DHCSTC TIN3.047

Service Accommodation

New Employment Model

CAAS Location Element User Guide

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Distribution		
Name	Role	Organisation

Contents

Acronyms & Abbreviations

Acronym	Definition
CAAS	Combined Accommodation Assessment System
IMD	Index of Multiple Deprivation (England)
LSOA	Lower Layer Super Output Area
NEM	New Employment Model
NIMDM	Northern Ireland Multiple Deprivation Measure
NISRA	Northern Ireland Statistics and Research Agency
NSPL	National Statistics Postcode Lookup
OA	Output Area
Ofcom	The Office of Communications
ONS	Office for National Statistics
ONSPD	Office for National Statistics Postcode Database
SFA	Service Family Accommodation
SLA	Single Living Accommodation
SIMD	Scotland Index of Multiple Deprivation
WIMD	Wales Index of Multiple Deprivation

1 Introduction

Introduction

This guide sets out details of the external data-sources and the procedures used in creating the MODs location element of the Combined Accommodation Assessment System (CAAS), as it forms part of the New Employment Model (NEM). The remit of the guide is to describe the steps necessary to produce a location classification of MOD stock within the UK, which is fed into the rent setting calculation. The same external data sources are used to separately classify the Service Family Accommodation (SFA) and the Single Living Accommodation (SLA) types of stock.

It is not the purpose of this guide to discuss the rationale for the choice of external data sources or the choice of limits derived from them, but rather how to re-create and update the location element of the CAAS classification. A background, discussion, and analysis of the range of datasets used in the classification can be found in two separate documents: *TIN3.047 Service Accommodation Location Element: Final Technical Report, October 2013*, and *DHCSTC 3.047 Amendment 1 (Updated) – New Employment Model (NEM) – Service Accommodation: Analytical note, May 2014*.

MOD Regulations

The rationale for the choice of CAAS location criteria and thresholds, endorsed by the NEM Programme Board, can be found in the following separate documents: *NEM PSB Combined Accommodation Assessment System for Service Living Accommodation – Location Related Factors [PSB 17/13 dated 3 Oct 13]* and *NEM CAAS – Response to Out of Committee Comment on PSB Location Paper [dated 19 Mar]*.

The PSB approval of the CAAS mechanism, including the location-related factors described in this guide, can be found in the following separate documents: *Service Personnel Board (SBP) – Assessing Grade, Condition, Scale and Charge for Service Living Accommodation – A New Approach [SPB 06/13 dated 6 Feb 13]* and *NEM PSB Combined Accommodation Assessment System [PSB 34/14 dated 11 Jun 14]*.

The MOD regulations for the application of the assessment criteria described in this guide are set out in *JSP 464 Volume 5, Part 1*. This guide is designed to supplement the guidance provided in the calculation of Service accommodation charges, set out in *JSP 464 Volume 5, Part 2*.

The location element of CAAS aims to provide a discount (from the top charge) for SP allocated Service accommodation in locations where access to essential amenities is more difficult, when compared to those with reasonable access. The charging structure is tiered to reflect the extent of disadvantage at three levels:

a. Remote locations – meriting the greatest reduction in charge (20% discount);

b. Intermediate locations – meriting some reduction in charge (10% discount); and

c. Urban locations – not meriting a reduction in charge based on location factors.

Aim

This guide sets out the entire set of procedures involved in creating the CAAS classification, such that the whole MOD stock database classification could be re-created. An alternative approach would be to make use of the external data sources in conjunction with the procedures set out in this guide to manually update the existing classification of the SFA and SLA databases as new stock is added.

Overview of the location element classification procedure

The location element of the CAAS classification treats the SFA and the SLA stock individually, with the same procedures (with small modification) separately performed on each of the stock databases. The procedures set out in this guide therefore need to be completed twice to classify the two types of stock.

The process begins with the full postcodes of the SFA and SLA addresses. Each postcode is classified according to a range of external measures that indicate the extent to which it may be 'disadvantaged' in certain ways. These external measures need to be obtained from different sources, the relevant fields need

to be extracted, and these fields need to be attached to the SFA and SLA datasets to facilitate the classification.

The external measures are updated with varying degrees of regularity, which means that updates of the CAAS classification may involve use of some updated external measures but not others, depending on how often the location element is revised. It is also necessary to separately perform analysis on some of the external measures in order to identify national-level limits for use in the classification of the SFA and SLA stocks.

Following the attachment of relevant fields to the SFA and SLA datasets, a series of limits, or flags, need to be created. These are then used to reclassify each MOD postcode from an initial urban/intermediate/remote category to a final urban/intermediate/remote category. The latter classification comprises the locational element that is fed into the rent setting calculation.

Geography considerations

The external data sources required for the MOD stock classification are available at three different geographies: the postcode level, the Output Area (OA) level, and the Lower Layer Super Output Area (LSOA) level. It is therefore necessary to convert the MOD postcodes into (the higher) OA and LSOA geographies to allow several of the external data sources to be married to the SFA and SLA stock databases. This process involves identifying which OAs and LSOAs correspond with the MOD postcodes.

OA and LSOA geographies have become widely used in Government and other national data sources to provide information at a small area level. OAs were introduced by the ONS for the 2001 census. They are the smallest level of geography for which census and other data are available, and they are the building blocks from which LSOAs (as well as other higher geographies, such as local authority areas) can be built. OAs are constructed from contiguous postcodes so as to be broadly comparable in terms of population size (they must have a minimum number of 100 persons and 40 households to protect anonymity, and the target size is 125 households), and for each one to have a relatively homogenous socio-demographic profile. Each LSOA is typically comprised of five contiguous OAs. OAs and LSOAs are identified in data sources by a unique nine character alpha-numeric code. In England in 2011, there were 171,372 OAs, and 34,753 LSOAs.

The intention of OAs was that they would facilitate relatively consistent comparisons geographically and over time. Due to population changes between the 2001 and 2011 censuses, however, a number of the original OAs have been split into two or more new OAs in 2011, some of the 2001 OAs have been merged together in 2011, whilst others have changed between the two censuses in less clear ways. The OAs that did not change between the two censuses retained the original 2001 code in 2011 datasets, whereas the changed and new OAs have been given new codes in 2011. Only a small minority of the 2001 OAs (2.6 per cent) and LSOAs (2.5 per cent) have been changed between the 2001 and 2011 censuses in England.

The impact of these changes for the MOD classification exercise is that the appropriate OA and LSOA, either from 2001 or 2011, for each postcode is required to allow matching with the external data sets as they currently stand, because some of the external data sets (currently) are available at 2001 geography whilst others at 2011 geography. As a result of lags between changes in the OAs for census purposes and the updating of other area classifications that use these OAs, therefore, it has been necessary in the initial CAAS classification procedure for both the 2001 and the 2011 OA and LSOA codes to be attached to the MODs stock postcodes to facilitate data-matching. Naturally, this situation will evolve between the censuses depending on when new versions of the OAs and LSOAs classifications are introduced in the external sources of data.

CAAS classification stages

There are seven stages involved in the classification procedure that need to be completed for both the SFA and the SLA stock databases:

1. Attach OA and LSOA geographies to the MOD stock postcodes
    a. Source: postcode lookup table
    b. Coverage: UK-wide
2. Create an initial classification of each postcode into an urban/intermediate/remote area type

   a. Source: postcode lookup table
   b. Coverage: UK wide
   c. OA geography
      i. Currently 2011 geography for England & Wales and Scotland, and 2001 geography for Northern Ireland
3. Attach measures of accessibility to key services to each postcode
   a. Source: DfT accessability indicators
   b. Coverage: England
   c. LSOA geography, 2001
4. Attach average broadband speeds to each postcode
   a. Source: Ofcom lookup table
   b. Coverage: UK-wide
   c. Postcode geography, most recent available (currently 2013)
      i. 2011 OA and LSOA geography as required due to missing postcode values
5. Attach Indices of Multiple Deprivation scores to each postcode
   a. Source: Indices of Multiple Deprivation for each UK country
   b. Coverage: UK-wide
   c. LSOA geography, 2001
6. Define the limits for each MOD stock postcode
7. Reclassify each MOD postcode from the initial to a final urban/intermediate/remote class

External data sources

Table 1 lists the external data sources required for the CAAS classification procedures, and indicates the provider for each, and the date of the version of each that was used in the initial classification. The postcode lookup tables are updated on a quarterly basis by ONS, and the DfT accessibility statistics and Ofcom broadband speed data are updated annually. The IMDs for the four UK countries are updated at irregular intervals, but generally every three to four years.

Table 1 : The external data sources

External data source	Provider	Date of version used	Updating periodicity
Postcode lookup tables	ONS	February 2014	Quarterly
Accessability to key services	GOV.UK (DfT)	2011	Annually
Average broadband speeds	Ofcom	February 2013	Annually
Index of Multiple Deprivation: England	GOV.UK	2010	Irregular: previous was 2007
Index of Multiple Deprivation: Scotland	Scottish Government	2012	Irregular: previous was 2009
Index of Multiple Deprivation: Wales	StatsWales	2011	Irregular: previous was 2008
Index of Multiple Deprivation: Northern Ireland	NISRA	2010	Irregular: previous was 2005

Conventions to the guide

Links are given to websites from which the external data sources can be freely obtained. Direct links to the data sources are not generally given, as those will change as the data sources are updated, but rather links further up webpage hierarchy or to home pages, followed by descriptions on how to locate and download the relevant data. Percentages in this guide are rounded and may not sum exactly to 100.

2 Geography classifications and codes

Introduction

This section of the guide sets out details of the external data sources that contain a range of geography classifications for all UK postcodes. These geographies are contained within postcode lookup files, and need to be extracted for each MOD stock postcode to expand the SFA and SLA databases to include extra fields that identify the associated geographies for each postcode. The extra fields required are for the OA2001, LSOA2001, OA2011, and LSOA2011 codes within which each MOD postcode resides.

Postcode lookup file

A postcode lookup file is available from the ONS Open Geography Portal. Two versions of the lookup file are available: the National Statistics Postcode Lookup (NSPL) version, and the ONS Postcode Directory (ONSPD) version. Each lookup file provides a range of higher geographies for all current and terminated postcodes within the UK. The lookup files are updated quarterly. At the time of the initial CAAS classification, the most recent version available was for February 2014, and is the version used as an example in this description. The exact content of the lookup tables vary slightly, however, due to the range of geographies being updated periodically, which makes it essential for the relevant user guide for the lookup table to be consulted to ascertain which versions of the geographies are included.

The postcode lookup table contains in excess of 2.5 million records (the February 2014 version contains 2,556,016 records). This large file size means that the Excel software cannot be used to extract the relevant geographies, since Excel 2010 can work with a maximum of 1,048,576 records (Excel 2003 has a limit of 65,536 records).

The methoology used in the creation of the two types of lookup file varies slightly. The NSPL version identifies the OA associated with each postcode, and then allocates postcodes to higher geographies based on the postcode's OA. The ONSPD version allocates postcodes to OAs, and it also directly allocates postcodes to higher geographies, which means that postcodes in the same output area can be allocated to different higher geographies when OAs straddle boundaries. For the purposes of the CAAS classification, however, either file type will be suitable, since only OAs and LSOAs are required, and OAs nest exactly within LSOAs.

Location and content of the postcode lookup file

The ONS Open Geography Portal contains a wide range of Government and other data that is freely available to download:-

https://geoportal.statistics.gov.uk/geoportal/catalog/main/home.page

From the portal home page, select 'Download Products' from the button bar, then go to the 'Postcode Products' item in the list, and then select the most recent lookup table of the preferred format (.txt, .csv, .dbf, and .mdb formats are all supported). Selecting the relevant lookup table will initiate the download of a compressed file that includes a data folder, a documents folder, and a user guide folder. The documents folder contains lists of names and corresponding codes for the range of geographies in the lookup table. The user guide describes the content of the lookup table, Annex B providing variable descriptions.

In the downloaded data folder there are currently two versions of the postcode lookup table, one of which is based on the 2001 OAs and LSOAs (NSPLC01_FEB_2014_UK.csv), and the other on the 2011 OAs and LSOAs (NSPL_FEB_2014_UK.csv). At the current time, three NSPL fields are required from each of these two lookup files: the Output Area, the lower Layer Super Output Area, and the remote-urban classification. From the 2001 lookup table, the required fields are 'oa01', 'lsoa01', and 'ur01ind'. From the 2011 lookup table the equivalent fields of 'oa11', 'lsoa11', and 'ru11ind' are required. Other fields in the lookup tables might be useful - such as country, region and local authority codes - but are not essential for the CAAS classification, and can be dropped. Good practice would be to adopt these 2001 and 2011 OA and LSOA field names throughout the classification process with all sources of data, as the external data sources do not always contain a date indication in the OA and LSOA field names.

Three versions of the postcode are contained in the lookup tables: the fields 'pcd', 'pcd2', and 'pcds'. The field 'pcds' corresponds to the form in which the postcode is recorded in the MOD stock databases: left aligned, eight characters long, variable length, and with a space between the outward (the first part of the postcode) and inward (the last part of the postcode) codes. Using the 'pcds' postcode field, the six geography fields need to be extracted from the two lookup tables and married to the postcodes in the SFA and SLA data sets.

Whilst the 'pcds' field corresponds to the version contained in the MOD data sets, a different version of the postcode for file-matching purposes was created in the initial classification in both of the MOD databases and also in the postcode lookup tables. This version was left aligned, seven characters in length, and with the space between the inward and outward codes removed. This version was found to be the most reliable format when matching the files, and also is essential for matching with the Ofcom broadband speed data. If the MOD stock databases are updated manually, then a version of the postcode in this format could be included as part of that process.

Table 2 : Postcode lookup tables and fields required

Lookup table	Field name	Field description	Geographical coverage
NSPLC01_FEB_2014_UK	pcds	Variable length postcode	UK
	oa01	OA2001 code	UK
	lsoa01	LSOA2001 code	UK
	ur01ind	2001 rural/urban code	UK
	PostcodeNoSpaces	Postcode matching variable	UK
NSPL_FEB_2014_UK	Pcds	Variable length postcode	UK
	oa11	OA2011 code	UK
	lsoa11	LSOA2011 code	UK
	ru11ind	2011 rural/urban code	England & Wales, Scotland
	PostcodeNoSpaces	Postcode matching variable	UK

3 Urban/intermediate/rural classification

Introduction

A single area type classification does not exist for the UK as a whole. A pan-UK classification of urban, intermediate, and rural area types has therefore been devised, derived from the three separate rural urban classifications of area type that are available for England and Wales together, Scotland, and Northern Ireland. The three-part classification is created at the OA level, and applied to each MOD postcode according to the OA in which it resides. This new field will contain the initial urban, intermediate, and rural classification of the MOD stock postcodes.

Creation of a pan-UK three group classification of area type

The field 'ru11ind' that has been attached to the SFA and SLA databases contains the 2011 ten class rural-urban indicator for postcodes in England and Wales, and also the 2011 eight class indicator for postcodes in Scotland. New iterations of the lookup tables are likely to extend the coverage of this field to include Northern Ireland, when an updated version of the rural-urban indicator based on 2011 becomes available. At present, however, the most recent rural-urban indicator for Northern Ireland is based in 2005 using the 2001 geography, and is contained in the field 'ur01ind' taken from the 2001 postcode lookup.

Table 3 shows the groupings required with the three rural-urban classifications to produce the three class pan-UK indicator. Thus a new variable (named 'RU3Code' and the corresponding 'RU3Name' in the SFA spreadsheets) needs to be created in which the codes in the 'ru11ind' field in the SFA and SLA data sets of A1, B1, C1, and C2 all are grouped together to produce the pan-UK urban classification (code 1). Likewise, where codes 1 and 2 occur in the 'ru11ind' field for the Scotland postcodes, these require grouping together in the urban classification of the pan-UK indicator. Similarly, codes A, B, C, and D in the field 'ur01ind' for Northern Ireland should be grouped into the urban classification in the new 'RU3Code' variable.

The 'ru11ind' codes of D1, D2, E1 and F1 comprise the pan-UK intermediate classification (code 2) for the England and Wales postcodes; as do codes 3, 4, 5 and 6 for Scotland in the same field; and codes E, F, G, and H for Northern Ireland in the 'ur01ind' field. The England and Wales codes E2 and F2 in the 'ru11ind' field equate to the pan-UK rural classification (code 3); as do codes 7 and 8 in Scotland. There are no areas within Northern Ireland classified as rural in the pan UK classification.

Table 3 : Classification of the three rural-urban indicators into a single Pan-UK 3 class indicator

Pan-UK 3 class	England & Wales codes (ru11ind)	Scotland codes (ru11ind)	Northern Ireland codes (ur01ind)
1. Urban	A1, B1, C1, C2	1,2	A,B,C,D
2. Intermediate	D1, D2, E1, F1	3,4,5,6	E,F,G,H
3. Remote	E2, F2	7,8	None

4 Accessibility to key services

Introduction

Accessibility indicators are available for England only. They can be obtained from the Department for Transport (DfT) at LSOA level, and are updated annually. The indicators currently available are for 2012, and are provided at the 2001 LSOA geography (although the 2011 versions of the accessibility indicators were the ones used in the initial CAAS classification, as these were the most recent version available at that time). DfT has indicated that the 2013 release of the indicators will be for the 2011 LSOAs.

Travel times to a range of key services need to be extracted from the accessibility indicators, then an average travel time needs to be calculated across the range of services, and then cut-off times need to be used to identify MOD stock that lies in 'disadvantaged' areas with limited accessiblility to services, and to which a rental discount can be applied.

Data source and fields required

There are two options for downloading the accessibility indicators from the DfT. One option is to download all indicators in bulk, which includes historical versions also (in .csv format only), from:- https://www.gov.uk/government/publications/accessibility-statistics-2012. Alternatively, the individual files for each service type can be downloaded (in Excel 97-2003) from:- https://www.gov.uk/government/statistical-data-sets/acs05-travel-time-destination-and-origin-indicators-to-key-sites-and-services-by-lower-super-output-area-lsoa.

The accessibility indicators provide measures of accessibility to eight key service types, and include a range of statistics for each. Following the development of the methodology used in the CAAS classification, the measure adopted to indicate accessibility is the average travel time across a range of service types by the public transport/walking method of travel. In the accessibility data, these figures are given in minutes in the range 0 to 120, with a value 999 recorded if a journey cannot be made within 120 minutes. The meta data should be consulted to identify the appropriate fields to extract in future iterations, as file and field names may change with new releases. Table 4 sets out the file and relevant field names required from the 2011 version of the accessibility indicators.

Table 4: 2011 accessibility file names, public transport/walking travel time field names, and fields required for classifying the SFA and SLA stock types

Key service type	File name	Public transport/walking travel time field	SFA requirement	SLA requirement
Employment centres	acs0501	EMPLO008	✓	✓
Primary schools	acs0502	PSCHO008	✓	
Secondary schools	acs0503	SSCHO008	✓	
Further Education institutions	acs0504	FEDO007	✓	
GPs	acs0505	GPSO008	✓	
Hospitals	acs0506	HOSPO008	✓	
Food stores	acs0507	SUPO008	✓	✓
Town centres	acs0508	TOWN008	✓	✓

The label of the LSOA field does not indicate whether the LSOAs are for 2001 or 2011, as neither does the meta data that accompanies the indicators. It is therefore necessary to either contact the DfT for them to advise (https://www.gov.uk/contact/govuk), or to make attempts to marry the accessibility indicators using 2001 or 2011 LSOAs to ascertain which version produces a complete match.

The LSOA2001 field in the accessibility data has the label 'LSOA_code', which should be used to marry all eight of the public transport/walking travel time fields to the SFA data set. The next step with the SFA data is to calculate an average public transport/walking travel time across the eight individual travel times. This new field in the SFA data

needs to be the arithmetic average of the eight travel times, and is the value that is used in setting the accessibility limits for the SFA postcodes in England.

The SLA data set requires a selection of three of the public transport/walking travel times to be attached, due to the different needs associated with single personnel. Again this process will use the 'LSOA_code' field in the accessibility data to match with the LSOA2001 codes in the SLA data, to attach the travel times to employment centres, food stores, and town centres. An average public transport/walking travel time across these three fields needs to be created, and which will be used in setting the accessibility limits for the SLA postcodes in England.

Currently, the MOD has selected the following thresholds:

Category Name	Travel time to key amenities by foot/public transport
Urban	<20 minutes
Intermediate	20 40 minutes
Remote	>40 minutes

5 Broadband accessibility

Introduction

Average broadband speeds are used in the CAAS classification to identify MOD stock that is located in areas in which the average broadband speed is below a certain level, and to which a rental discount can be applied. The average broadband speed can be obtained for each UK postcode and attached to the MOD stock postcodes. The chosen broadband speed break-point used in the classification can then be implemented depending on whether Government targets (for example, 2 Mbit/s currently), the national average speed (for example, 17.8Mbit/s for November 2013), or some other speed is of relevance (such as the Government target of 24Mbit/s by 2017). **Currently, the MOD has selected 17.8Mbit/s as the break-point.**

Data source and fields required

Average broadband speed data are available from Ofcom: http://maps.ofcom.org.uk/broadband/. The most recent data available is for the year 2013, and whilst Ofcom has only started providing these data publicly recently, it appears likely that there will be annual updates. The 2013 download comprises a relatively large file at the individual postcode level (of circa 1.7 million records). A range of data fields are contained in the download, the key one of relevance being 'Average Speed/Mbps'. This field contains the arithmetic average broadband speed, and which can therefore be compared with updated targets set by the Government, or the national average speed at a given time, as these use the same measurement.

Whilst the Ofcom data is made available at the postcode level, average broadband speeds are not provided for many individual postcodes , due to a lack of data for various reasons. Where the postcode level data is available, this needs to be extracted and used for the MOD stock postcodes. Where postcode level data is not available for the MOD stock postcodes, it becomes necessary to make a substitution with an average figures for a higher geography. If an average OA broadband speed can be calculated from the relevant postcode averages, this will be the preferred value to use as a substitute, but failing that it may be necessary to use an average LSOA broadband speed figure as a substitute. A flag in the SFA and SLA databases also needs creating to indicate the geographical level of the broadband speed that is attached to each MOD postcode. In this first classification exercise, for example, average broadband figures were available at the postcode level for 96.7 per cent of the SFA stock. The 2011 OA broadband average speed was substituted for 3.1 per cent of SFA stock, and the 2011 LSOA average was substituted for the remaining 0.1 per cent of the SFA stock (percentages are rounded).

A first stage is to marry the average broadband speed at the postcode level to the SFA and SLA data using the postcode format described under Section 2 above, which in the Ofcom data is the field named 'Postcode(No Spaces)'. It is also necessary to create two additional files from the Ofcom postcode level file that contain the average broadband speeds at the OA2011 and LSOA2011 levels.

To facilitate the creation of OA and LSOA averages, it is first of all necessary to join the NSPL lookup table (only the OA2011 and LSOA2011 fields are required from the NSPL lookup table) to the Ofcom broadband data at the postcode level, using the seven character postcode variable created in the lookup tables ('PostcodeNoSpaces'), and the field 'Postcode(No Spaces)' in the Ofcom data. The resulting file will then contain the 2011OA and 2011LSOA geography codes for each current UK postcode. It is then possible to create two aggregated files from the Ofcom data, one containing average broadband speeds at the OA2011 level (specifically, averages of the postcode average broadband speeds), and the other containing average broadband speeds at the LSOA2011 level. These two aggregated files can then be joined to the MOD stock data using the respective OA2011 and LSOA2011 codes, which can then be used to substitute for postcodes without an average speed at the postcode level, and also to create a flag to indicate whether the average speed for each postcode is at the postcode, OA2011, or LSOA2011 level.

6 Indices of Multiple Deprivation

Introduction

There is no UK-wide Index of Multiple Deprivation (IMD), but rather four separate IMDs, one for each constituent country of the UK. The IMDs are updated sporadically, making it necessary to check the respective providers to identify the most recent version available. The most recent IMD for England is 2010-based, for example, and prior to this versions were produced for 2007, 2004, and 2000.

The purpose of incorporating the IMD into the CAAS classification is to identify MOD stock that is located in the most deprived areas, and to which a rental discount can be applied. **Currently, the MOD has selected the bottom decile as the break-point.**

The bottom deciles of the four IMDs have been used as the break-points to identify the tenth most deprived LSOAs across the UK, and which are then used to identify MOD stock located in these areas. As updated versions of the IMDs become available, it will be necessary to re-calculate the bottom decile cut-off points, as the exact scores or ranks at which these occur are likely to change slightly with newer versions. The versions of the IMDs used in the initial CAAS classification are set out in Table 3, the use of which placed 0.3 per cent of SFA stock in the most deprived decile across the UK.

Data sources and fields required

The relevant field needs to be extracted from the four IMD datasets, and matched to the 2001 LSOAs in the SFA and SLA databases using the geography fields indicated in Table 4. Postcodes in the two stock databases can then be identified as being in the most deprived tenth of LSOAs using the bottom decile scores shown in the table. Thus, the MOD postcodes in England with an 'IMD SCORE' of 44.89 or higher are within the bottom decile, as are the Welsh postcodes with a 'WIMD' rank of 190 or lower. Similarly, Scottish postcodes with an 'Overall SIMD 2012 Score' of 46.09 or higher are within the lowest decile, as are the Northern Ireland postcodes with a 'Multiple Deprivation Measure Score' of 43.19 or higher.

These scores and ranks pertain only to the versions of the IMDs shown in Table 5. As newer versions of the IMDs appear, these will based on updated sources of data, and most probably using 2011 LSOAs (although this will need to be confirmed for each source). The newer IMDs will therefore need to be analysed to identify the national bottom decile values to apply to the MOD stock.

Table 5 : Current Indices of Multiple Deprivation, relevant data fields, and bottom decile cut-off points	
England (IMD)	
Date	2010
Data source	https://www.gov.uk/government/statistics/english-indices-of-deprivation-2010
Matching geography field name	LSOA2001CD
IMD field name	IMD SCORE
IMD field type	Weighted composite score
Bottom decile score	44.89 and higher
Note	A range of Deprivation files are available from this Government data source, including the individual domains and sub-domains of the IMD. For these purposes, only the IMD is required, which has the download file name of 'English indices of deprivation 2010: overall'.
Scotland (SIMD)	
Date	2012
Data source	http://simd.scotland.gov.uk/publication-2012/
Matching geography field name	Data Zone
IMD field name	Overall SIMD 2012 Score
IMD field type	Weighted composite score
Bottom decile score	46.09 and higher
Note	Select the 'Download SIMD 2012' Data option, then select 'Part 2 – SIMD 2012 Data - Overall ranks and domain ranks', then in the File options, select 'Open in new window', which will download the SIMD.
Wales (WIMD)	
Date	2011
Data source	https://statswales.wales.gov.uk/Catalogue/Community-Safety-and-Social-Inclusion/Welsh-Index-of-Multiple-Deprivation/WIMD-2011
Matching geography field name	LSOA Code
IMD field name	WIMD
IMD field type	Rank of weighted composite score
Bottom decile rank	190 and lower
Note	The download file to select is 'Welsh Index of Multiple Deprivation 2011 by rank and local super output area', which will display a page containing the WIMD, and from which it is possible to export the data in a range of formats, including .csv and .xls. The entire table will be downloaded using the export option, but it is only the WIMD field that is required.
Northern Ireland (NIMDM)	
Date	2010
Data source	http://www.nisra.gov.uk/deprivation/nimdm_2010.htm
Matching geography field name	OA CODE or SOA CODE
IMD field name	Multiple Deprivation Measure Score
IMD field type	Weighted composite score
Bottom decile score	OA2001 = 43.19 and higher LSOA2001 = 44.74 and higher
Note	The NIMDM is available at a range of geographies.The Output Area option provides the greatest level of granularity, whilst the LSOA option provides UK-wide geographical consistency in the IMDs. None of the Northern Ireland stock, however, was located in the bottom NIMDM decile in the initial CAAS classification. Selecting the chosen NIMNM link on the aabove link will download the data OA level data. From the downloaded file, the MDM 2010 page contains the Multiple Deprivation Measure Score.

7 Defining the limits and creating the CAAS classification

Introduction

This section of the guide describes the limits that were used in the initial CAAS classification of the MOD SFA stock. It sets out how the limits operated in the re-classification of the initial urban/intermediate/ remote to the final positions in the classification. The procedure was slightly more involved for the MOD stock located within England, as this included the DfT accessibility indicators, whereas this was not the case for the rest of the UK. As set out in the preceding section, the SFA and SLA stock make use of different accessibility indicators in the calculation of an average public transport/walking travel time.

Operation of the location element

The location element feeds into the MODs rent setting strategy for its stock. It is intended to reflect locational disadvantage in terms of an initial urban/intermediate/remote classification, to which is added a consideration of access to key services (in England), the average broadband speed available, and the level of deprivation. After consideration of these extra measures, a final urban/intermediate/remote classification is produced, which comprises the locational element in the rent setting process. In the final classification, MOD stock that is in the final urban category receives no rental discount due to locational factors, stock in the intermediate class receives an intermediate level of discount, and stock in the remote class receives a fuller amount of discount.

The process of reclassification from the initial to the final urban/intermediate/remote categories operates in one direction only, such that a greater level of locational discount can be applied, but not a lower level of discount. Thus, stock initially classified as urban is moved into the intermediate class if there is one locational disadvantage, or into the remote class if there are two or more disadvantages. Stock initially classified as intermediate is moved into the remote class if there are one or more disadvantages, or it remains as intermediate if there are no locational disadvantages. Stock that is initially classified as remote remains in the remote category irrespective of the existence of any or no additional locational disadvantages.

The locational element classification: Northern Ireland, Scotland, Wales

In practical terms, the simplest way to classify the stock is to create a series of flags in the SFA and SLA databases, that indicate the presence or absence of the measures of disadvantage. For the UK excluding England, in the initial CAAS classifiction these included whether an MOD postcode was associated with a broadband speed of less than 17.8Mbit/s or not, and whether a postcode was in the bottom IMD decile or not.

Table 6 shows how these two limits affected the initial urban/intermediate/remote classification of the MOD stock based on the operation principle described above. Thus, stock initially classified as urban in an area with a broadband speed of 17.8+Mbit/s and not located in the bottom decile of the IMD remained classified as urban, since it had no associated area disadvantages. Stock initially classified as urban with a broadband speed of 17.8+Mbit/s and located in the bottom IMD decile moves to the intermediate category, since it is associated with one disadvantage. Likewise, stock initially classified as urban with a broadband speed of less than 17.8Mbit/s and not located in the bottom decile of the IMD is also transferred to the intermediate category, since it too is associated with one disadvantage. Urban stock in areas with a broadband speed of less than 17.8Mbit/s and also located in the bottom IMD decile is transferred to the remote category, as it is associated with two area disadvantages.

Table 6: Operation of the location thresholds for SFA and SLA stock in Northern Ireland, Scotland, Wales			
Step 1	**Step 2**	**Step 3**	**Result**
Initial urban/intermediate/remote pan-UK 3 class	**Broadband speed (Mbit/s)**	**Whether in the IMD bottom decile**	**Final CAAS class**
1. Urban	17.8+	No	1. Urban
		Yes	2. Intermediate
	<17.8	No	2. Intermediate
		Yes	3. Remote
2. Intermediate	17.8+	No	2. Intermediate
		Yes	3. Remote
	<17.8	No	3 Remote
		Yes	3. Remote
3. Remote	Any	Any	3. Remote

The locational element classification: England

In addition to the broadband speed and whether it is located in the IMD bottom decile, the MOD stock in England has the extra disadvantage measure of the average travel time to key services. This measure has been divided into three travel time bands, each of which has been found in other analysis to be associated with the initial urban/intermediate/remote classification. Thus stock in urban areas largely had an average travel time to the key services of under 20 minutes, for stock in the intermediate areas it was in the range 20 to 39 minutes, and for stock in the remote areas it was 40+ minutes. These average travel time associations with the initial area classification mean that stock in urban areas with a travel time of 20 to 39 minutes was classed as having an area disadvantage; whereas stock in the intermediate areas with this travel time was not, as this was typical of these areas and so was already accounted for in the initial intermediate classification. On the other hand, stock in the intermediate areas with an average travel time of 40+ minutes was considered to have an additional disadvantage that was taken into consideration in the final CAAS classification.

Table 7 shows how the three additional limits affected the initial urban/intermediate/remote classification for the MOD stock located within England. Taking stock initially classified as urban, that which was in areas with an average travel time of under 20 minutes, a broadband speed of 17.8+Mbit/s, and not in the bottom decile, remained classified as urban, as it did not have any area disadvantages. Urban stock with one area disadvantage - a 20 to 39 minute travel time, or a broadband speed of less than 17.8Mbit/s, or in the bottom IMD decile - is moved into the intermediate class. Urban stock with two or more area disadvantages - 40+ minutes travel time, or any combination of 20 to 39 minutes travel time plus less than 17.8Mbit/s broadband speed or IMD bottom decile - is moved into the remote class.

Table 7: Operation of the location thresholds for SFA and SLA stock in England				
Step 1	**Step 2**	**Step 3**	**Step 4**	**Result**
Initial urban/intermediate/remote pan-UK 3 class	**Average public transport/walking travel time (Minutes)**	**Broadband speed (Mbit/s)**	**Whether in the IMD bottom decile**	**Final CAAS class**
1. Urban	<20	17.8+	No	1. Urban
			Yes	2. Intermediate
		<17.8	No	2. Intermediate
			Yes	3. Remote
	20 to <40	17.8+	No	2. Intermediate
			Yes	3. Remote
		<17.8	No	3. Remote
			Yes	3. Remote
	40+	17.8+	No	3. Remote
			Yes	3. Remote
		<17.8	No	3. Remote
			Yes	3. Remote
2. Intermediate	<20	17.8+	No	2. Intermediate
			Yes	3. Remote
		<17.8	No	3. Remote
			Yes	3. Remote
	20 to <40	17.8+	No	2. Intermediate
			Yes	3. Remote
		<17.8	No	3. Remote
			Yes	3. Remote
	40+	17.8+	No	3. Remote
			Yes	3. Remote
		<17.8	No	3. Remote
			Yes	3. Remote
3. Remote	Any	Any	Any	3. Remote

8 Output results

Introduction

This final section of the User Guide contains details of the extent to which the range of area classifications impact on the initial pan-UK 3 class area classification to produce the location element of the CAAS classification for the SFA stock.

Initial Classification

The University of York (authors of this Guide) has completed the initial classification against the pan-UK 3 class area (using the process and data sources set out in this guide), to produce property specific location assessments for individual SFA and SLA. The results of the initial classification are held by MOD Service Veterans Welfare (Service Accommodation Charging) and have been incorporated into the CAAS assessment for individual SFA and SLA, in preparation for implementation of CAAS (from April 2016 for SFA). The results are recorded in two separate workbooks, held by MOD:

SFA: 20140619-CAAS Location SFA broadband17.8_standardised version.xls

SLA: 20141103-CAAS Location SLA_access_broadband_deprivation.xls

The following tables contain the outputs in the same order in which the area classifications are discussed in the preceding sections of the Guide. Outputs are provided for the constituent countries of the UK as well as for the UK as a whole.

The pan-UK three group classification of area type

Table 8 shows the distribution of the SFA stock according to the initial classification of area type. Slightly more than half of the SFA stock was located in urban areas of the UK, and slightly less than half was located in intermediate areas. Less than half of one per cent of the SFA stock was located in remote areas.

Table 8 : Distribution of SFA stock across the Pan-UK 3 class area type by country

Pan-UK 3 class	England (%)	Wales (%)	Scotland (%)	Northern Ireland (%)	UK (%)
1. Urban	50.6	56.8	67.9	48.7	51.8
2. Intermediate	49.4	26.0	31.5	51.3	47.8
3. Remote	0.1	17.1	0.5	0.0	0.4
Total	100	100	100	100	100
N.	43,453	910	3,275	1,625	49,263

Accessibility to key services in England

Table 9 shows average travel time to the eight key services using the public transport/walking mode of travel for the SFA stock in England. Overall, 61.0 per cent of the SFA stock had an average travel time across the eight key services of below than 20 minutes. A further 36.1 per cent had an average travel time of from 20 to under 40 minutes, and 3.0 per cent had an average travel time of 40 minutes or longer. A very small proportion of SFA stock in the urban areas had an average travel time of 40 minutes or more, and none of the remotely located SFA stock had an average travel time of under 20 minutes.

Table 9 : Accessibility to key services for SFA stock located within England by the public transport/walking mode of travel

Pan-UK 3 class	< 20 minutes (%)	20 to < 40 minutes (%)	40+ minutes (%)	Total (%)	N.
1. Urban	84.6	15.4	0.1	100	21,968
2. Intermediate	36.9	57.3	5.8	100	21,458
3. Remote	0.0	3.7	96.3	100	27
All area types	61.0	36.1	3.0	100	43,453

Average broadband speeds

Tables 10 to 14 show the extent to which SFA stock is located in areas that meet or exceed the current Ofcom national average broadband average speed of 17.8Mbit/s. For all area types across the UK as a whole (Table 14), 70.8 per cent of the SFA stock was located in areas that had an average broadband speed that was below the national average broadband speed, whilst the remaining 29.2 per cent was in areas with an average broadband speed equal to or greater than 17.8Mbit/s.

Table 10 : SFA Ofcom broadband average speeds for the SFA stock in England

Pan-UK 3 class	National average speed cut-off			
	<17.8Mbit/s	17.8+Mbit/s	Total (%)	N.
1. Urban (%)	57.7	42.3	100	21,968
2. Intermediate (%)	82.8	17.2	100	21,458
3. Remote (%)	100.0	0.0	100	27
All areas types	70.1	29.9	100	43,453

Table 11 : SFA Ofcom broadband average speeds for the SFA stock in Wales

Pan-UK 3 class	National average speed cut-off			
	<17.8Mbit/s	17.8+Mbit/s	Total (%)	N.
1. Urban (%)	94.2	5.8	100	517
2. Intermediate (%)	99.6	0.4	100	237
3. Remote (%)	100.0	0.0	100	156
All areas types	96.6	3.4	100	910

Table 12 : SFA Ofcom broadband average speeds for the SFA stock in Scotland

Pan-UK 3 class	National average speed cut-off			
	<17.8Mbit/s	17.8+Mbit/s	Total (%)	N.
1. Urban (%)	79.0	21.0	100	2,225
2. Intermediate (%)	99.5	0.5	100	1,033
3. Remote (%)	100.0	0.0	100	17
All areas types	85.6	14.4	100	3,275

Table 13 : SFA Ofcom broadband average speeds for the SFA stock in Northern Ireland

Pan-UK 3 class	National average speed cut-off			
	<17.8Mbit/s	17.8+Mbit/s	Total (%)	N.
1. Urban (%)	59.7	40.3	100	792
2. Intermediate (%)	76.5	73.5	100	833
3. Remote (%)	-	-	100	-
All areas types	42.7	57.3	100	1,625

Table 14 : SFA Ofcom broadband average speeds for the SFA stock in the UK

Pan-UK 3 class	National average speed cut-off			
	<17.8Mbit/s	17.8+Mbit/s	Total (%)	N.
1. Urban (%)	60.4	39.6	100	25,502
2. Intermediate (%)	81.7	18.3	100	23,561
3. Remote (%)	100.0	0.0	100	200
All areas types	70.8	29.2	100	49,263

Indexes of Multiple Deprivation

Tables 15 to 19 show the proportions of SFA stock located in areas in the bottom decile of the four indexes of multiple deprivation across the UK, and also in combined form for the UK as a whole. Table 19, for example, shows that 99.7 per cent of all SFA stock in the UK is not located in areas that are in the bottom decile of the relevant index of multiple deprivation, and just 0.3 per cent is in areas in the bottom decile. As the Tables 15 to 18 indicate, however, all of the SFA stock in the bottom IMD decile is located in urban areas of England.

Table 15 : Extent to which SFA stock is in areas in the bottom decile of the IMD in England

Pan-UK 3 class	Not in bottom IMD decile (%)	In bottom IMD decile (%)	Total (%)	N.
1. Urban	99.3	0.7	100	21,968
2. Intermediate	100.0	0.0	100	21,458
3. Remote	100.0	0.0	100	27
All area types	99.7	0.3	100	43,453

Table 16 : Extent to which SFA stock is in areas in the bottom decile of the WIMD in Wales

Pan-UK 3 class	Not in bottom IMD decile (%)	In bottom IMD decile (%)	Total (%)	N.
1. Urban	100.0	0.0	100	517
2. Intermediate	100.0	0.0	100	237
3. Remote	100.0	0.0	100	156
All area types	100.0	0.0	100	910

Table 17 : Extent to which SFA stock is in areas in the bottom decile of the SIMD in Scotland

Pan-UK 3 class	Not in bottom IMD decile (%)	In bottom IMD decile (%)	Total (%)	N.
1. Urban	100.0	0.0	100	2,225
2. Intermediate	100.0	0.0	100	1,033
3. Remote	100.0	0.0	100	17
All area types	100.0	0.0	100	3,275

Table 18 : Extent to which SFA stock is in areas in the bottom decile of the NIMDM in Northern Ireland

Pan-UK 3 class	Not in bottom IMD decile (%)	In bottom IMD decile (%)	Total (%)	N.
1. Urban	100.0	0.0	100	792
2. Intermediate	100.0	0.0	100	833
3. Remote	-	-	100	-
All area types	100.0	0.0	100	1,625

Table 19 : Extent to which SFA stock is in areas in the bottom decile of the four IMDs in the UK

Pan-UK 3 class	Not in bottom IMD decile (%)	In bottom IMD decile (%)	Total (%)	N.
1. Urban	99.4	0.6	100	25,502
2. Intermediate	100.0	0.0	100	23,561
3. Remote	100.0	0.0	100	200
All area types	99.7	0.3	100	49,263

Overall CAAS classification

Table 20 contains the final CAAS classification after the operation of the combined limits of accessability to key services, average broadband speeds, and the indices of multiple deprivation, as shown in Tables 6 and 7

above. Compared with the initial classification, in which 51.8 per cent of the SFA stock in the UK (Table 8) was within the urban category, after the operation of the limits a much reduced 16.0 per cent remained in this category. A broadly similar proportion of SFA stock overall was within the intermediate category (41.8 per cent after classification compared with 47.8 per cent before), and a substantially larger proportion is defined as remote in the CAAS classification compared with the initial classification (42.2 per cent and 0.4 per cent).

Table 20 : Distribution of SFA stock across the CAAS classification by country

Pan-UK 3 class	England (%)	Wales (%)	Scotland (%)	Northern Ireland (%)	UK (%)
1. Urban	16.3	3.3	14.3	19.6	16.0
2. Intermediate	39.7	53.6	53.8	66.8	41.8
3. Remote	44.0	43.1	31.9	13.6	42.2
Total	100	100	100	100	100
N.	43,453	910	3,275	1,625	49,263

Table 21 shows the ways in which the SFA stock has been re-allocated to the three area types by the operation of the limits. Within the UK as a whole, three quarters of the SFA stock (74.8 per cent) is re-classified by the operation of the limits, and one quarter has an unchanged classification (25.1 per cent). The majority of the re-allocation involved movement between neighbouring categories: 33.0 per cent of SFA stock initially classified as urban is moved into the intermediate category, and 39.1 per cent of the stock initially classified as intermediate is moved into the remote category. Only a small minority of the stock (2.7 per cent) is moved from an initial urban to a final remote categorisation.

Table 21 : Extent of reclassification from the inial pan-UK 3 class to the CAAS classification

Pan-UK 3 class	England (%)	Wales (%)	Scotland (%)	Northern Ireland (%)	UK (%)
Unchanged urban	16.3	3.3	14.3	19.6	16.0
Unchanged intermediate	8.5	0.1	0.2	37.7	8.7
Unchanged remote	0.1	17.1	0.5	0.0	0.4
Urban to intermediate	31.2	53.5	53.6	29.1	33.0
Urban to remote	3.1	0.0	0.0	0.0	2.7
Intermediate to remote	40.9	25.9	31.4	13.6	39.1
Total	100	100	100	100	100
N.	43,453	910	3,275	1,625	49,263

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