Housing Need and Demand Assessment (HNDA)

HNDA Tool Instructions (2020)

Version 4.0, November 2020

Contents   Page

What's Refreshed in 2020

- The HNDA Tool and all three HNDA guides been refreshed based on the latest available data that feeds into the HNDA Tool. However, the approach and process remains largely the same.

- The main changes include:

  > Updated data inputted to the HNDA Tool for household projections, existing need (HoTOC), house prices, rent prices and incomes.

  > All income and house price scenarios and economic assumptions have been updated based on the latest economic outlook. More details about the evidence used and defaults setting are set out in the [HNDA Tool Instructions 2020](). The number of scenarios have been slightly increased to provide HNDA Practitioners with more options for scenario planning and scenarios have been renamed.

  > For simplification, fewer results sheets are shown in the HNDA Tool.

  > In the previous HNDA (2018) the HNDA Tool and guidance referred to four Strategic Development Planning Authorities (SDPAs). The Planning (Scotland) Act 2019 removed the requirement for strategic development plans and the associated authorities. Local Authorities may now choose to work together in regional groupings. Not all regional groupings have, as yet, adopted formal titles and for the time being they are referred to as 'regional partnerships' in the guidance. In the Tool four regional partnerships have been inputted based on the previous SDPAs. These are referred to as 'city regions'. This will be kept under review.

Comparability with previous HNDAs

- For unitary Local Authorities (LAs) the outputs of the previous HNDA will be comparable with a future unitary HNDA. Where groups of LAs work together as regional partnerships to produce an HNDA these will be comparable with previous SDPA HNDAs, where the regional partnerships and SDPA members are the same.

- The 2018 version of the guidance and the last version of the HNDA (v3.3) remain for reference on the Scottish Government Centre for Housing Market Analysis (CHMA) [website]. Those authorities who are part way through and HNDA can continue to use these should they wish to or they can choose to use the refreshed version of the HNDA

Tool (v4.0). Authorities who are in this position may wish to contact the CHMA for advice.

Scottish Government Planning Reform

- The Scottish Government (SG) is in the process of taking forward Planning Reform and implementation of Planning (Scotland) 2019 Act. We have consulted on a methodology that could be used for setting 'targets for the use of land for housing in different areas of Scotland' as required in National Planning Framework (NPF) 4 by the 2019 Act.

- This will not impact on the requirement for an HNDA to support the Local Housing Strategy as set out in the 2001 Housing (Scotland) Act or to inform Local Development Plans. The SG will seek to align its work in support of NPF as closely as possible to existing systems and processes. Whilst the SG is looking to use HNDA to support NPF, local authorities undertaking an HNDA should continue to follow this guidance.

COVID-19

- In order to align with the latest 2018-based household projections, the data used for the HNDA Refresh pre-date the first known cases of COVID-19 in Scotland. As such, the HNDA scenarios and projections take no account of the pandemic.

- Whilst there remains uncertainty surrounding the impact of COVID-19 on the economy and society, it is important to highlight that the HNDA Tool is a long run (20 year) model that is not designed to model short-term spikes in the housing market or economy. Local authorities should continue to augment the HNDA with local information and data where it exists including the impacts for particular groups and to consider appropriate policy responses through the development of its LHS and Local Development Plan.

1. PREPARATION

Aim

- These instructions explain how to prepare for, set-up and run the HNDA Tool. This includes a step-by-step guide and an explanation of the choices and scenarios available. It explains how to interpret results and how to input local data and scenarios if required. If users have any questions please email the CHMA Mailbox.

I.T. Issues

- The Tool is an Excel spreadsheet with additional code. It was created in Excel 2016.

- If using the Tool on a laptop the clarity of the image may be enhanced by zooming in or zooming out using the buttons at the right hand corner of the screen. It is a lot easier to navigate the Tool with a mouse plugged into the laptop rather than using the laptop's touchpad.

- The Tool includes Macros and these must be enabled before it will function. Some operating systems may not let Macros run. In this case it is possible to change system settings to allow this if the system operators agree to this.

Preparatory Reading and Analysis

- Before using the Tool, the user should be familiar with the HNDA Managers Guide and HNDA Practitioner's Guide (in particular Chapter 4 about how to estimate housing need and demand).

- It is also advisable to complete Chapter 2 of the HNDA before running the Tool. This will evidence the key factors driving the local housing market, a thorough understanding of which is essential before running the Tool.

Scenarios, Alternative Futures & Sensitivity Testing

- Future house prices, rents and incomes are difficult to predict long-term and with precision. However, HNDAs must project housing estimates into the future to enable medium and long term planning of housing. The Tool does this, in part, by projecting house prices, rent prices and incomes to make an assessment of the future affordability of different housing tenures.

- The Tool is populated with a range of scenarios about future incomes, house and rental prices (alternative futures). However, it is for HNDA Practitioners to decide which scenario or scenarios best reflect what might happen in their local area in future. It is worth bearing in mind that a good predictor of the future is what happened in the past. Analysing what happened to incomes, house prices and rental prices in the past is a good way to anticipate what may happen to them in future and, in turn, to help decide on future affordability scenarios.

- With this in mind, **the Tool is designed to produce a range of BROAD, LONG RUN housing estimates** about several alternative futures; any of which might occur but one or two of which are more likely to occur based on previous housing market trends and local knowledge of housing markets.

- The user's choice of scenarios **should NOT attempt to predict future housing estimates with complete precision**. Instead, it should be based on producing a range of broad housing estimates. This gives the user a range of housing estimates that can be accepted or rejected as the future of the housing market unfolds. A single housing estimate that is too precise cannot provide enough flexibility to plan for a future which will always contain some uncertainty.

- Users should keep the number of scenarios to a minimum as a further way to help constrain the level of resource required to produce the HNDA. No more than six scenarios are recommended (the [key findings template](#) reflects this) and no less than three:

  (1) a baseline scenario <most likely in future>
     e.g. house prices remain flat

  (2) a low scenario <less likely in future>
     e.g. house prices decline

  (3) a high scenario < less likely in future>
     e.g. house prices increase

- It may also be advisable to adjust only one or two factors between scenarios. If too many factors are changed at once it may be difficult to understand and explain how this is affecting differences in the results across scenarios.

- The concept of **sensitivity testing** is also a useful concept in terms of thinking about what scenarios to use. In the above example the high and low scenarios can be used to test how sensitive the baseline scenario is to changes in house price.

- The Tool will be run several times using several scenarios. Each time the Tool is run - and the user is happy with the results - a copy **must be saved**. Otherwise results will be lost. A copy of the Tool for each final scenario should be submitted to the CHMA as part of the robust and credible appraisal submission process.

- The user can input their own income, house and rent price scenarios into the Tool. The practicalities of doing this are set out further on. The decision to do this should be determined by what resources are available to produce the HNDA and whether the use of local scenarios would add sufficient value to the estimates to justify additional resource; whilst always bearing in mind that HNDAs are designed to produce a broad housing estimates; not precision estimates.

Default (core) settings in the Tool

- In order for an Excel model of this kind to function, and be tested, it was necessary to populate it with default (core) settings. This allows the users to see how their housing estimates would change when they change these settings according to local circumstances.

- The default settings were chosen to reflect, as far as is possible, the prevailing state of the Scottish housing market and economy when the Tool was refreshed in 2020. Each default setting is explained within this document.

Data used to populate the Tool

- The Tool is populated with nationally available datasets. A list of data sources is set out at Annex A. Users may overwrite national data with local data and the method for doing this is set out within this document. It should be borne in mind that using national datasets is sufficient for robust and credible status, will speed up HNDA production and will help to constrain the level of resource required.

- Any decision to use local datasets should be weighed against whether their use adds sufficient value to justify the resources required to source, clean and input local data into the Tool; bearing in mind that HNDAs are meant to provide broad range of housing estimates rather than precise estimates.

- If this choice is made it must also be justified in the HNDA write-up. The Tool will be updated once a year, at the end of the year, to include any new national data and also any HMA boundary revisions provided by authorities to the SG CHMA.

Issues of geography

- The Tool outputs at three main geographies; City Regions (groups of Local Authorities), Unitary Local Authorities and functional Housing Market Areas (HMAs) within each of these. A small number of authorities requested sub-HMA level output areas and these have also been included in the Tool. National Park areas are also available.

- Some of the data used to run the Tool are built-up from data zones to create larger geographies i.e. HMA level outputs, then LA level outputs etc. However, the smallest geography for which National Records of Scotland (NRS) household projections are available is LA level and a method had to be found to disaggregate these to HMA level.

- This was done using NRS's household estimates which are available at data zone-level. Firstly, the number of households in each HMA was built-up from data zones. Secondly, the relative proportion of households in each HMA across an LA was worked out. Thirdly, these relative proportions were then applied to the household projections (at LA-level) to estimate household projections at HMA-level.

Benefits of using the Tool

- **Quick scenario testing** - It allows HNDA Practitioners to test and compare different scenarios and see the results of this in real time. This is useful when Housing Market Partnerships (HMP) meet to discuss and agree scenarios; as it can be done 'live' at a meeting.

- **Frees up thinking time** - Time saved sourcing, cleaning and computing data can be spent thinking about which scenarios are best to use and what the results may mean for housing policy and planning.

- **Consistent results** - As data sources are consistent within and between areas and authorities, it means that estimates can be compared consistently, for example, with neighbouring authorities or the HMAs within an authority.

- **Less costly** - Where previously, some authorities, may have contracted out their HNDAs at considerable cost this is no longer required. This should mean substantial cost savings.

- **Understanding and skills** - The Tool allows all authorities to produce HNDAs in-house rather than contracting out. This means that authorities are likely to acquire a deeper understanding of their HNDA

results and the skills for HNDA production will remain with authority staff.

The next section explains how users set up the Tool

2. SETTING UP THE TOOL

Finding and Opening the Tool

▪ The HNDA Tool (v4.0) is accessed from the CHMA's website. On this page:

> click the `**HNDA Tool'** link.

> click on the **'open'** link or **'open in new window'** to start the Tool. It takes a few moments.

Starting the Tool

▪ The Tool contains macros which perform calculations. If prompted:

> click **'enable macros'** or **'enable contents'**. This activates the macros.

> The Tool allows users to enter various data and scenarios. This should only be done at those places indicated. Changes made elsewhere in the spreadsheet can break macros and, in turn, break the Tool.

▪ The Tool homepage will now appear. To start working:

> click **'Go to map worksheet'**. This brings up the **'Area selection screen'** which shows a map of Scotland and a drop-down menu.

> then, optionally, **'Go to schematic worksheet'** which will take users to a set of diagrams illustrating how the Tool fits together to produce the outputs.

▪ The drop-down menu includes every local authority in Scotland, four City Regions, and the National Parks.

> select the **area** of Scotland that the user wishes to work with. Note, selection of an area automatically includes any sub-areas that were provided by authorities.

> select the starting **year**. The default year is 20202. If users want a later year type this in.

> click **'Set Areas'** and wait. After a few seconds, a Microsoft window will appear advising that the **'HNDA Tool is now set up'**. Click **'ok'**.

What can Now be Seen on Screen

Different Coloured Worksheet Tabs

- The **light green-tabbed** worksheets indicate where the user can change scenarios, input local data or input local scenarios. The **'scenario all'** sheet is for the whole area and the `**S1, S2, etc.'** sheets are for each sub-area.

- The **red-tabbed** worksheets show the results for all areas. There are three results sheets, a summary, detailed results for the core (default) settings and detailed results for the scenarios run. The last two inform the first. More on this further on.

- The **purple green-tabbed** worksheets contain the data that are pre-programmed into the Tool and which power the Tool calculations.

Buttons at the Top of the Screen

- There are two buttons at the top right of the screen:

    > by clicking **'Show Results'** a graph of the housing estimates is displayed (both the core and user scenarios) and users can see how these change as different scenarios are chosen at each stage of the Tool

    > **by** clicking the **'Hide Results'** button these results graphs get hidden.

    > the **green graph** shows results based on the core (default) setting pre-programmed into the Tool. The **orange graph** shows the user's results based on the scenarios/ choices they have made in the Tool.

Core (default) and user scenarios

- As users choose scenarios at each stage of the Tool, those scenarios are charted. Each chart shows two sets of trends:

  Green data lines represent the core (default) scenarios pre-programmed into the Tool. These do not change. **Orange data lines** show the scenarios selected by the user. These change as the user makes changes.

- If the core and user scenarios are the same, the data lines appear on top of each other. This is how the Tool appears when opened. When the user chooses different scenarios these data lines diverge. Details of the all scenario core (default) settings are set out [further on](#).

Graph Features

- By placing the cursor over the data line it will display the value of that data point.

- By clicking on the data line, right clicking the mouse and choosing `**source data'** this will takes the user to the data which are generating this chart. Take care not to change the source data as this could break the Tool. The source data is located beneath the charts (scroll down).

- Some of the chart axes have very big scales because the numbers being charted are big. This can sometimes mean that it is difficult to see the chart changing when a different scenario is selected. However, if the user hovers the cursor over the graph they will be able to see the value of a data point changing.

Users are Nearly Ready to Start Running Scenarios

- [Section 3](#) provides a step-by-step guide to choosing and running different demographic and economic scenarios. It is important to note that there are two options when doing this:

  1) Choose scenarios and apply them to all sub-areas areas, in which case users will only be working on the **'Scenario All'** sheet.
  OR
  2) Users can vary scenarios for one or more of the sub-areas, for example where affordability differs across a local authority. In which case users will be working with not only the **'Scenario All'** sheet but the individual sheets i.e. `**S1, S2 etc**.'

  In this instance, first choose the scenarios for the whole area using the **'Scenario All'** sheet. Then go to the sub-area(s) in question and alter the scenario for that area(s).

The next section is a step-by-step guide to running the Tool

3. STEP-BY-STEP TOOL GUIDE

STAGE 1: Future Need for Additional Housing Units – Demography Choices

DEMOGRAPHY CHOICES

1. Use the Official NRS Household Projections (2018-based)

The CHMA recommends using NRS's household projections. These data should be considered sufficient to produce a range of broad estimates of future housing. There are 3 variants as set out below to allow for the best local fit and full details of the projections can be found on the NRS website. They include:

- **Principal**
- **High Migration**
- **Low Migration**

Default (core) setting = principal household projection

The new projections are constrained to the Scottish Government's big surveys annually. This help to maintain the accuracy of the projections in the years following the Census in a way not previously possible. Increasing the validity of the projections in this way means that fewer variants are required to account for degrees of uncertainty in the principal projection.

1(a) Create and Use Own Household Projections

This is very resource intensive. The CHMA do not recommend this approach. If a decision is made to do this, it must be based on robust evidence, the data must be added to the Tool and the methodology used should be written-up in the HNDA. It is strongly recommended that any methodology is checked with NRS.

1(b) Adjust NRS's Household Projections

Any adjustment must be based on robust evidence and written-up in the HNDA. Users can adjust the household projections up or down and for one or multiple years.

STEP 1

> **If** using NRS's projections, select which one from the drop-down menu.

STEP 1(a)

> If using own projections. Tick the box entitled **'use own projections'**. A drop-down table will appear. Enter the data here (number of projected households each year). This will need to be changed to reflect that you need to change the base data to get the HMAs to update.

STEP 1(b)

> If, however, only adjusting NRS's projections, select which projection to adjust from the drop-down menu.

> In the yellow boxes enter a % increase or decrease for any or all years.

STAGE 2: Existing Need for Additional Housing Units

EXISTING NEED CHOICES

2. Use the Proxy Built into the Tool

This is a count of homeless households in temporary accommodation and households who are both overcrowded *and* concealed **(HoTOC)**. Additional housing units would need to be found for these households. Using this is acceptable as part of the robust and credible appraisal.

Default setting:
= HoTOC switched on
= affordability filter switched off i.e. all need goes to social rent

The affordability filter settings are explained at Section 5.2.

2(a) Use Own Estimates of Existing Need

Estimate the existing need for <u>additional</u> housing units outwith the Tool. This should exclude any existing need that can be dealt with using an in-situ or housing management solution. It is suggested that this would as a minimum include the elements included in HoTOC. Whatever methodology is used, this should be included in the HNDA write-up.

Default setting:
= zero need entered
= affordability filter switched off i.e. all need goes to social rent

The affordability filter settings are explained at Section 5.2.

2(b) Decide how many years to clear existing need

The default is set at 5 years reflecting the position in a number of previous HNDAs. The default position in the Tool is for existing need to be cleared over a 5 year period. However authorities can change this to however many years they consider to be appropriate for their local circumstance and where they can evidence this. Selecting a longer period will smooth the existing need over more years in the projection period, rather than it being concentrated in the first five years of the projection period.

STEP 2

> If using the proxy for existing need, tick the box called **'Use HoTOC method'**. The HoTOC figure will then appear. All need will be assigned to social rented housing.

STEP 2(a)

> If using own estimates of existing need, type the calculated estimate into the box called **'Existing need'**.

> Un-tick the **'HoTOC'** box.

> If using the affordability filter, tick the box called **'Use Affordability Model'**. This will apportion some existing to social rent but also to the other tenures choices; buy, rent privately, below market rent. If the affordability filter is un-ticked all need is apportioned to social rent.

STEP 2(b)

> Type in the number of years for clearing existing need into the box called **'Existing (Cleared) Years'**.

At this point;

- **the Tool has estimated the total number of household who will require additional housing of some kind in future**

- **this includes new households that will form in future and certain types of existing households in need.**

In the next stage;

> ▪ the Tool will estimate how many of these household can afford to purchase in the market and how many cannot (who will need rented property of some kind).

STAGE 3: Affordability
Income Growth and Distribution

INCOME GROWTH & DISTRIBUTION CHOICES

3. Decide which income data source to use

The Scottish Government Small Area Income Estimates are modelled on a number of surveys e.g. Scottish Household Survey (SHS) and Family Resource Survey (FRS) and the Census. They were produced on behalf of the Scottish Government by Heriot-Watt University and the David Simmonds consultancy. The Scottish Government used these estimates to produce income estimates by percentile using a method called interpolation. Both sets of estimates and the methodology used to produce them are available at the above link.

<div align="center">

Default (core) setting =
Scottish Government Small Area Income Estimates (2018)

</div>

3(a)   Decide how average (median) income might grow over the projection period (e.g. 2018-2038)

The Tool is pre-programmed with five income scenarios that are designed to offer the users a range of income growth scenarios for average (median) household income. They are based on the latest economic outlook (2020) and were produced by Scottish Government Economists. The scenarios are as follows (these are also depicted in Chart 1 below):

Moderate Real Terms Growth (Tool Core/Default)
Household income growth is assumed to grow at **2.5%** per annum in nominal terms. Assuming that inflation is at 2% per annum over the forecast horizon (the Bank of England's inflation target), then in the long run this scenario assumes that there is real terms income growth of 0.5% per annum.

Over the past ten years, the average growth rate of (gross) earnings in Scotland has been 2.0% per annum (or -0.2% per annum in real terms). This

is below the rate of real terms growth in earnings in the ten years prior to the 2008 financial crisis, when real household earnings in Scotland increased at an average annual rate of 1.8% per annum.

The Scottish Fiscal Commission's latest (pre-Covid) forecast predicted that real household earnings growth would pick up over the forecast period, increasing at 1.2% per annum from 2022 to 2024. However, it is likely that unemployment will rise (and subsequently put downward pressure on real wage growth) as a result of Covid-19 and Brexit. As such, the suggested core scenario is for a more moderate rate of real terms growth over the forecast horizon, of 0.5% per annum.

Below Real Terms Growth
Household income growth is assumed to grow at **0.5%** per annum in nominal terms. Assuming that inflation is at 2% per annum over the forecast horizon (the Bank of England's inflation target), then in the long run this scenario assumes that there is an annual real terms fall in household income of 1.5% per annum.

Moderately Below Real Terms Growth
Household income growth is assumed to grow at **1.5%** per annum in nominal terms. Assuming that inflation is at 2% per annum over the forecast horizon (the Bank of England's inflation target), then in the long run this scenario assumes that there is an annual real terms fall in household income of 0.5% per annum.

No Real Terms Growth
Household income growth is assumed to grow at **2%** per annum in nominal terms. Assuming that inflation is at 2% per annum over the forecast horizon (the Bank of England's inflation target), then in the long run this scenario assumes that there is no real terms growth in household income.

High Real Terms Growth
Household income growth is assumed to grow at **3.5%** per annum in nominal terms. Assuming that inflation is at 2% per annum over the forecast horizon (the Bank of England's inflation target), then in the long run this scenario assumes that there is real terms income growth of 1.5% per annum. This is similar to the level of growth seen in the ten years prior to the 2008 financial crisis.

HNDA Practitioners should select those scenarios which best reflect what might happen to incomes in the local area in future years. If any local authorities employ an Economist it would be useful to seek advice from them about this.

The Tool also allows HNDA Practitioners to develop and input their own local income growth scenario(s) if they consider this appropriate for their local circumstances. If this is done it must be based on robust data and written-

up within the HNDA.   Details of how to input scenarios are described further on.

Chart 1 below plots nominal (gross) median Scottish household earnings from 1997 to 2019 (Source: Scottish Government), along with the path of earnings under each scenario.

Chart 1

HNDA: Income Scenarios
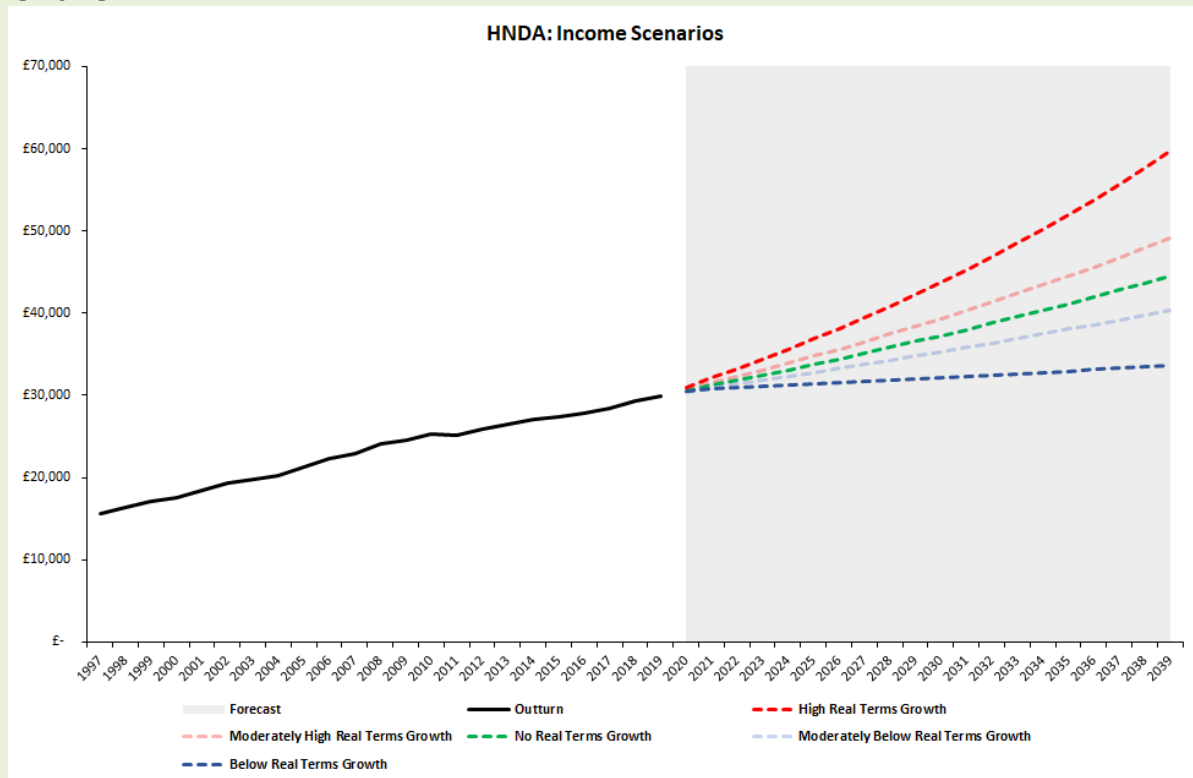
3(b) Decide how the shape of the income distribution may change over the projection period (e.g. 2018-2038)

The Tool is pre-programmed with three income distribution scenarios to reflect, for a given growth rate in average (median) household income, different household income distributions. The scenarios are defined in terms of how household income at the 10th and 90th percentiles grow relative to median household income (the 50th percentile), where the median household income growth rate has been chosen as discussed in Section 3(a) above. The Tool then automatically calculates growth rates at intermediate percentiles using a pro rata adjustment.

Greater equality
The incomes of the least affluent (represented by the 10th percentile of the income distribution) increase more steeply compared to the incomes of most

affluent (represented by the 90th percentile of the income distribution).

No change (Tool core/default)
The incomes of the least affluent (represented by the 10th percentile of the income distribution) and the most affluent (represented by the 90th percentile of the income distribution) increase at the same rate as median household income. The gap in the income distribution between the most and least affluent will not change over time.
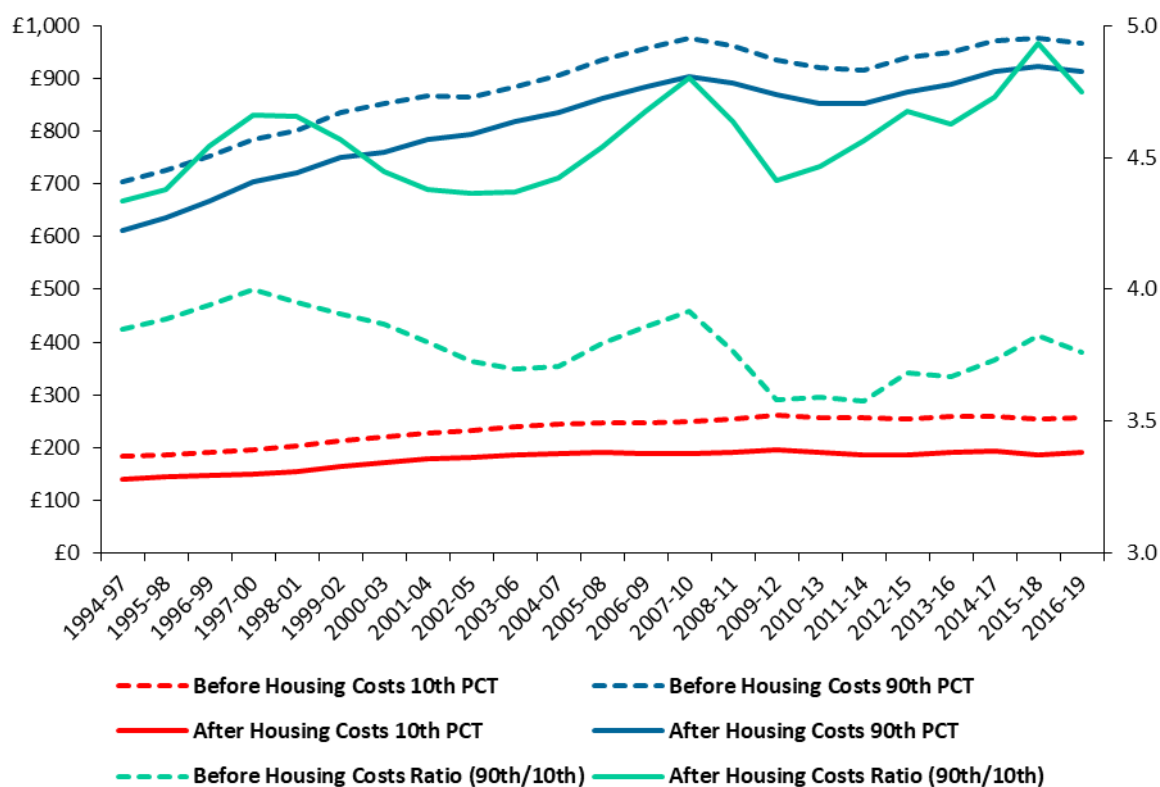
Greater inequality
The incomes of the most affluent (represented by the 90th percentile of the income distribution) increase more steadily compared to the incomes of least affluent (represented by the 10th percentile of the income distribution).

Chart 2 below plots the 10th and 90th percentile average annual *equivalised household income across Scotland, before (dashed line) and after (solid line) housing costs (left-hand side of the chart) (Source: Scottish Government). It also plots the ratio of the 90th percentile to the 10th percentile before and after housing costs (on the right-hand side of the chart). There has been a slight upward trend in the ratio of the 90th percentile to 10th percentile equivalised income (after housing costs) over the past ten years (the highest incomes were growing faster than the lower incomes); however, over a longer time span, there is less of a discernible trend. As such, the default setting in the tool is for no change in income inequality.

Chart 2

Equivalised Weekly Household Income (Scotland, 3 Year Averages)

Source: SG Analysis of DWP Data

Legend:
- Before Housing Costs 10th PCT
- Before Housing Costs 90th PCT
- After Housing Costs 10th PCT
- After Housing Costs 90th PCT
- Before Housing Costs Ratio (90th/10th)
- After Housing Costs Ratio (90th/10th)

*Equivalisation is a standard methodology that adjusts household income to account for the different financial resource requirements of different household types. Household size is an important factor to consider because larger households usually need a higher income than smaller households to achieve a comparable standard of living. The composition of a household also affects resource needs, for example, living costs for adults are normally higher than for children. After equivalisation has been applied, households with the same equivalised income can be said to have a comparable standard of living.

Users may include their own income distribution scenario(s) based on local circumstances should they wish to. Details of how to input scenarios are described further on. Additional income distribution scenarios should be evidence-based and written-up in the HNDA.

3(c) Decide which part of the income distribution is of interest.

The Tool is set up to analyse affordability (incomes divided by house prices and rent prices) at the 25th percentile of income, house prices and rental prices.

The 25th percentile has been has been chosen because, historically, this is seen to represent where First-Time-Buyers enter this housing market, where housing need and demand is most critical.

However, the Tool also allows users to examine another point in the income distribution if that is of interest. For example, the Tool is also set up to show what is happening to incomes at the 75th percentile of the distribution i.e. the more affluent end.

Users can change either of these by typing other percentiles into the boxes provided.

<div align="center" style="color:blue">

Default (core) setting:
= 25th percentile of the income distribution
= 75th percentile of income distribution

</div>

STEP 3

> Use the **'Income data source'** box to select which income source to use.

STEP 3(a)

> Use the **'Growth in income scenario'** box to select which income growth scenario to run.

> If using own scenario, the data should be inputted on the worksheet called **'IncomeScenarios'**. The place where data should be inputted by users is highlighted in orange. When this is done, the new income growth scenario will then appear in the drop-down menu.

STEP 3(b)

> Decide which parts of the income distribution are of interest. The core (default) is set at the 25th and 75th percentile.

> If interested in different percentiles, type these directly into the boxes in the section called **'select part of the income distribution'**.

STEP 3(c)

> Use the drop-down menu to decide which scenario about the shape of the income distribution might be relevant to the local area in future.

> If using own scenario(s), the data should be inputted on the worksheet called **'IncomeScenarios'**. The place where data should be inputted is highlighted in

orange. When the data have been entered, this scenario will now appear in the drop-down menu when returning to the 'Scenario All' worksheet.

STAGE 4: Affordability House Prices

HOUSE PRICE CHOICES

4. Decide how house prices may grow over the projection period (i.e. 2018-2038)

The Tool is pre-programmed with 5 house price scenarios that are designed to offer users a range of options. Users should select the scenario which best reflects what might happen to average house prices in the local area in future years. The choice of scenarios includes (these are also depicted in Chart 2 below):

Trend Growth (Core/Default)
House price growth is equivalent to the annualised growth rate of the average Scottish house price (UK HPI) over the last ten years, which is 1.6% per annum.

In the lead up to the 2008 financial crisis, the growth rate of the average Scottish house price was persistently high (around 15% year on year growth in the three years prior to the 2008 financial crisis, according to the UK HPI). However, in the aftermath of the 2008 financial crisis, a combination of reduced mortgage availability and increased unemployment put downward pressure on the average Scottish house price. Over the past ten years though, volatility in Scottish house price growth has moderated, with a fairly stable average growth rate of around 1.6% per annum.

The latest Scottish Fiscal Commission forecast of house prices (published in February 2020, pre-Covid-19) predicts that the year-on-year change in the Scottish house price will be 1.9% from 2021-22 until the end of the forecast period (2024-25). The HNDA core/default setting is slightly lower; however, owing to the adverse economic effect of Covid-19 that has transpired since this forecast was produced, we think that this is a reasonable, long-term assumption.

If it is assumed that CPI is 2% per annum over the HNDA projection period (the Bank of England's inflation target), then this scenario assumes that house prices will gradually fall in real terms, by 0.4% per annum.

Moderately High
House price growth is equivalent to the average annualised growth rate in house prices of the **16** local authorities with the **highest** rates of annualised house price growth over the last 10 years, which is 2.3% per annum.

Moderately Low
House price growth is equivalent to the average annualised growth rate in house prices of the **16** local authorities with the **lowest** rates of annualised house price growth over the last 10 years, which is 0.7% per annum.

High
House price growth is equivalent to the average annualised growth rate in house prices of the **8** local authorities with the **highest** rates of annualised house price growth over the last 10 years, which is 2.9% per annum.

Low
House price growth is equivalent to the average annualised growth rate in house prices of the **8** local authorities with the **lowest** rates of annualised house price growth over the last 10 years, which is 0.3% per annum.

Chart 2 below plots the average Scottish house price (Source: UK HPI) from 2004 to 2019, along with the path of the average Scottish house price under each scenario.
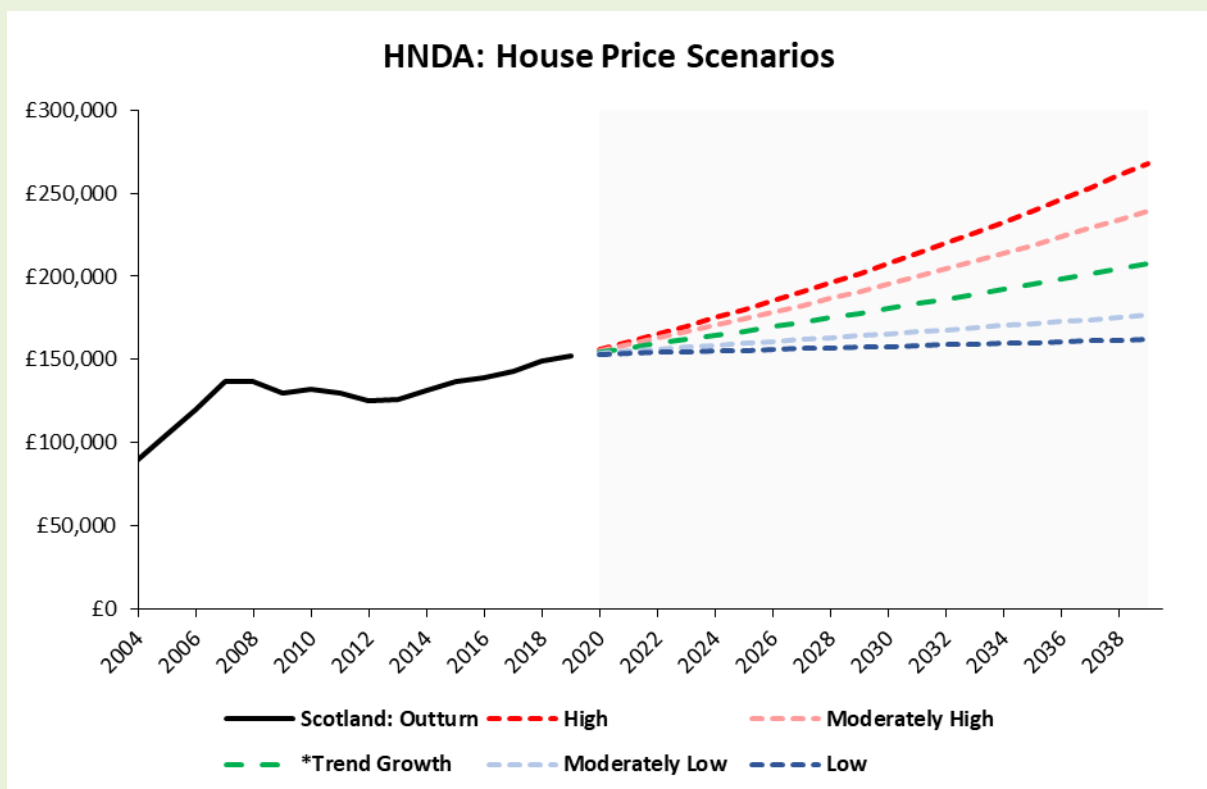
The year-on-year changes in average house prices for each scenario are shown in the HNDA Tool on the worksheet called '**PriceScenarios'**.

Users may include their own house price growth scenario(s) to reflect local circumstances should they wish. Details of how to input scenarios are described further on. Additional scenarios should be evidence-based and written-up in the HNDA.

When choosing a house price scenario, users may wish to refer to the UK HPI or Registers of Scotland house price statistics to examine long-run trends in house prices in their local area*. Users may also wish to refer to official forecasts of house price growth to inform the scenario they choose. The Scottish Fiscal Commission produce a forecast of Scottish house price growth (this can usually be found in the 'Tax – Supplementary Tables' workbook produced at the time of the Scottish Budget), as does the Office for Budget Responsibility (for the UK).

* Registers of Scotland house price statistics report the arithmetic mean house price, while the UK HPI reports the geometric mean. The latter is typically closer to the median than the arithmetic mean.

4(a) Set affordability criteria to decide a cut-off point for who can afford to buy in the market and who cannot (and will some form of rental accommodation)

The default setting in the Tool assumes that a household is suitable for home ownership provided that they could afford to purchase a house at the lower quartile (25th percentile) of the house price distribution.

The test for affordability is that the house price is no more than 3.9 times the household's income. To calculate this, the mean loan-to-value ratio for a first-time-buyer mortgage in Scotland in 2019/20 (82%) and mean loan-to-income ratio (3.2) were obtained from UK Finance. To get the house price to income ratio, 3.2 is divided by 82%.

The default (core) = 25th percentile house price; 3.9x lower quartile income. All households whose income is above the threshold which allows them to afford a lower quartile house price are considered to be suitable for home ownership.

The default (core) = 25th percentile house price; 3.9x lower quartile income

All households whose income is above the threshold which allows them to afford a lower quartile house price are considered to be suitable for home ownership.

Users can adjust these affordability criteria based on local circumstances if they wish by typing new values into the **'Percentile'** and **'Income Ratio'** boxes. This needs to be evidence-based and written-up up in HNDA.

Users may set their own affordability criteria. Details of how to input these are described below. These should be evidence-based and written-up in the HNDA.

STEP 4

> Using the **'Future house price scenarios'** box select a future housing price scenario using the drop-down menu.

> If using own scenario data should be inputted on the worksheet called **'PriceScenarios'**. The place where data should be inputted is highlighted in orange. When the data have been entered, this scenario will now appear in the drop-down menu when returning to the 'Scenario All' worksheet.

STEP 4(a)

> Select an affordability criteria (what income multiple would be required to purchase a lower quartile house) using either the default or own criteria.

> If using own, type the house price threshold in the **'percentile'** box and type the income multiple in the **'income ratio'** box. The latter should also take into account the size of deposit and size of mortgage. Some worked examples of this is set out below:

At this point:

- **the Tool has estimated the number of household who will require some form of additional housing units in future**

- **split this between those who can afford to purchase in the market and those who cannot and will need rental accommodation.**

STAGE 5: Affordability
Rental Prices

RENTAL CHOICES

5. Decide of those who can afford to purchase in the market, what proportion will actually go on to do so.

The default in the Tool is set at 60%. This assumes, of those who can afford mortgage repayments, only 60% also have the deposit to actually go on to buy.

HNDA practitioners can change this % based on local circumstances should they wish. This can be done by inputting a different percentages into the worksheet called `**Core Assumptions'**. This should be evidence-based and written-up in the HNDA.

The effect of increasing this percentage would be to increase the amount of housing need that would be met via owner occupation and reduce the amount that be met by the rental sector (PRS, below market rent and social rent). Lowering the 60% threshold would have the reverse effect.

The default (core) = Of those who can afford to purchase, 60% have enough deposit to go on to do so

5(a) Set two affordability thresholds to split the remainder of the need into three rental sectors.

The 1ˢᵗ threshold determines those who can afford to rent in the private sector.

The 2ⁿᵈ threshold determines those can afford below market rent.

The remainder of the need (who cannot afford the private rent or below market rent) are apportioned to those who can afford social rent. This falls out of the above calculation and does not require a third threshold.

The Tool examines rent affordability by looking at income level in relation to both median and 30th percentile market and social rents. Those with incomes nearer the 30th percentile are more likely to need social rents and those nearer the median to afford private rents, with intermediate rent somewhere in between.

Whilst below market rent does refer to the need for some form of subsidized private rent, it may also be viewed as an potential indicator of demand for alternative shared equity products that are used to support home ownership. As such, the HNDA results may suggest that local authorities should potentially consider further analysis on this.

The default thresholds in the Tool are set as follows:

> If a household spends less than 25% of their income on rent the Tool assumes they can afford to rent in the private sector. This threshold has been used historically as the threshold for PRS affordability.

> If a household spends between 25% to 35%[1] of their income on rent the Tool assumes they are suitable for below market rent.

> If a household spends more than 35% of their income (including housing benefit) on rent the Tool assumes they are suitable for social rent.

Users may choose to vary these two parameters. For example, if the two parameters were moved closer to each other, this would reduce the amount

---

[1] The definition of below market rent is determined by how narrow or wide these thresholds are set by the users to reflect what might be appropriate for local circumstances. However, whatever this is, below market rent is always rent which is subsidised, in some way, below private rent but above social rent levels.

of need apportioned to below market rent, and in doing so, increase need apportioned to the PRS and increase need apportioned to social rent.

If HNDA Practitioners decide to change the thresholds this can be done by typing in two new % into the 'Split Need into Tenure' boxes on the 'ScenarioAll' sheet. This should be evidence-based and written-up in the HNDA Tool.

5(b) Decide how rental prices are likely to change over the course of the projection period e.g. 2012-2032

The Tool is pre-programmed with five future rental price scenarios that are designed to offer the users a range of options. The scenarios are identical to the house price scenarios set out above, with the assumption that over the long run rental prices are likely to track trends in house prices.

Users should select those scenarios which best reflect what might happen to rental prices in the local area in future years. The scenarios are:

Trend Growth (Core/Default)
House price growth is equivalent to the annualised growth rate of the average Scottish house price (UK HPI) over the last ten years, which is 1.6% per annum.

In the lead up to the 2008 financial crisis, the growth rate of the average Scottish house price was persistently high (around 15% year on year growth in the three years prior to the 2008 financial crisis, according to the UK HPI). However, in the aftermath of the 2008 financial crisis, a combination of reduced mortgage availability and increased unemployment put downward pressure on the average Scottish house price. Over the past ten years though, volatility in Scottish house price growth has moderated, with a fairly stable average growth rate of around 1.6% per annum.

The latest Scottish Fiscal Commission forecast of house prices (published in February 2020, pre-Covid-19) predicts that the year-on-year change in the Scottish house price will be 1.9% from 2021-22 until the end of the forecast period (2024-25). The HNDA core/default setting is slightly lower; however, owing to the adverse economic effect of Covid-19 that has transpired since this forecast was produced, we think that this is a reasonable, long-term assumption.

If it is assumed that CPI is 2% per annum over the HNDA projection period (the Bank of England's inflation target), then this scenario assumes that house prices will gradually fall in real terms, by 0.4% per annum.

Moderately High
House price growth is equivalent to the average annualised growth rate in house prices of the **16** local authorities with the **highest** rates of annualised house price growth over the last 10 years, which is 2.3% per annum.

Moderately Low
House price growth is equivalent to the average annualised growth rate in house prices of the **16** local authorities with the **lowest** rates of annualised house price growth over the last 10 years, which is 0.7% per annum.

High
House price growth is equivalent to the average annualised growth rate in house prices of the **8** local authorities with the **highest** rates of annualised house price growth over the last 10 years, which is 2.9% per annum.

Low
House price growth is equivalent to the average annualised growth rate in house prices of the **8** local authorities with the **lowest** rates of annualised house price growth over the last 10 years, which is 0.3% per annum.

The year-on-year changes in rent prices for each scenario are shown in the HNDA Tool on the worksheet called '**PriceScenarios'**.

Users may input own rent scenarios. Details of how to input these are described below. Use of own rent scenarios should be evidence-based and written-up in the HNDA.

STEP 5

> Decide of those who could afford to buy in the market i.e. have sufficient income to secure a mortgage, what proportion have enough deposit to actually go on to buy.

> If NOT using the default, enter a percentage into the box called '**Proportion of Market who Buy'.** This should be evidence-based and written-up in the HNDA.

STEP 5(a)

> If NOT using the default, set the income threshold for ability to afford to rent in the private sector – use the box called '**Upper i-rent income threshold**'

> If NOT using the default, set the income threshold for those who can afford below market rent (and above which people could afford social rent) – use the box called **'Lower i-rent income threshold'**

STEP 5(b)

> Using the **'Rent Growth Assumption'** box, select a future rental price scenario using the drop-down menu.

> If using own scenario, the data should be inputted into the worksheet called **'PriceScenario'**. The place where data should be inputted is highlighted in orange. When the data have been entered, this scenario will then appear in the drop-down menu when returning to the 'Scenario All' worksheet. Any own scenarios should be evidence-based and written-up in the HNDA

- **The Tool has now finished running.**

- **It has generated an estimate of the additional, new housing units required in future to meet housing need and this has split total need into those who can afford:**

    > owner occupation

    > private rent

    > below market rent

    > social rent

- **These estimates are based on an analysis future household formation, existing housing need, future incomes, future house prices and future rental prices.**

The next section explains how to find and interpret results

4. RESULTS: Where to find results and how to interpret them

Finding and interpreting results

The Tool results are displayed in several ways depending on what users need. This includes:

 > **'Results'** = summary results (use to populate the 'Key Findings Template'
 > **'RawResultsCore'** = detailed results using the core (default) settings.
 > **`RawResultsSummary'** = detailed results using your scenario settings.

Both sets of raw results populate the summary results.

Worksheet called 'Results'

- shows annual(ised) estimates for additional housing units for **groups of years** within the projection period.

- The default is set at 5 yearly intervals e.g. 2018-2023, 2024-2029 etc. but these intervals can be changed using the drop-down box at the top left of the screen (to 4, 5, 6, or 7 year intervals).

- Estimates represent the value for **each year in that time interval**. To get a total value for all five years, multiply by 5.

- Results displayed by banded years are useful because planners and policy makers often need to work in periods of time rather than single years. This is the case for LHS and Development Plans.

- The **green-shaded values** show the default (core) results and the **orange-shaded values** show the user's results.

- Results for the whole area are shown at the top of the page and results for each sub-area are shown below this.

- Totals are shown for each tenure.

- For each area three sets of results are displayed:

1) **'Top Level' =** total for the whole area e.g. Local Authority, regional, National Park

2) '**Summed' =** total based on the sum of any sub-areas (HMAs and sub-HMAs).

3) **Constrained =** if changes were made to the sub-areas, the sub-areas (and differences between them) are constrained to the total for the whole areas (1).

   This ensures that the sum of the sub-areas is the same as the total for the whole area, whilst at the same time ensuring that the results reflect the differences between the sub-areas.

Worksheet called 'RawResultsScenario'

- Shows results for the *user scenarios* for every year, every tenure and every sub-area. These are the most detailed results. These are the most detailed results and haven't been summarised in any way. The 'RawResultsCore' is the same but for the Tool core(default) settings.

Data Used to Populate the Tool   ANNEX A

Demography	Description
Indicator	Household Projections (including variants)
Source	National Records for Scotland
Date	2018-based projections from 2018 to 2043

HaTOC	Description
Indicator	Homeless households and household that are both concealed *and* overcrowded
Sources	Scottish Government Communities Analytical Services Division based on the following datasets: HL1 Dataset and Scottish House Condition Survey (SHCS) AND National Records of Scotland Census
Date	Homeless households as at 31 March 2020 Concealed *and* overcrowded households, SHCS (2016 to 2018) and 2011 Census

Income Data	Description
Indicator	Scottish Government Small Area Income Estimates
Source	Heriot-Watt University and the David Simmonds Consultancy
Date	2018

House Prices	Description
Indicator	Average House Price
Source	Registers of Scotland (RoS)
Date	2018

Private Market Rents	Description
Indicator	Average Private Market Rents for 2 Bed Property
Source	Scottish Government Rent Registration Service (RSS)
Date	October 2017 to September 2018