



Centre for
Homelessness Impact

April 2022

Insights into the use of modular housing in addressing homelessness

Dr Katy Karampour
Dr Gemma Burgess

About the Centre for Homelessness Impact

The Centre for Homelessness Impact champions the creation and use of better evidence for a world without homelessness. Our mission is to improve the lives of those experiencing homelessness by ensuring that policy, practice and funding decisions are underpinned by reliable evidence.

About the authors

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Person-first language

This report uses person-first language, putting a person before their circumstances. This is to avoid defining an individual by homelessness, which should be a temporary experience.

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Executive summary

- Across the UK there has recently been development of housing constructed from prefabricated modular units and shipping containers to house people who have experienced homelessness. A number of different local authorities, manufacturers, social enterprises and charities have been involved in developing these housing schemes. There is, however, little research about these shipping container and modular developments.
- The aim of this research is to provide information about the existing modular and shipping container schemes in the UK and to provide a discussion of their potential benefits and limitations. This is part of a broader programme of work aiming to investigate the relative effectiveness of these modern construction methods in comparison to more traditional approaches to offer temporary accommodation (TA) for people experiencing homelessness. A later phase of the work will seek to capture the experiences, views and outcomes of residents living in these types of modular and container housing; and assess the relative effectiveness of these approaches.
- The typology proposed in this research can be a platform to understand the differences in outcomes achieved by these different models of provision of TA and where and how they are used.
- A desk-based internet search was conducted to identify existing modular and shipping container housing schemes. Some of the stakeholders who are involved in their development were contacted to provide further information. Drawing on our existing research and the available evidence, the potential benefits, limitations and barriers to the development of such schemes are identified in the report.
- The schemes identified are all intended to be temporary accommodation, providing transitional housing for residents with the aim that residents are supported to move on to permanent, long term independent accommodation.
- In mapping the existing modular and container schemes to house people experiencing homelessness in the UK, we identified 33 schemes in 22 local authorities. Of these, six schemes are constructed from converted shipping containers and 27 are constructed using prefabricated modular units. The schemes

provide 808 units of accommodation, of which 427 units are for families and 381 units for single households.

- The detailed characteristics of the schemes are provided in the Appendix. To help identify the main differences between the existing projects and to provide a basis for future comparison, we categorised them into groups based on three criteria which we believe may be important considerations in future evaluation of the schemes. The first is the construction method used (modular/container). The second is the number of units on an individual site (under 20 units/20 units and over). The third is the type of households accommodated (families/single households). The table below (which reproduces table 1 later in the report) shows the number of projects identified in each category.
- We believe that the construction type, that is, whether the units are constructed from shipping containers or are purpose-built modular units, may be an important consideration in future evaluation of the schemes because converted shipping containers and purpose-built modular units may perform differently and may provide different living experiences for residents.
- We believe that the number of units on a single site may be an important consideration in future evaluation of the schemes because these factors may affect the quality of the overall living environment and the residents' experience.
- We believe that the characteristics of the cohort housed by a project may be an important consideration in future evaluation of the schemes because family households and single households may have different needs and requirements.

Table 1 Types of schemes and the number of projects identified in each category

Type	Construction method	Size of scheme	Cohort housed	Number of projects identified	% of projects identified
A	Shipping container	Under 20 units on site	Families	0	0%
B	Shipping container	20 units and over on site	Families	4	12%
C	Shipping container	Under 20 units on site	Singles	0	0%
D	Shipping container	20 units and over on site	Singles	2	6%
E	Modular	Under 20 units on site	Families	3	9%
F	Modular	20 units and over on site	Families	5	15%
G	Modular	Under 20 units on site	Singles	14	43%
H	Modular	20 units and over on site	Singles	5	15%

- Additional characteristics that may be useful to include in a future typology as further research collects detailed information about the schemes could include the size of the units and the nature of the location of the site. Our mapping exercise shows that most of the units are smaller than the recommended size advised by national space standards.¹ The nationally described space standard is not a building regulation and remains solely within the planning system as a new form of technical planning standard. Further research is needed to assess the impact of unit size on the living experience of different types of residents. We do not currently have information about the nature of the location of the identified schemes. In some cases, there is anecdotal evidence suggesting that the land may in some cases be located some distance from local amenities and services, making it difficult for the residents to do their shopping, go to work or take children to school. Further research is needed to explore the nature of the scheme locations and the impacts on residents.

1. <https://www.gov.uk/government/publications/technical-housing-standards-nationally-described-space-standard>

43% have permanent planning permission and are on permanently available sites

- 6 schemes (18%) are constructed from converted shipping containers and 27 (82%) are modular units.
- Shipping container schemes, with an average of 40 units on a site, tend to be larger in scale than modular schemes, with an average of 20 units on a site.
- 52% of schemes have under 20 units on a site and 48% of schemes have 20 units or more on a site.
- 12 schemes (36%) are for families and 21 schemes (64%) are for single households. However, out of a total of 808 units, 427 units (53%) accommodate families and 381 units (47%) accommodate single tenants.
- For 11 schemes, the unit size was not available. Where unit size information is available, 18 (82%) have units which are smaller than the national space standards and only 4 (18%) have units which meet the minimum space standards.
- 11 schemes (33%) have temporary planning permission and are on 'meanwhile' sites which will be developed in future for other uses, 14 schemes (43%) have permanent planning permission and are on permanently available sites, and for eight schemes (24%) the planning application information is not available.
- In 23 (70%) of the identified schemes, the local authority is the landowner of the site.
- For 24 (73%) of the schemes, information about the nature of the support provided to residents is not available. For the nine schemes where information is available, six provide floating support and three provide on-site support.
- The report identifies some potential benefits of the use of modular and container temporary accommodation. Procuring and installing modular or container houses is potentially faster and cheaper than waiting for new social housing to be constructed. However, although it is generally considered that modular and container housing is less costly than other forms of temporary accommodation, there is little robust cost data available to determine the exact cost of building modular and container units.
- The units make efficient use of under-utilised land and many are portable and can be moved to new sites in future. They may provide a better quality of life for residents than that experienced in other types of temporary accommodation, such as shared housing and hostels. These potential benefits need to be evaluated through further research.

- There are some potential limitations to the use of modular and container temporary accommodation and some possible barriers to development of the schemes. The units are generally smaller than the minimum space standards. There are concerns about the quality of the design of some of the schemes, the distance of some sites from local amenities, and the lack of onsite communal facilities, particularly in schemes housing children. Finding appropriate empty sites on which to locate the units is challenging. Funding the development of the schemes is also a challenge as the full costs of the schemes must be met through public subsidy, charitable donations, or through borrowing against the future potential rental income stream of the units. These are still relatively complex housing schemes to bring forward as they require considerations of planning, building regulations, finance, land access, unit design and site build-out management. They may also involve multiple actors, and in some cases there has been opposition from the existing local community.
- All the modular and container schemes identified are move-on homes with a temporary tenancy agreement. Our mapping exercise shows that the length of tenure varies from one scheme to another, but they all intend to house residents for no longer than two years. However, in practice, there are examples of schemes where tenancies were extended beyond the intended maximum length because of the unavailability of long-term affordable housing. Our understanding is that most schemes have applied for planning permission with the units described as providing temporary accommodation rather than permanent accommodation - hence tenancies are expected to last no longer than 2 years before households move on.
- As the schemes are relatively new, there is a lack of evidence about overall costs, resident experiences and the outcomes and impacts of the schemes. The aim of this research is to provide information about the existing schemes and their characteristics and to provide a discussion of their potential benefits and limitations to create a platform for further evaluation of the different schemes.

Tenancies are expected to last no longer than 2 years before households move on.



1. Introduction

1.1 Research aim and objectives

The use of temporary accommodation to house people experiencing homelessness has increased substantially over the past few years, particularly some of the more expensive models of accommodation. As such, understanding the relative effectiveness of alternative provision is a relevant policy question. Modular and container housing are one of the innovations increasingly used in the homelessness sector to provide temporary accommodation, but there is very limited evidence about the effectiveness of these models, the barriers and facilitators to set them up and operate them, and the experiences of people housed there.

The aim of this research is to provide an overview of current modular and container housing provision in the UK. It begins to explore whether such housing projects are an effective way to address housing needs for people experiencing homelessness or who are at risk of homelessness. The research categorises existing projects into different types, which should help to facilitate evaluation of their relative effectiveness in comparison to other types of temporary housing. This research looks specifically at self-contained modular units and converted shipping containers providing temporary accommodation for people experiencing homelessness.

This programme of work has three main objectives:

1. To conduct a mapping exercise of existing practice by identifying modular and container schemes in use across the UK, and by collating key information about the schemes.
2. To summarise existing insights into the use of modular and container housing in addressing housing needs of people experiencing homelessness, and to identify the barriers to implementing these schemes.
3. To test the relative effectiveness of modular and container housing in comparison to other types of temporary housing.

This report addresses the first objective and provides information about existing modular and container housing schemes. The report begins to address the second objective by collating case studies of current projects across the country and by identifying the potential



benefits and limitations of such schemes and the barriers to their development. This initial research aims to provide the information needed to meet the longer term objective of testing the relative effectiveness of modular units and shipping containers vis-a-vis other types of provision of temporary accommodation for people experiencing homelessness. A central element of this programme of work will be to listen to and analyse feedback from residents.

Sleeping pods are not considered in this research as they are not self-contained and do not offer independent accommodation. Provision of modular solutions for general needs housing and affordable housing through regular development programmes are also not considered in the scope of this research.

1.2 Research methods

The primary research method was a desk-based internet search for existing evidence and publications about the use of modular and container housing in addressing homelessness and to identify the benefits and barriers to implementing these schemes. The main sources of data were published reports, planning permission documents, online news reports and other media.

To fill in the gaps in the information about the identified projects, we also contacted 19 local authorities across the country who are involved in modular and container schemes to tackle homelessness. We also contacted some of the housebuilders, manufacturers, consultants and social enterprises involved in the projects, as well as the Department for Levelling Up, Housing and Communities, for further information and had informal conversations with some of these stakeholders.

1.3 Definitions

Before presenting the findings of the research, some of the most used terminologies in this report are defined in this section.

1.3.1 Homelessness

There is much debate surrounding the definition of homelessness (Fitzpatrick et al. 2021) and, in the UK, there is a slight variation in how each of the devolved nations defines homelessness (GSS 2019). However, it is generally understood that homelessness is a situation in which a person or household has no accommodation that is available and reasonable to occupy. Homelessness does not just refer to people who are experiencing street homelessness. The following

housing circumstances are examples of homelessness, as defined by the European Federation of National Organisations Working with the Homeless (FEANTSA) (2005):

- rooflessness (without a shelter of any kind, sleeping out.)
- houselessness (with a place to sleep but temporary, in institutions or a shelter)
- living in insecure housing (threatened with severe exclusion due to insecure tenancies, eviction, domestic violence)
- living in inadequate housing (in caravans on illegal campsites, in unfit housing, in extreme overcrowding)

1.3.2 Temporary accommodation

Local authorities across the UK have a duty to secure accommodation for households that are not classed as 'intentionally homeless'.

Households might be placed in temporary accommodation pending the completion of inquiries into an application, or they might spend time waiting in temporary accommodation after an application is accepted and until suitable secure accommodation becomes available. Local authorities use a range of types of temporary accommodation, including bed and breakfast accommodation (B&Bs), hostels, and self-contained accommodation.

1.3.3 Modular housing

The term modular housing can cause misunderstandings as it may refer to any kind of off-site construction, including pre-manufacture, prefabricated, or volumetric methods. A House of Commons report (2019, p.14) refers to all of these under the banner of 'modern methods of construction' (MMC) which includes 'forms of off-site manufacture for construction, including modular and panelised systems, and timber or steel framed homes'. The Modern Methods of Construction (MMC) definition framework identifies the following seven categories of MMC (MHCLG 2019):

Category 1 – Pre-Manufacturing - 3D primary structural systems: a systematised approach based on volumetric construction involving the production of three-dimensional units in controlled factory conditions prior to final installation. Volumetric units can be brought to the final site in a variety of forms ranging from a basic structure only to one with all internal and external finishes and services installed, all ready for installation.



In England, the number of households in temporary accommodation arranged by local authorities was 95,450 on 31 March 2021.

Category 2 – Pre-Manufacturing - 2D primary structural systems: a systematised approach using flat panel units for basic floor, wall and roof structures of varying materials which are produced in a factory environment and assembled at the final workface to produce a final three-dimensional structure.

Category 3 – Pre-Manufacturing - Non systemised structural components: use of pre-manufactured structural members made of framed or mass engineered timber, cold rolled or hot rolled steel or pre-cast concrete. To include load bearing beams, columns, walls, core structures and slabs that are not substantially in-situ workface constructed and are not part of a systemised design.

Category 4 – Pre-Manufacturing - Additive Manufacturing: the remote, site based or final workface based printing of parts of buildings through various materials based on digital design and manufacturing techniques.

Category 5 – Pre-Manufacturing – Non-structural assemblies and sub-assemblies: a series of different pre-manufacturing approaches that includes unitised non-structural walling systems, roofing finish cassettes or assemblies (where not part of a wider structural building system), non-load bearing mini-volumetric units (sometimes referred to as 'pods') used for the highly serviced and more repeatable areas such as kitchens and bathrooms, utility cupboards, risers, plant rooms.

Category 6 – Traditional building product-led site labour reduction/productivity improvements: includes traditional single building products manufactured in large format, pre-cut configurations or with easy jointing features to reduce extent of site labour required to install.

Category 7 – Site process-led labour reduction/productivity improvements: encompasses approaches utilising innovative site based construction techniques that harness site process improvements falling outside the five main pre-manufacturing categories 1-5 or materials innovation in Category 6. This category would also include factory standard workface encapsulation measures, lean construction techniques, physical and digital worker augmentation, workface robotics, exoskeletons and other wearables, drones, verification tools and adoption of new technology led plant and machinery.

Few manufacturers currently use this framework to describe their products, but most of the modular units identified in the mapping exercise appear to be category 1 units developed entirely offsite.

1.3.4 Container housing

Container housing is a unit made of one or more converted shipping containers. To make a distinction between the schemes using shipping containers and the schemes using other modular construction types, we differentiate these types in the report.

1.4 Background

A key driver of homelessness is a shortage of affordable housing, including social rented properties. Although homelessness in the United Kingdom is measured and responded to in different ways in England, Scotland, Wales and Northern Ireland, there is an increasing demand for suitable temporary accommodation in all four devolved nations. The following statistics on the number of households experiencing homelessness and being housed in temporary accommodation help to contextualise the issue.

In England, 284,480 homelessness applications were received in 2020-21, indicating that the number of people approaching homelessness services reduced by 7% in 2020-21 compared to 2019-20 (DLUHC, 2021). In 2020-21, 120,310 households were owed a prevention duty, a decrease of 20% compared with the 2019-20. However, a further 150,400 households were owed a relief duty in 2020-21, a 7% increase compared to 2019-20 (DLUHC 2021).

In England, the number of households in temporary accommodation arranged by local authorities was 95,450 on 31 March 2021, up 3.5% from 92,190 on 31 March 2020. This increase is driven by an increased number of single adult households, which at 29,120 was up 24.6% on 31 March 2020, while the number of households with children at 31 March 2021 was 59,120, down 6.1% from 31 March 2020 (MHCLG 2021, p. 27).

In England, there are regional differences between the type of temporary accommodation that households with children are living in. In London, households with children in temporary accommodation are most likely to be in private sector accommodation (16,660 households), or nightly paid self-contained accommodation (14,040 households); in the rest of England, households with children in temporary accommodation are most likely to be in local authority or housing association provided accommodation (6,840 households) (MHCLG 2021, p. 29).



Single households in temporary accommodation in London are most likely to be in nightly paid self-contained accommodation (5,380 households) or private sector accommodation (4,920 households); in the rest of England, single households in temporary accommodation are most likely to be in B&Bs (6,220 households) or local authority or housing association provided accommodation (4,110 households) (MHCLG 2021, pp. 28, 29).

In Scotland, 33,792 homeless applications were received in 2020-21, a decrease of 9% in the number of people approaching homelessness services compared to 2019-20. In terms of the number of people receiving a homelessness duty, in the 2020-21 period, 27,571 households were assessed as homeless in 2020/21, a decrease of 13% compared to 2019-20 (Scottish Government 2021).

In Scotland, 13,097 households were living in temporary accommodation on March 31, 2021, according to the snapshot data. There was an increase in the use of B&B accommodation in 2020-21, compared to the previous year (7% to 9%) and a decrease in hostel accommodation (12% to 10%) (Scottish Government 2021).

In Wales, the latest data available is for 2019-20. In that period, a total of 9,993 households were assessed as being threatened with homelessness within 56 days, a decrease of 7% on the 10,737 households recorded during the previous year (Welsh Government 2020). During 2019, 12,399 households were assessed as being homeless and owed a duty to help to secure accommodation (under Section 73 of the Housing (Wales) Act 2014). This was an increase of 6% compared to the 2018-19 period, and is the highest number reported since the introduction of the current legislation in April 2015 (Welsh Government 2020).

In Wales, the number of households in temporary accommodation was 2,324 households on March 31, 2020. This indicates an increase of 4% compared to March 2019 (Welsh Government 2020). On March 31, 2020, 496 households were placed in temporary B&B accommodation, an increase of 68% compared to March 2019.

In Northern Ireland, in the period January-June 2021, 8,610 homeless applications were received, an increase of 9% compared to January-June 2020. In the 2021 period, 5,067 households were accepted as statutory homeless, a 10% increase on the previous year (Department for Communities 2021).

In Wales 9,993 households were assessed as being threatened with homelessness within 56 days.

In Northern Ireland, the number of households in temporary accommodation was 3,402 on 13 August 2021, an increase of 16% compared to 6 July 2020. On August 13, 2021, 49% of the households were accommodated in hotels and B&Bs (compared to 58% in the previous year), 21% were in private lets (the same as the previous year), and 18% were in voluntary sector hostels (12% in the previous year) (Department for Levelling Up, Housing and Communities 2021; 2020).

To provide an alternative form of temporary accommodation, a number of local authorities, social enterprises and charities have introduced modular and shipping container self-contained housing units for people experiencing homelessness or at risk of homelessness. These units are mostly an alternative to sleeping on the street, or being accommodated in hostels, shared housing, B&Bs or sofa surfing.

This type of accommodation can range from converted shipping containers to high specification, factory produced volumetric units. The number of schemes for people experiencing homelessness using modular and container units has increased considerably in the past couple of years but there is as yet little research conducted to evaluate them, making this research, with its objective of mapping out existing schemes, very timely.

In Northern Ireland, the number of households in temporary accommodation was 3,402 on 13 August 2021.



2. Examples of housing projects

A number of housebuilders, charities and third parties are involved in providing funding and technical support to tackle homelessness through the provision of modular or container housing. This section provides some examples of these projects, and the following section will provide an overview of the characteristics of the identified schemes.

2.1 Hill Foundation 200 (types G and H)

In 2019, to mark their 20th year of business, Hill, a housebuilder based in London and the South East, established Foundation 200. As part of this initiative, Foundation 200 made a pledge to build 200 modular units over five years which will be donated to be used as temporary accommodation. Hill is committed to spend £12 million on the design and construction of modular homes for people experiencing homelessness.

The modular homes (SoloHaus prototype) have been designed with the help of leading homelessness charities and stakeholder groups, with a minimum 60 year life expectancy. They have been produced using off-site manufacturing methods, and will be sited on small plots of land, such as former garage sites, across Hill's area of operation. The homes will be arranged in small groups, with no more than eight on one site and no higher than two storeys.

Foundation 200 works with local authorities and housing associations to source land and secure planning for each of the small sites. Each site will also have a local homeless charity partner, which will be gifted the completed homes and will manage the re-homing process. The properties will be handed over to the partner charity fully furnished. Since the launch of the Foundation 200 SoloHaus prototype in April 2020, Hill has seen significant demand from local authorities, charities, housing associations, suppliers and consultants for purchasing SoloHaus homes, as well as considerable interest in Hill's pledge to deliver 200 homes.

The individual SoloHaus homes are stackable and moveable. Hill took a 50% stake in a start-up design and manufacturing business, Volumetric Modular Ltd, based in Shrewsbury, to design and construct various MMC products, initially for the partnership and eventually for third parties. Each home weighs approximately 9.5t and is delivered

on a flatbed lorry and lifted into location using a mobile crane. All homes, staircases and balustrading for upper floors are uniform in design, meaning they can be removed and reinstalled in any order or form on any site.

The main features of SoloHaus homes are:

- Insulated to be warm in winter and cool in summer
- Card operated electric meter, to encourage budgeting
- Cheap to run – just £5 electricity per week
- Fully furnished living/dining area, bedroom with storage, fully fitted kitchen and bathroom with shower
- Integrated cabling for Broadband and TV connectivity
- Composite door and windows
- Built off-site in a factory to the Future Homes Standard
- BOPAS accredited with a 60 year life span – enables grants, loans and mortgages
- Building Control approved design
- Constructed with A1/A2 fire rated building materials
- Manufactured in 20 days
- Easy to transport, deliver and install – can be lifted off a flatbed lorry onto a site in 30 minutes
- 24m² internal living environment
- Stackable to two storeys
- Sits on six foundation pads to minimise groundworks
- Requires only electric, water and waste connections
- Heated via an air source heat pump (one per six homes)
- Soil Vent Pipe and Rainwater outlet
- Controlled flow shower mixer and dual flush cistern to minimise water consumption
- Fully traceable factory inspection and test plan linked to a unique serial number (SoloHaus, n.d.).

Our mapping exercise identified that Hill's Foundation 200 initiative has implemented six schemes so far, in Cambridge, Southend-on-Sea, Ipswich (all type G, constructed with modular units, under 20 units on the site, housing single households) and Haringey (type H, constructed with modular units, 20 units or more on the site, housing single households).

The SoloHaus units are approximately 24m², according to the national space standards, the minimum gross internal floor area for a one-bedroom flat housing one person is advised to be 37m² (DCLG, 2015).

Figure 1 Floor plan of a SoloHaus unit



Source: <https://solohaus.co.uk/the-solution/>

Figure 2 Example of SoloHaus units



Source: <https://solohaus.co.uk/the-solution/>

2.2 Centrepoin't's Independent Living Programme (type H)

Centrepoin't is a charity providing young people aged 16 to 25 experiencing homelessness with accommodation, health support and life skills in order to get them back into education, training and employment. To mark its 50th anniversary in 2019, the charity launched a capital investment plan to deliver 300 new modular homes across London and Greater Manchester to help young people into affordable accommodation, training and employment. To achieve this, Centrepoin't is building new partnerships with landowners, potential funders and politicians (Centrepoin't 2019).

Centrepoin't has a £50,000-per-unit plan which seeks to address the current shortage of affordable homes for young people who are ready to move on from the charity's services but cannot afford to do so, even if they are in work. To support young people, rents will be capped at no more than one-third of their income during their tenancy, which will last up to five years (Centrepoin't, 2019).

For the charity, one of the advantages of modular housing is the ability to transport units between sites to reduce the costs of development due to high land values. Centrepoin't is working with landowners to identify potential sites where they can work in partnership to deliver these homes for young people (Centrepoin't 2019).

Centrepoin't was granted planning permission in February 2021 to develop a project in the London Borough of Southwark that would see the demolition of an existing building to enable the erection of 33 self-contained modular studio flats with associated communal facilities, landscaping, refuse, cycle and amenity provisions. This will be type H, constructed with modular units, 20 units or more on the site, housing single households.

Figure 3 Artist's impression of Centrepoin't's project in Lugard Road, Southwark, Lugard Road



Source: <https://www.southwarknews.co.uk/news/peckham-modular-homes-for-homeless-young-people-approved-by-southwark-council/>

2.3 PLACE (type E)

Pan-London Accommodation Collaborative Enterprise (PLACE) was established in May 2018 to tackle homelessness through the acquisition of modular temporary accommodation. PLACE is a collaborative programme that will see London boroughs deliver new temporary accommodation for use by households that are homeless or at risk of homelessness (London Councils n.d.).

PLACE was developed by the London Housing Directors' Group and the umbrella body London Councils in response to the capital's worsening homelessness crisis and the chronic shortage of temporary accommodation options. The initiative is supported by £11 million of funding from the Mayor of London and it is the first collaboration between UK local authorities purchasing modular housing for this purpose (London Councils n.d.).

PLACE accommodation will meet London's design requirements and building control regulations. The modular homes will be placed on vacant 'meanwhile' sites – land earmarked for development in the long term which would otherwise remain underused (London Councils n.d.).

Our mapping exercise identified a modular scheme implemented by PLACE, in collaboration with ESS Modular, in the London Borough of Tower Hamlets to provide temporary housing for 16 families. This scheme has temporary planning permission for 10 years. This is an example of type E, constructed with modular units, under 20 units on the site, housing family households.

Figure 4 Artist's impression of PLACE's project in Poplar, London Borough of Tower Hamlets



Source: Savills, 2020

3.4 Social Bite (type G)

In Scotland, Social Bite's two founders set up a social enterprise to run a café in Edinburgh. Through their café, the founders and staff got to know people living on the streets and in other unsafe settings. Over time, they explored the potential for their social enterprise to provide a safe place for people experiencing homelessness and in 2018, they launched The Social Bite Village project.

The Social Bite project is a small village made up of 10 two-bedroom prefabricated houses and a community hub built on vacant, council-owned land in Edinburgh. The organisation partners with the homelessness charity Cyrenians to provide dedicated on-site support

with links to employment, education and community activities. This is an example of type G, constructed with modular units, under 20 units on the site, housing single households.

Figure 5 Social Bite Village, Granton, Edinburgh



Source: <https://social-bite.co.uk/about-us/>

3.5 The Salvation Army (type D)

The Salvation Army is a worldwide Christian church and registered charity. In the UK, it offers practical support and services in relation to homelessness: The Salvation Army operates over 80 supported accommodation services across the UK and the Republic of Ireland.

The Salvation Army has formed a partnership with Citizens UK to develop Malachi Place in Ilford, London Borough of Redbridge. The initiative, which began with five-year old Malachi Justin donating his tooth fairy money, has now provided homes for more than 56 people since it opened in March 2020. This scheme is made of shipping containers and has temporary planning permission for five years. This is an example of type D, constructed with shipping container units, 20 units or more on the site, housing single households.

Figure 6 Malachi Place in Ilford, Photo by: Ellena Cruse



Source: <https://www.standard.co.uk/news/london/salvation-army-ilford-homeless-shelter-malachi-justin-tooth-fairy-a4371836.html>

Continuing this mission, The Salvation Army and Citizens UK have formed a partnership with Hill to develop more modular schemes. Our mapping exercise identified a project planned to be built using Hill's SoloHaus in Southend-on-Sea.



3. Characteristics of the projects

In mapping the existing modular and container schemes to house people experiencing homelessness, we note that the schemes are diverse. This section introduces the schemes and their characteristics by categorising the schemes according to their construction method, the number of units on site, and the type of households they accommodate.

3.1 The schemes

We identified 33 schemes in 22 local authorities using modular and container housing to address homelessness across the UK. From the 33 identified schemes, six are made from shipping containers and 27 are modular housing. These schemes provide a total of 808 units of accommodation, 427 units to accommodate families and 381 units to accommodate single tenants.

Appendix 1 presents information about the identified schemes. This is not an exhaustive list of all the practices as there are more schemes in the pipeline and there may be other schemes that we have not been able to identify at the time of writing.

3.2 Typology

To help identify the main differences between the existing modular and container projects and to provide a basis for further evaluation and comparison of the different schemes, we categorised the 33 identified housing projects into groups. The categorisation is made according to three main criteria: the construction method used (modular/container), the number of units on an individual site (under 20 units/20 units and over), and the cohort housed by the scheme (families/singles)..

We believe that the construction type, that is, whether the units are constructed from shipping containers or are purpose-built modular units, may be an important consideration in future evaluation of the schemes because converted shipping containers and purpose-built modular units may perform differently and may provide different living experiences for residents. The number of units on a single site may also be an important consideration in future evaluation of the schemes because these factors may affect the quality of the overall living environment and the residents' experience. Finally, the

characteristics of the cohort housed by a project may be an important consideration in future evaluation of the schemes because family households and single households may have different needs and requirements.

A typology to explore the effectiveness of these models may also consider additional characteristics in the future as further research collects detailed information about the schemes could include the size of the units and the nature of the location of the site.

Table 1 shows the number of projects identified in each category.

Table 1 Types of schemes and the number of projects identified in each category

Type	Construction method	Size of scheme	Cohort housed	Number of projects identified	% of projects identified
A	Shipping container	Under 20 units on site	Families	0	0%
B	Shipping container	20 units and over on site	Families	4	12%
C	Shipping container	Under 20 units on site	Singles	0	0%
D	Shipping container	20 units and over on site	Singles	2	6%
E	Modular	Under 20 units on site	Families	3	9%
F	Modular	20 units and over on site	Families	5	15%
G	Modular	Under 20 units on site	Singles	14	43%
H	Modular	20 units and over on site	Singles	5	15%

3.3 Characteristics of the identified schemes

3.3.1 Construction method

In considering the general construction method of the 33 identified schemes, we found that 18% are constructed by shipping containers and 82% are constructed using modular units. We believe that the construction type, that is, whether the units are constructed from

shipping containers or are purpose built modular units, may be an important consideration in future evaluation of the schemes. Costs, ease of construction, build quality and resident experience may all be shaped by the construction type and could be explored in further research.

Shipping container schemes

From the 33 identified schemes, six schemes with a total of 240 units were made of shipping containers. This means that although 18% of the schemes are made from shipping containers, they comprise 30% of all units, implying that shipping container schemes on average tend to be larger in scale compared to modular schemes. The average number of units on an individual site for shipping container schemes is 40 units. Three of these schemes are in London and the other three are in Brighton, Reading and Manchester.

The dates of the development of container schemes shows that the earlier schemes were made using converted shipping containers. The first scheme developed was built in 2013-14 in Brighton, and the second in Ealing in 2016. More recent projects tend to be made using prefabricated modular construction methods. However, we identified one project currently about to start construction (Embassy Village, Manchester) which was originally planned to be constructed from shipping containers, although other options are being considered.

Shipping containers are easily stackable and all the shipping container schemes that we identified are stacked and have between two to five storeys.

Whilst there is as yet little robust evaluation of such container housing, anecdotal evidence suggests that the experience and level of satisfaction of residents living in shipping containers varies. Shipping containers are made of steel which has a high thermal conductivity, and consequently one of the main concerns of residents is that the units are too hot in summer and very cold in winter (The Guardian 2019).

Figure 7 Richardson's Yard, Brighton



Source: BBC News

Figure 8 Shipping container flats at Meath Court, Acton



Source: Martin Godwin/The Guardian, 2019

Modular schemes

From the 33 identified schemes, 27 schemes with a total of 568 units are made of modular build. This means that 82% of all schemes are a

modular construction type. In terms of the number of units on a single site, the average number of units on a scheme using modular build is 20 units, half the number of units of the average for shipping container schemes.

Built in 2016, Westfields Lodge in the London Borough of Ealing, is the first modular scheme in the UK built as temporary accommodation to house people experiencing homelessness. This scheme was followed by Lambourn Close in the London Borough of Ealing and the Social Bite Village in Edinburgh in 2018. There has been an increase in the number of modular schemes from 2020 onwards.

Figure 9 Lambourn Close, London Borough of Ealing



Source: https://www.ealing.gov.uk/news/article/1892/work_begins_on_unique_project_to_move_16_modular_homes_to_hanwell

Modular units are constructed offsite in a factory and then installed on site. The materials used to make the units vary depending on the factory producing them. Examples identified in our research are made from cross-laminated timber or fibre cement panels, and are timber-framed or steel-framed. Some of the units are expected to last 60 years. For example, the SoloHaus units are BOPAS-accredited with a 60 year life span.

In England, if a temporary accommodation scheme built using modern methods of construction aims to receive government grant funding through the Rough Sleeping Accommodation Programme (RSAP), it needs to have a minimum life expectancy of 60 years and should comply with minimum space standards (MHCLG, 2021, p.8). At the

time of this research, DLUHC confirmed that, under the 2020-21 round of RSAP, the government has funded modular schemes in Reading, Haringey and Cowllins Mill at Carn Brea, Cornwall. There are additional schemes under review for funding. This funding stream is available in England only and we are not aware of any equivalents in other parts of the UK.

There is some variety within the modular category and some units are referred to as cabins and Bunkabins, a model of housing developed around the portable cabins often used for temporary accommodation on building sites. These have been included as units in the modular category as they are modular in construction.

3.3.2 Number of units on a site

We believe that the number of units on a single site may be an important consideration in future evaluation of the schemes. The number of units on a site and their density may affect the quality of space and the residents' experience, but there is as yet no evaluation of such impacts. Some stakeholders (e.g., Hill) believe that the homes should be arranged in small groups, with no more than eight on one site and no higher than two storeys to avoid the creation of 'ghettos'. On the other hand, there may be economies of scale and cost efficiencies in developing larger schemes.

Units have either a single storey or are stacked in multiple storeys of up to five storeys, as seen in the High Wycombe project in Buckinghamshire (modular) and Richardson's Yard in Brighton (shipping containers). The number of units on a single site ranges from four units on a site in Cambridge, to 70 units on the Fishermead scheme in Milton Keynes. Meath Court in the London Borough of Ealing has 60 units, High Wycombe has 58, and the Grangetown project has 48 units. These four larger projects accommodate families, and the number of people living on the site is therefore likely to be relatively large. The impact of the number of units on a site would be a useful area of future research.

We categorised the schemes into two main groups, under 20 units on a site (52%) and 20 units or more on a site (48%). Table 2 shows more information about the number of units on the identified sites.

Table 2 The number of units in schemes

No. units	1 to 9	10 to 19	20 to 29	30 to 39	40+	Total
No. schemes	8	9	3	6	7	33
Percentage	24%	28%	9%	18%	21%	100%

3.3.3 Cohorts housed by the schemes

We believe that the characteristics of the cohort housed by a project may be an important consideration in future evaluation of the schemes. We categorised the cohorts into family households and single households as these two groups are likely to have different needs and requirements. Out of the 33 identified schemes, 12 (36%) are for families and the other 21 (64%) are for single households. However, if we look at the total number of units, out of a total of 808 units, 427 units accommodate families (53%) and 381 units (47%) accommodate single tenants. Other than the Social Bite Village in Granton, Edinburgh, where 20 single residents share 10 units, the other schemes for single cohorts are single occupancy.

3.3.4 Other important characteristics

Size of the units

Our mapping exercise shows that most of the units are smaller than the recommended size advised by national space standards (DCLG, 2015) which are shown in Table 3. The nationally described space standard is not a building regulation and remains solely within the planning system as a new form of technical planning standard.² Unit size information for 11 schemes (33%) was not available. Where unit size information is available, we identified that 18 (82%) of the schemes have units which are smaller than the space standards and only 4 (18%) have units which meet the minimum space standards.

2. <https://www.gov.uk/government/publications/technical-housing-standards-nationally-described-space-standard>

Table 3 Minimum gross internal floor areas (m²), source: DCLG, 2015

Number of bedrooms	Number of bedspaces (persons)	Gross internal floor areas
1b	1p	37 m ²
1b	2p	50 m ²
2b	3p	71 m ²
2b	4p	70 m ²
3b	4p	74 m ²
3b	5p	86 m ²
3b	6p	95 m ²

For the schemes where unit size information was available, one-bedroom units had an average unit size of approximately 24m²; according to national space standards, the minimum gross internal floor area for a one-bedroom flat housing one person should be 37m² (DCLG, 2015). In two of the schemes (Marston Court and Meath Court, both in Ealing), we found that families were living in units as small as 25.08m² (for a two-bedroom unit) and 37.30m² (for a three-bedroom unit). Only four schemes met the space standards, see Table 4.

Table 4 Schemes which meet the minimum space standards

Location	Size of Units	Type	Cohort
LB of Tower Hamlets	4 x 2b (74m ² and 96.6m ²) 3 x 2b (96.6 m ²) 9 x 3b (97.6 m ²)	Modular	Families
Norfolk, King's Lynn	1b (40m ² and 51m ²)	Modular	Singles
LB of Havering, Romford	1b (37m ²)	Modular	Singles
Bristol, St George	9x 1b (39m ²) 2x 2b (70m ²)	Modular	Singles

Concerns have been raised about accommodating people in housing units that are smaller than the space standards (East London Housing Partnership 2017). However, planning permissions have been granted on the grounds that these units have been designed as specialist housing for temporary accommodation to support people who have been experiencing homelessness at a low cost. Additionally, we noticed in planning permission applications that the smaller unit size is argued to be associated with the reduction in the risk of 'cuckooing' (a practice where people take over a person's home and use the property to facilitate exploitation).

Further research is needed to assess the impact of unit size on the experience of different types of residents. For example, it is possible that families find living in units smaller than the space standards more challenging than single people, but there is as yet little evidence.

Site availability and the length of planning permission

The schemes we identified are either developed on 'meanwhile' sites, that is, sites waiting to be developed for other uses in the future, or on permanent sites. The schemes on meanwhile sites were granted temporary planning permission for the length of time that the site is available. Out of 33 schemes, 11 schemes (33%) have temporary planning permission and are on meanwhile sites, 14 schemes (43%) have permanent planning permission and are on permanently available sites, and for 8 schemes (24%) we do not have access to the planning permission information. Our mapping exercise shows that the length of temporary permission for the sites that we identified ranges from three years in the Newmarket Road, Cambridge project to 30 years in the St George's Bristol project.

Land ownership of the site

In 23 (70%) of the identified cases, the local authority is the landowner of the site. In six schemes (18%), where the local authority is not the landowner, we have identified that the land may be owned by private developers, housing associations, churches, or charities. Information about the land ownership of the remaining four schemes was not available.

Onsite facilities and support

Some schemes only encompass living units with no additional facilities, while others may have facilities like a play area for children, a community hall, communal open and green space, or a sports area (e.g., as planned in Embassy Village in Manchester). As this

information is not available for many of the schemes, we could not put definite numbers on how many schemes provide onsite facilities.

Some schemes provide onsite support for their residents while others have floating support for residents. For 24 of the schemes (73%) we do not have information about the nature of support provided to residents. For the nine schemes where information is available, six provide floating support and three provide onsite support.

In our mapping exercise we have not identified any scheme being built for residents with high support needs, nor any scheme only for women.

Information about the onsite facilities and the level and type of support provided on each scheme is currently limited and needs further research.

Figure 10 Embassy Village, Manchester (Image: Embassy)



Conditions of entry

Some of the identified schemes have entry conditions that tenants need to meet to be admitted to the accommodation. In some of the few schemes where such information was publicly available, a zero tolerance drug and alcohol policy exists and there are support staff who either live on the site or who visit the site on a regular basis. However, information on these conditions was not available for the majority of the schemes.

For one scheme in Cambridge (Crowland Way), the management strategy submitted as part of the planning application describes some conditions that prospective tenants should meet:

- The homes will be let to individuals with needs which are appropriate to the facilities being provided. The proposed client base are single individuals with a history of homelessness, with moderate to significant support needs, who would benefit from some private space where they can establish a measure of independence.
- A 'typical' modular home tenant is likely to be an individual who has made significant progress in the period prior to being offered a tenancy, and is ready and eager to live more independently. Very often they will have been living in a hostel immediately before the offer for up to two years.
- A modular home tenancy, and the responsibilities that go with that tenancy, will have been discussed and agreed with the tenant, and to live in a modular home will be a choice that they have freely made. Should the tenant have had non housing-related difficulties such as mental health or substance use problems, they will be well on their way to addressing these and will have been stable for a considerable period. Some prospective tenants will already be working, in training or volunteering and, of the rest, most will be on their way to returning to employment or some other useful daytime activity. Via the hostel system and the charities supporting them, the tenants will still be able to access the community in which they've been living.

Costs vary from
£35,000 to £75,000
for a one-bedroom
unit.

4. Benefits and barriers

Schemes using modular and container units to address homelessness are relatively new in the UK. Little research has been conducted about these housing types and robust evidence of the benefits of these schemes and the barriers to their development is limited. This section is based on our existing research, our knowledge of some of the projects and discussions with some of the actors involved (Burgess et al. 2021, 2020) and our wider research on modular housing (Maslova et al. 2021). The mapping of the current schemes and their characteristics provided in this report should provide a basis for future evaluation of the different schemes and for research on their impacts.

4.1 Benefits

This report identifies a number of potential benefits of the use of modular and container temporary accommodation for people experiencing homelessness. However, it is possible that these benefits may vary from one scheme to another. Depending on the quality of materials used in a scheme, its design, the number of units on the site, and the available support, the experience of residents may also vary and should be explored through further research.

4.1.1 Speed of construction

The greater speed of construction provided by using modular and container units is identified as one of the main advantages of using such housing as opposed to using traditional construction methods to tackle homelessness. Using modular and container units rather than traditional brick and mortar construction increases the speed of onsite operations, reduces the need for onsite reworking and reduces the disruption caused by construction for the local community.

Assembled and fitted out off-site units, ready for delivery to site as completed units, can reduce health and safety risks onsite and provide safer working conditions. Modular solutions may also benefit from higher fabrication quality, improved material efficiency and reduced waste (Maslova et al. 2021).

Meath Court, in the London Borough of Ealing, was constructed using shipping containers. Housing 60 households, it was assembled in only 24 weeks (The Guardian 2019). In the London Borough of Haringey, Hill's SoloHaus modular homes are planned to be erected on site in seven days (Streets Kitchen 2021). Further research would be needed to understand the construction times for the projects identified, and

to identify how long it took to secure a site, planning and finance. This would provide a basis for comparison with other forms of accommodation provision.

4.1.2 Relative low costs of construction and maintenance

With constraints on the supply of new affordable housing stock and long waiting lists for social housing, local authorities have increasing numbers of families and individuals who are experiencing homelessness or are at risk of homelessness and who need emergency and then permanent accommodation. Shipping containers and modular homes are considered as more cost-effective options to provide temporary accommodation than hostels, bed and breakfasts, and hotels (East London Housing Partnership 2017).

Our mapping exercise shows that unit costs vary from £35,000 to £75,000 for a one-bedroom unit, although it is not necessarily clear if these figures are manufacturing costs only, or include associated costs, such as planning, installation and fit out. These are relatively modest amounts compared to buying property or funding new build affordable housing. It also allows for local authorities, charities and businesses to fund the homes themselves as unit costs are relatively low and allow for a variety of stakeholders to support the development of the schemes by providing in-kind help.

Although it is generally considered that modular and container housing is less costly than other forms of temporary accommodation or the general construction or acquisition of social housing, there is little robust cost data available to determine the exact cost of building modular and container units. Although there is information available for some schemes about the cost of a unit, there is very little information about the other costs involved, such as in-kind contributions from other stakeholders involved in developing a scheme, and any subsidised rates and pro bono services associated with the project, including the search for land, the design of the units, planning application support, site preparation, manufacturing, transportation and onsite installation of the units and furnishing.

Additional costs also arise from the provision of onsite and floating support services offered to the residents as well as from ongoing operational costs. There are as yet no evaluations that take into consideration all the capital and operational costs, nor is there evidence to compare these housing schemes directly with other forms of housing provision. Whilst there is an assumption that these units are a relatively inexpensive form of provision of temporary

The stability gained from living in the modular housing and receiving the support services have helped residents to return to work.

accommodation, there is as yet insufficient evidence to demonstrate this robustly.

4.1.3 Quality of life for residents

It is possible that the quality of life experienced by residents of different modular and container housing schemes varies, shaped by individual, scheme and support related factors, but there is little evidence as yet about the resident experiences of such housing or the outcomes. There are anecdotes of success stories of residents whose lives improved and who moved on to permanent independent housing after living in the temporary accommodation³ but there are also stories of people who did not have a positive experience living in such housing (i News 2020). Without further in-depth research, it is not possible to determine what factors shape the experience of residents living in the different types of schemes.

Recent research about the six modular units in the Newmarket Road project in Cambridge, (Burgess et al. 2021) shows that independent living provided by modular homes in tandem with robust support services has the potential to improve the quality of life for people experiencing homelessness. All six residents in the modular homes were men. There were considerable variations in how long residents had been sleeping out or moving in and out of temporary accommodation. Two had experienced long-term homelessness (over ten years). All had previously been accommodated in Jimmy's Cambridge hostel. Evidence from interviews with the six residents throughout their first year of residency identified eight areas of improvement in residents' lived experience:

3. For example, see Thames Gateway YMCA Romford project video: <https://youtu.be/mGtTe7oDvSU>

- Residents gained a greater sense of self, safety and security. The modular homes provided residents with a private, independent home, thereby enhancing their sense of personal safety and autonomy. This is a more positive living environment than hostel accommodation.
- Residents stopped or significantly reduced the use of drugs and alcohol. This has also resulted in positive outcomes in terms of better physical and mental health, improved financial management and stronger social relationships.
- Residents improved their financial management skills, including budgeting for their rent and service charges, saving for personal future use and development, buying tools for work, and providing limited financial support to dependents.
- Residents had become enthusiastic about returning to work by training to acquire new skills to seek employment or returning to a previous trade or business. The stability gained from living in the modular housing and receiving the support services have helped residents to return to work.
- Residents were restoring, or making efforts to restore, social relationships. Many residents reported that they had lost contact with their family whilst experiencing homelessness. Having a place to live that residents can be proud of and can call home, along with the support of key workers, improved their social relationships.
- Residents were developing a good sense of community and developing trusting relationships amongst themselves, with family members, and with support workers.
- Residents were developing a sense of control over their lives by having their own space to call home. This sense of control over their lives was improved further by maintaining a tenancy, managing money and restoring social relationships, in addition to reduced drug and alcohol use. They had been able to develop stable daily routines in their homes, managing and making decisions about their own home, including cooking for themselves.
- Residents were making plans to move eventually to permanent housing. One resident was about to move on to social housing. Not all of the residents were either ready to sustain a tenancy in permanent housing or were interested in moving yet. The time and degree of support needed before a resident of the modular homes is ready to move on to permanent accommodation will vary, depending on their individual circumstances and needs. (Burgess et al. 2021, pp. 2,3)

There is a need for more research as we still know very little about the relative effectiveness of accommodating people in modular and container housing compared to other types of accommodation. Future research could consider how such housing meets the needs of people with higher support needs, of women and of families.

4.1.4 Move on support

The schemes identified in the mapping exercise are all intended to be temporary accommodation, providing transitional housing for residents with the aim of supporting residents to move on to permanent, long term independent living. The housing schemes are generally supported by a local homelessness service or charity which provides on-site or floating support to residents. This might include support with tackling drug and alcohol use, budgeting, employment skills and access to training, for example, and support in accessing physical and mental health services.

The target client group for some schemes are people who would otherwise be living in hostel accommodation or who have lived for long periods in hostels. Foundation 200, the initiative of the house builder Hill, described the aim of the units in information provided as part of the planning application as follows:

The self-contained modular homes will provide high quality transitional accommodation for people who have previously found it difficult to qualify for a home via the traditional housing waiting list. This especially applies to those who have spent 2 years in hostel accommodation and are desperate to move on. Feedback from previously homeless clients indicates that individuals feel better able to manage a small home than a conventional property. Larger properties also bring the risk of 'cuckooing' which is why these are 1 person, 1 bedroom homes.

The modular housing schemes themselves will be let to single people who are able to maintain a tenancy but who require a 'stepping stone' between homelessness or hostel accommodation and a more established long-term tenancy in a general use residence. The aim will be to provide secure accommodation for a period of time, estimated at 12-18 months, to allow the tenants time to re-establish stability in their lives and their own address prior to moving on to more permanent general use housing.

The proposed client base are single individuals with a history of homelessness, with moderate to significant support needs, who would benefit from some private space where they can establish a measure of independence.

In the Foundation 200 scheme, a tenant selection process is in place to try and ensure the residents are a good fit for the scheme. Although robust support measures are provided, the Hill homes are not offered to anyone requiring intensive support.

4.1.5 Good use of under-utilised land

Container and modular homes make efficient use of what are generally brownfield sites and currently disused, or little-used, space. They can be erected on temporary sites earmarked for future development and they can be moved to other sites when necessary. Some of the sites used for modular/container temporary housing are not suitable for other types of housing development because of their size and shape. The small footprint and modular capabilities of the units maximises the potential of the available land.

For example, in Haringey, the development is planned to be in place for seven years after which Crossrail will pass through the site; because of these plans, it is not possible to build permanent housing or any other permanent development on this site. Modular homes make the most of an opportunity to utilise currently unused space whilst it is available for a limited period.

4.1.6 Portability of units

Another advantage of using modular and container housing is their portability, as they can be transported to site as completed units and moved to new sites when the temporary planning permission expires for a site, or if the land is not available for longer occupation for any other reason. However, these schemes are all relatively new and we did not identify any unit which had occupied one site and then been moved to another.

4.1.7 Collaboration

Most of the schemes we identified are collaborations between several actors which in some cases allows for the local community to come together to take action to address rough sleeping and homelessness. The work and effort that goes into delivering these developments is often significant and requires considerable amounts of coordination between different collaborators, which might be a benefit as well as a barrier, depending on the situation.

There are examples of how a small initiative has resulted in big impacts. The idea for Malachi Place in Ilford, London Borough of Redbridge, was sparked by a schoolboy donation of £5 to his

local Salvation Army branch and has subsequently brought several stakeholders together for the provision of new homes for rough sleepers in east London (Evening Standard 2020).

4.2 Barriers

The advantages of using modular and container housing solutions are discussed in the previous section. However, there are a number of barriers to the development of such schemes and some areas of concern about them. Further research is needed to evaluate these housing schemes more robustly.

4.2.1 Space standards and quality of design

One of the concerns about some of the schemes is the risk that they are of sub-standard quality relative to mainstream housing, both in terms of the quality of the individual units or the quality or lack of communal spaces. This concern is articulated for schemes built of shipping containers to house families with children; these have been argued to have a negative psychological impact on the children living in them (Children's Commissioner for England 2019, Shelter 2018).

Our mapping exercise shows that, in most of the schemes, unit sizes are less than the minimum space standards, as discussed in the previous chapter. While the minimum gross internal floor area for a one-bedroom flat housing one person is 37m² (DCLG 2015), most of the schemes are smaller than this. However, it is possible that self-contained modular units, even if smaller than the minimum space standard, may offer a better standard of accommodation than other available alternatives for temporary accommodation. The experience of living in a home smaller than the minimum space standards is an area for further research.

In addition to concerns about minimum space standards, there are concerns about the quality of the design and the materials used in some of the schemes (Berkshire Live n.d.). Some of the family schemes lack safe play areas for children, proper community and communal outdoor spaces for residents to use and, in some cases, there are signs warning against anti-social behaviour and drug use which are not conducive to a pleasant living environment.

In terms of material performance, repurposed steel shipping containers do not perform well in summer and winter. In some of the schemes, residents described their homes as being freezing in the winter and very hot in the summer and, in some cases, had developed mould (i News 2020).

There is some concern around the longevity of modular prefabricated units. As this method of construction is relatively new, there is little evidence on how they perform over the long term and how they will age both externally and internally. In some cases, the life expectancy of the modular units is estimated to be 60 years.

4.2.2 Length of tenancy

All the modular and container schemes to house people experiencing homelessness are intended to be move-on homes with a temporary tenancy agreement. Our mapping exercise shows that the length of tenure varies from one scheme to another, but they all intend to house residents for no longer than two years. However, in practice, there are examples of schemes where tenancies were extended beyond the intended maximum length because of a lack of availability of permanent affordable housing.

This can be particularly concerning for families with children living in temporary accommodation, which is often not well suited for children (Children's Commissioner for England 2019). It is understood that children who have lived in temporary accommodation for more than one year are three times more likely to have mental health problems, including depression and anxiety, than their peers (The Guardian 2016).

4.2.3 Access to appropriate land

Using brownfield land and currently unoccupied land for temporary accommodation can be an efficient use of an under-utilised site. However, the site still needs to be supplied with utilities and services, including electricity, gas, water, waste removal and broadband, and this is not always easy or possible for empty sites. One of the problems mentioned by residents (for example, in the Meath Court scheme in Ealing) is the absence of an internet connection in some schemes, which means that children cannot, for example, do homework online. This is increasingly becoming an issue for adults as many activities and services move online (The Guardian 2019). Digital exclusion in temporary accommodation has been recognised as a problem (Holmes and Burgess 2021).

Not all sites are suitable for off-site construction, as the land must have appropriate access to transport links and enough space to allow onsite installation. Roads leading to the site must be wide enough to enable units to be delivered and the site may need room for cranes to lift units into position.

One of the problems mentioned by residents is the absence of an internet connection in some schemes, which means that children cannot, for example, do homework online.

4.2.4 Location of the site

We do not currently have information about the nature of the locations of the identified schemes. In some cases, the land may be located some distance from local amenities and services, making it difficult for the residents to do their shopping, go to work or take children to school or, indeed, to feel safe. Further research is needed to explore the nature of the scheme locations and the impacts for residents.

4.2.5 Access to finance

Although modular and container solutions are considered to be cost-effective solutions, their reliance, in some cases, on in-kind support and donations for their capital and operational costs, can make their delivery and maintenance complex and potentially risky.

Some funding schemes impose limiting conditions. For example, schemes with temporary planning permission on temporary sites cannot apply for funding from the Rough Sleeping Accommodation Programme as this only grants funds to schemes with permanent planning permission in place and which comply with minimum space standards.

4.2.6 Stigma and local opposition

An examination of the local authority planning portal and planning documents of some of the examples shows that there have been instances of local resistance towards the granting of planning permission for modular and container housing for people experiencing homelessness. In some cases, local councillors voted against the planning application because of the weight of local opinion against the scheme, as was the case in the London Borough of Haringey (Streets Kitchen 2021).

According to the consultation documents, objections to the planning applications from local residents reflected concerns about the people who would move into the modular and container homes, their anticipated behaviour, and the impact on the character of the area. In one case, in the London Borough of Haringey, some people from the local community proposed that signs should be installed around the site with a telephone number which people could ring to make complaints (Streets Kitchen 2021). This reflects the considerable stigma attached to homelessness, as people experiencing homelessness disproportionately suffer stigmatisation and social exclusion (Watson et al. 2016).

4.2.7 Complexity of provision

Most schemes involve multiple actors and it is unclear what the transaction costs of organising such schemes are. Furthermore, local authorities or other organisations wanting to develop these sorts of schemes must gain new knowledge about the different types of modular construction, their performance, cost, transport and installation requirements.

There are also uncertainties around the future of some of the schemes because of the lack of long term site availability and the temporary nature of many planning permissions. Our mapping exercise shows that not all the planning permissions for the modular and container schemes are permanent. The length of the permission can be as short as three years, creating uncertainty for the future of the scheme as another suitable site will need to be identified, planning permission secured, and the units relocated.

Lack of robust evidence

As the schemes are relatively new, there is a lack of evidence about costs, resident experiences, and the outcomes and impacts of the schemes. The aim of this research is to provide information about the existing schemes and their characteristics and to provide a discussion of their potential benefits and limitations. This should create a platform for further research and evaluation about the different schemes.



5. Conclusion

By reviewing and grouping some of the current examples of modular and container projects used to provide temporary housing for people experiencing homelessness, this report shows that there is a diverse range of provision across the country. There are variations in the unit construction type and size, the number of units on a site and the type of households housed. We identified 33 schemes in 22 local authorities. Of these, six schemes are constructed from converted shipping containers and 27 are constructed using prefabricated modular units. The schemes provide 808 units of accommodation, 427 units for families and 381 units for single households. To help identify the main differences between the existing projects and to provide a basis for future comparison, we categorised them into groups based on three criteria which we believe may be important considerations in future evaluation of the schemes. The first is the construction method used (modular/container). The second is the number of units on an individual site (under 20 units/20 units and over). The third is the type of households accommodated (families/single households).

We believe that the construction type, that is, whether the units are constructed from shipping containers or are purpose built modular units, may be an important consideration in future evaluation of the schemes. Costs, ease of construction, build quality and resident experience may all be shaped by the construction type and could be explored in further research.

We believe that the number of units on a single site may be an important consideration in future evaluation of the schemes. The number of units on a site and their density may affect the quality of space and the residents' experiences. Some stakeholders suggest that the homes should be arranged in small groups to avoid the creation of 'ghettos'. On the other hand, there may be economies of scale and cost efficiencies in developing larger schemes.

We believe that the characteristics of the households accommodated by a project may be an important consideration in future evaluation of the schemes. We categorised the resident cohorts into family households and single households as these two groups are likely to have different needs and requirements, which needs further exploration. The mapping exercise did not identify any scheme for residents with complex support needs, nor any scheme only for women. The suitability of modular and container housing for different

types of residents who have experienced homelessness is an avenue for further research.

Other characteristics of the schemes which could be evaluated in future research include the experience of residents living in units smaller than the space standards, which was the case for 82% of the schemes with available information; the nature and impact of the location of the schemes, given some anecdotal evidence suggesting that some schemes are located far from amenities which could impact on residents' experience and the type of support provided to residents including any restrictions to access the schemes (e.g. requirements to partake in specific activities, no-alcohol-or-substances requirements).

Our research suggests that there are several perceived benefits of modular and container housing schemes. Procuring and installing modular or container houses is faster and cheaper than waiting for new social housing to be constructed. The units make efficient use of under-utilised land. They may provide a better quality of life for residents than that experienced in other types of temporary accommodation such as shared rooms and hostels. The schemes identified in the mapping exercise were all intended to be temporary accommodation, providing transitional housing for residents with the aim that residents are supported to move on to permanent, long term independent living.

There are, however, issues and barriers associated with using modular and container houses to address homelessness. The units are generally smaller than the minimum space standards. There are concerns about the quality of the design of some of the schemes, the distance of some sites from local amenities, and the lack of onsite communal facilities, particularly in schemes that house children. These are relatively complex housing schemes to bring forward and in some cases there is opposition from the existing local community.

Generally, there is currently a lack of robust evidence to evaluate the projects and the outcomes for residents, making it difficult to compare them with more traditional forms of accommodation. For example, although it is generally considered that modular and container housing is less costly than other forms of temporary accommodation, there is little robust cost data available to determine the exact cost of building modular and container units. By providing information about the existing schemes and their characteristics, this research intends to create a platform for further research and evaluation about the different schemes.

This report is not advocating that modular or container housing schemes are an alternative to the provision of a greater supply of good quality affordable housing. However, in the context of considerable affordable housing supply pressures and the problems associated with some types of temporary accommodation, using modular and container solutions could be a positive approach to increasing the supply of self-contained, supported, temporary accommodation for people experiencing homelessness. A useful next step would be to evaluate the different types of modular and shipping container housing schemes identified in this report to provide evidence of their impact and to be able to compare them robustly with other types of temporary housing provision.

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7. Appendix

Identified schemes

The schemes were categorised as follows:

Type A: Shipping container/Under 20 units on site/Families

Type B: Shipping container/20 units and over on site/Families

Type C: Shipping container/Under 20 units on site/ Singles

Type D: Shipping container/20 units and over on site/Singles

Type E: Modular/Under 20 units on site/Families

Type F: Modular/20 units and over on site/Families

Type G: Modular/Under 20 units on site/Singles

Type H: Modular/20 units and over on site/Singles

More detailed information is presented in the table below.

Type	Construction method	Location	Date	Size of scheme	Cohort housed	No. of storeys	Unit size
B	Shipping container	LB of Ealing Marston Court	2015	34	Families	2 & 3	10 x one-bedroom (12.45m ²) 16 x two-bedroom (25.08m ²) 8x three-bedroom (37.30m ²)
B	Shipping container	LB of Ealing Meath Court	2016	60	Families	4	8 x one-bedroom (12.45 ²), 20 x two-bedroom (25.08m ²), 32 x three-bedroom (37.30m ²)
B	Shipping container	Reading Lowfield Road	2017	28	Families	2	Two-bedroom (50.6m ²)
B	Shipping container	Brighton Richardson's Yard	2013-14	36	Families	3 & 5	Not known
D	Shipping container	LB of Redbridge Malachi Place	2018	42	Singles	4	One-bedroom (14.4 m ²)
D	Shipping container	Manchester Hulme	Under construction	40	Singles	2	One-bedroom
E	Modular	LB of Ealing Westfields Lodge	2016	17	Families	1 & 2	4 x 1b (12.45m ²) 5 x 2b (28.04m ²) 1x 3b (43.7m ²)
E	Modular	LB of Ealing Lambourn Close	2018	16	Families	3	7 x 1b 7 x 2b 2 x 4b

Type	Construction method	Location	Date	Size of scheme	Cohort housed	No. of storeys	Unit size
E	Modular	LB of Tower Hamlets	2021	16	Families	3	4 x 2b (74 m2 and 96.6 m2) 3 x 2b (96.6 m2) 9 x 3b
F	Modular	LB of Barking & Dagenham	2021	20	Families	2 & 3	2b
F	Modular	Buckinghamshire High Wycombe	2021	58	Families	5	1b (28 m2)
F	Modular	Milton Keynes Fish-ermead	2020	70	Families	3	2b
F	Modular	Cardiff Grangetown	2020	48	Families	3	1, 3 and 3b
F	Modular	Coventry	2019	24	Families	Un-known	2, 3 and 4b
G	Modular	Cambridge Crowland Way	2020	6	Singles	1	24 m2
G	Modular	Cambridge Barnes Close	2021	6	Singles	1	24 m2
G	Modular	Cambridge Dundee Close	2020	4	Singles	1	24 m2
G	Modular	Cambridge Newmarket Road	2019	6	Singles	1	25 m2
G	Modular	Cornwall Cowlins Mill	2021-2022	10	Singles	1	1b

Type	Construction method	Location	Date	Size of scheme	Cohort housed	No. of storeys	Unit size
G	Modular	Cornwall New County Hall car park	2021	18	Singles	1	1b
G	Modular	Cornwall Truro	2020-21	11	Singles	1	1b
G	Modular	Southend-on-Sea Leigh-on-sea	In planning process	6	Singles	1	1b (24m2)
G	Modular	Ipswich Whitton Church Lane	2021	8	Singles	1	24 m2
G	Modular	Norfolk King's Lynn	2020	6	Singles	1	Junior unit 3.3m x 3m
G	Modular	Norfolk King's Lynn	2020	10	Singles	1	Junior unit 3.3m x 3m
G	Modular	Norfolk King's Lynn	2021	7	Singles	1	1b (40m2 and 51m2)
G	Modular	Edinburgh Social Bite Village	2018	10	Singles	1	2b (3.4m wide x 3.6m-7.2m long)
G	Modular	Bristol St George	2020	11	Singles	2	9x 1b (39 m2) 2x 2b (70m2)
H	Modular	LB of Havering Romford	2021	39	Singles	3	1b (37 m2)
H	Modular	LB of Southwark	2021-2022	33	Singles	3	1b (19.5 m2)
H	Modular	Reading Cattle Market	2020	40	Singles	2	Not known
H	Modular	LB of Haringey Tottenham	2021	32	Singles	2	24 m2
H	Modular	LB of Merton	2015	36	Singles	3	Studio 26 m2





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