



Housing & Land Delivery Board

Date: Wednesday 3 March 2021

Time: 10.00 am **Public meeting** Yes

Venue: This meeting is being held entirely by video conference facilities
[Please click here to view the meeting](#)

Membership

Councillor Mike Bird (Chair)	Walsall Metropolitan Borough Council
Sarah Middleton	Black Country Local Enterprise Partnership
Councillor Sharon Thompson	Birmingham City Council
Councillor George Adamson	Cannock Chase District Council
Councillor Jacqueline Sweetman	City of Wolverhampton Council
Bill Blincoe	Coventry and Warwickshire LEP
Councillor David Welsh	Coventry City Council
Councillor Angus Lees	Dudley Metropolitan Borough Council
Simon Marks	Greater Birmingham and Solihull LEP
Philip Farrell	Homes England
Councillor David A Wright	North Warwickshire Borough Council
Councillor Julie Jackson	Nuneaton & Bedworth Borough Council
Councillor Matthew Dormer	Redditch Borough Council
Councillor Sebastian Lowe	Rugby Borough Council
Councillor Keith Allcock	Sandwell Metropolitan Borough Council
Councillor Robert Macey	Shropshire Council
Councillor Ian Courts	Solihull Metropolitan Borough Council
Councillor Daren Pemberton	Stratford on Avon District Council
Councillor Jeremy Oates	Tamworth Borough Council
Councillor David Wright	Telford and Wrekin Council
Councillor Peter Butlin	Warwickshire County Council
Kevin Rodgers	West Midlands Housing Association Partnership

Quorum for this meeting shall be at least eight members

If you have any queries about this meeting, please contact:

Contact Carl Craney Governance Services Officer
Telephone 0121 214 7965
Email Carl.Craney@wmca.org.uk

AGENDA

No.	Item	Presenting	Pages
1.	Apologies for Absence (if any)	Chair	None
2.	Notification of Substitutes (if any)	Carl Craney	None
3.	Declarations of Interests (if any) Members are reminded of the need to declare any disclosable pecuniary interests they have in an item being discussed during the course of the meeting. In addition, the receipt of any gift or hospitality should be declared where the value of it was thought to have exceeded £25 (gifts) or £40 (hospitality).	Chair	None
Business Items for Consideration			
4.	Minutes of last meeting [For approval]	Chair	1 - 8
5.	Strategic Outline Business Case for an Affordable Housing Delivery Vehicle	Gareth Bradford / Rob Lamond	9 - 20
6.	Zero Carbon Homes Charter and Routemap	Gareth Bradford / Rachel-Ann Atterbury	21 - 26
7.	The Advanced Manufacturing in Construction (AMC) Routemap	Gareth Bradford / Rachel-Ann Atterbury	27 - 112
Business item for Noting			
8.	Update on Housing and Land Portfolio Deliverables 2020/21	Gareth Bradford / Hannah Stock	113 - 120



West Midlands Combined Authority

Housing & Land Delivery Board

Wednesday 13 January 2021 at 10.00 am

Minutes

Present

Councillor Mike Bird (Chair)
Sarah Middleton

Councillor Sharon Thompson
Councillor Jacqueline Sweetman
Bill Blincoe
Councillor David Welsh
Councillor Angus Lees
Marc Lidderth
Philip Farrell
Councillor David A Wright
Councillor Ian Lloyd

Councillor Matthew Dormer
Councillor Robert Macey
Councillor Ian Courts
Councillor Daren Pemberton
Councillor Peter Butlin
Kevin Rodgers

Walsall Metropolitan Borough Council
Black Country Local Enterprise
Partnership
Birmingham City Council
City of Wolverhampton Council
Coventry and Warwickshire LEP
Coventry City Council
Dudley Metropolitan Borough Council
Environment Agency
Homes England
North Warwickshire Borough Council
Nuneaton and Bedworth Borough
Council
Redditch Borough Council
Shropshire Council
Solihull Metropolitan Borough Council
Stratford on Avon District Council
Warwickshire County Council
West Midlands Housing Association
Partnership

In Attendance

David Butler
Neil Taylor
Rachel-Ann Atterbury
Gareth Bradford
Carl Craney
Dan Essex
Mia Higgins
Rob Lamond
Tim Martin
Gurdip Nagra
Lyndsey Roberts
Hannah Stock
Patricia Willoughby
Hannah Worth

Coventry City Council
Walsall Metropolitan Borough Council
West Midlands Combined Authority
West Midlands Combined Authority
West Midlands Combined Authority
West Midlands Combined Authority
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West Midlands Combined Authority

Item Title No.

25. Apologies for Absence (if any)

Apologies for absence had been received from Councillor Julie Jackson (Nuneaton and Bedworth Borough Council), Councillor Keith Allcock (Sandwell Metropolitan Borough Council) and Councillor Lisa Trickett (Chair – WMCA Overview and Scrutiny Committee).

Apologies for absence had also been received from Gill Hamer (The Marches Local Enterprise Partnership), Simon Tranter (Walsall Metropolitan Borough Council), Mark Ryder and Geraint Stoneman (Warwickshire County Council) and Isha Bhatt (West Midlands Combined Authority).

26. Notification of Substitutes (if any)

Councillor Ian Lloyd had been nominated as a substitute member for Councillor Julie Jackson (Nuneaton and Bedworth Borough Council).

27. Declarations of Interests (if any)

No declarations of interest were made in relation to matters under consideration at the meeting.

28. Minutes of last meeting

Councillor Jacqueline Sweetman commented that she had been unable to attend the last meeting and had nominated her colleague, Councillor Stephen Simkins, to attend as her substitute but he was not recorded as being in attendance at the meeting. She asked whether the attendance of substitute members was recorded or whether the attendance of Councillor Simkins had been omitted inadvertently. The Chair confirmed that such attendance was recorded and that the record could be amended.

Carl Craney reported that no nomination of Councillor Simkins acting as a substitute had been received and, accordingly, an invitation to the meeting including the necessary link had not been provided. Councillor Simkins had not attended the meeting.

Resolved:

That the minutes of the meeting held on 2 November 2020 be confirmed as a correct record and signed by the Chair.

29. Affordable Housing Delivery Vehicle - Update and Next Steps

Gareth Bradford reminded the Board that the report on the Affordable Housing Collaborative Delivery Vehicle, which had been noted at the last meeting had been 'Called in' by the WMCA Overview and Scrutiny Committee and at the meeting of that Committee held on 23 November 2020 the report had been referred back to this Board for further consideration. Tim Martin reported that, unfortunately, neither the Chair or Vice-Chair of the Overview and Scrutiny Committee were able to attend this meeting to outline the reasons for the decision of that Committee.

Rob Lamond read out to the Board a letter from Councillor Lisa Trickett, Chair of the Overview and Scrutiny Committee to the Chair of this Board as follows:

Dear Cllr Bird,

Re: Affordable Housing Collaborative Delivery Vehicle: Progress Update

As you know the Overview & Scrutiny Committee called-in the decision of the Housing & Land Delivery Board held on 2 November 2020 relating to the proposals for an affordable housing collaborative vehicle. The reason for the call-in was stated as:

The panel was not made aware of the extent of need and possibility of specifying a purpose to deliver on social housing requirements. Our concern is that members have not been given the information required to make an informed decision and that this report unduly fetters the opportunity to use such a vehicle to deliver on housing need in the region.

Thank you for attending Overview & Scrutiny Committee on 23 November to discuss and answer questions in relation to the above. The committee concluded that:

“The Affordable Housing Collaborative Delivery Vehicle: Progress Update report be referred back to the Housing & Land Delivery Board for further consideration in order that the members of that board can be assured that the proposals and the full business case provided sufficient evidence that the proposals would deliver on the intended objectives as stated at this committee by the Chair of the Housing & Land Delivery Board and the Director of Housing & Regeneration”

I understand that you will be re-considering the Affordable Housing Delivery Vehicle report at the next meeting of the Housing & Land Delivery Board on 13 January which, in accordance with the provisions of the WMCA’s constitution, I am able to attend and report on the findings of the Overview & Scrutiny Committee. Unfortunately I am not able to attend due to a clash of meetings but would welcome a summary of the conversation from your reconsideration of this item.

Thank you.

The Chair reminded the Board that work on the preparation of a Full Business Case for the Affordable Housing Delivery Vehicle was on-going and that, in his opinion, the ‘Call In’ had been premature.

Gareth Bradford reported that the report presented to this meeting was more detailed than that submitted previously and included information on the history and context of the proposal and addressed the issues raised by the Overview and Scrutiny Committee insofar as it explained the position with ‘affordability’ with it being measured against the regional definition. He emphasised that, at this stage, the WMCA was not being asked to commit any resources in terms of finance or land and (any such decisions would be made by the Investment Board) that any concerns raised at this meeting could be included within the Heads of Terms. He assured the Board that work on the governance arrangements for the Delivery Vehicle were progressing to ensure that they were sufficiently robust.

He advised that any allocation of resources to the Delivery Vehicle would be subject to the WMCA's governance requirements and that the intention was to achieve 'additionality' i.e. the provision of affordable housing over and above what could be delivered normally on difficult to develop sites. He also reminded the Board that in respect of 'Housing Needs', this was a matter for each local authority, in their role as Local Planning Authorities, to determine through the Local Plan process albeit that the WMCA worked in collaboration with local authorities. Local authorities worked in collaboration with the WMCA with local authorities to support the delivery of such proposals particularly those on brownfield land.

Councillor Angus Lees concurred with the views now expressed as no decision was required at this stage with the Full Business Case still in the development stage. He suggested that this be presented to the Overview and Scrutiny Committee in the first instance for consideration. He queried how the Management Board of the Delivery Vehicle, once established, would be held to account. The Chair commented that the Delivery Vehicle would be comprised of and operated by a number of Housing Associations, all of which would be subject to their normal governance arrangements and contracts with Homes England.

Councillor Jacqueline Sweetman commented that the development of the Delivery Vehicle was still in an embryonic stage and that this Board had the opportunity to shape its form. She drew to the attention of the Board that many brownfield sites were often unviable for development and asked whether the WMCA would contribute to the remediation and development costs in order to off-set the negative value. She also asked, in the circumstance of loan funding, whether the WMCA would be providing guarantees for this finance. Gareth Bradford explained that the Delivery Vehicle would act as a project Sponsor and, in the same way as any other organisation, would be required to comply with the Single Commissioning Framework to access any funding. He explained that there were rules and restrictions imposed on those funds by Government and these would have to be complied with e.g. the amount of money that could be put into any one development. He gave the example of the Housing Deal Land Fund which required the WMCA to deliver 8,000 dwellings in return for £100 million. This required the average support per unit to be no greater than £12,500 across the programme as a whole (although there could be significant variations on the level of grants within individual projects).and this matter was the subject of regular reports to the Investment Board. Currently, the WMCA was on track to deliver on the target. Any applications for loans would need to be applied for in the normal way with funding only being accessed with the approval of the Investment Board. Any decisions made in respect of funding would be subject to reports to the appropriate Board in the usual way.

Neil Taylor asked why the vehicle was needed and what value it would add. Gareth Bradford explained that on some sites, the risk for the development industry were just too high. He explained that, if housing associations worked together and with the WMCA, they could achieve more than if working independently.

Councillor Sharon Thompson commented that given the housing need in the

region the development of the Delivery Vehicle should be supported.

Kevin Rodgers explained that the intention had always been for the Housing Associations to work collaboratively with the WMCA with a view to providing more social housing units than defined in their respective business plans and contracts with Homes England. Subject to the approval of the Full Business Case, the Affordable Housing Delivery Vehicle would assist in fulfilling this aspiration. He explained that the majority of housing association homes were provided as social or affordable rent, or as shared ownership. Sites that could not readily be undertaken by individual housing associations could be developed by housing associations provided that the risk was shared. The available expertise of the 26 members of the Partnership, anchored across the West Midlands, would allow more affordable homes to be provided across the region as a whole. By working with the WMCA, the Partnership would be able to deliver new homes on sites that the private sector would not be prepared to develop or on which they would provide only private sector housing. He concluded by saying that the WMCA would be a member of the partnership and the delivery vehicle would be owned 50% by the WMCA.

Councillor Ian Courts commented that if the Delivery Vehicle could deliver more homes and sites it should be supported although a strong risk assessment process would be required to be in place.

Rob Lamond drew particular attention to elements of the report which addressed the concerns of the Overview and Scrutiny Committee in relation to the definition of affordable housing and the role of Housing Associations. He highlighted that social rented housing was an important offer of the affordable housing delivery vehicle and that the partnership very much reflected the shared values and objectives of both the WMCA and the housing associations.

Resolved:

1. That the background, strategic context and rationale for developing a proposal between the WMCA and the West Midlands Housing Association Partnership for a collaborative Affordable Housing Delivery Vehicle to address the pressing housing affordability challenge of the West Midlands be endorsed;
2. That the development of a Full Business Case to be prepared for the March 2021 Housing and Land Delivery Board be agreed;
3. That it be noted that any WMCA investment into the proposed Affordable Housing Delivery Vehicle would be subject to Investment Board consideration and approval and the robust gateway approval and assurance processes for all investments made via the WMCA's Single Commissioning Framework.

30. Zero Carbon Homes: Charter and Routemap

Rachel-Ann Atterbury presented a report which updated the Board on the excellent progress being made under the Zero Carbon Homes Work Programme of the Board.

Councillor Ian Courts advised that he supported fully the proposals although there was a need to examine the cost parameters to ensure they were realistic. He also asked whether developers could make alternative provisions (allowable offsets) if they could not deliver zero carbon homes on a site. Rachel-Ann Atterbury assured the Board that both matters were built into the Routemap and acknowledged particularly the need to attempt to drive down costs and what the WMCA could do in this area. She commented that the issue of 'off-setting' and the need for consideration to be given to retro-fitting some measures at existing properties were also being addressed. She commented that as offsetting could sometimes reduce any adverse impacts rather than deliver zero carbon homes further work was being undertaken on this matter.

Councillor Peter Butlin challenged whether it was possible to deliver both affordable housing and zero carbon homes in view of the additional costs in fitting, for example, an air source heat pump or a ground source heat pump compared to a traditional gas boiler heating system. He suggested that the affordable technology required was not yet available and that concentrating on delivering affordable housing should be the priority of this Board. Councillor Ian Courts suggested that the additional costs could be met by driving down the purchase price of the land required for development. He commented that it was for the WMCA to set the standards and act as 'Champion' on such matters. Rachel-Ann Atterbury acknowledged the comments on the additional costs involved and explained that further work was being carried out but advised that developments at scale brought the average price down. It was possible for some developers to include such measures at cost and that implications other than cost needed to be considered e.g. zero carbon measures could lead to the running costs of the building being reduced.

Councillor Daren Pemberton commented that, ultimately, developers would deliver the product that the market demanded and was of the view that there was no choice but to persevere with the delivery of zero carbon homes. He reported that on 14 January 2021 Stratford on Avon District Council and Warwick District Council would begin the development of a new Joint Strategic Plan and invited Rachel-Ann Atterbury to work with colleagues in those authorities to ensure that the provision and delivery of zero carbon homes was embedded in that Strategy. Rachel-Ann Atterbury advised that both authorities played an active part in the work of the Zero Carbon Homes Working Group.

Gareth Bradford reminded the Board that its Terms of Reference included a requirement to improve the quality of housing provided and to be pro-active in promoting new forms of development. He commented that whilst initially the requirement to provide a 20% affordable element on schemes before WMCA financial assistance could be provided had received resistance, this was now accepted by developers. Adopting a similar line on zero carbon homes would deliver additional benefits for local people. He commented that progress on delivery would be monitored closely and would be reported regularly to this Board.

Resolved:

1. That the principles and format of the Zero Carbon Homes Charter as set out in Appendix A to the report be agreed in readiness for publication;
2. That the contents of the Zero Carbon Homes Routemap as set out in Appendix B to the report be agreed in readiness for publication;
3. That the proposal to launch formally the Zero Carbon Homes Charter and Routemap in early 2021 (date to be confirmed) be agreed;
4. That the excellent support from local authority officers on the Zero Carbon Homes Working Group and industry experts on the Zero Carbon Homes Taskforce in formulating the charter and Routemap be noted;
5. That delegated powers be granted to the Director of Housing and Regeneration in consultation with the Portfolio Holder for Housing and Land to agree the final versions of the charter and Routemap (ready for publication).

31. Brownfield Land Funding

Gareth Bradford reported that the WMCA had been awarded a sum of £24 million out of a national allocation of £40 million for brownfield land remediation and that this should be viewed as a credit to the work of this Board.

The meeting ended at 10.49 am.

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WMCA Housing & Land Delivery Board

Date	3 rd March 2021
Report title	Strategic Outline Business Case for an Affordable Housing Delivery Vehicle
Portfolio Lead	Councillor Mike Bird, Leader, Walsall MBC
Accountable Employee	Gareth Bradford, Director of Housing & Regeneration (Accountable Director) Pat Willoughby, Head of Policy (Housing & Regeneration) (Accountable SRO) Rob Lamond – Strategic Planning Manager (Report Author)
Report has been considered by	The Affordable Housing Delivery Vehicle has been the subject of several reports to WMCA Housing & Land Delivery Board– these are listed under Section 12 below, and Delivery Steering Group and the relevant meetings of the West Midlands Housing Association Partnership throughout its ongoing development

Recommendation(s) for action or decision:

The Housing & Land Delivery Board is recommended to:

- 1) **Consider and endorse this Outline Business Case**, which sets out the background, strategic context and rationale for the development of a Full Business Case between WMCA and West Midlands Housing Association Partnership Investments (WMHAPI) for the establishment of a new regional collaborative Affordable Housing Delivery Vehicle to address the pressing housing affordability challenge of the West Midlands.
- 2) **Agree, subject to conditions, the principles of establishing an Affordable Housing Delivery Vehicle (AHDV) and endorse the work underway to develop a comprehensive Full Business Case with supporting detailed financial and legal due diligence for consideration later in 2021.**
- 3) **Note** that any WMCA investment into the proposed Affordable Housing Delivery Vehicle (of land/grant/loan) would be subject to Investment Board consideration and approval and the robust gateway approval and assurance processes for all investments made via the WMCA's Single Commissioning Framework and Single Assurance Framework and approval by the WMCA Board of the Full Business Case setting out the legal, financial

and risk implications arising from the proposal to establish a new Delivery vehicle structure

The above recommendations are subject to

- 1) The completion of detailed financial and legal due diligence which is feeding in to a Full Business Case for the establishment of the AHDV to the satisfaction and approval of the WMCA Director of Housing and Regeneration, WMCA Head of Governance, and WMCA Finance Director.
- 2) Confirmation of the first tranche of sites to be brought forward by the vehicle.
- 3) The identification and assessment of any WMCA funding based on appraisals and approvals that are fully compliant with the Single Commissioning Framework, Single Assurance Framework and the associated assurance and gateway process.

1. Purpose

- 1.1 The purpose of this report is to set out the Outline Business Case (OBC) for the proposal to establish a new regional Affordable Housing Delivery Vehicle (AHDV). This proposal, for a joint venture between the WMCA and housing association partners in the region, has been the subject of robust and detailed assurance and due diligence work and its purpose, success criteria and operation has been considered by the Housing & Land Delivery Board on many occasions over the previous two years.
- 1.2 The January 2021 meeting of the Housing & Land Delivery Board received a further paper containing an easily accessible summary of its previous decisions on the context, rationale and potential benefits of the proposed vehicle, the context for affordable housing in the region, and the pressing housing affordability challenge the new vehicle seeks to address and proposed next steps. **The January 2021 Housing & Land Delivery Board agreed a recommendation to work up an outline business case for a proposed WMHAPI/WMCA vehicle for further discussion and endorsement at March's Housing & Land Board – hence this report.**
- 1.3 It is important to note that this report recommends the agreement of the Housing & Land Delivery Board only to the *strategic case for establishing* an AHDV.
- 1.4 This report does not recommend or seek to recommend any investment by WMCA into the proposed vehicle. Investment into a proposed vehicle would be subject to the approval of a Full Business Case to WMCA Investment Board, in line with the established robust governance and approval process for consideration of all other investments of devolved housing and land funds made by WMCA via its Single Commissioning Framework. As it involves the creation of a new vehicle it would also need to be ratified by a full WMCA Board.

2. Background and timeline

- 2.1 The Housing Deal, agreed by the WMCA and Government in March 2018, set out a range of measures to support the delivery of new homes. It included ambitious targets to deliver 215,000 new homes by 2031, increasing the annual delivery rate from 10,000 to 16,500.

WMCA stated that increasing the supply of affordable and social housing is critical to delivering these overall targets. Whilst specific commitments to affordable housing policy and investment were not detailed in the Deal, WMCA made it clear, during negotiations, that this would be a matter to which the Authority would return in due course.

- 2.2 Discussions have been ongoing with Homes England, the West Midlands Housing Association Partnership (WMHAP) and the National Housing Federation (NHF) ever since the Housing Deal was signed in March 2018 to support increased affordable housing provision and investment across the region. WMHAP is a partnership of circa 30 housing associations across the West Midlands and has represented the sector as a member of the Housing & Land Delivery Board since its formation in 2017.
- 2.3 A detailed summary of the ongoing proposals was included in the January 2021 report to Housing & Land Delivery Board. It is important to note that from the inception of discussions, **a key requirement was that delivery of any new homes should be above and beyond those already planned within the committed and approved business plans of the housing associations.** From the outset, the focus was on a regional proposition to help address regional conditions and provide additionality.

3.0 The Proposed ADHV

- 3.1 As noted in Section 2 above, the development of a proposal for a joint delivery vehicle with housing associations has been the subject of many reports to the Housing & Land Delivery Board since 2018 and its grounded in the pressing need to address the well understood housing affordability challenges in our region. Importantly, it seeks to provide a mechanism to deliver additional affordable homes which will sit alongside (rather than replicate) those which are supplied by housing associations individually – **providing genuine additional affordable homes.**
- 3.2 The concept, agreed in principle by Housing & Land Delivery Board in November 2019, looks to bring together the combined expertise and resources of several of the largest housing associations within the region who are forming a dedicated Limited Liability Partnership known as West Midlands Housing Association Partnership Investments (WMHAPI). The affordable homes developed by the Limited Liability Partnership will be available for “offtake” by any of the WMHAP members, not solely the investing partners. Therefore, the vehicle would demonstrate genuine collective delivery across the region and help to secure wider inclusive growth benefits and community partnerships.
- 3.3 The AHDV will utilise the resources and expertise of the WMCA and WMHAPI to directly deliver new homes in the West Midlands by:

- WMCA investing land and grant/loan investment, following approval through the SCF, as equity in the AHDV (in line with similar investments made by WMCA);
- WMCA, may, if necessary, also make grant funding available – for example, to remediate or clear a challenging brownfield site for the vehicle to develop affordable homes on - subject to full compliance with the SCF framework and single assurance framework;
- WMCA may also make available loans to the AHDV, which will be repayable with commensurate interest and terms, reflecting the risk of the development;
- The Registered providers will invest risk capital and potentially land for equity in the vehicle.

3.4 Initially, the AHDV will focus on land controlled by the WMCA (the first tranche). A portfolio of sites would be included to enable brownfield developments that would not ordinarily be delivered commercially in the marketplace.3.5 A review has been undertaken of WMCA owned land identified as surplus including operational land and sites recently purchased using Housing and Land programme funding. A long list of sites has been appraised against criteria agreed with WMHAPI, including ownership, capacity to deliver at least 20% affordable housing and a mix of unit types. This has resulted in six sites being identified as potential for inclusion in the first tranche (**NB these sites are at this stage being identified for potential assessment only. No decision on disposal of these sites is being sought: that would be a decision to be made under the WMCA’s established constitutional arrangements for the acquisition and disposal of land**).

Table 3.1 sets out summary details of the potential first tranche sites.

Table 3.1: Potential Tranche 1 Sites	
Number of sites	6
Total size (ha)	4.5
Housing Capacity (units)	400+
Average unit size and range	69 (24 – 158) units
Locations	Wolverhampton Birmingham Coventry Dudley Sandwell (2)

- 3.6 Based on advice from Trowers and Hamblins, it is proposed that the AHDV will be a Limited Liability Partnership owned between the WMCA and the WMHAPI. However, other options will continue to be assessed in completing the FBC.
- 3.7 In line with the direction of travel indicated by the Housing & Land Delivery Board in 2019 and 2020, the proposed model ensures that WMCA is an **equal partner** in the joint venture and therefore shares equally in financial returns of the vehicle whilst also sharing the development risk. Accordingly, the WMCA would nominate 50% of the Board members of the proposed vehicle and would have equal voting rights on decisions made.
- 3.8 The draft Heads of Terms for the establishment of the proposed new vehicle include sections on the proposed:
- AHDV LLP membership structure
 - The Business of the AHDV
 - Decision making and governance
 - Proposed Board composition and reporting to WMCA Board
 - Investment principles and returns
 - Warranties etc

The draft Heads of Terms also include provisions for parties to exit the agreement at the conclusion of each tranche, in the event of deadlock, and on dissolution of the AHDV.

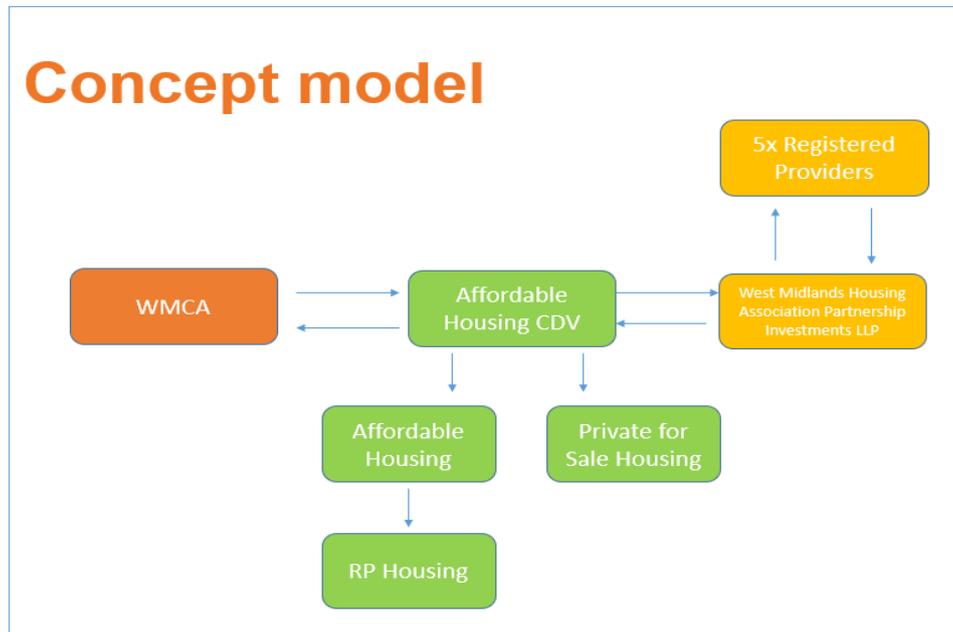
- 3.9 The Full Business Case will include and reflect the key criteria of the WMCA Single Commissioning Framework and Single Assurance Framework in order to ensure compliance with WMCA governance arrangements.
- 3.10 The AHDV would report to the WMCA Board, Investment Board and Housing & Land Delivery Board in line with governance arrangements for similar proposals. Any arrangements would be open to accountability and scrutiny by the WMCA Overview and Scrutiny and Audit Committees in line with the Constitution.

4.0 Strategic Fit

- 4.1 The proposed vehicle provides a delivery mechanism whereby WMCA establishes multiple benefits including:
- it maintains influence over the quality, delivery and community benefits of developments through the proposed vehicle;
 - it recycles investment into further schemes that deliver additional affordable housing and brownfield regeneration;
 - it aligns with the strategic housing needs identified by local authorities and contributes additionality; and
 - it implements policy objectives centred on design, construction, brownfield development, affordable housing, zero carbon and promoting inclusive growth.

It is important to note that the proposed approach is expected to generate revenue for further investment into future housing schemes in our region, thus maximising and multiplying the public investment into any site. This approach is in line with steers from the Housing and Land Board and exemplifies the WMCA's strategy for delivery of high quality, additional affordable homes and wider community outcomes.

- 4.2 This vehicle will seek to harness the resources and expertise of the largest housing associations (which would be investing their own funds in the vehicle) to establish a direct delivery vehicle capable of intervening across the West Midlands with the objective of creating new homes and communities to contribute towards the region's social and economic growth.
- 4.3 Through leveraging significant investment and expertise from the investor partners in the West Midlands Housing Association Partnership, in combination with assets and/or investment from the WMCA, the proposed Affordable Housing Delivery Vehicle has the potential to play a significant role in the delivery of more affordable and high quality homes in the region, which will then be "off taken" by Registered Providers. ***It is important to note that the AHDV business model does not propose that the vehicle maintains or owns any housing stock itself following completion of development.***
- 4.5 All properties developed will be disposed either on the open market to the general public or targeted households or to principal Registered Providers and other members of the West Midlands Housing Association Partnership to secure additional affordable housing. This will ensure that local housing associations with a relevant presence in the area are able to participate in, and benefit from, the outcomes of the proposal. The criterion of a minimum of 20% affordable homes (including social rent, affordable rent and shared ownership) included within the SCF will be applied to all schemes delivered by the vehicle, in accordance with local planning policies regarding tenure, housing mix etc. **NB in areas where local planning conditions set a higher than 20% threshold for affordable homes, the vehicle will work within the local policy requirements.**



5 Financial Implications

- 5.1 There are no financial implications from this paper, as no vehicle or legal entity is to be created, no land put forward or financial investment made at this stage. A detailed financial appraisal of the Affordable Housing Collaborative Delivery Vehicle is on-going and will need to be completed to fully understand all financial and tax implications to the WMCA. This appraisal will be completed as part of the Full Business Case and any subsequent Investment Board process.
- 5.2 The work to date on the AHDV has been carried out using internal resource and external advice. The total cost to bring forward the Full Business Case and ultimately create the vehicle is estimated to be between £150,000 - £200,000. This is all funded by Housing and Land grants previously secured from MHCLG.
- 5.3 WMCA investment in any proposed Affordable Housing Collaborative Delivery Vehicle and subsequent projects, due diligence, feasibility or studies would be governed and administered through the Single Commissioning Framework, WMCA Single Assurance Framework, Commission Pathway and in line with the accounting and taxation policies of the WMCA and HMRC.

6. Legal Implications (*)

- 6.1 Section 113A(1)(a) of the Local Democracy, Economic Development and Construction Act 2009 gives WMCA a power of competence appropriate for the purposes of carrying-out any of its functions. Part 4 of The West Midlands Combined Authority Order 2016 (2016 No 653) confers that the functions relating to any economic development and regeneration in the constituent councils are exercisable by WMCA. Part 3 of The West Midlands

Combined Authority (Functions and Amendment) Order 2017 confers functions corresponding to the functions of the Homes and Communities Agency has in relation to the combined area. Paragraph 10 (2) (a) of the 2017 Order confers the function of improving the supply and quality of housing to the Combined Authority, 10 (2) (b) to secure the regeneration or development of land or infrastructure in the combined area, 10 (2)(c) to support in other ways the creation, regeneration or development of communities in the combined area or their continued well-being and 10 (2)(d) confers the function of contributing to the achievement of sustainable development and good design.

- 6.2 It is noted that the development of the business case and the formation of a new Affordable Housing Delivery Vehicle is being supported with additional external legal support and at this stage no significant legal barriers have been identified. Legal input will continue to be required at the relevant stages involving putting in place appropriate governance structures and legal processes and agreements. Any co-investments including grant and/or loan funding from WMCA will need to comply with the criteria and governance systems set out in the WMCA Single Commissioning Framework and will need to be considered on a case by case basis.

7.0 Options Appraisal

- 7.1 The OBC has considered several alternative options, as follows:

- Do nothing - continued level of delivery of affordable homes in region via existing delivery and funding models
- Preferred option – the proposed AHDV provides a delivery mechanism to achieve additionality and regional scope in order to make a significant contribution to delivery of more affordable homes in future
- Alternative structures – during the development of the AHDV proposal a number of alternative models and delivery structures have been considered, including Special Purpose Vehicles and individual site disposal agreements. However, these options provide a more piecemeal and less co-ordinated approach to delivery and the additional inclusive growth benefits available via the AHDV.
- Site disposals and grants to the private sector – the financial analyses indicate that public sector gap funding requirement would be greater under this approach than the proposed AHDV option. Furthermore, it is uncertain whether the private sector would be interested in taking on the more difficult brownfield sites without substantial grant support.

- 7.2 At this OBC stage the preferred AHDV option is identified as meeting a clear need in terms of bringing forward brownfield land for additional homes in particular affordable homes, with the opportunity for the WMCA to influence the design and nature of the schemes and reinvest any returns into further land and development projects to bring forward more affordable housing and brownfield regeneration in the region.

8.0 Risk Assessment

8.1 The key risks and mitigations are summarised in Table 16.1. Overall, the level of risk is assessed to be medium-high, which is to be expected for a pilot of a new affordable housing delivery vehicle at the OBC stage.

Table 16.1: Risk assessment			
Risk	Management / Mitigation	Residual	
		Impact	Likelihood
Financial returns – key assumptions such as land value	The financial model, assumptions and potential returns on investment have been subject to considerable analysis to date and will be subject to further due diligence, peer review and stress testing as part of the FBC development. Identification of sites suitable for AHDV development will be key to the Full Business Case.	High	Medium
Exit if not working	Heads of Terms include provision for exit strategies should the vehicle not deliver its objectives or should partners wish to dissolve the agreement	High	Medium
Debt	Securing appropriate debt terms for the vehicle will be key to delivery. If the appropriate terms cannot be negotiated, then the vehicle could not continue and the additional affordable homes would not be delivered	High	Medium
RP delivery track record	The RPs forming the investment partners for the proposed vehicle are all significant and recognised £multi-million enterprises with considerable footprint in the West Midlands region. Individually they have considerable delivery records. The risks of provider failure and financial/economic stability will be included in the FBC and mitigated via the business planning process.	High	Low
Reputational risks	Due diligence, options appraisal and collaborative approach with the RPs and wider WMHAP partnership has mitigated reputational risks, however any high-profile collaboration with commercial partners to deliver affordable homes carries a residual level of risk. Agreed partnership communications, stakeholder engagement and governance arrangements will play a critical role in mitigating and reducing reputational risk. Arrangements to monitor and manage these processes will be included in the FBC.	Medium	Medium
Delivery of strategic objectives	The principles, objectives and outcomes for the proposed AHDV have been refined and articulated throughout several reports to Housing and Land Board. In order to assure WMCA Board and other stakeholders that the vehicle is delivering its purpose and objectives, robust reporting and management	High	Low

Table 16.1: Risk assessment

Risk	Management / Mitigation	Residual	
		Impact	Likelihood
	procedures will need to be in place to provide the necessary governance and assurance.		

9.0 Next steps

- 9.1 Subject to endorsement from Housing and Land Delivery Board for the Outline Business Case proposed establishment of the vehicle, all parties will collaborate on the development of a Full Business Case and detailed investment proposals to subsequent Boards for approval.
- 9.2 The proposed FBC will be based upon detailed strategic, economic, financial, commercial and management assessment and appraisal of the development model, in line with the due diligence and governance processes for all investment cases made to Investment Board. It will need to achieve all the “success criteria” set out by the Housing and Land Board and full compliance with the Single Commissioning Framework, and WMCA Single Assurance Framework as noted above in this report in order to progress further for any investment, subject to Investment Board governance processes.

10. Impact on Delivery of Strategic Transport Plan

N/A

11. Equalities Implications (*)

- 11.1 A full Equalities Impact Assessment is being completed in parallel with the development of the Full Business Case for the AHDV. This will assess the potential impacts of the proposed AHDV and any mitigations required.

12. Inclusive Growth Implications

- 12.1 The proposed Delivery Vehicle would operate via the WMCA’s Single Commissioning Framework which includes Inclusive Growth outcomes including affordable housing, use of local labour and suppliers, and quality of design and placemaking as part of the key criteria for investment of Combined Authority funds.
The proposed Vehicle will establish key outcomes and measures relating to Inclusive Growth as part of the business case.

13. Geographical Area of Report’s Implications

- 13.1 The report covers the whole of the WMCA area.

14. Schedule of Background Papers

- 14.1 06.09.2018 Housing & Land Delivery Board - Social Housing Green Paper Update and Response
- 14.2 21.02.2019 Housing & Land Delivery Board – Housing Affordability: Update and Proposal to HM Government
- 14.3 04.11.2019 Housing & Land Delivery Board – Affordable Delivery Vehicle: Update
- 14.4 27.04.2020 Housing & Land Delivery Board – Affordable Housing Delivery Vehicle Update
- 14.5 06.07.2020 Housing & Land Delivery Board – Affordable Housing Delivery Vehicle Update
- 14.6 04.11.2020 Housing & Land Delivery Board - Affordable Housing Collaborative Delivery Vehicle: Progress Update
- 14.7 13.01.2021 Housing & Land Delivery Board - Affordable Housing Delivery Vehicle

Note; (*) denotes mandatory field

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Housing & Land Delivery Board

Date	13 January 2021
Report title	Zero Carbon Homes Charter and Routemap
Portfolio Lead	Councillor Mike Bird, Leader, Walsall Council
Accountable Employees	Gareth Bradford, Director of Housing & Regeneration, WMCA Patricia Willoughby, Senior Reporting Officer, WMCA Rachel-Ann Atterbury, Report Author
Report has been considered by	An earlier report on the Zero Carbon Homes Programme was considered by the Housing & Land Delivery Board at its meeting on 2 nd November 2020, and by the officers of the Delivery Steering Group at its meeting on 9 th December 2020.

Recommendation(s) for action or decision:

The Housing & Land Delivery Board is asked to:

- 1) **Consider and agree** the principles and format of the Zero Carbon Homes Charter as set out in Appendix A.
- 2) **Consider and agree** the contents of the Zero Carbon Homes Routemap as set out in Appendix B.
- 3) **Agree** the proposal to launch the Zero Carbon Homes Charter and Routemap in 2021 (date TBC).
- 4) **Note** the excellent support from local authority officers on the Zero Carbon Homes Working Group and industry experts on the Zero Carbon Homes Taskforce in formulating the charter and routemap.
- 5) **Delegate** to the Director of Housing & Regeneration, in consultation with the Portfolio Holder for Housing & Land, authority to agree the final versions of the charter and routemap (ready for publication).

1.0 Purpose

- 1.1 The purpose of this paper is to update the Housing & Land Delivery Board on the progress being made under the Zero Carbon Homes Work Programme of the Board.
- 1.2 This is work led and developed by WMCA working closely with our regional Zero Carbon Homes (ZCH) Officer Working Group and an independently chaired ZCH Expert Taskforce. The focus of this work in 2020 has been producing a ZCH Charter and Routemap – agreed by the Board as key portfolio business plan deliverables.
- 1.3 Draft final versions of both the Charter and Routemap have been considered and supported by the groups above and are attached to this report as Appendices A and B for discussion and agreement by this Board.

2.0 Background

- 2.1 In January 2020, the Combined Authority launched its 2041 Climate Change Action Plan (WM2041) including a commitment to delivering a ZCH standard by 2025. The Housing & Land Delivery Board agreed that a major deliverable for the Housing & Land Portfolio in 2020/21 was to establish a clear ZCH standard for new homes in the region, alongside a Charter and Routemap to achieving it with supporting guidance to enable the industry to meet the ambitious 2025 target. The Board commissioned WMCA officers to take forward this work during the year in partnership with local councils and the private sector.
- 2.2 In April 2020, the Housing & Land Delivery Board agreed that WMCA would adopt the UK Green Building Council's (UKGBC) '[Net Zero Carbon Buildings: A Framework Definition](#)' to define zero carbon development in the region and guide the development of the 2025 ZCH standard. As a reminder, the UKGBC's framework defines net zero carbon in terms of emissions in three ways: construction, operation and whole life.
- 2.3 There is general agreement within the industry that the third part of the definition, meeting net zero **whole life** carbon, is currently aspirational. This ambition cannot be delivered at this stage because it requires us to address **all** aspects of a building's carbon footprint. As such, it places demands upon new development which cannot be implemented in the timescale required. The benefit of the UKGBC's framework definition is that it identifies the steps required to shift towards whole life net zero carbon, allowing clear progress to be made, whilst at the same time demonstrating the scale of the overall ambition.
- 2.4 Alongside UKGBC's definition framework, the Housing and Land Delivery Board agreed **a defined phased programme of work to meet the 2025 commitment at its April meeting**. Following the Board meeting, officers appointed Useful Projects to co-develop and co-ordinate the workplan, programme and activities to accelerate the move towards zero carbon development in the region. Additionally, WMCA assembled a ZCH Taskforce and Officer Working Group to oversee, steer and review the programme as it developed.

2.5 When complete, the programme would deliver the three outputs agreed by the Board at the outset, including the **Baseline Gap Analysis report** (Output 1) discussed and endorsed by Housing & Land Delivery Board at its November 2020 meeting as well as a **ZCH Charter and Routemap** (Outputs 2 and 3 considered by the Board today).

3.0 Output 2: ZCH Charter

3.1 The second agreed output of this programme of work was the production and publication of a ZCH Charter which would frame the commitment by WMCA and its partners, and the objectives for, net ZCH in the region. In this regard, the document would be vision-setting with a focus on delivering associated benefits such as whole life cost savings, supply chain opportunities and social value. The Charter structure broadly follows that of the Regional Design Charter, in both its appearance and hierarchy of themes and principles. Similarly, the ZCH Charter is expected to be included in the Single Commissioning Framework, setting out the desirable features of new low and zero carbon development on all projects supported by WMCA.

3.2 Based on findings from Output 1 (the Baseline Gap Analysis) and workshops with the Officer Working Group and Taskforce, **a final draft of the Charter has been prepared for consideration and agreement by the Board today**. This draft is included in Appendix A.

4.0 Output 3: ZCH Routemap

4.1 The third agreed output of this programme of work was the production and publication of a ZCH routemap, included in Appendix B. The routemap provides an implementation plan for meeting the Charter's aspirations, as well as other short and medium-term goals to meet the 2025 commitment. The routemap is not binding on WMCA or its partners and does not include financial commitments or hold legal status. The recommendations will be used to guide future policy development, with full financial and legal implications considered on a case by case (and site by site) basis. Additionally, monitoring and review protocols are included .

4.2 Approaches to delivering net zero whole life carbon across all development sites are still being developed by UKGBC and will need to be taken on board as the work progresses. For this reason, therefore, the routemap sets out a timeframe for achieving net zero emissions for each element of the definition framework (operational, embodied, whole life). This means the definition of 'ZCH' in terms of the West Midlands approach will evolve over time. This timeframe is set out on p.6 of the routemap.

4.3 Based on findings from Output 1 and input from the Taskforce, it is suggested that **WMCA's initial focus should be on meeting net zero emissions in operation** (i.e.

by 2025). Steps towards achieving net zero embodied and whole life emissions would remain clear ambitions to be delivered over the coming decade and the timescale for their achievement would be reviewed on a regular basis and reported to this Board. One of the clear benefits of prioritising reductions in operational emissions now is that it will reduce the need to retrofit in the future. There are also significant benefits to the occupier in terms of limiting fuel poverty and improved health and wellbeing.

- 4.4 For ease and accessibility, a key is included in the routemap which identifies relevant stakeholders for each action, enabling partners to easily establish where they may be involved in or impacted by the proposed actions.

5.0 Next Steps

- 5.1 Members of the Housing & Land Delivery Board are asked to consider and comment upon the content of both the Charter and Routemap attached as Appendices A and B. Following the meeting further revised drafts will be prepared for publication.

Members are also asked to agree that authority to agree any minor changes (which do not affect the overall purpose or sense of the documents) should be delegated to the Director of Housing & Regeneration, in consultation with the Portfolio Holder for Housing & Land. WMCA will look to formally launch the routemap in early 2021 with an appropriate communications strategy and publicity.

- 5.2 In the meantime, in collaboration with the officer working group and expert advisory group, WMCA will begin to explore options for implementing the priority actions for 2021 within the routemap.

6.0 Financial Implications

- 6.1 There are no direct financial implications from the information contained in the report. The Single Commissioning Framework provides a single set of criteria and governance systems that will be applied to all applications for available devolved WMCA Housing, Land and Property Development funds, together with a consistent process and timelines for decision.
- 6.2 WMCA investment in any proposed Zero Carbon Homes projects, due diligence, feasibility or studies would be governed and administered through the Single Commissioning Framework, WMCA Single Assurance Framework, Commission Pathway and in line with the accounting and taxation policies of the WMCA and HMRC.

Legal Implications

- 7.1 Section 113A(1)(a) of the Local Democracy, Economic Development and Construction Act 2009 gives WMCA a power of competence appropriate for the purposes of carrying-out any of its functions. Part 4 of The West Midlands Combined Authority Order 2016 (2016 No 653) confers that the functions relating to any economic development and regeneration in the constituent councils are exercisable by WMCA. Part 3 of The West Midlands Combined Authority (Functions and Amendment) Order 2017 confers functions corresponding to the functions of the Homes and Communities Agency has in relation to the combined area. Paragraph 10 (2) (a) of the 2017 Order confers the function of improving the supply and quality of housing to the Combined Authority, 10 (2) (b) to secure the regeneration or development of land or infrastructure in the combined area, 10 (2)(c) to support in other ways the creation, regeneration or development of communities in the combined area or their continued well-being and 10 (2)(d) confers the function of contributing to the achievement of sustainable development and good design.
- 7.2 It is noted that the purpose of this Report is to update the Housing & Land Delivery Board on the progress being made on the Zero Carbon Homes Work Programme and the launch of the Zero Carbon Homes Charter and Route Map which will accelerate the move towards zero carbon development in the region. It is further noted that the Charter is expected to be included in the Single Commissioning Framework as a consideration for WMCA's investment decisions. Hence any requirements or issues/implications arising from this will need to be reflected and adequately covered in the various Gateway stages and in the funding agreements on a case by case basis.

8.0 Equalities Implications

- 8.1 There is no equality impact in relation to these reports.

9.0 Inclusive Growth Implications

- 9.1 The ZCH programme will seek to improve the performance of residential properties across the region as part of wider transition to a more resilient, people-centred low carbon economy. Improving building performance means addressing some of the key impacts of deprivation, such as fuel poverty, reduced levels of comfort and higher risk of disease related to poor air quality. It will also involve limiting exposure to future climate risks. This means that a key output and measure of the programme would be the degree to which it reduces climate inequities related to housing.
- 9.2 Additionally, the programme would seek to provide new opportunities for local residents and businesses to prosper, through the creation of a low and zero carbon pipeline that brings with it new employment, upskilling and growth opportunities across the region.



10.0 Geographical Area of Report's Implications

10.1 The ZCH routemap and charter would inform WMCA investment and policy decisions across the whole geography of the WMCA area, including the 3 LEPs and non-constituent Member authorities.

11.0 Other Implications

11.1 There are no other implications.

12.0 Schedule of Background Papers

12.1 There are no background papers.



Housing & Land Delivery Board

Date	3 rd March 2021
Report title	Update on the Advanced Manufacturing in Construction (AMC) Routemap
Portfolio Lead	Councillor Mike Bird, Leader, Walsall Council
Accountable Employee	Gareth Bradford, Director of Housing & Regeneration Patricia Willoughby, Head of Policy (Housing & Regeneration) Senior Reporting Officer Rachel-Ann Atterbury, Policy Advisor, Report Author
Report has been considered by	14 October 2020: Housing & Land Delivery Steering Group.

Recommendation(s) for action or decision:

The Housing & Land Delivery Board is asked to:

- a) **Consider** the contents of Part 2 of the AMC routemap (Appendix B) that has been worked up with the AMC Officer Working Group and Expert Advisory Group.
- b) **Agree** the proposal to explore options for implementing the AMC routemap's recommendations in collaboration with the AMC Officer Working Group and Expert Advisory Group.
- c) **Note** the intention to formally launch the AMC routemap.
- d) **Delegate** to the Director of Housing & Regeneration, in consultation with the Portfolio Holder for Housing & Land, authority to agree the final version of the AMC routemap (for publication).
- e) **Note** the excellent support from local authority officers on the AMC Working Group and industry experts on the AMC Expert Advisory Group in formulating the routemap.

1.0 Purpose

- 1.1 The purpose of this paper is to update the Housing & Land Delivery Board on the extensive work undertaken by WMCA, the AMC Officer Working Group and the AMC Expert Advisory Group in producing a routemap for accelerating Advanced Manufacturing in Construction in the region, as commissioned by the Housing and Land Board.

2.0 Background

2.1 At its 15 January 2020 meeting, the Housing & Land Delivery Board received an update on the work on AMC in the region - a key programme outlined in the Board's Annual Business Plan, the approved Portfolio Covid Recovery Plan and central to delivery of other programmes such as brownfield regeneration, inclusive growth and zero carbon homes. This included agreement to the development of a comprehensive AMC routemap and strategy. As a reminder, the primary purpose of the routemap was to ensure that AMC delivers housing and job numbers, but also social value, inclusive growth and environmental benefits.

An AMC Officers Working Group and AMC Expert Advisory Group have been central to the development of the AMC roadmap.

2.2 It is important to note that there are some differences between MMC and AMC. MMC is a term defined by MHCLG to cover a broad range of pre-manufacturing techniques in construction which aim to improve quality, programme efficiency and reduce material waste. AMC, describes a sub-set of MMC technologies which focus specifically on advanced construction techniques, typified by the fundamental use of digital technology throughout the design and construction process, automation, high quality materials and performance and potential for mass-customisation. Both of these terms are clarified on page 3 of the routemap.

2.3 To ensure that the routemap that was produced is accessible to those less familiar with the AMC sector, but robust enough to inform credible actions, a two-part structure was proposed and agreed by the Board in April 2020:

- Part 1 - An Executive Summary - which would be a standalone, focussed and accessible document. The summary would broadly address the opportunities and challenges provided by AMC, and the key strategic and policy drivers for the West Midlands. As well as this, it would suggest short, medium and long term actions, with recommended next steps. The Housing & Land Delivery Board agreed the structure and format of Part 1 at the September meeting. (Appendix A)
- Part 2 -A detailed report – which would underpin the summary, providing a comprehensive evidence base and analysis of the AMC sector in the West Midlands. This is presented to the Board today. (Appendix B)

2.3 Part 2 of the routemap (Appendix B) has been produced and WMCA is seeking comments on the routemap in its entirety today. Part 2 is top and tailed by Part 1 (appendix A) and includes 3 additional chapters (p.7 – p. 37) based on the research pieces presented to the Steering Group in June 2020.

2.4 Alongside the routemap, AMC has also been identified as a core game changer in the Housing and Land Board's Covid19 recovery plan. An investment case for an AMC Acceleration Fund has been prepared and submitted to Government. Talks are ongoing with government to secure new investment into AMC. This funding would be used to increase uptake of AMC in the region by bridging the gap between the cost of AMC vs traditional methods of construction and providing the certainty business needs to invest and develop in new technologies and training in the region.

2.5 Draft final versions of the routemap have been considered and supported by the AMC Officers Working Group and industry experts on the AMC Expert Advisory Group. The full document is available upon request to all Board members (it has not been included within the meeting pack due to the document size).

3.0 Next steps and Implementation

- 3.1 WMCA officers are requesting delegated authority from Housing & Land Delivery Board to make any amends necessary to finalise the routemap for publication. WMCA will look to formally launch the routemap in Winter 2021 with appropriate comms and publicity.
- 3.2 In the meantime, WMCA, in collaboration with the officer working group and expert advisory group, will begin to explore options for implementing the recommended short-term actions in Part 1 (appendix A).

4.0 Financial Implications

- 4.1 There are no direct financial implications from the information contained in the report. The Single Commissioning Framework provides a single set of criteria and governance systems that will be applied to all applications for available devolved WMCA Housing, Land and Property Development funds, together with a consistent process and timelines for decision.
- 4.2 WMCA investment in any proposed Advanced Manufacturing in Construction projects would be governed and administered through the Single Commissioning Framework, WMCA Assurance Framework and in line with the accounting and taxation policies of the WMCA and HMRC.

5.0 Legal Implications

- 5.1 Section 113A(1)(a) of the Local Democracy, Economic Development and Construction Act 2009 gives WMCA a power of competence appropriate for the purposes of carrying-out any of its functions. Part 4 of The West Midlands Combined Authority Order 2016 (2016 No 653) confers that the functions relating to any economic development and regeneration in the constituent councils are exercisable by WMCA. Part 3 of The West Midlands Combined Authority (Functions and Amendment) Order 2017 confers functions corresponding to the functions of the Homes and Communities Agency has in relation to the combined area. Paragraph 10 (2) (a) of the 2017 Order confers the function of improving the supply and quality of housing to the Combined Authority, 10 (2) (b) to secure the regeneration or development of land or infrastructure in the combined area, 10 (2)(c) to support in other ways the creation, regeneration or development of communities in the combined area or their continued well-being and 10 (2)(d) confers the function of contributing to the achievement of sustainable development and good design.
- 5.2 It is noted that the purpose of this paper is to update the Housing & Land Delivery Board on the work undertaken by WMCA, the AMC Officer Working Group and Expert Advisory Group in producing a routemap for accelerating Advanced Manufacturing in Construction in the region. Legal advice should be sought as and when required in the development of the AMC strategy and routemap. Once the AMC requirements have been established the existing requirements for AMC in the Single Commissioning

Framework would need to be strengthened and implemented through the funding agreements on a case by case basis.

6.0 Equalities Implications

6.1 There is no equality impact in relation to this report.

7.0 Inclusive Growth Implications

7.1 The research presented at this meeting will be used to inform WMCA's approach to growing the AMC sector in an equitable way, maximising economic benefits, housing quality and job/skills opportunities across the region's communities.

8.0 Geographical Area of Report's Implications

8.1 The research presented applies to the whole WMCA geography. The proposed AMC Charter and routemap would be used to guide WMCA investment decisions across the whole geography of the WMCA area.

9.0 Other Implications

9.1 There are no other implications.

10.0 Schedule of Background Papers

10.1 There are no background papers.

Please find the documents for the AMC routemap as 'Appendix A' and 'Appendix B' attached separately.

West Midlands Combined Authority

Roadmap for Advanced Manufacture in Construction

Draft for Consideration by WMCA Housing and Land Board
August 2020



Introduction

WMCA committed to increasing the uptake of advanced construction technologies in WMCA's 2019/2020 Annual Plan, in response to the findings of the Land Commission and Farmer Review which highlighted the role that advanced construction technologies could play in accelerating housing delivery.

This definition has been adopted by the Board, to connect to the West Midlands' rich heritage of manufacturing and innovation, and to signify the standard to which the WMCA should aspire in the future, as part of a number of decisions including supporting the establishment of an AMC Expert Advisory Panel, and the approval of a series of principles to guide the development of an AMC Roadmap for the region.

This draft Roadmap for AMC has been prepared for consideration by the Housing and Land Board following a series of meetings of the Expert Advisory Panel, chaired by Mark Farmer – CEO of Cast Consultancy and MHCLG's champion of modern methods of construction in home building – and of the AMC Working Group, made up of representatives from councils across the WMCA region. Both groups have been supported and enabled by research commissioned to understand and map the current situation in relation to AMC in the region, including auditing the current AMC supply chain "eco-system" in relation, understanding the potential for AMC growth, and developing a picture of the knowledge, skills and training needs for AMC.

The Roadmap distils the information that has been collated and created during this process into a draft, high-level, document for the Board's consideration ahead intended publication in late 2020. It is intended to set the frame for future action in the region, balancing ambition for growth and change with some of the known barriers that still exist and that are set out in the document. In doing so, it seeks to set an appropriate long term, 10-year, vision across a number of strands of activity, and then develops a series of short and medium term steps that could enable that vision to be realised.

This Roadmap will be further developed to incorporate feedback, and as such the Board is asked to consider and comment on this report ahead of final publication.

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Why change?

Challenges in the construction sector

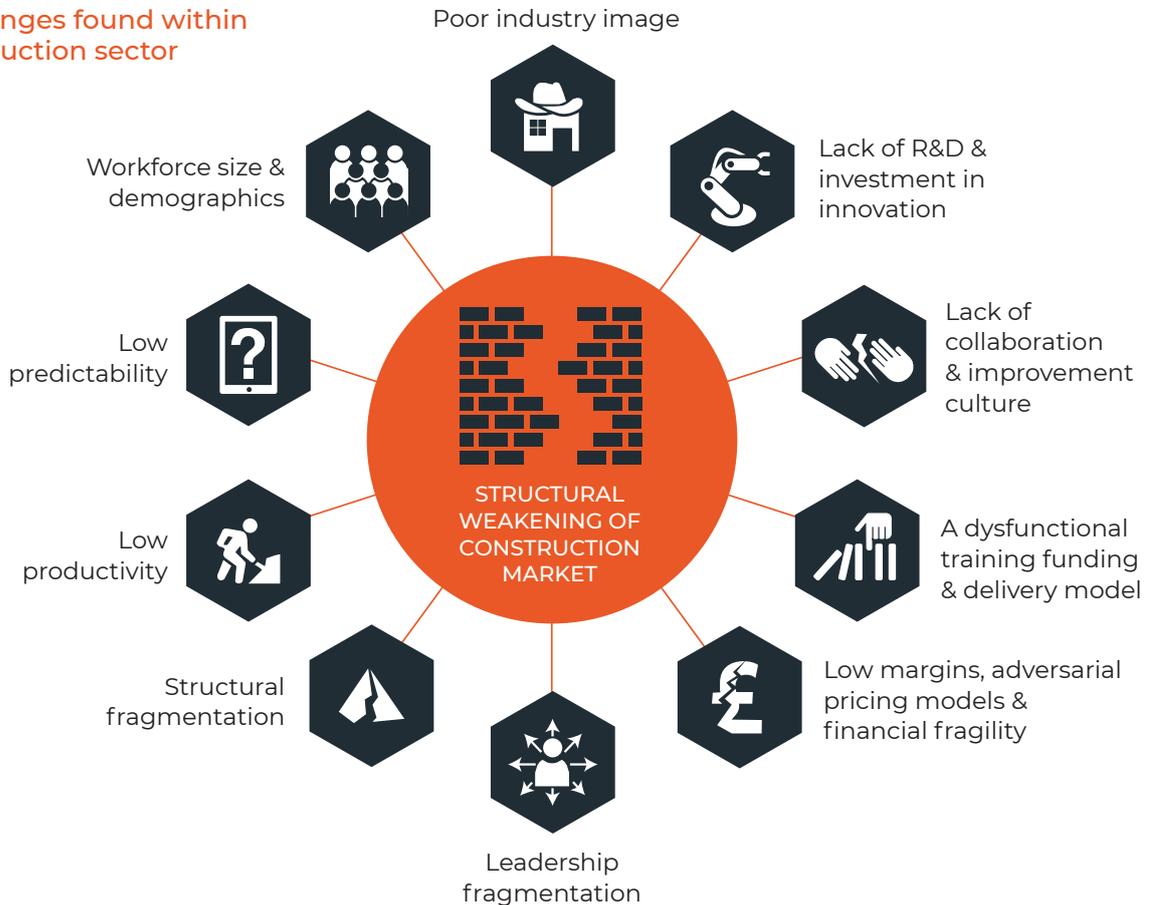
The UK construction and housebuilding sector faces severe structural challenges that act as a drag on productivity and innovation. The resulting impacts range from a sector wide culture of short-termism, to new homes not being seen as consumer products in the same way as other large purchases people make, to being a contributing factor to the UK-wide under supply of new homes relative to housing need.

These challenges impact on the ability of the WM to deliver 215,000 and change is required to achieve the quality, pace and performance in housebuilding that the region needs

“The Government is determined to build a stronger, fairer Britain where people who work hard are able to get on in life...we will diversify the housing market, opening it up to smaller builders and those who embrace innovative and efficient methods.”

– Fixing our Broken Housing Market (2017)

The challenges found within the construction sector



Advanced manufacture in construction

What is AMC?

Modern Methods of Construction (MMC)

A term defined by MHCLG to cover a broad range of pre-manufacturing techniques in construction. Pre-manufacturing encompasses work executed away from the final workforce including in remote factories, near site or on-site “pop-up” factories. These techniques are alternatives to traditional house building and aim to improve quality, programme efficiency, and reduce material waste in construction. It also includes on site labour productivity measures including digital tools and innovative materials and processes.

Advanced Manufacture in Construction (AMC)

A term which covers a sub-set of the technologies described as MMC. AMC techniques are typified by the fundamental use of digital technology throughout the process, from design through to component manufacture and assembly, and the use of automation and high-performance materials where appropriate to drive quality, performance and mass-customisation through standardised processes. AMC techniques will also learn from, adopt and evolve manufacturing processes already established in other sectors.

The potential benefits of AMC over the long term include:

				
<p>Financial benefits with increased speed in construction</p>	<p>Tackling the skills shortage by changing workforce needs</p>	<p>Reducing cost and improving site efficiencies</p>	<p>Making offsite homes a viable alternative through mass production</p>	<p>Benefit the Zero Carbon agenda by reducing construction waste</p>
				
<p>Achieve a fast weathertight envelope</p>	<p>Improving health & safety with increased oversight</p>	<p>Future proofing skills and jobs using technology</p>	<p>Assisting a national, economic & industrial strategy</p>	<p>Making the sector attractive to a more diverse workforce</p>



Delivering in the West Midlands

While AMC has significant potential to drive a range of long term benefits to the construction sector by focussing on growing AMC use around the West Midlands, we see considerable wider benefits to the region. Specifically, AMC can supporting four of our existing policy goals for sustainable and inclusive manner growth:

Accelerating housing delivery:

WMCA's housing trajectory aims to increase annual housing completions to nearly 18,000 homes per year by 2031. We have a good track record of delivery, with more than 16,000 homes delivered in 2019, up 15% on the previous year, but nonetheless need to maintain and expand upon this level of delivery to maintain the trajectory we need to achieve. In addition, fully 80% of the homes in our trajectory will be built on brownfield land, requiring potentially length remediation ahead of construction.

AMC offers a number of potential solutions – the increased speed of delivery on-site, compared to traditional methods, can offer a partial balance to the time taken on remediation for instance, and specialist MMC developers can offer additionality in new supply to augment the output of other methods of construction.

Investing in regional and inclusive growth:

The WMCA approach to social value recognises the importance of local businesses within our communities in terms of job creation and wealth generation. We are committed to ensuring local businesses are provided with the skills to compete and offered the opportunity to work within our supply chain. We are also committed to promoting growth and development that ensures our communities develop new skills and gain meaningful employment.

AMC represents a significant growth opportunity for the UK and we are committed to securing the West Midland's share of that opportunity by utilising and growing our manufacturing base to supply our housing need. We also advocate collaboration between WMCA and other authorities around the country to support for our businesses to take advantage of the national growth trend, and not rely solely on demand from our region.

Delivering a zero-carbon future:

In June 2019, WMCA declared a climate emergency, and has set a challenging 80-year carbon budget. As a region, we have committed to taking urgent action to cut harmful emissions, but the impacts of climate change are already being felt and will continue to impact upon the health and wellbeing of our residents and natural resources.

To ensure it contributes its part to the Paris Agreement, WMCA has agreed net zero carbon emissions by 2041. Advanced manufacture in construction, in controlled conditions, offers great potential to move towards carbon neutral homes. AMC processes minimise construction waste, achieve very high standards of in-use energy performance, and can minimise construction vehicle movements, with follow-on air quality benefits. By committing to AMC in new homes, WMCA and partners will be making a conscious and proactive step towards achieving its zero-carbon ambitions.

Design that reflects the character, context, and aspirations of our communities:

The West Midlands is a diverse region with a distinctive set of places all sat within a landscape of high-quality natural environments, an extensive river and canal network and a unique geological heritage. It is also a region in renaissance – unprecedented levels of investment and development over the next decade will shape the way our residents live and work for years to come. The opportunity is one to seize; setting a new benchmark for what 'great places' mean now will enable our residents to prosper, our communities to thrive and our businesses to grow.

Great design can have a huge and positive impact on the quality of life and wellbeing, and we see advanced manufacture in construction as a key enabler in making that vision a reality. We want to harness the opportunity that manufacture brings to create a product-led mindset, championing high-quality, design flexibility and consumer choice.

The scale of the opportunity

In developing this Roadmap, we have analysed the current output of the AMC sector across the UK, focussing in particular on MMC category one 3D volumetric solutions and on MMC category two 2D panellised solutions, which are currently the two solutions in focus with the WMCA, as both are now required on 200+ home sites funded by the SCF. The two figures opposite demonstrate the outcome of this analysis, and map that against the UK-wide housing need that has been stated by the Government.

Figure 1 shows that there were approximately 44,000 new homes delivered using volumetric and panelised solutions last year, with the vast majority of these utilising a panellised approach. Our analysis has identified that volumetric providers currently have significant capacity within their existing manufacturing base, which would allow for the production of 15,000 homes from current facilities. Using this, and drawing in other industry forecasts, we estimate that the number of homes developed using these two systems could more than double in the coming ten years, from 44,000 to more than 100,000 annually.

As shown in Figure 2, even at 100,000 new homes annually from these two types of AMC, there would still be significant scope for growth within traditional methods of delivery before AMC started to replace traditional construction, if the UK is to hit the 300,000 home per year target.

AMC, therefore, is clearly a sector with significant growth potential, and the opportunity to provide additional housing supply rather than necessarily competing with traditional construction methods.

By way of comparison, our work has estimated that the WM AMC sector has capacity to deliver around 4,500 new homes using AMC today – roughly 10% of the UK-wide output – and that presently it is delivering around 2,000 to 2,500 homes per year from that capacity. Approximately 12,000 homes per year have been delivered, on average, over the past seven years in the region and so this level of output is equivalent to approximately one in six of every new homes in the region, although of course much of the AMC output could have been exported out of the region.

WMCA's housing trajectory shows that the current 12,000 home per year average needs to increase to nearly 18,000 homes per year by 2031, and so were the sector in the region to double its output, to 5,000 homes per year, it could do so and not replace traditional construction on the assumption that the 18,000 home target is met and traditional construction remains stable.



National growth potential for MMC

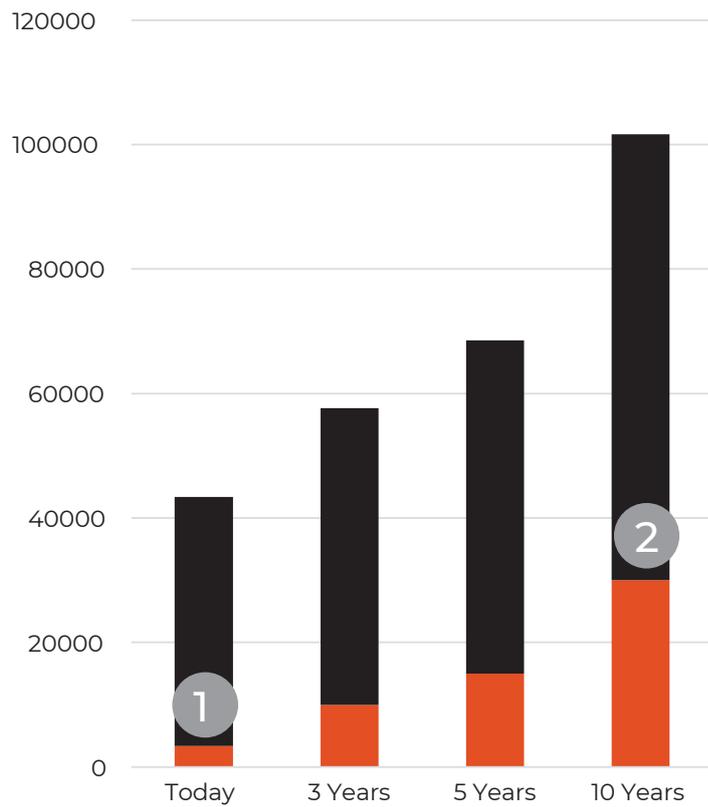


Figure 1 ■ Volumetric ■ Panelised

Building capacity for a growing housebuilding sector

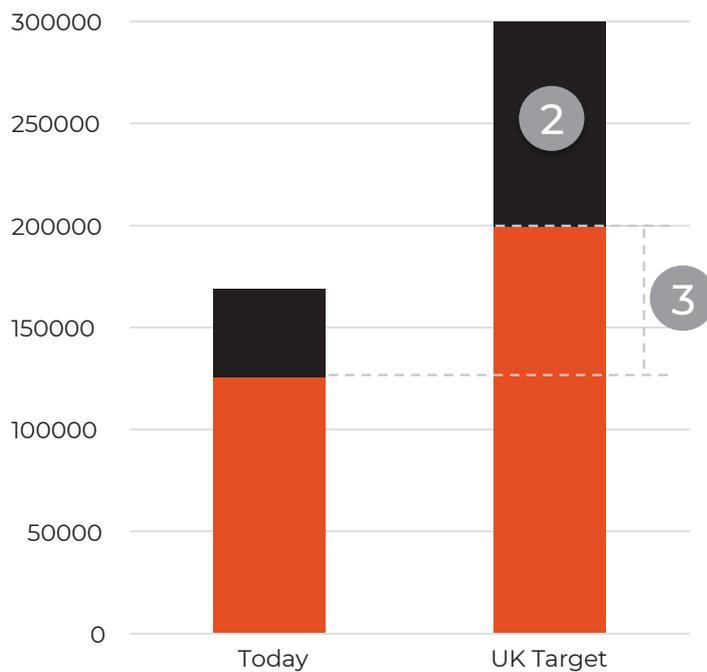


Figure 2 ■ Other Housebuilding ■ MMC

1

3,300 volumetric & 40,000 panelised homes in 2019

2

30,000 volumetric homes & 71,000 panelised homes by 2029

3

Further 70,000 homes opportunity before MMC replaces traditional construction output

Building on the West Midlands' unique strengths

The WM is uniquely well placed to take a leading role in the introduction of pre-manufacture, and especially advanced manufacture, into the construction sector.

The strengths and opportunities set out opposite provide the region with an excellent foundation on which to build its roadmap for the next decade of AMC investment.

WM economy and construction sector

- WM has a high value construction sector relative to comparator regions, employing 55,000 people across 10,300 businesses.
- There are signs of an advanced manufacture cluster forming in the region, particularly in the Black Country – there are already 58,000 jobs across 1,900 businesses and this has the potential to drive upstream activity for AMC.
- WM has a notable concentration of AMC-related activities – 44 companies in a range of sectors including renewables, sustainability, logistics and supply chain, represents a concentration of nearly three times the national average.

AMC sector

- WM is one of the key hubs of AMC nationally, underpinned by strong advanced manufacture capability and transport infrastructure.
- Nine Tier 1 AMC residential manufacturers are located within the region, and are committed to capacity building within the local supply chain.
- There is already a strong supply chain which could be equipped to diversify its offering to support growing AMC capability and capacity.
- There is an opportunity to develop the AMC sector as a nationally leading “vanguard” to bring together manufacturing and construction and also to balance negative structural changes in other sectors such as automotive.

Policy environment

- WMCA has signalled support for AMC through a commitment to deliver at least 20% AMC on any site funded by the strategic commissioning fund of 200 homes or more.
- Nationally significant partnership commitment to deliver 10,000 AMC homes with national developer/manufacturer Urban Splash.

R&D, skills and qualifications

- WM is home to a uniquely relevant collection of R&D and HEFE institutions which are clear assets in support of AMC including the MTC and Wolverhampton, Coventry and Birmingham City Universities.
- The WMCA has a legacy of skills in manufacturing and innovation, with key actors in a position to drive the agenda forward, including WMCA Skills Board/West Midlands Skills Advisory Panel.
- Dudley College is the national exemplar in AMC skills delivery and is already exporting programmes nationally, and other UK-leading training partnerships include those between MOBIE and the HEFE sector.
- There is a strong policy focus on investment in STEM skills and boosting productivity. The opportunity is for the growth of new technologies acting as a catalyst for digital skills in construction which can become a specialism for the WM economy.





Addressing the barriers and challenges

While there are a unique combination of strengths and opportunities, these need to be balanced against a series of barriers and challenges which will need to be addressed in order to maximise the impact of investment and growth in the AMC sector.

A number of these are UK-wide challenges which WMCA and partners will not be able to address alone, but nonetheless they are included here as they will inform the pace and focus of the 10 year roadmap.

WM economy and construction sector

- There has been recent decline in the region's construction sector, from nearly 60,000 jobs in 2015 to 55,000 today.
- The WM construction economy is less productive than comparator regions and the national average, with output per full time employee of £67.6k in WM compared to £78.5k nationally.

AMC sector

- UK-wide, the AMC sector is still relatively young, and is made up of a number of emerging manufacturers with varying levels of capacity and experience.
- AMC can present challenges in relation to funding, insurance and warranty. UK-wide efforts including an MHCLG working group are addressing these, and there have been recent positive changes as a result including NHBC's new "NHBC Accepts" route for AMC products, but nonetheless these challenges need to be recognised.
- UK-wide, there has been a relatively large investment into productive capacity, a large proportion of which is currently unutilised. Similarly, the WM AMC sector is currently estimated to be operating at c50% of capacity.
- Sustainable growth of the sector will require intelligent commissioning practice, smarter procurement models and likely will require demand growth to run slightly ahead of manufacturing growth in the medium term.
- The WM AMC sector is made up of manufacturers of a range of sizes, and a key challenge is to ensure the growth of SME manufacturers as part of a varied production economy.

Capital cost, procurement and process

- Given the young nature of the sector and lack of scale economies, AMC products can be more expensive in terms of initial capital expenditure on a like-for-like basis compared to traditional house building.
- The full value of AMC-led development requires a different procurement approach from the start, for clients and commissioners to adopt a design for manufacture approach from the outset and to engage manufacturers early to maximise the benefit of manufacturing efficiencies.
- The challenge for the WM in maximising the use and value of AMC is to develop approaches to development process and procurement that better enable AMC. These will include balanced scorecard procurement models that prioritise the total cost of ownership on an equal basis to up front capital cost.

AMC skills and jobs development

- There is a need to balance UK-wide growth of AMC with benefits to the WM regional economy. There needs to be a joined up approach to demand and supply planning to ensure WM plans are integrated into the national picture as far as possible to avoid 'cannibalising' markets.
- Relevant training provision for AMC is limited UK-wide. Only 82 qualifications have potential relevance and two qualifications in Innovative/Manufacturing were withdrawn due to lack of take up.



Roadmap for advanced manufacture

LONG TERM VISION (10 year objectives)

SHORT TERM ACTIONS (practical steps for years 1-3)



ACCELERATED HOUSING DELIVERY

AMC drives scale and pace in housing delivery across the WM. Integrated AMC-specific developers create additional supply models, while AMC plus brownfield remediation unlocks land that would otherwise be unviable to deliver. "Traditional" construction delivery models can incorporate hybrid on-site AMC approaches to improve speed, quality, productivity, and worker safety.

- Implement 20% minimum AMC categories 1 & 2 on large sites.
- Explore measures of pre-manufactured value (PMV) as recommended by the Construction Leadership Council, as the basis for providing additional funding for projects that can demonstrate an uplift in PMV, across all seven categories of MMC.
- Develop appraisal/funding methodology to enable additional funding where AMC proportion is increased.
- Explore use of Value Tool as being developed by Construction Innovation Hub (CIH).
- Identify and aggregate land assets that might enable 100% AMC housing delivery to create scale and momentum.
- Engage and support AMC-led integrated developers which might create true additionality in supply and diversify the housing market.



QUALITY AND CHOICE IN NEW HOMES

Advanced manufacture combines standardised processes with both standardised and customisable products to improve consumer choice. Digitally enabled development creates a golden thread for quality and components from conception through assembly to in-use performance monitoring. Advanced materials and design enable WM to achieve carbon zero objectives in new home delivery.

Bring together architects, planning professionals and manufacturers to develop a programme of design-quality led AMC product development. Focus areas could include:

- Enabling a standard specification for AMC from public sector clients and drive use of Construction Quality Planning (CQP) as defined by Construction Innovation Hub (CIH).
- Design code approaches to planning that enable consumer choices around a standardised "chassis" that might link to an accelerated 'type approval' process linked to pattern books.
- Develop a strategy connecting AMC to the proposed planning reforms.



ADVANCED MANUFACTURE GROWTH

The regional manufacturing sector is the leading location for AMC manufacturing in a now-significant UK-wide industry. Existing manufacturers, including SMEs, play a significant role as part of this sector, alongside new entrants who have been deliberately attracted to the WM. All AMC categories are represented, to enable agility and flexibility in delivery models.

- Play an enabling role across the wider public sector in the WM region to create a transparent and aggregated future pipeline of AMC development land, and use this to support the managed growth of the existing manufacturing sector.
- Secure Government investment and identify land for an expansion of manufacturing capacity in the region ensuring that this is complementary to existing capacity and focuses on consolidation and additionality.
- Begin to explore options for aggregated models of delivery that could be enabled by interoperability between AMC systems (see below).



MEDIUM TERM ACTIONS (practical steps for years 4-10)

- Expand focus on AMC by encouraging other AMC categories through SCF funding – encouraging AMC as part of hybrid traditional/manufacturing-led development.
- Deliver aggregated public land pipelines (see below) as part of programmatic approach that creates certainty for sector and scale and pace in delivery.
- Identify opportunities for AMC and brownfield remediation to combine with new appraisal methodology to unlock unviable sites.

- Develop structured partnerships with AMC manufacturers around a common specification for new homes and transparency of future pipeline.
- Build on the initial steps (left) by:
 - creating incentives for manufacturers to improve on that standard in relation to e.g. quality, cost or carbon performance.
 - connecting these partnerships with the R&D theme below to explore for instance advanced material use and structured performance testing to enable co-ordinated product development.
- There is great scope for proposed planning reforms focussed on digitised planning process to benefit AMC-led development because they incorporate digital design from initiation and are therefore better placed to integrate their current approach with new digital planning processes. This workstream could also ensure adequate planner education and awareness of AMC.

Utilise the expanded AMC focus of WMCA funding (above) and the previously developed options to implement an aggregated approach to AMC delivery that might incorporate the following features:

- Co-location of SME manufacturers.
- A move to more of a platform-based approach to delivery which does not damage previous investments made by high quality offsite manufacturing businesses with a promotion of more inter-operability between providers, drawing on the work of MTC.
- A greater focus on component-led sub-assembly delivery as additionality to volumetric modular AMC, which would still be delivered by larger Cat 1 manufacturer/ developers.

LONG TERM VISION (10 year objectives)

SHORT TERM ACTIONS (practical steps for years 1-3)



SUPPLY CHAIN ENGAGEMENT

The wider supply chain base in the WM grows in parallel with the manufacturing base. Component and material specialists form strategic partnerships with AMC manufacturers UK-wide. There is clarity of the end-to-end supply chain incorporating design through to operation and WM enjoys a specialism in supplying those services to digitally enabled AMC developments. There is increased 'virtual' integration of multiple businesses, including SMEs and products that are consolidated into sub-assemblies and building systems that can be used by SME developers and larger developers and contractors.

- Explore co-location for regional SME manufacturers and supply chain companies single new facility above.
- Develop a comprehensive map of local supply chain capacity linked to the standardised specification referenced above.
- Broker collaborative partnerships between supply chain companies and AMC manufacturers and potential for aggregation of ordering combined between manufacturers.
- Develop a collaborative forum between AMC manufacturers and potential commissioners of AMC homes in the public, private and housing association sectors to provide an opportunity to build knowledge, connections, trust and understanding.
- Engage the local AMC supply chain in the emerging programme of retrofit, as AMC solutions (across all categories) will be very well positioned to drive the speed and efficiency of activity in this area.



KNOWLEDGE AND SKILLS DEVELOPMENT

The WM retains its stand-out strength in delivering industry-leading pathways to employment in AMC through partnerships between industry, further education and higher education. Partnerships across the region bridge the gap between construction and manufacturing, to develop new roles that operate at the interface between the sectors. End-to-end digital delivery knowledge and skills requirements are well understood and provided for.

- Develop a comprehensive AMC skills proposition, drawing on existing strengths, that offers a qualifications at all levels from level 2 to post-graduate.
- Map the end-to-end AMC delivery process, and the digital skills requirements at each stage, and develop action plans to address core teaching skills and curriculum coverage gaps, for instance through additional funding for tutor recruitment.



R&D PARTNERSHIPS BETWEEN GOVERNMENT, INDUSTRY AND HIGHER EDUCATION

R&D partnerships make a significant contribution to national and regional AMC growth by tackling some of the biggest barriers to AMC growth. For instance R&D partnership to enable interoperability between AMC systems, developing a robust evidence base and showcasing "best in class" AMC development, and supporting AMC product development through testing, advanced materials development and by enabling consumer feedback to influence design. This should align to national initiatives to improve the data and evidence base related to innovative construction and should build confidence in the finance and insurance underwriting markets. New entrants and SMEs are actively encouraged into the regional AMC sector to drive innovation and introduce new approaches.

- Develop a forum or partnership vehicle through which cross-sector links and delivery can be enabled – potentially by maintaining the AMC advisory group
- Key focus areas in the short term could include:
 - Building the evidence base for AMC development, including by linking to Homes England existing work in that regard.
 - Supporting the development, testing and optimisation of the standardised AMC specification.
 - Enabling pre-competitive collaboration between manufacturers, and connecting to national efforts in that regard such as through the MTC at Coventry or the AMRC in Sheffield, both part of the High Value Manufacturing Catapult.
- Connecting the WMCA and partners to the AMC-related activities being undertaken across the UK, particularly in other combined authority regions, to maximise collaboration, value and growth in the AMC sector UK-wide.
- Explore and support opportunities to develop high-profile sites and other projects which will generate national interest and enable local manufacturers to demonstrate their systems to the widest possible audience.



MEDIUM TERM ACTIONS (practical steps for years 4-10)

- Develop bespoke partnerships with supply chain companies where necessary to enable their expansion to meet the demands of a growing AMC market.
 - Broker collaborative partnerships between supply chain companies and AMC manufacturers to enable component design and development to support AMC product development.
 - Focus support and effort on models with the greatest potential for scalability, across the WM and beyond including the potential for IP technology transfer domestically and internationally.
-
- Implement WM-wide approaches to apprentice and trainee sharing/placements between AMC manufacturers.
 - Target AMC training pathways on other WM-based sectors under-going structural .
 - Broker partnership working between CITB, local FE colleges, local universities and the MTC designed to break down the barriers between manufacturing and construction skills training.
-
- Long term programme to be developed through the forum (left) and the outputs of early stages, but features could include:
 - Developing connections between AMC and the WM specialism in brownfield regeneration, to create true additionality in housing supply including links to the proposed National Brownfield Institute.
 - Connecting WM manufacturers to developments in advanced materials research, where this might drive improvements in cost, speed, performance and sustainability.

West Midlands Combined Authority & Urban Splash: A memorandum of understanding

WMCA and Urban Splash have established a long-term partnership commitment, which is codified in a Memorandum of Understanding (MOU) and which supports the ambition for House by Urban Splash to deliver 10,000 homes by 2031 - 5% of the WMCA overall housing target, including on the *Port Loop* urban regeneration masterplan, pictured.

The MOU sets out *House by Urban Splash's* commitment to AMC as a default construction approach. *House by Urban Splash* has made significant investment into AMC since 2012, including establishing a factory in Alfreton, East Midlands. The MOU and the developments it will lead to are evidence that the vision of this Roadmap is already translating into real, practical delivery.



Woden Road, Wolverhampton

This development at Woden Road in Wolverhampton is just one of many high-quality and highly-sustainable developments to have been manufactured and assembled by West Midlands based LoCaL Homes, part of the Accord Group.

Woden Road consists of 91 houses and 21 apartments, all of which were constructed using LoCaL's *Eco 200* system at its factory near Walsall before being assembled on site. The project achieved outstanding speed of delivery – with 86 of the homes built in 86 days – excellent environmental and energy performance, and fantastic value for money with all above ground works being completed for less than £1,000 per square metre.



National Brownfield Institute

University of Wolverhampton (UoW) has invested £100 million in the new Springfield campus, to host its world-class school of Architecture and Built Environment and the planned National Brownfield Institute (NBI), which was recently awarded £14.8759m from the Government's Getting Building Fund.

The NBI will research soil and groundwater contamination and ways of regenerating contaminated land. NBI will also use knowledge from other research centres at UoW to help assess new construction methods and will enable AMC use in the region in a range of ways, including by coordinating research into new remediation technologies. It will advocate for AMC use as the additional speed of delivery will partly counteract the time required for brownfield remediation, a crucial factor as around 80% of the WM housing pipeline is on brownfield land.



Acknowledgements

West Midlands Combined Authority

A Strategy for Advanced Manufacture in Construction

Draft for Consideration by the WMCA Housing & Land Board
October 2020



Introduction

An introduction will be included here after the Housing & Land Board has reviewed the final draft.

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Why change?

Challenges in the construction sector

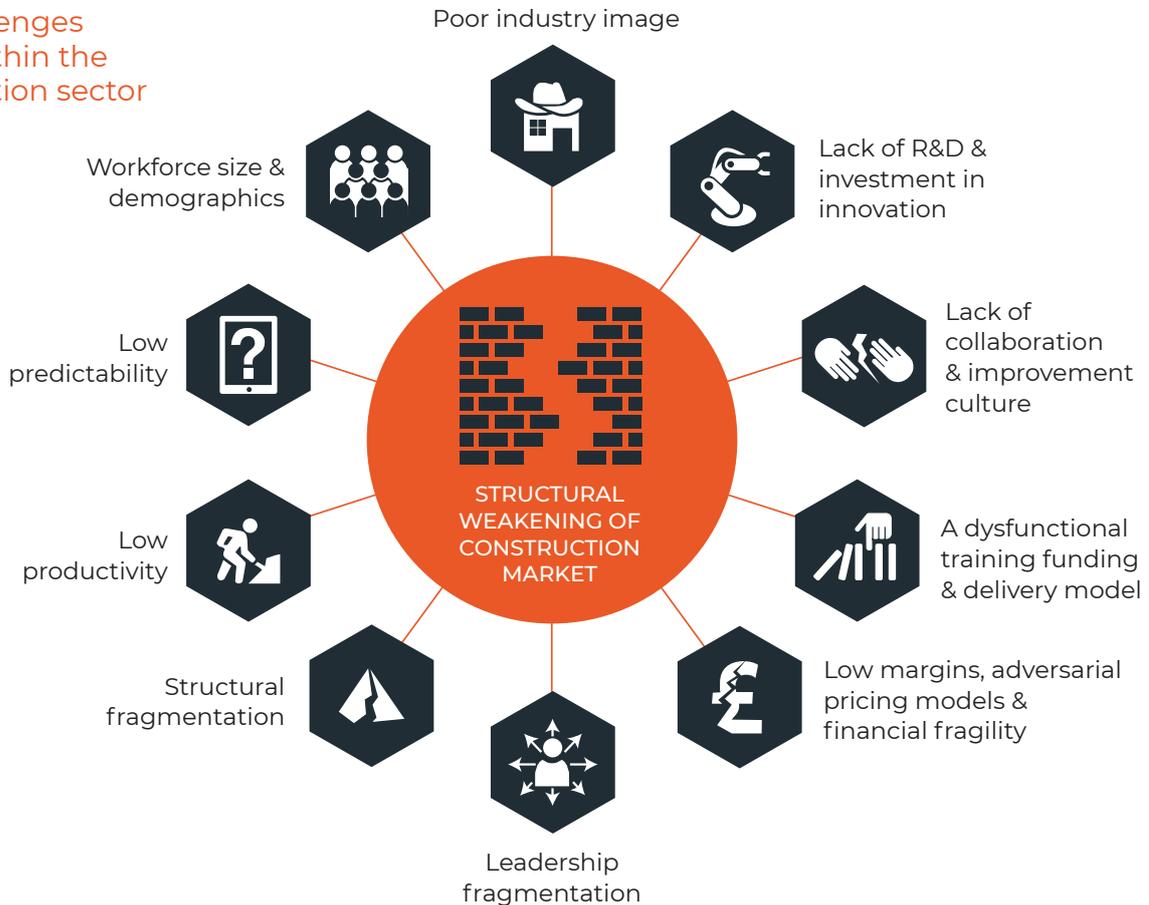
The UK construction and housebuilding sector faces severe structural challenges that act as a drag on productivity and innovation. The resulting impacts range from a sector wide culture of short-termism, to new homes not being seen as consumer products in the same way as other large purchases people make, to being a contributing factor to the UK-wide under supply of new homes relative to housing need.

These challenges impact on the ability of the WM to deliver 215,000 and change is required to achieve the quality, pace and performance in housebuilding that the region needs.

“The Government is determined to build a stronger, fairer Britain where people who work hard are able to get on in life...we will diversify the housing market, opening it up to smaller builders and those who embrace innovative and efficient methods.”

– Fixing our Broken Housing Market (2017)

The challenges found within the construction sector



Advanced manufacture in construction

What is AMC?

Modern Methods of Construction (MMC)

A term defined by MHCLG to cover a broad range of pre-manufacturing techniques in construction. Pre-manufacturing encompasses work executed away from the final workforce including in remote factories, near site or on-site “pop-up” factories. These techniques are alternatives to traditional house building and aim to improve quality, programme efficiency, and reduce material waste in construction. It also includes on site labour productivity measures including digital tools and innovative materials and processes.

Advanced Manufacture in Construction (AMC)

A term which covers a sub-set of the technologies described as MMC. AMC techniques are typified by the fundamental use of digital technology throughout the process, from design through to component manufacture and assembly, and the use of automation and high-performance materials where appropriate to drive quality, performance and mass-customisation through standardised processes. AMC techniques will also learn from, adopt and evolve manufacturing processes already established in other sectors.

The potential benefits of AMC over the long term include:

				
<p>Financial benefits with increased speed in construction</p>	<p>Tackling the skills shortage by changing workforce needs</p>	<p>Reducing cost and improving site efficiencies</p>	<p>Making offsite homes a viable alternative through mass production</p>	<p>Benefit the Zero Carbon agenda by reducing construction waste</p>
				
<p>Achieve a fast weathertight envelope</p>	<p>Improving health & safety with increased oversight</p>	<p>Future proofing skills and jobs using technology</p>	<p>Assisting a national, economic & industrial strategy</p>	<p>Making the sector attractive to a more diverse workforce</p>



Delivering in the West Midlands

While AMC has significant potential to drive a range of long term benefits to the construction sector by focussing on growing AMC use around the West Midlands, we see considerable wider benefits to the region. Specifically, AMC can supporting four of our existing policy goals for sustainable and inclusive manner growth:

Accelerating housing delivery:

WMCA's housing trajectory aims to increase annual housing completions to nearly 18,000 homes per year by 2031. We have a good track record of delivery, with more than 16,000 homes delivered in 2019, up 15% on the previous year, but nonetheless need to maintain and expand upon this level of delivery to maintain the trajectory we need to achieve. In addition, fully 80% of the homes in our trajectory will be built on brownfield land, requiring potentially length remediation ahead of construction.

AMC offers a number of potential solutions – the increased speed of delivery on-site, compared to traditional methods, can offer a partial balance to the time taken on remediation for instance, and specialist MMC developers can offer additionality in new supply to augment the output of other methods of construction. Manufactured components and homes that are created in clean and dry factory conditions also create much greater predictability for build programmes and avoid the worst of the seasonality issues that affect traditional construction, which is particularly beneficial for the delivery of new affordable homes.

Investing in regional and inclusive growth:

The WMCA approach to social value recognises the importance of local businesses within our communities in terms of job creation and wealth generation. We are committed to ensuring local businesses are provided with the skills to compete and offered the opportunity to work within our supply chain. We are also committed to promoting growth and development that ensures our communities develop new skills and gain meaningful employment.

AMC represents a significant growth opportunity for the UK and we are committed to securing the West Midland's share of that opportunity by utilising and growing our manufacturing base to supply our housing need. We also advocate collaboration between WMCA and other authorities around the country to support for our businesses to take advantage of the national growth trend, and not rely solely on demand from our region.

Delivering a zero-carbon future:

In June 2019, WMCA declared a climate emergency, and has set a challenging 80-year carbon budget. As a region, we have committed to taking urgent action to cut harmful emissions, but the impacts of climate change are already being felt and will continue to impact upon the health and wellbeing of our residents and natural resources.

To ensure it contributes its part to the Paris Agreement, WMCA has agreed net zero carbon emissions by 2041. Advanced manufacture in construction, in controlled conditions, offers great potential to move towards carbon neutral homes. AMC processes minimise construction waste, achieve very high standards of in-use energy performance, and can minimise construction vehicle movements, with follow-on air quality benefits. By committing to AMC in new homes, WMCA and partners will be making a conscious and proactive step towards achieving its zero-carbon ambitions.

Design that reflects the character, context, and aspirations of our communities:

The West Midlands is a diverse region with a distinctive set of places all sat within a landscape of high-quality natural environments, an extensive river and canal network and a unique geological heritage. It is also a region in renaissance – unprecedented levels of investment and development over the next decade will shape the way our residents live and work for years to come. The opportunity is one to seize; setting a new benchmark for what 'great places' mean now will enable our residents to prosper, our communities to thrive and our businesses to grow.

Great design can have a huge and positive impact on the quality of life and wellbeing, and we see advanced manufacture in construction as a key enabler in making that vision a reality. We want to harness the opportunity that manufacture brings to create better homes, championing high-quality, design flexibility and consumer choice.

The scale of the opportunity

In developing this Roadmap, we have analysed the current output of the AMC sector across the UK, focussing in particular on MMC category one 3D volumetric solutions and on MMC category two 2D panellised solutions, which are currently the two solutions in focus with the WMCA, as both are now required on 200+ home sites funded by the SCF. The two figures opposite demonstrate the outcome of this analysis, and map that against the UK-wide housing need that has been stated by the Government.

Figure 1 shows that there were approximately 44,000 new homes delivered using volumetric and panelised solutions last year, with the vast majority of these utilising a panellised approach. Our analysis has identified that volumetric providers currently have significant capacity within their existing manufacturing base, which would allow for the production of 15,000 homes from current facilities. Using this, and drawing in other industry forecasts, we estimate that the number of homes developed using these two systems could more than double in the coming ten years, from 44,000 to more than 100,000 annually.

As shown in Figure 2, even at 100,000 new homes annually from these two types of AMC, there would still be significant scope for growth within traditional methods of delivery before AMC started to replace traditional construction, if the UK is to hit the 300,000 home per year target.

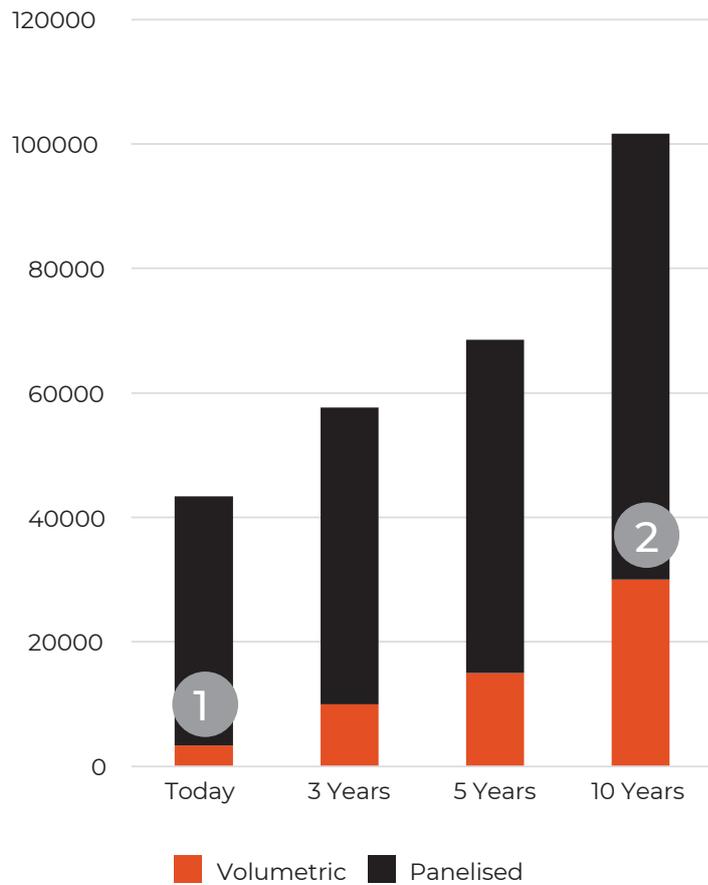
AMC, therefore, is clearly a sector with significant growth potential, and the opportunity to provide additional housing supply rather than necessarily competing with traditional construction methods.

By way of comparison, our work has estimated that the WM AMC sector has capacity to deliver around 4,500 new homes using AMC today – roughly 10% of the UK-wide output – and that presently it is delivering around 2,000 to 2,500 homes per year from that capacity. Approximately 12,000 homes per year have been delivered, on average, over the past seven years in the region and so this level of output is equivalent to approximately one in six of every new homes in the region, although of course much of the AMC output could have been exported out of the region.

WMCA's housing trajectory shows that the current 12,000 home per year average needs to increase to nearly 18,000 homes per year by 2031, and so were the sector in the region to double its output, to 5,000 homes per year, it could do so and not replace traditional construction on the assumption that the 18,000 home target is met and traditional construction remains stable.



Figure 1
National growth potential for MMC



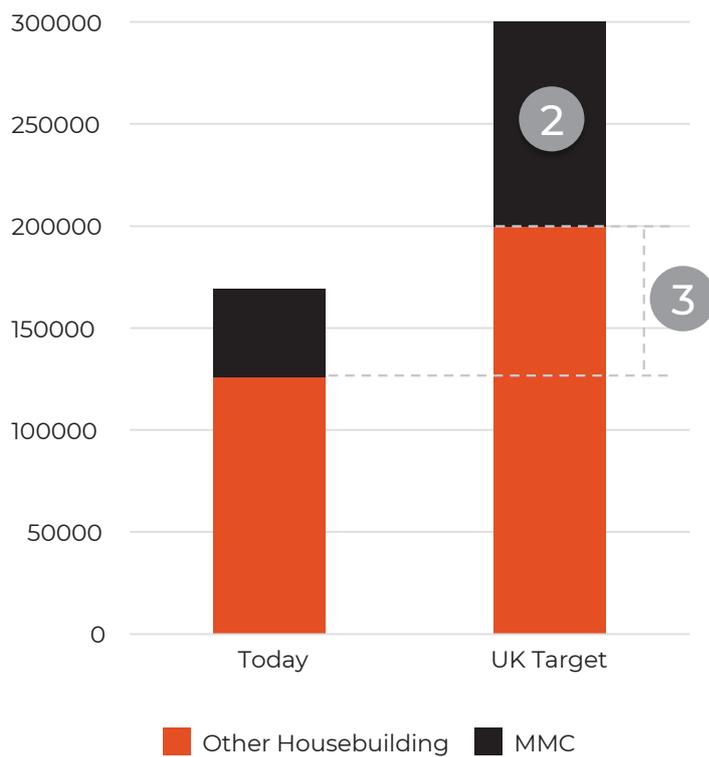
1

3,300 volumetric & 40,000 panelised homes in 2019

2

30,000 volumetric homes & 71,000 panelised homes by 2029

Figure 2
Building capacity for a growing housebuilding sector



3

Further 70,000 homes opportunity before MMC replaces traditional construction output

Understanding the economic MMC opportunity in WMCA

Much has been made about the novel nature of MMC and how it can be used as a key pillar to tackle the UK's housing crisis. There has however, been limited insight on the economic opportunity that MMC presents. This section explores the nature of this economic opportunity, reflecting both the current picture of MMC nationally and within the West Midlands Combined Authority (WMCA). Consideration is also given to the national growth potential of MMC and what this could mean for WMCA economically speaking if it were to seize the opportunity that emerges. In this chapter we use the broader MMC term to frame our research, in order to understand the long term potential of all aspects of the MMC definition framework.

Strategic significance

In order to understand the specific opportunity that MMC presents to WMCA, a consideration of the wider strategic significance of the sector is required. To this end, this section provides a wider framing of the national priorities of MMC and more broadly how MMC can deliver economic value.

In partnership with



The national challenge



The construction sector is a significant component of the UK economy

The construction sector in the UK represents around 6 per cent GDP and 10 per cent employment with an estimated £150 billion invested through public and private sectors¹.

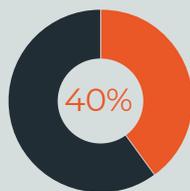
Construction productivity is lagging

In the past two decades, productivity growth in the construction sector stood at just 10 per cent, compared to 20 per cent across the economy as a whole and 65 per cent in the manufacturing sector².

Enhancing the pace of house building is essential

The Housing White Paper entitled *Fixing our broken housing market* published by the government in 2017 listed three main challenges facing the housing market:

- Over 40 per cent of local planning authorities do not have a plan that meets the projected growth in their area
- The pace of development is too slow
- The very structure of the housing market makes it harder to increase supply



The government has committed to resolving these challenges through the introduction of more efficient methods.

The built environment is significant generator of carbon emissions – 45% of total UK carbon emissions derive from the construction, operation and maintenance of the built environment³. There is a clear and urgent need to develop more advanced construction models that can deliver better performing homes more quickly than traditional models.

1 RICS: "Policy position statement: Modern Methods of Construction". <https://www.rics.org/uk/news-insight/latest-news/press/press-releases/modern-methods-of-construction/>

2 Infrastructure and Projects Authority: "Transforming Infrastructure Performance". https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/664920/transforming_infrastructure_performance_web.pdf

3 The Royal Academy of Engineering: "Engineering a low carbon built environment". <https://www.raeng.org.uk/publications/reports/engineering-a-low-carbon-built-environment>

The economic value of MMC

MMC accelerates the pace of housing delivery

A report by the National Audit Office found that using new methods of construction could reduce construction time by more than half, and enable up to four times as many homes to be built with the same on-site labour⁴. The potential for acceleration of housing delivery provides additional benefits related to the time preference of economic impacts (where future impacts are discounted at 3.5% a year – in line with Treasury Green Book guidance).

MMC can enhance the density of housing

The potential for high density housing constructed by MMC is rapidly being realised. In London, two towers which are to break the record for tallest modular building are approaching completion. The 44 and 38-storey residential towers at 101 George Street, Croydon will have been built in around 24 months and half the time of traditional methods⁵. Nearby, planning permission has also been granted for a further two towers which will again break the record for tallest modular building, including a 930-unit co-living tower⁶.

MMC is a driver of productivity

Various studies have emphasised the productivity benefits that MMC can deliver⁷. The MMC process is typically more capital intensive than traditional house building, and the off-site nature of building can allow for a greater specialisation of roles – by adopting factory style manufacturing practices

MMC can generate significant carbon savings

Evidence from Arcadis suggests the higher environmental performance of MMC has the potential to reduce energy bills from average £800 per annum to circa £300-400 per annum. This is equivalent to reducing energy usage by 3,200 kWh per home per year by conservative estimates. These savings are able to be monetised and represent both significant economic value as well as notable savings to homeowners.

Alignment with economic priorities of WMCA

The value of MMC within the WMCA is both strategically and economically significant. At the same time the WMCA faces both productivity and housing challenges, in addition to the challenge of sustainable economic development of the region within the context of twenty-first century climate change.

Housing

The Strategic Economic Plan estimates that to accommodate a growing population of an additional 500,000 people, the West Midlands housing stock will need to increase by an additional net 215,000 homes by 2031. This target is equivalent to around 24% of the West Midlands total dwelling stock⁸.



Please can we change the first sentence to the following: The Government backed Housing Deal securing in March 2018 supports the delivery of these 215,000 homes by 2031, with annual delivery required to rise to nearly 18,000 homes per year by that time. The West Midlands has a good track record of delivery, with more than 16,000 homes delivered in 2019, up 15% on the previous year, and AMC represents a significant potential enabler to achieve this higher annual output in ten years time⁹. The establishment of a long-term partnership with Homes England aims to support this housing deal through initiatives including the exploration of the potential for Modern Methods of Construction and other innovative opportunities within the West Midlands.

4 National Audit Office: "Using modern methods of construction to build homes more quickly and efficiently". <https://www.nao.org.uk/wp-content/uploads/2005/11/mmc.pdf>
5 Centre for London: "Made for London: Realising the Potential of Modern Methods of Construction". <https://www.centreforlondon.org/wp-content/uploads/2018/09/Centre-for-London-Made-in-London.pdf>
6 Planning Resource: "Croydon approves 49-storey 950-unit modular co-living scheme". <https://www.planningresource.co.uk/article/1675633/croydon-approves-49-storey-950-unit-modular-co-living-scheme>
7 Modern Methods of Construction – Introducing the MMC Definition Framework https://www.buildoffsite.com/content/uploads/2019/04/MMC-I-Pad-base_GOVUK-FINAL_SECURE-1.pdf
8 Subnational dwelling stock by tenure estimates, ONS, 2019. <https://www.ons.gov.uk/peoplepopulationandcommunity/housing/datasets/subnationaldwellingstockbytenureestimates>
9 West Midlands housing package. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/689710/W_Mids_overview.pdf

The West Midlands became the first region to re-define and introduce a localised definition of affordable housing that links the definition to the real-world incomes of people in the area, rather than local house prices.

The West Midlands built almost 17,000 properties in 2018/19 which represents a rise of 15% from the previous year and double the UK average increase¹⁰.

Productivity

Construction is identified as a key sector strength within the West Midlands Local Industrial Strategy, with a specific focus on offsite modern manufacturing and land remediation¹¹. Creative content, techniques and technologies is identified as a new market opportunity and includes the modular construction of high quality, low energy homes as a sector worth £2-3bn per year in the UK, with modular build growing by 25 per cent per year.

Major investments in the region such as HS2 and accelerated housebuilding are to be supported by the Construction Gateway skills programme which seeks to ensure that the demand for construction jobs within the region is met.

Local actions of the LIS include supporting new entrants to the market to support the increased delivery of housing such as through modular housing, and to work with the sector to enhance process innovation via modern methods of construction.

The WMCA Construction Action Plan Draft, published in May 2019, identifies construction as a significant part of the local economy and major employer of almost 200,000 people within the WMCA area¹². Offsite construction already represents **over 15% of total construction sector output in the West Midlands**, with significant future growth expected, including the West Midlands ambition of delivering 25% of homes through advanced methods of construction (AMC) by the early 2020s and the majority of delivery by 2031.

While existing strong advanced manufacturing capabilities across the WMCA can assist in developing a world class offsite manufacturing capability, the Draft Plan highlights a lack of offsite training provision as one of the biggest potential challenges to exploiting the growth of offsite construction within the region.

The West Midlands Strategic Economic Plan highlights housing as a priority action which will be supported by a range of initiatives, most relevant which include the support of local off-site construction, supporting SME housebuilders and supporting the development of low carbon and zero carbon homes¹³.

Climate emergency

The WMCA declared a climate emergency in June 2019¹⁴ and the Combined Authority is working towards becoming carbon neutral by 2041, as outlined in the WM2041 green paper in January 2020¹⁵.

Under 'we will create places and connections that help us to meet the climate challenge', all new build infrastructure is to be constructed thoughtfully and energy efficient, in order to achieve the ambitious 215,000 homes to be built by 2031. The emissions associated with construction and new homes could add £100-£300m to annual regional energy spending at current prices. With this in mind, ensuring new homes are zero carbon will provide both an economic and environmental boost to the region.

WMCA are developing a routemap for delivering zero carbon homes by 2025, with a focus on operational carbon in the short term and embodied carbon in the medium term.

10 West Midlands Combined Authority: "West Midlands becomes first region to re-define 'affordable housing.'" <https://www.wmca.org.uk/news/west-midlands-becomes-first-region-to-re-define-affordable-housing/>

11 West Midlands Local Industrial Strategy. <https://www.wmca.org.uk/media/3094/west-midlands-local-industrial-strategy-single-page.pdf>

12 WMCA Construction Sector Action Plan Draft.

[https://www.blackcountrylep.co.uk/upload/files/Industrial%20Strategy/WMCA%20Construction%20Action%20Plan%20May%202019%20\(002\).pdf](https://www.blackcountrylep.co.uk/upload/files/Industrial%20Strategy/WMCA%20Construction%20Action%20Plan%20May%202019%20(002).pdf)

13 West Midlands Combined Authority Strategic Economic Plan. <https://www.wmca.org.uk/media/1382/full-sep-document.pdf>

14 West Midlands Combined Authority: "Climate Public Engagement". <https://beta.wmca.org.uk/the-mayor/climate-public-engagement/>

15 West Midlands Combined Authority: "Zero carbon WM by 2041" https://www.wmca.org.uk/media/3639/wm2041-final.pdf?_ga=2.125254194.1070291611.1597070437-1251179460.1597070437

Approach

Determining the scale of the MMC opportunity

To understand the scale of the sector nationally a desk-based review of MMC literature and engagement with industry experts has been undertaken to determine the scale of MMC delivery at present as well as future growth scenarios. These have been applied to MHCLG house building data to establish levels of MMC delivery.

Through engaging with MMC manufacturers a determination of employees relative to housing output has been established, which has been applied to the national picture to gather a high level estimation of employment. Jobs figures have been applied to GVA per FTE data from the ONS to determine what the level of economic output currently is and could be if MMC growth reached the levels anticipated.

To establish what this could mean for WMCA, a series of notional statements have been tested. These include WMCA securing a certain proportion of the national MMC growth and what this could mean in economic terms.

Understanding WMCA's relative MMC proposition

To derive a relative understanding of the MMC proportion in WMCA relative to other locations a scan of other prominent MMC locations has been undertaken to determine the sector's:

- Scale
- Specialisation
- Distinctiveness

To do this, data has been drawn from an array of public and private datasets.

Here, ONS data of the broad construction sector is used to understand the scale of opportunity for AMC to grow and support the wider construction sector regionally. As the construction sector definition does not allow for a determination of MMC activity, this has been supplemented with an additional approach. Here, a manual interrogation of WMCA scraped web data from Glass.ai has been undertaken to get a better understanding of MMC beyond the stringent SIC Code definition of construction

To understand the relative scale and distinctiveness of WMCA as an MMC location, a series of wider comparator locations have been selected. These provide a valuable reference point to understand relative scale, concentration and distinctiveness of MMC activity. These locations are detailed spatially on Figure 3 below.

Figure 3

WMCA as an MMC location, a series of wider comparator locations have been selected.



Findings

MMC currently generates notable economic value nationally

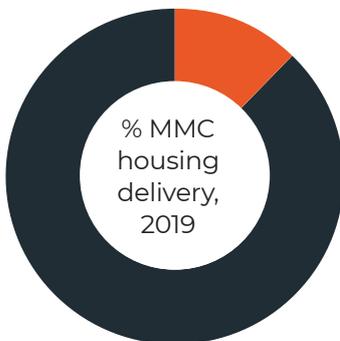
At the national level MMC at present is delivering a notable amount of units, but is currently making a small contribution to national house building efforts:

Using assumptions from wider industry reports and insights from sector experts, it is estimated that there are currently 27,000 homes built per year via MMC methods.

It is anticipated that currently only a small proportion of these homes are built using volumetric methods – an entirely new source of housing supply where the manufacturer is also the contractor and therefore is adding a new form of housing supply to the UK market.

Figure 4
MMC housing delivery, 2019

	% of Total UK Housing Delivery	Homes
Volumetric	2%	3,380
Panelised	14%	23,660
Total MMC		27,040

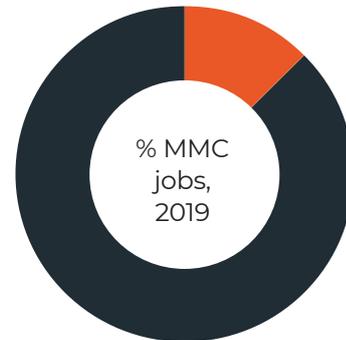


MMC house building sustains a significant amount of employment

It is estimated that the sector currently sustains in the order of 8,100 jobs nationally. Again, only a small proportion of these (1,010) are currently sustained by the volumetric market which is where the real driver and value add of the MMC sector lies.

Figure 5
MMC jobs, 2019

	Jobs
Volumetric	1,010
Panelised	7,100
Total MMC	8,110

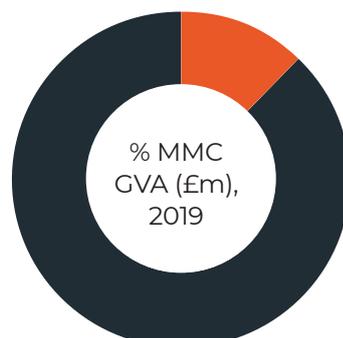


MMC house building jobs sustain a notable level of economic output

MMC jobs contribute in the order of £500m GVA per Annum to the UK Economy.

Figure 6
MMC GVA, 2019

	GVA (£ Millions)
Volumetric	£80
Panelised	£558
Total MMC	£638



In the coming years, MMC is set to grow considerably.

It is estimated that there is already notable latent capacity in the sector in the order of around 7,000 homes per annum. Furthermore, it is estimated that the sector is set to grow at 6% per year¹⁶.

The sector is currently dominated by panelised construction. However, it is also anticipated that volumetric construction has the potential to account for a significantly larger share in the future. Growth of the sector has been considered on the basis that:

- Latent volumetric capacity is realised in the next five years.
- The wider sector continues to grow at 6% pa thereafter.
- Growth of volumetric occurs at a faster rate to account for a larger share of MMC capacity.
- Overall capacity increases to 56,000 homes by year ten (which is broadly in line with the *Farmer Review* which estimates the potential to reach 50,000 homes through MMC methods).

Overall housebuilding is expected to increase above the current level of 169,000 home per annum – closer to the government’s target of delivering 300,000 new homes by the mid-2020s. Expansion of MMC will diversify the supply of housing, encourage new market entrants and draw on supply chains that are complementary to existing housebuilding delivery approaches. It therefore has the potential to provide a key element in securing a significant expansion of housebuilding. On this basis, the growth of MMC is assumed to be additional to the current housebuilding sector and will not displace other forms of housing delivery.

The suggested growth of MMC still requires other forms of house building (including traditional methods) to increase by over 100,000 homes over this period.

The level of growth proposed for MMC is equivalent to 5-9 new factories (with a capacity of 1-2,000 homes per annum) coming online within the next decade (less than one per year).

Figure 7
Housing delivered via MMC

	3 Years	5 years	10 Years
Volumetric	10,000	15,000	24,158
Panelised	25,857	27,432	31,801
Total MMC	35,857	42,432	55,958



Were the sector to grow as set out above, it would sustain support a significant amount of national employment:

10,800 jobs in 3 years, 12,700 in 5 years and 16,800 in 10 years. This compares to an estimated 8,100 jobs today – and represent growth of 8,800 over this period (a doubling of employment across England).

Figure 8
Jobs directly supported through MMC

	3 Years	5 years	10 Years
Volumetric	3,000	4,500	7,200
Panelised	7,800	8,200	9,500
Total MMC	10,800	12,700	16,800

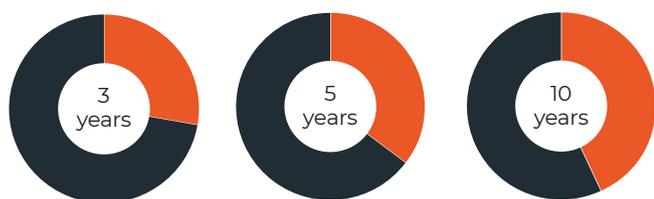


¹⁶ Frost and Sullivan project an annual growth rate of 6.3% from 2018 to 2025. <https://ww2.frost.com/news/press-releases/global-modular-and-prefabricated-building-market-set-for-robust-cagr-of-6-3-from-2018-to-2025/>

These jobs would deliver a considerable degree of economic output: Over £1.3 billion, compared to £630 million today.

Figure 9
GVA generation directly supported through MMC (£m)

	3 Years	5 years	10 Years
Volumetric	£236	£354	£569
Panelised	£609	£647	£749
Total MMC	£845	£1,000	£1,319



What this could mean for WMCA

Whilst it is difficult to say exactly what this may mean for WMCA, it is possible to set out some indicative scenarios of what proportion of this national activity WMCA could reasonably secure. These notional levels of MMC activity are not a prediction of the level of growth WMCA will secure, but set out the scale impact that could materialise if WMCA is able to grasp the opportunity that lies ahead.

On this basis the notional opportunity for WMCA is for the area to secure additional capacity for 2,000 homes per annum, which represents circa 10% of the UK's additional volumetric production within the next ten years – equivalent to 2 factories with 1,000 homes per annum capacity or one larger facility.

If WMCA was able to secure this level of MMC growth, this could deliver:

2,000 homes
per annum

Support **600 jobs**
(within the factory)

Deliver **£47 million**
GVA per annum

As identified above, our evidence suggests that growth in MMC, particularly that around volumetric is **highly additional and will not displace existing construction activity**. This has been brought to light through a series of sources. The engagement process with those involved in MMC has suggested that manufacturers are looking to different skills sets and different types of people to fulfil these roles, with an emphasis on digital and design skills. Moreover, this form of construction is a completely new form of housing supply to the UK market and as such would supplement traditional approaches which would cumulatively help the UK to realise its national house building targets.

This activity is also likely to generate a considerable degree of economic value through the **wider supply chain**. Here, a series of high level estimations of indirect impacts can be generated¹⁷. It is anticipated that MMC activity will indirectly support **560 jobs** in the supply chain, generating in the order of **£44m in Gross Value Added**.

The delivery of 2,000 homes per annum would secure around 13% of WMCA's housing target for 2025 onwards. This could be considered a cautious estimate, and demand can be aggregated nationally in the future, as has been proposed in the recent *Build Homes, Build Jobs, Build Innovation* report by Mark Farmer and Mike De'ath, then the potential for MMC manufacture in WMCA may be even greater.

¹⁷ The multipliers are taken from the Hatch Regeneris Input-Output model (last updated in 2017). These impact capture the indirect impacts of employment and outputs (i.e. the spend in construction supply chain) and the impact would be associated with the induced impacts of employee expenditure in the local economy.

Construction sector at large

Understanding the wider construction sector across WMCA can provide valuable insights into the area's current construction credentials and an indication of how well placed the sector is to support future MMC activity that comes forward.

Whilst the construction sector is slightly less specialised and there is a lower concentration of businesses than is seen nationally, there is a critical mass of construction activity equivalent to 55,000 jobs across 10,295 businesses. This represents 4.3% of the total jobs and 9.7% of the total businesses across the West Midlands Combined Authority.

Within the construction sector there is a strong concentration of heavy infrastructure activities (Figure 10) which are relatively small sectors nationally, but large employers in the West Midlands. Notably:



The construction of railways is:

x 22
the level seen nationally



The construction of roads and motorways in WMCA is:

x 5
the level seen nationally



The construction of commercial buildings is also more specialised than the national profile:

x 2.7
the national concentration

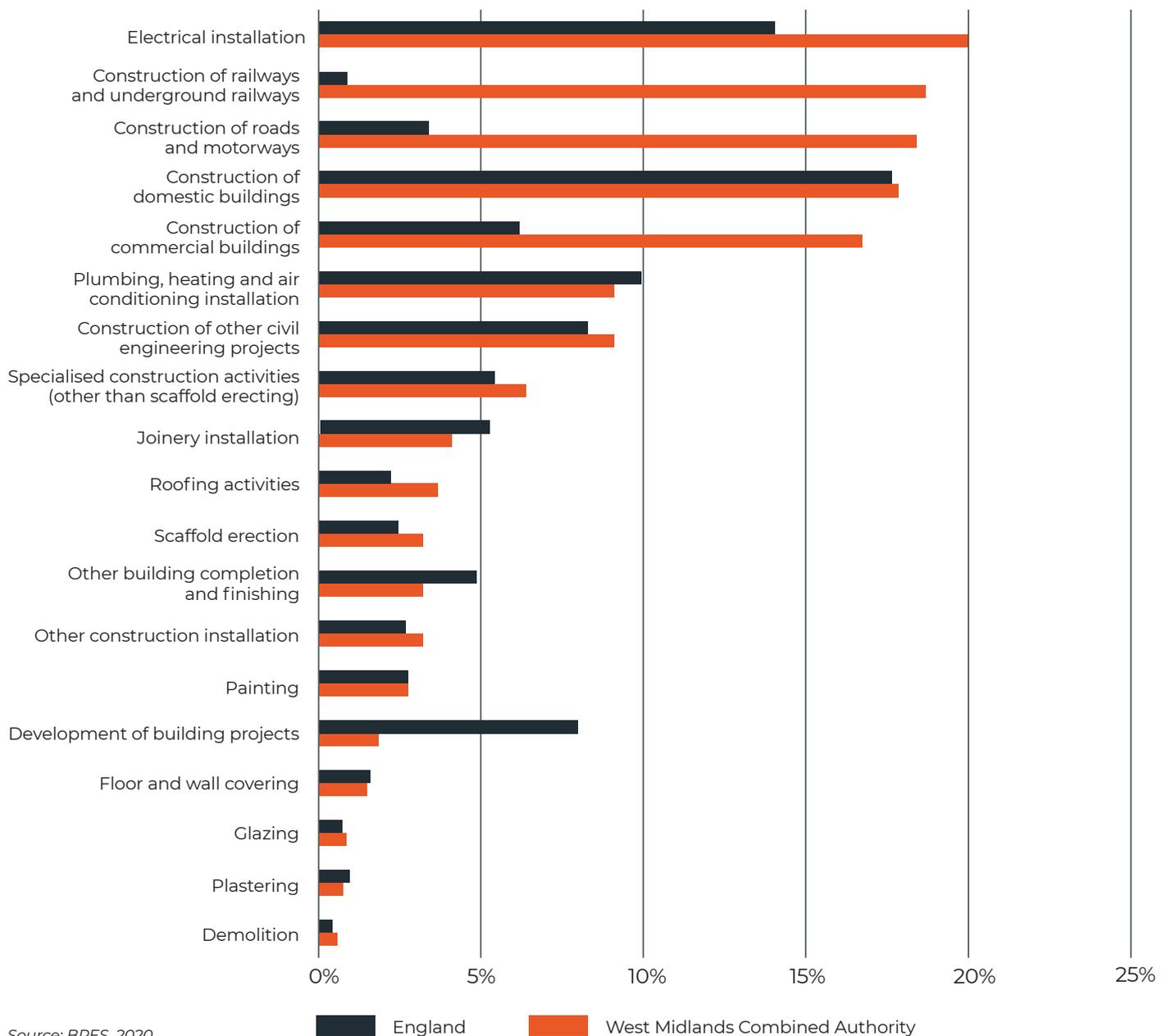


These sectors require highly specialised expertise and skills and reflect the tacit knowledge that exists within the construction sector locally. This provides a strong foundation for the growth of MMC activity going forward.

Supporting sector

The sector is made up of a strong presence of sub sectoral activities that will support any core MMC activity that takes place. These are summarised in the accompanying chart to the right and include a prominent commercial building sector as well as supporting activities such as electrical installation, plumbing, heat and air-conditioning and roofing. All of these activities are highly likely to supplement any MMC activity that comes forward and provide an important foundation and supply chain for the sector to grow.

Figure 10
Construction sector profile (2018)



Source: BRES, 2020

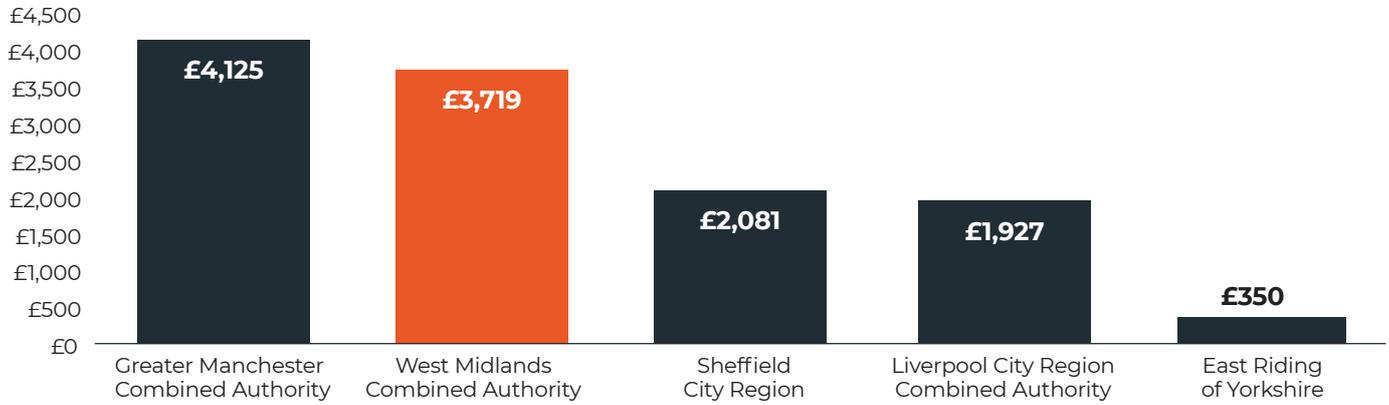
Construction productivity

The West Midlands' Construction Sector is relatively large in gross terms

GVA of £3,700m indicates that in terms of scale the wider construction sector is significantly larger than the Sheffield and Liverpool City Regions but is lower than the GMCA.

Figure 11

Construction sector total GVA (Millions)



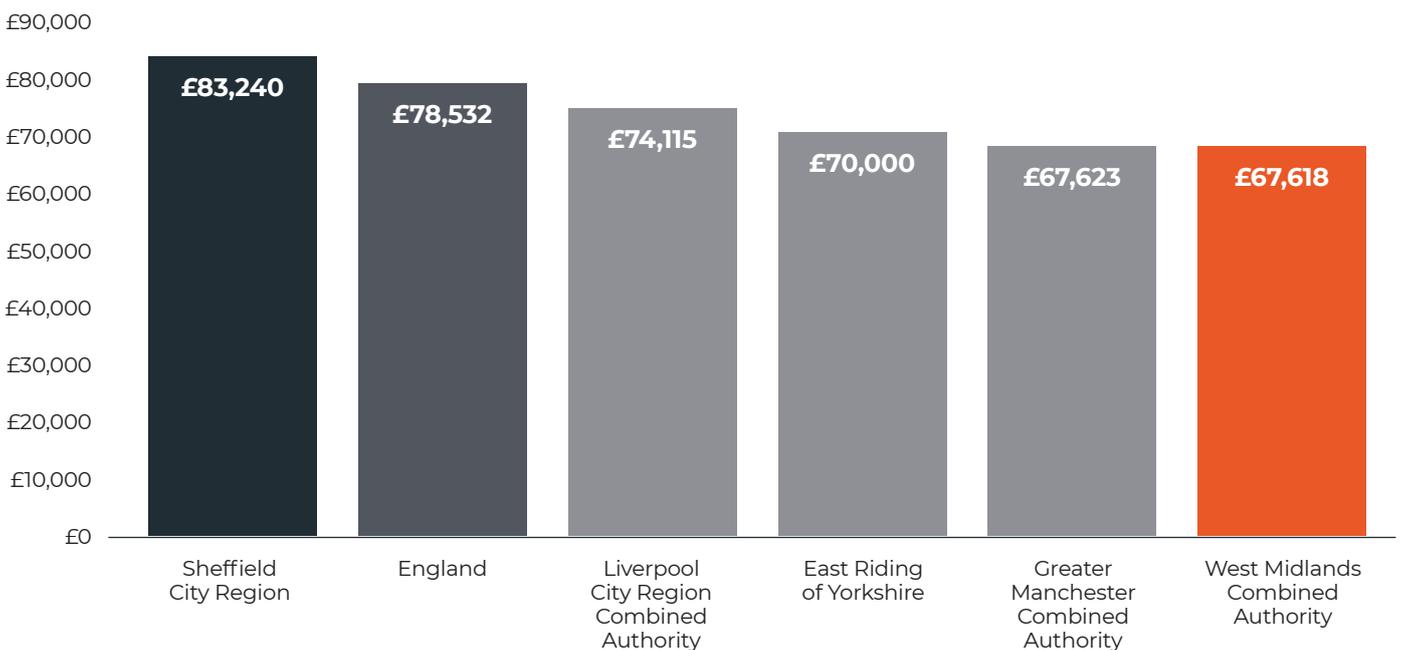
Source: ONS, 2019

In relative terms the West Midlands Combined Authority has low productivity across the construction sector

GVA per FTE of £68,000 is significantly lower than the comparator locations and national average. This reflects the lower levels of specialism in the WMCA construction sector than comparator locations, and its relatively larger employment in supply chain sub-sectors that are less productive in nature. To this end, MMC provides a means by which to improve productivity in the construction sector locally and meet the WMCA strategic ambitions to secure greater productivity in the area.

Figure 12

Construction sector GVA per FTE



Source: ONS, 2019

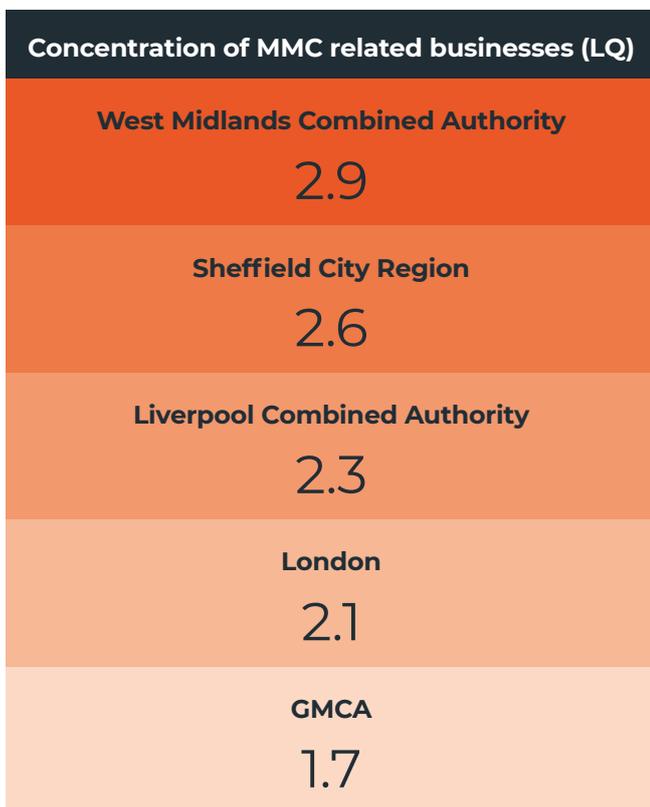
MMC related activities

Clearly, a large degree of MMC related activity will not be picked up or specifically identified through a traditional SIC Approach. To get around this issue data has been used from Glass.ai, which uses bespoke web crawling techniques to pinpoint companies that are engaged in relevant cyber and digital activities, by assessing company characteristics from their online presence.

Whilst this process provides a much deeper layer of analysis and goes beyond the limitations of SIC codes, it may still overlook companies that do not have an active website but are legitimate trading entities. As such, this has been used here to get an understanding of the relative strength of different MMC locations and to determine levels of specialisation in *MMC related activities*.

The data suggests that WMCA has a very strong specialisation of MMC related businesses with three times the level seen nationally. This is the most specialised location across all the comparators reviewed as part of this research.

A review of the companies that sit behind this data indicate that there is a diverse range of businesses operating in MMC related activities. These activities represent a strong foundation for the growth of MMC within the West Midlands and are summarised below.



Understanding the current AMC supply chain

Engaging with and understanding the West Midlands' AMC businesses

In order to understand the starting point for AMC in the West Midlands, we have undertaken a comprehensive mapping and engagement project, researching the market as it stands. Our research followed six streams:

1. Volumetric and panelised AMC manufacturers
2. Principal contracting businesses:
3. Types of businesses that could be involved in supplying the emerging AMC market and how many are in WMCA
4. Enabling assets: physical infrastructure, political and regulatory assets within the region
5. What is happening and future potential in innovation and R&D
6. Map how the housebuilding sector in WMCA compares to northern and national comparators

In partnership with

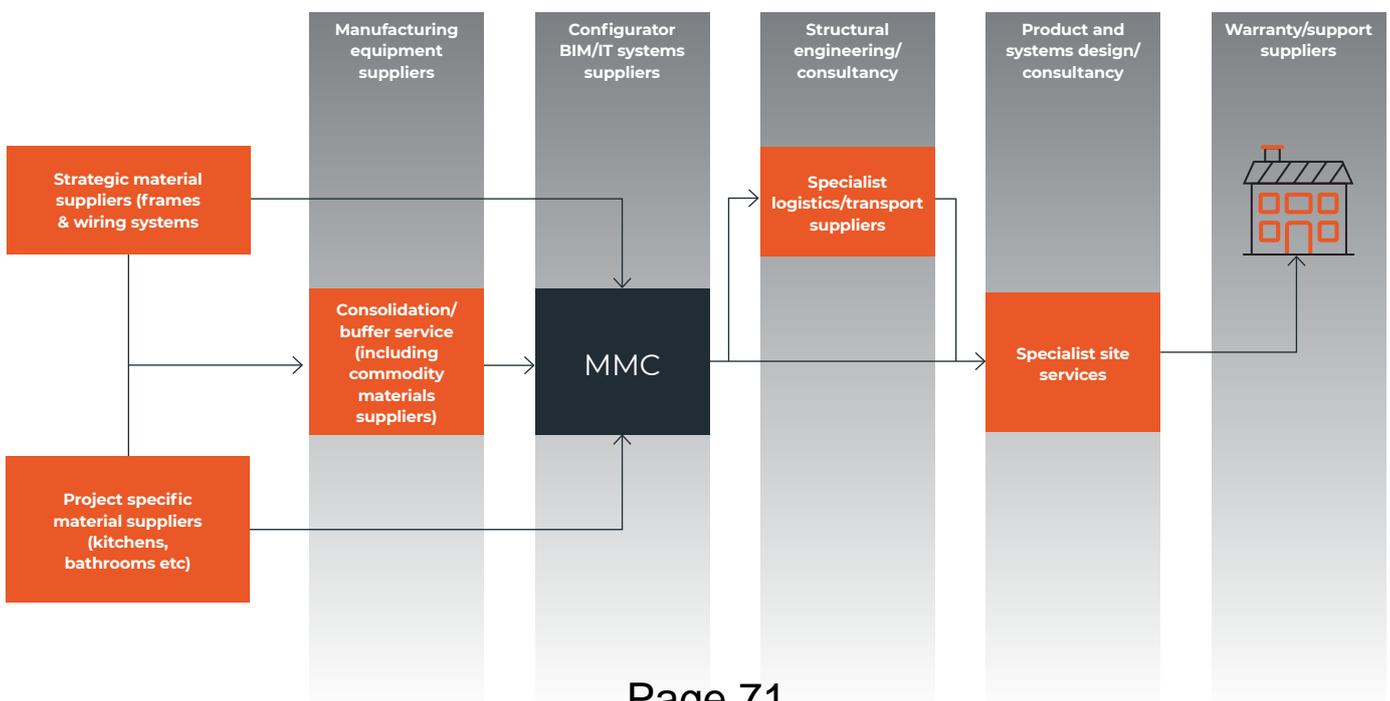


Methodology for discovery / analysis

Our research followed six streams:

- 1. Volumetric and panelised AMC manufacturers:**
 The geographic boundary of research was outlined as the WMCA region. The Arcadis National AMC manufacturers database was filtered to identify manufacturers within the region. This short-list was validated through internet research and further validated through phone conversations/engagement calls with industry experts and manufacturers.
- 2. Principal contracting businesses:**
 Definitions of "Principal Contractor" and the geographic boundary of research were developed. Internet searches were conducted to identify principal contracting organisations within the region. This information was validated through engagement calls with key principal contracting organisations and AMC manufacturers.
- 3. Types of businesses that could be involved in supplying the emerging AMC market and how many are in WMCA:**
 Arcadis' AMC Residential value chain was used to identify ten types of business supplying AMC manufacturers (see below). Internet research and engagement calls were then used to develop a high-level supply chain analysis of the AMC ecosystem within West Midlands which was further validated through phone conversations.
- 4. Enabling assets: physical infrastructure, political and regulatory assets within the region:**
 Internet desk research into the region's physical infrastructure assets was focussed on the logistics network surrounding WMCA (key roads and motorways, rail and intermodal freight terminals and airports), accompanied by the WMCA Transport strategy. Political and regulatory enablers within region were identified through engagement calls with AMC manufacturers, house developers, supplying organisations and research institutes.
- 5. What is already happening and future potential in innovation and R&D:**
 Research into the Innovation and R&D within the region was conducted through a combination of internet research and engagement calls.
- 6. Mapping the housebuilding sector in WMCA and comparison with northern and national comparators.**

Figure 17
Types of businesses supplying AMC manufacturers



There is an opportunity for WMCA to attract additional AMC manufacturing capability to the region. ilke homes represents an example of not only an AMC manufacturer but a fully integrated housing developer currently outside the region with a desire to have multi-region manufacturing capability; they have recently opened an office within Birmingham.

It was expressed through our engagement sessions that a higher degree of collaboration and engagement with WMCA would be beneficial in enabling growth in the sector regionally, as multiple AMC manufacturers within the region are looking to scale their operations.

All AMC manufacturers engaged through the interview process have declared strategies encouraging local sourcing within their supply chain.

Other enablers and insights emerging from engagement calls with AMC manufacturers include:

- Three factors identified when analysing the AMC landscape within a region:
 - Housing demand – evident in WMCA
 - Land availability – no group currently in place to represent landowners
 - Offsite manufacturing capability – evident in WMCA
- Aggregation of regional pipeline for affordable housing
- Consistency and certainty of demand would encourage manufacturers to further invest in scaling operations or additional shifts
- Changes in the planning system towards a preference for volumetric construction would aid growth of the industry

Manufacturers engaged through this process also felt that the Government could act as an enabler in the following ways:

- Clear and concise standards and regulations, which might include housing standards and building regulations, all of which were considered important criteria for creating standardisation of demand
- Zero carbon economy, insulation requirements and other stricter building regulations could signal the end of achieving energy efficiencies from traditional methods
- Enable manufacturers to build to standards with a clear criteria or target to adhere to
- Planning pre-approval for standard house types or portfolios would also be an aid to growth
- Early engagement in the development cycle with local authorities, housing associations and other providers is important as are long-term relationships and open dialogue
- Government assistance and financial help for R&D and manufacturing
- Earlier engagement in the procurement process for the public sector

Contractors

Principal contractors are defined as 'Contractors appointed by the client to have control of the construction phase of the project; to plan, manage, monitor and coordinate health and safety during this phase'.

Eight prominent principle contractors operate within the Residential AMC sector in WMCA:

- Seddon
- Henry Riley
- FI Modular
- Bowmer & Kirkland
- Keepmoat
- Farrans
- Grahams

Keepmoat has identified AMC as a major part of their strategy to deliver affordable homes and zero carbon housing, with plans to develop 400 modular homes with their volumetric module supplier ilke Homes. They also have a strategy to increase their timber frame AMC offering (currently 10% of their revenue) and provide a turnkey solution which includes land development.

ilke Homes has recently opened an office within WMCA and have a vision to operate within the region as a fully integrated housing developer with an aim to acquire land, get consent and supply finished modules enabling them to bring homes to the market more quickly. With a strategy to operate as a principal contractor within residential AMC projects and to collaborate with housing associations and local contractors, this highlights an example of the strategy of many AMC manufacturers to adopt vertical integration and add principal contracting to their offering pushing towards turnkey solutions.

All contractors engaged in this research shared an ambition to improve their AMC capability and scale their offering by increasing the number of houses developed using AMC. They believe that manufacturing capability in and around the region is key to their supply chain and an enabler to fulfilling their demand for their affordable housing requirements.

Enablers identified in engagement calls with contractors include:

- Traditional principal contractors accommodating AMC requires large-scale changes to existing operations
- The majority of housing projects have been principally designed for traditional construction and must be redesigned for AMC; WMCA can counter this by encouraging AMC concepts early on in planning and development cycle
- Currently AMC costs are considerably higher than traditional build; to justify using AMC methods they need to access additional grants that Housing Associations have access to.
- Public sector could help force the private sector and wider construction industry to look ahead with policies e.g. a percentage of new developments should be built using AMC methods
- Homes England are key to funding and research, understanding that there is land to unlock in the coming years, introducing restrictions on types of homes on the land unlocked is a key player in increasing volumes
- Help-to-buy stimulates demand
- Forward visibility of housing plans and projects is key
- Open conversation with key stakeholders and early engagement in local plans
- Warranty providers and their ability to offer insurance to customers is critical

Further observations include:

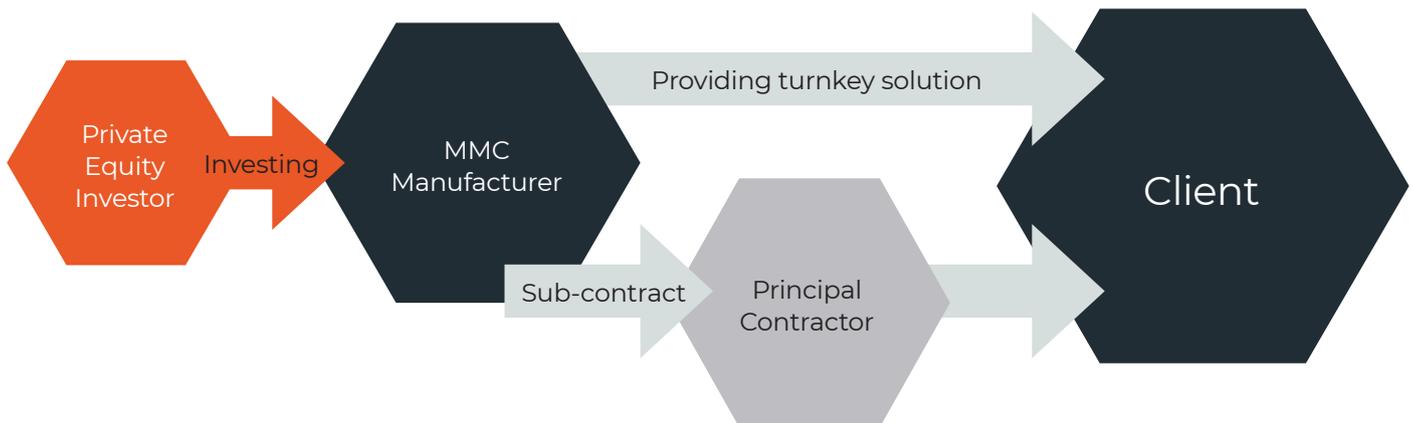
- Private equity investment into AMC

The figure below outlines a common theme within the AMC ecosystem which has been identified through research and the engagement calls with AMC manufacturers. There is a wealth of evidence of Private equity-based investors entering the AMC residential development landscape and investing in AMC manufacturers. This is providing the capital for the manufacturers to invest and develop their facilities and their production capability to deal with the forecasted growth in demand for affordable homes. Examples include Impact Capital investment in Lesko Modular, TDR Capital investment in ilke Homes and Goldman Sachs investment in TopHat.

Private equity investment could potentially extend further down the AMC supply chain with the acquisition of strategic component suppliers to further support and secure the pipeline and resource for affordable housing.

Figure 20

Private equity investment and manufacturers providing turnkey solutions



AMC manufacturers providing turnkey solutions

There is also evidence that AMC manufacturers are moving upstream by providing turnkey solutions directly to the clients and in doing so bypassing principal contractors. Examples from our engagement sessions of manufacturers adopting the strategy of vertical integration, upscaling their principal contracting and housing delivery capabilities to provide turnkey solutions include:

- Innovare systems
- Hadley Group
- Accord Group
- ilke Homes
- Totally Modular
- Dynamic Build UK
- Elements Europe

In this model, onsite work is still subcontracted to local organisations for activities such as groundwork and site installation, but this is under the management of the manufacturer. There are also instances where the manufacturer has acquired these service providers to expand their offering.

This model provides an opportunity for local contractors and SMEs to become specialist partners to AMC manufacturers within region supporting the growth within their offering and the sector as a whole.

- AMC manufacturers are keen to take on principal contracting roles and sub-contract on project basis to complete on-site installations
- Where manufacturers work through a principal contractor, they typically require a concrete slab, site access and scaffolding (for panelised products) and then installation is conducted by their own employed teams or installation sub-contractors
- The benefit to end client is estimated at 15% saving due to bypassing principal contracting charges and using AMC manufacturer's turnkey proposition
- Providing turnkey solutions also allows AMC manufacturers to control end to end quality and build process
- AMC manufacturers and principal contractors with AMC capability also looking into land development
 - Keepmoat is expanding their turnkey offering with a strategy of working with landowners to acquire and secure new sites across brownfield and greenfield locations. Acquiring both small and large-scale land developments
 - As the AMC landscape evolves and acknowledging some of the challenges entering the market, ilke Homes have set up their own land and development team as part of their strategy to move towards a full turnkey solution
- Opportunity remains for local developers as AMC is not cannibalizing Construction market
 - A further opportunity to provide a wider range of jobs in the region as AMC adds an additional requirement to the job market rather than cannibalizing existing labour within the construction sector
 - AMC projects can be deemed less attractive to traditional principal contractors as the existing highly fragmented sub-contracting model in traditional construction presents opportunity for margin to be made across large number of sub-contracting organisations. Same opportunity is reduced within AMC due to reduced number of sub-contracting organisations required on projects

Supply chain

The region has a strong supply base which can be developed to support AMC activity and other future opportunities both within the region and nationally.

The supply chain within the region is predominantly equipped to service the traditional construction sector. This includes a large base of consolidators and buffer services for commodity supplies (building materials and key components), however there are some strategic materials suppliers identified within research which support the AMC ecosystem. These strategic materials include steel frame structures and timber frames suppliers that play a key part in the AMC value chain.

Engagement sessions with Tier 1 AMC manufacturers have revealed that they interact with, and procure products from, organisations within the traditional construction supply chain; due to this being a reliable source of supply that has been established and built to service the wider construction sector. A key takeaway from the engagement sessions identified the fact that Tier 1 manufacturers were often procuring from national organisations with regional distribution centres and capabilities ensuring:

- Reduced risk due to reliability and continuity of supply
- Ability to handle large peaks and variations in demand brought by the intermittent nature of demand within project-based environments

The heatmap opposite identifies the current supply organisations within WMCA aligned with the ten types.

Figure 21
Heatmap of supply chain organisations

Strategic material suppliers (frames and wiring systems)

Steel frame – walls / ceilings / floors	Hadley Group	Kingspan (steel frames)	Frameclad	Superior Sections	Drywall Steel Sections	Met Structures	Albion Sections	Midland Erection	Midland Structures	Ash and Lacy
Wiring system and electrical components	Adren electrical services	West Midlands Electrics	CEL Electrical	Contact Electrical	RS Electrical Supplies					
Timber Frames & Structures	(SC) – Pasquill	(SC) – Roofspace Solutions	(WB) – Timber Innovations	Taylor Lane	(WB) – Timber Engineering	Lowfield Timber Frames	Skyline Timber Systems			

Project specific material suppliers (kitchens, bathrooms, etc.)

Kitchens	Symphony	Ideal Standard													
Bathroom – vanity units	Core Modular	Symphony	Ideal Standard	Kondor Pods	Walker Modular	Offsite solutions									
Doors and windows	Central RPL	DW Windows	West Midlands Double Glazing	Reliant Windows	Finesse Windows	Stedek Windows & Doors	Carera Windows Ltd	Diamond Windows Droitwich	Wombourne Windows	Hayley windows					
Brick slip / cladding	Eurocell	Rhino Steel Cladding	Ash and Lacy	Bushbury Cladding	Phoenix Steel	Johnsons Timber Supplies	Just Walls UK	Ketley Brick company	Brictec	Slips on Site Ltd	The Brickslip Brothers	SPV Group	NV Roofing	SB Roofing & Cladding	
Plumbing, piping & water management systems	City Plumbing	BSS Group plc	Bes Ltd												
Walls / Panels / Insulation – SIPs	Kingspan	CCF	Falcon Panel Products	(SG) Glosford Sips	(WB) – Timber Innovations	Birmingham Asphalt	Superior Insulated Panels Ltd	Encon Insulation							
Roofing	(SC) – Pasquill	(SC) – Roofspace Solutions	Scotts Timber Engineering	(WB) – Smart Roof	Rinus Roofing	SIG Roofing									
Consolidation / buffer service (including commodity mat’s suppliers)	(SC) – Jewson	(SC) Grahams	(SC) CTD Tiles	Wickes	Buildbase	Travis Perkins	Eurocell	Buildbase							
Specialist logistics / transport suppliers	WS Transportation	Midlands Portable Buildings	Marshals of Evesham	Modular Movements											

Specialist site services (Installers – subcontractors)

Manufacturing equipment Services	Mantech Manufacturing	Eriks	Raybould Machining Tools	Mazak											
Structural engineering / consultancy	Arcadis	OES Consulting	BK Consultants	David Smith Associates	Harborne Building Consultancy	KWL Consulting	Simplify Structural Engineering	Brookbanks Consulting	Patrick Parsons	Adept Consulting	Integrated Designs & Associates	OES Consulting	PJ Barnett Associates	Glencross & Hudson	
product and system design consultancy	Modularize	Arcadis	Eurobond	BSRIA	Mott Macdonald	Bryden Wood									
Configurator / BIM / IT systems suppliers	UK Construction online	Autodesk	Tekla	BIMobject	CoBuilder	Solibri									
Warranty / support suppliers	NHBC	Bopas													



Further observations on the supply chain include:

Large number of prospective AMC supply chain participants in WMCA

Eighty-six businesses identified within WMCA currently supply the construction sector and could contribute to the AMC supply chain.

These range from local SMEs to national organisations with regional distribution operations.

17

Strategic Material suppliers identified

8

consolidation and buffer services for commodity suppliers

41

project specific material suppliers

14

structural engineering/ consultancy providers

Business within WMCA currently supplying the AMC ecosystem

Saint Gobain, with their off-site solution division, presents an example of an organisation which could play a key role in the region's AMC supply chain with a multitude of off-site services within their offering. Two of their offsite manufacturing brands Pasquill and Roofspace Solutions have facilities within the region that deliver strategic components (roofing, whole timber house kits, steel frame solutions) to the AMC manufacturing sector. British Gypsum is also part of the group and work closely in partnership with Hadley Group to develop drywall construction solutions.

Saint Gobain has adopted a strategy of vertical integration and a product-based approach to their offsite services. While manufacturing 4,500 homes annually from their timber frame assembly, they also work with National Tier 1 AMC manufacturers as a supply chain partner providing products and components. This includes receiving housing designs or bills of materials from their partners and producing housing components and other components needed for offsite manufacture.

Opportunity to encourage growth of supply base to supply AMC industry around the region.

There is an opportunity for some of the current supply chain to diversify their offering and support the growing AMC capability and manufacturing operations within the region.

Engagement calls have confirmed that AMC manufacturers are promoting a strategy of local sourcing which would help promote the supply chain within WMCA and create an opportunity for the supply chain to develop further and support the requirements of more manufacturers, such as those situated around the M62 corridor.

One of the key focuses for local sourcing is within specialist site services which are subcontracted to local organisations and include groundwork, landscapers, site installations, external finishing, on site fit out and decoration which tend to be sourced within the region.

Enabling assets

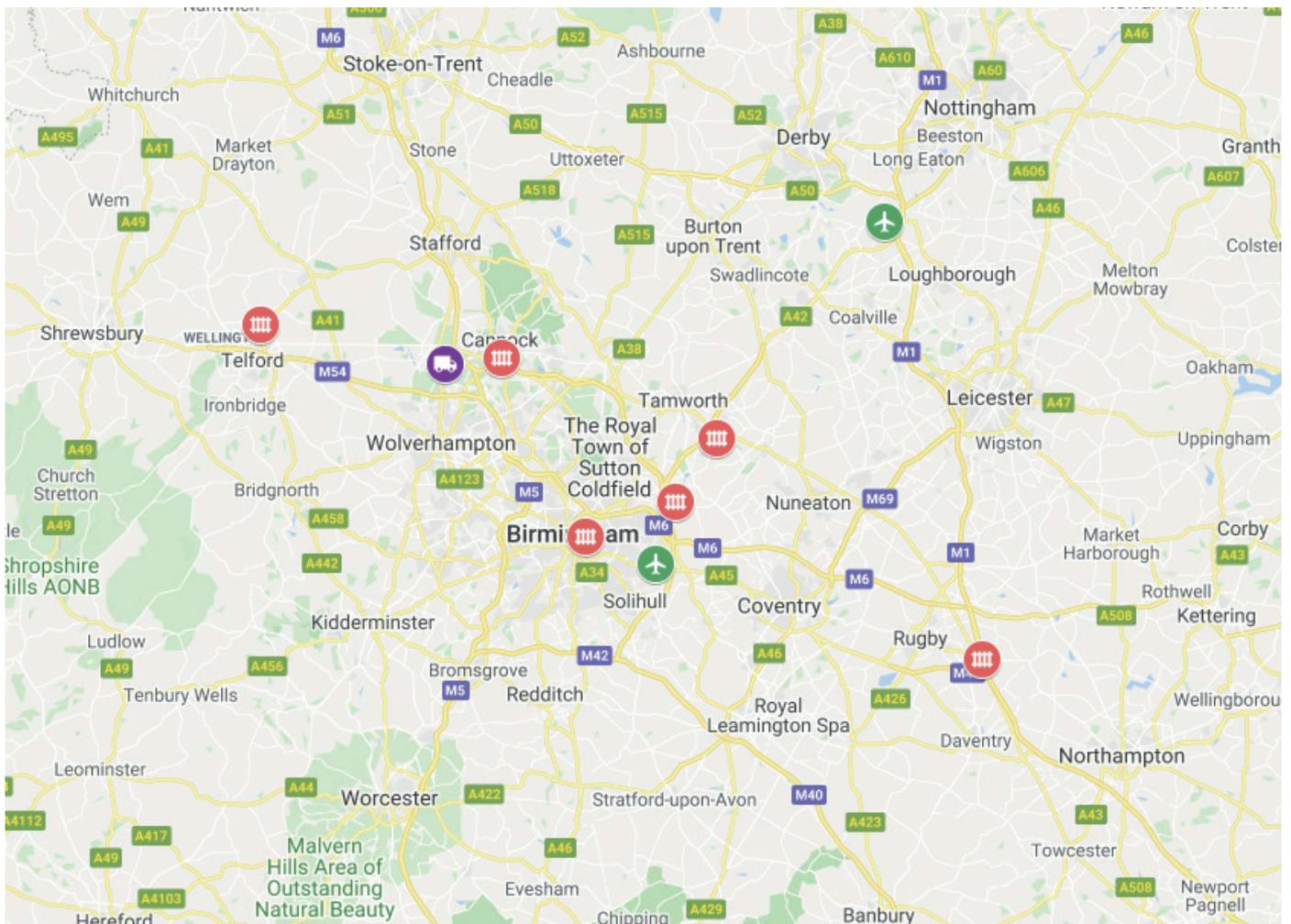
Physical (road/infrastructure/land)

WMCA is uniquely positioned at the centre of a strong transport network. This physical infrastructure supports the opportunity for the region to promote itself as a pivotal hub for the AMC activity across the midlands and support the national AMC ecosystem. It also presents an opportunity to bid as a future site for a national construction logistics hub as Birch Coppice Business Park in Tamworth was considered previously.

- Physical location and surrounding infrastructure are key assets of the WMCA:
 - The network of key roads surrounding the region including the M6, M42, M40, M5 and M1 motorways provide a strong road network to allow efficient logistic operations. These roads connect the region to another corridor of AMC activity in the north across the M62 and provide a link to London, both locations within 3-4 hours' drive of Birmingham.
 - This strong road network is supported by five intermodal freight terminals and two airports within a 30-mile radius around WMCA further displaying the regions connectivity.
 - Alongside this strong logistics infrastructure, there are plans to develop the West Midlands Strategic Rail Freight interchange; a large development close to the M6/A5 intersection with more than seven million sq. ft of rail-served and rail-linked warehouses to support the regions logistics industry growth and help offer a more sustainable, efficient and reliable approach to logistics through rail freight.

Figure 22

Key infrastructure assets around WMCA



Regulatory and political organisations

Across the WMCA and its constituent bodies there is a strong political ambition and range of policies to encourage growth, with key ambitions of investing in the local community and fulfilling the housing demand within the region.

- The AMC ecosystem could be a great way to fulfill the demand for housing (specifically affordable housing) and the opportunity to encourage and support local SMEs and other organisations to support this ecosystem.

WMCA are encouraging growth within the AMC sector through a range of initiatives:

- WMCA plans to insist on the use of offsite construction on projects within the region. The speed of offsite delivery outweighs the potentially higher current cost of undertaking AMC methods compared to traditional construction. Some of these costs could be offset by funding mechanisms; grants and investments which WMCA are willing to offer to developers committed to AMC.
- The strategic partnership with Urban Splash to build 10,000 new homes using AMC which aims to deliver circa 5% of the WMCAs target of 215,000 homes by 2031 demonstrates the region's progressive stance. Having delivered projects within the region at Fort Dunlop, Rotunda and currently working on site at the Port Loop, the collaboration between a local authorities and the private sector highlights an avenue which can be taken to enable AMC to service the demand for houses.
- Furthermore in the past year WMCA and Lovell have agreed a further strategic partnership, for 4,000 homes over the coming eight years, and this will also promote the use of AMC.
- The Advanced Manufacture in Construction (AMC) Expert Advisory Group which has been formed by the WMCA also identifies their commitment to the progression of the AMC agenda and its ability to help economic growth within the region; also providing a shorter term recovery strategy to offset the impacts of the coronavirus pandemic. This provides WMCA with an opportunity to capitalise on the current manufacturing and innovation capability within the region by establishing a platform to promote collaboration and utilise the expertise and innovation within the region to help develop and build AMC capability and best practice.

Other institutions playing a key role in WMCA:

- Innovate UK plays a pivotal role in the sector regarding funding, facilitating collaboration and accelerating innovation. This enables organisations to carry out research, invest in pilot schemes and initiatives to improve their capability around AMC manufacturing.
- Examples of manufacturers who have had assistance from Innovate UK in relation to funding projects include:
 - Hadley Group to help build a prototype of a modular home and access to the R&D tax credit system provided by Innovate UK
 - Totally Modular & TDS for a modular collaborative project.

Benefits not considered under other categories

In dialogue with AMC manufacturers it appears that there is a mismatch between their expectations/requirements for investing in a new site with what local authorities are able to offer. Other enablers identified by stakeholders within the engagement calls to help support the growth of AMC operations and the supply of affordable homes within WMCA would include:

- Consistency and predictability of demand
- Regional demand aggregation
- Assurity of pipeline when considering investment within the region
- Collaboration between housing associations, councils and AMC ecosystem
- Early engagement in development cycle
- Governance and regulation regarding modular housing and lifetime cost
- Long term relationships with clients with open and honest dialogue.
- Encourage investment in digital capability in building design as it enables transparency of end to end process (material, product, and resource requirements)
- Housing authorities will need to implement a quota within developments making AMC mandatory to change behaviour. As cost tends to be key driver to shape behaviour currently and adoption of new modules and innovation.

Innovation and R&D

WMCA is well established as a hub of innovation and research. The key institutions contributing to the West Midlands reputation globally include the heavy presence of manufacturers and research capability within the automotive sector and a multitude of academic institutions which engage in research within the manufacturing and built environment sectors.

Academic Research Institutions

Aston University
 Birmingham City University
 University of Birmingham
 University of Warwick
 Coventry University
 University of Wolverhampton
 Dudley College

West Midlands R&D Assets

Aston University Logistics Expertise
 Birmingham Centre for Rail Research & Education
 Centre of Excellence in Digital Systems
 Energy Systems Catapult
 High Temperature Research Centre
 Manufacturing Technology Centre (MTC)
 MIRA Technology Institute
 MIRA Technology Park
 National Automotive Innovation Centre (WMG)
 National Transport Design Centre (NTDC)
 Quinton Rail Technology Centre
 Smart City Mobility Centre
 TIC-IT (Horiba-MIRA)
 UK Central
 UK Mobility Data Institute (WMG)
 UK Battery Industrialisation Centre (UKBIC)
 Very Light Innovation Centre
 Warwick Manufacturing Group (WMG)

Innovation and R&D Facilities

Coventry University Technology Park
 University of Warwick Science Park
 Warwick Innovation Centre
 Wolverhampton Science Park
 Innovation Birmingham Campus

With the strong research and innovation footprint within the WMCA, there is an opportunity for the AMC sector to utilise this capability; aligning current and future research to the needs of the sector and facilitating these institutions in conducting manufacturing and built environment research.

The region's wealth of academic institutions is a key facilitator. WMCA could draw on the academic institutions and their current research and projects to facilitate an AMC-focused coalition to assist the sector within the region and nationally:

University of Wolverhampton

AMC based research and projects with Tier 1 AMC manufacturers within the WMCA

- (Hadley Group) Researching into Ontology – Heating, lighting and cooling in housing.
- (LoCaL Homes) Research into long term benefits to homeowners around energy efficiency and incorporating it into their housing design process and also the CHARM project into plastic free housing, which is considered to be a leading R&D project Europe-wide.

Birmingham City University, School of Engineering and The Built Environment –

Currently undertaking research to improve the housing crisis by facilitating offsite construction & Design for Manufacture (DfMA). Aim to construct six DfMA houses with further 200+ new homes in the pipeline and assist choosing design options for 400 houses per annum.

University of Birmingham, Civil Engineering Research (Structural Engineering)

Current research includes studies in structured materials, structural insulated panels and structural component design, novel design methods using cold formed steel structures and off-site construction methods facilitated by new construction materials.

University of Warwick

Innovative manufacturing & future materials research into the decarbonisations of products, processes and operations on the house including battery technology research which could play a role in the environmental and sustainability aspects of affordable housing. Warwick Manufacturing Group (WMG) research includes sustainable materials and processes, materials engineering, and life cycle analysis and knowledge transfer partnerships with Tier 1 AMC manufacturers.

University of Coventry, Centre for Manufacturing and Materials Engineering

Offsite Wrap-around Large Scale retrofit (OWLS) is a project which aims to develop a rapid, highly replicable and innovative approach to external insulation of walls and roofs by applying modern methods of construction to retrofit. This research aims to benefit social housing projects through improvements to comfort, environmental improvements with the reduction of CO₂ and reduction in energy costs.

Dudley College

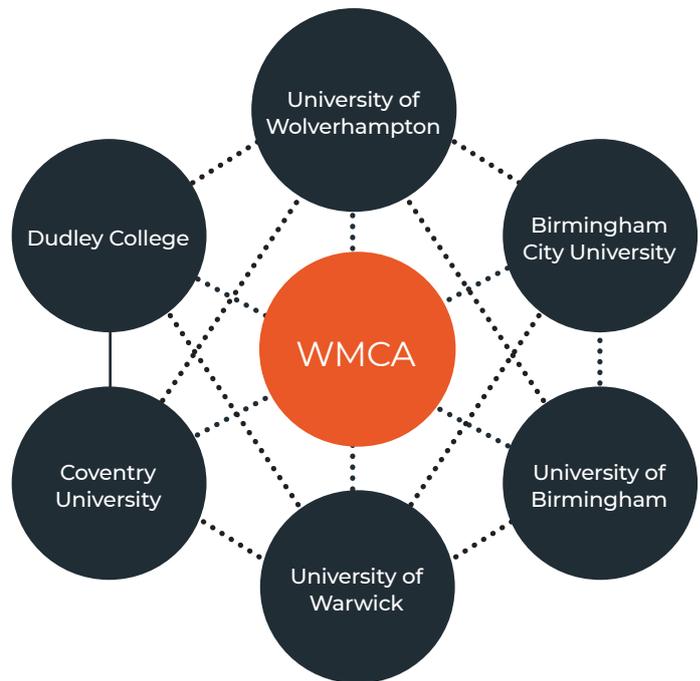
Dudley Advance II, a purpose-built facility geared towards providing apprenticeships, training and education for offsite manufacturing and digital skills including developing techniques such as BIM. Involved with multiple Tier 1 AMC manufacturers within the region and the Sustainable Housing Action Partnership (SHAP) assisting to push a smart, sustainable national housing infrastructure for 2050.

There is an opportunity to combine automotive manufacturing expertise and best practice with the AMC manufacturing landscape within the WMCA by:

- Marrying WMCA's strong foundation of automotive manufacturing knowledge to the research currently being undertaken across multiple academic and research bodies within the built environment and manufacturing sector. This presents an opportunity for West Midlands to align these expertise and research to help propel the AMC manufacturing sector within the region and nationally.
- Marrying the capability found in WMCA between the private institutions (manufacturers) and academic research would benefit organisations and the workforce within the sector as it would develop the manufacturing process, expertise, product knowledge and develop that skill set within the region.

Figure 23

The academic institutions within the region which WMCA could utilise to assist their AMC initiatives and strategy



The Manufacturing Technology Centre (MTC) also plays a key role in the research and innovation capability within the region. There is an opportunity to expand the MTC's collaboration with the Advanced Manufacturing Research Centre (AMRC) on initiatives and innovation relating to the AMC sector; enabling these institutions to utilize the synergies from their research, combining operational excellence from the automotive sector with manufacturing and materials-based research relative to the AMC ecosystem.

- Opportunity for West Midlands Innovation network with its focus on automotive and manufacturing process to collaborate with AMRC to utilise their expertise in AMC manufacturing and materials to benefit capability, skill sets and create synergies.
- Facilitate the connection between industry and academia within the region. Individual connections have been made between manufacturers and academic institutions in the shape of knowledge transfers and training schemes, but development of innovation and research which will introduce applicable innovation and improve manufacturing operations within the sector needs further encouragement.
- Use the strong research and expertise of the MTC, academic institutions and the private sector to understand *the art of the possible* in regard to building sustainable homes and help manufacturers to make incremental changes to their operations using an agile approach.

Case Study

Woden Road, Wolverhampton

This development at Woden Road in Wolverhampton is just one of many high-quality and highly-sustainable developments to have been manufactured and assembled by West Midlands based LoCaL Homes, part of the Accord Group.

Woden Road consists of 91 houses and 21 apartments, all of which were constructed using LoCaL's *Eco 200* system at its factory near Walsall before being assembled on site. The project achieved outstanding speed of delivery – with 86 of the homes built in 86 days – excellent environmental and energy performance, and fantastic value for money with all above ground works being completed for less than £1,000 per square metre.



Understanding the skills and training environment for AMC

In partnership with

HARLOW
CONSULTING

Skills profile in the West Midlands Combined Authority

The WMCA Regional Skills Plan identifies a number of challenges as well as positive trends for the region from a labour market perspective:

- A low employment rate (70% of 16-64 year olds being employed)
- High levels of unemployment
- High numbers of residents with no qualifications
- A high number of residents in low paid jobs
- A quarter of vacancies described as 'hard to fill'
- + A growing number of jobs
- + Improvements in school attainment
- + Large and growing population of young people

Major new homes development (in the order of 12,000 new homes each years) presents just one of various opportunities to address the identified challenges.

Furthermore, sectors aligned with AMC such as advanced manufacturing, construction (building technologies) and digital creative have been highlighted by the WMCA as 'transformational'. Housing is one of the key priorities set out in the *Strategic Economic Plan*, with construction (building technologies) the key sector to deliver the Authority's £500m investment in this area.

The skills profile of AMC

Roles and functions involved in AMC

It should be noted that this section focuses on the core functions involved in the manufacturing and construction-related elements of AMC. This excludes other cross-sector roles and functions such as sales and marketing.

Offsite versus onsite

Firstly, there is a need to differentiate between offsite manufacture and onsite assembly and the functions that they each perform. From a skills perspective, this is important because 'construction' is tightly defined, based on the construction sectors 'in-scope' to the CITB Levy.¹⁸ These sub-sectors range from traditional trades (e.g. bricklaying, carpentry, painting and decorating), to groundworks, drilling, scaffolding, to road building. Activities performed 'offsite' in a manufacturing facility are outwith this definition of construction.

The interface between the onsite and offsite elements of AMC therefore sets a unique challenge in terms of skills integration. This is particularly true where 'traditional' companies, such as Tier 1 employers are adopting AMC techniques involving offsite manufacture.

The interface is where the build process becomes more closely assimilated with manufacturing, requiring integration between different disciplines (Figure 13).

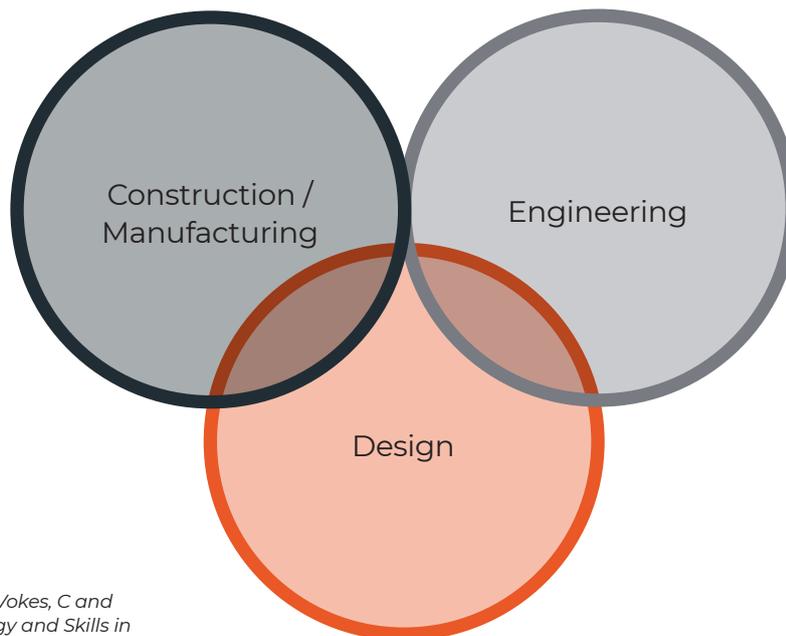
As a consequence, AMC requires close collaboration and a mutual understanding between all parties involved in manufacture and assembly. Contractors undertaking placement and assembly need to work to tighter tolerances, work more productively and efficiently, have an appreciation of the manufacturing process and understand the difference between traditional and AMC builds. To achieve this, it is widely acknowledged that all parties need to be involved from the design stage.

“Knowledge of the different disciplines is key. The challenge comes in the interdisciplinary nature of the profession.”

Feedback from stakeholder interview.

Figure 13

Integration between different AMC disciplines



Source: Reproduced from: Vokes, C and Brennan J (2013) 'Technology and Skills in the Construction Industry', UKCES

Functions and job roles involved in AMC

Due to the cross-fertilisation between AMC and traditional skills – i.e. the need for a mixture of innovative production techniques in the offsite manufacturing environment, as well as traditional skills required in onsite groundwork, assembly and finishing – there is a need to consider the functions performed by the different parties as well as the job roles. This is particularly the case where Tier 1 contractors have diversified into manufacturing. For clarity, and as an exemplar, Table 1 illustrates the core functions involved in AMC, and the associated job roles.

Table 1

Functions and job roles involved in AMC

Function	Description	Job role
Digital design	Success of projects hinges on the right design	<ul style="list-style-type: none"> • 3D Visualiser • CAD Modeller • Architectural Technician • BIM Technician <ul style="list-style-type: none"> • Pre-construction Designer • Electrical Engineer • Architect • Design Engineer • Structural Engineer
Estimating/commercial	Seen as a 'black art' Getting it wrong can undermine benefits of using offsite	<ul style="list-style-type: none"> • Contracts Manager • Commercial Manager • Estimator • Quantity Surveyor
Offsite manufacturing	Moving towards multi-skilled operatives however training is largely in silos Collaborative nature of offsite working requires cultural shift for traditional trades	<ul style="list-style-type: none"> • Wood Machinist • Multi-Skills Operative • Steel Fixer • Welding Fabricator • Trades (joiner/kitchen fitter) <ul style="list-style-type: none"> • Factor Supervisor • Project Manager • Factory Manager • Plant Manager
Site management and integration	Sequencing and scheduling crucial for efficient on-site assembly Requires generic skillset in construction plus knowledge of materials and products	<ul style="list-style-type: none"> • Site Manager • Project Manager • Construction Manager
Logistics	Critical function – requires key skills in supply chain management Training does not explicitly address interface between offsite and onsite	<ul style="list-style-type: none"> • Banksman/Signaller • Dispatch • Logistics/Plant Manager • Dispatch Manager • Transport Manager
Onsite placement and assembly	Lack of precision can compromise the entire build To realise benefits of offsite, understanding is required of the offsite process and materials used	<ul style="list-style-type: none"> • Assembly Technician • Erectors (steel, precast concrete) • Operatives (groundworks, roofing) • Banksman/Signaller • Crane Operator • Forklift Driver <ul style="list-style-type: none"> • Trades (plumber, painting, joiner) • Chargehand • Site Supervisor • Project Manager • Site Manager • Site Inspector

At the lower levels, job roles are unlikely to change, but those at the higher levels are predicted to evolve¹⁹.

Academics consulted for this research suggest that, to realise an increase in AMC and to optimise production, the opportunities lies with manufacturers. As one academic stated: manufacturers already know how to produce, so to introduce a new business model might not be that difficult for them.

Skills, knowledge and behaviours

UK-wide research with sector employers conducted in 2017 identified the common AMC-specific skills and knowledge needs of those working in the six core functions described on page 5. These needs relate predominantly to higher-level knowledge requirements concerned with realising the productivity benefits of AMC, as well as a wide range of soft skills and attributes (Table 2)²⁰.

Table 2
Common skills and knowledge needs

Knowledge needs	'Softer' skills needs
<ul style="list-style-type: none"> • Design codes and standards • Low carbon agenda • Materials suitability • Relevant products and systems • Lean methodologies • Offsite manufacturing processes • Current and emerging technologies (e.g. 3D printing) • Site specifics • Safe lifting and handling • Order or sequencing • Assembly processes and tolerances • Quality assurance processes and tests • Waste management 	<ul style="list-style-type: none"> • Effective and ongoing communication • Problem-solving • Team-working • Attention to detail • Accuracy • Process improvement • Commercial awareness • Customer service • Business case for offsite • Negotiation • Adaptability • Resilience • Organisation

Those working in production roles need well-developed soft-skills equally as much as those working at higher levels. A key differentiator between construction and manufacturing, however, is that the latter relies on a relatively low-skilled or 'de-skilled' worker, heightening the need for those employed in production roles to possess appropriate behaviours and attitudinal characteristics.

Stakeholders consulted for this research identified the following as key skills needs for the future:

- Digital (specifically Virtual Reality and Augmented Reality)
- Robotics
- Analytics

“The skills of the person working on the building are the same as working on site, such as tiling. The mindset and work ethic is different to being on a construction site. That’s what’s most important.”

Feedback from stakeholder interview.

²⁰ Brennan, J and Vokes, C (2017) 'Faster, Smarter, More Efficient: Building Skills for Offsite Construction', CITB

Supply of AMC qualifications and training

Higher Education and academia

The Register of English Higher Education Providers²¹ lists 21 providers of higher education programmes in the West Midlands Combined Authority area (Table 6). Some of these providers – such as colleges – offer ‘franchised’ provision on behalf of a university, sometimes acting as an additional campus. These providers deliver the programmes, which are then awarded and accredited by the respective university.

Three Universities and one Further Education College within the WMCA offer higher education provision related to advanced manufacturing in construction.

Birmingham City University

The University offers 27 courses related to construction and the built environment ranging from Architectural Technology, to Architecture, Building Services Engineering, Building Surveying and Design Management.

Of particular note is ‘BA (Hons) Design for Future Living’ created in partnership with MOBIE, which aims to develop innovative design thinking which ‘prepares a new model of creative, skilled and disruptive designer with knowledge of home, digital technologies and creative design’. The programme aims to offer pathways into employment in a range of areas including design, delivery (e.g. prefabrication, offsite manufacturing) and development.²²

The course is in its final stages of approval and is accepting its first cohort of applications for a course start date of September 2020.

Aside from the Design for Future Living programme, AMC is incorporated into the content of Masters level courses including Quantity Surveying, Construction Project Management, Planning and Civil Engineering. There is specific coverage in the MSc in Construction Project Management by way of a module entitled ‘Integrated project delivery’ which covers aspects such as lean concepts and advanced methods of construction.

At the School of Engineering and the Built Environment Dr Franco Cheung is leading a project which aims to “create a knowledge-based engineering system that allows forecasting and easy planning of DfMA houses”. The team is working with a major housing association – whg – which is looking to increase its housing stock from 250 new homes a year to 400 new homes a year through the adoption of DfMA²³.

Dr Cheung estimates that an investment of £2m would allow them to scale up the model; they are also currently developing a distribution model of factories that can be replicated in a local area (to reduce logistics).



²¹ The Register lists all the higher education providers officially recognised by the Office for Students (OfS): <https://www.officeforstudents.org.uk/advice-and-guidance/the-register>

²² Birmingham City University, Design For Future Living – BA (Hons): <https://www.bcu.ac.uk/courses/design-for-future-living-ba-hons-2020-21>

²³ Birmingham City University, ‘Improving the housing crisis by factoring in offsite construction’: <https://www.bcu.ac.uk/built-environment/research/transforming-building-life-cycle/research-projects/transforming-house-construction-using-design-for-manufacture-and-assembly>

Coventry University

Coventry University is home to two research centres focused on the built environment:

- **Built and Natural Environment**
With an emphasis on design, research areas include the dynamic performance of buildings; occupant and owner response; whole-life decision making; monitoring buildings.²⁴
- **Future Transport and Cities**
Which brings together expertise in art and design; human factors; engineering; manufacturing; computer systems and business studies.²⁵

Also of relevance is the centre for 'Manufacturing and Materials Engineering Research'²⁶ which integrates with the Institute for Advanced Manufacturing and Engineering (the University's collaboration with Unipart Manufacturing). Areas of expertise comprise – amongst other things – supply chain management, process control and materials for advanced technologies. Although the courses offered²⁷ at the Institute do not include coverage of advanced manufacturing in construction they do cover generic skills areas of relevance, such as engineering material and manufacturing technology a part-assembly manufacturing project, design and computer aided manufacturing and design principles for manufacturing; lean and agile operations, CAD, automation and robotics.

The Centre is currently working on a couple of areas they consider relevant to AMC:

- Fibre composites (a replacement for asbestos)
- 3D printing

Wolverhampton University

The School of Architecture & the Built Environment offers HNCs, HNDs and undergraduate degrees in various disciplines from architecture and civil engineering to construction management, building surveying and quantity surveying. The school also hosts a BIM studio (formerly the Virtual Design Enterprise Centre (VIDEC)) delivering CAD and technology training to industry.²⁸ Modules on AMC have been introduced in Quantity Surveying and Construction Management undergraduate programmes.

The University offers its most AMC-specific provision at postgraduate level, for example:

- MSc Offsite Housing Construction
- MSc Building Information Modelling for Integrated Construction
- Postgraduate Certificate Building Information Modelling
- MSc Construction Project Management
- Postgraduate Certificate Construction Project Management

The MSc Offsite Housing Construction, developed in partnership with MOBIE and launched in January 2020, currently has a cohort of three learners, one of whom is based abroad. The distance learning approach to delivery means the programme has a truly international market.

Dudley College of Technology

Although the College currently has limited HE provision – a Construction HNC – it is looking to expand its offer. The College enjoys a partnership with the Sheffield-based Advanced Manufacturing Research Centre (AMRC) and the Manufacturing Technology Centre (MTC), based in Coventry and is currently working on the development of a Higher Education Centre with Wolverhampton University. The Centre is intending to focus on three areas: Advanced Manufacturing; Medical Engineering, and; Modern Methods of Construction.

²⁴ <https://www.coventry.ac.uk/research/areas-of-research/built-and-natural-environment/>

²⁵ <https://www.coventry.ac.uk/research/areas-of-research/institute-for-future-transport-and-cities/welcome-to-the-institute-for-future-transport-and-cities/>

²⁶ <https://www.coventry.ac.uk/research/areas-of-research/manufacturing-materials-engineering/manufacturing-materials-engineering-research/>

²⁷ Manufacturing Engineering MEng/BEng (Hons) and Production Engineering & Operations Management MSc

²⁸ University of Wolverhampton, School of Architecture and the Built Environment
<https://www.wlv.ac.uk/schools-and-institutes/faculty-of-science-and-engineering/school-of-architecture-and-built-environment/undergraduate-courses/>

The Manufacturing Technology Centre (MTC)

The MTC was established in 2010 as an independent research and technology organisation (RTO) to bridge the gap between industry and academia. Currently the Centre operates across nine markets, which includes Construction & Infrastructure. Since 2015, the MTC has been home to a training centre, offering the Advanced Level 4 Engineering Manufacturing Technician Apprenticeship and a degree apprenticeship (Management of Manufacturing MBA) with Aston University. The centre also offers short courses in areas such as additive manufacture, laser processing, project management and transferable skills such as recruitment management, finance and leadership.

The MTC is a key partner in the Construction Innovation Hub²⁹ which has recently developed a series of upskilling programmes pitched at Masters level such as an online course in DfMA and Quality Management for Construction. The Hub worked with BRE in developing the content and has an audience of approximately 2,000 companies of all sizes (although mainly large).

Although not originally funded for delivering training, the Hub is considering looking at skills gaps in the industry: mapping what's available and what's needed. This work would potentially focus on three areas: offsite and onsite assistive technology; design; management.

Further Education learning aims

This section focuses on the supply of post-16 qualifications and training available, the analysis has been divided into nationally regulated qualifications offered by Further Education institutions (e.g. Colleges and private providers) and non-regulated training, such as short courses and online modules.

There is a distinct lack of AMC-specific training provision in terms of regulated qualifications.

Ofqual's register contains 83 qualifications with potential relevance to AMC,³⁰ identified by mapping qualification titles (using existing knowledge of their broad content) to the six main AMC functions, and associated job roles (Table 7).

The mapping focused on level 3+ qualifications because we know from manufacturers that they tend to recruit low-skilled workers for factory floor operations and train them up in-house. Furthermore, existing construction-related qualifications at levels 1 and 2 focus mainly on trade and craft roles (e.g. bricklaying, carpentry and joinery). These qualifications are therefore not directly relevant to AMC-specific roles although, depending on the type of assembly, some of these trades will be used on site for interior fit out and finishing. The long-list of qualifications is available in the appendix.

The BTEC Level 3 Diplomas in Construction and the Built Environment offer a potential route into, and coverage of, AMC. Mandatory units include: sustainable construction, construction technology and design and building technology. Optional units allow the learner to follow a particular route such as surveying, planning, or civil engineering.

- Due to the unitised structure of many level 3+ qualifications, there is limited flexibility for providers to modify content and delivery. Without changes to the content and structure of the units, there is little opportunity to add or increase knowledge or skills development around AMC into these qualifications. Any changes would need to be made by the respective awarding organisation
- Lower level (e.g. level 1 and 2) offer most flexibility for introducing content for AMC because – according to providers – the content is more loosely specified. However, qualifications at this level do not appear to be in demand from AMC employers – specifically manufacturers – because these companies require low-skilled workers who they can train up in-house
- Two AMC-related Level 2 learning aims have been withdrawn,
 - Level 2 NVQ Certificate in Innovative/ Modern Methods of Construction - Cold Formed Steel Frame (Assembly) (QCF)
 - Level 2 NVQ Diploma in Innovative/ Modern Methods of Construction (QCF)

These awards do not appear to have been replaced, confirming the lack of demand for lower level provision for AMC.

²⁹ The CIH is a partnership between MTC, BRE and the Centre for Digital Built Britain (CDBB).

³⁰ This is from a total of 976 'currently offered' qualifications for the Sector Subject Area of 'building and construction'.

Further Education provision in the WMCA

These findings are based on analysis of Datacube data.

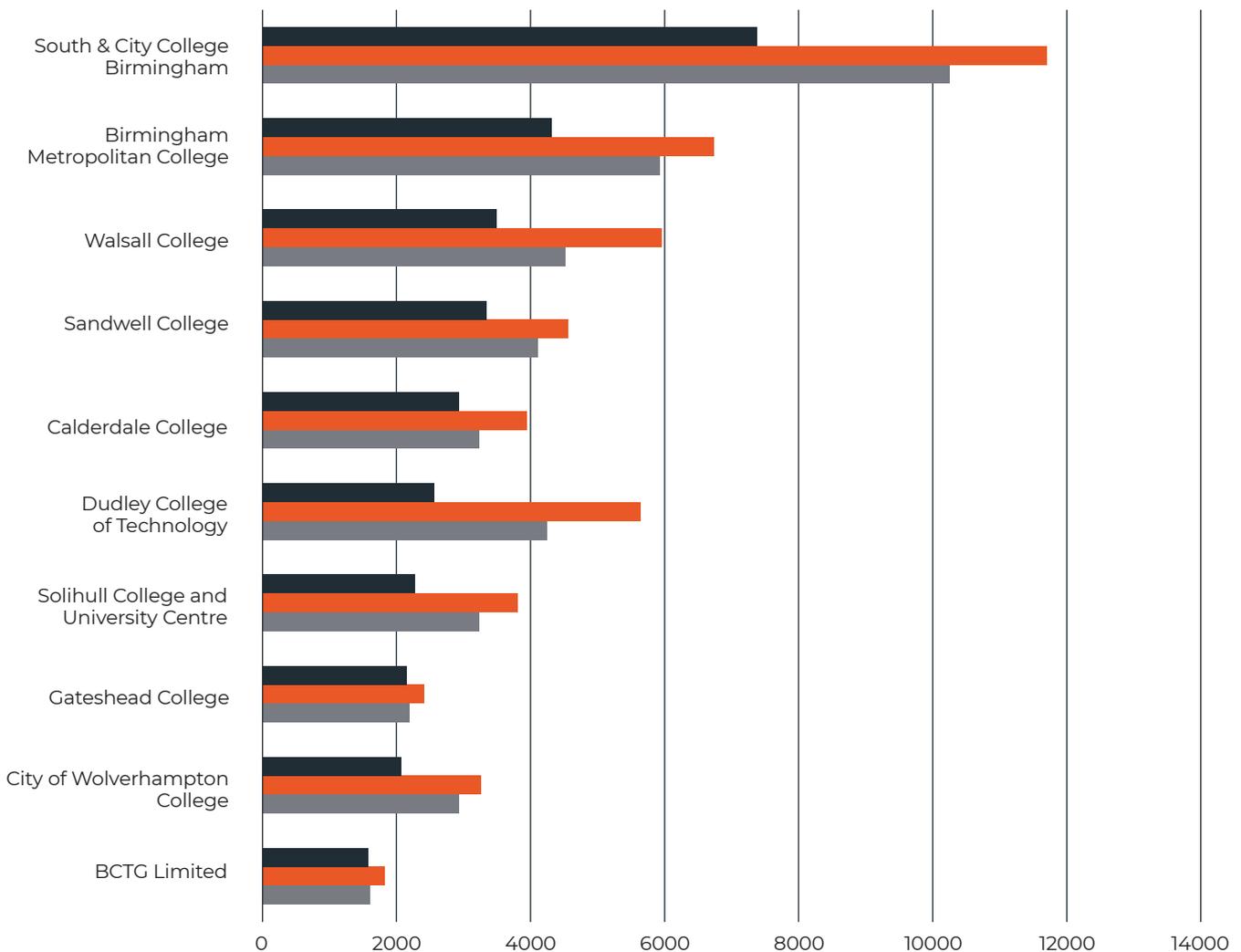
Travel to learn distances for relevant qualifications tend to be short. Most learners remain within the WMCA.

South & City College Birmingham provides the highest number of construction-related learning aims to learners resident in the WMCA (Figure 2), ranging from level 1 and 2 trade and craft courses, level 3 BTEC Diplomas, HNC and HNDs in Construction and the Built Environment. Birmingham Metropolitan College's offer is focused on trade and craft courses at levels 1-3 only (Figure 2).

Nine out of the 10 providers are colleges with the only private provider – BCTG, based in Oldbury – specialising in the provision of apprenticeships and 19+ adult skills, including pre-employment courses.

Figure 14

Top 10 providers of Learning Aim Sector Subject Area Tier 2 to learners in the WMCA, by total achievements 2016/17 to 2018/19



Based on analysis of Datacube data provided by WMCA

Total Achievements
 Total Enrolments
 Total Starts

Dudley College of Technology

Although Dudley College is sixth on the list, it offers the most relevant provision needed for AMC at a number of specialist facilities:

- **Dudley Advance** offers full-time and part-time courses linked to traditional processes and emerging technologies in the engineering and manufacturing sectors.
- **Dudley Advance II** has been created in partnership with leading construction companies; it offers apprenticeships in new and traditional trades as well as professional upskilling in areas such as BIM.
- **Advance Technical Engineering and Construction Centre**, based in London, offers niche training in modern building technologies and construction trades.
- **Construction Apprenticeship Training (CAT) Centre** offers facilities for traditional construction trades as well as modern technical and digital-focused skills.

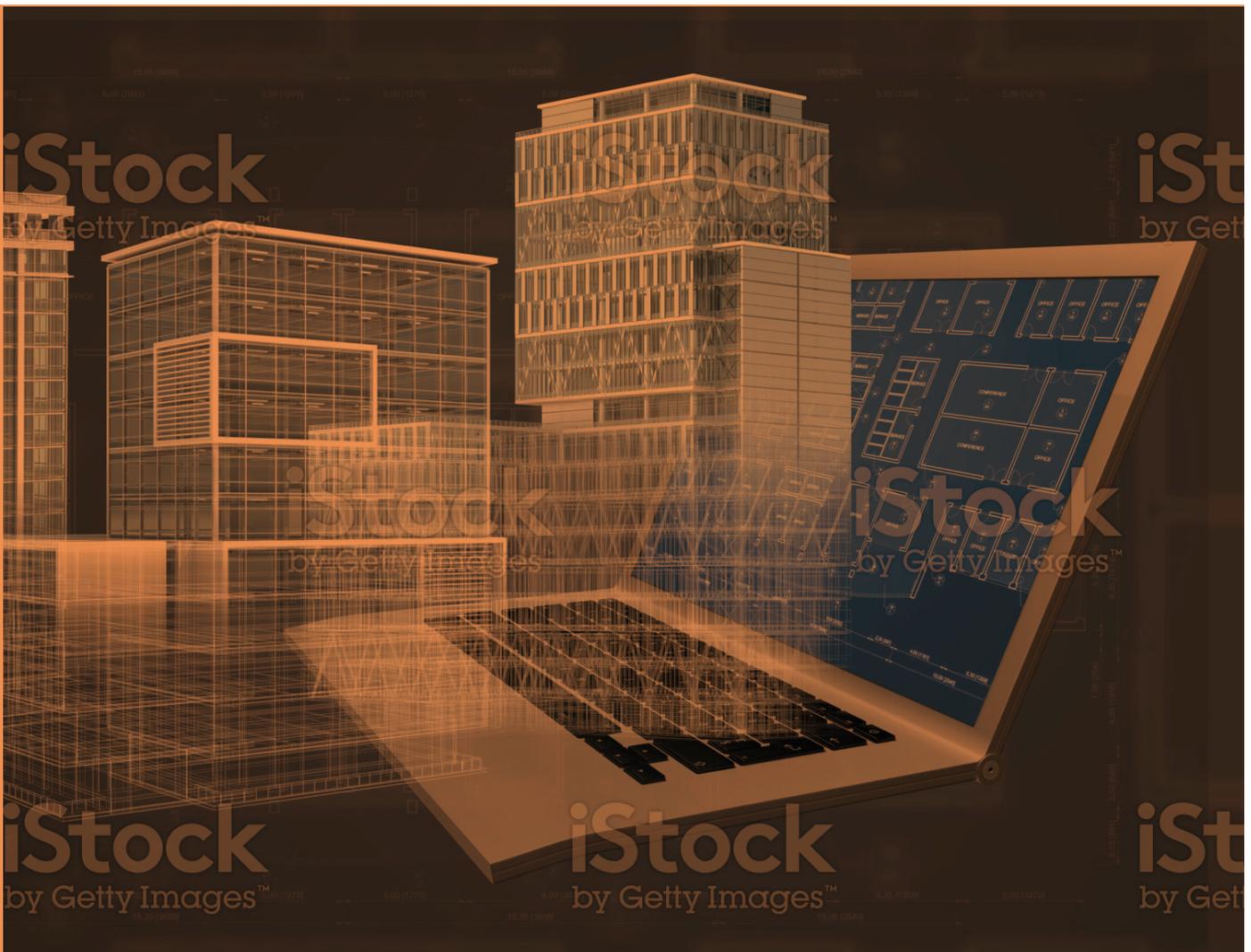
Overview of all SSA Tier 2 learning aims

Of the almost 600 learning aims in Sector Subject Area Tier 2 undertaken by learners resident in the WMCA, the most popular are level 1 and 2 aims – particularly non-regulated provision (Figure 15). The most popular aim – the Level 1 BTEC Certificate in Construction – had 1,072 achievements in the three years 2016/17 to 2018/19, with the QCF predecessor qualification having 825 in 2016/17 alone.³¹

Three of the top 20 most popular learning aims are qualification units:

- Level 2 Preparing for manufacturing operations (9 credits)
- Level 2 Conducting manufacturing operations (9 credits)
- Level 2 Promoting effective working relationships (5 credits)

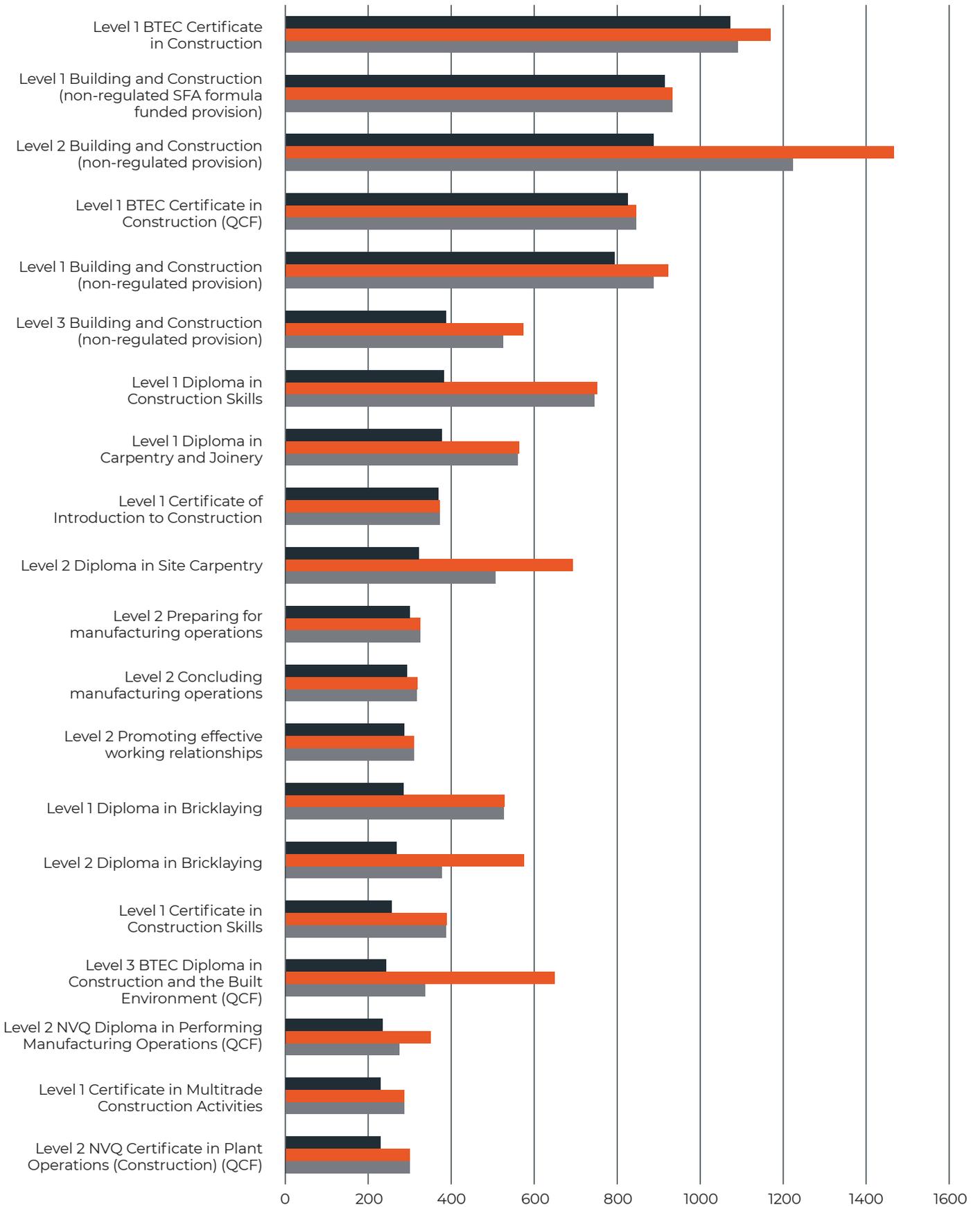
All of these units are components of the Level 2 NVQ Diploma in Performing Manufacturing Operations.



³¹ No starts, enrolments or achievements were recorded in 2017/18 or 2018/19.

Figure 15

Top 20 Learning Aim Sector Subject Area Tier 2 taken by learners in the WMCA (2016/17 to 2018/19)



Based on analysis of Datacube data provided by WMCA

Total Achievements 2016/17-2018/19
 Total Enrolments 2016/17 - 2018/19
 Total Starts 2016/17-2018/19

Potentially AMC-relevant learning aims (Level 3+)

Of the 83 learning aims identified as being 'in-scope' to this study, 29 have been undertaken in the last three years by learners residing in the WMCA. Table 3 lists these aims, showing the number of achievements in the period 2016/17-2018/19; those with '0' achievements had learner starts or enrolments.

Table 3

AMC-relevant qualifications taken by learners resident in the WMCA (2016/17 - 2018/19)

Learning Aim Title	Level	Total starts 2016/17- 2018/19	Total enrolments 2016/17- 2018/19	Total achievements 2016/17-2018/19
BTEC 90-credit Diploma in Construction and the Built Environment (QCF)	Level 3	159	160	101
BTEC Certificate in Construction and the Built Environment (QCF)	Level 3	6	6	1
BTEC Diploma in Construction and the Built Environment (QCF)	Level 3	337	649	242
BTEC Extended Diploma in Construction and the Built Environment (QCF)	Level 3	261	344	136
BTEC Higher National Certificate in Construction and the Built Environment	Level 4 (original)	168	229	35
BTEC Higher National Diploma in Construction and the Built Environment	Level 4 (original)	27	40	12
BTEC HND Diploma in Construction and the Built Environment (QCF)	Level 4 (original)	32	45	12
BTEC National Diploma in Construction and the Built Environment	Level 3	16	16	2
BTEC National Extended Certificate in Construction and the Built Environment	Level 3	11	11	7
BTEC National Foundation Diploma in Construction and the Built Environment	Level 3	1	1	1
BTEC Subsidiary Diploma in Construction and the Built Environment (QCF)	Level 3	37	41	25
Diploma in Insulation and Building Treatments (QCF)	Level 3	7	7	7
Higher National Certificate in Construction	Level 4 (original)	29	29	0
Higher National Diploma in Construction	Level 5 (original)	5	5	0
NVQ Diploma in Accessing Operations and Rigging (Construction)	Level 3	3	3	0

Learning Aim Title	Level	Total starts 2016/17- 2018/19	Total enrolments 2016/17- 2018/19	Total achievements 2016/17-2018/19
NVQ Diploma in Built Environment Design	Level 3	26	38	1
NVQ Diploma in Built Environment Design (QCF)	Level 3	5	5	0
NVQ Diploma in Cladding Occupations (Construction)	Level 3	10	13	10
NVQ Diploma in Construction Contracting Operations	Level 3	60	161	60
NVQ Diploma in Construction Contracting Operations (QCF)	Level 3	26	85	23
NVQ Diploma in Construction Management (Sustainability)	Level 4 (original)	26	40	6
NVQ Diploma in Construction Site Management (Construction)	Level 4 (original)	0	2	2
NVQ Diploma in Construction Site Management (Construction) (QCF)	Level 4 (original)	2	2	0
NVQ Diploma in Construction Site Supervision (Construction)	Level 4 (original)	30	52	5
NVQ Diploma in Construction Site Supervision (Construction) (QCF)	Level 4 (original)	5	5	1
NVQ Diploma in Occupational Work Supervision (Construction)	Level 3	231	285	172
NVQ Diploma in Occupational Work Supervision (Construction) (QCF)	Level 3	20	53	16
NVQ Diploma in Surveying, Property and Maintenance	Level 3	9	14	1
NVQ Diploma in Surveying, Property and Maintenance (QCF)	Level 3	2	3	1
Total		1551	2344	879

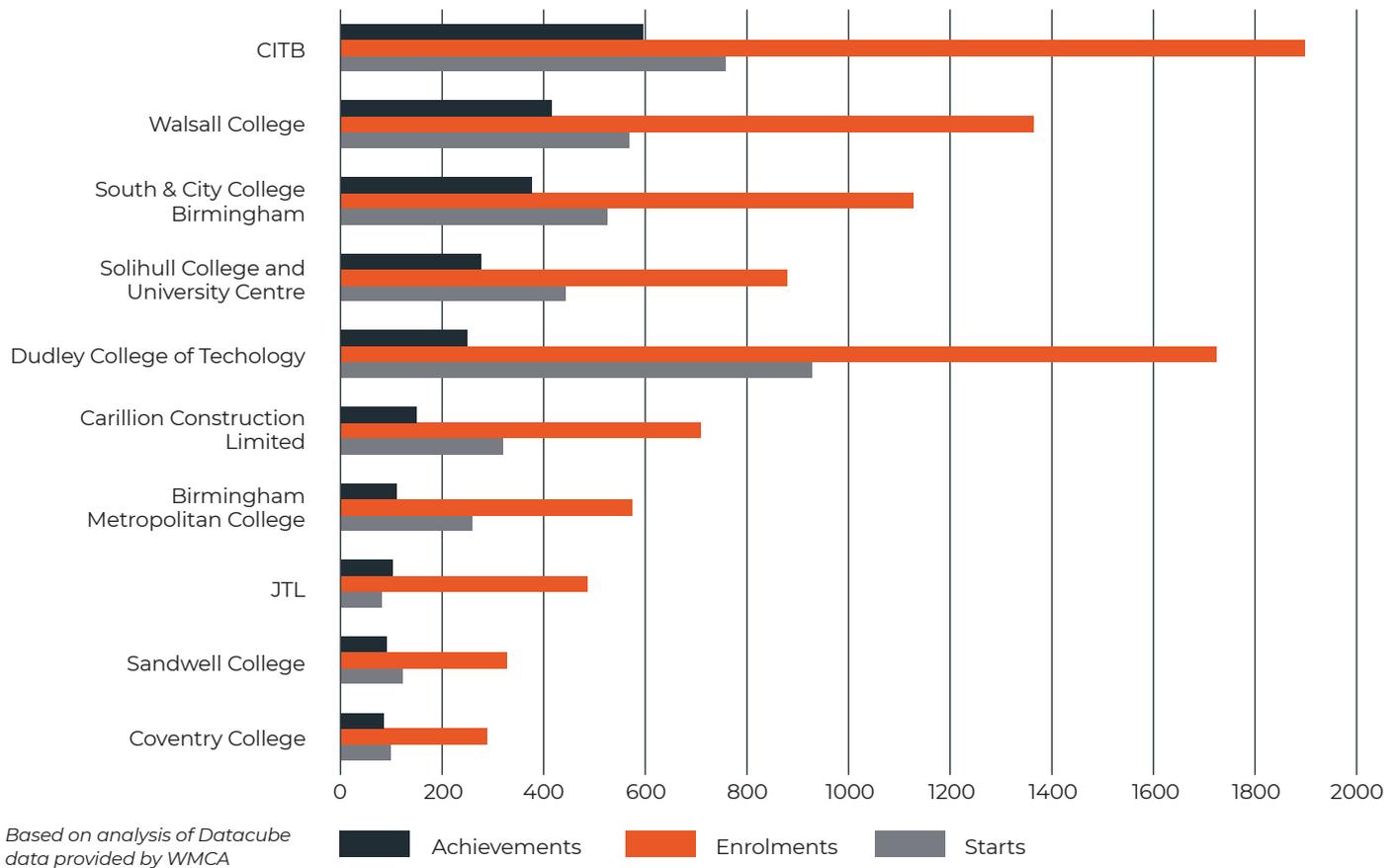
Apprenticeships

Profile of construction apprenticeship providers in the West Midlands

The largest provider of construction-related apprenticeships to learners resident in the WMCA is CITB at Levels 2 to 4+ (594 achievements between 2016/17 and 2018/19), followed by Walsall College (414 achievements) and South & City College Birmingham (375 achievements) (Figure 16).

Figure 16

Top 10 providers of apprenticeships to learners resident in the WMCA (2016/17 to 2018/19)



Anecdotally, we have been made aware that the main digital-focused programme of relevance to AMC is the Level 3 Digital Engineering Technician standard. It covers subjects such as virtualisation and simulation of design, construction and management of assets; digital measurement; integration of construction data and information.³²

The only provider currently offering this Standard in the WMCA is Dudley College, with the first cohort of apprentices in 2017/18 numbering 12 starts; this increased to 30 in 2018/19. When learning at the college, Apprentices stay at a residential block on campus. Eight of the current apprentices are employed by a large housebuilder.

Looking ahead to future developments, Wolverhampton University is working with MOBIE to develop a postgraduate apprenticeship – an MSc in Offsite Construction. We understand it was felt by the Trailblazer group that postgrad is the most appropriate level of demand as it allows for the accommodation of students from different backgrounds and disciplines. Mark Farmer will be the chair with involvement from MOBIE, Wolverhampton Uni, Urban Splash and others.

T Levels

From September 2020, T Levels will be taught for the first time in England.

The programmes will be offered to young people as an alternative to A levels and incorporate a three-month industry placement. Released in waves, two of the first T Levels for delivery will be in Design, Surveying and Planning for Construction and Digital Production, Design and Development. Stakeholders consulted for this research reported that there is minimal content on AMC within the new construction T Level. A review of the outline content revealed there is only one learning outcome on AMC: 'Construction methods, including traditional and modern methods, e.g. on and off-site construction and robotics'.³³

Table 4 shows which Colleges in the West Midlands will be offering the construction route.

Table 4

Construction T Level providers in the West Midlands

T Level Provider	2020/21	2021/22	2022/23
Dudley College of Technology	X	X	X
Herefordshire, Ludlow and North Shropshire College		X	X
North Warwickshire and South Leicestershire College			X
Sandwell College		X	X
South & City College Birmingham			X
Thomas Telford UTC (formerly West Midlands UTC)		X	X
Walsall College	X	X	X
Warwickshire College Group			X

Source: DfE, T Level Provider List Final 22 July 2020

Informal provision

Informal training (e.g. online modules) relevant to AMC focuses on 'awareness-raising' and/or has a purpose of increasing knowledge and best practice. Examples of sources of online training are listed in [Table 5](#).

The uptake of this type of training is not known, neither are the courses easy to find. For example, none of the training listed above was readily detectable via internet searches using key words such as 'modern methods of construction training', 'modern methods of construction learning', or 'modern methods of construction courses'.

Table 5

Examples of online training for AMC

Supply Chain Sustainability School	Self-assessments, toolbox talks and learning resources covering: <ul style="list-style-type: none">• Sustainability• Lean construction• Management• BIM• Offsite
Offsite Ready/Construction Scotland Innovation Centre	Online learning materials and face-to-face events covering: <ul style="list-style-type: none">• Offsite fundamentals• Digital design• Estimating/commercial• Logistics• Offsite manufacture• Onsite placement and assembly• Management and integration The website also includes a 'teaching support system' to aid the integration of Offsite Ready content into existing curricula.

Drivers and barriers for AMC skills and training

Drivers for AMC skills and training

Policy

- In the 2018 Construction Sector Deal the UK Government committed to “establish a technical education system that rivals the best in the world to stand alongside our higher education system” as well as investing in maths, digital and technical education to address a shortage of STEM skills. This included increasing apprenticeships to 25,000 a year by 2020 and to increase the number of approved apprenticeship standards as well as increasing diversity of the sector in terms of gender, ethnicity and disability. A key action is to:

“Develop programmes to retrain the workforce with the skills to support the future industry needs to embed and maximise the use of digital technologies and modern methods of construction”.³⁴

- An increase in AMC growth in the WMCA would respond to this ambition of improving diversity in the sector. Due to manufacturers’ requirement for low- or de-skilled workers in the production environment, they are more likely to recruit from a different labour pool than for traditional trades. This labour pool can include ex-offenders, school leavers and ex-military.

Environmental and sustainability

- There is a need for upskilling in the areas of specification and installation of environmental technologies. The Committee on Climate Change (CCC) has identified substantial skills gaps in housing design, construction and in the installation of new energy efficiency measures.³⁵ The development of AMC provides an opportunity to help address these skills gaps and more generally respond to the low carbon agenda through better quality, more efficient housing.

Technology

- Since the UK Government published its BIM strategy in 2011, Cabinet Office and the former BIS have been working to implement “a long term programme to embed the use of BIM across centrally procured public construction projects”. The government Construction Strategy committed to using Level 2 BIM to deliver publicly funded project which was mandated in the same year.³⁶ In 2012, the UK Government went further, committing to develop capability in BIM-enabled design for manufacture and assembly (DFMA) and lean construction process.³⁷
- The government reaffirmed its commitment to AMC by recommending that government “ensure skills programmes, apprenticeship schemes and the new T Level give learners the skills they need for both traditional techniques and MMC and encourages more young people into the sector”. However, the new T levels in construction contain very little content on content on AMC.

Demographic change

- The Independent Review of Build out Rates found that, whilst “availability and price of labour was a significant concern for the major house builders”, transferability of skills between certain on-site trades means that labour could be drawn from other construction sectors (and potentially other industries) to meet an increase in demand for trade skills.³⁸ Consultation with stakeholders for this research suggested that, in the context of offsite, the flow of labour would only be appropriate for the transfer of traditional skills into the offsite manufacture and assembly environment. They suggested that skills learnt in the production environment could not easily be transferred into onsite roles.
- This may translate to a need for cross-skilling or up-skilling, potentially in the form of bite-sized training, possibly individual units.
- Stakeholders tend to agree that demands for professional and technical skills will increase, particularly in data use/ analytics, VR/AR and robotics.
- This requirement may be exacerbated by a current shortfall in technician-level and management skills. For example, various stakeholders highlight an existing skills gap around the use of BIM.
- At the lower levels, job roles are unlikely to develop, particularly in the manufacturing environment. Therefore, the current low, or no demand for low level qualifications and training is unlikely to change.

³⁴ HM Government (2018) 'Industrial Strategy, Construction Sector Deal'

³⁵ Committee on Climate Change (2019) UK housing: Fit for the future?

³⁶ HM Government (2018) 'Industrial Strategy, Construction Sector Deal'

³⁷ HM Government (2012) 'Industrial strategy: government and industry partnership, Building Information Modelling'

³⁸ Rt Hon Sir Oliver Letwin MP (2018) 'Independent review of build out: final report, Ministry of Housing, Communities and Local Government

Barriers to AMC skills and training

- Stakeholders confirm that there is currently very little demand for AMC-specific competency-based training or qualifications, however, future demand is likely to be for digital skills, particularly in terms of data use.
- Despite potential demand for higher level design qualifications, specifically around BIM, regulated qualifications are not currently offered to, nor taken-up by, learners in the WMCA. Demand appears to be for short, upskilling courses and for higher level (level 6/7) provision.
- Short, bespoke courses can be more attractive to employers because they only require workers to be away from the workplace for a small amount of time. Funded provision of small units may well be attractive to employers for upskilling; this could also be considered as a 'bolt-on' to existing construction/manufacturing-related courses to improve knowledge of and upskill those entering the labour market.
- There is a distinct lack of AMC-relevant provision available for the post-16 market at Level 3+. Of over 1,000 qualifications available nationally for delivery, only 83 are of potential relevance to AMC. However, there are positive developments in the apprenticeship market with the introduction of the Level 3 Digital Engineering Technician and the Level 2 Construction Assembly and Installation Operative and the proposed postgraduate level degree apprenticeship.
- Academics confirm there is an opportunity to embed AMC content into degree programmes; indeed there are examples of this happening in practice in construction management and quantity surveying courses. However, there is an apparent challenge in incorporating AMC into architecture programmes because of the rigidity of the RIBA validation criteria.
- Further Education providers face substantial challenges in attracting and retaining appropriately skilled tutors and assessors for higher level professions – e.g. Civil Engineering, Structural Design, Town Planning, Advanced Manufacturing – because FE is unable to compete with wages paid in industry. There are examples of providers paying industry professionals on a consultancy basis to support delivery.

Case Study

West Midlands Combined Authority & Urban Splash: A memorandum of understanding

WMCA and Urban Splash have established a long-term partnership commitment, which is codified in a Memorandum of Understanding (MOU) and which supports the ambition for House by Urban Splash to deliver 10,000 homes by 2031 - 5% of the WMCA overall housing target, including on the *Port Loop* urban regeneration masterplan, pictured.

The MOU sets out *House by Urban Splash's* commitment to AMC as a default construction approach. *House by Urban Splash* has made significant investment into AMC since 2012, including establishing a factory in Alfreton, East Midlands. The MOU and the developments it will lead to are evidence that the vision of this Roadmap is already translating into real, practical delivery.



Building on the West Midlands' unique strengths

The WM is uniquely well placed to take a leading role in the introduction of pre-manufacture, and especially advanced manufacture, into the construction sector.

The strengths and opportunities set out opposite provide the region with an excellent foundation on which to build its roadmap for the next decade of AMC investment.

WM economy and construction sector

- WM has a high value construction sector relative to comparator regions, employing 55,000 people across 10,300 businesses.
- There are signs of an advanced manufacture cluster forming in the region, particularly in the Black Country – there are already 58,000 jobs across 1,900 businesses and this has the potential to drive upstream activity for AMC.
- WM has a notable concentration of AMC-related activities – 44 companies in a range of sectors including renewables, sustainability, logistics and supply chain, represents a concentration of nearly three times the national average.

AMC sector

- WM is one of the key hubs of AMC nationally, underpinned by strong advanced manufacture capability and transport infrastructure.
- Nine Tier 1 AMC residential manufacturers are located within the region, and are committed to capacity building within the local supply chain.
- There is already a strong supply chain which could be equipped to diversify its offering to support growing AMC capability and capacity.
- There is an opportunity to develop the AMC sector as a nationally leading “vanguard” to bring together manufacturing and construction and also to balance negative structural changes in other sectors such as automotive.

Policy environment

- WMCA has signalled support for AMC through a commitment to deliver at least 20% AMC on any site funded by the strategic commissioning fund of 200 homes or more.
- Nationally significant partnership commitment to deliver 10,000 AMC homes with national developer/manufacturer Urban Splash.

R&D, skills and qualifications

- WM is home to a uniquely relevant collection of R&D and HEFE institutions which are clear assets in support of AMC including the MTC and Wolverhampton, Coventry and Birmingham City Universities.
- The WMCA has a legacy of skills in manufacturing and innovation, with key actors in a position to drive the agenda forward, including WMCA Skills Board/West Midlands Skills Advisory Panel.
- Dudley College is the national exemplar in AMC skills delivery and is already exporting programmes nationally, and other UK-leading training partnerships include those between MOBIE and the HEFE sector.
- There is a strong policy focus on investment in STEM skills and boosting productivity. The opportunity is for the growth of new technologies acting as a catalyst for digital skills in construction which can become a specialism for the WM economy.





Addressing the barriers and challenges

While there are a unique combination of strengths and opportunities, these need to be balanced against a series of barriers and challenges which will need to be addressed in order to maximise the impact of investment and growth in the AMC sector.

A number of these are UK-wide challenges which WMCA and partners will not be able to address alone, but nonetheless they are included here as they will inform the pace and focus of the 10 year roadmap.

WM economy and construction sector

- There has been recent decline in the region's construction sector, from nearly 60,000 jobs in 2015 to 55,000 today.
- The WM construction economy is less productive than comparator regions and the national average, with output per full time employee of £67.6k in WM compared to £78.5k nationally.

AMC sector

- UK-wide, the AMC sector is still relatively young, and is made up of a number of emerging manufacturers with varying levels of capacity and experience.
- AMC can present challenges in relation to funding, insurance and warranty. UK-wide efforts including an MHCLG working group are addressing these, and there have been recent positive changes as a result including NHBC's new "NHBC Accepts" route for AMC products, but nonetheless these challenges need to be recognised.
- UK-wide, there has been a relatively large investment into productive capacity, a large proportion of which is currently unutilised. Similarly, the WM AMC sector is currently estimated to be operating at c50% of capacity.
- Sustainable growth of the sector will require intelligent commissioning practice, smarter procurement models and likely will require demand growth to run slightly ahead of manufacturing growth in the medium term.
- The WM AMC sector is made up of manufacturers of a range of sizes, and a key challenge is to ensure the growth of SME manufacturers as part of a varied production economy.

Capital cost, procurement and process

- Given the young nature of the sector and lack of scale economies, AMC products can be more expensive in terms of initial capital expenditure on a like-for-like basis compared to traditional house building.
- The full value of AMC-led development requires a different procurement approach from the start, for clients and commissioners to adopt a design for manufacture approach from the outset and to engage manufacturers early to maximise the benefit of manufacturing efficiencies.
- The challenge for the WM in maximising the use and value of AMC is to develop approaches to development process and procurement that better enable AMC. These will include balanced scorecard procurement models that prioritise the total cost of ownership on an equal basis to up front capital cost.

AMC skills and jobs development

- There is a need to balance UK-wide growth of AMC with benefits to the WM regional economy. There needs to be a joined up approach to demand and supply planning to ensure WM plans are integrated into the national picture as far as possible to avoid 'cannibalising' markets.
- Relevant training provision for AMC is limited UK-wide. Only 82 qualifications have potential relevance and two qualifications in Innovative/MMC were withdrawn due to lack of take up.



Roadmap for advanced manufacture

LONG TERM VISION (10 year objectives)

SHORT TERM ACTIONS (practical steps for years 1-3)



ACCELERATED HOUSING DELIVERY

AMC drives scale and pace in housing delivery across the WM. Integrated AMC-specific developers create additional supply models, while AMC plus brownfield remediation unlocks land that would otherwise be unviable to deliver. "Traditional" construction delivery models can incorporate hybrid on-site AMC approaches to improve speed, quality, productivity, and worker safety.

- Implement 20% minimum AMC categories 1 & 2 on large sites.
- Explore measures of pre-manufactured value (PMV) as recommended by the Construction Leadership Council, as the basis for providing additional funding for projects that can demonstrate an uplift in PMV, across all seven categories of MMC.
- Develop appraisal/funding methodology to enable additional funding where AMC proportion is increased.
- Explore use of Value Tool as being developed by Construction Innovation Hub (CIH).
- Identify and aggregate land assets that might enable 100% AMC housing delivery to create scale and momentum.
- Engage and support AMC-led integrated developers which might create true additionality in supply and diversify the housing market.



QUALITY AND CHOICE IN NEW HOMES

Advanced manufacture combines standardised processes with both standardised and customisable products to improve consumer choice. Digitally enabled development creates a golden thread for quality and components from conception through assembly to in-use performance monitoring. Advanced materials and design enable WM to achieve carbon zero objectives in new home delivery.

Bring together architects, planning professionals and manufacturers to develop a programme of design-quality led AMC product development. Focus areas could include:

- Enabling a standard specification for AMC from public sector clients and drive use of Construction Quality Planning (CQP) as defined by Construction Innovation Hub (CIH).
- Design code approaches to planning that enable consumer choices around a standardised "chassis" that might link to an accelerated 'type approval' process linked to pattern books.
- Develop a strategy connecting AMC to the proposed planning reforms.



ADVANCED MANUFACTURE GROWTH

The regional manufacturing sector is the leading location for AMC manufacturing in a now-significant UK-wide industry. Existing manufacturers, including SMEs, play a significant role as part of this sector, alongside new entrants who have been deliberately attracted to the WM. All AMC categories are represented, to enable agility and flexibility in delivery models.

- Play an enabling role across the wider public sector in the WM region to create a transparent and aggregated future pipeline of AMC development land, and use this to support the managed growth of the existing manufacturing sector.
- Secure Government investment and identify land for an expansion of manufacturing capacity in the region ensuring that this is complementary to existing capacity and focuses on consolidation and additionality.
- Begin to explore options for aggregated models of delivery that could be enabled by interoperability between AMC systems (see below).



MEDIUM TERM ACTIONS (practical steps for years 4-10)

- Expand focus on AMC by encouraging other AMC categories through SCF funding – encouraging AMC as part of hybrid traditional/manufacturing-led development.
- Deliver aggregated public land pipelines (see below) as part of programmatic approach that creates certainty for sector and scale and pace in delivery.
- Identify opportunities for AMC and brownfield remediation to combine with new appraisal methodology to unlock unviable sites.

- Develop structured partnerships with AMC manufacturers around a common specification for new homes and transparency of future pipeline.
- Build on the initial steps (left) by:
 - creating incentives for manufacturers to improve on that standard in relation to e.g. quality, cost or carbon performance.
 - connecting these partnerships with the R&D theme below to explore for instance advanced material use and structured performance testing to enable co-ordinated product development.
- There is great scope for proposed planning reforms focussed on digitised planning process to benefit AMC-led development because they incorporate digital design from initiation and are therefore better placed to integrate their current approach with new digital planning processes. This workstream could also ensure adequate planner education and awareness of AMC.

Utilise the expanded AMC focus of WMCA funding (above) and the previously developed options to implement an aggregated approach to AMC delivery that might incorporate the following features:

- Co-location of SME manufacturers.
- A move to more of a platform-based approach to delivery which does not damage previous investments made by high quality offsite manufacturing businesses with a promotion of more inter-operability between providers, drawing on the work of MTC.
- A greater focus on component-led sub-assembly delivery as additionality to volumetric modular AMC, which would still be delivered by larger Cat 1 manufacturer/ developers.

LONG TERM VISION (10 year objectives)

SHORT TERM ACTIONS (practical steps for years 1-3)



SUPPLY CHAIN ENGAGEMENT

The wider supply chain base in the WM grows in parallel with the manufacturing base. Component and material specialists form strategic partnerships with AMC manufacturers UK-wide. There is clarity of the end-to-end supply chain incorporating design through to operation and WM enjoys a specialism in supplying those services to digitally enabled AMC developments. There is increased 'virtual' integration of multiple businesses, including SMEs and products that are consolidated into sub-assemblies and building systems that can be used by SME developers and larger developers and contractors.

- Explore co-location for regional SME manufacturers and supply chain companies single new facility above.
- Develop a comprehensive map of local supply chain capacity linked to the standardised specification referenced above.
- Broker collaborative partnerships between supply chain companies and AMC manufacturers and potential for aggregation of ordering combined between manufacturers.
- Develop a collaborative forum between AMC manufacturers and potential commissioners of AMC homes in the public, private and housing association sectors to provide an opportunity to build knowledge, connections, trust and understanding.
- Engage the local AMC supply chain in the emerging programme of retrofit, as AMC solutions (across all categories) will be very well positioned to drive the speed and efficiency of activity in this area.



KNOWLEDGE AND SKILLS DEVELOPMENT

The WM retains its stand-out strength in delivering industry-leading pathways to employment in AMC through partnerships between industry, further education and higher education. Partnerships across the region bridge the gap between construction and manufacturing, to develop new roles that operate at the interface between the sectors. End-to-end digital delivery knowledge and skills requirements are well understood and provided for.

- Develop a comprehensive AMC skills proposition, drawing on existing strengths, that offers a qualifications at all levels from level 2 to post-graduate.
- Map the end-to-end AMC delivery process, and the digital skills requirements at each stage, and develop action plans to address core teaching skills and curriculum coverage gaps, for instance through additional funding for tutor recruitment.



R&D PARTNERSHIPS BETWEEN GOVERNMENT, INDUSTRY AND HIGHER EDUCATION

R&D partnerships make a significant contribution to national and regional AMC growth by tackling some of the biggest barriers to AMC growth. For instance R&D partnership to enable interoperability between AMC systems, developing a robust evidence base and showcasing "best in class" AMC development, and supporting AMC product development through testing, advanced materials development and by enabling consumer feedback to influence design. This should align to national initiatives to improve the data and evidence base related to innovative construction and should build confidence in the finance and insurance underwriting markets. New entrants and SMEs are actively encouraged into the regional AMC sector to drive innovation and introduce new approaches.

- Develop a forum or partnership vehicle through which cross-sector links and delivery can be enabled – potentially by maintaining the AMC advisory group
- Key focus areas in the short term could include:
 - Building the evidence base for AMC development, including by linking to Homes England existing work in that regard.
 - Supporting the development, testing and optimisation of the standardised AMC specification.
 - Enabling pre-competitive collaboration between manufacturers, and connecting to national efforts in that regard such as through the MTC at Coventry or the AMRC in Sheffield, both part of the High Value Manufacturing Catapult.
- Connecting the WMCA and partners to the AMC-related activities being undertaken across the UK, particularly in other combined authority regions, to maximise collaboration, value and growth in the AMC sector UK-wide.
- Explore and support opportunities to develop high-profile sites and other projects which will generate national interest and enable local manufacturers to demonstrate their systems to the widest possible audience.



MEDIUM TERM ACTIONS (practical steps for years 4-10)

- Develop bespoke partnerships with supply chain companies where necessary to enable their expansion to meet the demands of a growing AMC market.
 - Broker collaborative partnerships between supply chain companies and AMC manufacturers to enable component design and development to support AMC product development.
 - Focus support and effort on models with the greatest potential for scalability, across the WM and beyond including the potential for IP technology transfer domestically and internationally.
-
- Implement WM-wide approaches to apprentice and trainee sharing/placements between AMC manufacturers.
 - Target AMC training pathways on other WM-based sectors under-going structural .
 - Broker partnership working between CITB, local FE colleges, local universities and the MTC designed to break down the barriers between manufacturing and construction skills training.
-
- Long term programme to be developed through the forum (left) and the outputs of early stages, but features could include:
 - Developing connections between AMC and the WM specialism in brownfield regeneration, to create true additionality in housing supply including links to the proposed National Brownfield Institute.
 - Connecting WM manufacturers to developments in advanced materials research, where this might drive improvements in cost, speed, performance and sustainability.

Case Study

National Brownfield Institute

University of Wolverhampton (UoW) has invested £100 million in the new Springfield campus, to host its world-class school of Architecture and Built Environment and the planned National Brownfield Institute (NBI), which was recently awarded £14.8759m from the Government's Getting Building Fund.

The NBI will research soil and groundwater contamination and ways of regenerating contaminated land. NBI will also use knowledge from other research centres at UoW to help assess new construction methods and will enable AMC use in the region in a range of ways, including by coordinating research into new remediation technologies. It will advocate for AMC use as the additional speed of delivery will partly counteract the time required for brownfield remediation, a crucial factor as around 80% of the WM housing pipeline is on brownfield land.



Case Study

Enabling local distinctiveness through AMC: Beechwood Village

Located in Essex, Beechwood Village is delivering 570 new, custom-build homes to people on a range of incomes, and is utilising AMC and an innovative approach to town planning.

The project is led by Swan Housing in partnership with Homes England and Basildon Borough Council who worked together to secure an outline planning permission that fixed some details, and enabled resident choice within a pre-agreed framework on others. As a result, residents can configure their own home, choosing features including the external treatment, number of rooms and floor layouts, exemplifying the potential for AMC to combine the benefits of manufacture and of consumer choice to deliver high quality and personalised homes.





WMCA Housing & Land Delivery Board

Date	3 rd March 2021
Report title	Update on Housing and Land Portfolio Deliverables 2020/21
Portfolio Lead	Councillor Mike Bird, Leader, Walsall MBC
Accountable Employee	Gareth Bradford, Director of Housing & Regeneration (Accountable Director) Hannah Stock – NGDP Housing and Regeneration (Report Author)
Report has been considered by	The Housing and Land Portfolio Deliverables for 2021/22 were approved by the WMCA Board on Friday the 12 th of February 2021.

Recommendation(s) for action or decision:

The Housing & Land Delivery Board is recommended to:

- **Note** the Housing and Land Portfolio Deliverables for 2021/22 agreed by WMCA Board on the 12th of February 2021.

1 Purpose

- 1.1 The purpose of this update report is to provide the Housing & Land Delivery Board with the Housing and Land Portfolio High Level Deliverables that were approved at the WMCA Board on the 12th of February 2021. These deliverables directly support implementation of the Covid-19 Recovery Plan agreed by the Housing & Land Delivery Board on the 7th of September 2020.

2 Background

- 2.1 As part of the formal process to determine the WMCA's budget, levy and precept levels for 2021/22, the WMCA Board approves each portfolio's annual deliverables. The Deliverables for the Housing and Land Portfolio were presented in draft at the WMCA Board of 15th January 2021 and agreed by the WMCA Board on 12th February 2021. The full list of High Level Deliverables are set out in Annex 1 to this report.
- 2.2 The deliverables set out how WMCA (namely through its Housing and Regeneration Directorate) will continue to work on the workstreams that Housing & Land Delivery Board have been overseeing throughout the last year.

- 2.3 The Housing and Regeneration Directorate is comprised of 29 (FTE) staff, directly overseeing and managing over £450 million in Brownfield Housing and Land funds whilst delivering on major policy initiatives around affordable housing, advanced manufacturing in construction (AMC), design and zero carbon homes (ZCH). A summary of the High Level Deliverables for the Housing and Land Portfolio is set out below, all overseen by the Housing & Land Delivery Board.
- 2.4 Housing and Regeneration will continue to deliver the objectives of and the specified output requirements of the 2018 Housing Deal including deploying funding and investment to support housing delivery and urban regeneration, reporting on performance on the terms of the Deal (eg on housing starts) and driving forward the pipeline of locally agreed sites.
- 2.5 Housing and Regeneration will develop and submit business cases for additional funding into agreed priority delivery and policy areas, including Advanced Manufacturing in Construction, Zero Carbon Housing, Brownfield Land, Affordable Housing and Public Land.
- 2.6 Housing and Regeneration will work closely with local authorities and expert taskforces to implement the Covid-19 Recovery Strategy approved at the Housing & Land Delivery Board in September 2020. This includes continual progression of the Covid-19 project schedule for locally agreed land and development projects.
- 2.7 Housing and Regeneration will continue to create strong investor engagement and developer relationships, including through the establishment of new partnerships and joint ventures.
- 2.8 Existing work on Town Centres, Advanced Manufacturing in Construction (AMC), Zero Carbon Homes and Affordable Housing will continue to be developed by working closely with local authorities and expert taskforces to develop compelling business cases. Specifically, a Zero Carbon Homes Routemap and Charter will be published in Q2 2021 and the Affordable Housing Collaborative Delivery Vehicle is expected to be established in 2021.
- 2.9 Housing and Regeneration will continue to deliver the regional One Public Estate (OPE) Programme, achieving all the prescribed targets and producing quarterly reports.
- 2.10 A new advisory Public Land Taskforce, as agreed by the Housing & Land Delivery Board on the 7th of September 2020, will be launched in February 2021.

3 Financial Implications

- 3.1 There are no direct finance implications from this paper, however there are significant financial implications to deliver the Housing and Land Portfolio Deliverables for 2021/22. To ensure solid financial stewardship the team will endeavour to utilise internal resource first, only commissioning externally after all internal options have been exhausted.

3.2 Any subsequent WMCA investment to deliver the Housing and Land Portfolio Deliverables for 2021/22 would be governed and administered through the Single Commissioning Framework, WMCA Single Assurance Framework, the Commissioning Monitoring Group and in line with the accounting and taxation policies of the WMCA and HMRC.

4 Legal Implications

4.1 There are no direct legal implications arising from this report.

5 Equalities Implications

5.1 There are no direct equalities implications arising from this report.

6 Inclusive Growth Implications

6.1 There are no direct Inclusive Growth implications arising from this report, but Inclusive Growth outcomes are intended to be delivered by the Housing and Land Portfolio deliverables.

7 Geographical Area of Report's Implications

7.1 This report covers the whole of the WMCA area.

8 Other Implications

8.1 There are no other implications arising from this report.

9 Schedule of Background Papers

9.1 The Housing and Land Portfolio Deliverables for 2020/21 as agreed by WMCA Board are annexed to this report.

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Housing & Land	
High Level Deliverable	Activity
<p>Deliver our nationally leading brownfield regeneration and housing delivery programmes to achieve the prescribed KPIs and Output Requirements set by HMG and WMCA Board</p>	<p>Deploy over £400m+ of devolved housing and land funds, including new Brownfield Funds, to achieve the prescribed housing, investment and jobs targets and outputs set by Government. Demonstrated by achieving monthly and quarterly output and investment targets.</p> <p>Drive forward our pipeline of locally agreed public and private sector led housing and regeneration projects on sites in market failure - securing thousands of new jobs and new homes and unlocking £millions of new investment on brownfield land that has been derelict or stalled for years. This builds on the track record the WMCA has shown in brownfield regeneration and housing delivery since 2017</p> <p>Deploy effective disposals strategies to land recently acquired through this programme to ensure full achievement of approved project delivery and spend programmes.</p> <p>Utilise funding from HMG to leverage wider inclusive growth outcomes of WMCA such as affordable housing, advanced methods of construction, supporting sustainable transport ensuring these are set out clearly as targets in the SCF</p> <p>Deploy funding through the WMCA approved and HMG endorsed single commissioning framework and procedures, achieving the timescale milestones for end to end process, which is a requirement of Land Fund and Brownfield Fund.</p>
<p>Ensure delivery of the requirements of the 2018 Housing Deal and lead performance reporting to Government</p>	<p>Oversee, monitor and report monthly to Government on satisfactory performance in delivering the requirements of the March 2018 West Midlands Housing Deal including the ambitious targets of 215,000 new homes by 2031, Land Fund housing outputs, and timely progress on Local Plans Reported quarterly to MHCLG and HMT</p>

Housing & Land	
High Level Deliverable	Activity
Effectively develop, collaborate and submit compelling business cases for additional funding from HMG to deliver WMCA approved priorities	Work with local authorities and existing and new industry groups (eg Town Centre Taskforce, Zero Carbon Taskforce) to submit compelling business cases each quarter to secure further HMG investment into agreed priority delivery and policy areas, including Advanced Methods of Construction, Zero Carbon Housing, brownfield land, affordable housing, Public Land.
Implement the approved Housing & Land Board Covid19 Recovery Strategy and Pipeline Development	<p>Work closely with local authorities and expert taskforces to support and implement delivery of the approved Housing and Land Board Recovery Strategy (September 2020) demonstrating the region's recharge programme for post-Covid19 inclusive growth –quarterly updates to Housing and Land Board</p> <p>Complete the Housing and Land Board commission for a Covid19 project schedule for locally agreed land and development projects – draft Q1 2021, complete Q3 2021/22</p>
Establish new partnerships and joint ventures and delivery vehicles	Establish new and strengthen existing strategic partnerships and joint ventures with public and private sector partners in line with requirements of the March 2018 Housing Deal and the Housing and Land Board Recovery Plan. Key goals being to unlock and deliver new land and development projects, attract new private sector investment, share risk and reward and improve development quality – including launching the Affordable Housing Delivery Vehicle in 2021 and more Joint Venture Projects on WMCA land. Goal is at least 5 new partnerships by Q2 2021.
Create strong investor engagement and developer relationships, working alongside West Midlands Growth Company	<p>Implement comprehensive and systemised engagement programme with investors, developers and other private sector investors and project promoters to build support, investment and drive projects to tangible delivery.</p> <p>Relaunch the West Midlands Investment Prospectus in Q2 2021 to present compelling investible propositions to the market</p>

Housing & Land	
High Level Deliverable	Activity
Develop and collaborate on identified policy development work that supports delivery of the Housing and Land Board's KPIs and the Recovery Strategy	<p>To broker dialogue between the region and HMG on identified policy issues, developments and emerging matters and to develop policy thinking on key issues commissioned by the Board.</p> <p>Establish quarterly key Policy forums programme for Housing & Land</p> <p>Examples already identified include employment land policy, public land and zero carbon homes.</p>
Town Centre Regeneration	<p>Working closely with local authorities and the expert Town Centre Taskforce to develop compelling business cases and bids to HMG Towns Funds throughout 2021 (timetable TBC) and support negotiations with HMG.</p> <p>Deploy devolved housing and land funds through the SCF to identified town centre projects</p> <p>Work with the Regional Town Centre Taskforce, local councils and other partners to develop investment propositions in town centres in the region, create a new town centre toolkit in Q2 2021 and demonstrate regional recovery</p>
Advanced Manufacturing in Construction	<p>Working closely with local authorities and the expert AMC Taskforce to Secure new funding from HMG for AMC by Q2 2021</p> <p>Complete evidence pack of AMC in the region in Q1 2021</p> <p>Deploy a new AMC Funding Prospectus and Commissioning Framework in Q3 2021</p> <p>Publish the AMC Routemap in Q1 2021</p>
Zero Carbon Homes	<p>Working closely with local authorities and the expert ZCH Taskforce to secure new funding from HMG for ZCH in Q3/Q4 2021</p> <p>Develop a ZCH Routemap and Charter in Q2 2021</p>

Housing & Land	
High Level Deliverable	Activity
Affordable Housing	<p>Establish Collaborative Delivery Vehicle with regional Housing Association partners by Q2 2021 to bring forward development on additional brownfield sites and secure more affordable homes in the region</p> <p>Review the operation of the regional affordable housing definition – Q2 2021</p> <p>Work closely with local authorities to develop revised business for affordable homes in the region – Q1 2021</p>
Regional One Public Estate Programme	<p>Oversee the delivery of the West Midlands' programme for OPE7 projects and OPE 8 (subject to agreement of proposals Feb 2021), achieving all the prescribed Cabinet Office targets and signed off quarterly reports.</p> <p>Work with OPE members on disposal and management of their individual public land assets</p> <p>Launch the Regional Public Land Taskforce to support new OPE projects</p>
Public Land Taskforce	<p>Launch a new Public Land taskforce, as agreed by the Housing and Land Board, in Q1 2021 to support wider public land disposals and alignment in the pursuit of new homes, jobs, investment and inclusive growth</p>