



Worcestershire Housing Strategy

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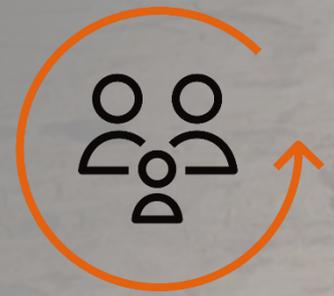


Health and housing



Future direction of housing policy

Introduction



Arcadis has been commissioned to work with the District and County authorities of Worcestershire and key stakeholders, including the NHS and members of the Worcestershire One Public Estate to develop a Worcestershire Housing Strategy to 2040. This strategy will comprise two key elements. Firstly, a more immediate and action driven series of delivery opportunities for the next 3 – 5 years and secondly, a longer term more visionary and guiding set of criteria / principles / themes for the period through to 2040. The aim of the strategy is to provide an ambitious vision for housing in Worcestershire, to recognise the part housing plays in the growth of healthy communities and economies of the county but also be reflective of the uniqueness of the county and its different places.

As part of the strategy's development stakeholders will be engaged and consulted to understand their views, needs, ambitions and opinions on housing in the county, now and into the future.

In order to stimulate these discussions and to gain the maximum value from these interactions we have prepared a number of 'thought papers' on a range of subjects relevant to housing. These papers do not seek to provide any boundaries or agenda to the engagement activity. They are merely aimed to allow the reader to think about housing in its wider context and to provide the reader with some insight into current activity taking place in the housing sector.

We trust these papers are interesting and thought provoking, but most of all enable some ambitious thinking and ideas to emerge and influence and shape the strategy under development.



Delivery Models

Worcestershire Housing Strategy

Delivery Models



Context

Delivery of housing is undertaken by a range of organisations. Large publicly quoted housebuilders, large privately owned housebuilders, small medium sized enterprises, Registered Providers (Housing Associations), specialist providers e.g. later living, and local authorities - who are also delivering housing either directly or through arms length companies. There are of course a range of joint venture models and partnership arrangements that bring together any number of the above, and the above list is far from exhaustive.

In this paper we look at some of the delivery models available to a local authority / the public sector to deliver housing programmes and projects. Developing housing whether promoted by or directly within the control of any public sector body (psb), has a relatively complex interplay of factors that will drive the choice of delivery model.

These include optimising the development opportunity; maximising commercial returns; controlling design quality; maximising affordable housing; delivering wider social benefits.

Delivery choices

For a simple housing development there are a series of steps to undertake and deliverables to be achieved. Each step requires a range of inputs and activities and comes with its risks, costs and timescales. The steps are:

- Promotion – stakeholder consultation, political support and pre-application planning support
- Land – land assembly and vacant possession
- Planning – achieving a deliverable and viable planning consent
- Delivery – procurement and construction of the scheme
- Exit / Revenues – sale of built assets
- Investment – capital lock-up

These steps do not always happen in series and overlaps will occur.

For a psb deciding how to engage / proceed in housing delivery, consideration should be given to these steps (the commitment, resources, costs etc).

There are also a number of **criteria** to be considered in deciding upon the **delivery model** to be adopted.

The interaction between the criteria and the delivery model are highlighted in the table fig 1 on next page.

The key message is that housing delivery is not straightforward, but at the same time more and more psb's are finding that with careful planning and the appropriate support they are able to leverage outcomes more aligned to their organisations definition of value and their objectives than merely selling their assets to the highest bidder.

We now consider a sample of the possible delivery models and the associated risks and benefits of each approach.

Land Sale: where a body sells land it owns either with or without planning permission. Selling without planning permission will generally realise a lower value as the risk of obtaining planning permission will sit with the purchaser. By securing planning the body will realise a higher value but of course there are costs and risk associated with securing that permission. Land sale also sees control of the land and what gets delivered relinquished.

Increasingly we are seeing fewer and fewer bodies promoting land sales with or without planning consent and progressing alternative solutions as summarised below.

Development agreement: Where a body prepares a development brief for a site identifying its requirements and then procures a private sector partner to work with it to develop the asset. Under the terms of the agreement, the private partner will deliver the body's requirements. Often within the development agreement there is a basis identified for a share of any profit generated (overage).

A development agreement allows a body to retain some control over development, whilst transferring the development risk over to the private sector. This is particularly useful for regeneration schemes where wider regeneration objectives are to be delivered but the constraints and process of delivery is complex.

Worcestershire Housing Strategy

Delivery Models



Fig 1 - Delivery Model

Interaction between delivery model & criteria

DELIVERY ROUTE	CRITERIA					
	Ability to control housing delivery (types, price point)	Ability to control economic/social outputs	Exposure to market risk	Need for direct capital investment	Commercial return	Need for property development expertise/resource
1. Land sale without planning consent	LOWER	LOWER	LOWER	LOWER	LOWER	LOWER
2. Land sale with planning consent	↓	↓	↓	↓	↓	↓
3. Development Agreement						
4. Partnering / Joint Venture (corporate or contractual)						
5. Direct development						
	HIGHER	HIGHER	HIGHER	HIGHER	HIGHER	HIGHER

Partnering / Joint venture: Involves an agreement between the public and private sector to develop (and potentially operate) a site. This involves sharing the costs, risks and benefits. A PSB and the private partner contribute to the development (cash/resource/asset) for an equivalent share of any profit or value generated. A separate company is set up between the two organisations.

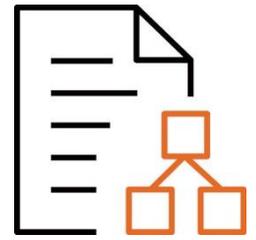
We find that joint ventures support the delivery of an asset where a council's aspirations and requirements are clear but significant upfront investment may be required which can only be recovered through land receipts at the point of sale.

Wholly owned Housing Companies:

There are a range of options for Housing Co's the most common is where a PSB sets up a company and sets out operating and governance systems as shareholder through articles of association. It provides finance, and staff resources at commercial rates to the company with land is transferred to the company which designs and develops sites. Profit from the company is transferred back to the council as a dividend.

This option has become increasingly popular with councils as they seek to take advantage of lower than market borrowing rates to deliver housing and financial returns and they look to control the nature of the housing delivered. There are a number of risks in this model that need to be considered and many examples of success and failure to be examined in order to assess the best fit for any particular organisation

Case Studies



Leicester City Council Housing Development Options

Leicester City Council wanted to take greater control of housing delivery utilising its surplus assets. They reviewed the legal implications of delivering a programme of housing development by establishing a new arm's length development company, a joint venture partnership or delivery through the Housing Revenue Account.

They reviewed the legal and governance requirements understanding how the company would operate, and they ran scenarios on three development schemes which would deliver housing and financial benefits over a 30-year period. The objective of the study was to demonstrate the benefits that could be generated from a development programme of the type being considered, both in terms of housing need and financial return but which also aligned to the Council's aspirations to have member involvement in the company's decision making.

The modelling they carried out demonstrated on three the sites, that the Council could develop over 300 units which would secure c. £2.3m of land value and over £15m revenue returns as well as new homes bonus and Council Tax benefits.

The governance structures developed also provided the Council with:

- More freedom and flexibility from Council decision making.
- Quicker development through the board's ability to commit assets for development and make decisions
- The opportunity to develop a new brand with the potential to be a genuine development company which could in future ultimately trade without reliance on Council assets



WHG / Lovell / Walsall Council Housing Development

This major regeneration project in Walsall is a joint venture between Anthem Homes (part of Walsall Housing Group) and Lovell with Walsall Council as an adjacent landowner and future partner.

The site comprises the remediation and redevelopment of a former industrial site into 252, mixed tenure, residential units comprising Affordable Homes, PRS, Open Market Sale and a Well-Being scheme for the over 55's.

The site was a well known contaminated former industrial site that had lain unused for many years. It was a site that the market ignored due to the costs of remediation. By careful analysing the site, identifying funding streams and by working together in a unique LLP Partnership the parties leveraged in WMCA funding to unlock the project.

The joint venture between public and private sectors is an open-book, cost and profit share partnership. Other stakeholders / funders include Homes England and the WMCA, The

The scheme commenced in August 2020 with remediation works complete and ground works underway.



WMHAP / WMCA Collaborative Delivery Vehicle

The WMHAP (West Midlands Housing Association Partnership) was formed by the RP's in the region in response to the formation of the WMCA. The WMHAP wanted to proactively support WMCA to deliver greater numbers of affordable housing quicker. To this end they developed a joint venture delivery vehicle structure and made an offer to the WMCA. The JV is to provide a policy impetus for WMCA, enabling the vehicle to incubate policy issues around, methods of construction, levels of affordable housing, use of brownfield sites, inclusive growth etc. Just as importantly, the vehicle has the ability to act as conduit between different streams of affordable housing funding. WMCA resources help support the viability of developing on brownfield and other WMCA policy imperatives, whereas Homes England grant (used by the housing association receiving the homes) will allow for greater percentages of affordable housing on the sites, over and above planning requirements. The idea of the vehicle is to build on success, If the vehicle demonstrates it has been able to deliver homes in strategic corridors and make a return, the funding can be recycled into future projects. The whole idea is to develop a self-sustaining model using pump priming and working capital funds to continue to deliver additional housing in the strategic economic corridors. Any returns would be commensurate with the risks associated with the development. The Joint Venture allows WMCA to share in returns made on the cashflows arising from the development.





Placemaking

Worcestershire Housing Strategy

Placemaking



Places impact the quality of people's lives. Whether a park, a building, a town or city, people and communities thrive when the spaces in which they live, work, move and play are designed and managed in a way that best meets their needs.

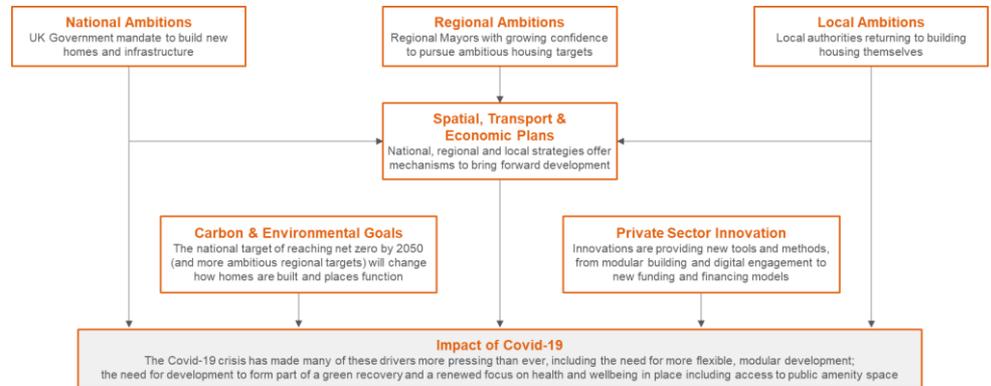
Our Definition of the Challenge

It has been proven, that there is a direct link between the quality of a place and its impact on health, wellbeing, life expectancy, education, economic outcomes and overall quality of life. The global Covid-19 pandemic has only highlighted and brought this into sharp focus. But making great places is not easy. Our extensive report into Placemaking, published in 2020 highlights what is important and what we should consider when setting out to renew, regenerate or create places.

We have identified that successful placemaking requires five core components;

1. The most critical area of placemaking – communities should be at the centre from the outset and placemaking should be done with, not to, communities.
2. The imperative of the climate emergency means sustainability is not optional, but fundamental. It reshapes the nature of placemaking & its delivery
3. Successful developments have a strong commitment to design and public realm, both of which are fundamental to the improvement of place
4. Funding will be scarce and targeted, more than ever development must be supported by an evidence base, a long-term plan and capacity to deliver.
5. Placemaking does not exist in a vacuum. It is a collaborative effort involving a wide variety of organisations

Background to the issue and relevance to the WCC strategy



Summary of current needs and issues relevant to a five-year timescale

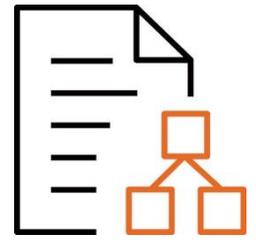
We are seeing an increasing need for places to provide homes, employment, social and physical infrastructure. Places should be resilient and flexible to changes in future societal trends. They should minimise their impact on the environment and they should enable their residents to embrace the new approaches to work, travel and social activity that have been accelerated by the Covid pandemic. In the next five years, placemaking will have to manage changes to Government policy and societal expectation.

This will require a focus on flexibility and engagement with communities to ensure that change can be embraced.

Summary of Future Trends

Looking to the future, placemaking will need to address changing patterns in how and where people work. There is likely to be a move towards more self-sufficient communities within highly connected networks of places creating '15-minute communities'. Sustainability and net-zero carbon places will be the norm with active travel and high levels of reliance on digital and physical connectivity

Case Studies



Cont'd

The Benefits of Effective Placemaking

- Places can be delivered more quickly and reliably, at lower cost, with higher return and greater satisfaction.
- The public sector will see the cost of delivering public services fall and quality of these services rise. By improving connectivity and social equality, and putting physical, social and mental health benefits at the forefront of planning, demand for many services will fall. We can also expect to see a positive boost to employment and overall GVA
- Infrastructure and utilities providers will see more predictable demand. A closer match of demand and provision will in turn make it easier to secure investment.
- Investors and funders will see reduced risk and a higher quality of return.
- All partners and collaborators in the creation of place will be able to use their data and analytics effectively to improve the quality of outcomes.
- Citizens will enjoy safer, more stable communities, more personal opportunity in employment and improved life chances, better connectivity, and better social infrastructure (including health, education and amenities). Communities will be more resilient and better curated, offering more personal choice and access to services with measurably improved well-being and attainment.

Perry Bar Regeneration Challenge

1. Perry Bar in Birmingham has long needed investment, but the 2022 Commonwealth Games has proved to be a key catalyst.
2. The Athletes Village is to be located in Perry Barr, and planned investment will drive wider regeneration, and create a long-term legacy post Games.
3. Engaging the local community has been vital in generating excitement.
4. The Council has worked with its professional team to support social and economic change.
5. Funded by corporate sponsor the Millennium Point Trust, 44 students from Great Barr Academy spent a day being coached and mentored by Arcadis as they worked on a real-life brief focused on the Perry Barr regeneration area.
6. Students gained a unique insight into the world of masterplanning, engineering, transport planning and other areas of the industry.
7. Students were able to not only learn about different career paths, like apprenticeships, but most importantly had the opportunity to contribute a valuable perspective on plans for their local area.

This community first approach has generated local support for the project and will make sure the legacy of the Games meets the needs of the community of today, tomorrow and into the future.

Otterpool Park , Homes England

A place in the countryside; a place where people and businesses want to be; a creative space, connected to wherever you need to be – that's the vision for Otterpool Park - the proposed Garden Town in Kent. Led by a development company set up by Folkestone & Hythe DC the creation of Otterpool is driven by placemaking principles. Responding to National, Regional and Local Ambitions, Otterpool will deliver up to 10,000 new homes over the next 30 years, meeting a significant proportion of the area's market and affordable housing need. This will be supported by the imaginative employment spaces, flexible working opportunities, schools, shops, medical facilities and other amenities that a vibrant and sustainable new community needs, Otterpool has been sensitively designed to complement its landscape setting, enhancing connectivity so current and future residents enjoy great walking and cycle routes into the countryside from the doorstep. An impressive 50% of the development will be green space, providing an environment within which a healthy community and rich array of biodiversity can thrive. Infrastructure to enable the delivery of the Garden Town is designed to support Otterpool's zero carbon ambitions, ranging from an on-site wastewater treatment facility recycling treated water back into the development to mobility hubs and electric only homes. Ensuring Otterpool's long-term success is a priority, with community involvement from the outset and a focus on stewardship so that funding for the facilities is sustained long after the development is completed





Later Living

Worcestershire Housing Strategy

Later Living



The UK's rapidly ageing population, with one in four Britons predicted to be 65 or over by 2037, is creating a clear need for more significant provision of housing with care for older generations, which could alleviate pressure on public services like the NHS.

Research shows those living in properties with provided care run by the ExtraCare Charitable Trust, saves the NHS £1,994 per person on over five years, reducing NHS spending for residents by nearly two fifths. Later living is a catch-all term, spanning retirement, downsizing, rightsizing, housing with care provision, and accommodation which encompasses greater levels of care.

Overview of Later Living

The UK Housing Crisis has been well publicised for many years with Government - prior to covid-19 and dealing with Brexit - putting Housing firmly at the top of the Political Agenda.

The Government has recently announced a new affordable housing build programme and continuation of the Help to Buy scheme (albeit in a new model) as part of the wider 'Build, Build, Build' strategy to stimulate this part of the market as one of the route out of the Covid-19 pandemic.

However, the UK continues to have a lack of supply in the Later Living segment of the residential market which only represents around 0.5% of the overall UK housing stock - compared to ten times this quantum in other parts of the world e.g., the US, Australia, and New Zealand. The UK currently has over 12.5m people aged over 65 years old which with projections from the Office for National Statistics is expected to rise by a further 2.5m people in the next 10-15 years..

Previous ONS data provided for Worcestershire, shows that many of the Districts have in excess of 20% of their local population being over 65 years. It is also expected that Worcestershire's population growth in this age group will mirror that of the wider UK meaning there will be an increasing need for this to be addressed in any future housing strategies and policy.

Furthermore, against this backdrop of lack of supply of fit for purpose accommodation - is the continued impact on the NHS, the increasing pressure on Adult Social Care budgets and Local Authorities ability to deal with these issues on the ground.

There is an interdependency between all these aspects and the need is to create a housing eco-system that considers the holistic situation, that balances need with supply, that provides both flexible accommodation with need specific accommodation and importantly provides choice that will support the current and planned future growth for Worcestershire.

What are Key Issues which impact delivery of Later Living?

A key issue of this market segment is the need to create a clear identity and accurately describe each of the product types that are available, both in terms that are recognised to the potential customers, investors and planning authorities.

An example is the definition of what 'extracare' is. The common view is accommodation that simply enables potential for continued independent living with access to levels of care commensurate to the customer and can often be provided within a 'village' type residency.

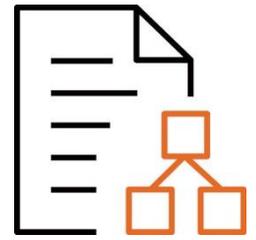
There continues to be much debate and lobbying to Government through leading sector organisations such as ARCO (Association for Retirement Communities Operators) www.arcouk.org and the HousingLIN www.housinglin.org.uk to create much clearer definitions and improved planning use classes ideally incorporated into the planned Planning Bill reforms.

Whether it is at the social/ affordable tenures or the retirement market, viability continues to be a major challenge for publicly or private funded developers and operators of later living accommodation. Land is often difficult to source directly when competing against the volume house builders, land allocations for C2 or C3 use can be limited in local plans, and the assessment as to whether planned developments should incur S106/ CIL or equivalent levies also puts pressure on scheme viability.

Operators also need to consider the substantial 'base of the iceberg' when considering whole life cycle and operating costs over the long term. Previously reports published including The Sunday Times, have reported 1 in 4 care homes faced closure even before the covid-19 pandemic so there is a need to support a new model to ensure the long-term viability of these facilities is preserved.

Many operators are keen to make sure that local amenities are close by to avoid replicating within their own developments and provide good accessibility for care staff meaning that urban or sub-urban locations adjacent to good transport infrastructure is crucial when selecting suitable sites.

Case Studies



Oxford City Council

Bradlands Close, Oxford – Social/Affordable Housing

To meet the need for affordable housing Oxford City Council (OCC) established a delivery programme for new build social housing covering the period 2012-15 with support from Homes England.

The programme comprised the development of five sites of varying size to provide 113 new homes under a single contract including 'Bradlands', which was the site of a former housing for the elderly scheme and that was under subscribed, substandard, and inefficient in terms of land usage.

The scheme was completed in 2015 and provided modern independent living for the elderly in the form of 49 no flats of one and two bed sizes over three floors with a number of communal facilities.

Whilst not a sheltered housing scheme OCC provided a regular visiting warden service. A number of residents from the former development took the opportunity to return to the scheme following redevelopment.

The ExtraCare Charitable Trust

Longbridge Extracare Village, Birmingham - Mid Market

The Longbridge Retirement Village forms the last of 5 sites delivered through a strategic partnership approach with Birmingham City Council and their Adult Social Care directorate, providing much needed extra care and retirement accommodation for the 55+ yrs. and opportunity to downsize and release family homes across the City of Birmingham.

The scheme formed part of St. Modwen's £1Bn regeneration project at the former Land Rover site at Longbridge.

Opened in 2017, the mixed tenure scheme provides; 260 no. 1 bed and 2 bed apartments, complete with bar, restaurant, gym, health and wellbeing, hairdressers, and village centre providing extracare and continued independent living.

Audley Group

Audley Ellerslie, Malvern – Retirement

Audley Ellerslie retirement village has 101 properties set against the backdrop of the Worcestershire countryside, in the town of Malvern. Three grand Victorian mansions, including a Grade II listed building, form the centrepiece of the village.

Audley Care provides as much support that is required and is designed so that residents can stay firmly in control, with complete freedom and independence to live the life they choose and want.





Modern Methods of Construction (MMC)

Worcestershire Housing Strategy

MMC



Modern Methods of Construction (MMC) also known as modular, off-site and on site manufacturing, volumetric housing manufacture, or design for manufacture and assembly – can offer an opportunity to rethink how we plan, design and delivery much needed housing for Worcestershire.

These approaches can speed up the process and provide homes that adapt to local character and community needs. MMC also offers an opportunity to achieve net zero carbon ambitions more easily than a traditional approach to housing delivery.

MMC has been around for decades but still today less than 10% of housing in the UK is delivered this way – despite the recognised need. However in the last three years the volume has been turned up on MMC and Covid-19 has provided further focus on its benefits.

Background to the issue and relevance to the WCC strategy

Accelerating housing delivery is an important element to dealing with the housing crisis – both supply and affordability. demand.

MMC and in particular modular, has the ability to deliver housing quickly, to high quality and, when at volume, economically.

Not all sites are suitable and having a clear vision, ambition and delivery plan in place is key to the successful long term use of this technology.

Our definition of the problem/challenge / opportunity

Delivering housing at volume quickly is a challenge, with limited labour in the UK, an ageing workforce, leaving the EU and Covid 19 all challenging our ability to deliver more.

MMC and Modular housing can respond to this having the ability to improve productivity - delivering homes with less labour.

It is important to understand the opportunity in the context of a wider housing strategy, having a longer term plan and surety of pipeline in order to ensure this offers a viable solution.

Considering MMC on a project by project basis will not offer all the advantages available and as such may not create a sustainable long term impact on housing delivery.

Summary of current trends and issues relevant to a 5-year timescale

MMC and Modular continue to gain momentum in the market and have clear support from government. To date, we have largely seen one off projects as the market wants to test products. We now see momentum building and some larger programmes emerging.

The recent announcement from Homes England that 25% of all delivery under the Affordable Homes programme should incorporate MMC (for strategic partners) and their financial support to modular initiatives is a clear indication of this.

One of the other barriers to MMC is also being removed as uncertainty of funding and warranty issues within the financial sector is being overcome. However this understanding is still not universal so there are still barriers with some developers around development finance, open market sales and re-financing/equity release for raising finance. Some recent successful models include funders or developers buying a manufacturer, or establishing a new facility; some public sector procurement and delivery; along with some independent manufacturers slowly gaining momentum and order book.

Summary of future trends

With a mature understanding, some refined products now available, government pressure to utilise and a recognition of its importance playing out through Homes England funding we could be on the cusp of MMC and modular having a far greater market share.

The necessity for the sector to improve productivity to maintain and accelerate delivery of housing requires intervention with MMC and modular providing part of the solution.

We expect to see growth in the use of MMC and modular in the next 5 years with fewer larger scale manufacturers focused around centres of excellence in manufacturing, supply chain, training and delivery.

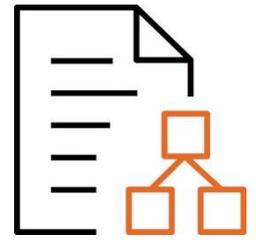
Implications for WCC and the housing strategy

MMC and modular can play a part in the successful implementation and delivery of the Worcestershire Housing Strategy.

Embracing this technology and approaching implementation with a clear plan and at scale offers the opportunity to deliver the Strategy and take advantage of potential funding streams and the associated economic benefits.

Whilst not providing a solution on all developments, successful implementation will centre around understanding where this technology can offer advantage as part of the wider delivery programme aggregating demand and commitment from all delivery partners in the region.

Case Studies



Lewisham Homes, Lewisham

A fully modular programme delivering 120 units of affordable housing and hostel accommodation across 3 sites.

Designed from the outset as a modular development these schemes were granted planning permission in 2019.

Lewisham successfully procured a modular manufacturer in 2020 through a competitive tender process and are now managing the delivery of this important programme.

Lewisham had to navigate the viability, cost and manufacture selection to ensure that their risk was managed and they had reassurance around the best procurement strategy and delivery partner.

Manchester Combined Authority

Manchester undertook project to consider the potential for Modern Methods of Construction (MMC) to accelerate housing delivery in the Greater Manchester city region.

This concluded that the combined authority should act to aggregate demand and engage with the manufacturing supply chain to accelerate delivery and drive wider benefits for the region. It also concluded that a strategic business case should be developed for the rational for co-ordinated use of MMC.

Similar exercises have also been undertaken by Sheffield City Council, Scottish Futures Trust, WMCA and Bristol City Council with Innovate UK.

Oxford City Council

Oxford City Council's housing delivery vehicle has a 2,500 unit programme. The council is seeking to deliver at this scale in order to address some of the affordability issues that come with being one of the most unaffordable places to buy a house in the UK. The programme is delivering a range of house types, using a range of delivery methods, from direct delivery to strategic partnerships.

OCC have been looking in detail at implementing an MMC strategy to deliver homes at pace that achieves their sustainability and carbon targets whilst remaining viable.

A procurement exercise is currently underway to establish a framework of manufacturers including implementing platform design (standard details) to enable collaboration between manufacturers and managing the risk of delivery failure.





Net zero carbon for housing

Worcestershire Housing Strategy

Net zero carbon for housing



Creating a strategy that drives Worcestershire towards the decarbonization of both existing and future housing stock will be an essential part of the overall framework. The obligation for the industry to lead this transformation is clear and if planned properly will deliver a broad range of benefits.

Summary of current trends and issues relevant to a 5-year timescale.

Technology - Maximising the impact of existing technologies

Waste minimisation and management addressed through shift towards offsite manufacturing and the use of recyclable materials.

Capital & Regulations - Incrementally tighter regulations

Building codes are reviewed and adjusted so that they don't hinder implementation of net zero solutions.

Ways of Working - Human driven, digitally supported

Building Information Modelling facilitates the shift towards systems engineering and creation of multidisciplinary integrated teams.

Background to the issue and relevance to the WCC strategy

The UK's legally-binding climate change targets will not be met without the near-complete elimination of greenhouse gas emissions from UK buildings.

Emissions from the UK's 29 million homes accounts for 14% of total UK emissions and 29% of energy consumption

Efforts to adapt the UK's housing stock to the impacts of the changing climate: for higher average temperatures, flooding and water scarcity, are lagging far behind what is needed.

The challenges are two-fold and reflected in both our pipeline of homes that are yet to be constructed and our existing homes.

Our definition of the problem/challenge/opportunity

The problem is how do we decarbonize both our existing and our new housing stock in a market that is fast evolving with costly new technologies but is reliant upon achieving economic viability and meeting people's aspirations.

The challenge is providing enough direction, legislation and control to give enough certainty to move housing development in the right direction, whilst at the same time maintaining the flexibility to constantly review and evolve the approach without deterring invest ability and appetite.

The opportunity is to develop a housing strategy that is deliverable and that achieves the sustainability targets.

Summary of future trends

Technology - Scaling up zero-carbon solutions

Additive manufacturing enables precision construction and waste minimisation. Platform-based approach makes the recycling and reuse of building components

Capital & Regulations - Focus on net zero operational carbon

Operational carbon tax and incentives to reduce embodied carbon

Ways of Working - Towards Construction 4.0

Construction sites turns into a digital assembly sites, where humans, supported with exoskeletons, work alongside

Implications for WCC and the housing strategy

In order to tackle the challenge, the Housing Strategy will need to focus on 5 key areas;

1. Performance and compliance

Quality and compliance with stated design standards needs greater emphasis and control as the tolerances need to be tighter to achieve low carbon in use.

2. Skills gap

Emerging policy and technologies are creating a skills gap in housing design, construction and in the installation of new technologies. Clear policy and training will be required.

3. Retrofitting existing homes

A carefully planned rollout programme of retrofitting low carbon fabric solutions and technologies to existing homes will be needed.

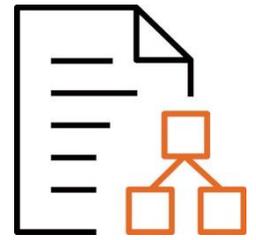
4. Building new homes

New homes must achieve appropriate sustainability credential for carbon (embodied and in-use) climate and flood resilience.

5. Finance and funding

There are urgent funding gaps which must be addressed, including secure UK Government funding for low-carbon sources of heating beyond 2021, and better resources for local authorities.

Case Studies



North West Bicester Eco Town A2Dominion / Cherwell District

Description of Works

North West Bicester is an Eco Town development achieving true Net Zero Carbon homes completed in 2017. Future phases are at feasibility stage undergoing reassessment of the development's viability.

Net Zero Carbon / Sustainability

The cost to increase the energy performance from Code for Sustainable Homes Level 5 to Net Zero Carbon was approx. £10,000 per unit.

The target was NZC in operation only, not the upfront embodied carbon.

The key sustainability measures which were implemented were:

1. Triple Glazing
2. Roof mounted PV panels
3. Rainwater harvesting
4. Prefabricated timber frame

Lessons Learnt

Very challenging optioneering for different sustainability measures at such an early design stage (feasibility) without any detailed design information.

Setting parameters to isolate Net Zero Carbon related costs, many elements (such as fabric performance improvements) were typically integrated into the overall build cost.

Following the completion of Phases 1 and 2, the viability of the Eco Town was reassessed (achieving such a high sustainability requirement meant that the homes were expensive to build).

New technologies, increasing standards and a supply chain move towards more energy efficient products and the growing popularity of MMC will reduce cost to deliver over time.



AGAR GROVE, Camden Council

Description of Works

Agar Grove was the first Passivhaus development in London and the largest in Europe at the time - 2014.

Phase 1A and 1B consisted of 95 units and costed circa £34m. And Phase 1C consisting of 125 units and costing circa £41m. It achieves CfSH 4.

Net Zero Carbon / Sustainability

Air source heat pump and ambient loop installation. No gas on site, all electric powered mechanical plant

Installation of PV panels, triple glazing and reduced Glass:Solid ratio of 26%

Thicker cavity wall with increased insulation was installed for solid areas

Due to it being a Passivhaus development, the requirements to reduce thermal bridging and improve air tightness were extremely strict

Extensive insulation was installed to ground floor slab to minimise heat loss

The extra over costs to achieve Passivhaus standard linked to the above were circa 9%.

Lessons Learnt

First Passivhaus development for the client and the contractor and therefore there were some programme delays mainly caused by the intense level of testing requirements.

In order to achieve the Passivhaus standard the façade should be designed with this requirement in mind from the outset, difficult to adapt existing design to meet the standard.

The Contractor's on costs (preliminaries, design fees and OH&P) were higher than expected due to the risk of trying to achieve Passivhaus status as well as the intense labour required during testing.



Wonderwoods Vertical Urban Forest, Netherlands

Vertical Forests

Once built, the Wonderwoods Building will be nearly energy neutral. The greenery on the building's façade will literally clean the city air. The structure will absorb 5.4 tons of CO2 and 15,000 tons of particulate matter. In the process, the building will also generate 41.4 tons of oxygen per year.

The additional vegetation will help to reduce operating costs of the building particularly in regards to energy usage.

By incorporating sustainable materials, costs will be further reduced and rectify the percentage increase in construction during the life cycle of the building.

The maintenance costs of the plants will be subsidised by the savings in energy.

The cost of a Vertical Forest (using the standard landscaping cost applied to a larger area) versus a traditional build, is an extra cost of between 1-5% depending on the extent of the vegetation incorporated.

Building Features

Visionary architecture

- A blueprint for harmonious cohabitation with nature in the heart of a city.

- Both towers share abundant green elements and a clear structure of terrace-like, stepped levels, clearly articulating the various aspects of the development – offices, residential and public/commercial spaces – combined total floor space of 65,000 m².

Live with nature

- Infused throughout each apartment; from the natural building materials to the finish, which is then enhanced by the ample natural daylight.





Health and Housing

Worcestershire Housing Strategy

Health & Housing



Houses are homes. They are places where we bring up our family, socialise, unwind, feel safe and spend time, they are our space.

The Global Covid Pandemic has meant for many their homes have also had to become a place of work, a gym, a school. Even when, eventually, a more normal existence returns it is likely that many will continue to work from home some of the time - having discovered you don't need to be in an office every day of the working week to be productive. And many have been voting with their feet, recognising that their homes aren't fit for the future, fuelling the housing market as people look for something new that better supports this new found flexibility.

But the pandemic has also highlighted some real inequalities in housing. Where those with a garden, home office, broadband, plenty of living space have endured lockdown, whereas those in overcrowded, conditions with no outdoor space have struggled.

It is also widely accepted that homes effect people's health and mental wellbeing. Several studies have highlighted that proximity to open space increases the propensity for people to exercise and can improve their mental wellbeing; that well designed communities and places that promote interaction can reduce the health impacts of loneliness – one of which is reduced life expectancy. Poor quality accommodation also impacts negatively on health and overcrowded accommodation has led to increased transmission of Covid 19.

The factors linking health and housing can be broadly described as follows:

- **Quality and condition:** from damp to overcrowding to having a garden or access to open space.
- **Stability and Security:** control over how long people can live in a home or how often they have to move.

- **Affordability:** relates to the financial pressure caused by housing payments, be these for the housing itself and / or the utilities and maintenance. Of course reduced disposable income means there is less to spend on things that promote health such as healthy food and exercise.

In October 2017 The Health Foundation published an article "How does housing influence our health?"

This infographic illustrates the way in which housing and health play out:

A report by BRE using 2011 data suggests that bringing the highest risk housing up to average standards could save the NHS £435m in first year treatment costs.

Why Housing matters to health A report by BRE suggests that in 2011 cold and damp homes cost the NHS an estimated £864m in first year treatment costs. They contribute to excess winter deaths and illnesses, particularly from cardiovascular and respiratory disease.

Why Housing matters to health When it comes to specialised, purpose built accommodation, there is a strong case for investment.



There have been many other published pieces on the link and impact of housing and health. Another very informative publication is the NHS England Quick Guide: **Health and Housing**. Here there are a range of statistics and cost benefit commentary that further reinforces the need to think of housing in a different way. Some of the key statements are included here for information.

KEY STATEMENTS

Why Housing matters to health A report by BRE suggests that at a system level, poor housing cost the NHS in 2011 at least £1.4bn in first year treatment costs.

Why Housing matters to health Unsafe housing is associated with increased falls, leading to otherwise avoidable hospital admissions.

According to a recent report by Frontier Economics, housing a frail older person in a specialised unit can save around £3k in health and social care costs per year. The savings are considerably higher for those living with a sensory impairment (£6k), a mental health condition (£12.5k) or a learning disability (£15.5k) when compared with the accommodation they would otherwise have had.

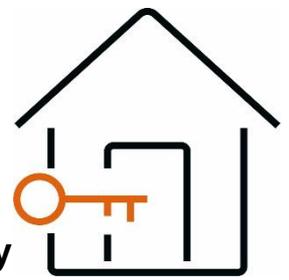
Why Housing matters to health Overcrowded homes increase infectious disease and are linked with poor mental health. A BRE report identified, using 2011 data, that bringing the most overcrowded homes up to the average standard could save the NHS £2m in first year treatment costs (excluding mental health savings).

A modern, two-story house with large windows and a central glass entrance, illuminated at night. The interior lights are on, and the exterior is lit with warm, ambient lighting. The house is set on a lawn with a few trees and a small patio area.

Future direction of housing policy

Worcestershire Housing Strategy

Future direction of housing policy



Housing is always a key component of Government Policy and party commitments. Speeding up planning, delivering more homes, addressing the affordability gap. The Government and industry has been trying to "fix the broken housing market for over 50 years". However, the global pandemic has highlighted - probably more than at any time since the second world war – the importance and impact housing has on the quality of people's lives. As we move from the pandemic into the economic, health and social recovery perhaps this time we can hope that, given the recognised importance of housing, whilst we might not 'fix' the problem we can certainly make great strides in transforming the industry into something that better meets the needs of the majority of this country's citizens, not the minority.

Government will not only see Housing as part of essential infrastructure (part of the levelling up agenda) but also will see it as a fundamental driver for economic recovery. With investment in housing achieving something like 2.5 times the growth in GDP it is likely to be central in the Treasury recovery strategy.

In addition, the focus the pandemic has brought on key workers (health service, teachers etc) Government is likely to come under more pressure to deliver more "affordable" housing, however their main delivery vehicles, Housing Associations, are under severe liquidity pressures, so we expect more support here from the public purse as well political encouragement from private funding (SIF's etc) to underpin the development of the required affordable numbers.

Government is increasingly seeing collaboration between the public and private sector through joint ventures and other delivery models as the way to maximise market intervention, policy will increasingly look to support this.

The House Builders Federation have stated that in 1988 more than 12,000 SME's builders were responsible for nearly 40% of all new homes, by 2017 this had reduced to around 2,500 responsible for only 12% of new homes. This trend has continued and delivery by SME's continued to fall. Government will see the opportunity of unleashing the potential here. By focusing on the perceived barriers of lack of development finance, a land market weighted in favour of larger builders and a complex planning system.

Government will be pushing Homes England to intervene more pro-actively where they see the market failing such as supporting the implementation of MMC delivery, unlocking and enabling land and facilitating partnerships. In fact Homes England has established its MPP (Markets, Places Partners) team to work with stakeholders and partners to do just this.

Government may well look at some sort of windfall tax on the large Housebuilder profits to help fund the increasing requirement for affordable housing although will be very mindful not to do anything that will impact on the current delivery momentum and numbers.

Support for the emerging different tenure groups, such as Build to Rent and Later Living will gain importance and will continue to rise on the agenda for planning reform.

Finally, how the zero carbon and diversity agendas will specifically impact on house building will be an emerging agenda throughout 2021 and beyond.



About Arcadis

Arcadis is the leading global Design & Consultancy firm for natural and built assets. Applying our deep market sector insights and collective design, consultancy, engineering, project and management services we work in partnership with our clients to deliver exceptional and sustainable outcomes throughout the lifecycle of their natural and built assets. We are 27,000 people, active in over 70 countries that generate €3.3 billion in revenues. We support UN-Habitat with knowledge and expertise to improve the quality of life in rapidly growing cities around the world.

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