

census
2021

Census 2021

Statistical output geography – Information paper

October 2021

1. Introduction

In order to realise key benefits, census statistical outputs need to be produced for a range of different output geographies. This includes census statistics for small areas/neighbourhoods right up to census statistics for large administrative units. There is a user need for statistical outputs from the census to be made available for a variety of geographical areas. However this must be balanced with the important requirement to protect the confidentiality of the data¹.

The statistical output geographies used by Northern Ireland Statistics and Research Agency (NISRA) for the reporting of 2011 Census statistics were [Small Area](#) (SA) and [Super Output Area](#) (SOA). The geographical units that underpinned the SAs and SOAs were linked to areas created in the mid-1990s and are now nearly 30 years old. Following a public consultation on Census outputs, it is clear that there is a user need to update the 2011 Census SAs and SOAs. Given this user input, the results from the 2021 Census will be published on a new set of geographical units (2021SA and 2021SOA). The remainder of this paper outlines in more detail the need to make this change.

2. Why Census output geographies need to be redesigned

There are three main reasons for the planned redesign of the statistical output geographies for the 2021 Census:

- 1) Change to Local Government boundaries in 2014
- 2) Demographic Change - Population and housing growth/decline
- 3) Areas becoming less socially-similar over time

2.1 Change to Local Government boundaries in 2014

The 2011 Census SAs and SOAs were aligned with the historical 26 Local Government Districts (LGDs) and 582 Electoral Wards in place in at the time of

¹ There is a well-known risk of disclosure by [differencing](#); therefore, there is a requirement to have a consistent hierarchical series for output geographies. NISRA has previously tested that the risk of disclosure rises beyond the provision of two hierarchical units.

that census. However, new LGDs (11) and Electoral Wards (462) were introduced in 2014. Therefore, the alignment no longer exists and as an example Figure 1 shows where the boundary between the current Belfast City and Lisburn and Castlereagh LGDs (black lines) is considerably different to the layout of the previous LGDs (purple lines).

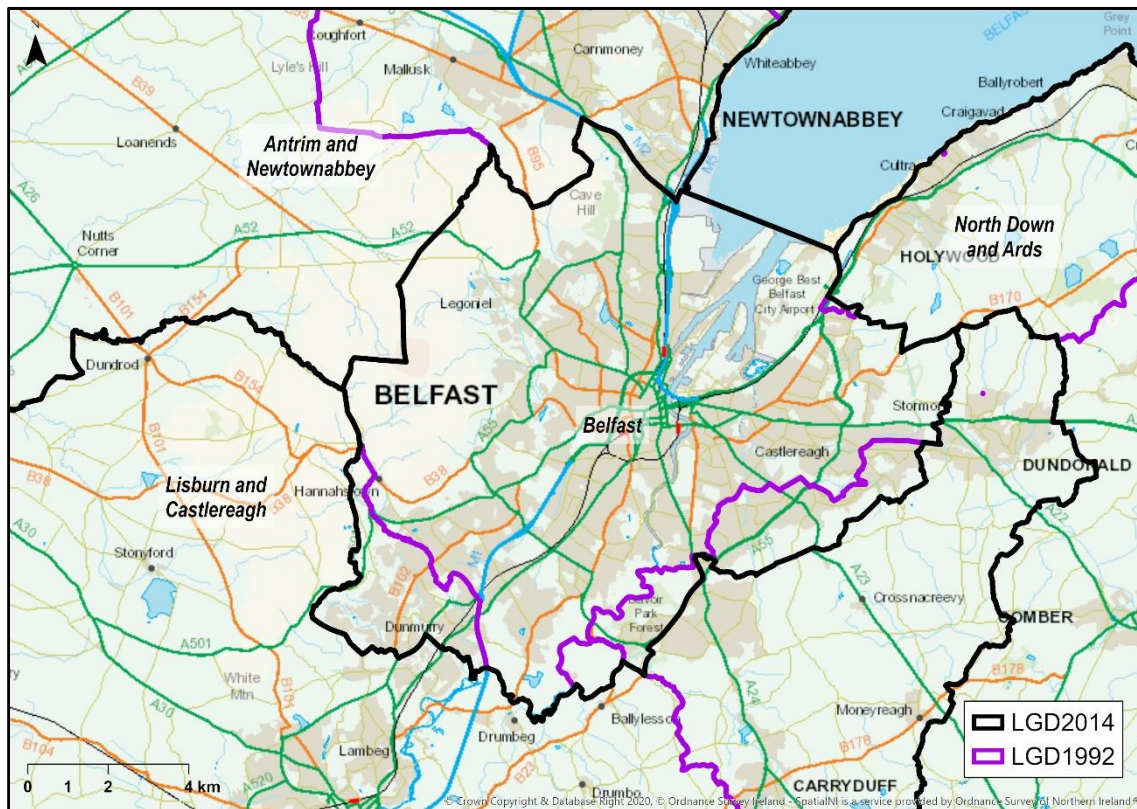


Figure 1. Difference between the current (black) and previous (purple) Local Government District boundaries in the Greater Belfast and Lisburn areas.

The redesigned output geographies for the 2021 Census will nest within the 11 LGDs, so this alignment will be restored. This was identified as a significant user requirement in the public consultation on Census outputs.

2.2 Demographic Change - Population and housing growth/decline

Since 2001, the overall population of Northern Ireland has grown steadily. Figure 2 illustrates the extent of population change by SOA between 2001 and 2020; the majority of areas have seen their population increase by up to 2,000, with some in the Greater Belfast area seeing a rise of over 4,000.

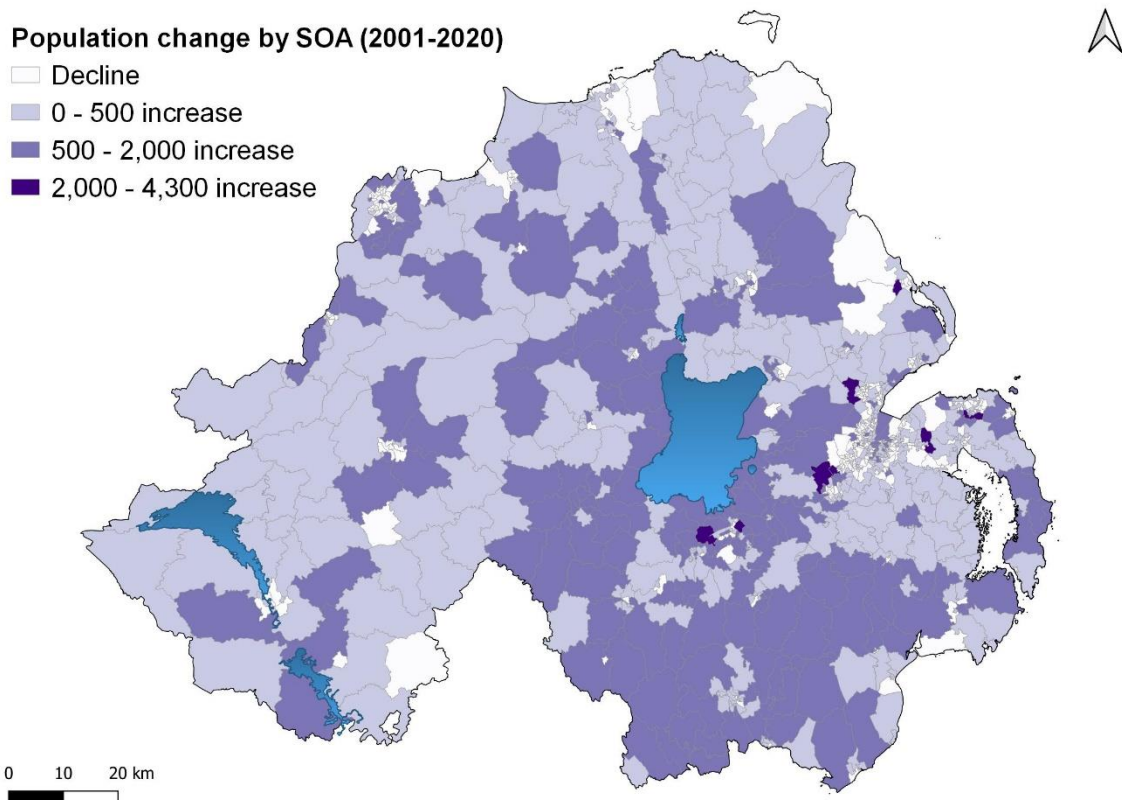


Figure 2. Population change by Super Output Area, 2001 -2020 (based on [mid-year population estimates by SOA, 2001-2020](#)).

However, this change is not uniform and the scale of the change varies substantially. This is shown in more detail when one looks at the scale of the change in housing units (see Figure 3 below).

Figure 3 shows the extent of housing stock change across SOAs in Northern Ireland from 2008 to 2021. In most of the SOAs, the housing stock has increased

by up to 500 since 2008, while it has risen by up to 1,200 in the aforementioned high population growth areas around Lisburn and Greater Belfast.

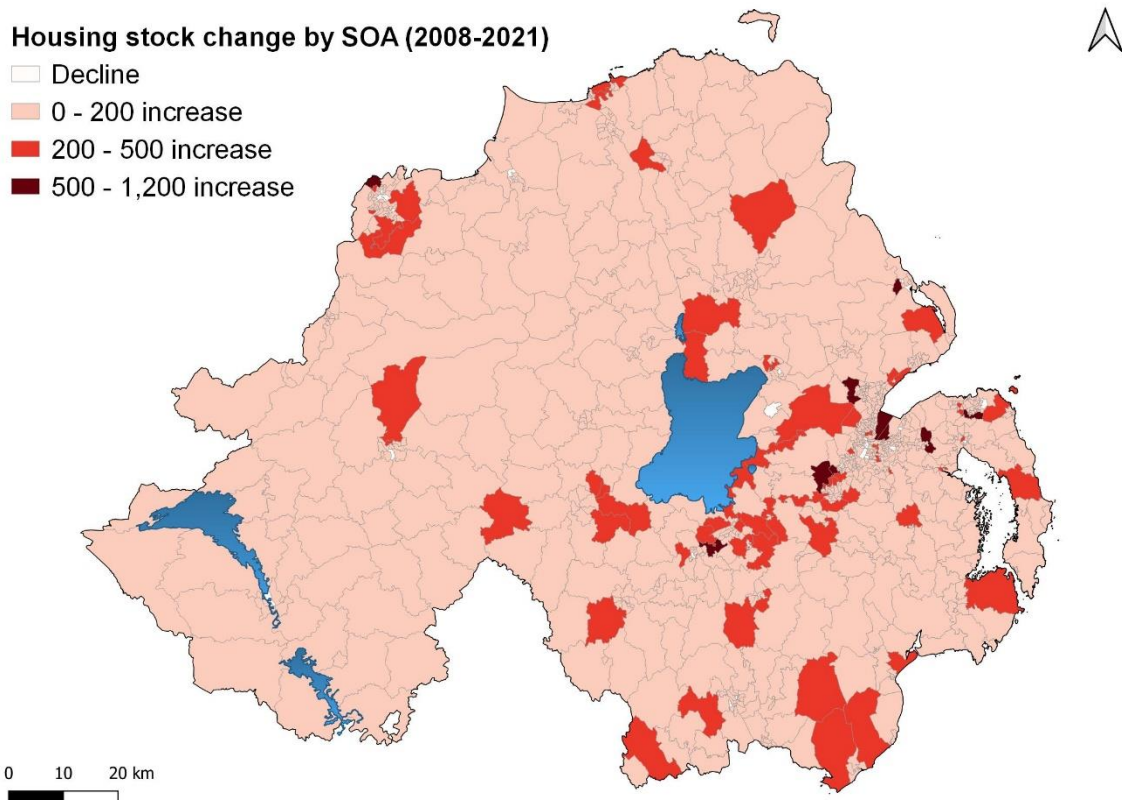


Figure 3. Housing stock change by Super Output Area, 2008-2021 (based on [housing stock by Super Output Area, 2008-2021](#)).

Variability in population/household size by area will mean that some of the detail in the 2021 Census statistics would be lost. This would reduce the insight provided to users by the Census outputs and thus create challenges in equitably assessing areas across Northern Ireland.

NISRA will redesign the output geographies to create suitably equal-sized areas in terms of population and households; this will maximise the value and benefit of 2021 Census statistics.

2.3 Areas becoming less socially-similar

The output geographies for the 2001 Census, the basis for the existing SAs and SOAs, were designed in such a way that they contained broadly similar housing types in terms of tenure (for example, owned, rented) and accommodation type (for example, detached, flat/apartment). The aim of this approach was to make the areas socially-similar.

These characteristics will have changed over time, particularly in areas that have seen a large amount of housing development. The redesign of the 2021 Census output geographies will look to restore this feature as it is beneficial when it comes to local service planning, resource allocation and measuring spatial deprivation.

3. Features of the redesigned output geographies

As mentioned in section 2, two of the main aims in redesigning the 2021 Census output geographies are alignment with the 11 LGDs and creating areas that are similar – both socially and in terms of population/households. NISRA plans to implement other design criteria for the new areas, which we believe will be beneficial to users. This will involve:

- aligning the boundaries, where suitable, with physical features such as roads and rivers
- situating the boundaries so they do not cut through individual houses
- creating areas that are more regularly-shaped than the current units

These steps will make it easier to identify the boundaries of the new areas on the ground, avoid the situation of individual houses being located in more than one area, and help to improve the output geographies when it comes to mapping and use in Geographic Information System applications.

4. Method

NISRA plans to use the [AZ Tool](#) to develop the new statistical output geographies for the 2021 Census. This program was developed by University of Southampton for automated zone design; it takes a set of geographical areas (termed building

blocks) and combines them to create larger zones according to specified design criteria. AZ Tool has been used extensively in the production of official statistics and in academic research; for example, Office for National Statistics used it to create/update the statistical output geographies in England and Wales for the 2001 and 2011 Censuses, and are doing so again for the 2021 Census. It is therefore a well-established and reliable method to employ for this work.

5. Statistics for other output geographies from the 2021 Census

In addition to the statistical output geographies, there is a demand for census statistics by various administrative geographies such as LGD, Electoral Ward and Assembly Area. The ongoing [Local Government Boundaries Review](#) is relevant in this regard, as it is proposing changes to Ward boundaries in each of the 11 LGDs. As a result, NISRA is not planning to align the redesigned output geographies with the current Wards as they are likely to be changed in the near future.

The boundary commission review is also recommending very minor boundary changes in a number of LGDs to address defacement (where houses have been built on the boundaries of existing LGDs). The timing of the introduction of the proposed minor changes will determine whether we produce 2021 Census outputs for the current 2014 or new, marginally changed LGDs.

NISRA provides census outputs for the [Grid Square geography](#) as far back as the 1971 Census, and we plan to continue this for the 2021 Census. The 100 metre Grid Square geography will be used to produce estimated Census outputs for administrative geographies other than LGD, according to user requirements. Users should be aware that these will be 'estimated' outputs in that the grid squares will not align exactly with administrative geographies. However, this approach was successfully trialled to produce [2011 Census statistics for Settlements in Northern Ireland](#). This estimation approach will give the flexibility to produce Census 2021 outputs for any administrative geographies that change over the coming years.