

Defining and measuring empty and under-utilised dwellings in London

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September 2020

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Executive Summary

London has a significant housing shortage, affordability is a major issue and there are a large number of homeless households. Whilst new affordable housing supply is paramount to alleviating these housing struggles faced by many Londoners, it is also prudent to consider how the existing stock is used.

One of the key housing stock issues to understand is the number and geography of dwellings that are not inhabited on a regular basis. If existing dwellings are not being used regularly then this could have implications for how effectively current housing stock is meeting London's residential needs.

The role of empty dwellings as a public policy issue is widely recognised, with a relatively well-defined and structured evidence base. For example, the Ministry of Housing, Communities and Local Government (MHCLG) reported that in 2019 there were 71,666 vacant dwellings and 24,677 long-term vacant dwellings¹ in London. However, dwellings that are recorded by boroughs as 'empty' for the purposes of council tax are only one form of potential underuse. In recent years there has been an increasing media and public discourse about dwellings that are only used intermittently or for only a small proportion of time.

This report was commissioned by the Greater London Authority in late 2019, with the aim of developing a potential model for differentiating between types of empty and under-utilised homes, and if possible, examining their prevalence in London. The research had two objectives: to develop a potential typology for empty and under-utilised homes; and to make recommendations for data collection methods to identify the number and broad geography of empty and under-utilised dwellings should this issue be pursued further by policymakers. The report does this through a literature review of academic, policy and practice-based literatures on the definitions of housing use and on existing and emerging research methods to quantify and locate under-utilisation.

Whilst the term 'empty home' is widely used in policy and public discourse, there has been very little agreement on what constitutes under-utilisation more broadly. While there is often public and media interest in empty and under-used homes, determining how under-utilisation should be defined has hitherto been under-explored in the academic literature and rarely pursued in public policy. Thus, this report recognises that any accepted definition of under-utilisation will require broad engagement and consensus. The study considers the categories of *time*, *primary purpose of use* and the *condition* of the dwelling as components of understanding under-utilisation.

In this report we use the thresholds of a dwelling uninhabited for six months consecutively (the standard definition of a long-term empty dwelling) and a dwelling uninhabited for no more than 30% of the year to develop a potential classification of different types of under-utilisation. We use vignettes to describe different hypothetical dwelling occupation patterns and explore the potential challenges of defining and classifying the under-utilisation of dwellings. From these vignettes we come to the view that where a dwelling is uninhabited for no more than 30% of the year, it is considered to broadly represent the typical levels of occupation of a dwelling that functions as someone's primary residence and hence should not be considered under-utilised. This report sets out the assumptions that have been made to

¹ Table 615: vacant dwellings by local authority district: England, from 2004: available here: <https://www.gov.uk/government/statistical-data-sets/live-tables-on-dwelling-stock-including-vacants>. The data is taken from council tax records. The definition of vacant dwellings is therefore only applied to dwellings that either have an exemption or discount applied to them. Long-term vacant dwellings are defined as having been unoccupied and substantially unfurnished for over six months.

reach this proposition, but further empirical evidence is needed to verify and explore it in more depth. Figure 1 is a summary of our typology of under-utilisation.

Fig 1. Types of under-utilisation

Under-utilisation type	Description	% of year uninhabited
Long-term empty	Uninhabited for six months or more consecutively	50% or more
Frequently uninhabited	Uninhabited for six months or more in total over non-consecutive periods	50% or more
Long uninhabitation	Inhabited for more than six months of the year, but uninhabited for more than 28 days consecutively, with total uninhabited period amounting to at least 30% of the year.	50% <> 30%
Short uninhabitation	Inhabited for more than six months of the year, but uninhabited for short periods (less than 28 days), with total uninhabited period amounting to at least 30% of the year.	50% <> 30%

The report identifies seven methods for data collection that could be used to quantify the prevalence and geography of empty and under-utilised (E/UU) dwellings. Some of these methods produce data that is widely available, whilst others would require bespoke application. None could currently be operationalised to provide a complete picture of E/UU dwellings, therefore a synthesis of methods is likely to provide the most accurate depiction for London. Combining several methods together offers the potential to provide an extensive (broad geographic coverage and types of E/UU dwellings) and in-depth account of E/UU dwellings at smaller scale geographies.

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Key terms used in the report

Inhabited	A dwelling that is lived in during a 24-hour period (i.e. a person is present in the dwelling and treating it as a home, including for holiday or work) – often synonymous with occupation
Uninhabited	A dwelling that is not lived in during a 24-hour period (i.e. no person is present in the dwelling and treating it as a home, including for holiday or work) – often synonymous with inoccupation
Empty	A dwelling that is uninhabited for any period of time (and may or may not be furnished)
Long-term empty	A dwelling that is uninhabited for six months consecutively (and may or may not be furnished)
Vacant	A dwelling categorised by a local authority or government agency as empty
Under-utilised	A dwellings that is uninhabited for more than 30% of the year (and may or may not be furnished)

1. Introduction

London has an historic housing shortage, significant issues with affordability and a large number of homeless households. Whilst new affordable housing supply is paramount to alleviating the housing struggles faced by many Londoners, it is also prudent to consider how the existing stock is used. Accordingly, there is substantial public and media interest in the number and type of empty and under-utilised (E/UU) dwellings in London.

In this work we have not attempted to disaggregate the standard definition of a dwelling into shared and unshared dwellings, or to challenge the definition of these types of dwelling. However, there may be some merit in considering to what extent these definitions mask or support the identification or under-utilisation. For this report we use the Office of National Statistics definition which includes the possibility of multiple households in the same dwelling.

The report was written over the period 2019-20 when COVID-19 emerged as a major challenge internationally. COVID-19 has highlighted the significance of high-quality housing environments for every household, and whilst there may be some changes in the structure of demand for housing in the future, this is unlikely to significantly diminish the overall housing requirement in London.

The *London Housing Strategy* (GLA, 2018) recognises that the provision of decent, affordable housing is one of the biggest priorities and challenges facing London. The Strategy sets out the framework for meeting housing needs across the city, with a particular focus on increasing the number of homes and delivering 'genuinely affordable housing'. These are necessary steps for London, however, it is also important to consider how existing stock is used as extensive under-use of existing housing stock could result in additional housing issues and a need for an even greater new housing supply.

In 2019 MHCLG estimated there were 71,666 vacant dwellings in London, or 2% of the housing stock, from the council tax base statistical release. 'Vacant' here used as defined by local authorities for council tax records, including those vacant for less than six months. This figure has been increasing in the last six years, but is below the 15 year average of 72,504 (2005-19; MHCLG 2019). The official estimate indicates that the proportion of stock that is vacant in each borough is widely variable, from 0.5% (Wandsworth) to 4.8% (City of London). In the same year MHCLG estimated, from council tax statistics, that there were 24,677 long-term vacant dwellings in London.¹ 'Long Term Vacant' here used as defined by local authorities for council tax records and vacant for a minimum of six months. The reason that a dwelling might be long-term empty are highly variable, in this paper we narrow the focus of rationales considered by explicitly excluding areas of regeneration where there has been substantial previous research.

Long-term empty dwellings are a concern for London. However, these statistics count only those dwellings that are assessed as entirely unoccupied for six consecutive months or more and do not include properties that might be occupied for a lower proportion of the year but are occupied at some point in a given six-month period thus not technically classified as 'long-term empty', and which may not even be officially recorded as empty. There is therefore a concern regarding dwellings that are not officially classified as empty or long-term empty, but which are regularly uninhabited and are therefore making only a limited contribution to London's housing provision. Media accounts have highlighted specific forms of under-utilisation such as infrequently used high-value flats (Guardian, 2016), second homes (The Times, 2019) and short-term lets (Financial Times, 2020). Many of these issues are found in other major cities internationally in some form.

We distinguish between ‘under-utilisation’ as a time-based description of low levels of use and ‘under-occupation’ as few people residing in a dwelling. ‘Under-occupation’ is beyond the scope of this report; hence we only consider whether a person occupies the dwelling and not how many people. Internationally, some research uses the term ‘under-utilisation’ as ‘under-occupancy’ (e.g. in Australia see Maher, 1995; Batten, 1999 or in New Zealand see Goodyear and Fabian, 2014), whilst in England some research into under-utilisation has incorporated under-occupation in the definition of under-utilisation, for example Shelter included empty homes, second homes, and under-occupied homes (Shelter, 2011); which was picked up in the work by Clarke et al. (n.d.) on under-utilisation of the housing stock and has had some impact on the perception that under-occupation should be included within the definition under-utilisation.

The implications for residents and the nature of neighbourhoods arising from E/UU dwellings have been described as a waste of resources when there are households in inadequate housing (e.g., Action on Empty Homes, 2020; Wyatt, 2008) and as creating ‘dead’ residential spaces that hinder community and social life (DeVerteuil and Manley, 2017; Atkinson, 2019). Given the need for efficient and effective use of the existing housing stock, it is necessary to understand the impact and prevalence of E/UU dwellings and any potential hindrance this poses to the goal of ensuring that ‘every Londoner has access to a decent and secure home they can afford’ (GLA, 2018).

The topic of E/UU dwellings combines a range of issues that are both significant and intertwined. However, the key concepts around E/UU dwellings are not well defined and there has been limited policy and research progress to date into defining what E/UU dwellings comprise of.

Without clear definitions of E/UU dwellings it is impossible to provide accurate evidence of the number and geography of their existence at any moment in time, and therefore to measure accurately the extent to which E/UU dwellings should be a concern for policy makers or whether there has been any temporal or spatial change in the phenomenon.

This scoping exercise has been designed to support this gap in understanding and contribute to the clarity of the discussion regarding E/UU dwellings. (For the purposes of this scoping exercise, we exclude several categories of dwelling that are known to have lower levels of utilisation, such as purpose-built student accommodation and dwellings that are part of estate regeneration programmes.) It does this through an overview of the existing definitions and literature on E/UU dwellings and a review of methods that could be used to assess the prevalence and distribution of E/UU dwellings in London. The goals of this exercise can be summarised by the following two questions:

- a) How might E/UU dwellings be defined and categorised?
- b) What data and methods can be used to measure the prevalence and distribution of E/UU dwellings?

2. Defining empty and under-utilised dwellings in London

Research and policy on the under-utilisation of dwellings is scant. However, the phenomenon of E/UU dwellings includes a range of specific types of dwellings that have been the focus of extensive research, for example the literature on second home ownership and holiday homes. This literature frequently describes difficulties in defining terms and cites the complexity of relating existing data sources (often collected for other purposes) to definitions (e.g. Wallace et al., 2005, Paris, 2009). However, whilst much of this literature considers issues within or proximate to the phenomenon of E/UU dwellings, they are not the direct focus and thus do not provide a clear foundation for this discussion. As such, we need to construct a new framework to define and describe the phenomenon of E/UU dwellings.

In this review we consider three aspects in defining E/UU dwellings: the amount of time the home is used; the primary purpose of the home from the owner's perspective; and its condition or habitability.

a. The amount of use over time

Whilst the extent to which a property is used could be measured in a range of different ways, the clearest and most frequently used measure is time. If occupation is normally understood as whether someone resides in the dwelling overnight, then any dwelling that is unoccupied for an extended period of time can be generally considered under-utilised, but how long a property is unoccupied for before it is deemed to be under-utilised draws different views.

Some of the definitions and uses of the terms 'vacant' and 'empty' dwellings

An 'empty home' could simply be viewed as a dwelling without an occupant at a particular moment in time. This definition of 'empty' is often labelled 'unoccupied' but does not adequately distinguish between dwellings that are uninhabited for very short periods of time (e.g. when the resident is at work or away for a holiday) and those that are not inhabited for longer periods of time (e.g. not lived in for eight months consecutively). A vacant dwelling is often contrasted legally with an unoccupied dwelling; with 'vacant' meaning a property that has no possessions in it, whilst unoccupied simply has no human living in it and may be furnished. In this report we use the term 'empty' to denote a dwelling that may be furnished but is not occupied for a particular period of time (usually six months).

The definitions relating to empty dwellings differ between countries. They also differ in the degree of disaggregation between types of empty dwelling, for example in the U.S.A, the Census Bureau makes a distinction between seven different types of empty dwelling: 'Vacant for rent; Rented, but not yet occupied; Vacant for sale; Sold, but not yet occupied; Maintained for seasonal, recreational and occasional use; Maintained for migrant workers; and Other vacant' (Lincoln Institute of Land Policy, 2018, p.12)

In England, the more common definition of an 'empty home' is a property that has been continuously unoccupied for six months and this definition is used across academia, and planning policy². The widespread use of this definition is due to the historic definition of a long-term empty dwelling for Council Tax administration purposes, which is still collected and verified by many authorities and remains the data source for a large number of media articles on the scale of empty properties in London and

² For example, long-term empty homes (i.e. empty for more than six months) are identified in the New Homes Bonus, and around the 2000's the English House Condition Survey identified dwellings as empty for six months as 'problematic'.

across England. Whilst local authorities can use other measures, such as inspections, to determine if a dwelling is empty, six months is considered the minimum threshold for local authorities to enforce action to bring the dwelling back into use (Wyatt, 2008).

The powers of local authorities to determine the rate of council tax varies between England, Scotland and Wales. In England local authorities have some discretion over the application of discounts to council tax on dwellings that are empty. This discretion relates to both second homes and dwellings that are the sole or main residence (Sandford, 2020). Local authorities also have the discretion to charge the 'empty homes premium' on dwellings that have been unoccupied and unfurnished for two years or more. The evaluation and monitoring of empty dwellings for council tax purposes is undertaken by local authorities and historically there has been some divergence in the approaches taken to update the databases of empty dwellings. As Peter Wyatt noted:

'In its advice to local authorities, the government defines an empty dwelling as being unoccupied for at least six months (ODPM, 2003a). Dwellings unoccupied for less than six months may also be included in certain circumstances for example, legal action taken by the local authority as a result of serious disrepair or other problems caused by the property. Also, dwellings that are occupied but the space is capable of more beneficial use and dwellings that do not have a reasonable prospect of being brought back into use by the owner alone are regarded as vacant. These cases are more subjective and the classification of a dwelling as being empty in these cases is at the discretion of the relevant local authority.' (Wyatt, 2008, p.1173)

Whilst local authorities are able to monitor dwellings for their own purposes, for charging council tax there are three different categories of empty or vacant dwelling ('vacant' and 'empty' are used interchangeably by both local authorities and the government in collating national statistics, in this report we use vacant to only refer to dwellings that have been classified by a local authority or government agency as empty). First, dwellings that are classified as 'empty' or 'vacant' are those that are unoccupied and substantially unfurnished for any period of time and at the discretion of the courts³, with the total for each local authority collected and reported by MHCLG (Live Table 615). Second, dwellings that are classified as 'long-term vacant' are those that are unoccupied and substantially unfurnished for over six months (and are also reported by local authority in Live Table 615). Third, local authorities that charge an 'empty homes premium' identify dwellings that are unoccupied and substantially unfurnished for two years or more.

If a dwelling is unoccupied for six months consecutively it is classified as long-term empty, but what about a dwelling that is unoccupied for more than six months of the year, but in an irregular pattern? If 'substantially unfurnished' some may be counted as empty (but not long-term empty) in Council Tax data. Others may be technically classified as occupied, despite potentially being used for a smaller proportion of the calendar year. As such, there is a case for considering whether another definition is needed to be able to identify dwellings that are uninhabited for a substantial proportion of the year, but do not meet any of the existing statutory definitions of empty or long-term empty.

³ MHCLG has published guidance on how this might be defined, but is clear that 'interpretation of legislation is in the first instance, a matter for the local authority, with definitive interpretation the responsibility of the courts' (DCLG, 2014, p.2).

Councils undertake a range of methods to identify empty dwellings. Whilst some properties are declared as empty by their owner, in other cases the local authority will try to identify properties that have not been declared. Evidently, the accuracy of the approaches employed by the local authority will determine the proportion of non-declared empty properties that are officially classified as ‘empty’ or ‘long-term empty’.

Figure 1: Example of ‘long-term empty’ and irregular use dwellings, 12-month period (occupied = yes, uninhabited = no)

Month	1	2	3	4	5	6	7	8	9	10	11	12
Long-term empty dwelling	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No	No
Irregular use, but not ‘long-term empty’	Yes	No	No	No	Yes	No	No	No	Yes	No	No	No

The English House Condition Survey and its successor the English Housing Survey likewise use six months as an adequate period of time to ascertain that a vacancy is ‘problematic’ rather than ‘transactional’ (ODPM, 2003). ‘Problematic’ is described as an uninhabited dwelling for more than six months or is unfit for habitation and ‘transactional’ as being vacant under one month (Wyatt, 2008). This distinction implicitly suggests that there is a large degree of uncertainty in how to describe dwellings that are vacant for between one and six months. Between 2004 and 2012 the official definition used in reporting long-term vacant dwellings in England by MHCLG was ‘unoccupied and substantially unfurnished for over six months’ (MHCLG, 2018), something which has supported the common understanding of long-term empty homes being dwellings that are uninhabited for six months.

In England there is often a distinction for insurance purposes between ‘vacant’ and ‘unoccupied’ property. ‘Vacant’ applies only to property that has no possessions in it, whilst ‘unoccupied’ can include possessions. According to Ashbunham Insurance: ‘The law defines the term ‘vacant’ as meaning ‘completely empty’. This means that there are no people and no personal items within the property. This is typical of an empty unfurnished rental property, waiting to be let. Whilst the term ‘unoccupied’ should be used to describe a property which contains possessions as if the residents were to return at any time’ (2019). However, this distinction is not routinely made in housing policy or in national statistics.

There are different approaches internationally to defining empty homes, but there is some convergence on six months as a useful indicator of a dwelling being empty for research and policy purposes. In South Korea the timeframe is less significant than the geographic proximity of the owner to the dwelling (Nam, Han and Lee, 2016). In Israel, Haramati and Hanarel (2016) use six months non-habitation as the definition of an empty dwelling (or ‘ghost apartment’ in their terminology). In Vancouver a property must be inhabited for more than six months per year in order to avoid being liable for an empty property tax. Some countries, such as the USA, distinguish between types of vacant dwelling (Lincoln Institute of Land Policy, 2018, p.12).

Underutilisation as a % of days per annum inhabited

Whilst some dwellings may be uninhabited for a period of six consecutive months or more, and thus classified as long-term empty, there is evidently a scale of use across a twelve-month period of occupation from 100% of days occupied to 1% of days occupied. It is very rare for a dwelling to be

occupied every day of a year. There are a large number of reasons why occupants may spend time away: with work; visiting family, friends and partners; on holiday; travelling for other purposes; spending time in hospital or other institutional care; and other reasons. This therefore raises the question: what proportion of days should a dwelling be uninhabited for it to be classified as under-utilised?

If anything above six months consecutive non-use constitutes a ‘long-term empty’ dwelling and under-utilisation can be considered on a scale of the percentage of days inhabited, we argue that a dwelling could be under-utilised if it is uninhabited for more than a certain proportion of the year.

Figure 2: Classification of dwelling under-utilisation

Under-utilisation type	Description	% of year uninhabited
Long-term empty	Uninhabited for six months or more consecutively	50% or more
Frequently uninhabited	Uninhabited for six months or more in total over non-consecutive periods	50% or more
Long uninhabitation	Inhabited for more than six months of the year, but uninhabited for more than 28 days consecutively, with total uninhabited period amounting to at least 30% of the year.	50% <> 30%
Short uninhabitation	Inhabited for more than six months of the year, but uninhabited for short periods (less than 28 days), with total uninhabited period amounting to at least 30% of the year.	50% <> 30%

We arrive at the two thresholds of 30% and 50% through the following logic. 50% of the year is a widely accepted indicator of *long-term empty* dwellings and should therefore be retained as an indicator of particular types of dwelling under-utilisation. The lower threshold of 30% is a pragmatic estimate of a lower proportion that might be considered to broadly represent the typical levels of occupation of a dwelling that functions as someone’s primary residence. If a household spends just one night per week not at their dwelling (e.g. staying with a partner, acting as a carer or away with work) and takes only the statutory minimum of 28 days annual leave (and spends this time away from their dwelling), the dwelling would be uninhabited for 21% of the year⁴. Whilst the decision regarding what proportion of the year should be used to classify under-utilisation is in essence a decision for policymakers, this project team would consider a dwelling uninhabited for 20% of the year a typical level of usage of a dwelling and therefore not classified as under-utilised. With this in mind, a lower threshold of 30% has been chosen to provide some leeway above the 21% (an additional 30 days per year) to allow for variability in circumstances before classifying a dwelling as under-utilised.

In this classification any dwelling that is uninhabited for more than 30% of the year is considered under-utilised. *Long-term empty* dwellings are therefore one type of under-utilised dwelling according to the classification in figure 2. In section b below we consider different examples of habitation, which highlight

⁴ There is currently very little up to date research on the proportion of days per annum that dwellings are not inhabited. Some of the methods suggested in this paper could support a statistical assessment and therefore provide greater clarity about the proportion of stock likely to be uninhabited at any point in time and provide a more precise lower threshold.

the complexity of habitation patterns and may provide additional challenges for measuring the precise proportion of days per year a dwelling is inhabited with currently available methods (considered in section 3).

b. The primary purpose of use from the owner's perspective

A dwelling that is not inhabited for a period of time may have a variety of uses attached to it, such as a period between two tenants letting the dwelling; a dwelling undergoing refurbishment; or a dwelling mostly used for holidays. A vacant dwelling can be very generally defined as a residential unit that is empty at a particular point in time (Hoekstra & Vakili-Zad, 2011). This definition may thus comprise a number of very different cases: dwellings that are temporarily empty between change of occupants or while undergoing refurbishment; dwellings that are unfit for habitation; dwellings that have been completed but are not yet occupied; dwellings for holiday use, either by the owner or on a rental basis (for example, Airbnb); dwellings that are on offer on the housing market and dwellings that are voluntarily kept away from it, potentially for investment purposes.' (Gentili and Hoekstra, 2018, pp.2-3)

Which category of under-utilisation a dwelling could fall into therefore also relates to the owner's intended use of the dwelling. In this section we focus on the owner's purpose of use rather than the occupier's purpose. We do not do this because the owner's view is intrinsically more important than the occupier's view, which it is not, but because the owner often (although not always) has greater capacity to determine the level of use of the dwelling than the occupier.

Whether or not a dwelling is classed as under-utilised needs to be framed in an understanding not only of the length of time that a dwelling is uninhabited, but also what function the dwelling is playing in meeting London residents' housing needs. In this section we consider six different types of dwelling owner motivation as a framework for exploring the different classifications of dwelling under-utilisation.

Frequently the literature will refer to investment rather than ownership, but we prefer the term 'ownership' to clarify that the ongoing purpose is of interest rather than the initial reason for owning the dwelling. We distinguish between properties that are owned to use; owned to leave; owned to rent; owned to holiday and owned to work. Evidently owners may have multiple motivations in retaining a dwelling.

Examples are provided for each of the categories to illustrate what proportion of days per annum that the dwelling would be likely to be uninhabited for. In the examples we use the calendar year to describe the pattern of occupation, but neither the examples nor the classification are limited to only being relevant for the calendar year, for example it would be possible to operationalise the same approach for the financial year.

Own to use

Own to use is our term for owner occupation⁵. Evidently these are households that both own (with or without a mortgage) the dwelling and use it as their residence and is perhaps the most intuitive of categories of use. The definition hinges upon both the capacity of the household to exercise certain property rights (vested on them by virtue of owning the real estate) and their use of the dwelling (otherwise they are absent owners). There has been very little work defining what amount of utilisation would be sufficient to classify a dwelling as 'utilised', something which is complicated with the rise in second homes, which raises questions about which dwelling is someone's primary residence (Paris, 2009). In the UK the statutory annual leave allowance for someone who works 5 days per week is 28 days⁶, with many employees receiving 33 days⁷ (8% and 9% of the year respectively, including bank holidays). Evidently, households may also be away from home for a wide variety of other reasons.

The below examples give an indication of different circumstances that result in varied proportions of the year that an own to use dwelling is uninhabited for.

Example a: On average the owner inhabits the dwelling six nights per week and spends one night per week away with work. The owner has the statutory minimum of 28 days annual leave per year. They do not normally stay in their home for their annual leave. The dwelling is uninhabited for 76 days and thus 21% of the calendar year and would not be classified as under-utilised.

Example b: The owners routinely stay in the dwelling every night of the week. They spend 14 days away travelling with work and take 28 days holiday away from home per year. The dwelling is uninhabited for 42 days, or 12% of the calendar year and would not be classified as under-utilised.

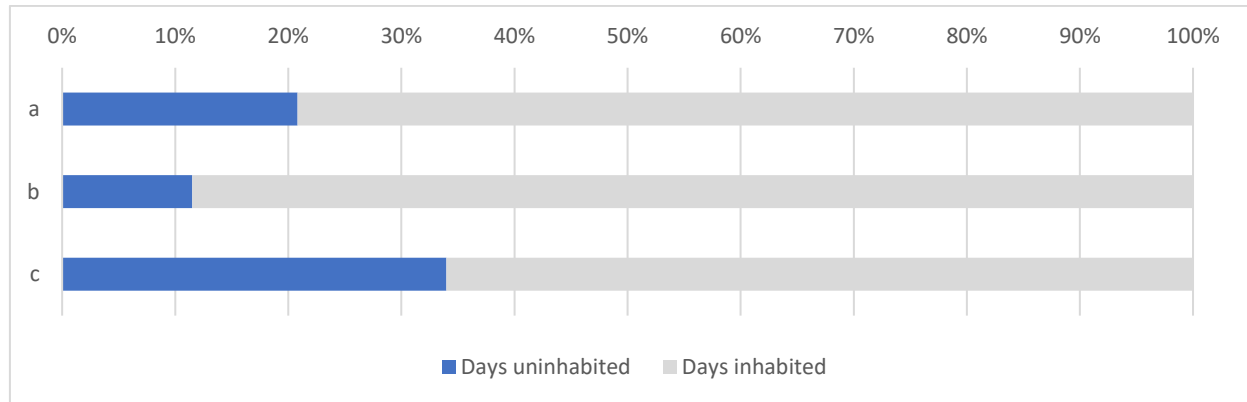
Example c: The owner takes 28 days holiday per year away from the dwelling. They spend two nights per week at a partner's dwelling. The dwelling is uninhabited for 124 days or 34% of the calendar year. Using the 30% threshold proposed in this study, this dwelling would therefore be classified as *Short uninhabitation*.

⁵ For the purposes of this report we do not distinguish between types of owner occupation, such as the distinction between individual owner-occupation (own the full property); shared equity owner-occupation (own some aspects of the property) and collective owner-occupation (own, with other some or all aspects of the property) (Rounavaraa, 1993), but note that these distinctions may have an impact on issues such as the external upkeep of properties that could alter perceptions of under-utilisation.

⁶ See <https://www.gov.uk/holiday-entitlement-rights> (accessed 1st July 2020)

⁷ See <https://www.brighthr.com/articles/leave-and-absence/annual-leave/what-are-typical-employee-annual-leave-allowances/> (accessed 1st July 2020)

Figure 3: Percentage of the calendar year that a dwelling is uninhabited / inhabited



Own to leave

Investment in London’s property market is driven by a wide range of motivations, some of which may not relate to rental income, such as the market being a safe haven for investment, the permission of international ownership without strict registration, and the relative liquidity of the market (Savills, 2013; Forrest et al., 2017; Fernandez et al., 2016). The legal situation in the UK is relatively relaxed regarding international ownership of property. Some countries have stricter rules regarding non-citizens owning property, requiring residence, evidence of the source of funds being used to purchase the property (e.g. Greece) or the ownership to be held in trust within the country itself (e.g. Mexico).

Given these motivations to invest in London, there may be incentives from some organisations or households to own housing in London without the express purpose of occupation in any form in the near future. Glucksberg (2016) defines the purchase of property as an investment with no intention to seek rental returns or the occupation of the dwelling as Buy to leave and argues that this uses London’s housing stock like a bank. We do not consider the method of becoming an owner, or the location of the owner, as crucial descriptors of E/UU dwellings, therefore in this report we describe this phenomenon as Own to leave rather than Buy to leave or ghost ownership (See Haramati and Hanarel (2016) for use of the term ‘ghost apartments’). Any ownership with no intention for the dwelling to be occupied is under-utilised in this classification as it plays no role in meeting London’s housing needs.

Example d: A purchaser buys a dwelling with no one resident⁸, with no intention of inhabiting it or renting it out. Prior to sale, the dwelling was occupied 100% of days. The dwelling is bought on 1st May and is empty for the remainder of the calendar year. The dwelling is uninhabited for 245 days or 67% of the calendar year. This dwelling should be classified as *Long-term empty*.

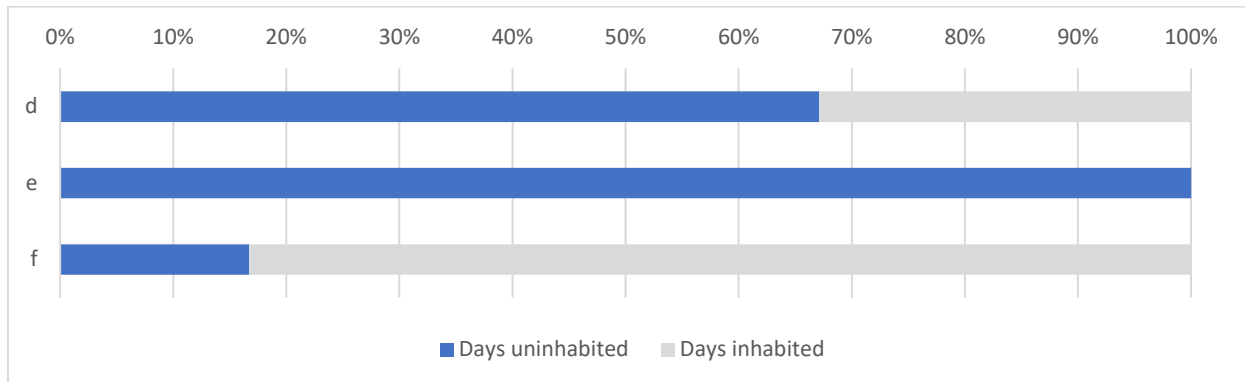
Example e: A household inherited a dwelling several years ago and is waiting for a peak in the market to sell the property. There is no one living in the dwelling. The dwelling is uninhabited for 365 days, or 100% of the year. This dwelling should be classified as *Long-term empty*.

Example f: On 1st November a purchaser completes on a new build dwelling, with no intention of inhabiting it or renting it out. The dwelling is uninhabited for 61 days, or 17% of the calendar year and would not be classified as under-utilised. The dwelling only becomes technically

⁸ This is technically vacant possession, but we avoid the term vacant possession due to potential confusion with the classification of ‘vacant’ meaning a dwelling that has been classified by a local authority as empty.

defined as *Long-term empty* in May the following year, after six months have elapsed from the purchase.

Figure 4: Percentage of the calendar year that a dwelling is uninhabited / inhabited



Own to rent

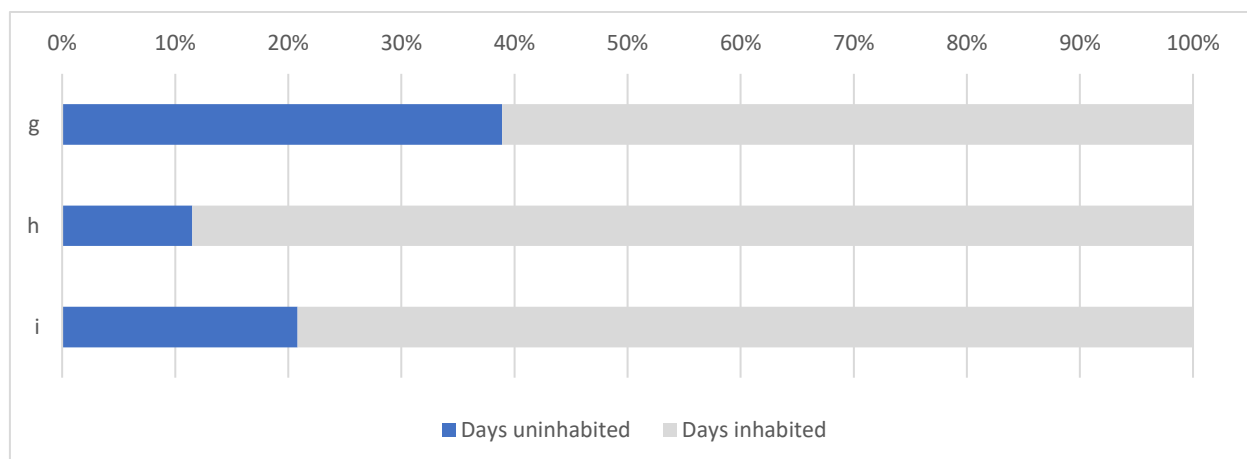
'Own to rent' is the same type of ownership that is often described as 'buy to let'. This form of investment is described as 'buy to invest' by Glucksberg; whose work on international investment in prime London argued that international 'buy to invest' was characterised by 'investors looking for higher returns on their savings than what is available in their domestic markets' (Glucksberg, 2016, p.246), who buy in London and seek to achieve a return through rental. As with 'Own to leave' we do not consider the location of the owner as the primary factor in describing the level of use, and whilst there are distinctions between owner locations (both domestic and foreign) this is not the main focus of this report and we group all 'own to rent' owners together.

Example g: An own to rent dwelling is uninhabited for 59 days between lettings. Both sets of tenants (either side of the uninhabited period) take 21 days holiday away from the dwelling. The second set of tenants moved into the dwelling on 1st August and stayed in the dwelling five nights per week on average. The dwelling is uninhabited for 142 days or 39% of the calendar year. This dwelling would be categorised as *Long uninhabitation*.

Example h: Tenants lived in the dwelling until 31st March, in this time they took fourteen days holiday, before quitting the dwelling. The void period was the average for the borough of 21 days. The new tenants then occupied the dwelling for the rest of the year, except for seven days of holiday. The dwelling is uninhabited for 42 days or 12% of the calendar year and would be not be classified as under-utilised.

Example i: On average the tenant inhabits the dwelling six nights per week and spends one night per week away with work. The tenant takes 28 days annual leave per year away from the dwelling. The dwelling is uninhabited for 76 days or 21% of the calendar year and would be not be classified as under-utilised.

Figure 5: Percentage of the calendar year that a dwelling is uninhabited / inhabited



Own to sell

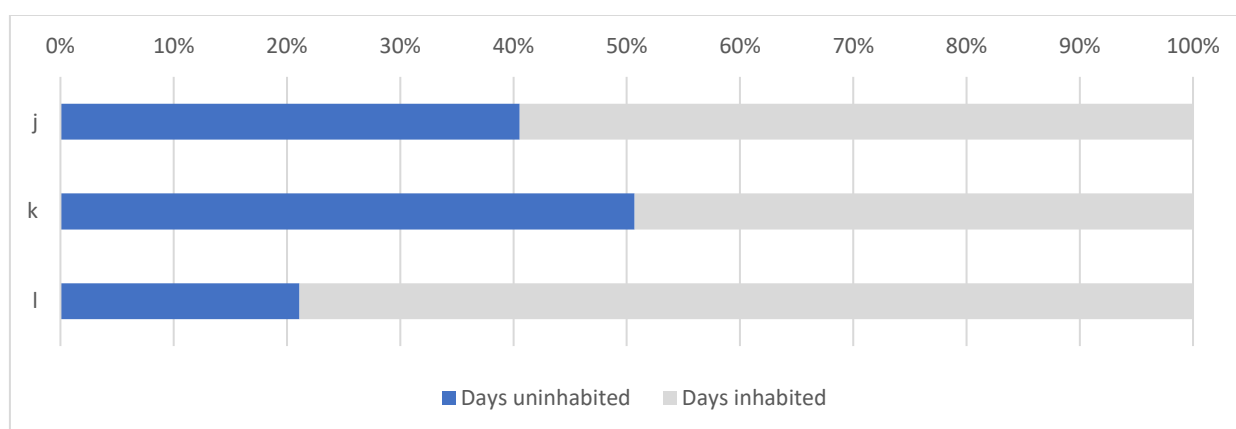
The 'own to sell' category of ownership describes dwellings that are being renovated, adapted or altered to sell in the near future. We do not put a precise time frame on this period (the time that a property is on the market for is likely to fluctuate with market conditions) but the behaviour of the owner is motivated by undertaking works to enhance the value of the property for sale rather than waiting for a change in market conditions to enhance the price (as would be the case in 'own to leave').

Example j: An elderly owner-occupier lived in the dwelling full time until selling the dwelling and moving into residential care. An investor purchased the dwelling with the intention of renovating it and selling it on as soon as possible. The refurbishment took 60 days and was then followed by a period of 60 days for marketing and completion of the sale. The new owner-occupier then takes 28 days holiday away from the dwelling before the end of the calendar year. The dwelling is uninhabited for 148 days or 41% of the calendar year. The dwelling would be classified as *Long uninhabitation*.

Example k: An occupied dwelling was purchased (with no one resident) by a developer at the beginning of the calendar year, who undertakes substantial work to renovate the dwelling, taking 150 days. The property is marketed simultaneously with the renovation period, but there is a 28 day period between completion and the new owner-occupiers moving into the dwelling. The new owner-occupiers take seven days of holiday away from the dwelling later in the year. The dwelling is uninhabited for 185 days, or 51% of the calendar year. The dwelling would be classified as *Long uninhabitation*.

Example l: A property was purchased (with no one resident) at the end of a tenant's lease (the exact date does not make a difference). The dwelling was refurbished in 42 days and marketed throughout, with a 21-day period between completion and the new owner-occupiers moving in. The new owners took 14 days holiday away from the dwelling, otherwise they stayed there 7 nights per week. The dwelling is uninhabited for 77 days, or 21% of the year and would be not be classified as under-utilised.

Figure 6: Percentage of the calendar year that a dwelling is uninhabited / inhabited



Own to holiday

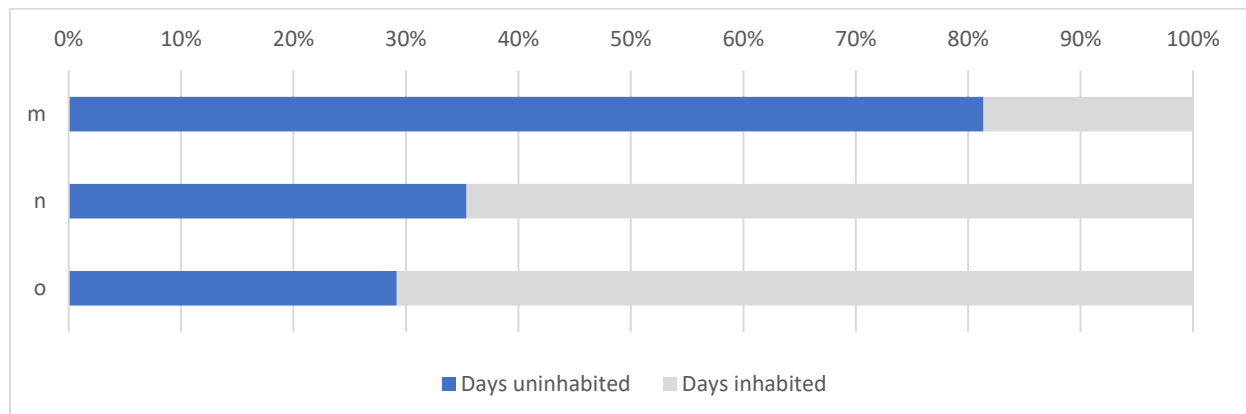
Second, or holiday, homes⁹ have been a major focus of academic, analytical and policy concern for decades and there is a sizeable literature on their effect on local communities and attendant planning policies (e.g. Gallent, Mace and Jones, 2016; Gurran, 2018). However, much of this literature has tended to focus on rural homes, dismissing urban and city core second home ownership's significance (e.g. Hall and Muller, 2004). Second homes are typified by their regular non-use by the owner (Bar-Sinai, 2009) and their relationship to a first, or primary residence in the mind(s) of the owner(s) such that the owner would not describe the property as their 'normal' or 'usual' dwelling. This is the distinction made for the purposes of council tax, but local authorities are able to decide if this is the 'sole or main residence' (Sandford, 2018).

Example m: The owners of a second home tend to use the dwelling at weekends. They visit about 20 weekends per year and in addition spend 28 days at the property in a single period. The dwelling is uninhabited for 297 days, or 81% of the calendar year. The dwelling would be classified as *Long uninhabitation*.

Example n: A family use their holiday home in London for 42 days of the year. They manage to rent the dwelling out as a holiday let for 60% of the time that they don't use the dwelling. The dwelling is uninhabited for 129 days, or 35% of the calendar year. The dwelling would be classified as *Short uninhabitation* or *Long uninhabitation* (depending on when the dwelling is let).

Example o: The owners of a second home rent the dwelling out for about 50% of the year as short term lets. They visit their second home monthly for a long weekend of four days and spend two periods of fourteen days in the house. The dwelling is uninhabited for 106 days, or 29% of the calendar year and would not be classified as under-utilised.

Figure 7: Percentage of the calendar year that a dwelling is uninhabited / inhabited



⁹ The distinction made between second homes (used occasionally for leisure) and holiday homes (usually leased on a short term basis) (Gallent, Mace & Tewdwr-Jones 2005; Paris, 2009) within much research on 'own to holiday' is less significant in this instance, but it should be noted that there is a significant degree of complexity in defining these terms

Own to work

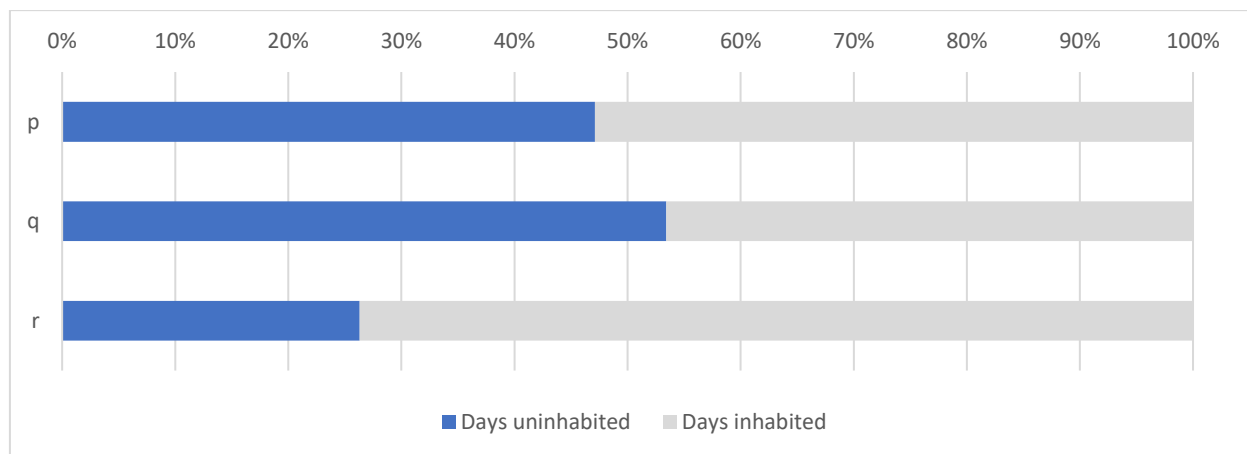
Own to work dwellings are properties that are utilised to support employment but are not considered the main residency (i.e. own to use). This might be described as a pied-a-terre, literally ‘foot on the ground’; used for short periods by an individual or household. We differentiate pied-a-terre dwellings conceptually from second homes as this primary purpose for ownership or use of a pied-a-terre is not on vacations, but on employment or other more regular activity (Ramidus, 2014). Own to work dwellings may be used for different lengths of time in one stay (e.g. three nights or three weeks) and for different frequencies (e.g. every week or monthly).

Example p: A worker in London uses their own to work dwelling in the capital four nights per week. They do this for 48 weeks per year. The dwelling is uninhabited for 172 days, or 47% of the calendar year. The dwelling would be classified as *Short uninhabitation*.

Example q: The owner of a pied-a-terre stays there for three nights per week for 40 weeks of the year. For 10 weeks of the year they rent the dwelling out for short term rentals, and achieve a 70% occupancy for the 10 weeks. The dwelling is uninhabited for 195 days, or 53% of the year. The dwelling would be classified as *Short uninhabitation*.

Example r: A worker in London uses their own to work dwelling five nights per week for 48 weeks per year. For the remaining weeks they often let friends or relatives stay in the dwelling for holidays (for which we assume every night is inhabited). The dwelling is uninhabited for 96 days, or 26% of the calendar year and would not be classified as under-utilised.

Figure 8: Percentage of the calendar year that a dwelling is uninhabited / inhabited



No singular motivation

Evidently, whilst it is conceptually neat to distinguish between motivations for owning property in London, many households' ownership may involve multiple motivations. For example, as per example q, it is easy to imagine a property that acts as a 'pied-a-terre' for someone that works 4-5 days per week in Central London and is rented out on an ad hoc basis through Airbnb or is used occasionally at the weekend for entertainment and recreation. In addition, owners' motivations may change over time (e.g. Paris (2009) discusses changes in motivation for ownership of second homes).

The definition of under-utilisation, therefore, needs to either consider whether it is practicable to identify purpose of use, or to accept a threshold for under-utilisation that is uniform across the purpose of use. The second of these approaches is undertaken in the classification of under-utilisation in Figure 2 above to explore the degree of habitation.

Patterns of occupation may change year after year – so a home which over a 12-month period is classed as *long uninhabitation* may change to *long-term empty*, or not be classified as under-utilised the next year. This is obviously the same with the current definition of long-term empty dwellings for council tax purposes, which could be classified as empty one year and not the next. Given that our classification of under-utilisation is necessarily broader than the definition of long-term empty dwellings, it is certain that more dwellings would change between types of under-utilisation and move between under-utilisation and non-under-utilisation than the current transition of dwellings between long-term empty and occupied. Thus, it is likely that the process of classifying dwellings for under-utilisation vis a vis long-term empty will be more involved, for example it may be more useful to look at patterns of habitation across more than one twelve-month period to support the classification of a dwelling.

c. The condition of the dwelling

A dwelling may be under-utilised or empty because it is unsuitable in its current state for habitation, whether because of the physical condition of the property or because of works being undertaken at the property which make it unsuitable for use as a home.

Legislation in England that can compel a property owner or permit the local authority to intervene in a property to prevent it from being a danger or hindrance to others or other properties nearby include: Public Health Act 1961; Building Act 1984; Housing Act 2004; Local Government (Miscellaneous Provisions) Act 1982; Town and Country Planning Act 1990. For more on the scope of these powers see House of Commons Library (2019).

It may be advantageous for policy to draw a distinction between long term uninhabitable and short-term uninhabitable properties in order to incentivise dwellings being brought into greater use. The distinction being the perceived length of time that a property will remain uninhabitable and the efforts put in place to make it habitable; for example, does the owner have a clear and actionable plan to improve the property to make it habitable?

As an example, consider two apartments, both have not been inhabited for six months because they have not been well maintained. One is being refurbished and will be made available to rent as soon as it is technically deemed habitable. The owner of the other dwelling has no intention to improve the dwelling this year. Whilst both dwellings are currently uninhabitable and could be classified as under-utilised, the first apartment may be of less concern for housing policy than the second as the dwelling should return to use in the near future.

This distinction between short- and long-term uninhabitable dwellings is theoretically simple but is complex to operationalise for the quantification of E/UU dwellings. This is because it would require not only analysis of the occupation pattern, but an understanding of the owner's future intentions of the dwelling. We do not therefore use this theoretical distinction in considering the methods for quantifying E/UU dwellings, both apartments in the example would be classified as under-utilised.

The report next considers the methods which could be used to assess levels of under-utilisation in London's housing stock, and then draws together conclusions on a definition and methodological approach.

3. Potential methods for measuring empty and under-utilised dwellings in London

This section of the report provides a range of methods that have been used in various studies for analysing the number and location of E/UU dwellings or new methods that could be used in London in appropriate circumstances.

Each method has been assessed by the research team and experts in the method but further work will need to be done by policymakers to judge their appropriateness with particular regard to the ethics of their use. The following sections provide a high-level summary of the ethical issues raised by particular methods as a basis for future consideration.

The definition of E/UU dwellings relates to three variables: amount of use over time; the purpose of use; and whether the dwelling is habitable. As such, to provide a comprehensive understanding of E/UU dwellings' location and number, three different types of data are needed. We considered a large number of alternative methods that were capable of providing data on aspects of E/UU dwellings. Methods were identified from the existing literature on empty dwellings, innovative research methods in the social sciences, exploration of existing policy attempts internationally at identifying E/UU dwellings and discussions with experts on E/UU dwellings. Details of the methods, including those considered but not recommended for further consideration, can be found in appendix one. Appendix one considers reliability, cost, strengths, weaknesses and ethical concerns (e.g. regarding privacy) for each method.

Council Tax

Data is collected annually by local authorities at the dwelling unit scale for several key use types (occupied, vacant, unoccupied exemptions (e.g., awaiting demolition for regeneration), empty, long-term empty, second homes and occupied exemptions (e.g. student or armed forces housing))¹⁰. This data is not intended to identify the primary purpose of use (except 'own to holiday' and 'second homes'), nor the precise proportion of days occupied per annum, but could identify uninhabitable dwellings and identifying properties uninhabited for more than six months. With the permission and assistance of London boroughs, this data could be mapped at a low spatial scale (e.g. Lower Super Output Areas) to give a fine-grained geographic analysis of empty dwellings across the whole of London. The quality of the data is contingent upon the proportion of owners self-reporting that their dwelling is empty and the abilities of the local authority to identify non-self-reported dwellings.

Airbnb data

Data has been legally scraped by *Inside Airbnb* for each dwelling advertised on Airbnb. This enables analysis of the number, frequency and geography of lettings at a low spatial scale (without exact locations being identifiable) at a very regular interval (e.g. monthly). Whilst not all short term lets are advertised on Airbnb, it could be used as a proxy to identify spatial concentrations, changes over time and support an overall estimate of short term/holiday lets (as has been conducted previously by the GLA). Thus, it is possible to estimate the number and geography of dwellings that are being used for short term/holiday lets and not for the occupation of London's long-term residents.

¹⁰ Details of the local authority council taxbase in England can be found here: <https://www.gov.uk/government/statistics/council-taxbase-2020-in-england>

Mobile phone geo-location

Digital data on the physical location of mobile phones can provide insights into the utilisation of properties. However, the benefits of using this method will need to be weighed against ethical considerations, particularly in relation to privacy. Whilst all application users would be required to give consent for use of their geolocation in order for their data to be legally collected there are still ethical concerns regarding informed consent for the purposes of identifying E/UU dwellings and whether the method is proportionate to the aim of measuring the under-utilisation of dwellings.

The method would involve the use of anonymised and suitably aggregated data collected from apps or mobile phones (those which are turned on) to indicate the number of mobile phones at a location at particular times of the day (e.g. between 10pm and 6am) to identify areas with few mobile phone signals in comparison to the number of dwellings. For example, it is possible to identify the regular locations of a mobile phone and therefore indicate whether the phone is regularly or irregularly within a 10m radius (or larger) during certain hours. Thus, it can identify areas where mobile phones are regularly at the same location for more than 50% of nights and distinguish between phones that are regularly at the same location for continuous periods (e.g. 6 or 7 nights per week = primary home) and those that are there for shorter periods (e.g. 4 nights per week = 'pied-a-terre' or equivalent). Thus, this method could be used to identify areas with high and low numbers of signals recorded in any of the temporal categories (see figures 2 and 10), but is limited by the behaviours of mobile phone users (presence of relevant application and phone switched on).

Household surveys

Bespoke household surveys could be operationalised to identify detailed information about the occupancy patterns of households within London. Surveys could identify respondent behaviour and perceptions of neighbourhood norms for occupation, for example asking respondents to indicate the proportion of their nearest 10 dwellings that relate to categories of utilisation. To provide a reliable estimate of E/UU dwellings at a low spatial scale for the whole of London would be expensive for household surveys, but they could be used to provide higher geography estimates or targeted on smaller areas which have been identified using other methods.

Utilities usage

Utilities data could in principle be used to estimate dwelling usage. As with the use of mobile phone data, however, there are ethical concerns around privacy and informed consent when using utilities data for the purposes of measuring E/UU dwellings, and these would need to be considered in greater detail by policymakers before deploying such a research method.

Smart meters can provide 'live' real-time data at the unit level on significant usage and non-significant usage. For example, trends of half hourly electricity usage have been shown to reveal different domestic usage patterns from smart meters in Ireland¹¹, successfully distinguishing between regularly, irregularly used and empty dwellings. This method could be operationalised at different spatial scales and provide an approximation at very low spatial scales but would require data to be purchased from a range of

¹¹ McLoughlin, F., Duffy, A. and Conlon, M. (2012) Characterising domestic electricity consumption patterns by dwelling and occupant socio-economic variables: An Irish case study. *Energy and buildings*, 48, pp.240-248.

utilities providers. This method could also provide very useful data at the scale of London as a whole to identify the distribution of utilities usage between dwelling types to indicate what low, normal and high frequency of electricity usage is. Thus, it could help inform whether 30% non-inhabitation per annum is justified empirically.

Sales/letting agents

The 'intention of buyers' is information which is useful to estate agents to help them monitor their markets and target their client base. Agents could give a basic indication of the number/proportion of the different types of ownership (e.g. own to use, own to rent) at an aggregate scale and for the geographies which they operate in. This data would provide intended rather than actual use data and be restricted to properties that are on the market.

Concierge interviews

Interviews with concierges (and other building management services) of residential blocks could collect information about residents' occupancy levels. Ethical concerns around privacy and resident consent would need to be considered in greater detail by policymakers if this method is to be used.

The output of the method is bespoke and could combine qualitative and quantitative insights across a large array of variables that contribute towards understanding the frequency and type of use (e.g. estimates of average number of days spent in the residency per year per household; number of units occupied on a particular date). This approach has worked for single point in time studies but is less likely to be replicable for longitudinal work due to the need for a long-term agreement between concierges and data collectors, which will raise privacy and consent concerns for residents and owners. Because concierges are most often found in higher-cost blocks, the findings from this method are also likely to be biased towards that end of the market.

Initial conclusions on methods

None of the methods investigated here can provide a comprehensive answer on its own. Several are of limited use today but are likely to become more useful in the future because they are being improved or expanded. Any comprehensive analysis of the prevalence of different types of under-utilisation across London's housing stock would likely need to be informed by a combination of methods.

Ultimately, the best solution is likely to be a layering approach whereby a base position is created from the most fine-grained data source and then successive layers of data are added to increase the depth of understanding. For instance, council tax data is a fine-grained, quantitative and categoric source for properties confirmed by their owners as long-term empty but adds little to the understanding of under-utilisation. Several other sources add insight to types of properties, typical locations and types of owners associated with under-utilisation but do not identify specific addresses. When layered over the council tax data, these multiple sources build a picture of the streets and neighbourhoods where under-utilisation is most likely to be found and help to direct the attention and priorities of policymakers.

The conclusions and recommendations follow on from this compendium of methods and explain how these methods may be combined.

Key: Does the method provide evidence of the variable? Green = Yes Amber = Partial Red = No

What is the quality of the method in relation to key criteria? Red = Low Amber = Mid Green = High

Figure 9: Overview of methods

Method name	A. Amount of use over time		B. Primary purpose of use. Own to...						C. State of dwelling	Spatial accuracy / granularity	Spatial Coverage	Data accuracy	Cost	Frequency of data availability	Connection to other records	Types of housing considered
	Underutilisation as % of days inhabited	Timing of use	... occupy	... leave	... rent	... sell	... holiday	... work	Uninhabitable							
Concierge interviews	Y	Y	Y	Y	Y	Y	Y	Y	Y	Mi	Lo	Hi	Hi	Lo	Lo	Lo
Airbnb listings	P	N	N	N	Y	N	N	N	N	Hi	Hi	Lo	Lo	Hi	Lo	Mi
Sales/letting agents' data	N	N	P	P	P	P	P	P	Y	Hi	Mi	Lo	Mi	Hi	Lo	Mi
Council tax data	P	N	P	P	P	P	P	P	N	Hi	Hi	Mi	Lo	Lo	Hi	Hi
Geo-location mobile phone app data	P	Y	P	P	P	P	Y	Y	N	Hi	Hi	Lo	Mi	Hi	Lo	Lo
Household surveys	Y	Y	Y	Y	Y	Y	Y	Y	P	Mi	Lo	Hi	Hi	Lo	Hi	Hi
Utilities	P	Y	P	P	P	P	P	P	N	Hi	Hi	Mi	Mi	Mi	Lo	Lo

4. Recommendations & Conclusions

This scoping exercise has been designed to provide greater clarity on potential definitions of E/UU dwellings and to identify which methods could be used to assess the prevalence and distribution of E/UU dwellings in London. Whilst some concepts such as *Long-term empty* dwellings are relatively well defined, there is no current consensus over how to define under-utilisation per se. There is significant complexity in defining and therefore measuring E/UU dwellings, and as explored through the vignettes, a wide spectrum of ‘normal’ behaviour that could fall under some of the classifications of under-utilisation proposed in this report. Given the lack of definitional clarity regarding under-utilisation, there are few existing methods which have been tried and tested to identify, quantify and locate high incidences of under-utilisation.

In this report we suggest some methods that could be used to identify areas with high levels of E/UU dwellings and estimate the overall number of E/UU dwellings in London. We do not provide a recommendation about how to identify individual dwellings for policy interventions, but it is likely that different methods will be needed than those that are presented here to provide an overarching picture of the situation. We highlight some of the ethical concerns that arise from particular methods and leave open to policymakers the question of whether the benefits of using such methods outweigh these concerns.

How might empty and under-utilised dwellings be defined and categorised?

We propose a definition for *long-term empty* dwellings as those that have not been inhabited for six months (consecutively) or more. This is in line with the broad consensus and historic definitions that have been utilised by local authorities and national government guidance.

Under-utilisation describes any dwelling that is inhabited below a particular number of days per annum (regardless of timing of habitation). From a public perspective the level of habitation which should be considered under-utilised is likely to vary by purpose of use, but this is impracticable for the purposes of quantification of under-utilisation and would be too complex to analyse on a regular basis. We have not determined a specific number of days for each type of use but give descriptors for various types of utilisation and indicative proportions of the year at which this type of utilisation could be considered under-utilisation.

Figure 10: Indicative proportions of the year that a dwelling is uninhabited for which it might be considered under-utilised

Under-utilisation type	Description	% of year uninhabited
Long-term empty	Uninhabited for six months or more consecutively	50% or more
Frequently uninhabited	Uninhabited for six months or more in total over non-consecutive periods	50% or more
Long uninhabitation	Inhabited for more than six months of the year, but uninhabited for more than 28 days consecutively, with total uninhabited period amounting to at least 30% of the year.	50% <> 30%
Short uninhabitation	Inhabited for more than six months of the year, but uninhabited for short periods (less than 28 days), with total uninhabited period amounting to at least 30% of the year.	50% <> 30%

This assumption within this classification is that dwellings that are uninhabited for 30% of the year or more should be considered under-utilised, as explained in section 2 above. There is very little existing evidence on (un)inhabitation patterns, as such it is not possible to derive an empirical explanation of the distribution of inhabitation or define what could be considered statistically as normal or at the upper or lower extent of utilisation. In the absence of a clear empirical starting point, we would recommend that dwellings uninhabited for 21% of the year are not considered under-utilised (based on 28 days annual leave and one night per week spent away from the dwelling). However, the vignettes presented in this report demonstrate that under-utilisation (defined in terms of the proposed system of classification) may arise from common patterns of occupation and it may be challenging for policymakers to determine a degree of uninhabitation (if any) that is considered problematic.

What data and methods can be used to measure the prevalence and distribution of empty and under-utilised dwellings?

A synthesis and combination of methods is likely to provide the most accurate depiction of E/UU dwellings in London. The review of methods has shown that whilst many different methods are capable of identifying a subset of E/UU dwellings, none is capable yet of identifying the full range of E/UU dwelling types. Combining several methods together offers the potential to provide an extensive (broad geographic coverage and types of E/UU dwellings) and in-depth account of E/UU dwellings at smaller scale geographies.

After a more thorough consideration of the ethics of the potential methods put forward in this report, a quantitative portrait of small area statistics for E/UU dwellings could be undertaken for the whole of London, to identify areas with high numbers of E/UU dwellings. This would be possible at LSOA level and should be conducted at the smallest scale practicable. This could be done through a combined analysis of council tax data, Airbnb and mobile phone data. In-depth research could then be undertaken in those locations with a high incidence of E/UU dwellings through household surveys to ratify this data.

This estimation could be the first step towards a systematic database created for London that is routinely updated using multiple datasets. This could entail creating a unique identifier for every dwelling in London and then aggregating information sources to build this picture. This kind of approach has been undertaken in a 'Vacant Properties Indicator Model' in Philadelphia, USA¹², which brings together data on utilities, planning, cadastre, property inspections and others, each of which is an indicator of possible empty properties. An algorithm combines dwelling level information from each of the datasets to produce the overall indicator, which is then used for desk-based planning and in identifying locations for field inspections.

This approach could be implemented in different ways, in order to answer slightly different research questions. Further analysis and testing of these methods should respond to specific research questions.

¹² This model is provided through open data, so that each resident can see the location of likely vacant properties, this can be found here: <https://www.opendataphilly.org/dataset/vacant-property-indicators>

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Appendix One: Methods

As identified in the main body of the report, it is likely that a mixture of methods would be required in order to provide a comprehensive picture of E/UU dwellings in London. All of the methods identified require some resources, for example through directly paying for data collection (e.g. interviewer's wages for concierge interviews), data aggregation (e.g. scraping websites) or incentivising the provision of existing data (e.g. council tax databases, mobile phone data and utilities usage data). Thus, there will be a balance between the overall cost of data collation and the extent of geographical coverage, and the degree of accuracy required. Some data methods are reliant upon multiple parties (e.g. each local authority's council tax database) which will add to the complexity of creating a uniform quality analysis for the whole of London, whilst other methods can provide comprehensive geographic coverage through a single party (e.g. mobile phone geolocation data).

1. Interview surveys with concierges of high-end residential blocks

Interviews with concierges of high-end residential blocks could collect information about residents' lifestyles and occupancy levels. The output of the method is variable, and could combine qualitative and quantitative insights across a large array of variables can be collected that contribute towards understanding the frequency and type of use (e.g. estimates of average number of days spent in the residency per year per household; number of units occupied on a particular date).

How frequently could the method be realistically deployed? To keep the goodwill of the concierge we would recommend no more than annual interviews.

Approximate geographic scale at which method output would be accurate for estimation: The scale is dependent upon the degree of sampling undertaken. A full survey could result in close to point level data for each building, but the trade off with the cost of implementing this and limitations to response rate would make a higher-level geography, such as the postcode district more likely to be appropriate.

Approximate cost of deploying the method: The cost is contingent upon the degree of precision required and is proportional to the labour costs of implementing the interviews. A sampling approach would enable a relatively low-cost overview of the prevalence of some types of E/UU dwellings within a defined geography (there are marginally higher costs in relation to increasing distances between sampled addresses). A comprehensive count would increase the labour costs of this method.

Ethical considerations: Confidentiality and anonymity would be required to prevent a conflict of interest on the part of concierges and to protect the privacy of residents and property owners. For the Ramidus Consulting Ltd (2014) study permission from residents was not sought, but for longitudinal analysis it would be necessary to seek permission from residents or owners to avoid conflict with concierges, which could hinder the reliability and extent of the data.

Primary strengths of the method: Similar to the agent data, this data gives an idea of occupancy levels. The data that can be obtained from the concierge is much more detailed and reliable (based on actual use rather than intended use) at unit level within managed blocks. It provides an excellent insight into the patterns of use within top end, managed blocks. This is a small, but high profile, segment of the housing market in London.

Primary weaknesses of the method: If it is a small sample size it will limit the ability to represent the stock. It only considers a subset of one building type (apartment blocks with concierges). Other methods would need to be operationalised in conjunction to ensure a comprehensive account of E/UU dwellings. There are some more minor issues in relation to the time taken to interview a number of concierges to collect this data (i.e. labour hours), variations in the observational skills of concierges and the cleaning/formatting of the data to ensure consistency between interviews so it can be used as one dataset.

2. Airbnb listings

Airbnb listings indicates where properties are available on short-term lets across Greater London. The listings data has been scraped from the website by an organisation called Inside Airbnb and this has been mapped and analysed. It is possible to see how the distribution and concentrations of Airbnb listings has changed over time (2011 to date) using an animated map. Airbnb listings provide a good indication of the scale of the holiday lets (short lets) in an area. This can be monitored over time relative to changing levels of housing stock, particularly in the private rented sector and local areas/hotspots could be flagged

when the proportion of stock reaches a set threshold. Dan Cookson has created maps of new AirBnB listings which reveal areas with increasing prevalence of short-term let clusters (e.g. Figure 11). It is possible to zoom in on the map and click on the point data.

How frequently could the method be realistically deployed? Updates could be run every month but may be more cost effective to quarterly or annually.

Approximate geographic scale at which method output would be accurate for estimation: Locations are accurate to within 150m metres. This would be accurate at output area level.

Approximate cost of deploying the method:

Low. The time it costs for an analyst to extract data from a source such as Inside Airbnb or scrape and clean the data independently at intervals selected for the analysis. It would take some time to update and analyse the data at regular intervals.

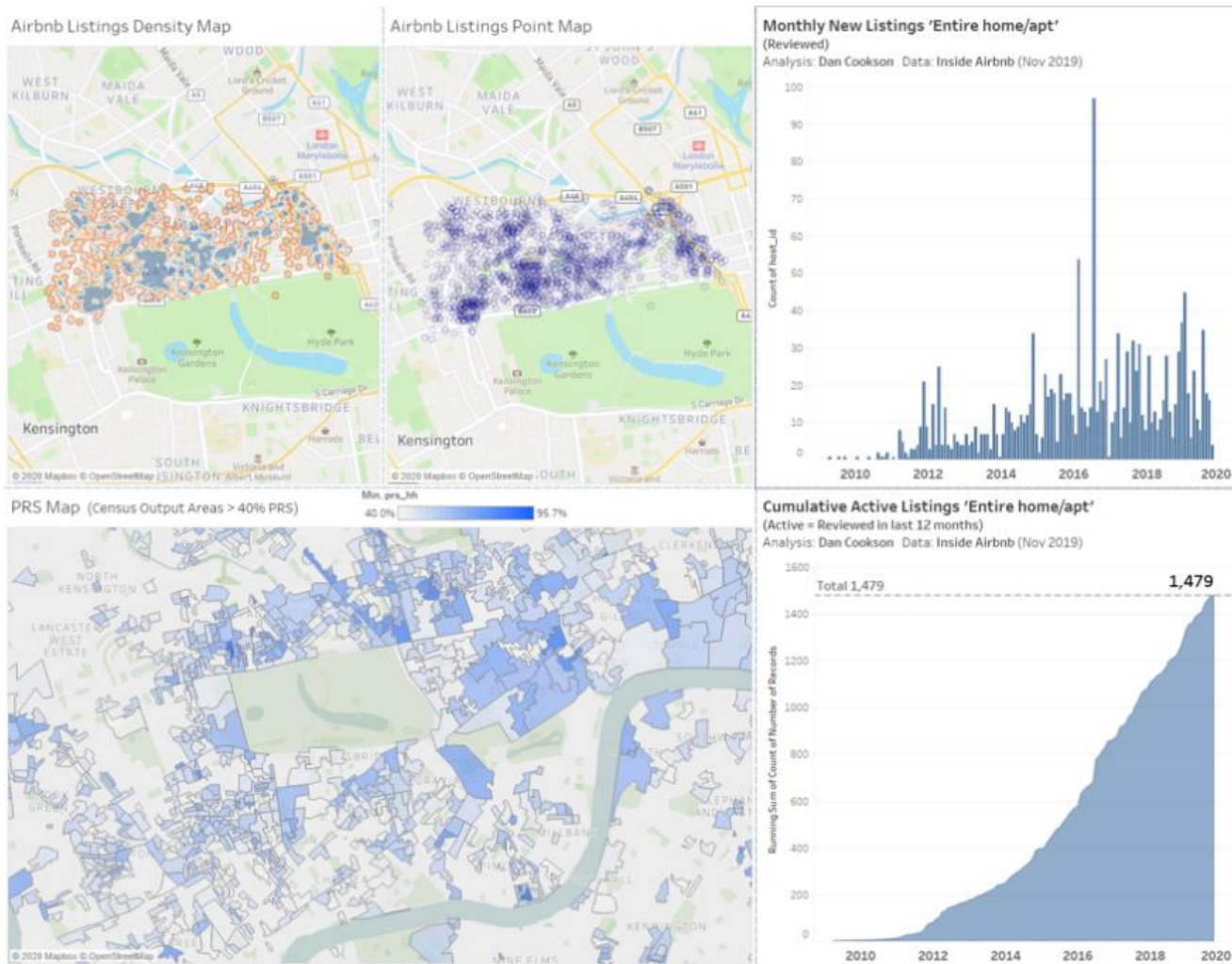
Ethical considerations: The data is publicly available, and the property owners have chosen to use the Airbnb site. However, consideration will need to be given to privacy considerations in the event that individual dwellings are identifiable.

Primary strengths of the method: Data can be scraped from their website, going back to data from 2010. Monthly aggregated data allows identification of the changing prevalence of Airbnb listings across the capital and neighbourhoods. Data includes: the listing price per night, name of the property, beds, host since date, date of listing (month/year) and the approximate location as shown.

Primary weaknesses of the method: The data is a snapshot at the time of scraping. It is not a fully comprehensive sample of short-term lets, as not all property owners use Airbnb to advertise, and this is difficult to disentangle from other data sources. The data requires cleaning as duplications can also exist on Airbnb itself (e.g., annexe only, or room only). The data does not identify actual dwellings/addresses to protect privacy but is accurate to within 150 metres. It is not possible to establish occupancy rates, but they can be estimated using assumptions¹³. The data processing and analysis is relatively straightforward but is dependent upon the ongoing availability of Airbnb data.

¹³ See GLA research here <https://www.london.gov.uk/what-we-do/housing-and-land/housing-and-land-publications/housing-research-note-short-term-and-holiday-letting-london>

Figure 11: Indicative maps of Aibrnb listings



Source: Dan Cookson for this report

3. Sales/letting agents' data

The 'intention of buyers' is information which is useful to estate agents to help them monitor their markets and target their client base.

Agents could give a basic indication of the number/proportion of investors versus main residence buyers. The motivation to record this data is currently driven by internal business processes to deal with investors differently. We suggest that agents include a more detailed question on buyer intention within their systems if possible, which could ask about buyers' primary intention and intended frequency of use.

How frequently could the method be realistically deployed? Agents collect this data as part of their CRM/invoicing systems and could include data fields that will be of mutual benefit in understanding the prevalence of different types of under-utilisation. It may be possible to set up Application Programming Interfaces with the agents' systems, resulting in minimal disruption to agents once set up and enabling regular analysis of the results.

Approximate geographic scale at which method output would be accurate for estimation: Although the agent will collect the data at full address level due to GDPR and privacy reasons the data would be aggregated to a bigger geography to suit the project, potentially neighbourhood.

Approximate cost of deploying the method: No data cost, some agents would be willing to supply the data at no cost. However, there is likely to be a longer-term cost, and some set-up costs to standardise data collection, clean and analyse.

Ethical considerations: Opt-out clauses limit privacy issues when anonymised and aggregated, but will need to meet standard GDPR requirements. Potential concerns from clients of conflicts with any declarations made with the HMRC, and or local authority.

Primary strengths of the method: Agents who have good relationships with their clients; whether that be with a buyer, a vendor, a landlord or a tenant can build a good picture about the profile of these households, including their likely intentions for the property. This could be combined with property/neighbourhood level data.

Primary weaknesses of the method: Limited geographical coverage (areas of London that the agents are active in); limited market coverage at present; transactions recorded rather than current utilisation; intended rather than actual levels of use; aggregated data for privacy; reliance on agent co-operation; potential inconsistencies in collection processes. Collating and synthesising data in different formats or creating a single platform for data sharing will be a complex task.

4. Council tax data

In England and Wales, the Council Tax Base provides data on the number of dwellings, including the numbers which are occupied, vacant, unoccupied exemptions (e.g., awaiting demolition for regeneration), long-term empty, second homes and occupied exemptions (e.g. student or armed forces housing) at local authority district/London borough level. Similar data published at a below local authority level geography in Scotland. Such an approach could be undertaken by local authorities at present.

How frequently could the method be realistically deployed? This could be done annually.

Approximate geographic scale at which method output would be accurate for estimation: The data is gathered at point level and has successfully been used aggregated to low levels of geography, for example in Scotland. It could be operationalised as Lower Super Output Area (LSOA) in England.

Approximate cost of deploying the method: This method would be low cost, though it should be noted that there is a cost to the councils and government departments which standardise and publish the data.

Ethical considerations: The dataset does not contain any directly identifiable personal information.

Primary strengths of the method: Uses a tried and tested methodology. Provenance of the data from robust Council Tax billing system. Expertise of National Register of Scotland (NRS) in producing Census and population/household estimates. Expertise of NRS in creating Census geographies that include unit postcode boundaries which ensure accurate allocation of dwellings to higher geographies (ie Output Areas and Data Zones). Expertise of Councils in extracting Council Tax Base data from their systems. Uses small area geography that is well known/used and relates to postcode and Census.

Primary weaknesses of the method: Data is not currently publicly available at sub-local authority level. Limited to existing classification of 'empty' homes and couldn't identify other forms of E/UU. This method requires that administrative systems are kept up to-date. It is possible that this may not be the case or that local authorities may be reluctant to share data or prioritise its accurate collection. Local authorities can be reliant on the person who is liable to pay Council Tax informing them of any changes in their circumstances and the abilities of the local authority in identifying non-self-reported dwellings that are empty (they use a range of methods to identify empty dwellings, with significant variation in practice between local authorities). There can be delays in changes due to demolitions or new house building being recorded.

5. Geo-location mobile phone App data (night time signals)

Digital data on the physical location of mobile phones can provide insights into the utilisation of properties. There are several data providers that could offer data on mobile phone usage. One example is *Locomizer's* residential algorithm, which analyses mobile phone signals during the night i.e., between 23.00 and 06.00 to a polygon with a radius of 10m. Weightings are applied to each hour, as some hours are more likely to be spent at home, to identify the most likely residential location. The results enable Locamizer to distinguish between residents (at least 25% of the year) and non-residents of Greater London and segment further within those categories. This typology is merely illustrative and differs from the research team's typology. With test data Locamizer can classify residents into broad categories, shown below.

Figure 13: A typology of use

Broad category	% nights in period	Length of stays	Type of resident
Primary residents	>50% of nights	> 6 nights continuous block	Main home
		< 6 nights continuous block	Pied-a-terre
Non-primary residents	30-50% of nights	> 6 nights continuous block	'Second home' for part of year, seasonal or work assignment.
		<6 nights continuous block	'Second home' for short periods and weekends or regular business travel.
Other	<30% of nights	Never in a block	Tourist or business visitors typically including late nights out and staying near transport hubs

How frequently could the method be realistically deployed? Monthly is possible but expensive and not necessary. We suggest an annual update would be most beneficial to assess any changes in behavioural patterns.

Approximate geographic scale at which method output would be accurate for estimation: The signals are located to within polygons with a 10-metre radius but clusters at neighbourhood are desirable in order to be meaningful. The creation of bespoke boundaries is possible to enable disaggregation across traditional boundaries (e.g. boroughs).

Approximate cost of deploying the method: High.

Ethical considerations: Data can be provided in a GDPR compliant form and anonymised. Mobile phone applications give informed consent for this kind of data use in the terms and conditions relating to the apps they use. There may be some public concerns regarding privacy implications, but the same data is currently used for other forms of market analysis. Application data would be aggregated at such a scale as to avoid identification of any individual user or dwelling.

Primary strengths of the method: The data is spatially and temporally accurate, and outputs may be refined by bespoke characteristics. It is adaptable over time and could become more robust through expansion to include further applications.

Primary weaknesses of the method: Reliance on supplier (e.g. Locomizer) to be transparent about method and analyse the data. Assumptions in Locomizer's algorithms to interpret the patterns in the data. Potential for regulation of geo-spatial data of this kind. Data and the amount of analysis and interpretation required makes this a costly exercise.

6. Household surveys

Household level survey data has proved a reliable source of information for social issues over time. It is possible to operationalise a lot of variations of survey type, enabling a bespoke approach to the particular E/UU type and spatial scale.

Survey respondents can be asked about their occupation patterns, to identify individual dwelling level responses. One option is to also include questions within a survey about trends within the immediate vicinity (such as the level of utilisation generally within the closest ten dwellings). This would enable insight into broader trends of E/UU dwellings.

National housing surveys incorporate interviewer's assessments of occupation (i.e. whether it is inhabited or empty) and clarification is sought from neighbours (e.g. English Housing Survey 2018/19). This reveals the possibility of both survey data at the individual unit level and asking 'neighbour' questions.

How frequently could the method be realistically deployed? Realistically this could be operationalised annually with limited respondent fatigue.

Approximate geographic scale at which method output would be accurate for estimation: Dwelling level data is routinely collected in household surveys. However, as all non-compulsory household surveys suffer from some non-responses and the purpose of the survey is to identify non-utilisation there is the potential for non-responses to require additional follow up work to identify whether they are because of no current resident or non-participation by a resident.

Approximate cost of deploying the method: Survey methods comprise a range of alternative methods, which have highly variable costs associated with them. Interviewer distributed surveys, in which an interviewer visits each (sampled) dwelling are expensive, but frequently return the highest response rate and enables collection of wider insights (e.g. external inspection of lights/maintenance) which could be valuable in building a picture of the number of E/UU dwellings (and the impact on the urban environment). Cheaper methods include online only surveys and postal surveys, both of which benefit from advertising campaigns. This might broadly be within the area of £1 per online response and £1-£4 per postal response. It is likely that survey-based approaches would be most cost effective when considering targeted neighbourhoods rather than the whole of London.

Ethical considerations: There are no significant ethical concerns with asking questions at the household level about the specific household. However, there are some ethical concerns with respondents 'informing' on their neighbours. Some of these issues may be overcome with appropriate framing of the questions and have been used successfully in other surveys (e.g. English Housing Survey).

Primary strengths of the method: Surveys offer bespoke information which can be tailored to E/UU dwellings, providing information on all types of utilisation at the individual dwelling level and capable of combining with detailed household level information (e.g. age, income, purpose of occupation).

Primary weaknesses of the method: A high non-response rate would be a critical flaw in accurately identifying E/UU dwellings. There is a trade-off between cost and response rates and the quality of data provided; without a large survey it is unlikely that data will be representative and large survey samples can be costly.

7. Utilities data

Utilities data can be used to estimate dwelling usage. The array of utilities data can be broad (e.g. gas, electricity, broadband, water) and combined to provide a composite measure. Smart meters can provide 'live' real-time data at the unit level on significant usage (e.g. heating on, computers in use) and non-significant usage (e.g. freezers or alarms). For example, trends of half hourly electricity usage have been shown to reveal different domestic usage patterns from smart meters in Ireland, successfully distinguishing between regularly and irregularly used and empty dwellings¹⁴.

How frequently could the method be realistically deployed? Data could realistically be updated at regular intervals (weekly snapshots) or at an aggregate level considered 'live' real-time data.

Approximate geographic scale at which method output would be reliable: This method is scalable at every useful geography. Dwelling level estimates may be undertaken with unique identifiers for monitoring. Small-area (LSOA / Neighbourhood) estimates could combine anonymised meters, providing an indicator of number and geography.

Approximate cost of deploying the method: The cost of purchasing this data is unknown

Ethical considerations: There are some issues with providing data at the individual unit level and any provision of data by utility companies will require GDPR compliance. This is less of an issue where data is aggregated at the area level.

Primary strengths of the method: No additional data is required, although some extra processing is required. Capable of building a fine grained geographical and temporal analysis.

Primary weaknesses of the method: Reliant on smart meters being used. Ethical concerns with individual level data may prove problematic in ongoing monitoring. Usage of utilities does not in itself prove that a property is/is not being used. Negotiation may be required with a large number of different utilities providers to build an accurate picture of E/UU dwellings. However, legislation could solve this through obligatory data sharing between utilities companies and local authorities.

It may be possible to provide accurate pictures of electricity consumption throughout the day according to alternative type of usage. However, if there is sufficient incentive (such as fines) then some households may obscure the accuracy of data collection through automated usage of utilities (e.g. electricity).

¹⁴ McLoughlin, F., Duffy, A. and Conlon, M. (2012) Characterising domestic electricity consumption patterns by dwelling and occupant socio-economic variables: An Irish case study. *Energy and buildings*, 48, pp.240-248.