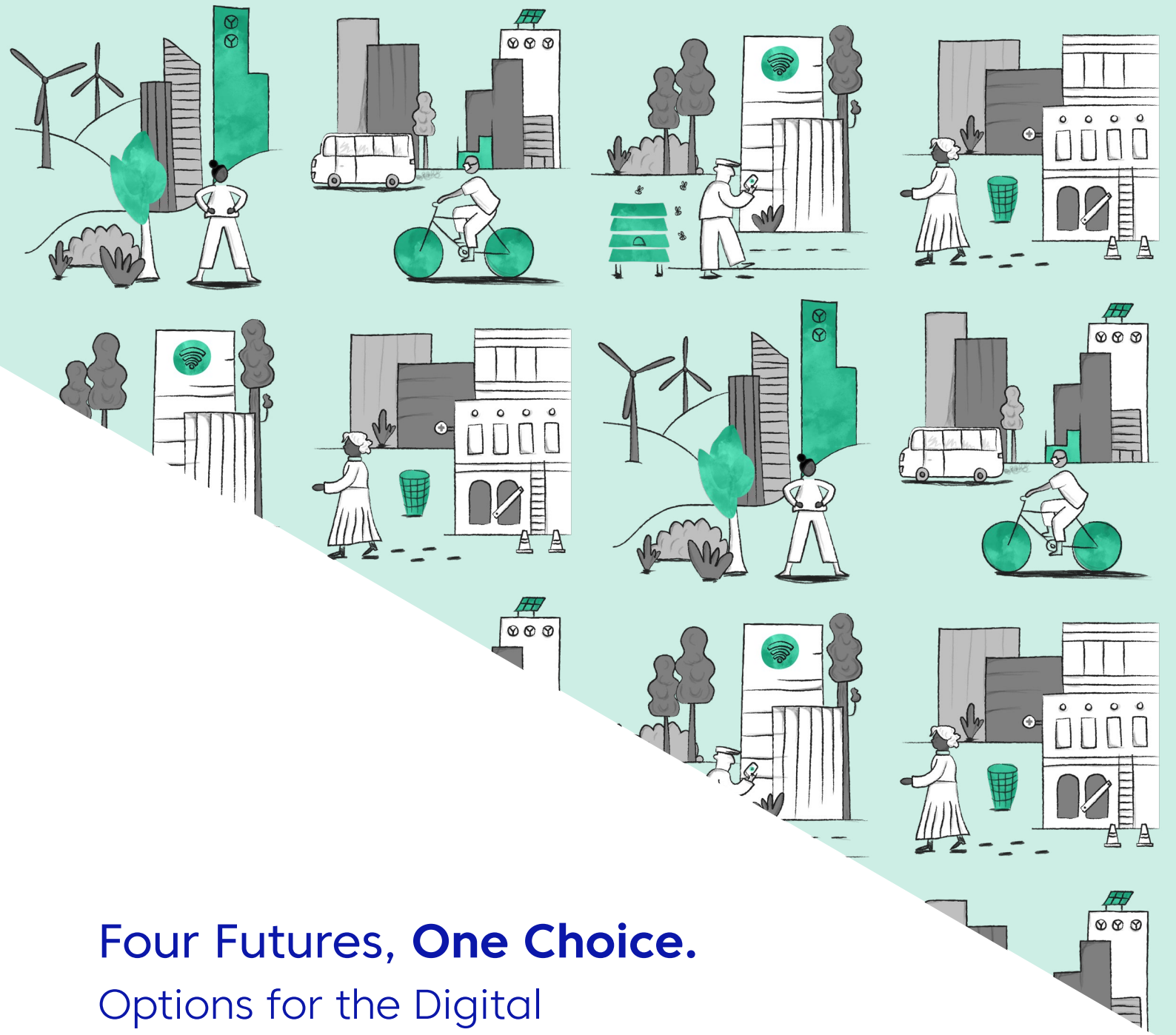


Four Futures, **One Choice.**

Options for the Digital Built Britain of 2040

Executive Summary
November 2020

CONSTRUCTION INNOVATION HUB

INDUSTRIAL STRATEGY

UK Research and Innovation

Unprecedented times

The arrival of 2020 has brought with it some of the most turbulent global events experienced in generations. Global pandemics, political unrest and environmental disasters have all contributed to 2020 being, for the majority, the very definition of 'unprecedented times'.

In Britain alone, and specifically within the built environment, at the time of publication the measurable effects of the COVID-19 pandemic have yet to be determined, however early predictions are that the impact on the economy, society and the environment will be sizeable and most likely long-tailed. In parallel, we have reached a tipping point with the global climate crisis, seeing several significant events within 2020 alone that present deep and urgent concern – notably reports that the Arctic is undergoing **"an abrupt climate change event".**[1] Scientists are now extremely concerned that, in the absence of significant cuts in emissions, the global climate will become increasingly unstable and present a situation that we, as humans, have no capacity to deal with.

Where the negative events that have blighted us thus far in 2020 are classed as 'unprecedented', it's worth remembering that unprecedented need not only have negative connotations. We are also in an unprecedented time for making positive and remarkable improvements. We, as society, policy makers or decision-makers in the built environment have an opportunity to build back better – to learn from the past and present in order to be able to shape a future that can protect us and help us thrive.

Four Futures, One Choice presents us with a future lens enabling us to view, with clarity and detail, four scenarios of what Britain could look like in 2040, depending upon the decisions that are made now, in these unprecedented times of opportunity. The four compelling scenarios provide us all with an insight into how we can strategise now, taking swift and decisive actions, that will not only aid the COVID-19 recovery, but also help develop a built environment that supports a flourishing future and reduces our negative impact on the global environment.

These are unprecedented times and we have a window of opportunity to make the most of them.

Four scenarios

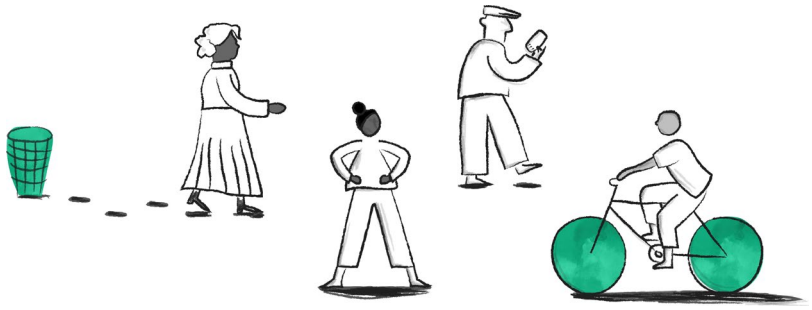
Four Futures, One Choice presents four plausible future scenarios designed to help you make better decisions now, that will shape the future you choose. In order to develop the scenarios, experts who specialise in the built environment and how it relates to technology, the economy, design and society, came together to imagine, organise and describe different future states. Part of the process involved identifying potential driving forces and factors that may influence future outcomes – these were then classed as certainties and uncertainties. Exploring how the uncertainties intersect with each other enabled the experts to build out the different views of how the future may unfold. In this instance the two uncertainties selected were:

1. **The SDGs – 'Sustainable Development Goals'** 17 goals set by the United Nations that envision a world where the built environment is a platform for the flourishing society and the natural world.

2. **The Age Dependency Ratio** is a measure of the number of dependents aged 0-15 and 68 plus, compared with the total population aged 16-67.

The diagram on the following page illustrates four different scenarios for how these uncertainties could influence the version of 2040 we may find ourselves living in.

Four Futures, One Choice presents four plausible scenarios to help envision the future you are making decisions about today.

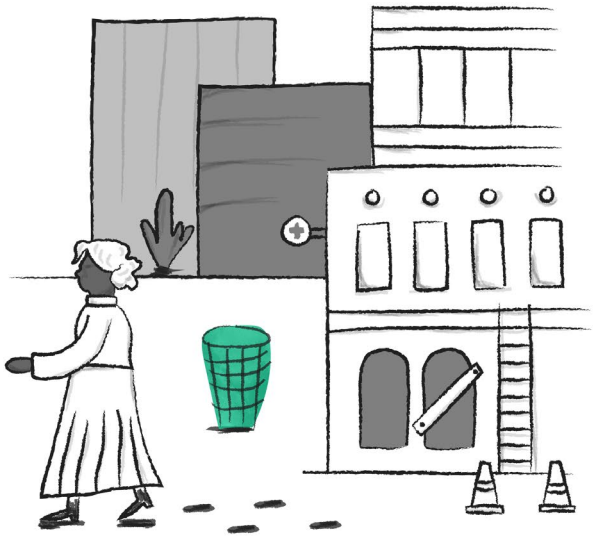


High Dependency Ratio

Sustainable Development Goals Failed

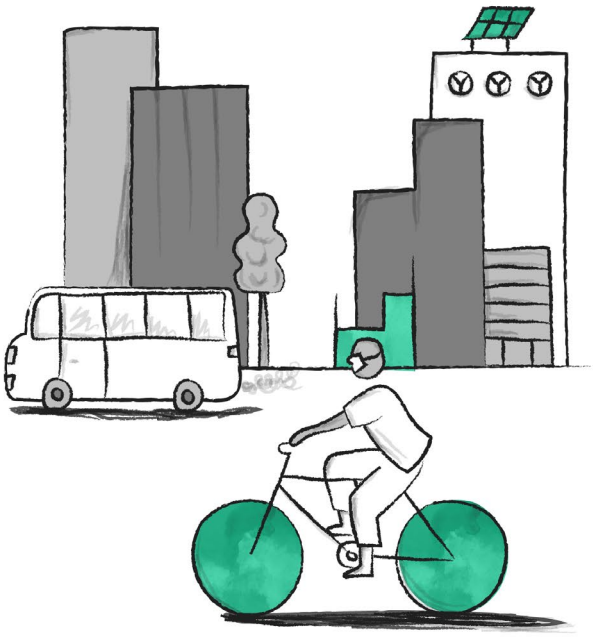
Sustainable Development Goals Succeeded

Scenario C
Resigned To Our Fate

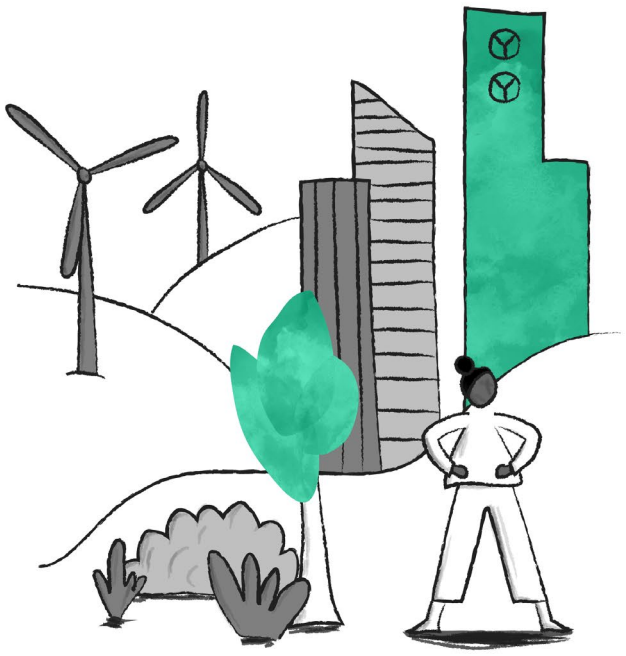


Scenario A
A Legacy Of Hope

Scenario D
Too Little Too Late



Scenario B
Generation Zero



Low Dependency Ratio

High Dependency Ratio

Sustainable Development Goals Failed

Sustainable Development Goals Succeeded

Low Dependency Ratio

Scenario C
Resigned To Our Fate

- We have passed climate tipping points, meaning that global heating and related environmental crises are out of our control
- Uptake of digital construction techniques outside of the early adopters has been low, and the carbon footprint of the sector is still high
- Buildings and infrastructure procured to restart the economy in the early 2020s have locked us into decades of carbon emissions
- Market-led development of digital technology has narrowed to focus on elder care and automation, but without a clear guiding strategy or focus on public benefit
- There is a small workforce, supported in places by automation, but not by interoperable data and systems
- Supply chains are still characterised by operational and informational silos

Scenario A
A Legacy Of Hope

- The climate crisis is coming under control thanks to rapid decarbonisation and aggressive legislation protecting green spaces and biodiversity
- The built environment has been adapted to meet the needs of an ageing population on a warming planet
- More communal green spaces for exercise, growing food, volunteering, outdoor socialising
- Widespread uptake of digital construction with a focus on human well-being and refurbishment, green infrastructure rather than new build
- Digitalisation has focused on elder care and supporting a smaller workforce through automation
- The green information economy is shaped by the smaller workforce, so efforts are focused in high priority areas

Scenario D
Too Little Too Late

- We have passed climate tipping points, meaning that global heating & related environmental crises are out of our control
- The built environment has continued to develop with business-as-usual predating 2020, though digital construction has been taken up by industry leaders
- Buildings and infrastructure procured to restart the economy in the early 2020s have locked us into decades of carbon emissions
- Market-led development of digitalisation without clear guiding principles has led to a wide distribution of smart devices, but low interoperability and low public benefit
- There is a large workforce, but a deepening wage gap as resources grow scarce
- We are trying to design our way out of a crisis, but have to react to the latest disaster rather than solve the deeper problems

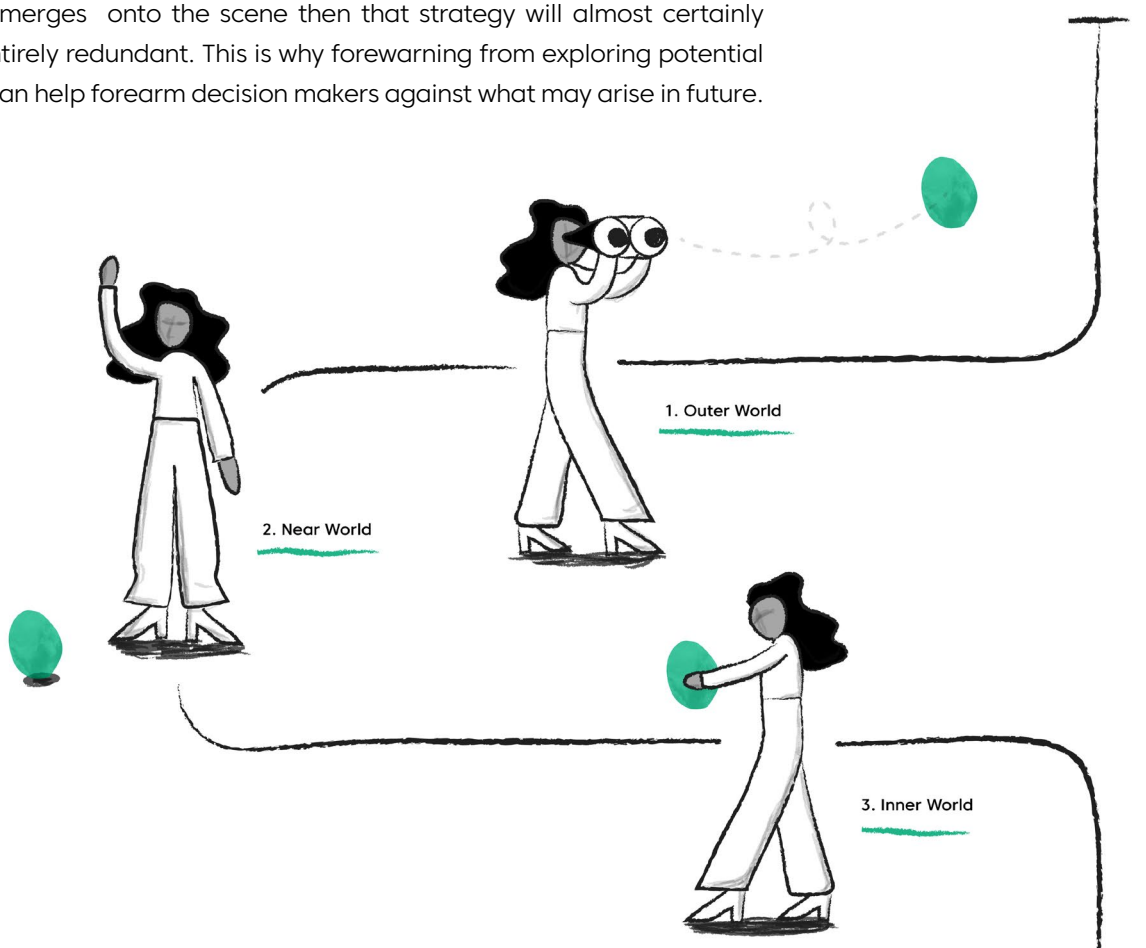
Scenario B
Generation Zero

- The climate crisis is coming under control thanks to rapid decarbonisation & aggressive legislation protecting green spaces & biodiversity
- The built environment has been highly reconfigured to promote human and environmental wellbeing using green infrastructure
- Widespread uptake of digital construction and transparent, secure integrated digital services
- The large workforce has been educated in digital skills to ensure a thriving green information economy and civic engagement
- Cities and towns are filled with smart devices supporting various needs, e.g. transportation, health care, education, environmental monitoring, infrastructure performance & security

Three worlds framework

As part of the scenario planning process, the experts also applied the '**Three Worlds Framework'.**[2] The framework highlights the three worlds in which we can have an effect or are affected by – the Inner World, Near World and Outer World.

For many organisations and the decision makers within them, it's natural, when developing a strategy for the future, to adopt an inside-to-outside (Near World to Outer World) perspective as we inherently assume that which will have greater control over – our Near World – will help to influence that which we have less control over – the Outer World. In reality, it's entirely the opposite. Future events unfold in response to the ever-changing context of the wider world. An organisation can create a seemingly water-tight strategy for future growth, but if, for example, a global pandemic suddenly emerges onto the scene then that strategy will almost certainly become entirely redundant. This is why forewarning from exploring potential scenarios can help forearm decision makers against what may arise in future.



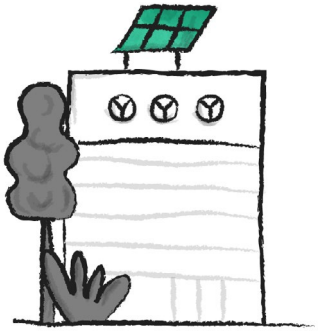
Future events unfold in response to the ever-changing context of the wider world.

Long term tips

While we can't guarantee, with any certainty, the outcomes our decisions as society, policy makers or decision-makers in the built environment will have, exploring future scenarios helps us identify the direction we would prefer and ultimately which way we should steer. The following are some recommended actions that experts have suggested would result in a fairer, greener future for all.

Thoughtful investment in digital technology

- **People and Planet First**
  Setting benefits to people and the planet as the core purpose of the built environment.
- **Value-led Procurement**
  Procuring against our own values to change the behaviour of the supply chain, and taking a future focused approach to procurement to create legacy value.
- **Moral & Ethical Principles**
  Being held accountable for upholding moral and ethical standards for the data, automation and AI we use, ensuring that it does not discriminate or disadvantage.
- **Build Smarter**
  Using smart technologies (such as digital twins) to build efficiencies into the lifecycle of the built environment, enabling improved performance, reduced cost, higher quality and longer-lasting assets.



Prioritise decarbonisation and biodiversity

- **Modern Methods of Construction**
  Researching and adopting methods that substantially reduce the carbon footprint of the sector.
- **Built vs Natural**
  Valuing the nature in equal weight to the built environment in order to drive decarbonisation of the built environment.
- **Circular Economy**
  Taking into account how materials and resources within the built environment can be repurposed beyond the life span of individual assets.
- **Join Forces**
  Forming strategic partnerships with other industry players/policy makers to deal with the complexities of sharing data and collaborating to develop a built environment that benefits all.

Governance today for a better tomorrow

- **Individual Flourishing**
  Making ourselves accountable to future generations for all the decisions we make today.
- **Green Information Economy**
  Having better data and insight, that can be easily shared, is vital if we are to have a more humane economy where decisions are taken that allow future generations to live a healthy, happy life on this planet.
- **Green New Deal**
  Create green jobs that will help to design, build and operate a digitally enabled and sustainable built environment for tomorrow.
- **Digital Democracy**
  Supporting wider participation and engagement of UK citizens, through the use of technology, in the decisions that directly impact them.

Endnotes:

1 Jansen, E., Christensen, J. H., Dokken, T., Nisancioglu, K. H., Vinther, B. M., Capron, E., Guo, C., Jensen, M. F., Langen, P. L., Pedersen, R. A., Yang, S., Bentsen, M., Kjær, H. A., Sadatzki, H., Sessford, E., & Stendel, M. (2020). Past perspectives on the present era of abrupt Arctic climate change. Nature Climate Change, 10(8), 714–721. https://doi.org/10.1038/s41558-020-0860-7

2 Lindgren, M., & Bandhold, H. (2009). Scenario Planning - Revised and Updated: The Link Between Future and Strategy. Scenario Planning - Revised and Updated: The Link Between Future and Strategy, 1–204. https://doi.org/10.1057/9780230233584

About:

Of the four future scenarios presented there are two that are clearly preferable – focused on a sustainable, equal and diverse world within which Britain's economy, society and environment can thrive. Given the unprecedented opportunity we've been presented with, we can't stand still any longer. We have the choice, let's make it now.

To read Four Futures, One Choice in full, with each scenario mapped out in detail, and more information and ideas for how to improve our chances for a better recovery and future please contact: engagement@cdbb.cam.ac.uk

To follow the progress, or learn how to improve our chances for a better recovery please visit: www.cdbb.cam.ac.uk/fourfutures

The full version of 'Four Futures, One Choice' will be published here from December 2020.

This research forms part of Centre for Digital Built Britain's (CDBB) work within the Construction Innovation Hub which brings together world-class expertise from the Manufacturing Technology Centre (MTC), BRE and CDBB to transform the UK construction industry.

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Authors:

Didem Gürdür Broo

Centre for Smart Infrastructure and Construction, Department of Engineering, University of Cambridge

Laing O'Rourke Centre for Construction Engineering and Technology, Department of Engineering, University of Cambridge

Centre for Digital Built Britain, University of Cambridge

Kirsten Lamb

Centre for Digital Built Britain, University of Cambridge

Richmond Juvenile Ehwi

Centre for Digital Built Britain, University of Cambridge

Cambridge Centre for Housing and Planning Research, Department of Land Economy, University of Cambridge

Erika Pärn

Centre for Digital Built Britain, University of Cambridge

Cambridge Service Alliance, Institute for Manufacturing, University of Cambridge

Antiopi Koronaki

Centre for Digital Built Britain, University of Cambridge

Centre for Natural Material Innovation, Department of Architecture, University of Cambridge

Chara Makri

Centre for Digital Built Britain, University of Cambridge

Thayla Zomer

Centre for Digital Built Britain, University of Cambridge

Cambridge Service Alliance, Institute for Manufacturing, University of Cambridge