

RIGHTSIZING

Wayne Forster

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St Teilo, Abergavenny, 4 Courtyard Bungalows for 'downsizers.'



Elm Rd, Caldicot 4 Mews Houses for 'first rungers.'

Rightsizing

Slim down and start up housing - new build

PROJECT DETAILS

Title		RIGHTSIZING: Slim down and start up housing
Principal Investigator		Professor Wayne Forster, DRUw, Welsh School of Architecture Cardiff University
Output No		
Output Type		Physical output (new buildings)
Date of Output		2016-2019
Client		Monmouthshire Housing Association
Function		Residential housing
Location		Locations across Monmouthshire, Wales
Funding		Award winning bid, Phase 1, Welsh Government's Innovative Housing Programme, Contract Value £1.1m

*in collaboration with the
following design team*

Project Management		Monmouthshire Housing Association (MHA)
Planning consultant		LRM
Structural consultant		Lodestone Cardiff
Services consultant		CRiBE Welsh School of Architecture
Main contractor		MHA Construction Ltd.
Cost consultants		AECOM Cardiff



Elm Rd, 4 Mews Houses for first timers



St Teilo, Abergavenny, 4 Courtyard 'downsizer homes'.

STATEMENT ABOUT THE RESEARCH CONTENT AND PROCESS

Description

RIGHTSIZING is a practice-based research project to develop, design and construct a new flexible housing prototype, tailored for demographics currently overlooked by the housing market: an older generation looking to downsize from larger properties and a younger generation looking for their first property. To achieve the desired flexibility, the project challenged and radically rethought Welsh housing and space standards as well as establishing a method for the development of blighted backland former garage sites.

The project was initiated by the Monmouthshire Housing Association (MHA) in response to a competition for funding by Welsh Government called the Innovative Housing Programme. Two locations in South Wales were selected from blighted back-land garage sites for the developments of four houses each, with designs based on the conclusions of the 2016 EPSRC-funded DWELL report, Welsh School of Architecture's MORE:BETTER report, and market testing.

Framed within the requirements of Welsh Government's Innovation Housing Programme – dwellings designed for long life and changing needs and establishing collaborative procurement within local supply chains – the research establishes a model suitable for wider implementation.

Question

The research questions are framed within the over arching requirements for Welsh Government's Innovative Housing Programme as follows:-

This demanded innovation in a number of areas and therefore in these projects design is employed as a resolution of a number of contradicting demands :

- How to achieve a model of settlement form and repeatable house types that can be emulated and that meet the needs of a particular population that currently are not catered for on 'back-land' sites that are difficult to develop.

This inevitably means adopting a critical stance toward prescribed space standards set out in the Welsh Design Quality Standards (DQR) but also attempts to draw out space and spaciousness.

- How to conduct research through design into flexible housing solutions through design for the housing needs and preferences of people who are either wanting to move from large houses that had become expensive and not fit for purpose (too big) and for those who could only afford a small dwelling but do not fit into a minimal space standard 1 bedroom apartment (first time occupiers).

Monmouthshire Housing Association were already experiencing difficulties in letting to these groups from their existing stock.

Subsidiary aims that were also included in order to meet the aims of the programme were

- How to establish ways of collaborative working with an in-house construction and maintenance organisation within the Housing Association.
- How to conceive a way of looking at 'sustainable' architecture from a user and social perspective as well as the current one dimensional technological 'measures'.
- To test, through design and construction, the central importance of particularly physical models in design methods to users and other stakeholders of innovative and spatially complex designs.

Research Aims

- To create model housing that can be emulated rather than a 'one-off' solution.
- To formulate through design a critique of current Welsh space standards.
- To demonstrate through design that long-life, low maintenance housing is possible within tight budgetary constraints.
- To develop sustainable architecture from a user and social perspective.



Map showing location of the two development sites in Monmouthshire - Caldicot and Abergavenny



more | better :

an evaluation of the potential of alternative
approaches to inform housing delivery in Wales

Dr Ed Green with Professor Wayne Forster

The MORE:BETTER report
Welsh Government 2016

This was a report commissioned by
Welsh Government to identify and
appraise different approaches to the
development and construction of
housing.

It proved important in guiding ideas
that underpinned the Innovative Hous-
ing Programme of 2017.

Authors were Dr Ed Green and Wayne
Forster

Methods

- Literature review: Literature was reviewed in the context of 'downsizing' and starter homes. (See p 25)
- Precedent studies. The use of precedent embraced building type - in particular courtyard forms and recent urban infill schemes notably on 'backland' sites in London (See p 29)
- Collaborative design
Collaboration across all stakeholders from central government to prospective tenants including local supply chains was required to ensure an integrated approach to novel performance standards and spatial arrangements (See p 37)
- Design methods with emphasis on hand drawing and the use of physical models
Drawing and physical modelling was used to engage all stakeholders in the process and to test form and massing and resolve the particular constraints that are inherent in the backland sites (See p 39)

Dissemination

- Open days at buildings for Welsh Government and Housing Associations and Welsh Government Workshops on IHP 1 to date
- Publications to date 'Royal Society of Architects in Wales - Touchstone' 2019

Statement of Significance

- The projects were won through competition as part of the Welsh Government Innovative Housing Programme.
- The success of the research outcomes has been recognised and further funding was announced September 24th 2019 in plenary session by Welsh Housing Minister Julie James.
- Innovation Award for 2020 - Constructing Excellence, Wales
- Shortlisted for Integrative and Collaborative Working 2020 - Constructing Excellence Wales

INTRODUCTION

The research fits within the Welsh Government Innovative Housing Programme which aimed to increase the supply of housing. However, within the aims and objectives set out in the Welsh Government Technical Guidance Notes there was also an ambition to promote innovation that 'facilitates greater use of active travel, consideration of innovative approach to the delivery of density for place-making benefits, the integration of different uses, tenures or unit sizes, and will involve consideration of the layout, mix of uses, connections beyond the site, green infrastructure and facilities as well as the design of individual homes'.

Additionally, 'homes to be able to better recover from natural challenges (flood, fire, storm, cold, heat), human challenges (power failures, internet outages), and changing lifestyles (layout preferences, family sizes) were prescribed of interest.

In the 'Rightsizing' projects questions about changing lifestyles, density, the life of homes and space, spaciousness and place are the spur for the aims and objectives. This had been prompted by a report commissioned from the Welsh School of Architecture (Green and Forster) which promoted a diverse approach to procurement as means to alleviating the housing crisis.

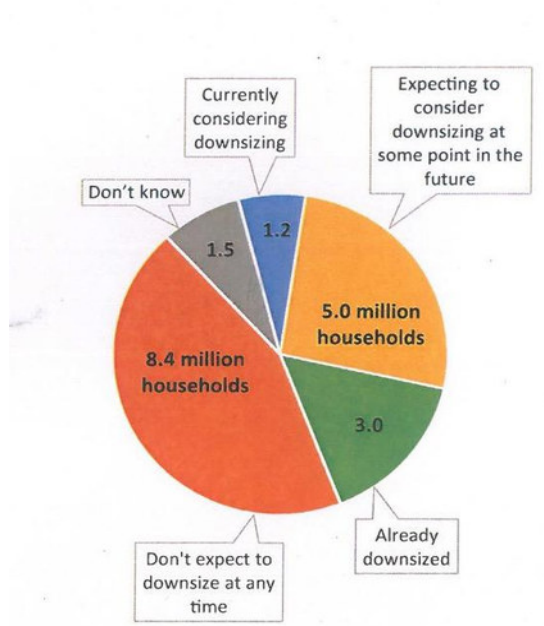
Two development sites in Monmouthshire were chosen to trial new house types and layouts that would provide potential solutions to the issues of downsizing and first-time occupiers.

AIMS AND OBJECTIVES

The research aims and objectives are :

- To achieve a model of settlement form and repeatable house types that can be emulated and that meet the needs of a particular population that currently are not catered for on 'backland' sites that are difficult to develop.
- This inevitably means adopting a critical stance toward prescribed space standards set out in the Welsh Design Quality Standards (DQR) but also attempts to draw out space and spaciousness.
- To conduct research through design into flexible housing solutions through design for the housing needs and preferences of people who are either wanting to move from large houses that had become expensive and not fit for purpose (too big) and for those who could only afford a small dwelling but do not fit into a minimal space standard 1 bedroom apartment (first time occupiers).
- Monmouthshire Housing Association were already experiencing difficulties in letting to these groups from their existing stock.
- Subsidiary aims that were also included in order to meet the aims of the programme were
- To establish ways of collaborative working with an in-house construction and maintenance organisation within the Housing Association.
- To conceive a way of looking at 'sustainable' architecture from a user and social perspective as well as the current one dimensional technological 'measures'.
- To test, through design and construction, the central importance of particularly physical models in design methods to users and other stakeholders of innovative and spatially complex designs.


Literature shows huge market for downsizers



Acute need for housing for first time occupiers

Argus
19th September 2017
Concerns over the lack of land to build new housing in Monmouthshire

[Young people can't afford to stay in Monmouthshire because of lack of affordable homes warns councillor](#)
Published: 11 October 2018 By [Charlotte Gwynne](#) Community News



Home ownership among young adults has 'collapsed', study finds
Chances of owning home in UK have more than halved in 20 years, Institute for Fiscal Studies says
Fri 16 Feb 2018 00:01 GMT
Last modified on Fri 16 Feb 2018 07:59 GMT

RESEARCH QUESTIONS

The research questions are framed within the over arching requirements for Welsh Governments Innovative Housing Programme and spring from the over arching aim of 'Design as a resolution of a number of contradicting demands' as follows:-

It is well known that as well as the fact that the UK population is ageing and that large numbers of people would like to 'downsize' to more appropriate and manageable dwellings. Additionally young people are finding it increasingly difficult to find affordable first homes.

The absence of dwelling types of appropriate sizes with requisite amenities in suitable locations was highlighted by Monmouthshire Housing Association which found that their existing stock was not suitable for this large group of prospective tenants.

As such design in this project was employed to resolve a number contradicting demands

- How to design 'loose-fit' (flexible) dwellings accommodating the potentially changing needs of a specific population type over time and integrate them in to existing settlements.
- How to design and develop backland garage sites that would otherwise remain
- blighted.
- How to design for long life but low maintenance buildings – 'long life within tight budgetary constraints

And additionally

- How to design for an 'active' legible and 'delightful' energy strategy for
- residents – 'low energy and comfort'.
- How to build an integrated collaborative procurement and construction framework using local supply chains.
- The outcome was intended to be able to be 'mainstreamed' as a repeatable model rather than a one-off demonstration project.

- MHA has seen a significant **decline in the demand for its older person accommodation**. Anecdotal evidence from other social landlords inform us that this is a sector wide problem
- The research concluded that older persons renting **preferences were for two bed bungalows in urban settings (due to restraints on benefits we can only develop a few of these, normally only 1 bed bungalows will stack up financially**
- MHA wish to **research some small sites owned by MHA which are difficult to develop. The properties need to be built to a high density in a style than can be repeated** to be sold at a price that will make them on balance attractive to older persons to downsize, likewise flexibility in shape is important so that the same components can be used in different configurations.

MHA brief 2016

The problem as identified and defined in the original brief from MHA for a viability study into new house types. From brief dated November 2016

Literature review and initial research conducted by MHA indicated that prospective tenants were in search of dwellings that:

- Could be bungalows (or on one level) for downsizers.
- Have their own front doors and external amenity space.
- Amenity space which was large enough to enjoy sitting out and manageable gardening.
- Could have 1 bedroom but should have spacious living spaces that had access to amenity space.
- Flexible enough to be able to accommodate occasional visitors or add a bedroom if the need arose. Must be warm, comfortable and affordable - definitely low energy.
- Above all a home that is safe, secure and allows people the pleasures of life today but can also adapt to future needs.

Note that this describes something that lays outside the definitions and standards of both general and special needs housing.

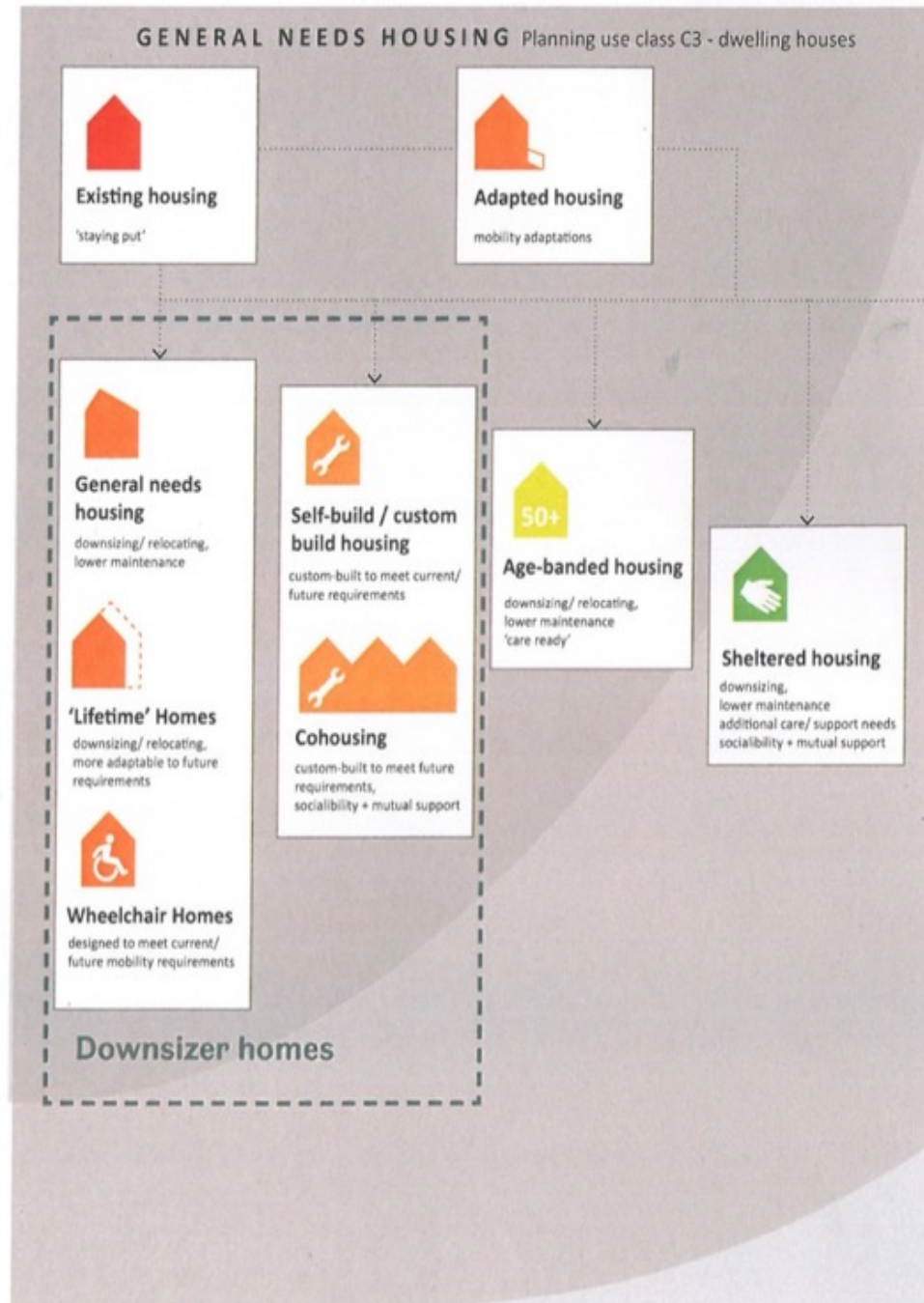


INCREASING

No care / domicillary care

Warden / alarm systems

INCREASING SPECIALISATION



This diagram from the Dwell report illustrates that the proposed housing types fall outside the various established and space regulated types

INSTITUTIONALISATION

On-site personal care / support

Nursing care

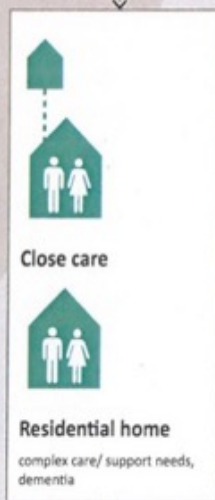
Palliative care

SPECIALIST HOUSING

Use class C3 / C2

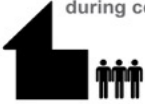


CARE HOMES

Use class C3 - residential institution



INCREASING SPECIALISATION

Potential benefits associated with housing, as they relate to WFGA

	 during construction	 benefits in use	 wider benefits	
WFGA goal:	short term benefit:	medium term benefit:	long term benefit:	focus:
globally responsible	low embodied CO ₂ locking in carbon	reduced carbon footprint potential for carbon negative	decarbonising communities meeting international targets	CO ₂
prosperous	addressing cost and value local resource use	more affordable housing supporting Welsh supply chain	affordability, local economy skills and community building	capital
resilient	robust, low maintenance changeable by the community	resilient to climate change accessible construction	adaptability and resilience reskilling and empowering	change
healthy	natural resource use breathable construction	healthy internal environment reduced impact on environment	positive health benefits reduced strain on health service	health
more equal	low embodied energy reduced heating bills	energy generation offsetting rental costs	affordable warmth for all energy positive homes	energy
cohesive communities	flexibility in layout constructable by end user	long life loose fit 'other' procurement pathways	meeting specific long term need flexible, high quality homes	space
thriving culture	variety in form and materials suitability to different contexts	building strong neighbourhoods creating places with character	supporting people, communities and distinctive places	place

The Welsh Government Innovative Housing Programme was framed within the Welsh Future generations Bill (above)

Competing schemes were expected to meet all seven goals and provide innovation in up to 3 - bordered in green above.

CONTEXT

The commission for the 'Rightsizing' projects was made following an initial viability study and a successful bid in phase 1 of the Welsh Government IHP competition for 'Innovation in Housing'. In 2016-2017, as part of the Welsh Government's 20,000 additional affordable homes target, the Cabinet Secretary for Children and Communities asked Welsh Government officials to develop a new programme to support the development of new approaches to delivering housing in Wales. £90m has been set aside to support schemes in the programme. The Innovative Housing Programme (IHP) aims to:

- increase the supply of affordable housing in Wales, as part of the 20,000 additional affordable homes target.
- align with the seven goals enshrined in the Wellbeing of Future Generations Act (WFGA).
- address cost and value in new homes and develop housing that meets specific current and future housing needs.
- provide support for those willing to innovate through the use of alternative approaches.
- demonstrate benefits associated with alternative approaches, to encourage their wider uptake.
- harness opportunities to deliver jobs, skills training, and develop local industry.
- publicly disseminate key findings and maximise learning.

The Innovative Housing Programme sought to support innovation and impact in three different streams:

- CONSTRUCTION TECHNIQUES - new and emerging forms of construction
- DELIVERY PATHWAYS - alternative approaches to procurement or collaborative working
- HOUSING MODELS - dwelling types that respond to a specific need

The 'Rightsizing' project met all of this criteria but the main thrust of the project was to focus on the acute need for new 'Housing Models' for the demographic described above.

AFFORDABLE HOUSING IN MONMOUTHSHIRE

Whilst the aims and objectives of the IHP programme are 'generic' and are part of a concerted effort to increase national housing supply it is important to set out the context of affordable housing in the geographic area that MHA operate in.

Monmouthshire has no real industrial urban centres. Housing supply in Rural Wales is challenging but exacerbated in Monmouthshire where a local housing market assessment (LHMA) found that average house prices in Monmouthshire increased by 28 percent between January 2010 and May 2018. House prices further increased by 12.86 per cent between July 2017 and September 2018, when the average house price was £307,600 – the highest in Wales. This coincides with the announcement that tolls on the Severn Crossings would be cut in early 2018 and scrapped altogether by the end of 2018. Despite average wages increasing, high house prices still put owning a home beyond the reach of many families living and working in Monmouthshire.

Worst hit are the two groups targeted in the projects – first timers who have significant problems with affordability and downsizers who face challenges in securing financial 'headroom' but crucially cannot find suitable housing models located close to vital amenities.

Monmouthshire County Council were looking for new ways to tackle the shortfall, including the allocation of small sites in rural areas which could deliver up to 60 per cent affordable housing.¹

Monmouthshire Housing Association had 'inherited' a number of blighted backland garage sites as part of a major stock transfer. The nature, location and condition of these sites lent themselves as ideal to address some of the issues identified above.

Negative qualities were the diverse physical constraints that hampered these kind of sites - overlooking, easements, existing services and undiscovered issues such as established rights of way and services.

IHP

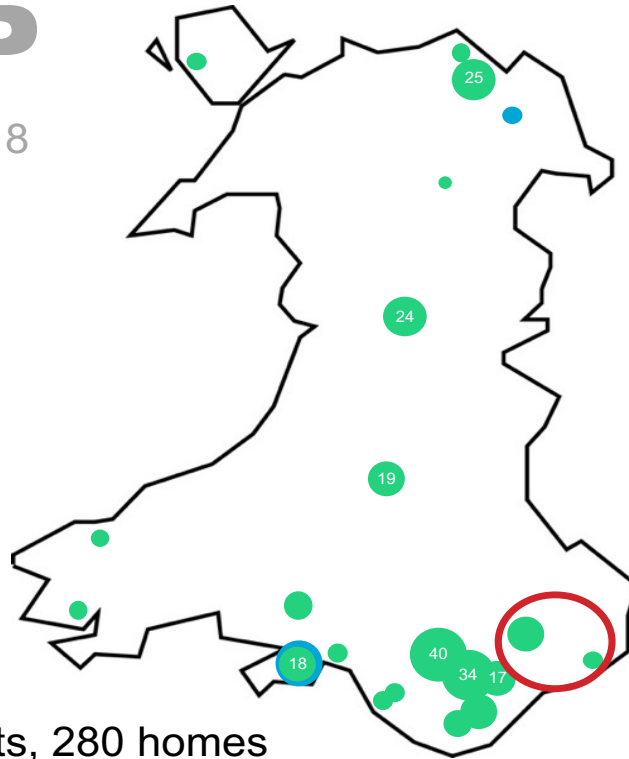
2017-2018



Llywodraeth Cymru
Welsh Government

capital

revenue



22 projects, 280 homes

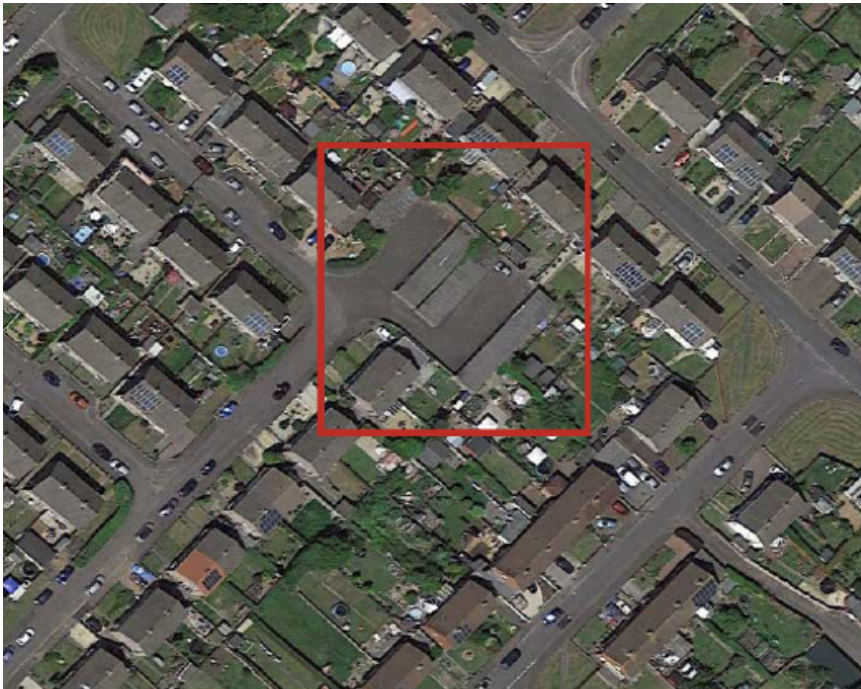
The geographical spread and size of Phase 1 of IHP. The Rightsizing projects are circled red in the South East of the Country and are also distinguished by being the only one focusing on space and place - the majority are focused on construction. The Rightsizing Project is the only one selected that aimed for innovation in house types and 'gap' sites.

Monmouthshire County Council were looking for new ways to tackle the shortfall, including the allocation of small sites in rural areas which could deliver up to 60 per cent affordable housing.¹ Monmouthshire Housing Association had 'inherited' a number of blighted backland garage sites as part of a major stock transfer. The nature, location and condition of these sites lent themselves as ideal to address some of the issues identified above.

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¹ <https://www.monmouthshire.gov.uk/app/uploads/2016/03/Adopted-Affordable-Housing-SPG-March-2016.pdf>

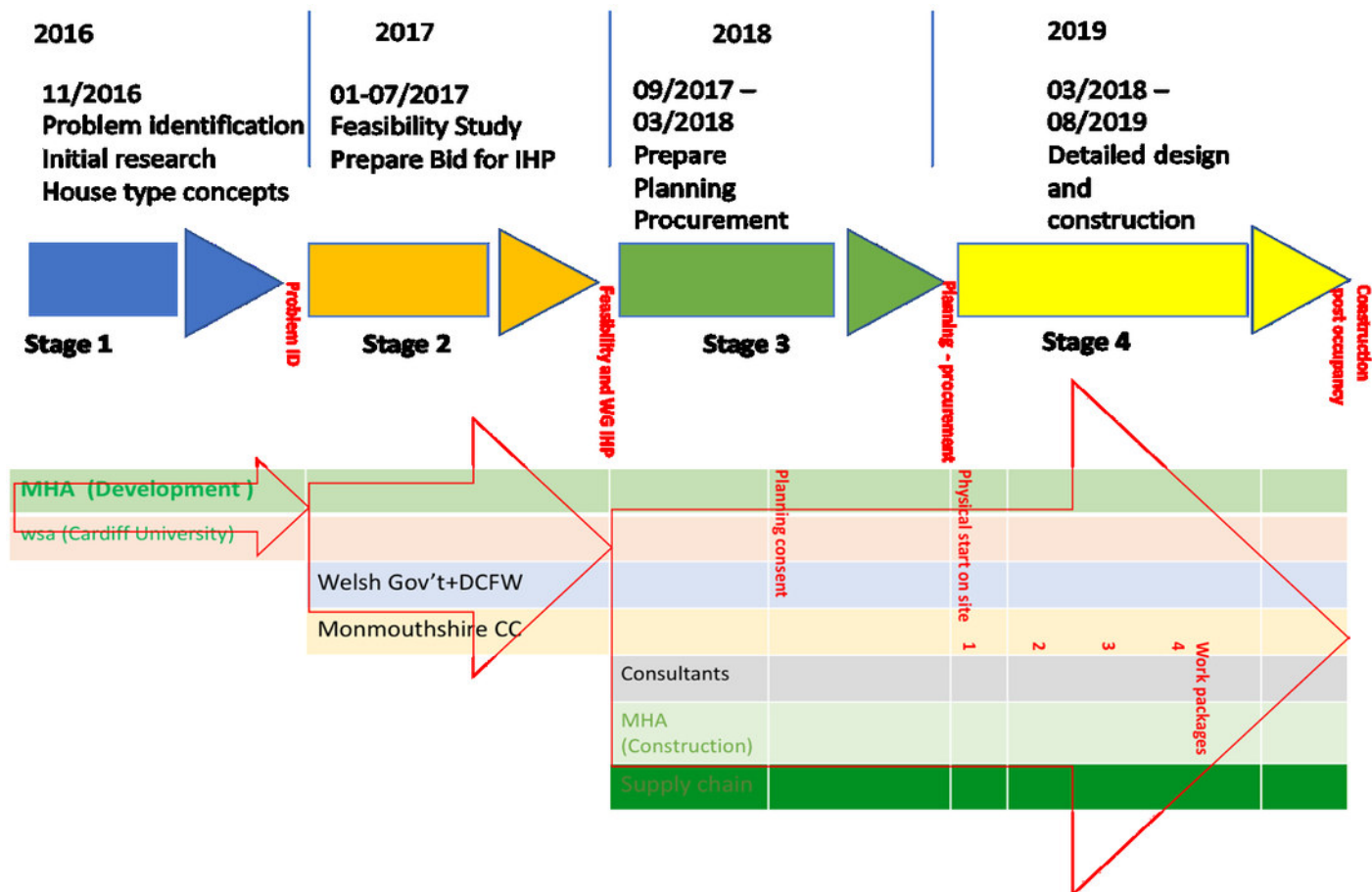
Elm Rd, Caldicot
Selected for the development
of homes for first time occu-
piers.
Note the hemmed in nature
of the sites, overlooking and
established rights of way
across the sites which add to
the complexit yof design and
development.





St Teilo, Abergavenny
Selected for the development
of homes for downsizers.





Timeline showing the extent of the Rightsizing project and involvement of stakeholders and supply chain

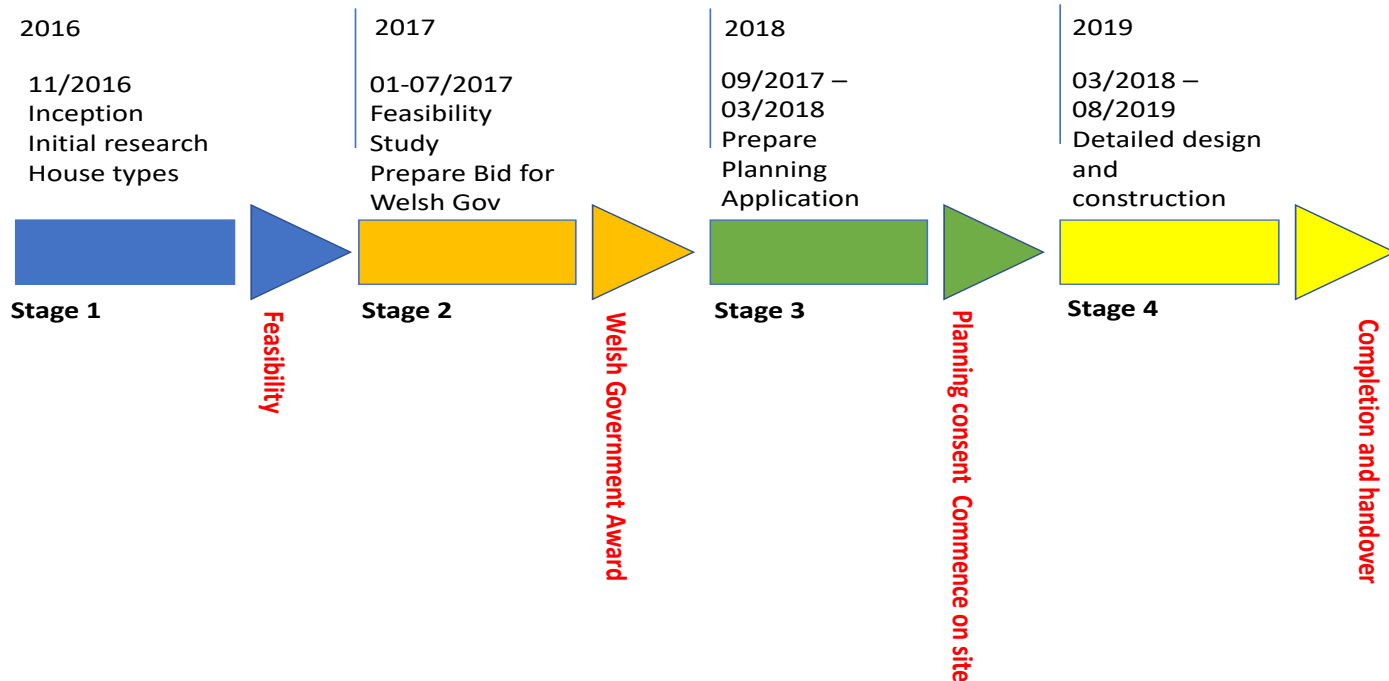
METHODS, RESEARCH CONTENT AND PROCESS

The method of research is through Practice-based Research where an original investigation is undertaken in order to gain new knowledge partly by means of practice and the outcomes of that practice. Here, knowledge may be demonstrated through creative outcomes in the form of designs, music, digital media, performances and exhibitions – in this case completed buildings. Whilst the significance and context of the claims are described in words, a full understanding can only be obtained with direct reference to the outcomes.

(17) (PDF) Practice Based Research: A Guide. Available from: https://www.researchgate.net/publication/257944497_Practice_Based_Research_A_Guide [accessed Jun 22 2020].

METHODS

- Literature review
- Precedent studies
- Collaborative design
- Design with emphasis on hand drawing and the use of physical models



Timeline from initial studies through to completed buildings.

LITERATURE REVIEW

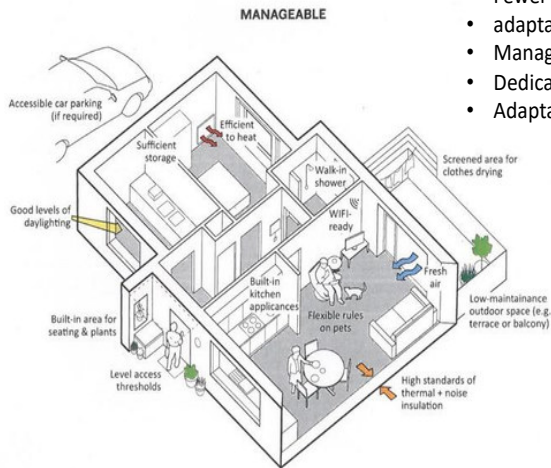
As the topic of provision of appropriate dwelling emerged prior to and during the viability study a review of design led research literature in particular was undertaken. The 'Dwell' report was published in 2016 as we commenced this study. The findings from the EPSRC funded 3 year research and co-design process with residents in Sheffield, developed a working definition for downsizer homes and proposed a series of co-designed typologies that respond to third-agers' aspirations. These findings were in line with the findings from surveys conducted by MHA with the same tenant group and so they formed the basis of the initial precedent studies and space studies.

Key characteristics were as follows:-

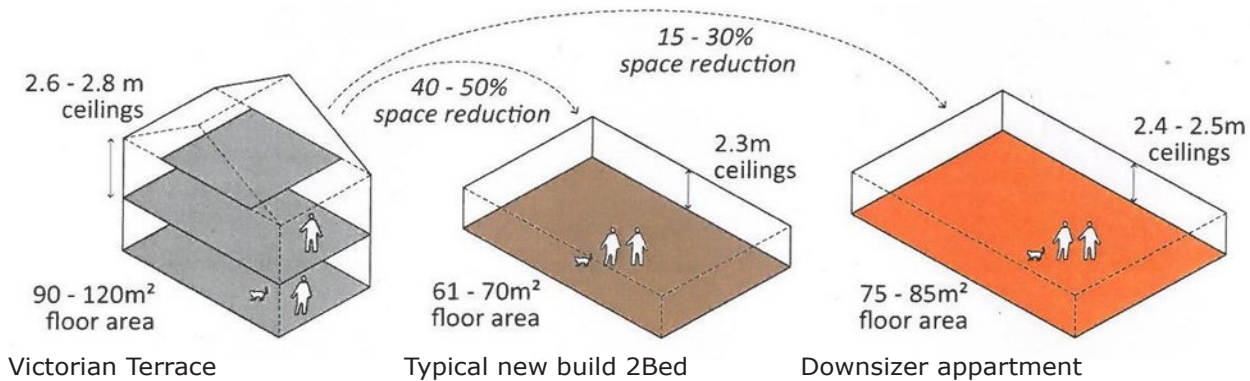
- Demand for accessible single storey or two storey typologies, with a continuing appetite for bungalow typologies (despite their apparent unpopularity with planners and developers.
- A willingness to consider apartment living, as long as the offer feels secure, spacious and is in a good location, and potentially provides extra facilities such as allotments and shared space to host social events.
- Demand for fewer (bed) rooms but more space and adaptability to accommodate separate living, visiting friends and grandchildren.
- Provision of manageable outdoor space for gardening and relaxation, such as courtyard gardens, roof terraces and generous balconies.
- The need for dedicated resident and visitor car parking provision in all but the most centrally-located sites.

What is needed

- Demand for single storey
- Apartment living ok provided amenities
- Fewer bedrooms but more space and
- adaptability – visiting friends
- Manageable outdoor space
- Dedicated car parking
- Adaptable to future needs



Common 'low-maintenance' design features or specification in a typical downsizer home



Key spatial characteristics of an ideal house type were outlined in the Dwell report and found to be in line with the findings of the MHA tenant survey.

More V Better

Prompted by concerns and worried that it could and would be a mistake to believe that focussing on numbers at the expense of space and quality. over housing space standards Julia Park of Levitt Bernstein undertook a review of the history of space standards in UK housing. (Pqrk 2017) and RIBA 2015. Her findings pointed to

'The inconvenient truth is that almost all of us live in the 'wrong home'.

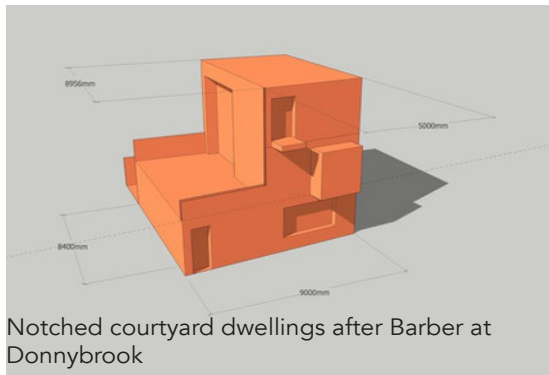
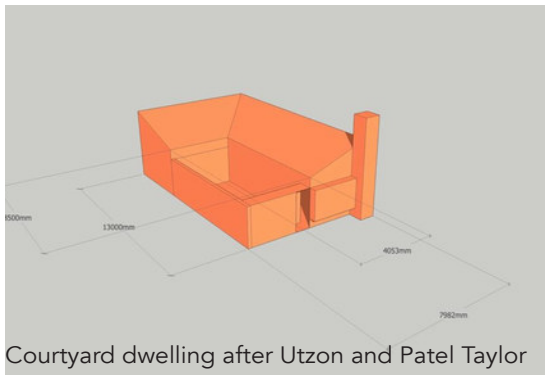
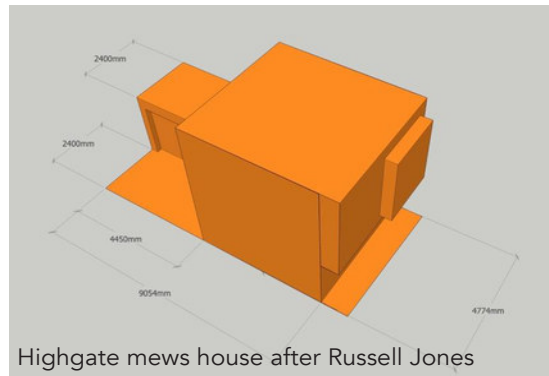
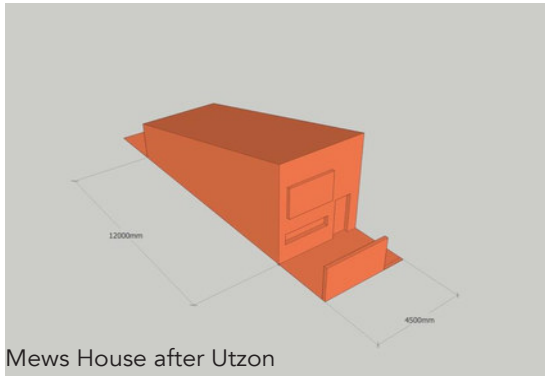
It is likely that small rooms are at least part of the reason for under occupancy and that older people would be more likely to move to smaller homes if rooms were larger and there was more storage these are commonly cited as reasons for not moving....

and concluded 'Let's move on from 'little boxes' to a rich mix of dwelling types and sizes, rooted in real places'.

The WG Innovative Housing Programme majors on quantity but the Rightsizing Project is more concerned with 'Better' and particularly how to create homes that meet the needs of emerging households.

Loose fit.

The principles identified in both the Sheffield study (above) and during this one extend beyond 'Lifetime Homes'. 'The recommendations for Lifetime Homes, whilst absolutely sensible in their own right, do not go far enough to provide truly adaptable housing. They mainly deal with modifications to discrete elements of design (socket heights, door widths and so on) rather than taking a more holistic view of the potential of adaptation.



These aspects are covered in the second approach to design for the lifetime of a home, namely recognising the demands of changing sizes and/ or ages of family or individual groups. This ability to react to changing household circumstances is clearly not incompatible with the tenets of Lifetime Homes, but takes on board a wider set of parameters'.²

Loose fit, or as Till and Schneider refer to it 'Flexible housing' would mean that people do not have to move elsewhere should certain circumstances change. For example if somebody becomes physically less able through age or illness to navigate their existing dwelling, an adaptable house could provide the continued interdependence to the dweller or should the dwelling need to accommodate an additional bedroom it has the capacity to do so.

In the DWELL report emphasis as well as 'Downsizing', the concept of 'Rightsizing' is introduced. This suggests the opportunity to provide housing for another group of the population who also appeared not to be catered for but that had some similar attributes to the needs of the downsizer. 'First-time occupiers' also had many of the needs that matched those listed above but perhaps with nuanced differences – enhanced affordability for example. It was decided to include this group within the scope of the study.

PRECEDENT STUDIES

Another crucial aspect of the research carried out involved not just looking at general housing design, but also an in-depth analysis of highly regarded practitioners, of which – as noted – the most influential on the final project was the work of Jørn Utzon at Fredensborg and the Kingo Houses just outside Copenhagen. Both schemes had been regularly visited by the design team. This source however was also reinforced by ongoing interest in the courtyard form and the idea of additive architecture, with the testing of various design options always being tied back what makes a place successful, or not, in generating a sense of privacy and neighbourhood. Initially four house types were chosen and tested against four sites (16 in all) for massing and potential fit and estimation of numbers of potential new dwellings. (see above)

Studies underpinned MHA's initial thoughts on downsizers.

Initial design studies demonstrate the potential that the 'infill' candidate sites provide for appropriate infill neighbourhoods for BOTH downsizers and possibly start-ups in line with WG ambitions

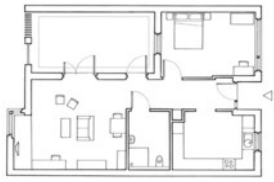
Courtyard dwellings and additive form

The courtyard dwelling has been a subject of interest within the design team for some time and were referenced as potentially suitable for downsizers in the literature review. The integration of inside and outside and the addition of spatial hierarchy from public to private provided by the private court is considered of great value in the design of the dwelling.

The detached or semi-detached house has emerged, in the late 20th c as the ideal form of dwelling. This may be for a number of reasons – not least the efficiencies of cash flow for developers in uncertain times – build one, sell one and perhaps the cultural demand for autonomy and perceived ideas of privacy and ownership.

However, given the nature of infill brownfield sites in particular, the courtyard form with its introverted nature has the potential to solve a number of issues. Peter Barber, in particular has demonstrated this on a number of dense, low rise infill schemes in London typified by the Donnybrook Quarter.

2 Tatjana Schneider and Jeremy Till, *Flexible Housing* (Routledge, 2007).



Barking Patel Taylor
Courtyard Houses



Single Storey Courtyard House Type

Based on earlier precedent

Key Dimensions

Kitchen 2.6x2.6

Bathroom 2.1 x 2.1

Bedroom 4x3.2

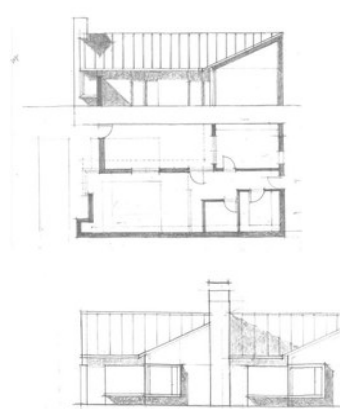
Lounge/Dining 6.3x4

Overall area

13.1 x 4 = 52.4

4 x 3.2 = 12.8

65.2 m2 nett int



Here, the courtyards are used as private secluded spaces providing daylight and ventilation. Used in this way in combination with one another the type allows for very dense urban developments as it can be linked to other units on three sides. In the research presented here the small infill sites did not provide much opportunity for this but the secluded court did provide the potential to alleviate overlooking on hemmed in sites. Living and sleeping places adjacent to the private court can 'borrow' space to add to feelings of spaciousness.

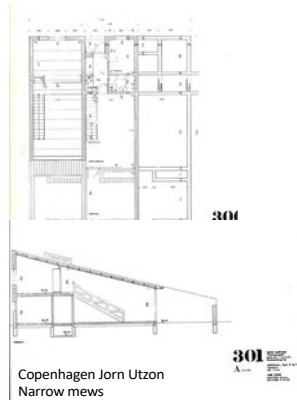
Additionally, the courtyard itself may be considered to be the energy garden enabling higher levels of glazing and daylighting and also catching useful solar gains. They also provide areas for activity (gardening and growing) and amenity – with privacy as a key quality. The modern urban courtyard house has little or no association with the ancient precedents as it has been re-worked throughout northern Europe through the 20th c.

Typology

'Typology is an approach that isolates the attributes of the architectural coherence, identifies them as characteristics in order to compare them with similar abstracted attributes from other contexts and define similarities or differences' ¹. In the design of residential architecture, in particular, the use of type a 'platform on which the dependencies between occupants, culture, social environment and topography and geography was thought to be a relevant approach on these projects.

The two main types selected by MHA for further development from a range of four are described in this study as a single storey L shaped courtyard and a Mews garden court. These both feature in Utzon's Fredensborg scheme although the L shaped courtyards invariably have two bedrooms on a wider plot. According to Macintosh, the modern atrium house in Europe is not really similar to ancient precedent.

¹ Günter Pfeifer and Per Brauneck, *Courtyard Houses: A Housing Typology* (Basel: Birkhäuser, 2008), p. 8.



Narrow Frontage Terrace w/ Mezzanine

4.5 Frontage

Based on earlier precedent

Key Dimensions

Kitchen 3.2 x 2.6

Bathroom 2.1 x 2.1

Bedroom 4.5 x 3.7

Lounge/Dining 6.0 x 4.5

Overall area

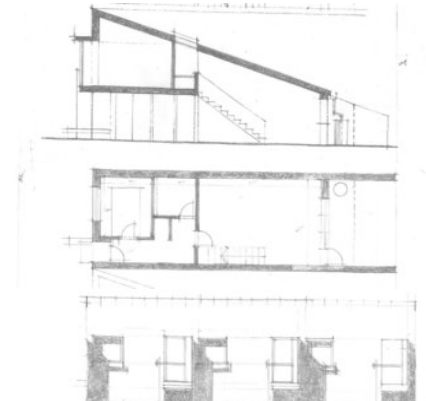
10.7 x 4.5 = 48.2

4.5 x 4.7 = 21.2

(whole mezzanine)

69.3 m2 nett int

Originally thought of as



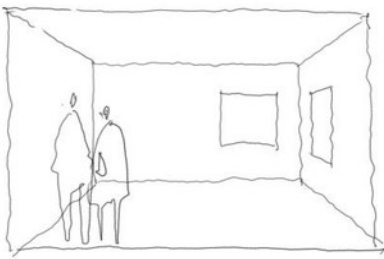
*'Mass courtyard housing, never had anything to do with earlier courtyard houses. It was created afresh during the search for a new, functional, low rise housing form for the urban working class.'*²

The courtyard plan was developed to achieve privacy in the garden and allow light to penetrate the surrounding rooms. The first modern courtyard housing was detached and looked south over its private garden. This single aspect courtyard house, designed by Hugo Häring in 1928 was then developed into an L shaped plan by Hannes Meyer and Ludwig Hilbersheimer at the Bauhaus. In 1931 Hilbersheimer produced an improved L shaped courtyard house, with sleeping and living rooms grouped in two wings of the block. It is this *'binuclear'* plan which is most used today.³ According to Macintosh the Mews 'patio' or garden type may have some roots in Spanish Colonial Revival in Southern California⁴ but it was the efficiency of the terraced combination at Fredensborg that appealed here.

2 Duncan Macintosh, *The Modern Courtyard House: A History* (London: Lund Humphries for the Architectural Association, 1973), p.8.

3 Ibid

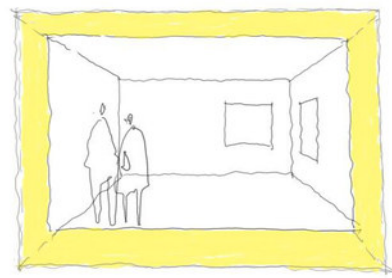
4 Ibid



Improve 'spaciousness'



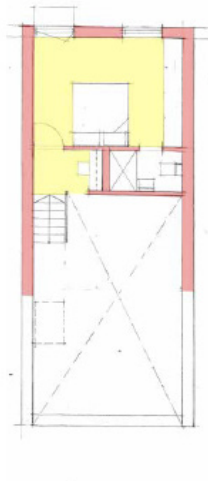
Borrow space from landscape and circulation



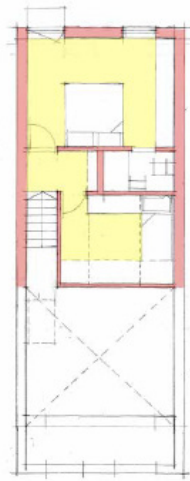
Add 10% living areas



Mews House Type
Proposed GF Plan



First Floor Plan

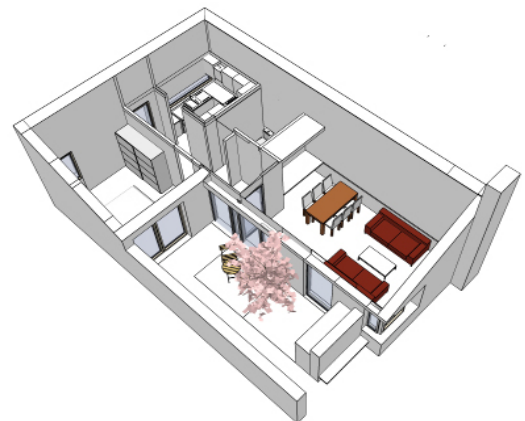


Mews House Type
Retrofitted First Floor Plan



Courtyard House 1B Type
Proposed Plan

Courtyard House 2B Type
Future retrofitted plan 2B 3P



Spatial strategies and plan development in the provision of flexible space in the two preferred house types

Some confidence was gained through reference to the relatively small courts in the Barber schemes and the one-bedroom courtyard unit used by Patel Taylor at Barking. Here the external finish was a darkish stock brick.

In the design of both house types for MHA window and patio door opening sizes have an increased head height and the courts are white to increase internally reflected component.

Long life, loose fit

In the literature review and in the focus group meetings of the subsequent market testing the ability for some adaptation and flexibility in the use of the dwellings was emphasised as a preference. Given the funding strictures and prescribed space standards this would prove challenging. The desire for spaciousness over multiple rooms provided some possibilities to accomplish both requirements. 'Oversized' or at least generously sized living spaces, in volume and area, were analysed to enable spaciousness but also subsequent adaptability and maintain minimum space standards. This was to be done without having to 'break' or 'add to' the building envelope as it was envisaged that dwellings would be on constrained sites.

Soft and loose v soft and hard

Using the Till and Schneider definition for 'Flexible housing' meaning that people do not have to move elsewhere should certain circumstances change.

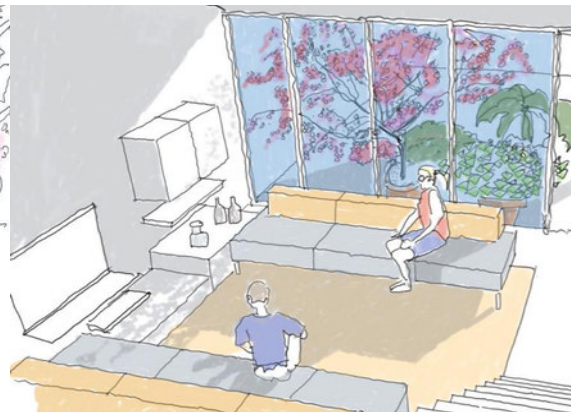
Soft and Hard

Till makes the distinction between two approaches to design for flexibility 'It is the natural tendency of a researcher to want to categorise in order to make sense of the mass of information in front of him or her. We were no different. Faced with our collection of over 150 examples of flexible housing, we came up with a simple method of division: soft and hard. In its binary the classification is quite crude, but it does identify the tensions evident in much flexible housing. 'Soft' refers to tactics which allow a certain indeterminacy, whereas hard refers to elements that more specifically determine the way that the design may be used. In terms of use it may appear a contradiction that flexibility can be achieved through being either very indeterminate in plan form or else very determinate, but historically both approaches have developed in parallel through the course of the twentieth century. Soft use allows the user to adapt the plan according to their needs, the designer effectively working in the background. With hard use, the designer works in the foreground, determining how spaces can be used over time....soft use generally demands more space, even some redundancy, and is based on a relaxed approach to both planning and technology, whereas hard use is generally employed where space is at a premium.'

In the context of this work, that change was interpreted as mainly an increment of growth in order to accommodate another person – more explicitly another single bedroom. In the case of the 'downsizers' two different scenarios were envisaged. First, a need for an occasional extra bed space on an intermittent and temporary basis – as in having the grandchildren over for a night or two and secondly the need for an additional permanent bedroom. In the literature review and in the focus group meetings of the subsequent market testing the ability for some adaptation and flexibility in the use of the dwellings was emphasised as a preference. The desire for spaciousness over multiple rooms provided some possibilities to accomplish both requirements. 'Oversized' or at least generously sized living spaces, in volume and area, were analysed to enable spaciousness but also subsequent adaptability and maintain minimum space standards. This was to be done without having to 'break' or 'add to' the building envelope as it was envisaged that dwellings would be on constrained sites and plots.

Till and Schneider refer to this as slack space. Others refer to it as overcapacity.

"Space that can be taken over by the residents. Slack space is typically space outside the housing units that can be appropriated by the users over time, providing more flexibility in use. It is not just any space, but areas which are suggestive of potential occupation;". On the rightsizing projects the living spaces were carefully sized so that Living/Dining spaces met the London Housing Standard for Kitchen/Living/Dining – therefore enabling the kitchen as designed to become a single bedroom.



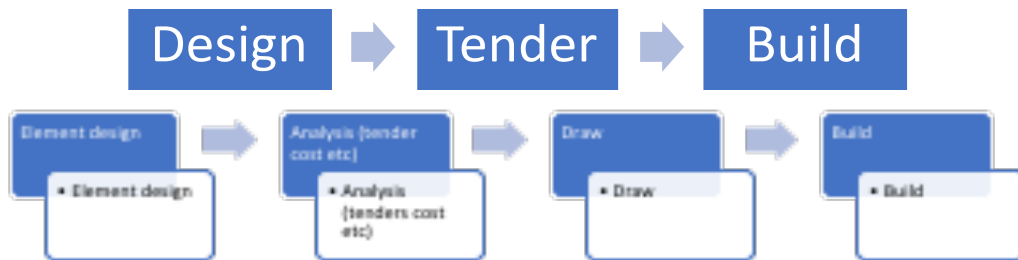
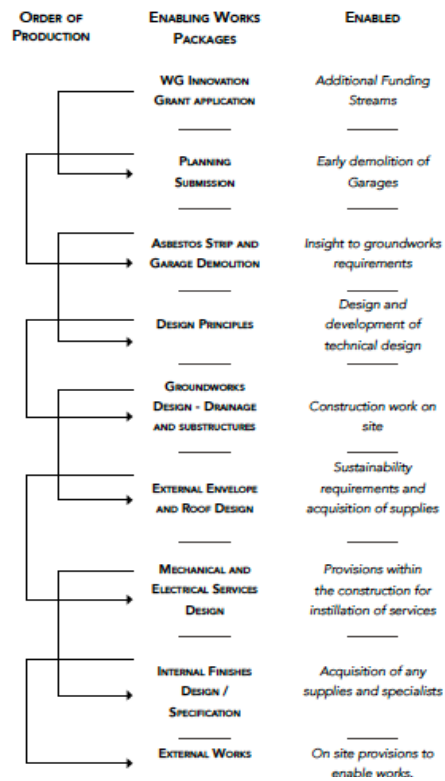
Early place and townscape studies drawn for discussion at client and tenant design workshops and market research focus groups - Top row - Mews House studies and courtyard bungalow below.

It is acknowledged that this is a limited form of flexibility but total flexibility is nigh impossible to achieve without huge overcapacity in plot size and building form. The standard 1 bedroom apartment that was being 'rejected' by potential tenants is around 50m² GIA with no external amenity space. The '*First time occupier*' mews unit was sized at 75m² with the additional area being provided with spacious lounge and dining space almost twice the area of the minimum set out in the London Housing Design Guide.¹

The 'Downsizer' courtyard bungalow similarly was nearly 50% bigger at 67m² GIA. These areas are commensurate with the recommendations from the DWELL report (left). Plans showing strategies for the retrofit addition of a second bedroom in both types and in addition the volume of the dwellings is expanded by the 'open' roof arrangement. Each dwelling then has two separate private amenity spaces. The use of floor to ceiling glazing then allowed these outside spaces to be 'borrowed' as part of the interior adding again to feelings of spaciousness and optimised daylight.

1 London Development Agency, 2010.





Traditional V Fast Track Agile system adopted on Rightsizing

COLLABORATIVE WORKING

The Management arrangement alongside design and build procurement provided the necessary multi-disciplinary approach and integration as it allowed a designer-contractor team at an early stage in the process. This brought all the participants onto the project early on so that both time and cost efficiency was enabled. DRUw was appointed early in the process and had contact with the client and other consultants and crucially the construction team in design and then project progress meetings throughout the process ensuring that everyone was well informed, and that good communication between all parties would be immediate.

Due to the Welsh Government requirement to commence within 6 months of the competition result and the ambition for close collaborative working and in-house management, it was necessary and possible to produce tender documents during the construction process, to fast track the process and enable time to evaluate design options against time and cost.

This process cut out the need for a competitive tender, allowing a more efficient design / construction process. This required a high quality of communication between DRUw, client and contractor and the supply chain.

1. The single point of the contract between the client and the contractor means that the client has the advantage of dealing with one single organisation that is responsible for all aspects of the project. Accordingly, the need to commit resources and time to contracting with designers and contractors separately is significantly reduced.

2. Provided that the client's requirements are accurately specified, certainty of final project costs can be achieved and this cost is usually less than when using other types of procurement systems.

3. The use of integrated procurement systems enables design and construction to be overlapped and should result in improved communications being established between client and contractor. These two characteristics enable shorter overall project and project management efficiency to be improved.

4. The strategy enables an integrated contractor contribution to the design and project planning.

Traditional procurement has often been criticised for its inability to integrate the separate design and construction functions and impossibility of the contractor becoming involved sufficiently early in the procurement process to make any significant contribution

The initial premise was that the scale, location and innovative characteristics of the schemes would be a good fit and a platform for training and development.

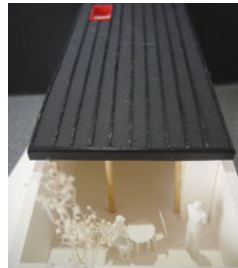
As the schemes have approached construction phases, the nearest comparison is that the design and procurement phases are similar to those adopted by volume house builders – with packages of work either let to sub-contractors and suppliers or to be completed by in-house labour.

The difference on these projects is that whilst housebuilders would be building tried and tested and well-known house types in Rightsizing they are new and each element is the subject of some proto-typing in terms of cost, availability of materials and critically cost.

The Management arrangement alongside design and build procurement provided the necessary multi-disciplinary approach and integration as it allowed a designer-contractor team at an early stage in the process. This brought all the participants onto the project early on so that both time and cost efficiency was enabled. DRUw was appointed early in the process and had contact with the client and other consultants and crucially the construction team in design and then project progress meetings throughout the process ensuring that everyone was well informed, and that good communication between all parties would be immediate.



The use of physical models in the design research process.
 1:200 Scale 'loose' models were used in design workshops with clients and local authority planners (above) to illustrate layout options.
 Larger scale 1:50 'dolls' type houses were used in market research processes and also to explain spatial configurations to clients and users



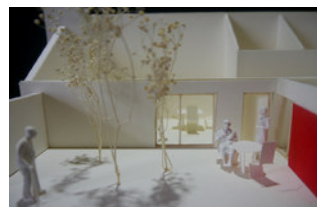
Modelling - large scale models of house types were made to illustrate space standards and inhabitation - for tenants, planners and client groups

DESIGN METHODS : DRAWING AND MODELLING

A range of models and particular drawing types were used to test out complex housing permutations and types involving a range of stakeholders, and to investigate construction technologies.

For the initial design workshops site models at a scale of 1:200 were made showing the site contexts. These were helpful as they provided an immediacy for others in the design process, planners and the client to observe the effect of physical constraints. Overlooking, rights of way and the impact of existing services could be quickly understood and different layout and massing studies were made by inserting (and removing) dwelling types.

February through till June 2017.





Drawn studies Elm Road



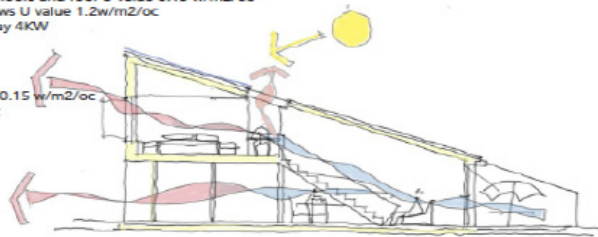


Drawn studies St Teilo



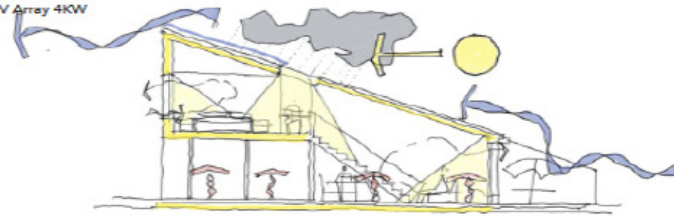
Fabric
Walls, floors and roof U value 0.15 w/m²/oc
Windows U value 1.2w/m²/oc
PV Array 4KW

Fabric
Walls, floors and roof U value 0.15 w/m²/oc
Windows U value 1.2w/m²/oc
PV Array 4KW



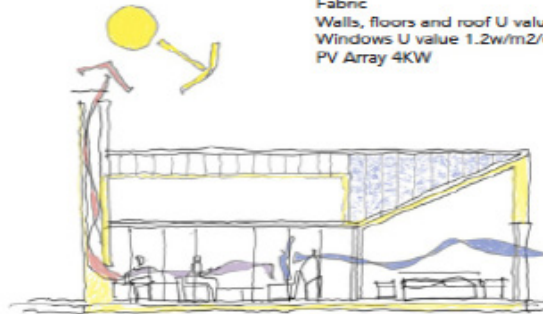
Mews - Summer Natural ventilation, Thermal mass balances gains, Heating off, Solar collector

Fabric
Walls, floors and roof U value 0.15 w/m²/oc
Windows U value 1.2w/m²/oc
PV Array 4KW



Mews - winter

Fabric
Walls, floors and roof U value 0.15 w/m²/oc
Windows U value 1.2w/m²/oc
PV Array 4KW



Courtyard - Summer Natural Ventilation, Thermal mass balances gains, Heating off, Solar collector

Fabric
Walls, floors and roof U value 0.15 w/m²/oc
Windows U value 1.2w/m²/oc
PV Array 4KW



LOW ENERGY

Whilst low energy and sustainability is a goal MHA explicitly were suspicious of the value of passivhaus in use. They had reason to suspect that the downsizer group in particular would find the passivhaus regime too restrictive and difficult to live with. Initially a SAP rating of 100+ was set. This was modelled for the house types under different orientations. Initially the School's own SAP calculator was used to set strategic parameters and then SAP calculations were made. The parameters were Passivhaus standard thermal performance for opaque parts of the fabric, a U value of 1.2W/m² for windows and doors. This was supplemented by a 4kW photovoltaic array. *Low energy and environmental delight - environmental modelling*

The potential of the houses to meet a SAP rating of 100 plus was further modelled on an iterative basis as the precise means of construction was investigated with the Housing Association's direct labour organisation.

The SAP sensitivity tool developed by the school's Architectural Science Group was of particular use during this phase as effect of variations in fabric performance and or systems could be immediately seen.

Whilst environmental efficiency was key environmental delight was also tested although not as explicitly reported upon.

The following were also observed through the use of physical and computer models:-

- Adaptability - A house whose space and occupants can adapt to changing conditions (daily and seasonal) and needs.
- Variation: The focus on nature's cycles implies that the indoor environment should vary in time and space rather than target uniformity or non-variability –one of the reasons for the early rejection of passivhaus.
- Outdoor and semi-outdoor areas to be easily accessible; and occupants are able to follow (changes in) outdoor conditions in all main living areas of the house.
- Light/darkness: Exposure to high levels of daylight is needed in the main living areas of the house during daytime, with special attention to the rooms that are mainly used in the morning, whereas the bedrooms need to provide complete darkness at night time.
- Cool/warm: The house should provide temporal and spatial variations in the thermal environment that are logical and follow, to a certain extent, outside temperature variations.
- Flexibility related to the seasons: The use of outdoor and semi-outdoor spaces should be stimulated outside the heating season.
- The occupants should be able to control the systems that influence parameters that can be sensed, e.g. lighting level, air quality and indoor temperature.
- Electrical lighting should follow, support and supplement change and variation in the light It was the intention to design for this and again solar and lighting studies were undertaken using physical and computer models to support these factors.

Fabric performance, construction and buildability

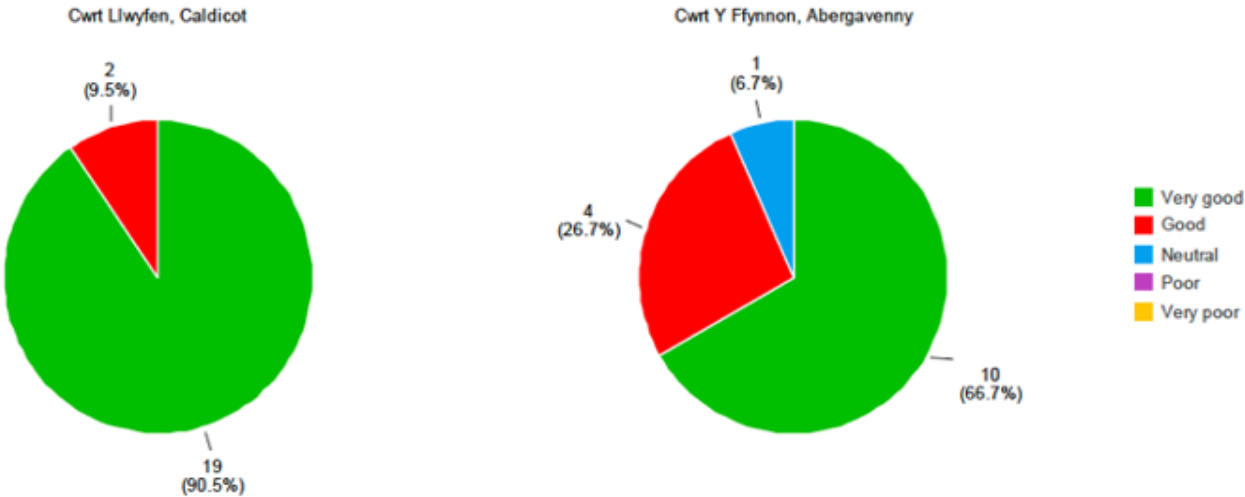
These aspects of construction were tested mainly through an iterative drawing process during which detail design workshops involving the whole construction team. The initial physical models were used to 'benchmark' changes as they arose.

MARKET RESEARCH

Independent market research was commissioned by MHA and took place through August and September of 2017 following the Design Review with the Design Commission for Wales. Part of this research was conducted with 4 focus groups with a semi-structured interview around the proposed drawings and models. DRUw were present at the focus groups to answer questions and queries. The models were frequently picked up and studied in detail as respondents analysed room size and configuration. The results of this phase of research confirmed that both house types would be popular with the segment of population – courtyard bungalows for downsizers and mews houses for first time occupiers.

Post construction resident survey

Whilst no full post occupation evaluation has been possible due to Covid 19 reference is made here to questionnaire results taken in July/August 2019 on completion of the houses. Around 100 prospective tenants and housing specialists were interviewed. Very high levels of satisfaction regarding design were recorded (see below).



DISSEMINATION

The intention for the 'downsizing project' is that it forms a prototype for new flexible house types for a demographic currently not catered for, on sites which may be considered difficult to develop. The early success of the project has led to two further Welsh Government funded schemes to take the core ideas forward and to refine them within a tight budgetary framework. This includes further design research work to develop a design guide to illustrate how to 'unlock' these difficult and constrained backland garage sites of which it is estimated that there may be around 500 in Wales. To date the scheme has been showcased at Welsh Government led 'road-shows' to promote the findings from ihp 1 and was published as a design prior to completion in the Annual Review of Welsh Architecture 'Touchstone' for 2019. Schemes were completed late Summer 2019. Further reviews and results of monitoring are anticipated.

On the Horizon - Rightsizing. Challenging space standards Touchstone : The Journal for Architecture in Wales pps 62-63 2019 ISSN 2398-2780

ELM ROAD

First time occupiers



Elm Rd completed. The blighted garage site is replaced by a compact close of 4 starter dwellings





Elm Rd - front elevations - individual front doors on to parking court.
Note large balcony window to first floor bedroom which focuses vistas up and through the dwelling and enhances privacy.



Elm Rd completed. Double height dining/lounge space. Large enough to accommodate the retrofitted galley kitchen to enable a second bedroom. Also note vistas up and through the dwelling to add to feelings of spaciousness.







Elm Rd completed. View of main bedroom at First Floor - light and views from bed and balcony window



Elm Rd completed. En-suite provision to first floor bedroom



Elm Rd completed. Storage cupboard with services. One of the challenges of comfort and low energy - the accommodation of more complex services takes a large amount of storage space.



Elm Rd. Patio space as an extension of indoor living space.

ST TEILO

Down-sizers



St Teilo completed. The blighted garage site is replaced by a compact close of 4 courtyard bungalows for down-sizers.





St Teilo completed. Note the corner windows connecting the interior and exterior both spatially and socially. Courtyards are accessed via individual gates



St Teilo, rear gardens provide drying areas and access to the kitchen side of the dwelling - additional amenity space



St Teilo, view from the dining living room into the private courtyard.



St Teilo, Galley kitchen
added to Dining Room/
Lounge to enable second
bedroom



Kitchen adapted to become
second bedroom



St Teilo, view from main bedroom into private courtyard





St Teilo, view through front to back - adds sense of spaciousness.





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