Rialtas na hÉireann
Government of Ireland

Housing Need and Demand Assessment (HNDA)

HNDA Tool Instructions (2021)

Prepared by the Department of Housing, Local Government and Heritage
gov.ie/housing

Contents

1. Preparation 04
2. Setting up The Tool 07
3. Step-by-Step Tool Guide 09
   Stage 1: Future Need for Additional Housing Units - Demography Choices 09
   Stage 2: Existing Need for Additional Housing Units 10
   Stage 3: Affordability Income Growth and Distribution 12
   Stage 4: Affordability House Prices 15
   Stage 5: Affordability Rental Prices 17
4. Results: Where to find results and how to interpret them 20
ANNEX A - Data Used to Populate the Tool and how it is used to clear the model 22

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 dedicated HNDA Mailbox. (HNDASupportQueries@housing.gov.ie).

Background Technical Information

- The Tool is an Excel spreadsheet containing a large number of worksheets and embedded macros. It was created in Excel 2016. The user **must** be able to run this type of file on their machine (file type .xlsm). It is not possible to produce a working version of the tool which is not macro enabled.
- 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.

Preparatory Reading and Analysis

- Before using the Tool, the user should be familiar with the HNDA Framework Guidance, 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 provide the evidence for 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. A tabulation of recent house prices in your area (which is included in the HNDA Data Sources Tool) will help with this.
- With this in mind, **the Tool is designed to produce a range of BROAD 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 and no less than three, which should reflect the following variants:

  1) **the convergence scenario which reflects the likely need for housing over the coming years <most likely in future> e.g. real house prices grow slowly whilst the population increases in line with the NPF 50:50 scenarios**

  2) **a low migration scenario <less likely in future> e.g. population still increasing but at a slower rate**

  3) **a high migration scenario < less likely in future> e.g. population increasing at a faster rate**

- 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 migration.
- 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**. Local Authorities should expect to save a minimum of 3 or 4 copies of the Tool in each development plan cycle. Saving a copy of each run used in any subsequent documentation is vital in order to be in a position to refer back to the inputs in any follow up interactions with internal stakeholders, the Department or other relevant bodies. Changes made for each scenario can be recorded in the **change log worksheet**.
- The user can input their own income, house and rent price scenarios into the Tool. The practicalities of doing this are set out in Stage 3 below. 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 estimate; 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. In the worksheets references to "core" in labelling refer to the default assumptions. 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 Irish housing market and economy when the Tool was created. 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, and a longer description of how these data sources are used in the model, 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 and 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 a 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 bi-annually to include any new national data. The first such update will occur after Census 2022 results become broadly available (and every two years thereafter).

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 the relevant local authority stakeholders 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.
- **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, over time, local authorities are likely to acquire a deeper understanding of their HNDA inputs and outputs and the skills for HNDA production will remain with local authority staff.

2. Setting up The Tool

Finding and Opening the Tool

- The HNDA Tool is accessed from the Department's website via the HNDA page at https://www.gov.ie/en/publication/eaa99-housing-need-and-demand-assessment-hnda/. On this page:
  - click the `**HNDA Tool for local authorities**' 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 cause macros to run incorrectly or not at all and/or interfere with data lookups. In either event, the Tool may not run correctly or at all. If you are concerned that you may have done so, please download a fresh copy of the Tool from the website.**
- It is recommended to activate the Front_Ireland worksheet (first on the right) when using the Tool for the first time. To start working:
  - click '**Go to map worksheet**'. This brings up the '**Area selection screen**' which shows a map of Ireland and a drop-down menu.
  - OR, '**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 Ireland.
  - select the **area** of Ireland that the user wishes to work with.
  - select the starting **year**. The default year is 2020. If users want a later year this can be selected in the Results worksheet. (Whilst selecting other start years is technically possible it is not advisable).
  - 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 white coloured tabs are information sheets. Here the user is given information about the Tool, its workings and can also (on the change log worksheet) store information on their own work on the tab in descriptive text.

- The **light blue coloured** Map worksheet is the worksheet used to run the Tool in the first instance for your required local authority
- The **light green-tabbed** worksheets indicate where the user can change scenarios, input local data or input local scenarios. **Please do not change any of the data on any other worksheets**.
- The **purple-tabbed** worksheets show the results for all areas. There are several results sheets and these are explained below.
- The **dark 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 Worksheet S1

- There are two buttons at the top right of the screen of the light green coloured tabs:
    - by clicking '**show summary**' 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 summary**' button these results graphs get hidden.
    - the **green-graph** shows results based on the core (default) setting pre-programmed into the Tool. The **purple-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. **Purple 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 (i.e. in default). When the user chooses different scenarios these data lines diverge. Details of the all scenario default (core) settings are set out below.

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 stop the Tool from working properly.
- 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.

3. Step-by-Step Tool Guide

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

1. Use the Household Projections from the Economic and Social Research Institute (ESRI)

The Department recommends using the ESRI's household projections (available at Regional Demographics and Structural Housing Demand at a County Level) and the Convergence Scenario, which is a modified version of the ESRI's 50:50 City Scenario (which in tandem with the unmet need is methodologically consistent with the housing supply targets in the December 2020 Guidelines for Planning Authorities issued under Section 28 of the Planning and Development Act 2000 as amended).

- **Convergence**
- **Baseline**
- **50:50 City**
- **High Migration**
- **Low Migration**

Default (core) setting = Convergence household projection

1(a) Create and Use Own Household Projections

This is very resource intensive. The Department does 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.

1(b) Adjust ESRI'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 the pre-populated scenarios, 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).

Step 1(b)

- If, however, only making minor adjustments to one of the built in housing demand projections, select which projection to adjust from the drop-down menu.
- In the white boxes enter a % increase or decrease for any or all of the years as appropriate.

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 emergency accommodation and households where there is evidence of overcrowding AND that there are more than one households in the same private dwelling. Additional housing units would need to be found for these households.

Default setting:

= Total Existing Need 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

This is for use where the local authority is using its own estimate of the existing need for additional housing units. 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 the default definition used. Whatever methodology is used, this should be included in the HNDA write-up.

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

The default is set at 10 years based on the rationale that the chosen scenario should operate from one year before the development plan is finalised plus halfway into the next development plan cycle. This may be changed by the user to take account of local decisions about how long it may to take to clear existing need.

Default (core) setting = 10 years

Step 2

If using the proxy for existing need, tick the box called 'Total Existing Need'. The default 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 '**Total Existing Need**' box.
- If using the affordability filter, tick the box called '**Use Affordability Model**'. This will apportion some existing need to social rent but also to the other tenures choices; buy, rent privately, affordability constraint. 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 households that 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 households can afford to purchase in the market and how many cannot (and will therefore require their housing needs to be met in some other way).

Stage 3: Affordability Income Growth and Distribution

INCOME GROWTH & DISTRIBUTION CHOICES

3. Income data source

The Tool is prepopulated with data sourced from the Central Statistics Office (CSO) Geographical Profiles of Income in Ireland 2016 and the data has been updated to 2019 values using a number of CSO sources (County Income Data and Earnings and Labour Cost Annual Data publications). The inputted income figures are those for each percentile between 10 and 90. When projecting income forwards in the model, incomes across the distribution increase at the same percentage rate by default.

Default (core) setting =

CSO Income Data inflated to 2019

3(a) Decide how income might grow over the projection period (e.g. 2020-2040)

The Tool is pre-programmed with three scenarios that are designed to offer the users a range of income growth scenarios for household income, as follows:

- **Modest real terms growth**: Household income growth is 3.5% per annum in nominal terms, which is 1.5 percentage points greater than the European Central Bank (ECB) inflation rate target of 2% per annum, and implies that in real terms income is growing at around 1.5% per annum, i.e. the purchasing power of the median household is increasing over time. (It is noted that measured inflation has not exceeded 2% for some years at this point- i.e. the HICP briefly exceeded 2% in 2012 – so in fact the scenario represents a higher rate of growth in real incomes should this pattern remain in place.)
- **No real terms growth – Inflation target:** Nominal median household income grows at the same rate as the ECB inflation rate target, which is 2%, which means that the purchasing power of the average household remains constant (but see earlier point).
- **Below real terms growth:** There is very little growth in income. Nominal median household income grows at 0.5% per annum, which is 1.5 percentage points below the ECB inflation target. This implies that the average household is worse off in real terms, i.e. the purchasing power of their income is falling.

Users should select those scenarios which best reflect what might happen to incomes in the local area in future years. This could include developing their own income growth scenario(s). Details of how to input scenarios are described further on. Additional income (or income growth) scenarios should be evidence-based and written-up in the HNDA.

3(b) Decide how the shape of the income distribution may change over the projection period (e.g. 2020-2040)

The Tool is pre-programmed with three scenarios to reflect, for a given growth rate of 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 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 income growth rate for the least affluent households (represented by the 10th percentile of the income distribution) is one percentage point per annum above the growth rate in median household income, while the income growth rate for the most affluent households (represented by the 90th percentile of the income distribution) is one percentage point below the growth rate in median household income. As a result, the gap in the income distribution between more and less affluent households will narrow over time.
- **No change (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 income growth rate for the least affluent households (represented by the 10th percentile of the income distribution) is one percentage point per annum below the growth rate in median household income, while the income growth rate for the most affluent households (represented by the 90th percentile of the income distribution) is one percentage point above the growth rate in median household income. As a result, the gap in the income distribution between more and less affluent households will increase over time.

For the above scenarios, the percentage point difference between income growth at the 10th and 90th percentiles compared to median household income growth is shown in the Tool on the worksheet called '**Income scenarios**'.

Users may include their own income distribution scenario(s). Details of how to input scenarios are described below. 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.

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. These parameters are **for illustration purposes only** and do not impact on the calculations in the model. If the default income distribution is selected then all income percentiles will grow at the same rate.

The example year figure is used for the chart to the right of this field – it is used to illustrate the income distribution in whatever year the user inputs for both the core and user assumptions. Similarly it is for **illustration purposes only** and is not included in any calculations.

Default (core) setting:

= 25th percentile of the income distribution (example B)

= 75th percentile of income distribution (example A)

2040 (example year)

Step 3

- Use the '**Income data source**' box to select the "Geographical Profiles of Income 2016" source. Please contact HNDASupportQueries@housing.gov.ie if your local authority has access to its own source of Gross Household Income distribution data for the area.

Step 3(a)

- Use the '**Growth in median 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 light green. 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**'.
- If interested you can vary the example year to see how the income distribution changes over time for both the default and user scenario.

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 light green. When the data have been entered, this scenario will now appear in the drop-down menu when returning to the 'S1' worksheet.

Stage 4: Affordability House Prices

HOUSE PRICE CHOICES

4. Decide how house prices may grow over the projection period (i.e. 2020-2040)

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

- **Strong growth:** Nominal house price growth is 6% per annum. Annual growth rates higher than 6% have occurred since 2005 on seven occasions but are unlikely to be sustainable or sustained in the long run.
- **Modest growth:** Nominal house price growth is 4% per annum.
- **Weak growth (no real terms growth):** Nominal house price growth is 2% per annum, in line with the ECB's inflation target.
- **Flat growth (real terms decline):** Average house prices are unchanged in nominal terms, which means that in real terms they will gradually decline if inflation is in line with the ECB's target. This approximates to what has happened to dwelling prices in Ireland between 2005 and 2019 inclusive albeit that it should be recalled that prices fell very significantly between 2007 and 2012 before stabilising and beginning to grow again.
- **Economic and Social Research Institute Forecast:** This scenario is based on the ESRI's model and assumes a 2.25% increase in prices.

The year-on-year changes in average house prices for each scenario are shown in the HNDA Tool on the worksheet called '**PriceScenarios**'. Please note that price growth for any given year 20XX should be understood as the price growth that happens to the 20XX price (rather than the price growth that happens in 20XX). So, for example, the price shown for 2022 is calculated by multiplying the price in 2021 by the price growth factor in 2021.

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

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 need to rent)

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. This is equivalent to the household taking out a mortgage which has a loan to value of 90% and a mortgage to income ratio of 3.5, which are both based on the Central Bank's macro-prudential rules.

The default (core) = 25th percentile house price; 3.9x 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 the affordability criteria by typing new values into the '**Income Ratio**' box. Future versions of the tool may allow variations in the house price percentile. Any deviations from the default values need to be evidence-based and written-up in the 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 S1 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 light green**. When the data have been entered, this scenario will now appear in the drop-down menu when returning to the 'S1' worksheet. Please note that price growth for the year 20XX should be understood as the price growth that happens to the 20XX price (rather than the price growth that happens in 20XX). So, for example, the price shown for 2022 is calculated by multiplying the price in 2021 by the price growth factor in 2021.

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 income multiple in the '**income ratio**' box. The latter should also take into account the size of deposit and size of mortgage.

AT THIS POINT:
• the Tool has estimated the number of households that 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.
IN THE NEXT AND FINAL STAGE:
• The Tool will estimate of those who can afford to purchase, how many will actually go on to do so, and • Split the remainder into their appropriate categories.

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 70%. This assumes, of those who can afford mortgage repayments, only 70% also have the deposit to actually go on to buy. This in based on data from the Banking and Payments Federation Ireland (BPFI) on average numbers of first-time buyer mortgage drawdowns between 2011 and 2020. Users can increase or decrease this percentage, if they have evidence to suggest it is appropriate for their local authority.

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 would be met by the other categories of tenure. Lowering the 70% threshold would have the reverse effect.

The default (core) = Of those who can afford to purchase, 70% 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 who may be eligible for social housing.
- The **remainder** is allocated to an "affordability constraint" category in cases of households not being eligible for social housing but facing affordability constraint (with regard to income and house prices). This falls out of the above calculation and does not require another threshold.

The Tool examines rent affordability by looking at income levels in relation to the median private market rent and social housing eligibility thresholds in a given local authority (25k, 30k or 35k). Whilst the affordability constraint does refer to the need for some form of subsidized private rent, it may also be viewed as a 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 of this.

The **default thresholds in the Tool** are set as follows:

- If a household can afford **median rent with less than or equal to 35% of their net income**, 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 income was **less than the minimum cut-off for social housing, the Tool assumes they are suitable for social rent**.
- **If** there is a cohort between social and rent/purchase affordability, this is allocated to the affordability constraint

5(b) Decide how rental prices are likely to change over the course of the projection period e.g. 2020-2040

The Tool is pre-programmed with five future rental price scenarios that are designed to offer 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:

- **Strong growth:** Nominal rental price growth is 6% per annum. This level of rent price growth (or higher) was experienced consistently from mid 2014 to end 2019.
- **Modest growth (core/default):** Nominal rental price growth is 4% per annum which is in line with the upper limit on rental price growth within RPZs.
- **Weak growth (no real terms growth):** Nominal rental price growth is 2% per annum, in line with the ECB's inflation target.
- **Flat growth (real terms decline):** Average rental prices are unchanged in nominal terms, which means that in real terms they will gradually decline if inflation is in line with the ECB's target. Annual Rent price changes were negative or relatively stable from end 2008 to early 2013. The most recent annual price change (Q3 2020) was 1.4% p.a.
- **Economic and Social Research Institute Forecast**: This scenario is based on the ESRI's model and assumes a 2.25% increase in prices.

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. Please note that price growth for the year 20XX should be understood as the price growth that happens to the 20XX price (rather than the price growth that happens in 20XX). So, for example, the price shown for 2022 is calculated by multiplying the price in 2021 by the price growth factor in 2021.

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**'.

Step 5(a)

- Rental assumptions on default rental thresholds can only be varied on the Core Assumptions worksheet.
- Both rental thresholds are based on 35% of net income by default in line with relevant legislative provisions in this area. The manner in which they impact on the running of the model is as follows:

- Intermediate Rate **Below** – varying this could impact on the numbers of households that are assigned to the social renters category (depending on how the other categories are interacting with one another). Increasing this value could reduce the numbers allocated to this category.
- Intermediate Rate **Above** – varying this parameter would impact on the numbers of households assigned to the private renters category. Increasing this value would increase the numbers allocated to this category (as it has the effect of allocating more of net income to household costs).

- Finally it is also possible to vary the social housing take-up value on the Core Assumptions Sheet. By default this is set to 100% but varying it downwards would have the effect of reducing the volume of new households allocated to the social renters cohort and increasing the affordability constraint cohort.

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 light green**. When the data have been entered, this S1 will then appear in the drop-down menu when returning to the '**S1**' worksheet.

THE TOOL HAS NOW FINISHED RUNNING.

- It has generated an estimate of the additional housing units required in future to meet housing need and has split total need into those who can afford:
  - owner occupation
  - private rent
  - social rent
  - affordability constraint
- These estimates are based on an analysis of future household formation, existing housing need, future incomes, future house prices and future rental prices.

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

Where to find results and how to interpret them

The purple tabs relate to the results of the Tool. There are three tabs, one of which summarises the data stored in the other two tabs. The RawResultsCore tab shows the detailed results of the default scenario whilst the RawResultsScenario shows the detailed results of the most recent user scenario.

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

- estimates for each year in the projection (from RawResultsCore or RawResultsScenario tabs)

OR using the Results tab:

- estimates for banded years within the projection
- estimates for the default (core) scenario
- estimates for the user scenarios

Worksheet called 'Results'

- Shows annualised estimates for additional housing units for **groups of years** within the projection period.
- Contains macro buttons to go to either of the RawResults tabs
- The default is set at 10 yearly intervals e.g. 2020-2029 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).
- By default the start year for these results is set to **2020** but users can change this value to another **later** year if that is what is required.
- Estimates represent the average value for **each year in that time interval**. To get a total value for all years, multiply by the number of years in the time interval used.
- 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 Local Area Plans and Development Plans.
- The **green-shaded values** show the default (core) results and the **purple-shaded values** show the user's results.
- For this version of the Tool the key results are shown in rows 22-32 of the Results tab. Totals shown above these lines will be consistent with what are shown for each tenure. Whilst the results are presented under headings of Top Level, Summed and Constrained these will be identical in this version of the HNDA Tool.
- Practitioners are recommended to use the Top-Level estimates to avoid confusion and

should extract the values from rows 24-28 for their local authority.

Future versions of this Tool may include the potential to model sub market areas. 'The aggregate types Constrained and Summed Up are only relevant in that context.

Worksheet called 'RawResultsCore'

- Shows results for the Default Scenario for every year and every tenure. These are the most detailed results and haven't been summarised in any way. If you wish to examine results for each year in relation to the default scenario this is the best source of this material. Annual results by tenure type can be found in rows 73-76.

Worksheet called 'RawResultsScenario'

- Shows results for the User Scenarios for every year and every tenure. These are the most detailed results and haven't been summarised in any way. If you wish to examine results for each year in relation to the user scenarios this is the best source of this material. Annual results by tenure type can be found in rows 74-77.

ANNEX A
Data Used to Populate the Tool and how it is used to clear the model

Demography	Description
Indicator	Household Projections (including variants)
Source	ESRI Structural Demand Paper
Date	December 2020
Detail	The ESRI were commissioned to produce four sets of population projections for the Department under the auspices of the Research Programme which are then used in turn to create projections for future household formation. These population projections which provide detailed population projections by year of age and gender are developed using four different perspectives on future internal and external migration. The other key input parameters to a population projection (and derived household formation projections) such as fertility, mortality and headship rates are held constant across the scenarios. The key addition brought to bear in these projections is the integration of modelled internal migration rather than the use of some set of assumptions based on Census data which is common elsewhere. The scenarios are as follows: Baseline – net external inwards migration dropping to 15000 persons per annum and remaining at that level – internal migration unconstrained 50:50 City – net external migration per Baseline scenario but whereby internal migration patterns are consistent with the primary population growth objectives of the NPF High Migration – net external inwards migration of 30000 persons per annum – internal migration not constrained Low Migration – net external inwards migration dropping to 5000 persons per annum by 2022 before recovering to Baseline levels by 2027 – internal migration unconstrained. Population projections are carried out initially on a county basis and these are extended (using Census data) to cover all local authorities. Structural household demand formation projections are then estimated using an assumption of constant headship rates and incorporating obsolescence of dwellings at local authority level (which were calculated based on Census 2016 and New Dwelling Completions figures). Finally a convergence scenario was estimated within the Department based on the 50:50 City Scenario but taking into account any under-supply relative to this scenario in the years 2017-2019. Projections for all years across 2020-2031 are adjusted upwards to allow for the shortfall to be covered off equally over this period. From 2032 onwards Convergence Scenario and 50:50 City Scenario are identical for all local authorities. This Convergence Scenario is the default scenario for use in the Tool whilst each of the other scenarios are available for sensitivity testing. It is also possible for local authorities to use their own projections if and where they can justify doing so.

Existing Need	Description
Indicator	Homeless households AND households that are both overcrowded (ratio of persons to rooms greater than 2) AND occupied by multiple adults (any Census household composition not included in the following list: One person household Two adult household One adult and 1 or more children Two adults and 1 or more children)
Sources	DHLGH Homeless Statistics and CSO Census 2016 (Special Extract)
Date	Homeless households 2019 (Homelessness Unit) Census 2016
Detail	Existing need covers two distinct areas as set out above. These were chosen as they largely mirror the Scottish approach but it is possible to use other data sources in the model if appropriate. The first source is derived from the homelessness figures reported by the Department at end 2019. The business unit involved supply a breakdown by county of the maximum number of households associated with the counts of persons using emergency accommodation. (This is used because the unit of account of the HNDA Tool is households rather than persons.) The data for Dublin, which was provided at county level, was split into local authority level based on Census 2016 population counts. The second element is extracted from Census data. CSO provided a breakdown of those family units with 3 or more persons by household composition and by numbers of persons per room. Where a household contains more adults than just the parents of any children in the household (which could relate to siblings, parents, other relatives or friends of the household reference person) AND the household demonstrates evidence of overcrowding (by virtue of the persons per room being greater than 2) then these households are also included. It is likely that there may be some crossover between these cohorts. Local authorities can use other data sources for Existing Need in their sensitivity testing of the model but these should be well documented and evidence-based.

Income Data	Description
Indicator	Gross Household Income
Source	CSO Geographical Profiles of Income 2016 projected forwards using a combination of CSO County Incomes data and CSO Earnings and Hours Worked Survey
Date	Geographical Profiles of Income (2016 – published 2019) CSO County Incomes & Regional GDP (2017 – published 2020) CSO Earnings and Labour Costs Annual Data (2019 – published 2020)
Detail	Detailed income at the level of local authority has only recently become available. The Geographical Profiles of Income data published in 2019 by the CSO which combines data from a number of sources including Census of Population, Revenue data on earnings and Department of Social Protection data on social transfers enables a range of new analyses of gross and net income data and variations thereof. The CSO supplied gross income data at various points on the income distribution. These distinct points were then used to estimate a Gross Income distribution for all percentiles between the 10th and 90th percentile for all local authorities. The Tool compares various dwelling price points (adjusted as necessary) against the income distribution to identify which cohort of households may be in a position to afford to pay rent/mortgage at that level. In respect of the rent related calculations these are based on net income calculations. An estimated equation was developed based on Revenue Gross and Net income statistics (by all taxpayers) to convert gross incomes to net incomes and vice versa where necessary. To estimate 2019 gross income distribution for all local authorities, the 2016 gross incomes are uprated based on the following method: The CSO County Income and Regional GDP dataset is mined to identify how county incomes have developed relative to the average over the period 2000-2017. The CSO Earnings and Labour Cost Annual Data is used to identify overall average growth rates and the adjustments outlined above are applied to those rates to estimate the 2019 gross income distribution. Thereafter when projecting future incomes the same rate of growth is applied to all local authorities as specified in the chosen income growth scenario. Local authorities can input their own income growth scenarios in their sensitivity testing of the Tool as outlined above.

House Price	Description
Indicator	Dwelling Prices
Source	CSO Residential Property Price Index
Date	2019
Detail	CSO RPPI have supplied four separate dwelling price statistics for all dwellings (broken down as usual by type of seller, type of buyer, status of dwelling, etc.) by local authority and year. The data for 2019 is now final and these are used as the reference prices in the Tool. The four statistics supplied are 25th percentile, median, average and 75th percentile price. The 25th percentile price is used in the Scottish version of the Tool and this has been deemed appropriate for use in the first Irish version of the Tool. Whilst the Scottish version of the Tool imputes the 25th percentile price using a calculation that leverages the median and mean prices the Irish Tool uses the 25th percentile price directly. It is considered likely that prices below the 25th percentile are being paid by investors. Approximately 2/3 of first time buyer properties are existing properties which tend to be available at lower price points than new properties. Whilst users cannot vary the price point used by the Tool it is possible, in sensitivity testing, to vary another critical input which is the house price to income ratio. The default setting for this parameter in the Tool is 3.9 which is based on the Central Bank rules that allow first time buyers to purchase a property with a minimum deposit of 10% of the value of the property at a price point that is no more than 3.5 times their combined gross income. Finally it is not assumed that every household in the Tool that could afford to purchase a property would do so. 70% of those households that could afford to buy according to the ratio are assumed to purchase. Users can vary this parameter in sensitivity testing if they feel that there is a greater or lesser propensity to purchase in their local authorities. Any such changes should be documented and evidence-based. Future versions of the Tool may attempt to integrate a more complex house price equation based on net rather than gross income.

Private Market & Social Rents	Description
Indicator	Private Market Rents for 2 Bed Property Minimum Social Housing eligibility threshold
Source	Residential Tenancies Board (Special Extract) DHLGH
Date	2019
Detail	The RTB have supplied the Department with anonymised data which details all tenancies registered in each local authority area and by number of bedrooms in the property. The selection of the two bedroom property as the reference property was again consistent with the Tool parameterisation in Scotland and reflects the property size normally required, at least initially, by newly forming households which is what the Tool sets out to describe. Median value is chosen as it is less impacted by outlier values. The calculation carried out in respect of the rents is to see at what point in the income distribution a household could afford to pay the median rent with no more than 35% of its net income. Similarly net income is used for the social renters category. Here the minimum net income threshold for social renters in the local authority (based on which band the local authority is in) is used as a threshold UNLESS either of the private sector renter or buyer thresholds is lower than this amount. In those cases the minimum of the three amounts is used. To remain consistent with the set-up of the Tool more generally, a dummy weekly rent is created that is consistent with the social rental threshold. Whilst it is acknowledged that many family units qualifying for social housing earn more net income than the minimum net income threshold, it is also known that many families earning less than the net income threshold do not apply for social housing supports. It is possible to vary the uptake of social housing supports in sensitivity testing (beneath the default value of 100%) if there is evidence to suggest that uptake of social housing is lower than average in a local authority area.

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