their 2008-based projections<sup>2</sup> and this is certainly borne out in the three districts locally. Reasons for this include changes to the make-up of the population, particularly in terms of the numbers of international migrants and students but may also be due to other demographic and housing factors. It is important to realise, though, that this discrepancy from what was projected had developed by 2008, i.e. before the slump in the housing market started, so it is unlikely to just be a short term response to recent housing issues.
- 4.7 It is also important to realise that assuming headship rates may be lower in the future does not mean accepting higher levels of overcrowding, as it is more due to different types of households living in the area than were projected by CLG. For instance, more students and younger migrants may mean more people who are happy to live in larger households. The quality and popularity of Nottingham's universities mean that there will still be large numbers of students in the future, despite the changes to student finances.

### ***The basis of the forecasts***

- 4.8 The Councils asked Edge to rescale the headship rates so that, when applied to the population projections, they produce the estimated household numbers at 2008 and 2010<sup>3</sup>. This work was only undertaken for Broxtowe, Nottingham and Rushcliffe, because of the difference between estimated and projected households in those districts mentioned above.
- 4.9 Refined household estimates were produced for the three districts for use in these forecasts. These estimates take account of council tax data, which has the advantage of allowing for changes in vacancy rates since 2001. Because of this, some of the estimates are significantly different from those in Table 1.

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<sup>2</sup> See "Updating the Department for Communities and Local Government's household projections to a 2008 base – Methodology", pages 10 to 12  
<http://www.communities.gov.uk/documents/statistics/pdf/1780350>

<sup>3</sup> See "Nottingham, Broxtowe, Rushcliffe – Rescaling headship rates for consistency with household data", Edge Analytics Ltd, February 2012, for details of this work.

**Table 2: Household estimates for Edge headship rate analysis**

	Estimated households			Projected households using CLG headship rates	
	2008	2009	2010	2008	Estimated as % of Projected
Broxtowe	47,290	47,546	47,724	48,295	97.9%
Nottingham	123,450	124,565	125,569	129,153	95.6%
Rushcliffe	45,229	45,188	45,308	46,572	97.1%

The estimates were produced in three stages (example given for the 2010 estimates):

1. The change in the council tax vacancy rate between 2001 and 2010 was applied to the 2001 Census households to estimate the number of households living in dwellings existing in 2001 at 2010.
2. The 2010 council tax vacancy rate was applied to the net dwelling change between 2001 and 2010.
3. Adding stages 1 and 2 produces a household estimate consistent with the actual (MYE) population – i.e. if the actual 2010 headship rates were applied to the MYE they would result in the estimated number of households. Edge used the scenario projections which they produced in 2011 as the basis for their headship rate work, none of which has a 2010 projected population the same as the MYE. Therefore, if the actual headship rates (which Edge were seeking to discover) were applied to 2010 projected population they would not result in these household estimate figures. It was necessary to allow for this by adjusting the household estimates by multiplying them by the ratio between the projected population and the MYE. The 2011 projections used the MYEs for their 2008 and 2009 population figures, so this adjustment is only necessary for 2010

The Migration-led scenario from the 2011 projections was used for the headship rate work because it generally has the nearest 2010 population figures to the MYEs and so the adjustments to the household estimate were minimised

To use Rushcliffe as an example:

The ratio between the 2010 projected population and the MYE is 0.99560404\*  
(112,335 / 112,831).

Stage 1: No of households in dwellings existing in 2001 at 2010 =42,756  
(compared with the 2001 Census household figure of 43,676).

Stage 2: 2010 Vacancy rate x net dwelling change = 2,752.

Stage 3: 42,756 + 2,752 multiplied by 0.99560404 = 45,308 (as shown in the table above).

\* The corresponding ratios for Broxtowe and Nottingham are 1.00186955 and 0.99406609 respectively.

4.10 The question then arises as to what to assume that headship rates do after 2010, as they are unlikely to simply resume the trend projected by CLG. Three options were examined:

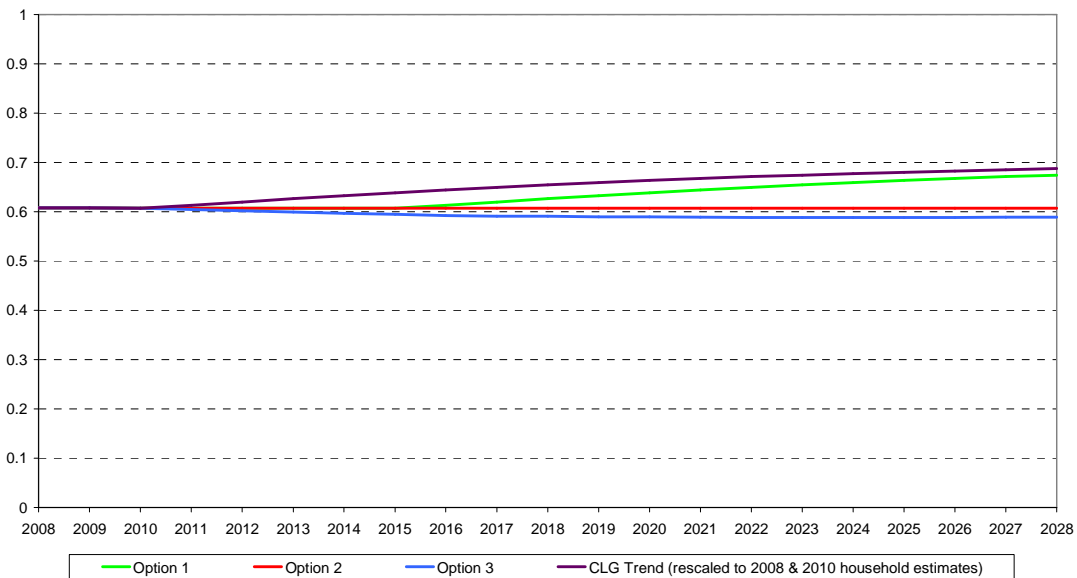
1. To use the rescaled (actual) 2010 headship rates for 5 years and then to resume the CLG trend
2. To use the rescaled (actual) 2010 headship rates for all years up to 2028



3. To continue the 2001 to 2008 trend shown in the rescaled headship rates up to 2028 (i.e. that, if they went down between 2001 and 2008, they would reduce further up to 2028).

Figure 1 illustrates what these options mean in terms of the headship rate for a particular age-group (35 to 44 year olds) in Nottingham City.<sup>4</sup>

**Figure 1: Headship rates of people aged 35 to 44 using the 3 Options and the CLG trend headship rates - Nottingham City**



*CLG Trend resumes the trend in the CLG headship rates after 2010.*

*Option 1 uses the rescaled (actual) 2010 headship rates for 5 years and then resumes the CLG trend.*

*Option 2 uses the rescaled (actual) 2010 headship rates for all years up to 2028.*

*Option 3 continues the 2001 to 2008 trend shown in the rescaled headship rates up to 2028 (i.e. that, if they went down between 2001 and 2008, they would reduce further up to 2028).*

4.11 Given the current uncertainties in the economy and housing market, it is believed that option 2 is the most reasonable one to take, as it seems unlikely that longer term CLG trends will resume after 2015 (option 1), but a continuation of short term trends (option 3) may be seen as being too pessimistic in household formation terms.

4.12 For the purposes of the Core Strategies, forecasts have been run which start off with the proposed average annual increase in dwellings to 2028 and from those generate household numbers and the population totals for each year<sup>5</sup>. The importance of amending the headship rates for this is that if the headship rates are reduced the population will be higher, as there will be more people who are not heads of household. To illustrate this hypothetically, if 40% of adults are heads of household and there are 1,000 households, there will be

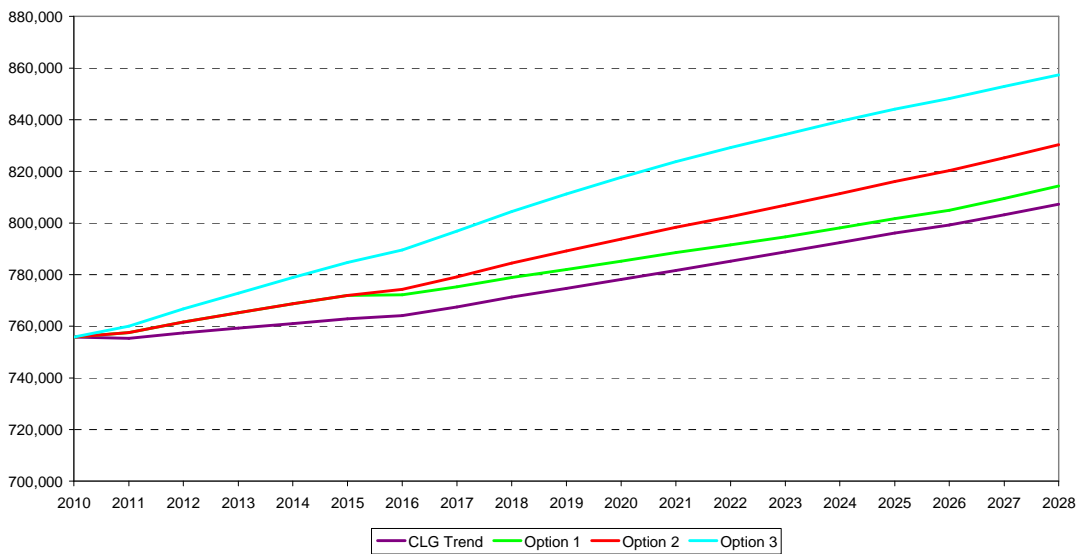
<sup>4</sup> It is not possible to show this graph from 2001, because the headship rates were not rescaled for the intervening years between 2001 and 2008.

<sup>5</sup> The Rushcliffe figures for 2011 to 2026 have been extended to 2028 pro-rata to provide consistency. This is not meant to suggest that this would be an appropriate level of housing provision between 2026 and 2028 for that district.

2,500 adults in total, but if the proportion who are heads is reduced to 35% there will be 2,857 adults.

- 4.12 This means that the Core Strategies' housing provision implies a higher population, larger labour supply and more net in-migration if the revised locally-referenced headship rates are used as against current CLG headship rates.
- 4.13 The CLG headship rates have been used unadjusted for the Districts where there was less discrepancy between the 2008 actual and projected households, Erewash and Gedling, as well as for the other districts in Nottinghamshire, for which the County Council needed population forecasts.
- 4.14 Figure 2 illustrates the effect on projections of the Nottingham Core HMA population of using the three options for future headship rate trends listed in paragraph 4.9 and the CLG trend. These are all controlled to the Core Strategies housing provision figures.

**Figure 2: Population resulting from Core Strategies housing figures using the 3 Options and the CLG trend headship rates**



*CLG Trend resumes the trend in the CLG headship rates after 2010.  
 Option 1 uses the rescaled (actual) 2010 headship rates for 5 years and then to resume the CLG trend  
 Option 2 uses the rescaled (actual) 2010 headship rates for all years up to 2028  
 Option 3 continues the 2001 to 2008 trend shown in the rescaled headship rates up to 2028 (i.e. that, if they went down between 2001 and 2008, they would reduce further up to 2028).*

**The ONS 2010-based population projections**

- 4.14 On 21st March 2012, ONS published 2010-based population projections. These use indicative revised 2010 population estimates as their base, rather than the published Mid-Year Estimates, and, as with previous ONS projections, they assume a continuation of past migration trends. Due to changes made to estimates of past migration, the indicative revised 2010

estimate for Nottingham City is 301,000, compared with the published figure of 306,700. Using the indicative revised estimate would have an effect upon the revised headship rates commissioned from Edge, as it would reduce the amount by which actual 2010 headship rates are lower than what was projected by CLG. However, it continues to be valid to use the figures produced by Edge because:

- The CLG projected headship rates are still too high at 2010, even allowing for the indicative revised population estimates.
- ONS make it clear that the Indicative Estimates are not replacement Mid-Year Estimates (MYEs)<sup>6</sup>. In July 2012, population data from the 2011 Census, which may well show different figures again. The Core Strategies work could not wait until we receive those.
- No CLG household projections are going to be produced from the 2010-based population projections. Any challenges to the Core Strategy figures are, therefore, likely to be on the basis of the 2008-based CLG household projections, the population element of which is not consistent with ONS 2010-based population projections due to the revisions made by the Indicative Estimates.
- Following publication of the 2011 Census results, new headship rates will be produced taking account of data for local areas, whereas the current CLG headship rates do not use any local data later than 2001. Unfortunately, the new headship rates will not be available until well into 2013, at the earliest. The Councils have tried to update local headship rates since 2001 using the best data available to them at the time.

### ***Results of the Forecasts***

4.15 The forecasts contain a large amount of information, including the future population by age/sex group, the implied levels of migration, the number of economically active people and household by type (e.g. the number of one person households). The bullet-points and table below summarise the most important points assuming that headship rates remain static at the rescaled 2010 levels (Option 2). They show the results from projections using the original CLG headship rates, for comparison. These are also dwelling-led, i.e. they start off with the Core Strategies' housing figures and look at the population implications.

- The population of Greater Nottingham<sup>7</sup> is forecast to increase by 72,700 (9.6%) between 2011 and 2028. This compares with 51,800 (6.9%) using the CLG headship rates.
- The Option 1 and 3 headship rate scenarios (see above) show increases of 56,800 (7.5%) and 97,200 (12.8%) respectively.

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<sup>6</sup> See "Improved Methodology for Estimating Immigration to Local Authorities in England and Wales", ONS, November 2011 <http://www.ons.gov.uk/ons/guide-method/method-quality/improvements-to-local-authority-immigration-estimates/index.html>

<sup>7</sup> Excluding Hucknall (i.e. Broxtowe, Erewash, Gedling, Nottingham and Rushcliffe).

- For the Plan Area<sup>8</sup>, the increase is 46,700 (8.8%) between 2011 and 2028.
- The annual net in-migration implied by the forecasts between 2011 and 2028 is 1,200 for Greater Nottingham and 40 for the Plan Area.
- For comparison, the trend-based ONS/CLG 2008-based projections assume an annual average of 2,700 net migration into Greater Nottingham over the same period.
- The number of economically active people aged 16+ is forecast to increase by 16,300 (4.2%) in Greater Nottingham and 12,200 (4.5%) in the Plan Area. Using the CLG headship rates the increases are 5,000 and 2,700 respectively. These figures assume no change in economic activity rates.
- The figures for the constituent districts are given below. Note that although the figures are given to the nearest unit it is not claimed that they are accurate to that level.

	Using rescaled headship rates					Using CLG headship rates	
	2011	2026	2028	Change 2011 to 2028		Change 2011 to 2028	
				No.	%	No.	%
Broxtowe	111,684	116,739	117,842	6,157	5.5	3,850	3.5
Erewash	111,318	117,372	118,433	7,115	6.4	7,115	6.4
Gedling	113,608	123,227	124,549	10,941	9.6	10,941	9.6
Nottingham	306,874	332,513	336,516	29,642	9.7	14,189	4.6
Rushcliffe	114,062	130,444	132,939	18,877	16.6	15,752	13.8
Plan Area	532,166	572,479	578,907	46,741	8.8	28,979	5.5
Greater Nottingham	757,545	820,295	830,279	72,733	9.6	51,847	6.9

<sup>8</sup> Broxtowe, Gedling and Nottingham.

<b>Table 4: Net migration (annual average) 2011 to 2026 &amp; 2028</b>				
	Using rescaled headship rates		<i>Using CLG headship rates</i>	
	2011 to 2026	2011 to 2028	2011 to 2026	2011 to 2028
Broxtowe	310	308	189	194
Erewash	237	237	237	237
Gedling	570	540	570	540
Nottingham	-898	-811	-1,665	-1,507
Rushcliffe	1,001	948	837	795
Plan Area	-18	37	-906	-773
Greater Nottingham	1,219	1,222	167	258

<b>Table 5: Change in economically active people (aged 16+) 2011 to 2028</b>				
	Using rescaled headship rates		<i>Using CLG headship rates</i>	
	No.	%	No.	%
Broxtowe	-186	-0.3	-1,497	-2.6
Erewash	-1,284	-2.2	-1,284	-2.2
Gedling	875	1.5	875	1.5
Nottingham	11,553	7.5	3,295	2.1
Rushcliffe**	5,309	9.2	3,605	6.3
Plan Area	12,242	4.5	2,673	1.0
Greater Nottingham	16,268	4.2	4,995	1.3

\*\* The 2011 to 2026 increase for Rushcliffe, using the rescaled headship rates, is 4,647 (8.1%).

- 4.14 Further details about these forecasts can be found in “Forecasts of population and households for Nottinghamshire and Derbyshire authorities controlled to new dwelling figures”, Derbyshire County Council, March 2012, and “Nottingham, Broxtowe, Rushcliffe – Rescaling headship rates for consistency with household data”, Edge Analytics Ltd, February 2012.

Graham Gardner (Nottingham City Council) and Richard Cooper (Nottinghamshire County Council) – June 2012