

# ORS Housing Mix Model Technical Paper

16<sup>th</sup> August 2010

## Opinion Research Services Housing Mix Model: Technical Paper

---

1. This paper provides a technical overview of the ORS Housing Mix Model, including information on the data sources, key assumptions and the way in which the Core Outputs are derived.
2. Reference is made as appropriate to the Strategic Housing Market Assessment Practice Guidance (Version 2) issued by the Department for Communities and Local Government (CLG) in August 2007, to demonstrate the way in which the Housing Mix Model provides robust and credible evidence to inform Strategic Housing Market Assessment Core Outputs.

### Introducing Strategic Housing Market Assessments

3. Strategic Housing Market Assessments (SHMAs) aim to provide evidence to inform policies about the level of affordable housing required and aimed at providing the right mix of housing across the whole housing market (both market and affordable housing).
4. The Practice Guidance for undertaking SHMAs outlines the process criteria required and sets out eight Core Outputs that need to be provided as a minimum in order for SHMAs to be considered robust and credible in line with PPS12. The SHMA Core Outputs are summarised in [Figure 1](#), which also identifies that the ORS Housing Mix Model provides three of the eight Core Outputs required.

Figure 1  
CLG SHMA Practice Guidance Figure 1.1 – Core Outputs

SHMA Core Outputs		Core Output from Housing Mix Model
1	Estimates of current dwellings in terms of size, type, condition, tenure	-
2	Analysis of past and current housing market trends, including balance between supply and demand in different housing sectors and price/affordability. Description of key drivers underpinning the housing market	-
3	Estimate of total future number of households, broken down by age and type where possible	-
4	Estimate of current number of households in housing need	-
5	Estimate of future households that will require affordable housing	YES
6	Estimate of future households requiring market housing	YES
7	Estimate of the size of affordable housing required	YES
8	Estimate of household groups who have particular housing requirements e.g. families, older people, key workers, black and minority ethnic groups, disabled people, young people	-

5. The Practice Guidance also provides advice on the issues that should be considered when deriving the Core Outputs – but it is not prescriptive in its approach, and notes (page 9):

*Housing markets are dynamic and complex. Because of this, strategic housing market assessments will not provide definitive estimates of housing need, demand and market conditions. However, they can provide valuable insights into how housing markets operate both now and in the future.*

6. Practice Guidance also promotes the use of secondary data where appropriate and feasible, recognising that they can provide consistency between different housing market areas, reflect actual behaviour and events rather than aspirations, are often cheaper to obtain than primary data and allow the monitoring of trends, usually on an annual basis. They can also provide a picture of market conditions based upon small areas and are less affected by methodological problems of bias than surveys.
7. Within this context, the Housing Mix Model developed by Opinion Research Services is based exclusively on secondary data from a wide range of sources, although it provides the opportunity to test a range of assumptions which may be informed by either primary or secondary data. In particular, the model has been designed to help understand the key issues and provide insight into how different assumptions will impact on the required mix of housing over future planning periods.

### The Future Housing Market

8. In considering the future housing market, the Practice Guidance recommends that housing market partnerships should base their analysis on the most recent official government population and household projections. Such projections are trend-based, so the Practice Guidance also suggests that partnerships undertake sensitivity testing of likely future household growth by varying the assumptions underpinning change and considering the impact of housing led forecasts.
9. The Practice Guidance recognises that future housing demand is extremely difficult to quantify – so partnerships are encouraged to ensure that the evidence brought together enables the identification of high-level messages about the key trends and drivers to which future policies will need to respond (including an estimate of the scale of future housing requirements based on net household projections) rather than aiming to pin down numerous details. It is also recommended that partnerships consider affordability trends, to understand how changes in affordability might affect the future housing mix.
10. Many County Council and Unitary Authority Research and Information Units and Regional Housing and Planning Bodies already undertake demographic work to inform a wide range of strategic policies – therefore it is not normally necessary for SHMAs to produce independent household projections. Using existing projections can provide consistency in planning across the range of different service areas covered by Local Authorities and other public services; therefore it is helpful for SHMAs to base their analysis on existing projections.
11. For this reason, the ORS Housing Mix Model builds on existing household projections to effectively profile how the housing stock will need to change in order to accommodate the projected future population. Assumptions on changes in affordability and the projected relationship between future housing costs and household income are readily updateable to enable effective sensitivity testing to be undertaken.

### Housing Need

12. The Practice Guidance considers the future housing market from a high-level, strategic perspective; considering how key drivers and long-term trends will impact on the structure of the household population over the full planning period. In contrast, the approach suggested for assessing housing need adopts a low-level, operational perspective; focussing on short-term trends and individual household transactions considered on a year-by-year basis. Furthermore, whilst the Practice Guidance seeks to understand affordability in the context of the future housing market, the affordability analysis for assessing housing needs again focuses on current household incomes and housing costs.

13. The approach suggested for assessing housing need includes many aspects which are a legacy from the earlier guidance “Local Housing Needs Assessment: A Guide to Good Practice” published by the Department for the Environment, Transport and the Regions (DETR) in July 2000, which is one of the documents that the SHMA Practice Guidance supersedes.
14. Whilst the suggested approach builds on a well-established framework, unfortunately it does not comfortably reconcile with the strategic nature of SHMAs. This in itself is not a problem – but one of the key questions for partnerships to consider in relation to the assessment of housing need is (page 53):

*How does the net annual need figure compare to the estimate of total future annual change in total numbers of households derived from Chapter 4 [the future housing market]? What are the implications of this in terms of estimating the number of households requiring market housing?*
15. In order to meaningfully compare the assessment of housing need with the change in total numbers of households (and the overall requirement for additional housing), both numbers need to be derived in comparable ways – either focussing on short-term trends and individual household transactions on a year-by-year basis, or alternatively considering key drivers and long-term trends over the full planning period.
16. ORS has a well established model – the ORS Housing Market Model – that considers housing need in the context of overall housing requirements on a short-term basis, which has withstood scrutiny at numerous Planning Inquiries since its inception in 1995. Nevertheless, this model is dependent on a significant amount of local-based information about current, past and future household circumstances, which requires primary data gathered through detailed personal interviews.
17. The ORS Housing Mix Model considers both housing need and overall housing requirements on a longer-term basis, providing robust and credible evidence about the required mix of housing over the full planning period and understanding how key housing market drivers (such as affordability) will impact on the appropriate housing mix.
18. In order to provide this long-term context for understanding housing needs, the Housing Mix Model does not adopt the granular approach suggested by the Practice Guidance in the housing needs chapter; but instead it develops the approach suggested by the Practice Guidance in the chapter on the future housing market.

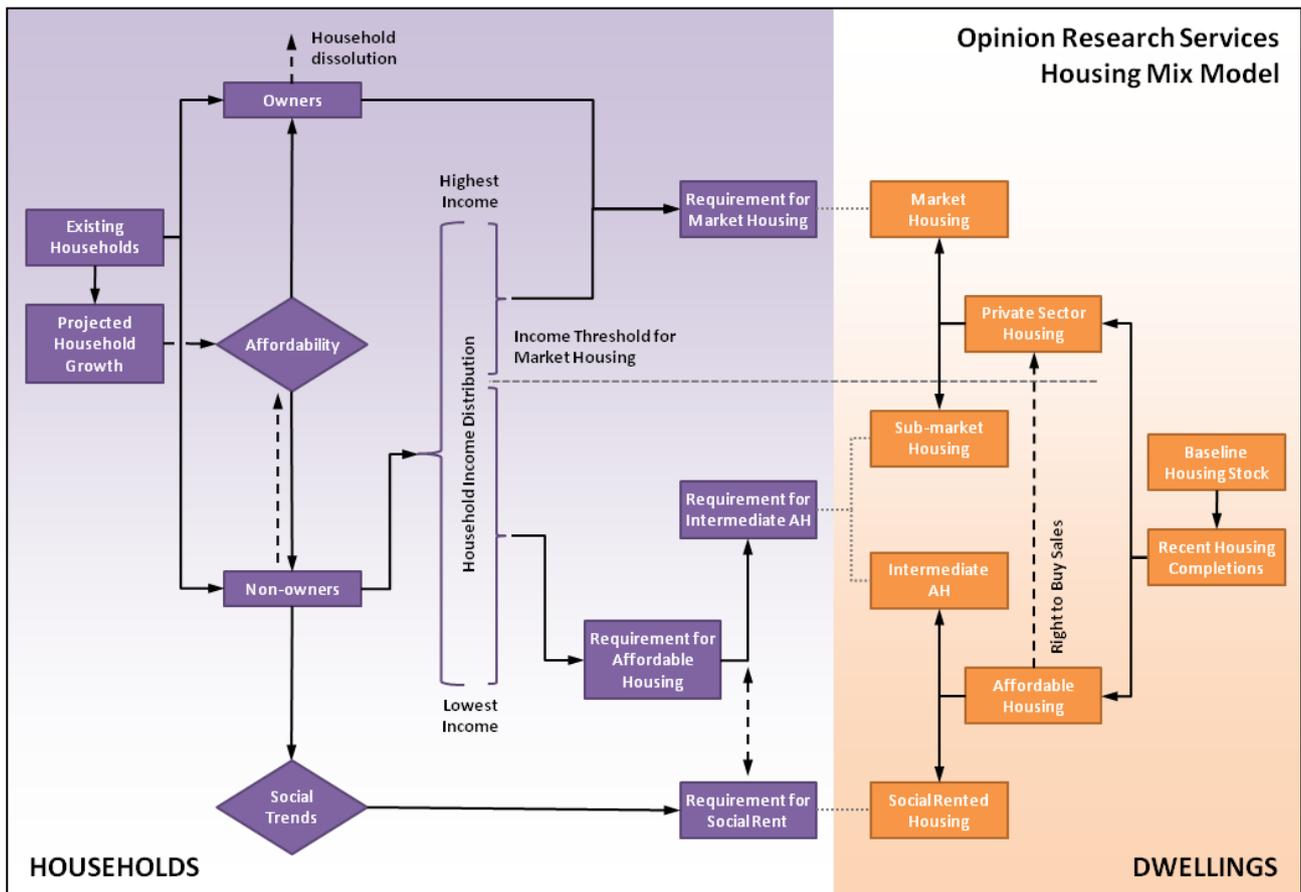
### Satisfying the Practice Guidance Requirements

19. The Practice Guidance is not a prescriptive document, but a tool to assist partnerships conducting SHMAs.
20. It recognises that different studies will adopt different approaches to deriving the required Core Outputs, and as long as the SHMA clearly satisfies the required process criteria (including ensuring that assumptions, judgements and findings are fully justified and presented in an open and transparent manner; a full technical explanation of the methods employed is included; and that house builders and other key stakeholders have been involved in the process) then it should be considered robust and credible in line with PPS12.
21. Any discussion at independent examination should focus upon the assessment’s findings rather than the approach used.

**Introducing the ORS Housing Mix Model**

- 22. The ORS Housing Mix Model uses a wide range of secondary data sources to build on existing household projections and profile how the housing stock will need to change in order to accommodate the projected future population. The secondary data sources are readily updateable as new information is published, and a range of assumptions can be varied to enable effective sensitivity testing to be undertaken.
- 23. Figure 2 provides a detailed overview of the structure of the Housing Mix Model and the way in which the different stages of the model interact.
  - The left hand section of the diagram considers households in terms of the baseline population and projected household growth, and their associated affordability and housing requirements.
  - The right hand section of the diagram considers the dwelling stock in terms of the tenure and housing costs for both the existing stock and the recent housing completions.

Figure 2  
Detailed Overview of the ORS Housing Mix Model



- 24. The Housing Mix Model considers the projected household population alongside the existing dwelling stock in order to establish the necessary balance between Market Housing and Affordable Housing in relation to the additional dwellings to be provided, and within the Affordable Housing dwelling provision the appropriate role of Intermediate Affordable Housing and Social Rented Housing.
- 25. The following sections set out the operation of individual components of the model in further detail. References to data sources are highlighted in blue with references to assumptions in green.

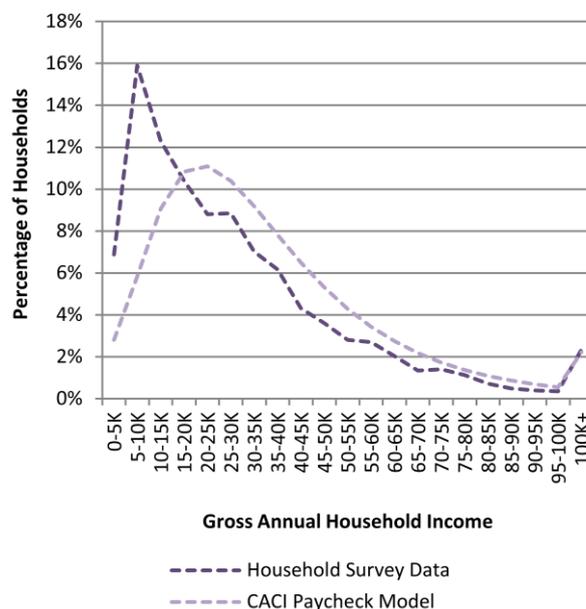
## Establishing the Balance between Owners and Non-owners

26. It is readily accepted that in considering household affordability, it is essential to consider the equity that existing owners have in their current home alongside household income. Many existing owners would be unable to afford to purchase a suitable home on the basis of their income alone – although they were able to afford when they first entered home ownership, and can now benefit from the equity that has appreciated in their property as house prices have increased.
27. Whilst some homeowners may move back into rented accommodation during later stages of their housing career, the substantial majority will continue to own their own home. For this reason, it is appropriate that the model considers the requirements of owners and non-owners separately – therefore the first stage of the model separates households into these two groups on the basis of baseline [information about existing households taken from the 2001 Census](#).
28. [Household projections](#) do not typically provide information about changing tenure patterns; therefore the model seeks to divide additional households into owners and non-owners on the basis of an affordability assessment. Within the modelled outputs, the [household projections](#) are also constrained to equate the RSS dwelling delivery targets for each local authority. However, the model can be easily adjusted to produce outputs linked to any dwelling delivery target.
29. The affordability assessment considers the likely affordability of newly forming households, but also the changing affordability patterns of existing households. It is important to recognise that the income distribution is cyclic to an extent – young households will tend to have lower incomes, incomes will tend to increase during the period that households are economically active and working (some incomes only changing marginally whereas others increasing more significantly), and finally incomes will tend to reduce later in life as households retire from paid work and subsequently as pensioner couples become single pensioners following the death of one partner.
30. In this context, many households will not be able to afford home ownership at the time that they initially form – but changing circumstances will enable them to move from rented to owned accommodation later in their housing careers. For this reason, the affordability assessment considers wider affordability across the full income distribution rather than naively focussing only on the income of newly forming households at the time that they form. The model is therefore not seeking to understand the household income and affordability of newly forming households, but the number of current non-owners who at any point in time have the ability to meet their own housing requirements in the market.
31. The model also takes account of the household dissolution of existing owners that is projected to occur over the household projection period (based on [Government Actuaries Department survival rates](#) and [2001 Census data on the tenure mix for older households](#)), offsetting this loss of owner occupiers against any new owners identified through the affordability analysis.
32. The outcome of this stage of the analysis is to establish the number of households who are owners and non-owners at each stage of the given household projection. The model does not seek to profile the income of newly forming households, but rather that of all non-owners. Therefore, at any point in time it is seeking to understand how many non-owners can afford to meet their housing needs in the market. This balance will be sensitive to assumptions about [affordability](#) and the [long-term relationship between house prices and incomes](#) which are addressed below.

## Profiling the Household Income Distribution

33. To assess household affordability, it is necessary to profile the income distribution of household in the study area. The Practice Guidance identifies a number of models are available that estimate household income at a local level, but many only provide an estimate of the mean or median income for the area and do not provide detail on the income distribution.
34. In developing the Housing Mix Model, ORS recognised the need for local level data about household incomes and secured a license to use the CACI Paycheck data within the model. This dataset provides information at both postcode level, detailing the mean and median income for the area and also the number of households in each £5,000 income band ranging from “Less than £5,000” through to “95,000 but less than £100,000”, and also those with incomes of “£100,000 or more”.
35. Since 1995, ORS has undertaken many thousands of detailed personal interviews to inform Housing Requirement analysis across a wide range of different local authority areas across England and Wales. These interviews have gathered a substantial amount of factual data about households’ housing circumstances, including household income.
36. We have been able to establish that a good correlation exists between relative mean incomes reported by the CACI data and the results from primary data in the areas where we have conducted household surveys. Nevertheless, analysis of the two sources shows a substantial discrepancy between the CACI income distribution and the household survey data.
37. **Figure 3** illustrates the income distribution for a sub-region where a household survey of over 5,000 personal interviews was conducted (and weighted to compensate for identified non-response bias) alongside the equivalent distribution from the CACI model.
38. It is worth noting that the household survey data is subject to sampling error, which is why the curve appears to be less “smooth” than the output from the CACI model. Despite this, it is clearly evident that the household survey shows a significantly higher proportion of households in lower income groups than the CACI model suggests.
39. The results from the CACI model consistently follow the same distribution pattern across every area, with the mean and standard deviation of the curve being adjusted to reflect local variations. The mismatch observed in the example sub-region illustrated in the chart above is typical of the mismatch found in every area where the household survey and CACI data were compared – but what was particularly noteworthy was that the household income profile curve derived from each primary dataset tended to follow the same shape – with a sharp income peak that gradually fell away.
40. Given the consistency of this pattern, ORS has developed a Household Income Model that profiles the distribution of local income on the basis of existing [primary data from a number of household surveys](#).

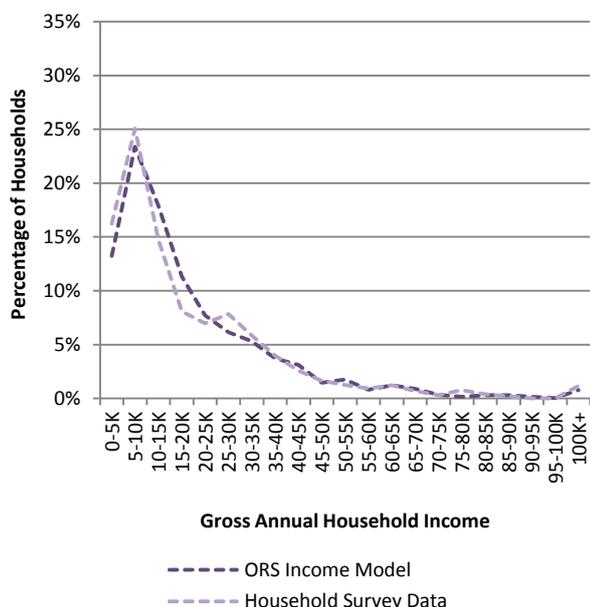
**Figure 3**  
Comparison of Income Distribution from Household Survey Data and CACI Paycheck Model



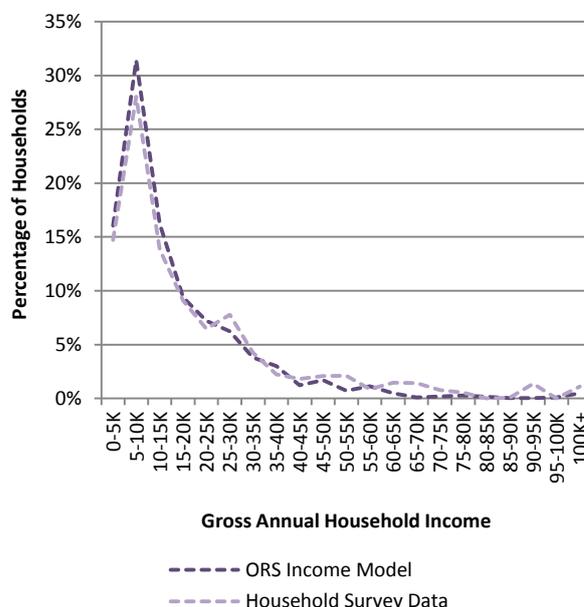
The data for each survey has been normalised to take account of the date that the data was gathered, using information from the [Annual Survey of Hours and Earnings](#) to adjust earnings and the [Retail Price Index](#) to adjust other income sources. The relative mean income of the area (taken from [CACI Paycheck](#)) was also used to normalise the income to a consistent baseline.

41. Through taking the relative mean income from CACI Paycheck for an independent area (for which we have no primary data), it is possible to produce an income distribution profile. In the absence of any primary data, it is not possible to validate the Household Income Model output – therefore, we have used the Household Income Model to profile the income distribution in areas that we already have primary data to compare the household survey with the modelled income. This has been undertaken both for areas where the survey data contributed to the model, and also in areas where we have subsequently undertaken household surveys where the data has not been included in the model.

**Figure 4**  
**Comparison of Income Distribution from Household Survey Data and ORS Income Model:**  
**Rural District, East of England, Data Contributed to Model Baseline**



**Figure 5**  
**Comparison of Income Distribution from Household Survey Data and ORS Income Model:**  
**Urban Borough, Inner London, Data Independent of Model Baseline**



42. Whilst the curve from the ORS Household Income Model differs slightly from the curve from the household survey data, outputs from the model clearly mirror the equivalent primary survey data and the input parameters derived from CACI Paycheck control the model outputs effectively in order to properly take account of local differences.
43. Given the information available within the primary data base, the ORS Household Income Model is also able to separate the income distribution of owners and non-owners to directly inform the Housing Mix Model affordability profiling. Information collated from the [tenure profile in the 2001 Census](#) for the split between owners and non-owners and from the [primary data from a number of household surveys](#) for non-owner income profiles is then applied to provide an income profile of non-owners.

**Establishing the Income Threshold for Market Housing**

44. By taking information from the [Land Registry transaction database](#), it is possible to profile the distribution of purchase prices for properties across a given area. Combining the Land Registry data with information from the [2001 Census on the balance between owner occupiers and private renters](#) (specific to the location and property type of each sale) the model establishes the likelihood of the

transaction being a property that will be occupied by the purchaser or let privately. Therefore, the model applies a probability to each dwelling sale based upon its location and property type as to whether it is owner occupation or rent, so it is assumed that sales in areas with proportionately larger private rent stocks in the 2001 Census are more likely to sales of privately rented dwellings. Given that private rented dwellings tend to be found in areas with lower house prices, a consequence of this process is that the model identifies a greater proportion of private rented dwellings as being available to households on lower incomes with little private rent being in more expensive properties.

45. For those properties that are likely to be owner occupied, the Housing Mix Model translates the recorded purchase prices into the household income that would be required to purchase each property by taking assumptions about **mortgage income multipliers** and **deposit levels**. The base assumptions for the model are that households can access **mortgages with 3.5 times their income**, but this assumption can be changed and sensitivity tested within the model. The 3.5 times mortgage multiplier is based upon CLG Practice Guidance for a single earning household and represent the largest mortgage which could be obtained. The profile of required incomes will be sensitive to these assumptions about affordability.
46. For those properties that are likely to be rented privately, the Housing Mix Model translates the recorded purchase prices into the household income that would be required to rent each property by taking assumptions about **rental yield** and **income multipliers relating to the proportion of weekly or monthly household income to be spent on rent**. For the LCB West the model assumes a **rental yield of 5.9** (Landlord Mortgages 2007), but this figure can be sensitivity tested within the model and requires to be monitored over time. The profile of required incomes will be sensitive to these assumptions about affordability and rental yield.
47. The Housing Mix Model considers both housing cost distribution profiles in order to establish the distribution of incomes required to access private sector housing. This profile is considered alongside the income distribution profile for non-owners. The income threshold for market housing is set at the level where there is sufficient private housing available to house all of the identified non-owners within the income group. If there is less private housing available than households seeking that housing, affordable housing will be required to address the shortfall and therefore the threshold price for market housing must be set above this level.
48. There will be some private housing affordable to households with incomes below the income threshold for market housing adopted by the Housing Mix Model. This is consistent with the Practice Guidance, which suggests the use of private sector lowest quartile prices as thresholds for market housing – therefore (by definition) leaving a quarter of private sector housing below the market threshold. The Housing Mix Model considers all private sector housing which is affordable to households with incomes below the income threshold for market housing as “Sub-market Housing”.

### Establishing the Requirement for Market Housing

49. Once the Income Threshold for Market Housing has been established, the Housing Mix Model can establish the number of households who are non-owners that can afford market housing. Combining this with the projected number of owner occupiers establishes the total number of households requiring market housing within the area.
50. The total number of market homes required can then be estimated by considering the overall number of households requiring market housing alongside assumptions about the **proportion of dwelling stock**

that is vacant or occupied by second home owners who are not counted within the number of households normally resident. For LCB West we have assumed a direct link between dwellings and household growth. Therefore, we have assumed that the vacancy rate as of the 2001 Census applies, while each newbuild dwelling will be occupied. Any additional vacancy in the newbuild stock will require more dwellings to be provided to house the same number of households. This implies that the model assumes that the same number of dwellings remain vacant as was the case at the time of the 2001 Census.

### Establishing the Requirement for Affordable Housing

51. The requirement for Affordable Housing can be established by offsetting the total number of households requiring market housing from the overall household projections.
52. The Housing Mix Model considers the need for Social Rented Housing on the basis of social trends. By considering each type of household within the household projections individually, the model establishes the way in which their dependency on social housing has progressively changed over the 20-year period 1981-2001 on the basis of tenure data from the 1981, 1991 and 2001 Censuses. The overall social trend is compared to tenure data from annual Housing Strategy Statistical Appendix submissions to CLG (from 1997 onwards) to confirm the accuracy of the model projections.
53. The social trends for each household type are then applied to the household projection data to establish the level of social rented requirement for future years for each type of household. Considering the collective requirement for all households, the model establishes a total requirement for Social Rented Housing.
54. The requirement for Intermediate Affordable Housing can be established by offsetting the total number of households requiring Social Rented Housing from the projected number of households requiring Affordable Housing overall.
55. Once again, assumptions can be taken about vacancy rates within the affordable housing stock to establish the overall affordable housing requirement. The assumption for LCB West is that the vacancy rate in affordable housing as of the 2001 Census applies in the second hand stock while all newbuild dwellings are occupied. This implies that the model assumes that the same number of dwellings remain vacant as was the case at the time of the 2001 Census.

### Establishing the Housing Stock Profile

56. To establish the housing stock profile, the Housing Mix Model considers the baseline housing stock from the 2001 Census broken down by tenure and supplements this information with data on housing completions broken down by tenure reported within Local Authority Annual Monitoring Reports.
57. The Housing Mix Model also considers data on losses from the affordable housing stock based on Local Authority returns to CLG about Right-to-Buy sales, and projects the likely future losses from stock on the basis of trends in sales since the change in legislation.
58. The private sector housing stock is divided into Market Housing and Sub-market Housing on the basis of the analysis employed for Establishing the Income Threshold for Market Housing – where any private sector property that is affordable to households with incomes below this threshold point is considered Sub-market Housing and all other private sector housing is considered Market Housing.

### Establishing the Tenure Mix for Additional Housing Provision

59. The Housing Mix Model considers the future requirement for Market Housing alongside the stock of Market Housing to establish the net additional dwellings that are required to be provided as Market Housing.
60. The future requirement for Intermediate Affordable Housing is considered alongside the stock of existing Intermediate Affordable Housing and also the stock of Sub-market Housing (which is affordable to households on incomes below the Income Threshold for Market Housing) to establish the net additional dwellings that are required to be provided as Intermediate Affordable Housing. The shortfall would need to be provided as Intermediate Affordable Housing as defined by PPS3 (including appropriate occupancy constraints) in order to ensure that it meets the needs of lower income households.
61. The future requirement for Social Rented Housing is considered alongside the stock of existing Social Rented Housing to establish the net additional dwellings that are required to be provided as Social Rented Housing.

### Establishing the Size Mix for Additional Housing Provision

62. The Housing Mix Model considers the nature of [housing that was occupied by different household types in terms of size and tenure on the basis of information from the 2001 Census](#), which recognises that many households will under-occupy their homes (and choose to live in larger properties than they technically need on the basis of the bedroom standard set out in the Housing Act) – although housing allocation policies will mean that social tenants will tend to be less likely to under-occupy their homes.
63. The [occupancy profile from the 2001 Census](#) is applied to the projected household mix in terms of the type of household in each housing tenure to establish an overall size mix of future housing requirements. This is then set alongside information about the existing housing stock to establish the net additional dwellings that are required to be provided within each tenure split by size. This information is provided on the basis of the total number of rooms, due to limitations of outputs from the Census data. The output is transformed to provide information on the number of bedrooms by applying a profile based on existing [primary data from a number of household surveys](#).

### Updating the Model using the Excel Model

64. For this section is necessary to have access to the Excel version of the ORS Housing Mix Model to understand where data sources are situated and also how they can be updated. Any tabs within the Excel based model which are referenced in this section are highlighted in **bold**.
65. The Housing Mix Model contains two types of data, those which are fixed over time and those which will see updates.

#### Fixed Data Sources

66. The main fixed data sources used in the model relate to the [UK Census of Population 1981, 1991 and 2001](#):
- **Census LA, Census 1991, Census LA for Size Mix and Sub-market COA Lookup tabs.**

67. A second type of fixed data within the model is that which is drawn from the [ORS primary data surveys](#). This data is drawn from a range of households surveys conducted by ORS across England and is used to help identify a series of relationships within the model including the household income profile and size mix for future dwellings. This data is utilised in **Census LA for Size Mix, CACI Sub-markets and Income**.
68. We would also note that **Key Workings by Year and Total Summaries** only use data from other parts of the Excel based model, so don't need updating.

#### Updateable Sources

69. Many of the data sources within the Excel based model will be updated over time. The Office of National Statistics will periodically update the mortality statistics which are included in **Death**. However, these are unlikely to see dramatic changes, so may not be worth seeking to actively monitor.
70. The Land Registry also constantly update house prices data which is utilised in the **Land Registry** tab and also **Affordability Summary** and **Chart**. However, this data does not need to be updated regularly – it is only necessary to monitor how prices have changed compared to long-term trends.
71. However a number of data sources do require active monitoring and updating. **Stock** includes information on [New Build Completion](#), [Right to Buy Sales](#) and [Right to Acquire Sales](#). The ORS Housing Mix Model works by assessing requirement for 2001-2021 and then subtracting any completions since that time.
72. To update this section the user must enter the number of market, intermediate and social housing completions ([Drawn from Annual Monitoring Reports and HSSA Section N](#)) and Right to buy/Right to acquire ([CLG Live Table 648 and Tenant Services Authority Regulatory Statutory Return LA breakdown](#)). This can be done by entering the data in spaces left in the model and will cause the model to immediately update. The data for 2001-2007 for already included.
73. Another set of data which will change within the model is [Household Projections](#). The data currently used within the model is the [CLG 2004 based Chelmer estimates](#) for each local authority. These have been [constrained to RSS targets for EERA](#).
74. To update this section with different [household projections](#) for each LA must be entered in the same format as those under **HH Projections**. It is also necessary to change the cells C3 to H3 on **RSS Targets** to projected growth in household number 2001-2021.

#### **Sensitivity Testing Within the Model**

75. The details on updating the model outlined above can be used to produce periodic updates based upon the original assumptions used in the model. However, the ORS Housing Mix Model also allows these assumptions to be varied. The two main tabs for updating and sensitivity testing the Excel based model are **Assumptions and Summary Tables for Report**.
76. Within **Summary Tables for Report** cells A67-C72 and A75-C80 contain main results for the sub-region. Cells I69-J72 contain the unrounded figures. For each LA, cells A84-G101 provide the main results.
77. **Assumptions** shows the assumptions which can be varied. Taking Change in House Prices (Cell B9) enter -0.18674. Move to Cells A67-C72 and A84-G101 on **Summary Tables for Report** will provide the main modelling outputs assuming long-term house prices and incomes.

78. Similarly, it is also possible to change the follow **Assumptions**:
- Mortgage Multiplier\_(Cell B4) with a base assumption of 3.5 times income
  - % of Income for Rent\_ (Cell B6) with a base assumption of 25% of income
  - Annual Yield Assumed from Rent\_(Cell B7) with a base assumption of 5.9.
  - Social Rates Kept Constant\_(Cell B12) type in TRUE to see impact of assuming no decline in social rental stock since 2001.

### Sources of Update Data

79. To update **Stock**, the number of market, intermediate and social housing completions are drawn from [Annual Monitoring Reports and HSSA Section N](#). Right to buy sales are reported in [CLG Live Table 648](#) while Right to Acquire sales can be obtained from [Tenant Services Authority Regulatory Statutory Return LA breakdown](#)).
80. The modelled results for house prices relative to incomes within the SHMA assume that house prices and household incomes follow long-term trends. To continue using this assumption requires the entering -0.18674 in Cell B9 of **Assumptions**. It is important to understand that while house price and household incomes vary over time the long-term trend represent the best current estimate for the average position across the period 2001-2021. However, house prices can be monitored with [Nationwide/Halifax/CLG data](#). Income growth is reported by the [Treasury](#). In entering alternative figures into Cell B9 the key issue is how house prices and household incomes compare to those in the base year of 2007.
81. Another part of the model which can be actively monitored is Rental Yields. The model uses an estimate of 5.9 which was drawn [Landlord Mortgages 2007](#). Yields do vary over time so do need to be monitored and a number of property websites produce estimates for the current yield.