

# **BIM in the UK house building industry: opportunities and barriers to adoption**

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# CCHPR

- The Cambridge Centre for Housing and Planning Research (CCHPR).
- Research centre, Department of Land Economy at the University of Cambridge.
- Over 29 years' experience of research and policy evaluation and analysis.

## Current and recent research

- Section 106 planning obligations and the Community Infrastructure Levy (CIL)
- How land use planning contributes to the provision of affordable housing
- New housing models and innovation in the PRS
- Housing need and affordability
- Centre for Digital Built Britain - a partnership between the Department of Business, Energy & Industrial Strategy and the University of Cambridge.

# Centre for Digital Built Britain

- Centre for Digital Built Britain was announced by Government on 29th November 2017
- Partnership between the Department of Business, Energy & Industrial Strategy and the University of Cambridge
- Supports the digitally enabled transformation of the full lifecycle of the built environment, to increase productivity and improve economic and social outcomes in the UK and, where appropriate, internationally.
- <https://www.cdbb.cam.ac.uk/>

## CDBB and BIM

- CDBB co-ordinating the Digital Framework Task Group (DFTG), launched by HM Treasury July 2018.
- Steer and guide the successful development and adoption of the “Information Management Framework for the Built Environment”.
- Pave the way for the development of the national digital twin.
- Building Information Modelling (BIM) sits at the heart of digital transformation across the UK built environment.
- CDBB has been tasked by BEIS to act as the custodians of the integrity of the UK BIM Programme and to be recognised both nationally and internationally as that institution.

# Construction Innovation Hub

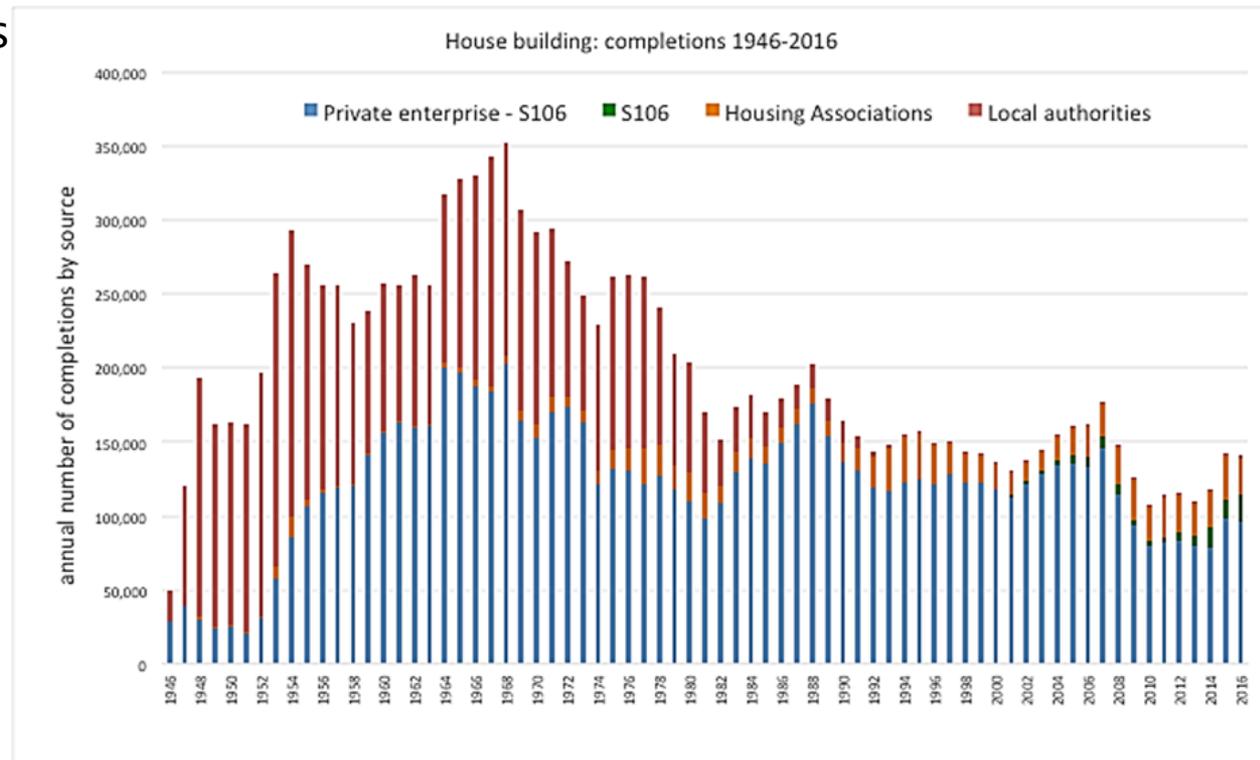
- £72 million government funding to drive innovation and boost UK construction productivity
- Construction Innovation Hub
- MTC (Manufacturing Technology Centre), BRE (Building Research Establishment) and the CDBB (University of Cambridge Centre for Digital Built Britain)
- Aims to be a catalyst for transforming the UK construction sector through manufacturing technologies and digital ways of working – boosting productivity, exports and asset performance to benefit society.
- [https://www.cdbb.cam.ac.uk/news/2018NovPR\\_TCA\\_CIH](https://www.cdbb.cam.ac.uk/news/2018NovPR_TCA_CIH)

# BIM in house building

- Aims to explore the use of BIM, and the opportunities and barriers to its wider uptake in UK house building.
- Review of existing evidence and literature, interviews with members of the house building industry, and a round table discussion with key stakeholders.
- Housing Digital Built Britain Network (OSM, digital FM, housing governance, planning system, housing for an ageing population)

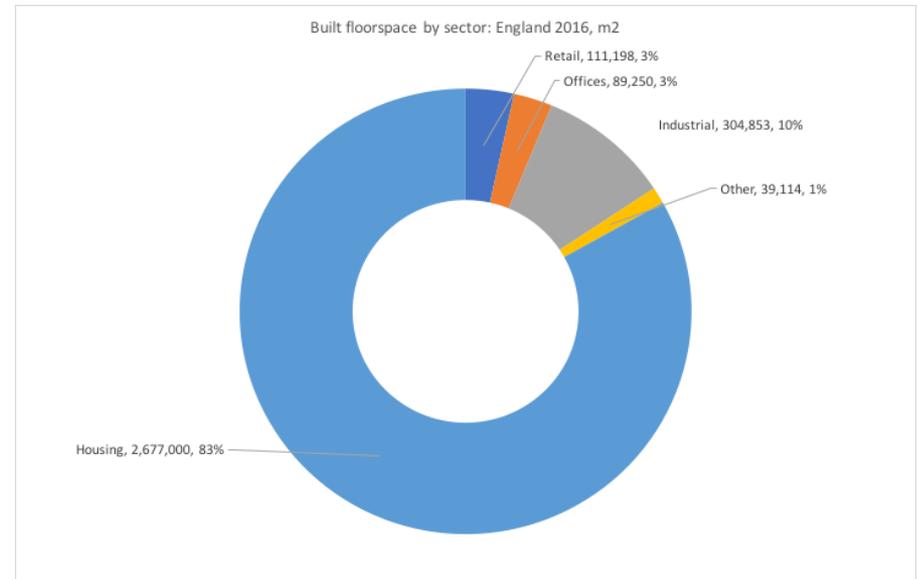
# UK housing crisis

- Lack of supply
- Few house builders
- Lack of innovation



# Nature of the house building industry

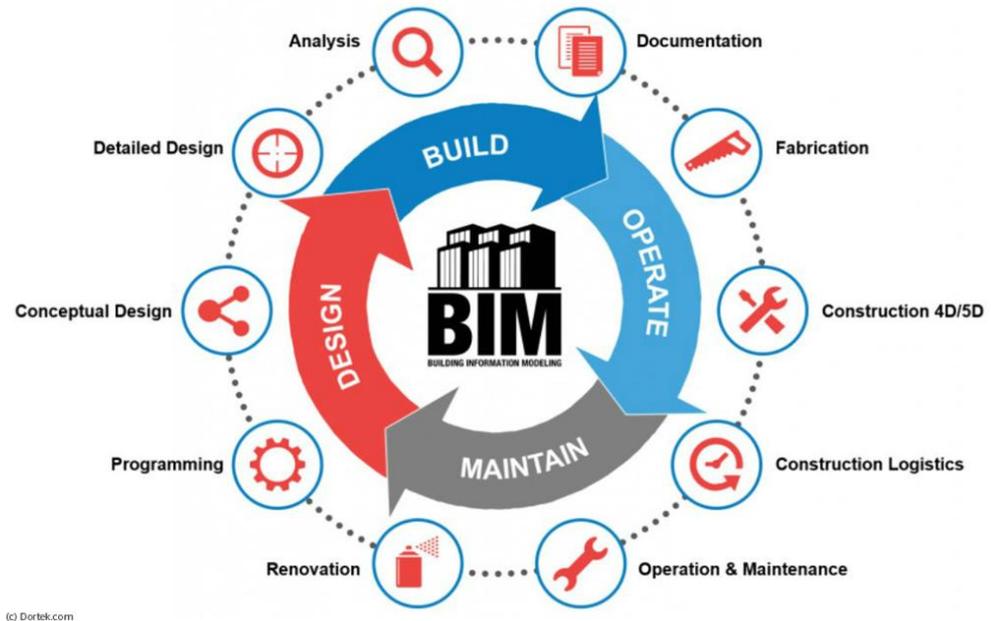
- Housing is 80% of the built floorspace in England
- Housing is 35% by value of all new construction work, and 53% of all repair and maintenance work
- 50% of output is by top 10 firms, and 80% by top 100
- 80% of output is houses, only 20% is flats





# Why bother with BIM?

- Improve sustainability and energy efficiency
- Save time
- Reduce costs



The top 10 benefits of using BIM (DorteK, 2017)

# Recent example of building homes with BIM

**Building a Better Nottingham**

Meadows and Cranwell Design

**Nottingham City Homes**

Meadows Q blocks currently out to tender in conjunction with Cranwell Road and consists of:

- 8 x 2 b semi-detached bungalows
- 1 x 2b detached bungalow
- 16 x 2b terraced houses
- 24 x 2b semi-detached houses
- 1 x 2b detached house
- 4 x 3b semidetached houses

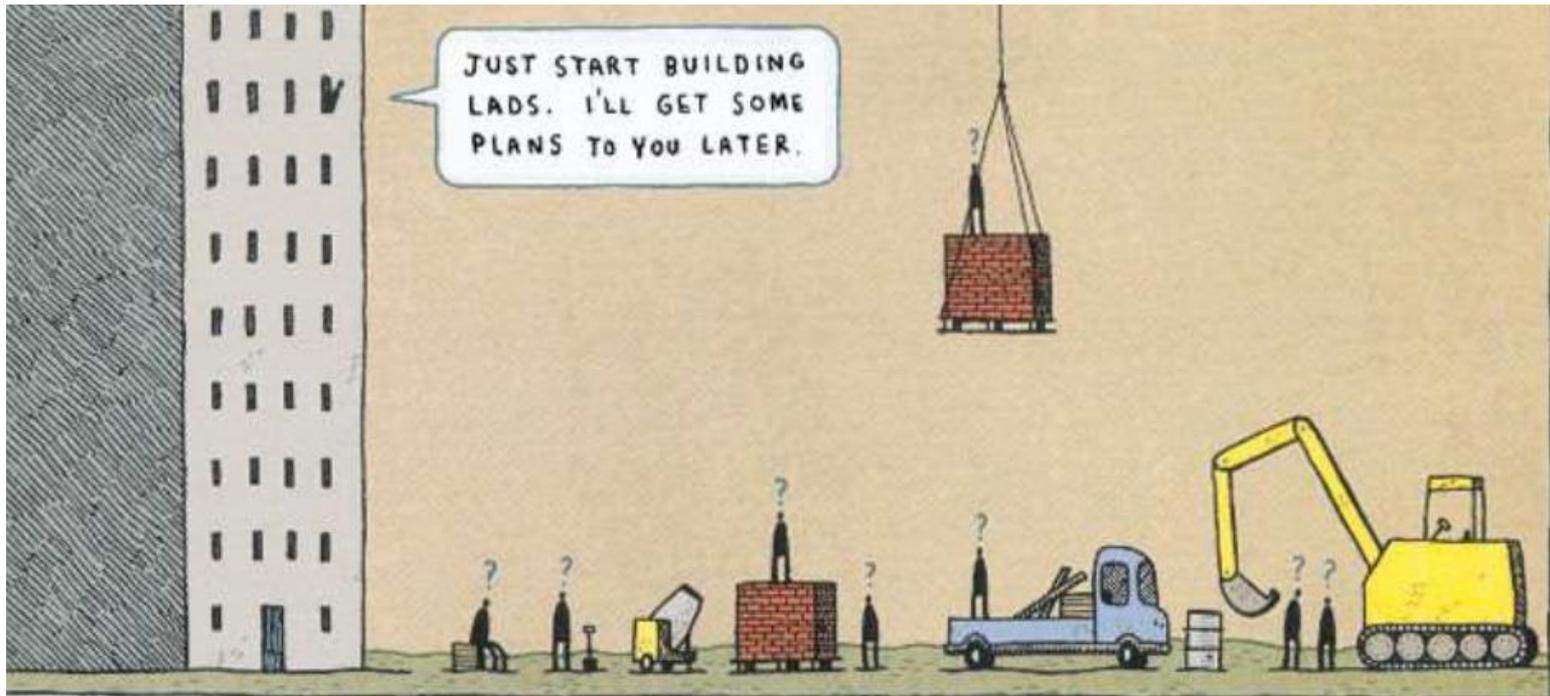
National BIM pilot

**Cranwell Road consists of:**

- 12 x 1 bedroom flats plus study
- 10 x 2 b terraced bungalows
- 1 x 1b detached bungalow
- 14 x 2b semi-detached houses
- 10 x 2b with study semi-detached houses
- 1 x 2b detached house

Creating homes and places where people want to live

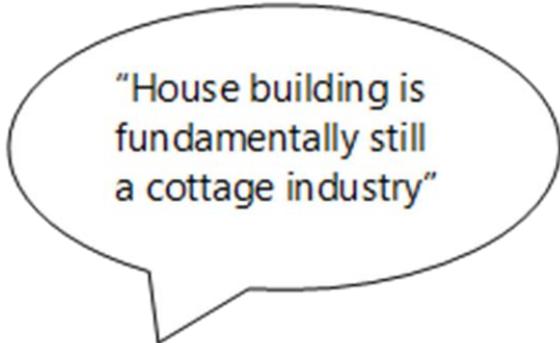
# House building industry lagging behind



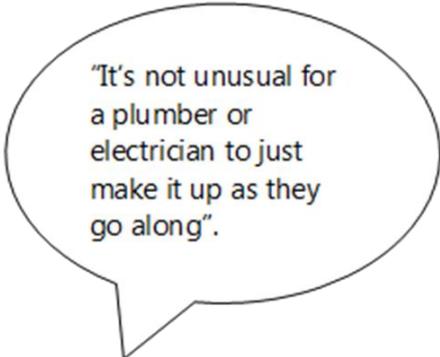
- <https://www.bsigroup.com/LocalFiles/en-GB/BSOL-Construction/BSI-Construction-Forum.pdf>, BSI Construction Forum

# BIM in the house building industry

- Supply chain issues
- Many subcontractors
- Building model is local and flexible
- Staffing
- Skills
- Time and resources
- SME house builders
- Security



"House building is fundamentally still a cottage industry"



"It's not unusual for a plumber or electrician to just make it up as they go along".



"The technology is there, but it is the investment of time that is the problem."

# Potential benefits of digitising housing production?

- Faster build programme
- Fewer defects
- Address the skills shortage
- Cost advantages from economies of scale
- More efficient land use
- Improved health and safety
- Reduced disruption to the local community

# Recommendations

- Awareness raising
- Guidance targeted specifically at the house building industry
- Inclusion of BIM on training and education in college courses
- Successful case studies and real life examples
- Bottom up and top down
- Collaboration to embrace the digital agenda – across all phases of the asset lifecycle – design, build, operate, manage, integrate
- BIM, digital twin, OSM, digital platforms, digitised planning
- Unlock value

# What do we need to know more about?

- Learning from other sectors and countries
- Subcontractors and supply chains
- Quantify the benefits of BIM
- Off-site housing manufacture
- Additional evidence base?



<http://www.dailymail.co.uk/news/article-2606881/Doorsteps-delivered-doorstep-Ready-homes-factory-built-scratch-just-three-weeks.html>

<https://www.cchpr.landecon.cam.ac.uk/>

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This research forms part of Centre for Digital Built Britain's work within the Construction Innovation Hub. The funding was provided through the Government's modern industrial strategy by Innovate UK, part of UK Research and Innovation.

