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Planning Design Economics

Economic Success and Housing

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1.0 INTRODUCTION

- 1.1 Nathaniel Lichfield and Partners and Deloitte were commissioned by the Yorkshire and Humber Regional Assembly to develop a methodology for calculating the extent to which different levels of economic success influence the scale of housing provision in the region for the purposes of emerging Regional Spatial Strategy. Additionally advice was also sought and has been provided on how to update the distribution model (adapted by the Regional Assembly) to take into account the spatial effects of the household growth arising from the economic scenarios.
- 1.2 This work will feed in to the Yorkshire and Humber's Regional Spatial Strategy covering the period up to 2021. The study will provide baseline information which the Regional Assembly and its partners will consider, along with all other relevant considerations, before arriving at suggested housing allocations for inclusion in the draft Regional Spatial Strategy.
- 1.3 This work takes forward the principles of the original methodology developed for the Regional Assembly in 2003/4 on how to establish the scale and distribution of new housing for the purposes of RSS, and which was prepared in liaison with a regional steering group. Subsequent to this, the Regional Assembly made some amendments to this methodology, and there has obviously been an evolution of emerging Government guidance on the subject. However, the terms of reference of this work mean that the focus is very much working to apply the economic scenarios to the existing methodological approach. The basis for this methodological approach and its rationale are not repeated here.

Background to Economic Scenarios

- 1.4 The work has taken advantage of the recent preparation of economic scenarios for each Local Authority by Yorkshire Futures and uses these projections of economic trends to inform estimates of household growth. The results of the economic scenarios have been taken as a given. The employment forecasts are central to the household estimates, therefore the Distribution Model will need to be scored appropriately; taking into account that people do not always live and work in the same Local Authority. Although local estimates of employment growth have been generated, the total figure is aggregated to a regional level and distributed using the

model, starting with the share of household growth derived from ONS Population projections.

- 1.5 Additionally, consideration will need to be given as to when the employment is forecasted to be created to feed into the phasing of household growth. The employment forecasts have been produced up to 2016 and have therefore been extrapolated to reflect the timescales of the RSS. As a result of this, there will be a degree of uncertainty post 2016 in terms of the household estimates and monitoring will be essential in establishing how the economy is performing and the subsequent impact of this on population and household growth.
- 1.6 The methodology used produces both population and household estimates. This work has taken the existing housing distribution model used by the Yorkshire and Humber Regional Assembly and has modified it to enable economic driven households to be separated from the ONS population based household estimates. The weightings of the variables and their subsequent scoring will require a series of judgements to be made, depending on policy aims and objectives as well as how the outcome of the scoring performs against a range of reality checks.
- 1.7 The approach taken to develop the housing estimates and the proposed approach to their distribution amongst Local Authorities are set out in this document.

Report Structure

- 1.8 This report is set out under the following headings;
 - Regional Housing Estimates – this section describes how the regional housing estimates were developed, setting out the assumptions and the realism of the estimates particularly in relation to migration
 - Distribution Model – an overview of the revisions made to the existing distribution model, setting out how the economic driven household estimates have been separated from the ONS based household estimates and the subsequent approach to distribution of these variables.
 - Conclusion – key issues to consider in taking the results of the work forward

2.0 REGIONAL HOUSING ESTIMATES

2.1 This section describes the methodology that has been applied to produce a range of household estimates for Yorkshire & Humber. It also includes the outcome of applying this methodology for the region and the levels of net migration required to support the household growth.

Methodology

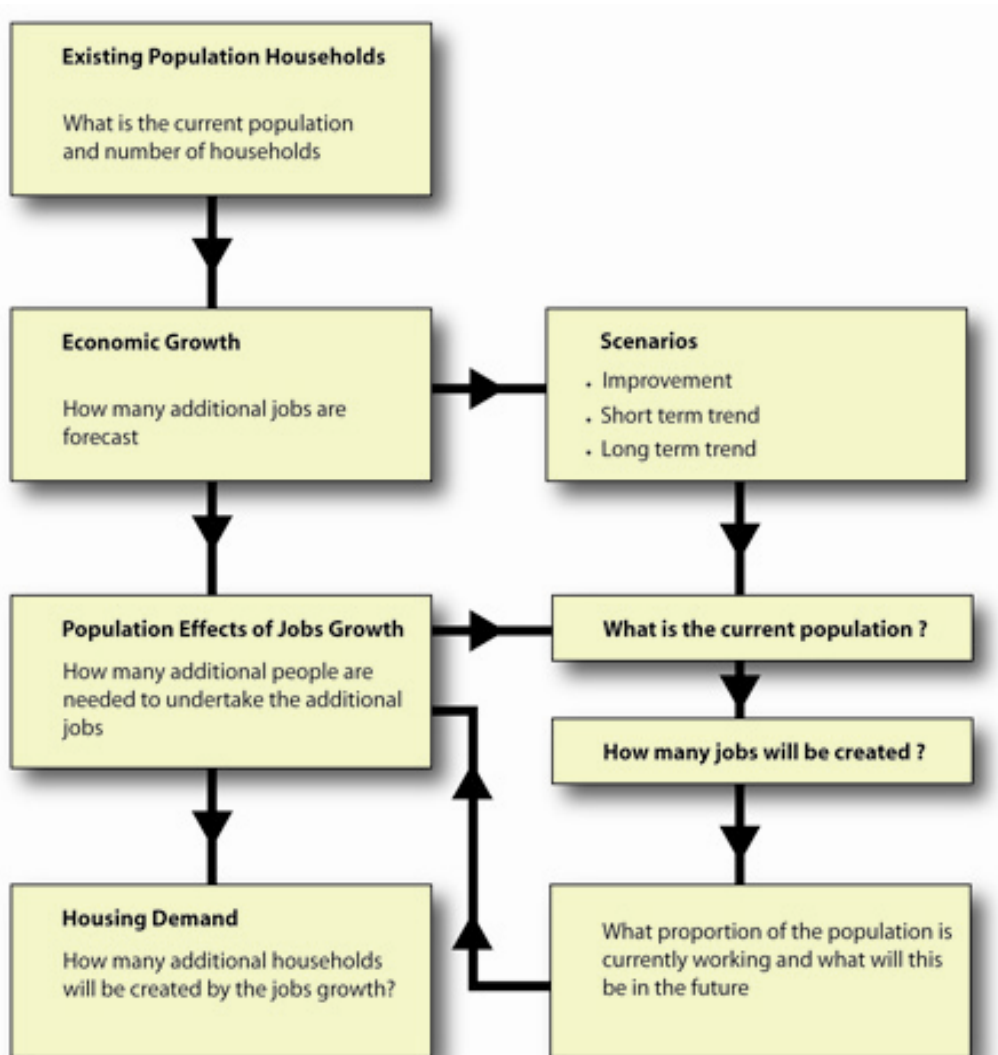
2.2 The methodology has used the three economic scenarios that have been produced by Yorkshire Futures as a starting point. The scenarios set out the anticipated increase in employment arising from economic growth, based on:

- a) long term trends;
- b) trends including the impact of planned investment and initiatives, recent alongside
- c) what may arise if higher rates of economic growth are achieved.

2.3 The economic scenarios produce employment forecasts from 2006 – 2016. This timescale does not correspond with the timescale for the RSS. As a result of this, an average has been taken over the ten year period. This average has then been multiplied by 5 and applied to the base data.

2.4 The employment forecasts produced as a result of the scenarios have not been questioned as part of this study. The realism and timescales of the employment forecasts and when employment is forecasted to arise will need to be taken into consideration in both the phasing of the housing figures to be included within the RSS as well as the monitoring of the performance of the economy and its subsequent impact on population and household growth.

2.5 The flow chart below illustrates the approach to translating the economic scenarios into household growth estimates.



Calculating the Working Age Population

- 2.6 A region's population comprises economically active and inactive people who make up the working age population. The proportion of working age people in Yorkshire & Humber is anticipated to decrease between now and 2021. To reflect the changing demographic profile of Yorkshire and Humber the working age population as a proportion of the total population has been derived for each individual Local Authority, using the 2003 ONS population projections.
- 2.7 Due to the data available, it has been assumed that the working age population is 15 – 64 for both males and females. The current definition is 16 – 64 for males and 16 – 59 for females, however it is proposed that the retirement age for women will increase to 64 in 2010 and this provides a reasonable assumption for the purposes of analysis.

Employment Rates

- 2.8 The economic scenarios produce employment forecasts. To project the anticipated increase in population arising from the increase in employment as predicted in the scenarios, it is necessary to establish current employment rates. Using the ONS Labour Force Survey, the current employment rate for each Local Authority has been used.
- 2.9 The Yorkshire & Humber region currently lags behind the second best performing region (the South East) in terms of employment rates by 6%.
- 2.10 To assess the population impact of different employment rates, two scenarios have been adopted:
- The continuation of current employment rates
 - An increase in the employment rate of each Local Authority by 6%
- 2.11 A view may need to be taken on this approach as a number of Local Authorities within Yorkshire & Humber have high employment rates, the highest being Craven 84.5%. Adopting the above approach would give Craven an employment rate of 90.5% which may be unrealistic as this would result in almost full employment, or it assumes that Craven's population have the skills required to fill the additional employment forecasted.
- 2.12 As a result of this it may be appropriate to adopt different employment rate scenarios as well as employment forecast scenarios for each Local Authority when determining household numbers. For the purpose of this research, we have not adopted a mix and match approach.
- 2.13 The current employment rate has been applied to the working age population as at 2003. This figure has been used as a base, to which the number of additional jobs generated by the economic scenarios and amended to reflect the RSS timescale has been added. This produces two alternative job forecasts, for the scenarios for each Local Authority: a) low, which is a continuation of current employment rates and b) high, if employment rates increased by 6% enabling the region to have the same employment rate as the South East.

Producing population estimates

- 2.14 If it is assumed that the job forecasts as a proportion of the working age population represent the different levels of economic activity, then the effects on the population can be calculated. For example if an employment rate of 71% produces 75,000 economically active people and one of 77% produces 75,000 economically active people, then this can be used to work out what the economically inactive population would be. If the economic inactive rate was 29% this would equal an economically inactive population of 30,633 people compared to one of 23% which would result in 22,402.
- 2.15 The economically active and inactive population have been added together to provide a working age population. It has then been assumed that this represents the proportion of working age people as at 2021, as identified in the ONS 2003-based population projections. This is to reflect that the working age population is projected to decline.
- 2.16 If the working age population for example equals 65% then the non-working age population can be derived. The non-working age population has then been added to the working age population to provide the total population. This has been undertaken for each employment rate.
- *Example 1* Using the example above, if the employment rate is 77%, then the total working age population is 97,402. If this equals 65% of the population then the total population will be 149,849.
 - *Example 2* the employment rate is 71%, the total working age population is 105,633. If this equals 65% of the population then the total population will be 162,512.
- 2.17 Six forecasts have been produced for each Local Authority, based on applying the two alternative employment rates to each of the three economic scenarios.

Producing Household Estimates.

- 2.18 To provide an indication of the number of additional households that are required during the RSS period, a Chelmer run has been undertaken by Anglia Polytechnic University (APU). The Chelmer model is a forecasting model that produces forecasts for a range of variables including population, housing numbers, household composition and labour supply. It has been used to translate the population forecasts into housing numbers. The Chelmer model uses a range of trend based

assumptions, and is therefore tailored to individual Local Authorities, providing household estimates that reflect local circumstances. The assumptions fed into the Chelmer model are constantly updated as new data sets become available, therefore a Chelmer run undertaken in the future could produce different household estimates.

2.19 The population figures produced for each Local Authority using the above approach have been provided to APU as a control. Using the population figures as a control the Chelmer assumptions have been applied (these are attached at Appendix 1) for each Local Authority. Headship rates have been applied to the population figures provided. The headship rates are based on historic trends for each Local Authority and are forecasted forward, this takes into account the ethnic composition of the population, the proportion of institutional population (military, prisons etc) and the potential household composition of the existing and migrant population. This information once applied to the population figures produces six household estimates for each Local Authority.

2.20 To compare how the economic driven household estimates vary estimates of household growth flowing from the ONS 2003-based population projections, a Chelmer run has been undertaken using the ONS 2003-based population projections as a control.

Regional Household Estimates

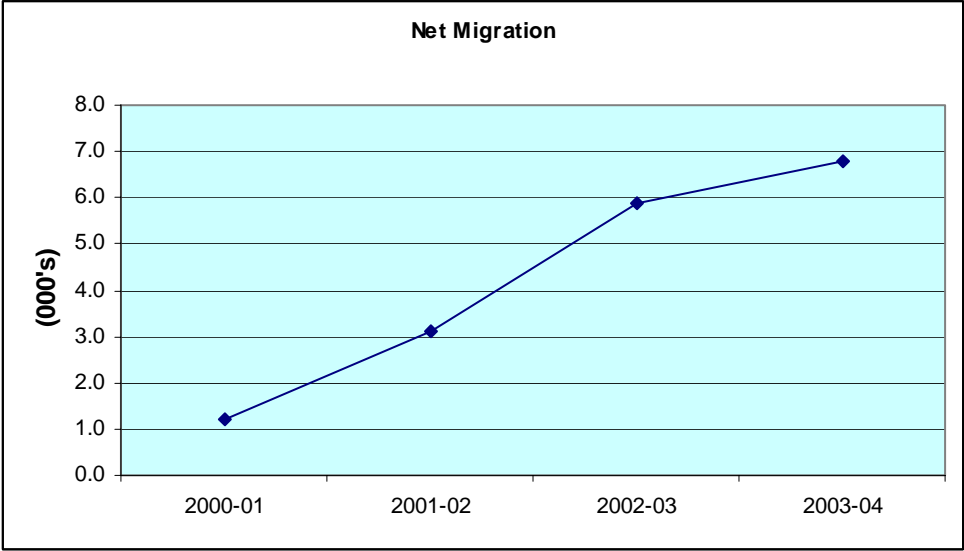
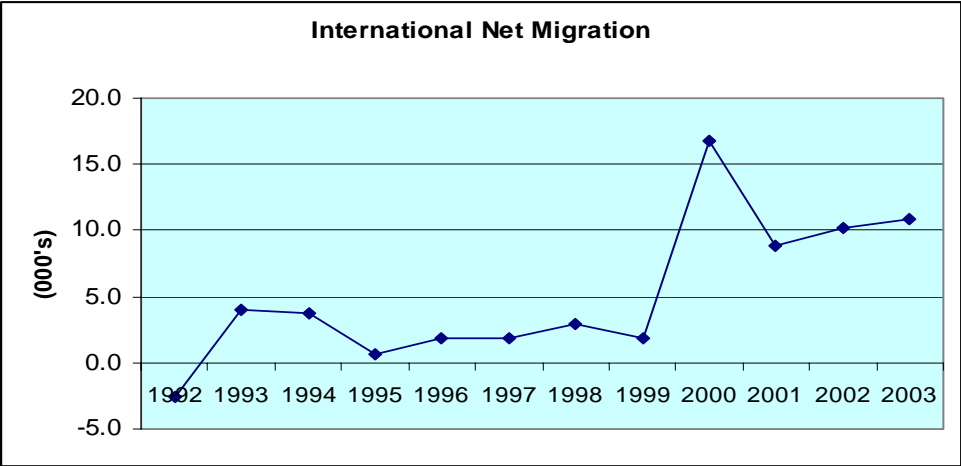
2.21 Seven regional household estimates have been produced using the above approach, these are cumulative of the Local Authority figures that have been derived for each employment rate and each scenario. The table below sets out the household estimates for each scenario.

2.22

Forecast Scenario	Annual net additional households	Annual Migration
ONS-based demographic led change	15,198	8,747
Long - High Employment Rate	14,106	6,707
Long - Low Employment Rate	14,345	7,168
Recent – High Employment Rate	19,190	16,677
Recent – Low Employment Rate	19,999	18,275
Improvement – High Employment Rate	24,126	26,385
Improvement – Low Employment Rate	25,507	29,111

2.23 In addition to providing household estimates, Chelmer were also asked to provide information on the level of migration that would be required for each of the household estimates. As can be seen from the above table this varies from a net in migration of 6,700 to 29,111 people per annum.

2.24 To provide an indication of the realism of these migration figures, an analysis of past migration trends for Yorkshire and Humber has been undertaken. This is set out in the graph below.



2.25 As can be seen from the above graphs Yorkshire and Humber has experienced a net in-migration into the region in the last four years. Migration in the last two years has exceeded 16,000 people per annum, which is similar to the level required under the Recent High/Low household estimates.

Conclusion

- 2.26 The above methodology has produced a range of regional household estimates ranging from 14,000 to 25,000 per annum. The household estimates arising from the continuation of long term trends are lower than the ONS projections and therefore should be viewed with caution. The household estimates produced under the improvement scenario would require an increase in both migration and build rates compared to current levels.
- 2.27 A number of issues will need to be taken into account when using this model to determine housing numbers for the RSS, these include;
- What level of economic growth can be achieved within Yorkshire and Humber? It will be essential during the RSS period to monitor economic, productivity and employment growth.
 - The economic scenarios assume that there will be a need for a higher skilled workforce in the future due to the type of jobs that are likely to be created. Due to labour market constraints, achieving higher employment rates in some of the Local Authorities may be challenging. A number of Local Authorities already have high employment rates - therefore it may be difficult to increase these rates further.
 - Migration is influenced by economic, quality of life factors and policy decisions; therefore these will need to be taken into account when determining the RSS housing requirement.
 - The results of this research will need to be aligned with policy considerations to determine the level of housing that is appropriate within Yorkshire and Humber, where it should be distributed and how it should be phased.
 - PPS11 advocates a “plan, monitor and manage” approach to be adopted during the lifetime of the RSS. A range of indicators will need to be collected and analysed to assess the impact of economic growth on housing including migration, commuting patterns, house prices, build rates, employment rates, jobs growth, vacancy rates etc.

3.0 THE APPROACH TO DISTRIBUTION

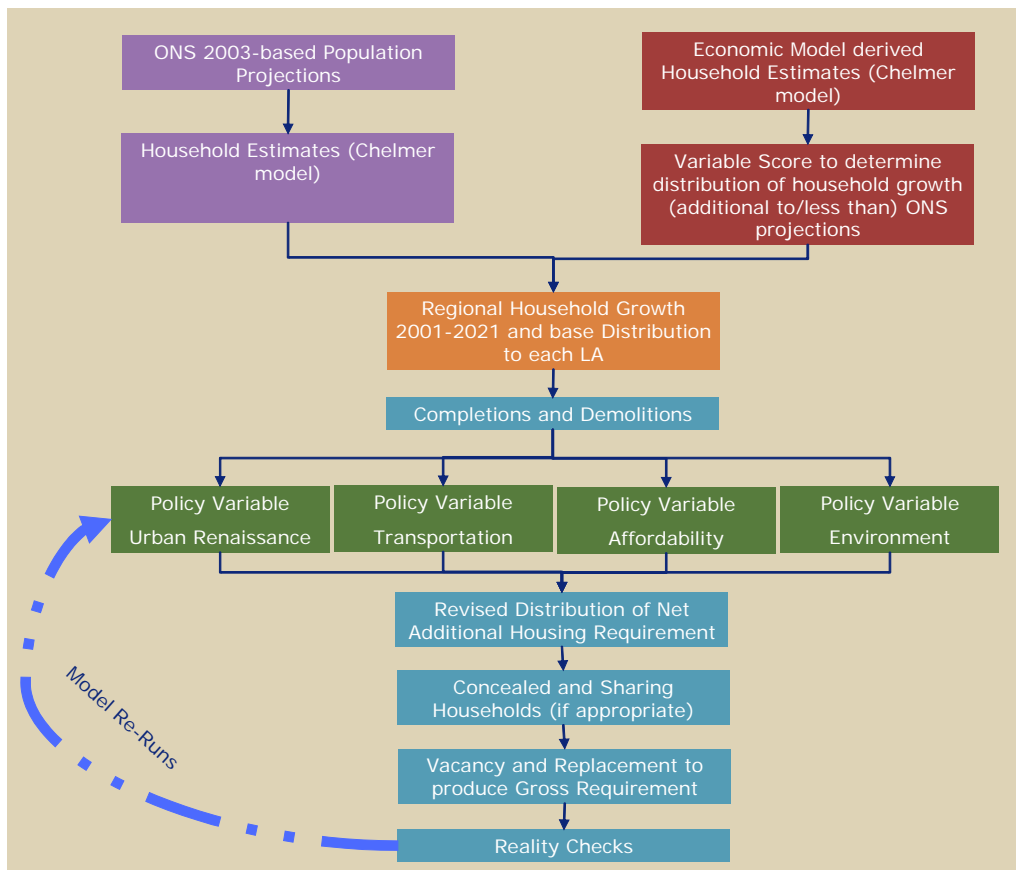
- 3.1 As stated in the original methodology, the process of distribution is intended to express the regional spatial strategy. Again, as within the original methodology, distribution of the net additional housing stock is achieved with assistance of the Distribution Model. An original version of the model was prepared by the NLP/DCHR Study Team in preparing the Methodology, whereby a significant element of distribution was focused around urban potential.
- 3.2 In the intervening period between completion of the original methodology in January 2004, and the commencement of this work in July 2005, the Regional Assembly made some alterations to the model, the principal one being the removal of urban potential data as a key determinant of distribution, although it remains in place as a 'reality check'.
- 3.3 The nature of the work undertaken by NLP/Deloitte as part of this engagement has been to update the model to reflect the economic-scenario-based household growth estimates, prepared by the Study Team. Whilst some restructuring of the original distribution model has been undertaken to make it more 'user friendly' (notably around the issue of variable scoring and weighting and data entry), the basic shape of the draft model is largely unchanged from that supplied by the Regional Assembly, and it is important to note that no formal review has been carried out to validate the integrity of changes that were made to the model subsequent to January 2004.

Principal Changes to the Distribution Model

- 3.4 The principal changes to the Distribution model (from that supplied by the Regional Assembly) are:
- Base data on households and the ONS projections are inputted based on the Chelmer model flows (see Section2)
 - The household growth estimates from the Economic Scenario Modelling are incorporated as a separate item, and calculated as a residual from the ONS Projections (ie how much more or less than the ONS projections).
 - An economic growth distribution score is separated from the other policy variables (environment, affordable housing etc) and is applied to the distribution of the residual household growth derived from the Economic Model

The Basic Process

- 3.5 As a result of these changes, a summary of the methodology for distribution (shown below), shows how the model is intended to assist in the process.
- 3.6 It is worth emphasising that the Distribution Model provides estimates to inform the RSS process based on the data and assumptions and judgements that are input – there is no single right answer. The objective of the model is to provide a systematic framework for trying to quantify the impact of what are, ultimately, qualitative policy judgements. It is intended as an aid to the process rather than as the process itself. As a computer spreadsheet with a set of prescribed formulae there are some parameters to what can be produced by it, and it has always been inevitable that some judgements will need to be made ‘outside’ the model, based on reality checks and other factors.
- 3.7 The original methodology document indicated that the model produced projections/estimates based on a consistent approach which were then set against the ‘reality checks’ allowing for a) adjustments to the model assumptions; and then b) manual adjustments to the figures to accommodate a particular policy viewpoint or set of circumstances. To that end, in arriving at the final numbers, it may be necessary to make revisions to the figures that are produced by the model.



3.8 The basic shape of the approach is:

- Establishing the base household projections derived from the 2003-based ONS population projections applied to the Chelmer model. This produces local authority-based figures of household growth based on a 5-year trend and consistent application of Chelmer assumptions
- Establishing the amount of additional or less household growth that is anticipated as a result of the economic-scenarios. Some scenarios result in lower levels of household growth than the ONS projections. Some result in higher levels of growth. The scoring variable for economic growth, distributes this residual between local authorities.
- The remainder of the model works in the same way as that adopted by the Regional Assembly
- Applying scores for each local authority for a series of policy variables. Each score (usually 1-5) has associated with it a factor by which the proportion of distribution for each LPA might increase over or decrease from the share of household growth envisaged by the Projections
- The application of a score gives a theoretical distribution for each policy variable based around the extent of change from the 2001 share of households. These are then aggregated, with a policy weighting multiple factor for each. The aggregate is divided by the sum of the weightings to produce an overall figure.

This figure is subject to a series of 'reality checks' (including build rates, and urban housing capacity)

- Taking into account a change in vacancy rate and the level of clearance and replacement, produces a gross housing supply

How to Use the Model in defining RSS figures

3.9 The Distribution Model is a tool to assist in the process of defining RSS figures. It is not appropriate to require the model to necessarily reflect every subtle requirement or adjustment that is needed in arriving at RSS. For this reason, it is suggested that the model is used in the following way:

- Arriving at the two Economic Scenarios that, on balance, are those that best reflect the likely economic futures for the region
- Arriving at an agreed set of 'scores' for each local authority against the policy variables
- Use these scores to undertake a model-run with equally balanced 'weightings'
- Consider the flows from these two model runs
- Apply and test different weighting combinations, presenting up to three different 'cuts' for each Scenario.
- Present these runs as the basis for discussion, reality checks, adjustments to weighting, a model re-run, and then, make adjustments outwith the model to arrive at proposed RSS figures.

4.0 CONCLUSIONS

4.1 The production of the household estimates and updates to the Distribution Model have been undertaken within the context of the following:

- d) The realism of the employment forecasts arising from the economic scenarios has not been questioned. Additionally we have not assessed the realism of attaining the different economic scenarios. The economic scenarios have been used as the base for this work and have been amended to reflect the timescales of the RSS. The performance of the economy will need to be an important element within the 'plan, monitor and manage' approach to the RSS. Guidance only just issued by ODPM on using economic information to inform RES and RSS may also be relevant.
- e) The Chelmer run is based upon a number of assumptions derived from a range of base data, which are constantly updated. Therefore the household estimates produced by Chelmer based on the population estimates derived from the methodology need to be assessed within this context.
- f) To reflect economic change within Yorkshire and Humber, the household growth estimates will need to be phased accordingly within the RSS timescales. This will be subject to a range of policy judgements based on both planned and proposed initiatives. Additionally the economic modelling runs only until 2016 and this will need to be borne in mind.
- g) There is no single solution or template for how a distribution model might operate. The amendments made are based on the discussions/email exchanges we have had with the Regional Assembly, but there is no right or wrong approach – it is very much a matter of judgement as to how a Region arrives at an estimate for scale and distribution of housing, and stakeholders will need to be comfortable with the approach adopted.
- h) The original approach and methodology (within which the current work is still very much rooted) was produced in the context of PPG3 and 11, prior to the recent Government Consultation document which sets out an approach to planning for housing in RSS that is, in part, at variance with the methodology currently in place. In particular, the sub-regional dimension is now a feature of the Government's proposed approach, as is use of additional market data. This emerging framework may well have an impact on how the regional household estimates are to be distributed and future changes in approach may be necessary.
- i) No attempt has been made by NLP/Deloitte to apply judgements on the scoring or targets inputted into the model – figures included are therefore either 'dummy' numbers or are those supplied originally. The Regional Assembly will wish to review these and the basis for making these judgements in light of amendments to the model.
- j) It is recommended that the Regional Assembly spend time 'flexing' the model using different cuts of the data and scoring prior to preparing specific 'runs' of the model and presenting the results of scoring. This is to ensure that the

impacts of changes in scoring and weighting and different assumptions are understood.

- k) One of the areas of discussion with the original model was the impact of scoring variables on distribution. The weightings palette in the model provides the opportunity for the Regional Assembly to adjust these weightings and the impact that scores have to whatever is considered appropriate.
- l) We have not undertaken a formal review of the version of the spreadsheet supplied by the Regional Assembly at the commencement of the current work (which itself evolved from the NLP/DCHR spreadsheet in 2003/4), and which forms the basis for the current updated version of the distribution model. Clearly, a number of amendments were made to the original, but we have not made a formal review of their integrity or the accuracy of the projections that result.
- m) More generally, it is difficult to develop a computer spreadsheet to the extent whereby it can be assured that all errors have been detected. Prior to placing any reliance on the spreadsheet, you may well wish to carry out checks upon it and consider whether to secure an independent review of its logical integrity.

4.2 The final point is that the model is a means to an end, and not an end in itself. It is a framework to assist in making policy judgements. Undertaking additional model re-runs based on 'reality checks' will be part of the process of arriving at RSS housing figures, but it will not be all of it. The reality checks will also need to inform judgements made outside the model in the final stage of defining RSS figures.

APPENDIX 1

CHELMER RUN ASSUMPTIONS

Variable	Source
Headship/household rates	1996 based DETR
Migrant headship/household rates	1996 based DETR
Migrant/age/sex	Census 2001
International migration	Census 2001/ONS 2003 based
Vacancy Rates	Census 2001
Holiday Accommodation/Second Homes	Census 2001/ONS 2001 Mid Year Estimates
Fertility Rates	2003 Based ONS
Mortality Rates	2003 Based ONS
Infant Mortality Rates	2003 Based ONS
Local Correction Factors	Register births/deaths 2003
Composite Participations	Economic Activity 2001
Population projections	2003 ONS
International net migrants	ONS 1998 – 2003
Househld Corrector	Census 2001 and mid year estimates

APPENDIX 2

Running through the Distribution Model Spreadsheet

The draft model spreadsheet has a series of components.

- The Base ONS Projections
- The Economic-model driven projections and economic growth policy variable score
- Completions and Commitments
- Policy Variables
- Concealed and Sharing Households
- Net Housing Requirement
- Gross Housing Requirement
- Reality Checks

The schedule below seeks to articulate the spreadsheet and its approach. The spreadsheet is long and superficially complex, particularly where it seeks to apply numerical quantification of qualitative judgements. Any mathematical equation is not always easy to articulate in English, so it is worth reviewing the schedule below in tandem with a cell-by-cell/column-by-column review of the spreadsheet. The Formula Auditing tool bar (below) in Microsoft Excel is a useful tool for tracing precedents and dependents in cell calculations.



Column	Contents	Function in Model
The Base ONS Projections		
B	Base Population Figures 2001	For information
C	Base Household Figures 2001	Used in calculation to derive household growth
D	Population Figures 2021 (based on ONS 2003-based population projections)	For information
E	Household Estimates 2021 (based on Chelmer run using ONS 2003-based population projections)	Used to calculate base household growth
F	Population Change 2001-2021 (D-B)	For information
G	Household Change 2001-2021 (E-C)	Used to provide the baseline projections of household growth (based on 2003-based ONS population projections)
H	% Share of regional household growth 2001-2021	For information
The Economic-model driven projections and economic growth policy variable score		
I	Household estimates 2021 (based on Chelmer run using economic-modelling scenarios)	Used to identify the quantum of household growth needed to sustain labour force in each economic scenario. This is used to derive the level of growth above or below that estimated to arise from the ONS projections

Column	Contents	Function in Model
J	Residual growth above or below ONS 2003-based population projection-based (I-E). This is the amount of household growth/decline that can be attributed to the economic scenario (as opposed to the ONS-based projection)	The figures for individual authorities are presented for information only. The top-line figure (Cell J10) is carried forward and used in subsequent columns to distribute the residual growth/decline.
K	The amount of residual growth (from Cell J10) estimated in each authority if it was shared out in the same proportion as the ONS 2003-based population projection-based household growth estimates (Column H). E.g. if Barnsley's growth is projected to be 5.18% of the total, this column calculates 5.18% of the region's residual economic model calculated growth/decline	The figures in this column are used as the basis for making adjustments to the share of the residual economic-driven growth/decline, for example, adjusting Barnsley's total up or down from 5.18%
L	Economic Growth Variable Score. This column allows the user to enter a score of 1-5 based on a judgement as to how much or little an area is anticipated to share in the additional economic-driven household growth/or decline.	The scores in this column work in two ways depending on whether the residual economic-model growth is positive or negative (ie above or below the ONS-based projections). The functionality is described in respect of cells N-P (if positive) and Q-S (if negative).
M	This column shows the results of the factor that the scoring (from Column L) uses to adjust the proportions (drawn down from the Weightings Sheet)	Applied to the proportion share in Column Q if the residual economic-driven household growth estimate is positive
N - P	These columns apply if the residual economic-driven household growth estimates are negative (ie the economic modelling driven household growth estimates indicate that household growth will be less than the ONS projections). The columns make a series of calculations, using the scoring (from Column L) to adjust the local estimates of residual decline (from Column K) by a fixed percentage (drawn from the Weightings Sheet – Column D). In this context, a score of 1 indicates weaker economic performance (which gives 100% of its share of decline below ONS projections), whilst 5 would indicate strong economic performance (which would result in -33% of its share of decline – ie residual growth above ONS projections amidst regional decline). Column N multiplies the proportions in Column K by percentages derived from the weightings sheet. The totals from column N are then turned into percentages of the total in Column M, and Column P then applies these percentages to the region's residual economic-driven household growth estimate (Cell J10).	The individual local authority estimates in Column P are transferred to Column T (if negative) and then deducted from the ONS-2003-based population projection-derived household estimates in Column U. If the residual economic-driven household growth estimates are positive, the outputs from this part of the spreadsheet are not used.

Column	Contents	Function in Model
Q-S	These columns apply if the residual economic-driven household growth estimates are positive (ie the economic modelling driven household growth estimates indicate that household growth will be more than the ONS projections). The scoring works in exactly the same as for the Policy Variables used in the previous version of the model. The columns make a series of calculations using the scoring (from Column L) to drives the weighting factor in Column M (drawn down from the Weightings sheet – Column C – which can be adjusted), which is multiplied by the proportion share of household growth (in Column H) to give a revised share (Column R). This revised share is applied to the region-wide estimate of residual economic-driven household growth in Column S.	The individual local authority estimates in Column S are transferred to Column T (if positive) and then added to the ONS-2003-based population projection-derived household estimates in Column U. If the residual economic-driven household growth estimates are negative, the outputs from this part of the spreadsheet are not used.
T	This column shows the residual economic-driven household growth estimates at local level based either on the output from the formulae in Columns N-P (if negative) or Columns Q-S (if positive).	Each local authority figure is added to the ONS-based figure (Column G) to produce local estimates of household growth for each authority. These figures are used as a platform for making future adjustments.
U	This column shows the % share of overall estimated regional household growth 2001-2021 derived from Column T	The % shares are used as the 'policy neutral' base for making future adjustments based on the policy variables
Completions and Commitments		
W – Y	These columns set out data on completions, permissions and demolitions. This is used to derive the residual requirement in Column Z.	This data is used to identify the residual requirement for net additional housing taking into account a) what has been built between 2001 and the RSS base-date of 2004; b) current permissions and sites under-construction; and c) houses demolished 2001-2004 that need to be taken into account and added to the housing requirement. These figures flow into column Z.
Z	This column provides a figure for the residual additional housing requirement for each authority and the region as a whole.	The figures for each authority are provided for information only and perform no function. The regional figure (Cell Z10) is the figure that is then distributed using the % share figures and policy variables.

Column	Contents	Function in Model
Policy Variables		
AA-TT	The Policy variables work in the same way as in the original version of the model (and indeed in the same way as the economic growth score in Columns Q-S above). In other words, a score of 1-5 is applied to each authority. The higher the score, the more the proportionate share of household growth should be increased. The effect of each grade of score is set by columns F-I in the Weightings Sheet.	Columns AD, AI, AN and AS show the revised % shares of distribution for each authority that result from each scoring against the policy variable.
AU and AV	These two columns provide the final % share for each authority based on the scoring, and the resultant residual net additional housing requirement (not including commitments)	The proportions in Columns AD, AI, AN, and AS are multiplied by the weightings (Row 3 in the Weightings Sheet) feed into an overall % share for each authority (Column AU) that is applied to the Residual Requirement (Column AV)
Concealed and Sharing Households		
AW and AX	These two columns are used to allow an adjustment (if one is needed) to account for the fact that the Chelmer estimates of household growth include a proportion of concealed households. The percentage of concealed households in 2001 is set out in Column AW. The yellow cell in Column AX can then be inputted with a target percentage rate for concealed households in 2021, and this is then extrapolated for each authority, based on its share of concealed households in 2001. If this variable is not desired to be used (for example by considering the issue of concealed households outwith the model), it can be set at 0.	The proportions in Column AX feed into column BA
AY and AZ	These two columns work in exactly the same way as Columns AW and AX, but for sharing households. Again, if this variable is not desired to be used, it can be set at 0	The proportions in AZ feed into column BA
BA	The combined percentage of total household growth that comprises concealed and sharing households.	The percentage figures for each authority in this column are deducted from the residual requirement (and commitments) in column BB
Net Housing Requirement		
BB	This sets out the estimated net additional housing requirement for the region and each local authority 2004-2021, taking into account the scoring against policy variables, and including commitments at 2004	This is the first key output of the model – a net additional housing requirement 2004 – 21. This figure is carried forward to other parts of the model to calculate gross housing requirements.
BC	The net additional housing requirement converted to an annual rate.	For information

Column	Contents	Function in Model
Vacancies and Gross Housing Requirement		
BD - BL	These columns are unchanged from the previous version of the model. Some formatting has been changed but the underlying formulae and data are unchanged.	Sets out a gross housing requirement for each area based on an assumed vacancy rate and future demolition rates.
Reality Checks		
BM – BY	Aside from some formatting amendments, these columns are unchanged from the previous version of the model.	Provides a series of other projections and measures against which to consider the outputs from the model.