



UK COLLABORATIVE
CENTRE FOR
HOUSING EVIDENCE

Housing Need and Demand Assessment

An evaluation and illustrative pilot of the Scottish
HNDA tool in the context of Northern Ireland

A report to the Department for Communities

Dr Joe Frey, Prof Chris Leishman, Prof Stanley McGreal and Dr Gillian Young

16 July 2020

About the authors

Dr Joe Frey is a Visiting Professor at Ulster University and is a Knowledge Exchange Broker at CaCHE with considerable experience in the analysis of Northern Ireland's housing market.

Professor Chris Leishman is Director of the Centre for Housing, Urban and Regional Planning at the University of Adelaide. Chris is CaCHE's lead investigator on housing markets and has published extensively on the economics of the housing market, including the relationship between housing supply and affordability.

Professor Stanley McGreal is Professor of Real Estate at Ulster University and is a Co-investigator at CaCHE. Stanley has been involved in major research contracts funded by government departments and agencies, the European Commission and research councils that have had the analysis of housing, urban renewal and property investment markets as central themes.

Dr Gillian Young is Director of Newhaven Research Scotland. Gillian previously worked for Communities Scotland and Scottish Homes and has wide ranging research experience in strategic planning and housing market analysis.

Acknowledgements

The CaCHE research team would like to acknowledge the contribution made by a number of organisations and individuals to the completion of this evaluation study:

The Department for Communities for commissioning the study and providing advice and support throughout the project, and in particular to David Polley, Julie Lavery, Donna Knowles, Joanne Cartland, Anne Mullan and Angela Reddick.

The Scottish Government for their very significant input to the study and in particular to Murdo MacPherson and Charles Brown from the Centre for Housing Market Analysis for providing key data (variant household projections, house prices, rents etc.) to populate the various scenarios examined, as well as their expertise and advice built up over years of using the HNDA model in the context of Scotland.

The Northern Ireland Housing Executive for its expert advice on data sources as well as the participation and contribution of Elma Newberry, Paul Reid, Karly Greene and Catherine Blease in the wider project team meetings. Jahnet Brown from the Housing Executive's Research Unit for her very helpful analytical contribution to the data audit.

Ciara Cunningham from Land and Property Services for her expert advice on House Price Indices.

Professor Chris Paris (Emeritus Professor, Ulster University) and Professor Tony O'Sullivan (University of Glasgow) for advice based on their long experience in housing needs assessment and applying the Net Stock Model in the context of Northern Ireland.

Dr Robert Smith for his helpful comments on the first draft of the report.

Content

Introduction.....	4
Policy and organisational context.....	5
The Scottish HNDA tool in outline	7
Methodology.....	11
Tasks 1 & 2: Audit of data requirements and data collection / collation.....	12
Task 3: Policy scenarios and key input variables.....	17
Task 4: Scenario planning – HNDA estimates for Northern Ireland.....	20
Task 5: Comparative models – triangulation	27
Task 6: Feedback from Knowledge Transfer meeting.....	30
Summary and conclusions.....	31
References.....	33
 Appendices	
Appendix A: Terms of reference.....	35
Appendix B: Paper 1: Consideration of backlog (current) need	37
Appendix B: Paper 1: Consideration of backlog (current) need	37
Appendix B: Bibliography	46
Appendix B: Glossary.....	48
Appendix B: Review of potential indicators of current (existing/backlog) housing need	50
Appendix B: 2011 Census – concealed families.....	56
Appendix C: Paper 2: Data sources for populating newly arising need.....	57
Appendix C: Bibliography.....	63
Appendix C: Addendum - house price data	64
Appendix C: Addendum (2) – FRS estimates and illustration of HB eligibility and affordability ratios.....	66

Introduction

The Northern Ireland Executive's *Programme for Government Consultation Document* highlighted the "Gap between the number of houses we need and the number of houses we have" (NIE, 2016, p.159). This issue had become cumulatively more significant following the Global Financial Crisis of 2007/08, which led to a reduction of more than 50 per cent in the number of new dwellings being built annually by the private sector in Northern Ireland. The rate of construction of new private dwellings increased somewhat after 2012/13, but the ongoing undersupply prompted the Department for Communities (DfC) to establish a Housing Supply Forum in 2013 (DSDNI, 2016)¹ and a Housing Market Symposium in 2017.

The Housing Market Symposium was tasked with "establishing what research and other statistical data is currently available on issues pertinent to housing supply and demand in NI, what evidence gaps remain and how these might best be addressed" (DfC, 2018:1). One of the specific objectives for the Symposium was to identify evidence gaps in relation to issues that are important to understanding the ongoing imbalance between supply and demand in the housing market. Following an analysis of Northern Ireland's economy and housing market and an examination of the main methods of assessing housing need and demand in the four jurisdictions of the UK, the Symposium concluded that the Scottish Government's *Housing Need and Demand Assessment (HNDA) Tool* appeared to offer a "robust and comprehensive approach that explicitly recognises the interdependency of economics, demography and housing supply and demand and the importance of the inter-tenure relationships" (DfC, 2018:50). The Symposium set out seven research priorities. One of these was to undertake *An Evaluation and Illustrative Pilot of the Scottish (HNDA) Tool* that should include an assessment of the "policy assumptions and priorities subsumed in the algorithms underpinning the HNDA tool" and "a pilot of the model using Northern Ireland figures, as well as sensitivity analysis to test the effects of modifications to assumptions and projections" (DfC, 2018:50).

In March 2018, the DfC and the Collaborative Centre for Housing Evidence (CaCHE) established a contractual relationship that would enable CaCHE, on behalf of DfC, to undertake additional collaborative research with a Northern Ireland focus. Based on this ongoing relationship and drawing on the considerable experience of carrying out assessments of housing need and demand in both Scotland and Northern Ireland, the CaCHE team was commissioned in 2018 to undertake an evaluation of the Scottish Government's HNDA tool². This report represents the outcome of this study.

¹ The Final Report and Recommendations from the Housing Market Symposium (DfC, 2018:8) sets out the 10 key recommendations of the Housing Forum (DSDNI, 2016)

² The original full Terms of Reference for the study are included as Appendix A.

Policy and organisational context

Up until 2015, statutory responsibility for planning for housing in Northern Ireland was divided between four organisations: the Department for Regional Development (DRDNI), the Department of the Environment (DoENI), the Department for Social Development (DSDNI) and the Northern Ireland Housing Executive. In 2015, this administrative complexity was compounded when most planning powers, including planning for housing, were transferred to the 11 new councils. Also, in 2015, the housing responsibilities of the DSDNI were transferred to the Department for Communities (DfC).

The Strategic Planning (NI) Order 1999 tasked the DRDNI with producing a Regional Development Strategy for Northern Ireland that provided an overarching framework for spatial planning. The first Regional Development Strategy (RDS) was published in 2001. One of its key aims was “to facilitate the supply of additional housing to meet the projected needs of the Region over the next 25 years” (DRDNI, 2001:109) and in meeting this aim produced the first tenure-neutral assessment of the overall future housing requirements for Northern Ireland. The RDS included a set of Housing Growth Indicators that were designed to provide the DoENI (with responsibility for Area Plans, Planning Policy Statements and development control) with guidance at local authority (or in the case of Belfast at Belfast Metropolitan Area) level on the likely future requirement for housing land to cater for new dwellings in both the social and private sectors. These Housing Growth Indicators were revised on a number of occasions in response to the publication of significant new demographic and housing stock information – in particular, new household projections (Beatty et al. 2005; NISRA, 2008, 2010, 2015, 2018) and new Northern Ireland House Condition Survey information (NIHE, 2009, 2011, 2013, 2018). The most recently published iteration of the Housing Growth Indicators used the 2016-based household projections and provided an estimate of overall housing requirements for the period 2016-2030 (DRDNI, 2019).

The Housing (NI) Order 1981 assigned the statutory responsibility for assessing housing need to the Northern Ireland Housing Executive. This included both an operational role in terms of assessing an individual household’s level of housing need and priority under the Housing Selection Scheme and a strategic role that was traditionally focused on assessing the need for new social housing based on an analysis of the waiting list for social housing and the production of District Housing Plans. In 1994, the Housing Executive added to its strategic role by commissioning Ulster University to develop a Net Stock Model that would assess the need for new social housing over a 10 year period and would serve to guide the Social Housing Development Programme and the associated budgetary provision. The most recently published iteration of this model was included in the final report that emerged from the Department for Communities’ Housing Symposium (DfC, 2018).

Since the early 2000s the Housing Executive’s role has evolved more and more to encompass a much broader analysis of the housing market as a whole. The Regional Development Strategy and more specifically Planning Policy Statement 12 (PPS12) *Planning for Housing in Settlements* (DRDNI, 2005) tasked the Housing Executive with preparing a Housing Need Assessment “in relation to identified areas of the housing market” for each of the new Area Plans that would be published as a “technical supplement in support of the development plan” (DRDNI, 2005: para. 37/38). A growing awareness of the advantages of placing housing needs assessment in the context of a wider housing market assessment process rather than this wider assessment being ‘included’ into the housing needs assessment process (Palmer, 2007) heralded a methodological transition to a broader housing market analysis using the Scottish Government’s Local Housing System Analysis approach as a model. The Housing Executive commissioned a team led by Glasgow University to undertake a study to define Northern Ireland’s housing market areas (HMAs) “to provide a suitable spatial framework for subsequent housing market analysis and strategy development” (Young et al., 2010, p.5).

Over the next three years the agreed delineation of Northern Ireland's 11 HMAs provided the geographic framework for a housing market analysis for each of them. More recently, these boundaries have been revised (Young et al., 2018) and work is now underway to update the actual housing market analyses on the basis of the revised boundaries.

Following the transfer of responsibility for most planning functions to the new 11 Councils under the Planning (General Development Procedure) Order (Northern Ireland) 2015, the Councils' planning teams have effectively become responsible for assessing the future housing requirements for their Council areas. These assessments are reflected in the Local Development Plan – Draft Plan Strategies that are in the process of being published. For example, Belfast City Council's Draft Plan Strategy published in 2018 envisaged a requirement for a total of 31,660 new homes over a 15-year period from 2020-2035 (BCC, 2018). The expected rate of construction is expected to rise significantly over time, from 1,100-1,300 dwellings per annum during the first five-year period (2020/21–2024/25) to an average of 2,100-2,300 during the second period and 2,700-2,900 dwellings during the third and final period (2030/31–2034/35). This rapid increase in the rate of construction is designed to reflect the expected significant improvement in the city's economic performance over the 15-year period.

The Planning (General Development Procedure) Order (Northern Ireland), 2015 also names the Housing Executive as a statutory consultee in the planning process, where, for example, "a development proposal is likely to require a statement of affordable housing need" (Schedule 3, Parts 1 and 2, Section 8³). This role is likewise set out in the Planning (Local Development Plan) Regulations (Northern Ireland) 2015 where the Housing Executive is named as a "consultation body".

The DfC continues to have strategic responsibility for developing policy and legislation that has a significant impact on the assessment of housing need and demand for housing in Northern Ireland. For example, it is currently examining potential changes to policy in relation to the Housing Selection Scheme, the private rented sector and the definition of affordable housing. It also continues to have overall budgetary responsibility for the Social Housing Development Programme and the provision of affordable homes via the Co-Ownership Scheme.

³ <http://www.legislation.gov.uk/nisr/2015/72/schedule/3/made>

The Scottish HNDA tool in outline

The Housing (Scotland) Act, 2001, imposed a statutory duty on Local Authorities to prepare a Local Housing Strategy (LHS) supported by an assessment of housing need and demand. This is in addition to the requirement to allocate sufficient land for housing under the Town and Country Planning (Scotland) Act, 1997. The HNDA tool developed by Scottish Government's Centre for Housing Market Analysis (CHMA) aims to support these tasks by reducing both the time and resources required to complete them and by bringing together nationally produced datasets "in a way which supports consistency in approach to estimating housing need and demand" (Scottish Government, 2018a:1.3). The use of the HNDA tool is supported centrally by CHMA, and local authorities are encouraged to undertake analysis on the basis of a framework of functionally-defined Housing Market Areas (HMAs) and be transparent about the processes and decisions underpinning their HNDA (Scottish Government, 2015).

The HNDA tool combines estimates of housing need from existing households with projected housing need and demand from households that will form in the future in an integrated comprehensive model that recognises the interactions between the three main housing tenures: owner occupation, private renting and social housing. The model underpinning the actual tool assumes that future housing need/demand is essentially determined by the rate of household formation and will be addressed primarily by building new homes. It also assumes as a baseline position that existing (backlog) need, based on what could be considered a rather limited definition, is to be met in its entirety by the construction of new social dwellings. HNDA estimates of the requirements for additional dwellings inform the LHS Housing Supply Targets (HSTs) – the level of housing to be delivered bearing in mind land and other resource constraints. However, the guidance emphasises that the HST is not part of the actual HNDA process, but the next stage of the planning for housing process, where HNDA estimates are refined to take account of factors such as housing policy, available finance and the capacity of the construction sector (Scottish Government, 2018b:i). In the last analysis, the supply of land for housing in Scottish Development Plans is based on HST figures and not HNDA figures.

The HNDA tool recognises the challenges inherent in any attempt to accurately estimate future house prices, rents and incomes that are not only key determinants of overall housing need/demand, but also key to understanding the affordability of the different housing tenures. The tool is therefore populated with a number of 'alternative futures' that produce a range of broad housing estimates "that can be accepted or rejected as the future of the housing market unfolds" (Scottish Government, 2018:4).

The Scottish Government's Practitioner's Guide (Scottish Government, 2018b) provides a step-by-step outline of the HNDA process and use of the HNDA tool:

The overall process begins with the identification of **key housing market drivers**, "including household formation, population and migration, housing affordability, including incomes, house prices, rent levels, access to finance and key drivers of the local and national economy" (Scottish Government, 2018b:11). The aim in this introductory step is to gain an understanding of the dynamics of the local housing market, which in turn should then inform the most realistic scenarios adopted in the HNDA tool.

The second stage focuses on providing a **Housing Stock Profile** and an insight into the **Pressures (and existing need) and Management Issues**. It identifies households with an existing housing need that can be met in-situ and those where a new dwelling unit is required. Key outputs from this stage include: an analysis of the housing stock by, for example, size, condition, tenure and turnover; the location of areas where there is undersupply or low demand; opportunities for more effective use of the housing stock; and suggestions about what kinds of new social housing could be provided to meet identified housing need.

Stage 3 of the HNDA process focuses on **Estimating Future Housing Need and Demand**. The HNDA tool enables overall future requirements (existing housing need and future additional households) to be divided into four tenure-based categories on the basis of estimates of housing affordability: (1) unsubsidised owner occupation; (2) unsubsidised private rented sector; (3) below market rent⁴ – including ‘intermediate rent’, ‘mid-market rent’ or shared equity/ownership schemes; (4) social rented sector. The accompanying narrative should set out the evidence-based assumptions and choices underpinning the chosen HNDA scenarios (demography, existing housing need, house prices and rents and affordability). The guidance emphasises that this stage of the HNDA process does not deal with existing need that can be dealt with by means of an in-situ or housing management solution (see Stage 2) or specialist provision (see Stage 4). It also does not incorporate future stock changes, e.g. demolitions, the sale of social dwellings and projected vacancies. Finally it re-iterates a key point, namely that the estimate of future housing requirements “is purely an arithmetic estimate” (driven mainly by estimates of household formation, incomes, house prices and rents) and that this does not necessarily equate to what “will realistically be delivered on the ground. This is determined in the HST” (Scottish Government, 2018b:23).

As part of Stage 3, the Practitioner’s Guide also provides further useful insights into the assumptions underpinning the HNDA tool and advice on a number of aspects of scenario selection:

A range of between three (e.g. high, medium, low) and six estimates should be produced based on a combination of demographic, economic or affordability projections. The use of official household projections is highly recommended, not only because these are viewed as robust but because they are resource intensive to produce.

The tool assesses existing housing need on the basis of a combination of homeless households in temporary accommodation and concealed households living in overcrowded conditions (HoTOC). These are the only households who are considered to need a new dwelling. It permits local authorities in Scotland to override this definition of existing housing need and use their own estimates, but this must be explained in the HNDA.

The tool also adopts a default position that all households in existing need will be housed in the social sector and that this ‘backlog’ will be cleared over a period of five years. Again, both these assumptions can be modified and if the choice is made to assume that not all these households will be housed in the social sector, the tool’s affordability model splits them across the four tenure-based categories (see below). Assumptions on house prices, rents and household income are combined into scenarios and agreed in advance before being inserted into the tool, whereby past trends are seen as a good indicator of future trends and scenarios should be based around a central ‘most likely’ scenario.

The division of the overall requirements for housing into four tenure-related categories is based on a number of specific assumptions that were developed in consultation with local authority stakeholders and are regarded as ‘robust and credible’ by Scottish Government:

A house is considered affordable “if its price does not exceed 3.6 times a household’s income”. The tool uses lower quartile house prices and incomes because it assumes that “this point in the price-income distribution represents First-Time-Buyers (rather than movers) who are in most housing need” (Scottish Government, 2018b:26). The use of a 3.6 times income to house price multiple equates to a 3.1 times income to mortgage multiple plus a 15% deposit. This is based on UK Finance data on average mortgage lending to first-time buyers in Scotland in 2017.

⁴ The HNDA tool specifically identifies Below Market Rent based on the data used to calculate this (i.e. rental data). It does not specifically calculate the need for shared equity/ownership homes. However, Scottish Government advises Local Authorities in Scotland that as this figure lies between the estimates for the unsubsidised private rented sector and social housing such households could be considered as being able to afford an alternative form of subsidised housing such as shared ownership.

A 'wealth affordability constraint' built into the model assumes that 60% of households that have sufficient income to buy can raise the necessary deposit to do so and will therefore become owner occupiers.

Households who do not fall into the (unsubsidised) owner occupation category are subdivided on the following basis: those who are spending less than 25% of their income on rent can afford to do so in the unsubsidised private market; those who are spending 25-35% on rent may benefit from subsidised private rented accommodation (or, alternative subsidised ownership schemes); households spending more than 35% of their income on rents (rents at the 30th percentile of market rents), including Housing Benefit (or the Housing Element of UC) who may benefit from social rent.

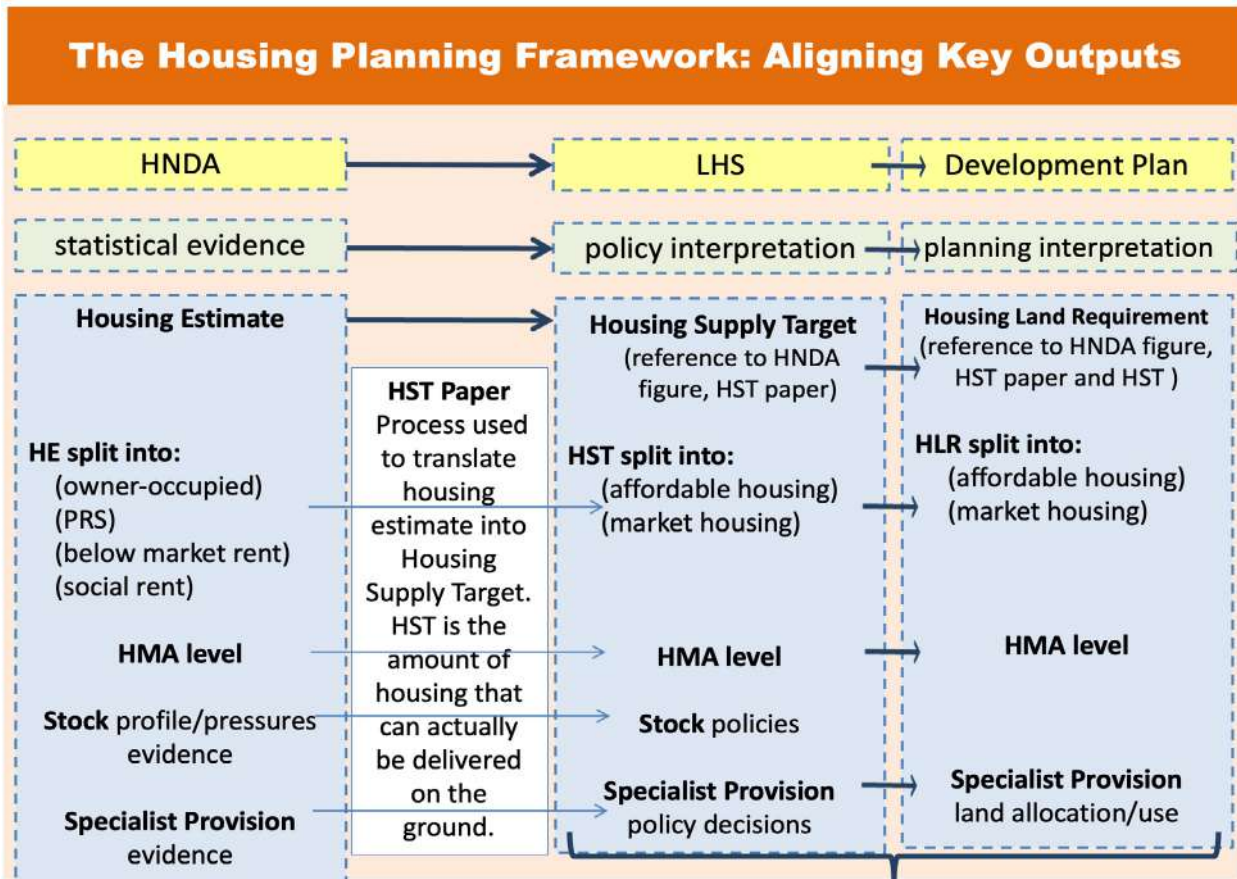
The outputs from this stage of the HNDA process include the agreed assumptions and scenarios to be used in the tool, an estimate of existing households who require additional housing (HoTOC or other agreed definition), i.e. those whose needs cannot be met by means of an in situ solution, and, finally, four projected estimated requirements: additional owner-occupied housing, additional private rented sector housing, additional below market rent (or subsidised owner occupation) and additional social rented housing.

The fourth and final stage of the HNDA process addresses **Specialist Provision** to support independent living for people requiring more specialised types of housing or support needs, including accessible and wheelchair housing, housing for students, migrant workers or asylum seekers, supported provision in care homes or sheltered complexes and site provision for Gypsy/Travellers. The Scottish HNDA model provides Specialist Provision Templates that help rationalise this more unstructured element of the process that relies on a wide range of statistics, research, policy documents and strategies from housing and health and social care., that will enable the templates to be populated. The estimates contained in these templates are not included in the actual HNDA tool⁵.

In summary, therefore, the HNDA tool provides an estimate of the overall requirement (existing and newly arising) for additional housing on an annual basis. It is divided into four tenure-based categories on the basis of whether households are likely to be able to afford unsubsidised owner occupation or privately rented accommodation or are more likely to need a subsidised below market rental (or a subsidised owner occupied) home or social housing. This four-way sub-division is calculated on the basis of the cut-off points agreed with local authority stakeholders and based on the proportion of household income required to meet lower quartile house prices and rents. Specialist provision is an additional requirement to this process and is stipulated by the Housing (Scotland) Act, 2001, but does not impact on the overall figures produced by the tool. The actual Housing Supply Target does not emerge automatically as part of the HNDA process. The HNDA provides an evidence base for the HST, but also takes policy and availability of resources into account. The overall process, including its relationship to the Development Plan is summarised in Figure 1.

⁵ The specialist provision figure is not part of the overall need/demand calculated by the Excel Tool. Rather it is the data gathering requirement for all forms of specialist provision for further consideration in the Local Housing Strategy.

Figure 1: The Scottish HNDA process and the framework for planning for housing



Source: [Scottish Government](#) (2015)

Methodology

The methodology adopted by this evaluation study reflects the key tasks that were set out in the original Terms of Reference for the project⁶. These tasks were as follows:

1. Audit of data requirements to allow adaptation of the Scottish HNDA model to Northern Ireland. This would focus on the following datasets / variables:
 - Population and household projections at NI level, including variant projections that reflect alternative future economic scenarios / outcomes.
 - Future scenarios of house prices, rents, employment, incomes, mortgage rates at UK / NI level (macro variables).
 - Profile of social housing stock management issues at NI level. This would be based on data on waiting lists, vacancies, time to let, size of difficult to let stock, occupancy, over-crowding, stock condition.
 - Available data on specialist categories.
2. Collection / collation of key datasets, including imputation of missing variables as needed.
3. Based on Scottish experience develop and agree policy scenarios and key input variables needed to inform the design of the NI version of the SHNDA model. Initially three labour market scenarios are suggested based on (updated) Ulster University Economic Policy Centre (UUEPC) analysis contained in Symposium report.
4. Re-working the Excel based Scottish HNDA model to ensure that it produces robust estimates at NI level and is user friendly.
5. Construction of a counter-factual model based on existing NI models (Department for Infrastructure's Housing Growth Indicators and Housing Executive's Net Stock Model and Waiting List/Cross-tenure analysis). This would use available data on anticipated current (backlog) and future housing need and provide the basis for formally evaluating the performance of the HNDA model at the Northern Ireland level.
6. A knowledge transfer event (involving social/affordable and private market housing providers, representative bodies and researchers/academics etc.) organised and run by CaCHE, designed to maximise end user engagement and understanding of the final outputs.

Subsequent sections of this report will address each of these tasks in turn, as well as indicate where they have been modified following discussion with the wider project team. A concluding section will provide an overall synthesis of the key findings and conclusions emerging from undertaking these tasks.

⁶ These are attached in full as Appendix A

Tasks 1 & 2: Audit of data requirements and data collection/collation

The audit of data requirements was undertaken by Gillian Young (Newhaven Research Scotland), who was asked to join the CaCHE research team because of her lengthy experience of analysing the specific datasets used to undertake functionally delineated housing market analysis in Northern Ireland since 2009 (Young et al., 2010; O'Sullivan et al., 2011; Newhaven Scotland, 2018). This section summarises her two detailed papers submitted to, and discussed by, the wider project team at its meeting on 15 March 2019 in fulfilment of this task (Young, 2019a; 2019b⁷), as well as providing a number of additional observations that highlight issues that are important in the Northern Ireland context.

Paper 1: Consideration of backlog (current) need

The first of these papers examined backlog need, and begins by briefly examining the four main criteria typically used in official guidance and national studies to define and calculate the total number of households whose housing circumstances fall short of the prevailing officially accepted normative housing standards:

Lack of a stable home: households who are officially considered homeless, concealed families and rough sleepers. Broader definitions can include 'sofa-surfers' or those living in non-permanent accommodation such as caravans.

Inadequate housing conditions: households living in what is deemed substandard housing in terms of an official standard such as the Fitness Standard or the Housing, Health and Safety Rating System.

Unsuitable housing: households who live in accommodation that is not appropriate for their personal circumstances. Narrower definitions are based on overcrowding standards, while broader ones include older people or people with a disability living in high rise flats or in homes not designed or adapted to meet their needs.

Un-affordable housing costs: households that are spending what is considered to be an excessive proportion of their income on housing costs that results in financial hardship.

Measurement of backlog housing need in the Scottish HNDA tool.

In addressing the issue of how to measure backlog need a key question is how to calculate "the proportion of households with unmet need that could be satisfied within the existing housing stock from the proportion that could only be addressed by a new (or additional) home" (Young, 2019a, p.2). The current version of the Scottish HNDA tool (Scottish Government, 2018a,b,c) utilises a narrow definition of backlog need: **Homeless households in temporary accommodation plus households that are both concealed and overcrowded (HoTOC)**. Indeed, this definition is even narrower than the earlier (Scottish Government, 2014) version that defined backlog need on the basis of: Homeless households including those in temporary accommodation plus households that are both concealed and overcrowded (Homelessness and Temporary Accommodation Pressure – **HaTAP**).

However, the Scottish Government's guidance does recognise that local authorities may wish to use their own definition of backlog need and the actual HNDA tool facilitates this. This issue was discussed in the context of Northern Ireland by the wider project team who recognised that a broader definition may be more appropriate, given that the number of households considered to be in urgent housing need (housing stress) in Northern Ireland has remained consistently above 20,000 since 2011.

⁷ Updated versions of these are included in full in Appendices B and C

Recommended data sources

The data audit examined two main sources for estimating current (backlog) housing need in the context of Northern Ireland: the Common Waiting List (CWL)⁸ for social housing and the Northern Ireland House Condition Survey (NIHCS).

In the context of the UK, the CWL is seen as a unique data source that provides a highly consistent assessment of housing need across Northern Ireland based on agreed normative standards expressed quantitatively in the points-based Housing Selection Scheme. As with all such large operational datasets there are some disadvantages with it, including the potential for an undercount (households not applying because social dwellings are not available in their preferred area of choice) and an overcount (households whose circumstances have changed and no longer require social housing or those who apply as an insurance policy with no serious intention of moving into a dwelling in the social sector in the foreseeable future) (O'Sullivan, 2010; DfC, 2018).

The data audit views the NIHCS as “the most comprehensive dataset for measuring housing need” (Young, 2019a, p.3). It could potentially be a valuable source too for a wider definition of backlog need that included households living in inadequate housing, in unaffordable accommodation or as a concealed family. However, currently it could not identify those living in temporary accommodation and given the sample size of the most recent 2016 survey it proved impossible to produce sufficiently robust figures for concealed families living in overcrowded accommodation.

In light of this and the stated project aim of assessing the Scottish model, the data audit proposed that for the purposes of this evaluation:

- the number of households living in temporary accommodation is sourced from the NIHE's database, which recorded that in January 2019 a total of 2,065 households lived in temporary accommodation.
- the number of concealed families living in overcrowded accommodation should be estimated using the overall number of concealed families from the 2011 Census (7,981) as a starting point. Then assuming that, as in Scotland and Wales, approximately 25 per cent of these were living in temporary accommodation, an estimated figure of 2,000 should be adopted for the purposes of calculating HoTOC;
- it was noted that the CWL and NIHCS could in the future provide additional evidence that could be used to sense check these figures if the model were to be used in Northern Ireland.

The wider project team accepted these recommendations for the purposes of this evaluation study, noting that requesting a special table from the Northern Ireland Statistics and Research Agency (NISRA) Census team to cross-tabulate concealed families and overcrowding was at this stage not a useful application of scarce public resources. It also asked that as part of the scenario testing that the broader figure of all those in temporary accommodation be used as one of the alternative scenarios. Finally, the data audit recommended that for the purposes of this evaluation it should be assumed that, as in Scotland, all households identified as being in backlog housing need required social housing.

⁸ The Common Waiting List for social housing in Northern Ireland was introduced as part of a new (common) Housing Selection Scheme for both Northern Ireland Housing Executive and housing association dwellings and approved by the Department for Social Development with effect from 1 November 2000. The Common Waiting List is managed by the Northern Ireland Housing Executive. <https://www.nihe.gov.uk/Documents/Housing-selection-Scheme/housing-selection-scheme.aspx>

Paper 2: Data sources for populating newly arising need

The second paper (Young, 2019b) likewise examined a range of data sources that could be used to identify future newly arising housing requirements. It identified the three elements required to fulfil the HNDA process for estimating the minimum number of new homes (across all tenures) required to meet newly arising need/demand under different economic and housing market trajectories, thereby enabling the Excel based model to produce estimates of overall housing requirements for each year of the projection period as follows:

- Household projections that (when combined with backlog need) provide an estimate of the overall annually arising requirement for new housing;
- A proposed breakdown of this additional requirement into four tenure-related categories (owner occupation, privately rented [open market], below market rent⁹ and social housing) based on a number of assumptions and a range of data;
- Scenario testing by inputting a range of data reflecting agreed assumptions about the future trajectories of the rate of household formation, incomes, house prices and rents.

Household projections

As in the case of both the Housing Growth Indicators and Net Stock Model in Northern Ireland, household projections are the key driver of overall future housing requirements. The implications of this will be examined in more detail at a later stage in the report. In Northern Ireland, NISRA produces the only official household projections using a two-point exponential model that effectively envisages household formation rates will continue to follow roughly the same exponential trajectory as the previous 10-year intercensal period. The (most recent) 2016-based projections were published in December 2018, but (with some modifications) are still ultimately based on the 2011 Census figures and the pattern of household formation that emerged in Northern Ireland between 2001 and 2011 (NISRA, 2018).

Young (2019b) correctly highlights the disadvantages of this level of dependence on household projections, in that they do not allow for the impact that changing economic and housing market conditions – as well as the closely linked subjective response of housing aspirations – have on household formation, never mind exceptional circumstances such as those that may arise from the UK's departure from the EU (Brexit).

The Scottish Government 'strongly recommends' using official household projections, viewing them as 'robust' and 'very resource intensive' (Scottish Government, 2018b, p.25). In Northern Ireland, there is effectively only one source, i.e. those produced by NISRA, and unlike in Scotland where three official variants are generated (principal, high or low), NISRA has, so far at least, not developed any variant projections. The HNDA tool allows users to vary the projections and ultimately if the tool was adopted in Northern Ireland users could choose appropriate modifications to the official projections.

The wider project team discussed this issue at some length and decided that bearing in mind the significant difference between the number of households projected by the 2008-based household projections for 2011 and the actual number of households as recorded by the 2011 Census (NISRA, 2012; NIHE, 2015) a variation of +/-5 per cent should be viewed as a realistic possibility and used for illustrative purposes in this study.

⁹ This category is also assumed to cover low cost affordable homeownership, including shared ownership.

Tenure split and affordability

The division of the total requirement for new housing (backlog and newly arising) by tenure is based on a number of explicit assumptions about affordability (expressed as a ratio of house prices/rents to incomes). The key assumptions are summarised in Table 1.

Table 1: Affordability assumptions in the HNDA tool

Tenure	Default assumption/setting
Potential to afford to buy	Can afford to purchase if the price of lower quartile dwelling (25% percentile) is no more than 3.6 times a household's gross income*.
Of which likely to have a deposit to buy (wealth constraint)	60% of households that can afford mortgage repayment are assumed to have the necessary deposit and go on to buy**.
Can afford private rent	Households spending less than 25% of income on rent, where rent is defined as the median PRS rent for a 2-bedroom unit.
Assumed to require below market rent product***	Households spending between 25% of income on rent (median PRS rent for a two-bedroom unit) and 35% of income on rent (30th percentile PRS rent for a 2-bedroom unit) that could benefit from some form of subsidised market rent (intermediate housing).
Assumed to require social rent	Households spending 35+% of income on rent (30th percentile PRS rent for a 2-bedroom unit).
<p>Source: Scottish Government (2018) HNDA Practitioner's Guide 2018 and Scottish Government (2019) HNDA Tool Instructions V3.1</p> <p>* The HNDA Tool Instructions confirm this is equivalent to a mortgage of up to 85% of a house price at 3.1 X income and a 15% deposit.</p> <p>** This assumption (and the homeownership multiplier) is regularly reviewed and adjusted to reflect trends in the first-time buyers by UK Finance.</p> <p>*** This is intended to represent the income range around which households could benefit from intermediate products such as Mid-Market Rent, shared equity products and, in the case of Northern Ireland, the Co-ownership Scheme.</p>	

Source: Young, 2019b

The wider project team accepted that these were reasonable assumptions for the purposes of this study and were effectively not dissimilar to the affordability measures utilised over the last twenty years by the Housing Executive and the Department for Communities (Department for Social Development). It was also noted that, in the event of the model being applied in Northern Ireland, the detail of these assumptions could be modified to reflect different circumstances, but that for the purposes of this study they would remain unchanged.

House prices

The Scottish HNDA model utilises house price data from the Registers of Scotland (General Register of Sasines) as the basis of its house price scenarios. The key house price metric used by the tool to represent the typical costs for a new homeowner is the lower quartile (25th percentile). There is no equivalent source of data in Northern Ireland and, having briefly examined a range of potential sources (including, for example, Nationwide's House Price Index), Young (2019b) concentrates on the two leading indices in Northern Ireland, the LPS/NISRA House Price Index and the Ulster University House Price Index. Both of these indices display similar trajectories. However, there are significant variations in terms of the key measures of central tendency they each produce, variations that reflect differences both in terms of data sources and methodology.

The official LPS/NISRA index is based on all domestic property sales notified to HM Revenue and Customs and uses a hedonic price methodology to produce a standardised house price that forms the basis of an index that goes back to 2005. The Ulster University index, on the other hand, uses a sample of approximately one third of all transactions to produce a mix-adjusted mean that forms the basis of an index going back to 1984.

At its meeting on 15 March 2019, the wider project team considered the merits of both indices in the context of the HNDA tool. The comprehensiveness of the data underpinning the LPS/NISRA index and the international recognition of the hedonic methodology were noted, as well some methodological differences compared to the UU index: for example, the inclusion of auctioned properties and the use of a geometric rather than arithmetic mean. However, it was agreed that for the purposes of this evaluation study both indices should be examined with a view to ascertaining a broad indication of the differential effect their utilisation in the HNDA tool would have on future housing requirements. This could be used to inform any future decision on which index is the most appropriate. On this basis it was agreed that NI-level median and lower quartile house price data from both indices going back to 2005 should be utilised in the testing of the model.

Rental data

In Northern Ireland there is only one real source of information on rents that is based on a reasonably comprehensive dataset: Ulster University's Private Rental Index that it produces in partnership with the Housing Executive. It is based on a quality-assured merger of two datasets (PropertyNews.com and the Housing Executive's Local Housing Allowance data) that ensures duplicates are eliminated and figures are adjusted to exclude rates. The wider project team agreed that NI-level data on mean, median and 30th percentile going back to the start of the NI index (2013) should be incorporated into the model evaluation.

Income

The Scottish HNDA model uses gross household income (earnings, private pensions, tax credits and social security benefits) before deductions for income tax and national insurance. It uses modelled estimates produced by a team from David Simmonds Consultancy and Heriot-Watt University and is based on a number of sources, including the Family Resources Survey (FRS). It uses the ONS definition of a household that includes the total income of adult household members. This is in contrast, for example, to the NIHCS that defines household income the basis of Household Representative Person and partner where applicable (Young, 2019b).

The wider project team debated the appropriateness of including, for example, adult children to contribute to mortgage payments, but agreed that for the purposes of the evaluation the Scottish approach should be adopted. At this stage there is no intention of commissioning a new dataset on incomes that would equate to the specific dataset used in the Scottish HNDA (although this could be considered at a later stage) and it was agreed that the most robust source of NI-level data was the FRS.

Task 3: Policy scenarios and key input variables

A key message emerging from the DfC's Housing Market Symposium emphasised the “unprecedented level of economic uncertainty” and that given Northern Ireland's ambition to improve its economic performance and increase housing supply “it is incumbent on planners and policy makers to use scenario planning which reflects the complex web of factors that will impact on housing demand and supply in the future” (DfC, 2018, Key Messages). The Scottish HNDA tool facilitates precisely this approach. The HNDA Tool Instruction (Scottish Government, 2018c) notes the difficulties of predicting the longer-term trajectories of house prices, rents and incomes and is therefore populated with a number of data series, which in various combinations offer a range of scenarios (“alternative futures”). Practitioners are advised to bear in mind that past trends are often a useful guide to future developments, but on this basis to then “decide which of the scenarios best reflects what might happen in their local area in future” (Scottish Government, 2018c, p.4).

The CaCHE research team proposed a number of broad scenarios based on the approach used in the DfC's Housing Market Symposium report. This report had used data from the UUEPC to set out three broad labour market scenarios for Northern Ireland ('pessimistic', central/expected and 'optimistic') – a key determinant of future developments in the housing market (Tables 2 and 3).

Table 2: Key forecasts 2018-21

	2017	2018	2019	2020	2021
GVA growth rate (%)	1.4	1.2	1.1	1.2	1.5
Unemployment rate (%)	5.0	4.5	4.6	5.0	5.2
Employment level '000s	874	882	883	881	879
House price growth (%)	4.4	3.8	3.6	3.8	4.0

Source: UUEPC, Outlook – Winter 2018

Table 3: Employment forecast by sector 2017-27 - three scenarios

	Lower Case (Pessimistic)	Central Estimate (Expected)	Upper Case (Optimistic)
Production & Manufacturing	-13,600	300	4,600
Construction	1,900	3,500	7,100
Public Sector Services	1,100	1,800	13,800
Private Sector Services	-1,000	28,400	70,500
Total	-11,500	28,400	70,500

Source: UUEPC, Outlook – Winter 2018

These economic and more specifically labour market estimates are not included in the actual tool but informed the data and trajectories that were discussed and agreed by the wider project team at its meeting on 15 March 2019. They effectively reflect three broad economic and policy scenarios. The central one assuming economic and policy neutrality, the other two variants envisaging a combination of small but significant positive or negative variations in terms of both economic growth and employment (including job quality) on the one hand and social welfare / housing policy (including, for example, welfare reform and subsidies for private housing supply) on the other. The agreed figures to be used as part of the evaluation process are set out below with a short commentary where appropriate¹⁰.

Demographic change

The Scottish HNDA model assumes that practitioners will use the National Records of Scotland principal variant household projections. In Scotland, unlike in Northern Ireland, upper and lower variant household projections are also produced. In Northern Ireland, while variant population projections are produced, there are no equivalent variant household projections. The most recent (2016-based) household projections uses essentially the same two-point (2001 and 2011) exponential methodology used in previous iterations of the household projections “on the basis that it is an excellent mathematical representation of what could reasonably be extrapolated to happen in the future” (NISRA, 2018, p.4). The weakness of this approach is that it assumes that the underlying household formation pattern that was apparent in the previous 10-year intercensal period would be replicated in the coming 10-year period. This weakness manifested itself in the late 2000s when, following the GFC and the associated sharp economic downturn in Northern Ireland, the rate of household formation dropped significantly. The 2006-based household projections envisaged that between 2006 and 2011 the number of new households would increase by 49,000 to 721,000 (NISRA, 2008). The 2008-based projections envisaged an increase of 27,000 households over a three-year period to 715,200 (NISRA, 2010). In the event the 2011 Census showed that the total number of households in Northern Ireland was only 703,000, a significant difference (18,000 [37%] compared to the 2006-based household projections).

In recognition of both the inherent disadvantage of using a two-point exponential model and the challenges of the current economic and policy environment since 2011¹¹ the wider project team decided that the evaluation of the HNDA model should examine the impact of a cumulative annual +/- 5 per cent variation in the projected number of additional households, i.e. in total 50 per cent over the 10-year period (Table 4).

Table 4: Agreed variant household projections 2017-2028

	2017	2018	2019	2020	2021	2022
Central	728,783	732,597	736,470	740,528	744,754	749,275
High	728,723	735,145	741,563	748,037	754,567	761,155
Low	728,723	730,969	733,162	735,314	737,469	739,681

	2023	2024	2025	2026	2027	2028
Central	754,109	759,156	763,976	768,472	772,903	777,247
High	767,800	774,502	781,264	788,084	794,964	801,904
Low	741,900	744,126	746,358	748,597	750,843	753,095

Source: Spreadsheet produced by Young and Scottish Government, 2019

¹⁰ These figures were agreed before the Covid-19 Emergency for illustrative purposes as part of this study. They would obviously have to be significantly revised if the Tool were to be adopted in the current context. However, this reinforces the importance of regularly examining, and if necessary, updating the model's projections or assumptions.

¹¹ The stagnation of real incomes, the growth of the Gig economy and ongoing 'austerity' measures, including welfare reform, (DfC, 2018)

Income growth and distribution

Bearing in mind the three UUEPC economic / labour market forecasts, and the expected ongoing uncertainties around Brexit and the Northern Ireland Assembly, the wider project team agreed that the following rates of income growth and associated proportion of gross household income would be used to populate the HNDA tool for the purposes of this study (Table 5). It was also envisaged that by 2023, these underlying uncertainties would have been overcome and the Northern Ireland economy would then achieve higher rates of growth going forward, and that would be reflected in higher incomes.

Table 5: Agreed variant rates of income growth

	0-5 years (%) [real%]	5-10 years (%) [real%]
Low	1 [-1]	2 [0]
Central	3 [1]	4 [2]
High	4 [2]	6 [4]

Income distribution

The wider project team agreed to use the three variant income distributions pre-programmed in the Scottish version of the HNDA tool (as at April 2019). These envisaged upper and lower variants that either increased or decreased the level of equality between the highest and lowest deciles of household incomes (90th and 10th percentiles respectively) by +/-1% annually. There was no particular reason to change these potential variations in assumptions for Northern Ireland for the purposes of the evaluation.

House prices and rents

Again, bearing in mind the potential economic / labour market trajectories, the wider project team agreed the following three house price growth scenarios: Strong 6%; Modest 4%; Weak/Flat 2%. (i.e. 4%/2%/0% in real terms). Given that in Northern Ireland increases in rents have typically lagged a little behind house prices, the following increases in rents were agreed: Strong 5%; Modest 3%; Weak/Flat 1%. (i.e. 3%/1%/-1% in real terms). The actual 2018 figures for house prices and rents utilised as the starting point for the evaluation are set out in Table 6).

Table 6: Agreed house price and rent metrics

	LPS House Price Index 2018 (£)	UU House Price Index (2018) (£)		Monthly Rents (£)
Mean	146,784	163,128		
Median	130,000	139,950	Median	488
Lower Quartile	95,000	107,355	30th Percentile	435

Source: Land & Property Services and Ulster University

Task 4: Scenario planning – HNDA estimates for Northern Ireland

The DfC's Housing Market Symposium's recommendation to adopt a scenario planning approach (DfC, 2018, Key Messages) is reflected in two ways in the methodological approach adopted by this evaluation. Firstly, it makes use of the HNDA tool's central estimate as a comparative baseline but allows the combination of assumptions and key inputs (data series) to be altered, changes which then ripple through the spreadsheet to affect the housing requirement outcomes. Secondly, it focuses on the period from 2018-2028 rather than a more extended period, to reflect the increasing uncertainty that is inherent in any such modelling of future housing requirements (Paris and Frey, 2018).

Given the number of potential scenarios based on various combinations of data/assumptions the report adopts the following approach. It begins by setting out the central projections contained as core default settings in the HNDA tool as a baseline comparator. It then examines the effects of changing one or two individual key variables in isolation to ascertain the magnitude of the effect this has on outcomes; this also provides an insight into the relative importance of specific variables in the overall equation. Finally, it sets out two composite scenarios in which all the key variables affecting newly arising need are amended to reflect what could be considered an 'optimistic' scenario and a 'pessimistic' scenario and compares these to the 'central' baseline outcomes.

The starting point (baseline) for the more detailed evaluation (Table 7) utilises both:

- Scottish Government's core tool default settings (reflecting both Scottish Government's interpretation of backlog need and the assumptions and cut-off points utilised to divide the overall future requirement for housing into the four tenure categories); and
- The central (most likely) estimates of income growth and distribution and annual rates of increase in house prices and rents agreed by the wider project team.

Baseline requirements

Table 7 shows a simplified version of the baseline Northern Ireland figures emerging from the HNDA tool using both the core tool default settings and the agreed rates of economic growth and increases in incomes, house prices and rents. Overall future requirements are calculated by a combination of estimated backlog need as determined by HoTOC (number of households in temporary accommodation plus concealed families living in overcrowded accommodation) and the rate of household formation. The principal household projection for Northern Ireland envisages the number of new households increasing from 732,597 in 2018 to 777,247 in 2028 – or approximately 4,465 pa. The HoTOC figure of 4,065 (2,000 in temporary accommodation and 2,065 concealed families in overcrowding) is assumed to be 'cleared' in 5 years resulting in a significantly higher estimated average annual future housing requirement of 5,115 for the first 5 years year period compared to the second (4,628), and an overall ten-year annual average of 4,872.

Backlog need

If the HoTOC figure is increased to 10,065 (to include all concealed families, regardless of overcrowding) and this backlog figure is 'cleared' over what could be considered a more realistic 10 year period, then (if newly arising requirements remain unaltered) instead of a future annual housing requirement of 4,872 the figure would become 5,472 (5,309 and 5,634 for the first and second five-year periods respectively). The higher figure of housing requirements in the second of the two five-year periods reflects not only the 10-year clearance rate, but also the higher number of newly forming households projected for this second period by NISRA.

Table 7: Baseline scenario: central projection 2018-2027¹²

HHs: Temporary Accommodation	2,000
HHs: Concealed & Overcrowded	2,065
Total Backlog Need (to be 'cleared' in 5 years)	4,065
Newly forming Households 2018-2022	21,512
Newly forming Households 2023-2027	23,138
Total newly forming households (2018-2027)	44,650
Total future housing requirements 2018-2022	25,577
Total future housing requirements 2023-2027	23,138
Total future housing requirements 2018-2027	48,715
Tenure-based Requirements (2% annual house price and rental increases, etc.)	
Social Rent 2018-2022: Average pa	1,649
Social Rent 2023-2027 Average pa	926
Total Social Rent 2018-2027 Average pa (Total)	1,288 (12,873)*
Below Market 2018-2022: Average pa	922
Below Market 2023-2027: Average pa	1,018
Total Below Market 2018-2027: Average pa (Total)	970 (9697)
PRS 2018-2022: Average pa	1,220
PRS 2023-2027: Average pa	1,296
Total PRS 2018-2027: Average pa (Total)	1,258 (12,578)
Buyers 2018-2022: Average pa	1,325
Buyers 2022-2027: Average pa	1,388
Total Buyers 2018-2027: Average pa (Total)	1,356 (13,565)
Total Requirements 2018-2027: Average pa (Total)	4,872 (48,720)

*This figure includes the total backlog (4,065)

¹² All the tables and figures used in this section of the report (Task 4) use the NISRA/LPS (HMRC-based price data unless otherwise explicitly stated.

Newly arising need – Household projections

The wider project team agreed that two variant scenarios would be tested based on a cumulative 5% increase or decrease in the annual number of new households formed, i.e. in total a 50% increase or decrease in newly arising need compared to the central household projections over the agreed ten year period (2018-2028) to reflect the current economic and policy environment. This effectively translates into a three percentage point difference in the annual rate of increase in the overall number of households between the central projection and the high and low variants (approximately 6% compared to 9% and 3%).

The principal household projection envisages 732,597 households in 2018, 754,109 in 2023 and 777,247 in 2028. This equates to an annual average increase (newly arising need) of 4,465 new households a year. During the first five-year period the average annual increase is 4,302 (5,115 if the backlog need is added in) and during the second it is considerably bigger at 4,628.

Applying the higher household projection variant to this scenario means that the newly arising need figure increases significantly to 6,531 for the first five-year period (7,344 including backlog) and 6821 for the second. The ten-year annual average newly arising requirement is 6,676.

If the lower household projection is applied there is obviously a significant reduction in the newly rising requirements for both the first and second periods (2,186 and 2,239 respectively), a ten-year annual average of 2,212.

In summary, therefore, the model deals with estimating newly arising need in a very straightforward way. It is determined purely and simply by the rate of household formation and the projected annual newly arising requirements reflect the chosen demographic scenario.

However, it is also worth examining the effect of changing the household projections on the outcomes by tenure (while keeping all other variables constant as in the central projection).

Table 8: Variant household formation rates – projected annual housing requirements

	Low HH Growth 2018-22	Low HH Growth 2023-27	Central HH Growth 2018-22	Central HH Growth 2023-27	High HH Growth 2018-22	High HH Growth 2023-27
Total	2,999	2,239	5,115	4,628	7,344	6,821
Social Rented	1,228	403	1,649	926	2,054	1,227
Below Market	459	466	922	1,018	1,371	1,419
PRS	638	699	1,220	1,296	1,905	2,129
Buyers	674	672	1,325	1,388	2,014	2,046

Table 8 shows that during the first five-year period the proportional distribution by tenure varies significantly depending on whether low or high household growth is assumed. For example, assuming low household growth, the proportion of the total requirement to be delivered in the form of social dwellings is 41 per cent, but this falls to 28 per cent if high growth is assumed. Conversely, the requirement for dwellings in the owner-occupied sector rises from 22 per cent (low growth) to 27 per cent (high growth). However, this is merely a reflection of the fact that backlog (existing) need is being cleared during the first five year-period – and that this backlog need is all allocated to the social sector. This is confirmed by examining the second five-year period where the proportions of the total allocated to each tenure remain constant, regardless of whether low or high household growth is assumed.

Income growth and distribution

The HNDA tool enables users to test the effects of different estimates of income growth compared to the baseline figures. Each of these estimates can then be used in combination with greater or lesser equality in terms of income distribution. Table 9 sets out the estimated future housing requirements (including the backlog need of 4065 for the period 2018-22) on the basis of the agreed lower real growth in incomes (-1.0% 2018-22 and 0.0% 2023-27) and the higher one (2% 2018-22 and 4% 2023-27).

Table 9: Variant income growth rates – projected annual housing requirements

	Low income growth: 2018-22	Low income growth: 2023-27	High income growth: 2018-22	High income growth: 2023-27
Total	5,115	4,628	5,115	4,628
Social Rented	1,766	1,283	1,630	771
Below Market	956	1,073	904	919
PRS	1,154	1,108	1,213	1,386
Buyers	1,240	1,163	1,368	1,553

As would be expected, Table 9 shows that varying the rate of income growth makes no difference to the overall total requirements, as these are driven by the rate of household formation and, for the first five-year period (2018-22), by backlog need. However, significant variations in the chosen scenarios for income growth (3 and 4 percentage points during 2018-22 and 2023-27 respectively) have a commensurately significant impact on the distribution of the overall requirements between the four tenure-related groups. As would be expected in a higher income scenario there would be a lower requirement for social rented and below market properties, with a commensurate increase in the number of unsubsidised PRS and owner-occupied ones. The two different income scenarios have a significant impact particularly in the second five-year period (partly because it is assumed that backlog need is fully addressed entirely during the first five-year period). The need for homes in the social sector in the first five-year period is an annual average of 1,283 compared to only 771 (-40%) under the higher income scenario. Conversely, in the owner-occupied sector the requirement is 1,163 under the lower income scenario compared to 1,553 compared under the higher one (+34%). The PRS estimate for the second five-year period experiences a significant change too: a 25% increase between the lower and higher income scenarios.

When this is combined with greater or lesser equality scenarios the differences can become even more stark (or less so if the combination is reversed). For illustrative purposes the above figures are combined in the following way: Lower income plus greater inequality compared to higher income plus greater equality (Table 10).

Table 10: Variant income/equality trajectories: projected annual housing requirements

	Higher income greater equality: 2018-22	Higher income greater equality: 2023-27	Lower income greater inequality: 2018-22	Lower income greater inequality: 2023-27
Total	5,115	4,628	5,115	4,628
Social Rented	1,551	560	1,836	1,385
Below Market	948	1,009	895	963
PRS	1,237	1,472	1,138	1,084
Buyers	1,379	1,586	1,246	1,196

Again, the most significant differences between the much more benign scenario and the more pessimistic one are apparent particularly during the second five-year period. The need for social homes rises from 560 to 1,385 (+247%), while the requirement for owner occupation falls by 25 per cent (1,586 to 1,196). The requirement for the unsubsidised privately rented accommodation would decrease from 1,472 to 1,084 per annum (-26%). The Below Market category – given its intermediary position in the market again changes only to a limited extent.

In summary, therefore, the choice of scenarios in relation to the combination of income growth and distribution can have very significant differential impacts on both the need for social homes and the requirement for unsubsidised owner occupied or privately rented homes.

House prices and rents

House prices and rents in Northern Ireland over the past ten years have followed significantly different trajectories. Rents have experienced slow but steady growth as the demand for privately rented properties has grown. The trajectory of house prices has been much more volatile. However, for the purposes of this evaluation it is assumed that both house prices and rents rise or fall in tandem (Table 11).

Table 11: Variant house price / rental growth – projected annual housing requirements

	Strong House Price and Rental Growth: 2018-22	Strong House Price and Rental Growth: 2023-27	Weak House Price and Rental Growth: 2018-22	Weak House Price and Rental Growth: 2023-27
Total	5,115	4,628	5,115	4,628
Social Rented	1,686	1,082	1,567	632
Below Market	939	1,027	867	817
PRS	1,251	1,350	1,266	1,543
Buyers	1,240	1,169	1,416	1,636

The general pattern that emerges is not dissimilar to the higher/lower income scenarios. If there is a combination of weak house price and rental growth then the need for social housing falls and the demand for owner occupation rises. In the case of social housing in the second five-year period need falls from 1,082 to 632 per annum (minus 42%), whereas the demand for owner occupation rises from 1,169 to 1,636 (40%). However, a comparison of Table 11 and Table 9 shows that the degree of change in demand for owner occupation is greater in the case of variant house prices and rents than it is in the case of income (40% compared to 34%, 2023-2027). In the case of the need for social housing the assumed change in income trajectories makes a more significant difference (minus 66% compared to minus 42%). For unsubsidised privately rented properties demand is 14 per cent greater if house price and rental growth are weaker compared to a 25 per cent increase for the lower to higher income scenarios (from 1,108 to 1,386).

The wider project team also indicated its interest in understanding the potential ramifications of using the house price data underpinning Ulster University's House Price Index instead of HMRC data. Table 12 illustrates the key effects of this using the central baseline projections and in the interests of simplicity each of the previous tables in this section is not repeated using Ulster University data.

Table 12: Central projected annual housing requirements – HMRC and UU data

	HMRC-based 2018-22	HMRC-based 2023-27	UU-based 2018-22	UU-based 2018-22
Total	5,115	4,628	5,115	4,628
Social Rented	1,649	926	1,649	926
Below Market	922	1,018	922	1,018
PRS	1,220	1,296	1,353	1,435
Buyers	1,325	1,388	1,191	1,249

As in the case of variant income growth, using Ulster University data makes no difference to the overall total requirements, as these are determined purely by the rate of household formation and in the case of the first five-year period (2018-22) by backlog need. However, the figures also remain the same in the case of the projected need/demand for social rented and below market rental/owner-occupied dwellings. It is only in the case of the demand for unsubsidised private rental or owner-occupied homes that there is any difference. Using the Ulster University figure (the higher of the two lower quartile figures: £107,355 compared to the HMRC figure of £95,000) results in a significantly higher demand for privately rented properties (2,788 over the ten-year period compared to 2,516) and a lower demand for owner-occupation (2,440 compared to 2,713). This, too, is unsurprising and reflects the greater affordability problems first-time buyers in particular would face if average house prices were higher.

Multi-faceted scenarios

The above paragraphs have examined the implications of changing the model assumptions one or two key variables at a time. The next section sets out two more complex scenarios in which all the variables affecting newly arising housing requirements are changed to represent one overall 'optimistic' and one overall 'pessimistic' scenario compared to the baseline:

- The optimistic scenario assumes a high level of household growth (5%), high income growth in real terms (2/4%), greater equality of income distribution, strong house price growth (4%) and strong rental growth (3%).
- The pessimistic scenario assumes a low level of household growth (-5%), low income growth in real terms (-1/0%), greater inequality of income distribution, weak/flat house price growth (0%) and weak/flat rental growth (0%).

In both cases the existing backlog need has been kept constant (at 4,065) and is cleared in five years.

Table 13: Pessimistic, central and optimistic scenarios – projected annual housing requirements

	Pessimistic 2018-22	Pessimistic 2023-27	Central 2018-22	Central 2023-27	Optimistic 2018-22	Optimistic 2023-27
Total	2,999	2,239	5,115	4,628	7,344	6,821
Social Rented	1,277	511	1,649	926	1,975	968
Below Market	437	398	922	1,018	1,463	1,678
PRS	611	658	1,220	1,296	1,947	2,111
Buyers	674	672	1,325	1,388	1,959	1,964

Table 13 once again highlights the very significant effects on future housing requirements of assuming differential household growth rates compared to the central projection. However, more importantly, when in combination with what may be considered a reasonably logical associated combination of lower rates of growth (in incomes, house prices and rents) in the case of the ‘pessimistic’ scenario and higher rates of growth in the case of the ‘optimistic’ scenario, Table 12 illustrates the considerable differences that could be expected in terms of the housing requirements by tenure. A number of examples will be used to illustrate this point:

- Counterintuitively, the ‘optimistic’ scenario envisages a higher requirement for social dwellings – 14,715 compared to 8,940. However, the proportion of social dwellings in the overall 10-year requirement under the ‘optimistic’ scenario is only 21 per cent compared to 34 per cent under the ‘pessimistic’ one.
- The number and proportion of owner-occupied dwellings required over the 10-year period required increases from 6,730 (26%) under the ‘pessimistic’ scenario to 19,615 (28%) under the ‘optimistic’ scenario.
- Similarly, the requirement for privately rented dwellings increases from 6,345 (24%) under the ‘pessimistic’ scenario to 20,290 (29%) under the ‘optimistic’ scenario.
- Likewise, the requirement for below market (privately rented or affordable owner-occupied) homes also increases in both absolute and proportional terms from 4,175 (16%) under the ‘pessimistic’ scenario to 15,705 (22%) under the ‘optimistic’ one.

Task 5: Comparative models – triangulation

The original terms of reference envisaged the construction of a counter-factual model based on existing Northern Ireland models (Housing Growth Indicators, Net Stock Model and Waiting List/Cross-tenure analysis) as the basis for evaluating the validity and performance of the HNDA model at the Northern Ireland level. Following methodological discussions it was agreed by the wider project team that rather than developing a new hybrid counter-factual model, this task would be fulfilled more effectively by using readily available data to provide updates to both the 2012-based Housing Growth Indicators (DfI, 2016) and the most recent version of the Net Stock Model (DfC, 2018). These two existing models were to be used as the basis for triangulation that would provide a clear indication of the potential robustness of the Scottish HNDA model in the context of Northern Ireland. Since this decision was taken, the Department for Infrastructure has published new 2016-based Housing Growth Indicators for Northern Ireland (DfC, 2019) and these figures have now been used in the report alongside an updated version of the Net Stock Model (Tables 14 and 15).

Table 14: Estimate of total new housing requirements (HGIs) for Northern Ireland 2016-2030

	Variable	Year of data	Value	Source
(A)	No. of households	2030	784,600	2016-based NISRA projections (occupied stock)
(B)	Second homes	2030	8,700	1.11% occupied housing stock. NISRA Central Survey Unit combined survey sample
(C)	Vacant stock	2016-30	57,000	6.70% of total housing stock. NISRA Central Survey Unit combined survey sample
(D)	Net conversions/closures/demolitions	2016-30	11,100	Net stock loss estimated using LPS housing stock and new dwelling completions data. Based on 9 year average.
(E)	New stock estimate at end of period	2030	861,400	Sum of (A), (B), (C) & (D)
(F)	Total stock at start of period	2016	776,500	LPS NI Housing Stock
(G)	Projected new dwelling requirement	2016-30	84,800	(E) minus (F)
(H)	Projected new annual dwelling requirement		5,700	

Source: DfI (2019) 2016-based Housing Growth Indicators

Table 15: Net Stock Model 2011-2021 and updated CaCHE estimate 2018-2028

	Projected Households (000) 2011-2021	Projected Households (000) 2018-2028
Extra Demand 2011-2021/2018-2028		
New Households	44.7	44.1
Concealed Households (Families)	8.0	8.0
Temporary Accommodation	3.0	3.0
<i>Total Extra Demand</i>	<i>55.7</i>	<i>55.1</i>
Extra Supply 2011-2021/2018-2028		
New Private Output	46.8	50.1
Less Net Demolitions, Conversions and Closures	(2.0)	(2.0)
Less 5% Second Homes	(2.3)	(2.5)
Less 5% Vacancy in New Private Housing	(2.3)	(2.5)
<i>Total Extra Supply</i>	<i>40.2</i>	<i>43.1</i>
New Social Housing Needed 2011-2021 / 2018-2028		
Deficit	15.5	12.0
Plus 2% Vacancy in New Social	0.3	0.2
Total Needed	15.8	12.2
Total Rounded and Allowance for Other Factors	16.0	13.0
Total Per Annum	1.6	1.3

Source: DfC (2018), NISRA (2018), LPS (2019)

As in the case of the HNDA tool, the main driver of the newly arising requirement for housing under both the HGI methodology and Net Stock Model is the rate of household formation. All three models utilise NISRA's household projections as their data source for this. As a result, it could be expected a priori that the annual future housing requirements are all in the same ballpark. Looking at the annual average for all three models this is indeed broadly the case when the different perspectives of the three models are taken into account.

The HNDA tool (central projection) envisages an annual average requirement of approximately 4,900 per annum (on the basis of a narrow definition of backlog need), the Net Stock Model 5,500 and the HGI methodology 5,700. Both the Net Stock Model and the HNDA tool focus largely on newly arising requirements (determined entirely by household formation), but also include a significant element for backlog. In the case of HNDA this backlog figure is based on a significantly more restrictive definition (HoTOC) than in the case of the Net Stock Model, which includes all concealed families (and not just those in overcrowded conditions) and does not just take into account the number of households in temporary accommodation at a particular point in time, but modifies this by average length of time spent in temporary accommodation. However, the estimated annual need for social housing across the ten-year period is almost exactly the same in both models (1,300).

In the case of the HGI methodology the main difference is that there is no specific allowance made for existing (backlog) need. However, it is also conceptually somewhat different in that it makes an allowance for vacant and second homes properties in the overall stock. In particular, the estimate of 57,000 (6.7%) vacant properties at any one time in Northern Ireland compensates for the absence of a backlog figure in the HGI model. In contrast, the Net Stock Model only accounts for vacant dwellings and second homes as a proportion of new properties while in the HNDA model they are not specifically taken into account at all (although because the HNDA model focuses solely on households rather than stock they are both implicitly taken into account at a constant proportion of the total stock).

All in all, however, the process of triangulation confirms the essential robustness of all three approaches with the relatively small differences being accounted for by somewhat different perspectives of what constitutes future housing requirements.

Task 6: Feedback from knowledge transfer meeting

The key findings of the study were presented to approximately 40 stakeholders at the fourth meeting of Northern Ireland's CaCHE Hub held in February 2020. Time did not permit any significant discussion of the findings during the formal proceedings. However, subsequently a number of useful written and verbal comments were received from Hub members.

There was general agreement that the scenario planning that forms a central plank of the integrated Excel-based HNDA tool was an essential element of planning for future housing requirements in an increasingly uncertain world. There was also recognition that the Tool offered an ideal platform for collaborative work between the range of organisations that contributed to planning for housing in the context of Northern Ireland.

A number of Hub members appreciated the potential for estimating the demand for Intermediate housing, including Mid-Market Rent and Co-Ownership and highlighted the complexity of the interaction between the underlying economic drivers of the market and house prices and rents that effectively determine the tenure breakdown of the estimates of future housing requirements.

Finally, one Hub member highlighted the lack of clarity with regard to the relationship between the estimates of future housing requirements and assessments of the need for more specialist forms of housing and for additional housing required to support people with complex needs in mainstream housing by providing a wrap-around package of support/care (Housing First). This issue is applicable in the context of Northern Ireland specifically in relation to the Strategic Needs Assessment process undertaken in connection with the Supporting People programme.

Summary and conclusions

This evaluation study has examined the HNDA tool from a number of perspectives. It has applied it to the Northern Ireland context using the most recently available household projections and a series of assumptions on the future trajectories of incomes, house prices and rents in Northern Ireland that were agreed in advance with the wider project team.

The HNDA model is conceptually simple with a clearly measurable definition of backlog need and newly arising need driven essentially by independently estimated rates of household formation. The model enables the user to alter the definition of backlog need, for example, by including all concealed families (or indeed an even wider definition of concealed households) – something that may be appropriate in Northern Ireland given the level of what is deemed to be urgent need (housing stress). However, this is in the end a strategic/policy decision rather than a criticism of the HNDA model. The tool also permits the user to input other household projections, although as the Scottish Government's Practice Guide indicates this can be a resource intensive exercise. The application of higher and lower household projections as part of this evaluation study clearly indicates the significant impact on future housing requirements that changed household projections can have.

The triangulation exercise showed that the HNDA tool provides estimates of future housing requirements (both overall requirements and for social housing) that are very similar to those produced by the Net Stock Model and the differences between HNDA estimates and the HGI methodology are largely a reflection of the latter not taking backlog need into account and making specific allowance for vacant properties and second homes. However, this could also be seen as a criticism of the HNDA tool which it could be argued should account for these more specifically. Similarly, the HNDA model assumes that unfit / below acceptable homes are addressed as part of the existing stock and the relationship between the future requirements for 'normal' stock and specialist stock is somewhat opaque.

There is no doubt, however, that in more general terms the HNDA tool offers some very significant advantages over existing models.

- It provides an integrated analysis of the housing system that recognises the interactions between tenures with estimates for each of the four tenure-based categories constrained to an overall annual future requirement figure determined by backlog and household projections. Currently no such model exists for Northern Ireland.
- It reflects the need for scenario planning in an increasingly uncertain economic and policy environment and provides a user-friendly Excel interface to facilitate the necessarily collaborative approach to planning for housing given the administrative complexity of the planning for housing process in Northern Ireland (three Government departments, the Housing Executive and 11 Councils).
- The HNDA model is clearly transparent in terms of its data and affordability assumptions as well as stressing the difference between the requirements produced by the HNDA tool and the HSTs (or in the case of Northern Ireland the Social Housing Development Programme).

Like all such models the robustness of the HNDA tool can be criticised both in terms of its data quality and methodological assumptions. For example, it implicitly assumes that there will be no fundamental change in the underlying economic and policy environment and that while labour market conditions may improve somewhat there will still be a mixed market economy and a shrinking commitment in terms of Government expenditure on housing. It therefore assumes that the private rented sector will continue to play an increasingly important role in meeting future housing needs. Likewise, the HNDA's use of gross household incomes can lead to an over-estimation of the ability of lower income families to afford privately rented housing, especially for families with dependent children. However, these kinds of limitations are in no way unique to the HNDA tool and should not be seen as detracting from its merits.

Introducing a new model for estimating the overall future housing requirements for Northern Ireland – and indeed

a model that is in some ways more complex than the Net Stock Model or the model for calculating Housing Growth Indicators – brings with it additional costs in terms of staff training and data collection and analysis. However, given the resources that are currently devoted to planning for housing in Northern Ireland any such additional costs are seen as fairly minimal.

In the last analysis, the HNDA tool is an analytical model that is underpinned by a clear rationale that is appropriate in the current Northern Ireland context. The fact that it produces similar estimates of overall future housing requirements as the Net Stock Model and, bearing in mind the appropriate modifications, to the HGI methodology is an indication of its robustness. Its potential as a means to facilitate scenario planning and promote inter-organisational collaboration means its application in the context of Northern Ireland has much to commend it.

POSTSCRIPT

This study was completed prior to the COVID-19 Emergency. Its publication has been delayed as a result. It is clear that the trajectories of incomes, house prices and rents set out under Task 3 of the report are unrealistic in the immediate post-pandemic period. However, this evaluation was undertaken as a proof of concept. The housing market will recover and even in the interim the systems approach and the scenario planning that lie at the heart of the HNDA model means that the evaluation and its overall conclusions remain valid.

References

- Barry, R., Beatty, R., Donnelly, D. and Marshall, D. (2005) *Household Projections for Northern Ireland: 2002-2025. NISRA Occasional Paper 21*. Belfast: Department of Finance and Personnel.
- Belfast City Council (2018) [Belfast Local Development Plan – Draft Plan Strategy](#), 2035
- Department for Communities (2018) [Housing Market Symposium 2017: Final Report and Recommendations](#). Accessed 20 June 2019
- Department for Infrastructure (2016) [2012 based Housing Growth Indicators and Methodology paper](#). Accessed 23 January 2020.
- Department for Infrastructure (2019) [Housing Growth Indicators: 2016-based](#). Accessed 23 January 2020.
- Department for Regional Development Northern Ireland (2001) *Shaping our future: regional developments strategy for Northern Ireland 2025*. Belfast: Department for Regional development, Northern Ireland.
- Department for Regional Development Northern Ireland (2005) [Planning Policy Statement 12 \(PPS12\) Planning for Housing in Settlements](#). Accessed 19 June 2019.
- Department for Regional Development Northern Ireland (2012) *Regional Development Strategy – RDS 2035 – Building a Better Future*. Belfast: DRD.
- Department for Regional Development Northern Ireland (2019) [Housing Growth Indicators: 2016-based](#). Accessed 18 August 2019.
- Department for Social Development Northern Ireland (2016) [Housing Supply Forum: Report and Recommendations](#). Accessed 18 June 2019.
- NISRA (2015) Northern Ireland Household Projections (2012-based), [NISRA Statistical Bulletin 26 March 2015](#). Accessed 17 September 2017.
- NISRA (2018) [Northern Ireland Household Projections \(2016-based\)](#), Accessed 17 September 2017.
- Newhaven Research (2018) [Mapping Northern Ireland's Housing Market Areas. Belfast: NIHE](#). Accessed 30 September 2019.
- Northern Ireland Executive (2016) [Programme for Government Consultation Document](#). Accessed 20 September 2019.
- NIHE (2008) *Northern Ireland House Condition Survey, 2006, Main Report*. Belfast: Northern Ireland Housing Executive.
- NIHE (2011) *Northern Ireland House Condition Survey, 2009, Main Report*. Belfast: Northern Ireland Housing Executive.
- NIHE (2013) *Northern Ireland House Condition Survey, 2011, Main Report*. Belfast: Northern Ireland Housing Executive.
- NIHE (2015) *Northern Ireland Housing Market, Review and Perspectives 2015-2018*. Belfast: Northern Ireland Housing Executive.
- NIHE (2018) *Northern Ireland House Condition Survey, 2016, Main Report*. Belfast: Northern Ireland Housing Executive.
- NIHE (2018) [Welfare Reform NI: A Scoping Report](#).
- NISRA (2008) [Northern Ireland Household Projections \(2006-based\)](#). Accessed 19 June 2019.
- NISRA (2010) [Northern Ireland Household Projections \(2008-based\)](#). Accessed 19 June 2019.
- NISRA (2012) [2011 Census – Key Statistics for Northern Ireland](#). Accessed 19 June 2019.
- NISRA (2015) [Northern Ireland Household Projections \(2012-based\)](#). Accessed 19 June 2019.
- NISRA (2018) [Northern Ireland Household Projections \(2016-based\)](#). Accessed 19 June 2019.

- O'Sullivan, T., Young, G., Gibb, K. (2011) *The Belfast Metropolitan Housing Market Area: a local housing systems analysis*. Belfast: NIHE.
- Palmer, J. (2007) *Housing Needs and Housing Market Assessment: A comparative review of methods used in England and Northern Ireland, Final Report*, Belfast: NIHE.
- Paris, C. and Frey, J. (2018) Demographic trends and changing housing systems in Northern Ireland, *Housing Studies*, 33 (8), 1264-1285.
- Scottish Government (2015) [Housing Need and Demand Assessment \(HNDA\): A Manager's Guide \(2014\)](#), Accessed 24 June 2020.
- Scottish Government (2018a) [Housing Need and Demand Assessment \(HNDA\) A Manager's Guide \(2018\)](#), Version 3.1. Accessed 23 February 2020.
- Scottish Government (2018b) [Housing Need and Demand Assessment \(HNDA\) A Practitioner's Guide](#), (2018), Version 3.0. Accessed 23 February 2020.
- Scottish Government (2018c) [Housing Need and Demand Assessment \(HNDA\) HNDA Tool Instructions \(2018\)](#), Version 3.1. Accessed 23 February 2020.
- Welsh Government (2019) [Estimates of Housing Need in Wales by Tenure](#). Accessed 24 June 2020.
- Young, G. (2019a) *Paper 1: Consideration of Backlog (Current) Need*. Edinburgh, Newhaven Research.
- Young, G. (2019b) *Paper 2: Data Sources for Populating Newly Arising Need*. Edinburgh, Newhaven Research.
- Young, G., O'Sullivan T. and Gibb, K. (2010) *Northern Ireland Housing Market Areas*. Belfast: NIHE.

Appendix A

UK Housing Evidence Centre (CaCHE) – NI research project

An evaluation and illustrative pilot of the Scottish HNDA tool

Terms of reference

Introduction

One of the key research priorities emerging from the [Department for Communities' Housing Market Symposium report](#) published in 2017 was to undertake "An Evaluation and Illustrative Pilot of the Scottish HNDA Tool". The Symposium noted that the HNDA Tool seemed to provide a "robust and comprehensive approach that explicitly recognises the interdependency of economics, demography and housing supply and demand and the importance of the inter-tenure relationships"(p.50). The evaluation of this model was to include an "assessment of the policy assumptions and priorities subsumed in the algorithms underpinning the HNDA tool" and "a pilot of the model using Northern Ireland figures, as well as sensitivity analysis to test the effects of modifications to assumptions and projections" (p.50).The Department for Communities has commissioned CaCHE to undertake this research project. The project would be overseen by Chris Leishman, leader of the 'Understanding housing markets' theme and undertaken by a project team comprising representatives of the Department for Communities, Scottish Government, CaCHE (NI), NIHE and Gillian Young (Newhaven Research, Scotland), with, if necessary, additional research assistance from staff affiliated to the Universities of Glasgow and Adelaide (host institution for Chris Leishman). The work would fall mainly within the existing funding arrangements for CaCHE.

It should be noted that The Housing Executive has responsibility for assessing housing need. This is set out in the 1981 Housing Order, Planning (Local Development Plan) Regulations (Northern Ireland) 2015, the Planning (General Development Procedure) Order (Northern Ireland) 2015 and in regional planning policy (the Regional Development Strategy and the Strategic Planning Policy Statement.

Components of the project

The project would involve a number of discrete tasks as follows:

1. Audit of data requirements to allow evaluation of the SHNDA model to Northern Ireland. This would focus on the following datasets / variables:
 - a) Population and household projections at NI level, including variant projections that reflect alternative future economic scenarios / outcomes.
 - b) Future scenarios of house prices, rents, employment, incomes, mortgage rates at UK / NI level (macro variables).
 - c) Profile of social housing stock management issues at NI level. This would be based on data on waiting lists, vacancies, time to let, size of difficult to let stock, occupancy, over-crowding, stock condition.
 - d) Available data on specialist categories.
2. Collection / collation of key datasets, including imputation of missing variables as needed.
3. Based on Scottish experience develop and agree policy scenarios and key input variables needed to inform the design of the NI version of the SHNDA model. Initially three labour market scenarios are suggested based on

(updated) UUEPC analysis contained in Symposium report.

4. Re-working the Excel based Scottish HNDA model to ensure that it produces robust estimates at NI level and is user friendly.
5. Construction of a counter-factual model based on existing NI models (Department for Infrastructure's Housing Growth Indicators and Housing Executive's Net Stock Model and Waiting List/Cross-tenure analysis). This would use available data on anticipated current (backlog) and future housing need and provide the basis for formally evaluating the performance of the HNDA model at the Northern Ireland level.
6. A knowledge transfer event (involving social/affordable and private market housing providers, representative bodies and researchers/academics etc.) organised and run by CaCHE, designed to maximise end user engagement and understanding of the final outputs.

Proposed timetable

- December 2018 / January 2019: Draft/agree scenarios
- January/February 2019: Data audit and collation
- February/March 2019: run NI HNDA model
- March/April 2019: Evaluate model - counter-factual trends – produce outputs
- April/May 2019 Knowledge Exchange Workshop with key stakeholders - review of NI model – final report.

Project team

The project would be led overall by Chris Leishman (University of Adelaide / CaCHE), but the majority of the modelling work and calibration would be undertaken by Murdo Macpherson and Charles Brown (Scottish Government) and funded in kind by Scottish Government. Data audit would be undertaken by Gillian Young and funded by CaCHE. Ongoing advice on Northern Ireland's housing market and current housing models would be provided by Stanley McGreal and Joe Frey (Ulster University / CaCHE), Joanne Cartland, Donna Knowles and Julie Lavery (DfC) and Karly Greene and Elma Newberry/Paul Reid (NIHE).

APPENDIX B

PAPER 1: CONSIDERATION OF BACKLOG (CURRENT) NEED

Introduction

1. This paper is one of the outputs from the data audit component of the study to explore the potential to adapt the Scottish Government's HNDA tool for use in Northern Ireland. It discusses current housing need and the possible indicators and data sources that could be used to quantify it. Terms like 'need', 'demand' and 'hidden homeless' are subject to differing interpretations; Appendix 1, therefore, provides a glossary of the terms used in this paper and Paper 2 (Appendix C).

Overview of backlog (current) need

2. Current housing need refers to the sum of households at a given point in time that have a shortfall in their housing situation relative to normative housing standards that cannot be met through the housing market. Official guidance and national studies in respect of housing need generally centre on one or more of the following categories:
 - **Lack of a stable home:** This refers to households without self-contained accommodation and having no immediate prospects of accessing such a home. Narrow definitions centre on households accepted as statutorily homeless, concealed families and rough sleepers. Broader definitions include hidden homeless households (e.g. people 'sofa-surfing' in the homes of friends' or relatives' homes), people involuntarily sharing with other households or living in non-permanent accommodation such as caravans.
 - **Inadequate housing conditions:** This refers to households living in properties that do not meet minimum physical standards, such as the Northern Ireland's 'Fitness Standard'. Other options include the 'Decency Standard' and the 'Housing Health and Safety Rating System' (HHSRS), which is under consideration as a potential replacement for the 'Fitness Standard' in Northern Ireland.
 - **Unsuitable housing:** This refers to households whose home is not suitable for their specific needs and poses a risk to the health and wellbeing of household members. Narrow definitions centre on overcrowding. Broader definitions include older and disabled households living in homes that are not designed or adapted for those with mobility difficulties. They also include families living in high rise flats, people that 'need' housing support and people that have to move to escape harassment, intimidation or domestic violence.
 - **Un-affordable housing costs:** This refers to households that may be adequately and suitably housed but have to spend an excessive share of their income on housing costs, leading to financial hardship that can make continued occupation of their home unsustainable. Un-affordability is usually assumed if a household has to spend more than a specified proportion of gross income on housing costs or their residual income falls below some pre-defined threshold or both. Affordability calculations are typically based on rent and/or mortgage costs but a few studies have included related costs such as rates and fuel costs.

Within this broad framework, the measurement of current housing need is applied in different ways, often reflecting the fact that housing need studies are produced for different purposes. For instance, organisations may want estimates to inform social housing investment plans and allocation policies whilst others may want to inform cross-tenure housing supply targets.

The Scottish Government's HNDA tool and the measurement of current need

3. This HNDA excel spreadsheet-based model is designed to estimate a range of scenarios (alternative futures) for additional housing and the probable tenure mix using a combination of household projections, assumptions on future income, house prices and rents, and an allowance for unmet current need in so far as it necessitates an additional home. A key question is therefore how to separate out the proportion of households with unmet need that could be satisfied within the existing housing stock from the proportion that could only be addressed by a new (or additional) home. To date, two different approaches have been adopted to address this issue.
4. The first approach, which the Scottish Government and now the Welsh Government have embraced, has been to strip back the measurement of current need to its bare essentials. Both administrations employ just two indicators that are said to unambiguously point to a 'need' for an additional dwelling – homeless households residing in temporary accommodation and concealed families living in overcrowded housing. This replicates the allowance for backlog need built into the older net-stock models for projecting housing requirements.
5. The second approach is to measure a range of indicators that extend across the four categories of housing need noted in paragraph 2 and then to apply a set of filters to arrive at two groupings:
 - **Net need for additional affordable housing:** Households in current housing need that lack the wherewithal to secure a home or to relocate to a property that meets normative standards of adequacy, suitability and affordability.
 - **Other housing needs:** Households whose need could be solved through 'in-situ' interventions (e.g. repairs, adaptations, extensions or help with housing costs) plus households than can afford market housing plus social renters that could be suitably rehoused within the sector.
6. In theory, estimates of current housing need resulting from these two approaches should not be of a fundamentally different order of magnitude, but in practice:
 - By focusing on just two indicators, the first approach invariably does not capture all current unmet needs that cannot be resolved within the existing stock, leading to concerns about the under-estimation of current need for additional housing, especially social housing.
 - As experience in Scotland prior to the launch of the HNDA tool in 2014 highlighted, the second approach is subject to problems of double counting, inconsistent measurement of in-situ need and the use of less than robust data, leading to concerns about the over-estimation of backlog need.
7. From the outset, the Scottish Government has been clear that the HNDA tool provides only a partial picture of housing need, especially current need. The HNDA tool therefore allows local authorities to replace the 'top-down' estimates with local estimates of current housing need so long as these discount needs that could be addressed "through an in-situ or housing management solution". HNDA guidance also tasks local authorities with reporting on in-situ need and stock issues elsewhere in their HNDA report to ensure such matters inform the setting of policy-based housing supply targets for the volume, tenure and composition of new housing.
8. As the objective of the present study is to test the existing HNDA tool, the first approach is to be adopted. Although it is doubtful that any advantages that might potentially be gained from adopting the second approach to estimating current housing need would warrant the increase in resources that would be required, some modification to the first approach might be appropriate, not least to take account of data availability.

Data sources available to measure current housing need

9. Irrespective of how current housing need is defined, it has to be translated into a framework of indicators that can be measured using available data. Appendix 2 therefore sets out the most frequently recommended and/or utilised indicators of current housing need for each of the four categories. It also outlines the main definitional, measurement and data issues associated with each indicator. This includes the presence or absence of data in Northern Ireland to produce statistically meaningful data for each indicator.
10. The data sources (or the Northern Ireland equivalent) typically used in national and regional studies to construct indicators of current need and their strengths and weaknesses are summarised in Table 1. Overall:
 - The Welsh Government estimate of concealed families living in overcrowded housing was based on the 2011 Census as it was the only data source that provided sub-national figures but generally Census data has been deemed not to be sufficiently timely to support the estimation of current need.
 - For the most part, housing waiting list data has not been seen as reliable enough to support the estimation of current need.
 - Most studies have made use of administrative data to measure statutory homeless and one or more large-scale government surveys to construct other indicators of current need.

Common waiting list

11. Viewed from a UK perspective, Northern Ireland's Common Waiting List (CWL) is a unique source of data. It includes all households that have applied for social rented housing in Northern Ireland and applicants are all assigned 'needs points' in accord with a single allocation policy. The CWL is therefore not subject to inconsistencies in eligibility and housing needs classification that have prevented the use of housing register data in national and regional studies across GB.
12. A potential limitation of using the CWL is that not all households in 'normative' housing need will necessarily apply for social housing. The CWL would also require processing to ensure the data was 'fit' for estimating current need. This would include work to minimise deadwood¹³ and to screen-out applicants living in GB, the Republic of Ireland or abroad, with the possible exception of those returning from the armed forces.

Northern Ireland House Condition Survey

13. The Northern Ireland House Condition Survey (NIHCS) is the most comprehensive dataset for measuring housing need. Initial analysis provided by the Housing Executive's NIHCS team has confirmed that it would be possible to construct various indicators that could be summed in a way that would avoid double counting. The downside is that the NIHCS sample size is far smaller than the Scottish House Condition Survey (SHCS). Consequently, provisional estimates for the 'test' indicator of concealed families living in overcrowded housing was based on too few cases (less than 25 cases) to produce robust numbers.

¹³ This includes applicants who are likely to have experienced a change in circumstances, but where this has not been reflected in a change to the number of points assigned and which would continue to include full duty homeless applicants as a result of the 'no detriment rule'.

Table 1: Main sources of secondary data used to inform calculations of current housing need

Data source	Examples of possible uses	Commentary
NI Census	<p>Lack of stable home: Concealed family units</p> <p>Suitability: Overcrowding; older and disabled for whom in-situ solution not feasible</p>	<p>Provides valuable population, household and dwelling data but its value is limited as only conducted every 10 years.</p> <p>Does not cover all four housing 'needs categories.</p> <p>In NI the definition of overcrowding is based on 'occupancy rating' as opposed to the 'bedroom standard'.</p> <p>Concealed families living in overcrowded housing figures would require commissioning a special table from NISRA.</p>
NI House Condition Survey (NIHCS)	<p>Lack of stable home: Concealed family units/ households</p> <p>Inadequate housing: Fitness Standards and other physical conditions</p> <p>Suitability: Overcrowding; older & disabled for whom in-situ solution not feasible</p> <p>Unaffordability: Income and housing cost data</p>	<p>The 2016 NIHCS has a sample of 2,023 dwellings and 1,917 household interviews.</p> <p>It is a rich data source for indicators across all 4 categories of need (except homeless in temporary housing). It is the only data source for housing quality indicators (Fitness Standard, Decent Homes Standard and HHSRS).</p> <p>Readily accessible and outputs for individual indicators can be summed in a way to avoid double counting.</p> <p>Initial analysis indicates that the some of the 'tested' indicators may not be statistically robust.</p>
Labour Force Survey (LFS)	<p>Lack of stable home: Concealed units and/or potentially involuntary sharers</p>	<p>Annual sample equates to around 2,700 households, 6,500 individuals for NI. Mainly collects labour market trends data but includes some household data.</p> <p>Potentially a useful source for concealed families or households due to ability to pool data from several waves.</p>
Family Resources Survey (FRS)	<p>Un-affordable housing costs: both ratio and residual income estimates</p>	<p>Annual survey of some 2,000 NI households.</p> <p>Some housing information (tenure, rent) but mainly used in housing needs studies as base for projecting income distributions and thus not discussed further in this paper.</p>
Understanding Society, (UK -HLS)	<p>Lack of stable home: Concealed family units/ households</p> <p>Suitability: Overcrowding.</p>	<p>NI survey follows a sample of some 2,000 people/ households over successive waves and entails several modules. The household module collects household and dwelling data, including housing expenditure and overcrowding.</p> <p>Overcrowding is based on the General Household Survey definition. This in addition to the small sample size, limits its use for triangulation purposes.</p>

Common Waiting List (CWL)	<p>Lack of stable home: Concealed units; temporary accommodation; potentially involuntary sharers; lack permanent housing.</p> <p>Suitability: Overcrowding; older & disabled where in-situ solution not feasible; moves to escape intimidation etc.</p>	<p>Includes all social housing applicants in NI. Single allocation policy for assigning 'needs points' - so not subject to inconsistencies in eligibility and need classification that has precluded use of waiting list elsewhere in UK.</p> <p>Would need to assess how to minimise problems such as 'deadwood' that can negatively impact on data reliability as well as assess what 'needs' indicators can be produced and how these are best specified.</p>
Administrative data (DfC)	<p>Lack of stable home: homeless in temp' accommodation</p>	<p>The newly re-designed DfC homeless statistical bulletin (5 March 2019) includes homeless statistics derived from CWL, including snapshot of homeless households in temporary accommodation.</p>
<p>Note: Whilst some local level housing need assessments make use of specially commissioned households surveys, official guidance in all three GB jurisdictions has long cautioned against such an option.</p>		

Proposed 'test' current need indicators

14. In order to explore the use of the HNDA tool using Northern Ireland figures it is appropriate to replicate the current housing need indicators used in Scotland (and now Wales) as closely as possible. In light of the fact that the NIHCS cannot produce a fully robust indicator for concealed families, it would be apposite to:
- Base the number of households living in temporary accommodation on the most recent snapshot of homeless households residing in temporary accommodation; in January 2019 there were 2,065 households in temporary accommodation.
 - Base the number of concealed families living in overcrowded accommodation on 2011 Census data, which would necessitate a specially commissioned table. This actual number is likely to be low. According to the Census there were 7,981 concealed families (see appendix 3). In both Scotland and Wales only around 25% of concealed families were living in overcrowded accommodation. This suggests the Northern Ireland figure may be around 2000.
 - Triangulate the concealed and overcrowded family Census figures with comparable evidence from the CWL and NIHCS to sense check if the figures provide a reasonable approximation of the current scale of the problem.

Converting the count of current need into a projected flow

15. The HNDA tool converts the total count of current need into a flow measure by assuming that this backlog will be cleared over a given number of years. Users are free to choose an appropriate timeframe, but the default is set at 5 years, which means that 20 per cent of current need would be addressed each year. National studies have tended to assume 10 years is a more suitable timeframe. However, there can be no 'objective' view on a preferred option for Northern Ireland and any final decision must be seen as a reflection of Government priorities in the context of constrained public sector budgets.

16. The HNDA tool also allows users to assume that either:

- All the backlog need should be assigned to the social rented sector. This is also the assumption that the Welsh Government has made.
- A proportion of backlog need may be able to afford 'intermediate' or 'market' housing, in which case the HNDA tool default position is to apply the same income distribution data as assumed for newly forming households.

17. It is very probable that the income distribution of households in current need differs substantially from the income distribution of the overall household population. In particular, 2011 Census data shows that concealed families are much younger and much more likely to be lone parents than unconcealed families. In light of this, the wider project team may wish to agree that in the first instance the count of backlog need should assume that all the backlog is assigned to the social rented sector.

Other potential indicators of unmet current need that might be considered for the future

18. At the Project Meeting held on 1 February 2019 reference was made to other potential indicators of backlog need. The potential to incorporate such additional indicators into the HNDA tool at some future point in time is examined below.

CWL applicant households in housing stress

19. One option might be to use 'Housing Stress' statistics as a proxy for backlog need. This refers to applicants who have been assigned 30+ 'needs points' under the Common Selection Scheme. At March 2018, some 24,148 out of 36,198 new (i.e. non-transfer) applicants were in housing stress. Between 2012-13 and 2017-18 the number of new applicants fell back whereas the numbers assessed to be in housing stress increased by over 1,700. The proportion of applicants in housing stress therefore increased from 54% to 67%.

20. Not all applicants in housing stress have a housing need that is unambiguously associated with the need for additional social rented housing. Figures for 2015/16 reported by DfC indicate that:

- Some applicants in housing stress only meet this 30 point threshold due to the assignment of 'primary social needs' or 'other social needs points' points for personal or social circumstances such as harassment, actual or fear of violence, prevention of care home admission etc.
- 414 applicants had applied for reasons of intimidation were classed as Full Duty Homeless Applicants' and presumably had been awarded 200 points.
- It is probable that a proportion of applicants assigned points for the lacking (or sharing) amenities and disrepair could be assisted through some form of in-situ solution.

21. In addition, the count of applicants in housing stress includes homeless applicants that have been placed in temporary accommodations. These applicants would have to be discounted from any indicator of the count of applicants in housing stress if DfC wished to retain a separate indicator of households living in temporary accommodation.

22. On balance, 'applicants in housing stress in its current form does not appear to provide a suitable proxy for current need as conceptualised in the HNDA tool. However, CWL outputs could still play a valuable role in sense checking and triangulating current housing need figures derived from the NIHCS.

Concealed families plus involuntary sharers living in overcrowded accommodation

23. As the NIHCS sample size contains too few cases to construct a robust indicator for concealed families living in overcrowded accommodation, a potential way forward might be to:
- Re-specify the indicator to include involuntary sharers. This could be defined as single adult households aged 35 years or above that share their home with another household (i.e. what DWP term a benefit unit as opposed to the ONS/NISRA definition of a household). This age threshold is in line with Local Housing Allowance rules in respect of 'house-shares'. However, further analysis would be beneficial to assess which age threshold would produce statistically valid findings.
 - Run the analysis for concealed families and involuntary sharers inclusive and exclusive of overcrowding in order to assess which measure would provide the more robust and meaningful statistics.
 - Triangulate NIHCS numbers with comparable figures from the LFS, and if possible, the CWL to sense check the outputs and ensure figures are of a similar order of magnitude.

Households living in inadequate housing that cannot be addressed by an 'in-situ' solution

24. Housing need studies often assume that stock in poor condition can be improved and that households living in sub-standard housing therefore have an in-situ need as opposed to a need that requires a new dwelling to be built. Analysis by the NIHCS team confirms that in most cases the cost of repairs to occupied homes is modest and that the assumption of in-situ need is appropriate.
25. There are some cases, however, where building a new home would appear to be a more cost-effective solution than repair. Moreover, higher repair costs are associated with lower income households lacking the financial capacity to compete in the open housing market. It is also the case that whilst a low-income household living in a sub-standard private dwelling could be assisted to move to a more suitable house, this would do nothing to reduce current need if the unimproved house was re-occupied. In short, it is important not to simply assume that all households living in sub-standard private housing have an in-situ need or that their needs can be met within the existing stock of private housing.
26. Accordingly, it may be useful to ask the NIHCS team to explore the potential to create a robust and statistically meaningful indicator of households living in poor quality private housing where it could be reasonably assumed that a new dwelling is required.

Households with an older or disabled person living in unsuitable housing that cannot be addressed within the existing housing stock

27. Housing need studies generally assume that households containing an older or disabled person with unmet mobility issues can be assisted by the provision of either:
- Housing adaptations or support, or a combination of both.
 - Assistance to move to a suitable existing property, thereby freeing up a property for another household.
28. Again, NIHCS analysis suggests that it is reasonable to assume the majority of cases have an in-situ need. There are instances, however, where a move to a suitable house would appear to be necessary, either because it is not technically feasible to make the required adaptations or the costs of adaptations would be unacceptably high. Discussions also indicate that the lack of suitable, alternative housing is a barrier to moving. This is reflected in the relatively high number of older persons included in the 'full duty' homeless application population in Northern Ireland compared to elsewhere in the UK.

29. More generally, this complex issue raises questions about the extent to which numerical estimates of the backlog of unmet need should, and could, be made sensitive to wider demographic conditions and trends. There is no easy answer to this issue, which is ultimately a policy matter for the Department for Communities.
30. The Scottish Government¹⁴ and the Welsh Government concluded that the model should not attempt to estimate the number of households living in accommodation unsuitable for their specific needs. However, if there is a desire to explore this matter further, the NIHCS team could be asked to explore the potential to produce a conceptually valid and statistically meaningful indicator of older and disabled households currently living in unsuitable housing for whom additional housing rather than an in-situ solution would be appropriate.

Concluding observations and recommendations

Housing need is a sensitive subject. It is always difficult to achieve a definition that is acceptable to everyone with an interest in its policy implications and at the same time can be translated into a set of indicators that can produce statistically meaningful estimates. In the case of the HNDA tool, an added complication is to ensure that the selected indicators are very clearly associated with a 'need' for additional housing.

The HNDA tool assumes that for the most part existing households with unmet needs can have their needs met within the existing housing stock through a combination of in-situ responses or transfers of households to suitable housing.

In practice, new house building or 'off the shelf' purchase for social rent may be desired in areas where the existing stock of social housing cannot satisfy the need for dwellings of a particular size or type. As the HNDA tool is not designed to explore such mismatches between the profile of households and the composition of the housing stock, the HNDA tool should not be seen as a model that somehow replaces the local housing market and submarket analysis undertaken by NIHE.

For the specific purpose of 'testing' the applicability of the HNDA tool for Northern Ireland as a whole, the data audit has focused on how the two HNDA current (backlog) housing need indicators used by the Scottish and Welsh Governments might be quantified.

The NIHCS has been identified as the single best data source for estimating housing need in the wider sense. However, as with all large-scale surveys of the general population, people who are not included in the private household population and concealed, homeless households are not well represented. The size of 2016 NIHCS sample makes it impossible to produce a fully robust estimate of concealed families living in overcrowded accommodation. This means that the 2011 Census may be a more appropriate data source for quantifying this indicator for 'test' purposes.

¹⁴ The Scottish Government have acknowledged this limitation by asking local authorities to review the need for "specialist provision", like other stock- household profile mismatches within the HNDA.

Recommended next steps

The wider project team are asked to agree that:

- Published NISRA/DfC (NIHE) figures should be used to quantify the number of homeless households in temporary accommodation.
- NISRA should be asked to produce 2011 Census figures for the number of concealed families living in overcrowded accommodation.
- All households assessed as being currently in housing need as measured by the two indicators noted above are assumed to require social rented housing.

In addition, the wider project team is asked to note that this paper has made some suggestions about how the measurement of current (backlog) housing need might be potentially enhanced in the longer term if a decision is made to adopt the HNDA tool.

APPENDIX B: BIBLIOGRAPHY

- Abdalla, S, Quirke, B, Daly, L , Kelleher, CC (2010) All Ireland Traveller Health Study Team. All Ireland Traveller Health Study: Our Geels. Summary of findings. Dublin: The Stationary Office.
- Bramley, G., Pawson, H. and Parker, J. (2000) Local Housing Needs Assessment: A Guide to Good Practice, Department of the Environment, Transport and the Regions, London: DCLG.
- Bramley, G., Karley, N.K., Watkins, D. (2006) Local Housing Need and Affordability Model for Scotland, Research Report. Edinburgh: Communities Scotland.
- Bramley, G., Pawson, H., White, M., Watkins, D. and Pleace, N. (2010) Estimating housing need, London: DCLG.
- Bramley, G., (2018) Housing supply requirements across Great Britain: for low-income households and homeless people, London: CRISIS.
- Department for Communities (2017) A Fundamental Review of Social Housing Allocations- Consultation on Proposals, Belfast: Northern Ireland Executive, DfC.
- Department for Communities (2016) Northern Ireland Housing Statistics 2017-18.
- Department for Communities and Local Government (2007a) Strategic Housing Market Assessments: Practice Guidance, Version 2. London: DCLG.
- Department for Communities and Local Government (2007b) Strategic Housing Market Assessments: Annexes. London: DCLG.
- Department for Communities and Local Government (2019) Housing and Economic Needs Assessment. Guidance, available at: <https://www.gov.uk/guidance/housing-and-economic-development-needs-assessments>
- Fitzpatrick, S., Pawson, H., Bramely, G., Wilcox, S. & Watts, B. (2016) The Homelessness Monitor: Northern Ireland 2016. London: Crisis.
- Holmans, A (2015) Future Need and Demand for Housing in Wales, Cardiff: Public Policy Institute for Wales.
- Newhaven Research (2010) Review of Housing Need Assessment Formula for the Northern Ireland Housing Executive. Belfast: NIHE.
- Newhaven Research (2011) Wagging the Dog, Edinburgh: CIH Scotland.
- Northern Ireland Housing Executive (2015) Housing Selection Scheme: Chapter 12: Rules, Belfast: NIHE.
- Northern Ireland Housing Executive (2015) Traveller Accommodation Needs Assessment 2014, Belfast: NIHE.
- Northern Ireland Human Rights Commission (2018) Out of Sight Out of Mind- Travellers' Accommodation in Northern Ireland, Belfast: NIHRC.
- O'Sullivan, T., Young, G., Maclennan, D., Gibb, K., McLaren, J., Britain, A., Dowie, A., and Thornton, C., (2004) Local Housing System Analysis Good Practice Guide, Edinburgh: Communities Scotland.
- Paris, C (2010) Net Stock Model for 2006-2016, Report to the Northern Ireland Housing Executive. Belfast: NIHE.

Paris, C., Palmer, J. and Williams, P. (2014) Demographic change and future housing need in Northern Ireland. Belfast: NIHE.

Powell, R., Dunning, R., Ferrari, E. and McKee, K. (2015) Affordable housing need in Scotland, Edinburgh: Shelter Scotland.

Scottish Government (2008) Housing Need and Demand Assessment Guidance, Edinburgh.

Scottish Government (2018) Housing Need and Demand Assessment Practitioners Guide, 2018, Edinburgh: Scottish Government <https://www.gov.scot/publications/hnda-practitioners-guide-2018>

Seelig, T., Milligan, V., Phibbs, P., and Thompson, A (2008) Reconceptualising housing need in the context of 21st century Australian housing policy, Victoria: Australian Housing and Urban Research Institute.

Stone, M.E. (2006) What is housing affordability? The case for the residual income approach, Housing Policy Debate, Vol. 17, Issue 1, 151-184.

APPENDIX B: GLOSSARY

Term	Definition
Benefit unit	<p>Many social security statistics and Family Resources Survey (FRS) statistics are based on benefit units. This term refers to groups of people regardless of whether they are in receipt of any benefits or tax credits. A benefit unit can be a single adult, lone parent or a married or cohabiting couple and any dependent children. Since January 2006, same-sex partners (civil partners and cohabittees) have been included in the same benefit unit.</p> <p>A couple living with their young children, their 25-year-old son and an older parent forms one household but three benefit units. The couple and their young children constitute one benefit unit, the elderly parent constitutes another, as does the older son.</p>
Concealed household	A concealed household is one living in the same accommodation as the host household, such as a young couple living with parents. The term can include single adult (usually 18+ years) living in the same household as their parents, an older person living with an adult child and their family and unrelated single persons sharing accommodation.
Concealed family	A family unit (e.g. a lone parent or a couple with or without dependent children) living with a host household. By definition this excludes single persons such as adults living with their parents.
Current housing need (backlog)	Term used to refer to unmet housing need at a specific point in time. Depending on how calculated, it can be subdivided into households requiring new homes, and those that can be housed through re-allocations within existing housing stock or modifications to the existing stock.
Decent Home	A decent home is one that is wind and weather tight, warm and has modern facilities. A decent home meets four criteria: (a) it meets the current statutory minimum standards for housing; (b) It is in a reasonable state of repair; (c) it has reasonably modern facilities and services, and (d) it provides a reasonable degree of thermal comfort.
Family unit	A family unit is defined as a married or cohabiting couple living on their own, or with their never-married children who have no children of their own. Lone parents with children are also defined as a family unit. In contrast to a household, members of a family must be related by blood, adoption or marriage.
Household	Single person living alone or a group of people (not necessarily related) living at the same address and share cooking facilities, a living room or dining area (e.g. a family or group of students).
Hidden homeless households	People who do not have their own secure home and may be in a similar housing situation to those who apply to NIHE as homeless but have not made a formal homeless application. It can include people sleeping rough (especially those in locations not included in periodic counts of rough sleepers) and people 'sofa-surfing' in the homes of relatives or friends. Some definitions also include single persons and family units involuntarily sharing with other households on a long-term basis. Many have no or little contact with services and thus their housing situation is not 'visible' in official statistics.
Housing aspiration	The end goal of households for housing in terms of tenure, property type, size, design and location, irrespective of the ability to pay and whether these desires can be realised.
Housing demand	Housing demand is a market driven concept and relates to the quantity and quality of housing that households will choose to occupy based on preference and ability to pay.
Housing need	The minimum standards that society considers should be satisfied in order for households to be considered adequately housed in terms of quality, suitability, size and arguably expenditure on housing costs. Households in housing need are therefore those that do not have access to accommodation that meets these normative standards.

Housing Health & Safety Rating System (HHSRS)	<p>The HHSRS is a risk assessment-based model that identifies up to 29 hazards that pose a risk to the health and safety of occupants, visitors, neighbours or passers-by, including hazards relating to: dampness, excess cold/heat; pollutants (e.g. asbestos, lead & carbon monoxide); lack of space, security or lighting, or excessive noise; poor hygiene, sanitation, water supply; accidents (e.g. falls, electric shocks, fires, etc) and collisions, explosions, structural collapse.</p> <p>The model generates a score which represents the seriousness of any hazard. Hazards that have a score of over 1,000 are described as 'Category 1' and are deemed to fail the statutory minimum standard. In England, local authorities have a duty to take the most appropriate action in respect of properties that fall within Category 1.</p>
Housing requirement	This refers to the combined count of housing need and demand and thus presents an overall picture of the estimated or projected additional volume of housing required.
Housing target	The number of homes planned to be built in an area. Housing targets are influenced by several factors. Aside from estimates of future housing requirements, these factors include land availability, land constraints, re-provisioning of obsolete homes, and opportunities for development in support of the economic growth ambitions of national and local government.
Newly arising need	The number of newly forming households projected to require additional social rented or affordable housing each year of the planning timeframe.
Overcrowded household (bedroom standard)	<p>An overcrowded household is one that occupies a property that provides insufficient space for their size and composition.</p> <p>The 2016 NIHCS definition of overcrowding is based on the same 'Bedroom Standard' used to calculate the Housing Benefit size criteria for social rented tenants. A separate bedroom is allocated to each co-habiting couple, any other person aged 16 or over, each pair of young persons of the same sex up to the age of 15, each pair of children regardless of gender under 10, and an overnight carer, where required. Any remaining unpaired persons under 16 are allocated a separate bedroom.</p> <p>The calculated standard is then compared with the actual number of bedrooms a household has available for its sole use to indicate deficiencies or excesses.</p>
Occupancy rating (alternative measure of overcrowding)	The 2011 Census occupancy rating provides an alternative measure of overcrowding and under-occupancy. It is calculated by subtracting the notional number of rooms (not bedrooms) required from the actual number of rooms available to a household. It assumes every household, including single person households, requires two common rooms (excluding bathrooms). Thereafter the ages of household members and their relationships to each other are used to derive the notional number of rooms required. A value of -1 implies that there is one room too few and that overcrowding exists.
Sharing households	<p>Sharing households include lodgers and separate benefit units that share a flat/apartment or house, or live in a bedsit or House in Multiple Occupation.</p> <p>The 2011 Census identified just 80 shared dwellings in Northern Ireland. These are defined as dwellings containing two or more household spaces that are not self-contained. This very low count reflects the fact that unrelated single adults sharing a flat or house are generally considered to form a single household dwelling because they share living space (e.g. living room) or share meals. The count of shared dwellings is therefore not a measure of households (i.e. benefit units) that share accommodation.</p>

APPENDIX B: REVIEW OF POTENTIAL INDICATORS OF CURRENT (EXISTING/BACKLOG) HOUSING NEED

The indicators highlighted in green are those that would, in the first instance, merit consideration for inclusion in the count of the backlog of current need assuming a formal decision is made to proceed with the HNDA tool.

Potential current need indicators:	Data source(s)	Comments
Lack of a stable home		
Households accepted as homeless and living in temporary accommodation	CWL DfC	<p>Current need is a snapshot measure, which requires any homeless indicator to be based on households lacking a settled home at a single point in time. It has therefore become widespread practice to count those placed in temporary accommodation.</p> <p>The latest DfC homeless statistical bulletin was issued on 5 March 2019 and reports that on 10 January 2019 there were 2,065 households in temporary accommodation.</p>
Rough sleepers	NIHE	<p>The NIHE works with other statutory and voluntary bodies to conduct street counts of rough sleepers in Belfast, Derry/Londonderry and elsewhere.</p> <p>In 2018 a total of 16 rough sleepers were identified in Belfast on 6 November during 02.00-05.00 hours. There is no other recent published data on rough sleeping in Northern Ireland.</p> <p>It is proposed not to proceed further with this indicator at this time.</p>
Concealed family units (living in overcrowded accommodation)	NIHCS CWL LFS UK-HLS Census	<p>Indicators of a concealed family unit are based on the assumption that such families are living in a multi-family household because of a shortage of housing and/or their lack of resources to secure a place of their own. Research evidence lends support to this assumption.</p> <p>ONS report that households containing 2+ family units were the fastest growing household type in the UK in the decade to 2017.</p> <p>Estimates derived from the LFS and UK-HLS suggest there are some 6,400 concealed family units in Northern Ireland (Fitzpatrick et al, 2016). However, this is based on a very small number of cases and should be treated as indicative rather than robust.</p> <p>The Scottish Government definition for this indicator also requires concealed families to live in overcrowded accommodation. However, it is not possible to derive overcrowding from the LFS; the UK-HLS overcrowding measure is not fully consistent with the 2016 NIHCS bedroom standard.</p> <p>Aside from the 2011 Census, the NIHCS is the only data source that could replicate the Scottish Government "Concealed AND Overcrowded" indicator, but tests suggest that sample size is too small to produce robust figures.</p>

Concealed single person households	NIHCS	<p>Figures derived from the LFS and UK-HLS (Fitzpatrick et al. (2016) indicate that some 111,000 (14%) concealed households were non-dependent adult children living in the parental home. A further 52,000 (7%) were classed as 'other', many of which are sharing households (see below).</p> <p>Concealed single persons living in the parental home are potential households that will form a separate household at some point in the future when the opportunity arises. Thus, including them in the backlog of current need can result in double counting.</p> <p>This underlines the need for considerable caution about which, if any, concealed single adults are included in the count of current need. For this reason, any such indicator is usually restricted to involuntary sharing households.</p>
Single adult households sharing accommodation involuntarily.	NIHCS LFS CWL	<p>LFS based estimates reported in the 2016 Homeless Monitor suggest that up to 4% of single adult households share their residence with at least one other household. This LFS figure is also understood to include people in temporary or supported housing.</p> <p>In the absence of data to differentiate between voluntary and involuntary sharers, standard practice is to assume that householders over a given age are involuntary sharers. The age threshold is often set at 25 or 30 but LHA rules might be seen to imply this should be set at 35 years.</p> <p>Dialogue with the NIHCS team, who have carried out initial testing of possible indicators, suggest it may be possible to produce robust Northern Ireland level estimates. This is something that DfC may wish to explore further if an 'in principle' decision is made to make formal use of the HNDA tool.</p>
People leaving institutions	None identified	<p>Some studies include a snapshot estimate of 'long stay' adults moving out of institutions such as hospitals and prisons. In part this reflects the fact that such individuals are not part of the private population on which household estimates and projections are based.</p> <p>There appears to be no suitable timely or robust data source. Homeless statistics show that institutional discharge was recorded as the reason for 286 'fully duty' homeless households in 2017/18 but this is a flow not a snapshot figure.</p> <p>Any snapshot figure derived from the CWL (i.e. applicant in month of January 2019) is likely to be minimal and make only a marginal difference to the overall count of current need, especially as those placed in temporary accommodation would have to be screened out (i.e. they would already be counted as living in temporary accommodation).</p> <p>It is suggested that this indicator should not be a priority for further investigation.</p>

Households living in non-permanent accommodation	Census NIHE traveller survey	<p>This includes people living in caravans, mobile homes, winter lets of holiday homes and other non-permanent housing. This definition could be widened to include households living in property served with a closing or demolition order or compulsory purchased.</p> <p>Again, robust and timely data is lacking. The 2011 Census reported there were 1,112 caravans and other mobile or temporary structures. However, more recent published figures from Northern Ireland's Domestic Valuation List exclude caravans and mobile homes.</p> <p>The numbers of households involved in winter lets is not known and it is not clear if CWL would provide usable figures.</p> <p>This measure should ideally take account of the proportion of households living in non-permanent accommodation that 'need' settled housing. This is a particularly pertinent issue for Northern Ireland due to the presence of the Traveller Community.</p> <p>NIHE figures for 2002-2014 show the traveller population fluctuated between 1,228 and 1,486 whilst the All-Ireland Traveller Health Survey indicates the numbers of travellers in Northern Ireland may exceed 3,900.</p> <p>According to NIHE (2015) research, of the 112 traveller households stating they required alternative accommodation, 51 preferred settled /social housing (46%). However, the reliability of the evidence has been disputed by Northern Ireland Human Rights Commission (2018).</p> <p>In the absence of timely and robust data, this indicator is not considered a priority for further investigation.</p>
Inadequate housing conditions		
Households living in dwellings lacking amenities (e.g. bathroom, kitchen or inside WC)	NIHCS	<p>Some studies have focused on dwelling lacking amenities. This indicator is often restricted to private dwellings on the assumption that in-situ solutions are (or should be) available for social renters.</p> <p>The provision of amenities is embedded in the Northern Ireland 'Fitness Standard' and the Housing Health and Safety Rating System (HHSRS). However, the definition and implementation of the 'lack of amenities' used in CWL is not consistent with these measures.</p> <p>As households living in private properties that lack amenities would generally be picked up in any indicator of disrepair, it is not felt to be a priority for further investigation.</p>

Households living in private sector dwelling that are in such a poor and costly state of disrepair that it necessitates a new home to be built	NIHCS	<p>In 2016, some 16,370 homes (2.1%) failed the Fitness Standard. Over half were unoccupied dwellings and virtually all others were private dwellings.</p> <p>Some 45,970 private occupied dwellings failed the Decent Home Standard and 54,490 such dwellings were classified as HHSRS Category 1 hazards.</p> <p>Housing need studies generally assume that stock in poor condition can be improved without the need for new dwellings to be built. This is mostly supported by NIHCS evidence but there are cases where repair costs are high and higher repair costs are associated with lower income households.</p> <p>In the longer term, the NIHCS team could be invited to explore the potential to create a statistically meaningful indicator of private sector disrepair that would require a new home to be built.</p>
Unsuitable housing		
Households living in overcrowded accommodation	NIHCS UK-HIS Census CWL	<p>Overcrowding is a long-standing normative standard of housing quality. It has some association with dwelling shortages and is linked with moves into and within the social rented sector.</p> <p>The 2016 NIHCS reports that 26,000 households (4%) live in overcrowded homes, the majority of which live in the social rented sector.</p> <p>Overcrowding could be addressed via property extensions, but it is generally assumed that relocation to a suitable home is often the better option, as it frees up a home suitable for another (smaller) household.</p> <p>Overcrowding indicators are typically based on households below the bedroom standard to determine if a household has fewer bedrooms than required for household members allowing for age and sex.</p> <p>Overcrowding indicators used in housing need studies generally discount social tenants. This is based on the assumption that social tenants can be assisted to move to a suitable property within the existing social rented stock.</p> <p>The Scottish Government and Welsh Government approaches have restricted the measurement of overcrowding to concealed families. However, in light of the data limitations noted above, it may be desirable to extend the measure of overcrowding to include both concealed families and involuntary sharers.</p>

Households containing an older and/or disabled person with mobility impairment occupying a home that cannot be economically adapted to make suitable	NIHCS CWL	<p>The assumption that older and disabled households can have their needs addressed without the need for new dwellings is largely supported by NIHCS data.</p> <p>However, as with stock condition, there is some evidence that an in-situ move is not a feasible option in some cases. The issue then becomes one of finding enough suitable units that such households can move into.</p> <p>Although this is an important indicator, there is a paucity of robust data. The NIHCS team could, however, be invited to explore the potential feasibility of creating a statistically meaningful indicator.</p>
Intimidation or harassment from neighbours or others necessitates a move	DfC CWL	<p>In terms of 'full duty' homeless applicants, DfC 2017/18 report that 355 applied due to intimidation and 952 for neighbourhood harassment.</p> <p>Whilst clearly an indicator of housing need there is little evidence that this typically necessitates a requirement for an additional dwelling.</p> <p>Those accepted as homeless but not found settled accommodation will, in any case, be included in the count of temporary accommodation. This indicator is therefore not considered a priority for further investigation.</p>
Domestic violence that necessitates a house move	CWL	<p>DfC 2017/18 figures for full duty homelessness applicants indicate that 904 applied due to domestic violence.</p> <p>Households accepted as homeless but not found settled accommodation are usually included in the count of those in temporary accommodation indicator.</p> <p>There is also some overlap between relationship breakdown and newly arising need.</p> <p>This indicator is therefore not considered a priority for further investigation.</p>
Families with children under 12 years living in unsuitable housing (e.g. high-rise or no garden) and lack the resources to move	Census NIHCS	<p>Studies have included indicators of this nature but their validity is contested. It also tends to be the case that families living in unsuitable housing are mostly social renters and are therefore often discounted from the current need count.</p> <p>High rise flats are not a widespread feature of Northern Ireland's housing system. NIHCS 2016 reports that 2% of households with children live in a flat of some kind.</p> <p>As this form of housing need is very unlikely to require an additional dwelling, this indicator is not felt to warrant further investigation.</p>

Un-affordable housing costs		
Households unable to afford to buy/rent a reasonable home in their locality of residence.	FRS NIHCS UK-HLS	<p>Income thresholds are used as an overlay (or filter) to identify existing households that might require social rented or other affordable housing. However, it has recently been used as an indicator of housing need in its own right (see for example Bramley 2018).</p> <p>This indicator is usually based on one of three affordability measures:</p> <ul style="list-style-type: none"> (a) income to housing cost ratios; (b) residual income after housing costs is below a stated minimum, such as income is below the social security 'Applicable Amount +20% for a given household type; and (c) Income is below the Minimum Income Standard (MIS) for the particular household type, or some percent (80% to 90%) of the MIS. <p>Academics differ on whether financial hardship should be seen as a form of existing housing need, albeit few would dispute it is a risk factor for potential homelessness.</p> <p>Opinions differ on the extent to which a lack of housing supply is a major driver of un-affordability. There is also debate about the extent to which the UK programme of welfare reforms as opposed to housing market trends is driving financial hardship and un-affordability.</p> <p>There is little clear evidence to suggest that financial hardship amongst existing households is unambiguously an indicator of a need for additional housing as opposed to a need for a potential change in tenure or improvements in the delivery of financial support with housing costs to low income households.</p> <p>If the wider project team considers this to be an applicable indicator, it would be more appropriate to embed this in Local Housing Market Analysis and local assessments of housing need rather than at a Northern Ireland level due to spatial variations in rent and prices.</p>
<p>Abbreviations used above refer to:</p> <p>CWL – Common Waiting List DfC- Department for Communities – housing/homeless published statistics FRS- Family Resources Survey LFS – Labour Force Survey UK-HLS- Understanding Society Longitudinal Survey</p>		

APPENDIX B: 2011 CENSUS – CONCEALED FAMILIES

Table CT0164NI : Family Composition By Age Of Family Reference Person (FRP)

	All families	Aged 24 or under	Aged 25 to 34	Aged 35 to 49	Aged 50 and over
All families	491,122	14,177	75,097	172,515	229,333
Concealed families	7,981	1,864	2,428	1,152	2,537
Lone parent families	4,579	1,562	1,502	767	748
with dependent child(ren)	3,818	1,556	1,492	587	183
with non-dependent child(ren) only	761	6	10	180	565
Couple families	3,402	302	926	385	1,789
with no children	2,214	247	619	158	1,190
with dependent child(ren)	751	55	306	195	195
with non-dependent child(ren) only	437	0	1	32	404
Unconcealed families	483,141	12,313	72,669	171,363	226,796
with no children	146,485	2,747	20,097	20,241	103,400
with dependent children	233,658	9,527	52,449	136,411	35,271
with non-dependent children	102,998	39	123	14,711	88,125

Notes

1. The family reference person may not be the oldest person in a couple, as economic activity is given priority over age.
2. A dependent child is a person in a household aged 0 to 15 (whether or not in a family) or a person aged 16 to 18 who is a full-time student in a family with parent(s).
3. A 'concealed family' is one that does not contain the Household Reference Person. This will occur where there is more than one family living in a household. The members of these families may or may not be related.
4. Family - A family consists of a couple (married, same-sex civil partnership or cohabiting) with or without children, or a lone parent and their children. It also includes a married, same-sex civil partnership or cohabiting couple with their grandchildren or, a lone grandparent with his or her grandchildren, if there is no parent in the intervening generation in the household. A family will also include step-children when their parent is part of the couple.
5. 'Age' is age at last birthday.

APPENDIX C

PAPER 2: DATA SOURCES FOR POPULATING NEWLY ARISING NEED

Introduction

1. This second paper identifies the main data sources that could be used to populate the HNDA excel based tool for Northern Ireland in respect of newly arising need and considers the robustness and practicality of accessing these different data sources.

Summary of model

2. The HNDA tool seeks to estimate the minimum need for additional housing under different economic and housing market scenarios in order to inform the setting of policy-driven housing supply targets. The tool:
 - Provides an annual estimate of newly-arising need as identified through official household projections plus an allowance for current need (as discussed in Appendix B, Paper 1) to identify the possible requirement for additional housing.
 - Estimates the likely breakdown of the additional requirement for housing into four tenure categories: home ownership, private rent, below market rent (or shared equity / shared ownership) and social rent and is derived from a combination of assumptions and data.
 - Enables alternative scenarios to be generated by varying explicit assumptions about the trajectory of household incomes, house prices and rents, selecting alternative household projection figures.
3. Estimates are produced for each year of the projection period as well as the cumulative total at the end of the projection period. For long range estimates, summary outputs for each five-year period are also available.
4. Some Scottish local authorities compare outputs from the HNDA tool with historic trends in new build completions and household tenure pattern to sense check the findings. Some also make comparisons to explore how the future may differ from the past and whether there may be a requirement for a major change in house building rates or a change in the balance between social, intermediate and private housing of new provision.

Household projections

5. The scale of the requirement for additional housing is largely driven by household growth. Like the long-standing Net Stock Model in Northern Ireland, the HNDA tool uses net household growth (i.e. after adjustments for household formation, dissolution and migration) to estimate additions to the number of households over the projected timeframe.
6. In Scotland, the central HNDA estimates are based on official National Records of Scotland (NRS) principal household projections. NRS household low migration and high migration variant household projections are also built into the HNDA tool. These look at how different migration prospects might impact on future household growth and can be used to inform different scenarios. Alternatively, Scottish local authorities can adjust the principal projections (say by plus or minus 5%) to create alternative scenarios, subject to explaining the rationale for these adjustments and providing supporting evidence.

Northern Ireland potential data sources

7. The 2016-based household projections for Northern Ireland were published by NISRA in December 2018. These projections were produced by establishing age-sex specific household membership probabilities and then applying these to NISRA's 2016 based population projections.

Potential issues

8. Household projections, unlike forecasts, do not allow for behavioural influences of housing market conditions and economic factors on future household growth, such as changes in household incomes, housing affordability and housing supply. Nor do NISRA's household projections allow for the possible demographic consequences of the UK's withdrawal from the European Union.
9. The derivation of household membership probabilities from trends in household formation between the 2001 and 2011 Census may potentially result in some under-estimation of household formation. On the other hand, since the global financial crisis of 2007/8, household formation has been suppressed throughout the UK, albeit the extent to which this has been driven by economic and housing market conditions as opposed to broader social changes is a matter of ongoing debate.
10. To allow for such matters, the HNDA tool, like former iterations of Northern Ireland's Net Stock Model, includes estimates of concealed families¹⁵ within the count of current need and (as noted earlier) enables different scenarios to be produced using alternative (or variant) household projections.
11. NISRA has not issued variant household projections. Assuming the HNDA was adopted, NISRA could be asked to create variant projections by applying their existing age-sex specific household membership probabilities to their high/ low population variant projections. In terms of evaluating the model, however, gradually increasing or decreasing the number of projected households by a given percentage would be appropriate. For instance, gradually increasing or decreasing the number of projected households by 10,000 (or 1.5%) over the period to 2021 would have a broadly similar effect to deriving variant household projections from the high/ low population variant projections.
12. Neither NISRA's household projections nor the HNDA tool currently make provision for potential changes in the numbers of involuntary sharers. As noted in Appendix B, Paper 1, this refers to single adults (above a specified age threshold such as 35 years) over the projection period. This may warrant further consideration if the HNDA model is adopted.

Tenure split and affordability

13. The HNDA tool is based on explicit assumptions about affordability ratios (gross household incomes divided by house prices or rents). The default ratios are generally based on the 25th percentile of income and house prices and 30th percentile rents, which are considered to be a reasonable approximations of the point where first-time buyers enter the market. The main affordability ratios are summarised in Table 1.

¹⁵ As discussed in Appendix B, Paper 1, the data on people unable to form a separate household or lack a stable home of their own is scarce and the indicators require careful specification to limit the risk of capturing aspirations rather than housing need.

Table 1: Affordability assumptions in the HNDA tool

Tenure	Default assumption/setting
Potential to afford to buy	Can afford to purchase if the price of lower quartile dwelling (25% percentile) is no more than 3.6 times a household's gross income*.
Of which likely to have a deposit to buy (wealth constraint)	60% of households that can afford mortgage repayment are assumed to have the necessary deposit and go on to buy**.
Can afford private rent	Households spending less than 25% of income on rent, where rent is defined as the median PRS rent for a 2-bedroom unit.
Assumed to require below market rent product***	Households spending between 25% of income on rent (median PRS rent for a two-bedroom unit) and 35% of income on rent (30th percentile PRS rent for a 2-bedroom unit) that could benefit from some form of subsidised market rent (intermediate housing).
Assumed to require social rent	Households spending 35+% of income on rent (30th percentile PRS rent for a 2-bedroom unit).
<p>Source: Scottish Government (2018) HNDA Practitioner's Guide 2018 and Scottish Government (2019) HNDA Tool Instructions V3.1</p> <p>* The HNDA Tool Instructions confirm this is equivalent to a mortgage of up to 85% of a house price at 3.1 X income and a 15% deposit.</p> <p>** This assumption (and the homeownership multiplier) is regularly reviewed and adjusted to reflect trends in the first-time buyers by UK Finance (previously Council of Mortgage Lenders).</p> <p>*** This is intended to represent the income range around which households could benefit from intermediate products such as Mid-Market Rent, shared equity products and, in the case of Northern Ireland, the Co-ownership Scheme.</p>	

The following paragraphs discuss potential house prices, private rents and gross household incomes in turn.

Northern Ireland house price data

14. The HNDA tool uses Registers of Scotland (RoS) house price statistics for sales with a price of between £20,000 to £1 million to create four pre-programmed house price scenarios. The RoS house price statistics are based on annual arithmetic mean, median and lower quartile figures as opposed to standardised house prices from the House Price Index (HPI) produced by ONS.
15. Assumptions that could be utilised to create Northern Ireland house price scenarios were detailed in the paper discussed at the Project Meeting of 1 February 2019.
16. Whilst Northern Ireland has no equivalent to the RoS data, four potential sources of house price data are available:
 - LPS/ NISRA House Price Index (NI-HPI)
 - University Ulster House Price Index
 - Halifax House Price Index
 - Nationwide House Price Index

17. Commercial companies like Zoopla and Rightmove also produce price data but these are based on asking prices that may differ significantly from achieved prices. As such, they are indicative of trends in price expectations as opposed to actual prices and were therefore discounted.
18. An Addendum to this appendix provides a brief outline of each of the four house price data sources. Although they have broadly similar trajectories in terms of price trends, there are important differences between the actual figures reported. These arise from a variety of factors that include different sample sources and different statistical methods used to adjust for the mix of properties sold from one period to the next.
19. Having considered the four possibilities, it is suggested that the use of Nationwide and Halifax data should be discounted as the core data source for populating the HNDA tool. Both use their own mortgage approvals data and as a result do not cover cash sales. The spread of the two samples is also believed to be skewed in terms of their geographical coverage. In addition, median and lower quartile house price figures are not readily accessible and there may be cost implications in seeking to source this data directly.
20. The underlying data underpinning both the Ulster University and LPS house price indices are readily accessible and could be used to produce simple arithmetic medians and lower quartiles prices. However, there are persistent and systematic differences in the key metrics reported for Northern Ireland from these two sources, linked to differences in the methods used to adjust for the mix of sold properties and the underlying data¹⁶.

Private rents data

21. The main source of data on private rents is the Northern Ireland Private Rental Index (PRI) which is prepared by Ulster University in partnership with the NIHE. The underlying data is based on combining rental data from:
 - PropertyNews.com for advertised properties that were let during the specified time period.
 - Data NIHE uses to calculate Local Housing Allowances for the administration of private Housing Benefit for private tenants.
22. Data from both sources is subject to cleaning and processing to improve the robustness of the data.
23. It is possible to produce weekly PRS rent statistics for 2-bedroom properties, which represent around 25% of the PRS market in Northern Ireland. The published statistics include rates, which requires NIHE collated rents data to be adjusted upwards to include an allowance for rates in order to ensure consistency with advertised rents. For the purposes of testing the HNDA tool it is recommended that the rates should be excluded from the gross rent for 2-bedroom dwellings.

Income data

24. The HNDA tool is based on gross household income, which is the sum of earnings, private pensions tax credits, and social security benefits such as the State Pension, Child Benefit, Housing Benefit and now Universal Credit before any deductions for income tax and national insurance.
25. The gross incomes included in the HNDA tool are synthetic modelled estimates that were produced by Heriot-Watt University in association with David Simmonds Consultancy¹⁷. The estimates are derived from the Scottish Household Survey (SHS), Understanding Society (UKHLS) and the Family Resources Survey (FRS). In particular, the FRS is used to prepare Scotland level gross (unequalised) income levels, which act as control totals for modelled incomes at the small area level.

¹⁶ The LPS NI House Standardised Price for 2018 Q4 was £136,669, whilst the closest comparable Ulster University figure was £163,165.

¹⁷ The HNDA tool previously included CACI Pay Check data but this has been judged to have become prohibitively expensive in the current fiscal climate.

26. The gross income estimates represent the distribution (up to 10% and 90% plus) of gross income across the total household population. As the estimates are based on the ONS definition of a household, they represent the earnings and other income of every adult member that lives in a household. This is in contrast to the HCS and most other surveys, which define household income on the basis of the Benefit Unit (i.e. householder and any partner).
27. At present, the FRS data is the only source of data that can readily produce appropriate income estimates for Northern Ireland. More specifically, it means that the gross (unequalised) income estimates should equate to the income distribution recorded in the latest FRS, weighted for household numbers and composition.

Other observations

28. The HNDA tool implicitly assumes that unless there is a fundamental change in economic and labour market conditions, the private rented sector will continue to play a substantial and growing role in meeting future needs. It therefore tends to produce findings that show growing demand for private renting from households who might otherwise have expected to access homeownership or social renting. This assumption may warrant further consideration in light of the lack of policy mechanisms in Northern Ireland to help ensure such units can be delivered. It may also be beneficial to consider the potential implications for new supply should future growth in private renting continue to be driven by the movement of existing properties from the owner occupied into the private rented sector (including those that were originally in the social sector).
29. The use of gross household incomes can result in some over-estimation in the ability of low to modest income households to afford intermediate and private rented housing, especially for families with dependent children. This is due to the various assumptions about the level of income different types of households require to pay for food and other essentials built into the social security system (Appendix C's Addendum illustrates this point). This limitation is hardly unique to the HNDA tool; it is common to all housing need estimates that employ gross income to gross housing cost affordability ratios.
30. This limitation is not necessarily a reason for adjusting the model, which would be extremely challenging, but it does suggest:
 - Care is required in interpreting the outputs.
 - End users should be cautious about adopting more stringent affordability criteria (e.g. that a household can afford to spend 30% of income on rent).
31. As gross household incomes are based on the incomes and earnings of all adult members they cannot by definition be representative of the incomes of concealed households that form part of a multi-family or multi-benefit unit household. Gross income estimates are therefore not an appropriate measure of the incomes of households in current housing need. This reinforces the suggestion in Appendix B, Paper 1 that for the purpose of evaluating the HNDA tool, all homeless households living in temporary accommodation plus all concealed families living in overcrowded accommodation should be assumed to require social rented housing.

Summary of proposals

32. This paper proposes that for operationalising the HNDA tool, the following data sources should be used:
- NISRA household projections plus working assumptions on the probability of lower and/or higher growth in additional household numbers that are consistent with the economic and housing market scenarios adopted and are broadly in line with high/low variant population projections.
 - Either the data underpinning the LPS or Ulster University House Price Index, depending on the outcome of future discussions.
 - PRS rents data (excluding rates) that underpins the Ulster University Private Rents Index.
 - FRS income distribution for the total household population, weighted to take account of household composition.
33. The paper has noted a number of matters that the wider project team may wish to consider in reaching a judgement on the potential future role of the HNDA tool for Northern Ireland. These include the possible requirement to:
- Invite NISRA to produce variant household projections.
 - Look at how gross income might be defined (i.e. Benefit Unit or all adults in a household).
 - Revisit the assumption that the growth of private renting should be unconstrained in light of the limited policy tools available to support both private renting and intermediate housing.

APPENDIX C: BIBLIOGRAPHY

[Lloyds Bank Group Halifax Price Index](#)

[The Nationwide House Price Index](#)

NI Executive (2018) [Northern Ireland House Price Index - Data quality report](#), Belfast: Dept of Finance

NISRA (2018) [Northern Ireland Household Projections \(2016 Based\) – Methodology](#), Belfast: NISRA

Scottish Government (2018a) [HNDA Managers Guide](#), Edinburgh: Scottish Government

Scottish Government (2018b) [HNDA Practitioner’s Guide 2018](#), Edinburgh: Scottish Government

Scottish Government (2018a) [HNDA Managers Guide](#), Edinburgh: Scottish Government

Scottish Government Communities Analysis Division (2017) [A Short Non-Technical Guide for Housing Affordability Analysis](#), Edinburgh: Scottish Government

Scottish Government Communities Analysis Division (2017) [Scottish Government Experimental Statistics on Local Level Household Income Estimates 2014 – Summary of Results and Methodology](#)

[Ulster University/NIHE Northern Ireland Quarterly House Price Index](#)

APPENDIX C: ADDENDUM (1) - HOUSE PRICE DATA

Data source	Summary
LPS/NISRA House Price Index (NI-HPI)	<p>From June 2016, the NI HPI is a component of the ONS UK House Price Index. It is based on HMRC Stamp Duty Land Tax (SDLT) returns submitted by solicitors plus property attributes sourced from the LPS Valuation List database.</p> <p>LPS statisticians undertake extensive work to clean, process and validate HMRC data (e.g. duplicate cases need to be removed and some 25% of addresses have to be manually matched to a property in the LPS Valuation List).</p> <p>The HPI excludes sales that do not require SDLT notification to HMRC. The HPI also exclude some 10% of SDLT cases that are incomplete and cannot be verified against the LPS Valuation List. RTB and co-ownership sales plus very small or large units that might distort figures are also excluded.</p> <p>Standardised house prices are calculated using a hedonic regressions approach¹⁸. The Regulated Mortgage Survey (RMS) and CACI ACORN classification system are used to inform HPI calculations.</p> <p>Due to some issues with seasonal adjustments to apartment sales, only non-seasonally adjusted figures are currently published. First-time buyer and existing owner occupier prices are also published, but there is a lag in finalising such figures.</p>
University Ulster House Price Index	<p>University of Ulster produces a House Price Index in partnership with the NIHE and the Progressive Building Society. Price trends are complemented with qualitative insights from estate agents.</p> <p>It is based on price data from a large sample of estate agents. The data is processed by the University to remove outliers, invalid cases and other anomalies.</p> <p>Basic price statistics are simple arithmetic averages whilst the index used to monitor trends is weighted to reflect the market share of each property type. Lower quartile figures can be readily accessed from Ulster University.</p>

¹⁸ Hedonic regression is a statistical technique for controlling for variations in the mix of properties sold from one period to another. It assumes that a house can be deconstructed into property attributes (type, size etc) and that each of these attributes has an associated ('hedonic') price, which in combination provides the basis for calculating a range of standardised prices, including in the case of the NI-HPI a single standardised price for Northern Ireland as a whole. A general limitation of this approach is that it is not possible to measure all the attributes that influence prices, including physical and neighbourhood conditions and proximity to shopping/places of work.

Halifax House Price Index	<p>This index is based on properties being bought with a Halifax mortgage. Data has been published since 1983 and the index has been in operation since 1984. The HPI is owned by Markit Group Limited and published by Lloyds Bank.</p> <p>Published price and percentage changes are based on standardised house prices derived via hedonic regression. Annual price changes are based on the average of the last three months' prices compared with the average for the same period a year earlier.</p> <p>There is a widely held perception that figures can be skewed in months when sales figures are low and that the data has a northern bias. A quarterly NI regional index is produced but it is not routinely published.</p> <p>Statistical data, including arithmetical median and LQ estimates) would have to be secured from IHS Market, which may have cost implications.</p>
Nationwide House Price Index	<p>This index is based on new mortgage loans issued by Nationwide. Nationwide says its share of the gross house purchase market has been about 10% in recent years, but their sale profile has a south of England bias.</p> <p>The Nationwide's method statement clarifies that buy-to-let, RTB and some very small or very large homes (using specified limits for each type of property) are excluded. Hedonic regression is then used to "mix-adjust" prices and arrive at standardised prices.</p> <p>Again, there is a risk statistical outputs can be skewed in months when there are low numbers of transactions and both median and LQ prices would have to be secured from Nationwide, with possible cost implications.</p>

APPENDIX C: ADDENDUM (2) - FRS ESTIMATES AND ILLUSTRATION OF HB ELIGIBILITY AND AFFORDABILITY RATIOS

This addendum exemplifies the distribution of non-equivalised gross household incomes reported in the FRS 2016-17 as well as inter-relationship between gross incomes, affordability ratios and HB.

FRS gross incomes (non-equivalised)

HH - Total Household income (weighted)		
	Weekly	Annual
Mean	£668.34	£34,753.68
Percentiles		
10	£208.00	£10,816.00
20	£291.00	£15,132.00
30	£363.00	£18,876.00
40	£440.00	£22,880.00
50	£530.00	£27,560.00
60	£639.00	£33,228.00
70	£764.00	£39,728.00
80	£955.00	£49,660.00
90	£1,279.00	£66,508.00
Source: FRS 2016/17		

HB and affordability

The table below shows the inter-relationship between gross incomes, affordability ratios and HB in the case of single persons, couples, lone parents and families. In all three cases it is assumed that:

- One adult in household is in employment.
- The rent is £130 per week (£563 pcm which falls within the range of median PRS rents across the 11 LGDs in NI in 2018).
- The gross income (including tax credits plus means tested and non-means tested benefits such as Child Benefit) is £25,000 per annum.

Household	Single adult 25+	Couple both 25+	Lone parent + 1 dep' child	Couple + 2 dep children
Gross weekly income	£481	£481	£481	£481
Of which gross weekly earnings	£481	£481	£410	£78
HNDA house price affordability threshold (3.6 X income)	£90,000	£90,000	£90,000	£90,000
Cost of £90,000 25-year repayment mortgage at 3% per week	£98.49	£98.49	£98.49	£98.49
Percent gross income spent of £130 rent	27%	27%	26%	26%
In receipt of weekly HB	No	No	£37.83	£130.00
In receipt other means tested benefits/tax credits	No	No	Yes	Yes