Our Vision for the built environment

This Vision is not about predicting the future for the built environment.

It is about describing the future we want.

Making better decisions now will create a better future.

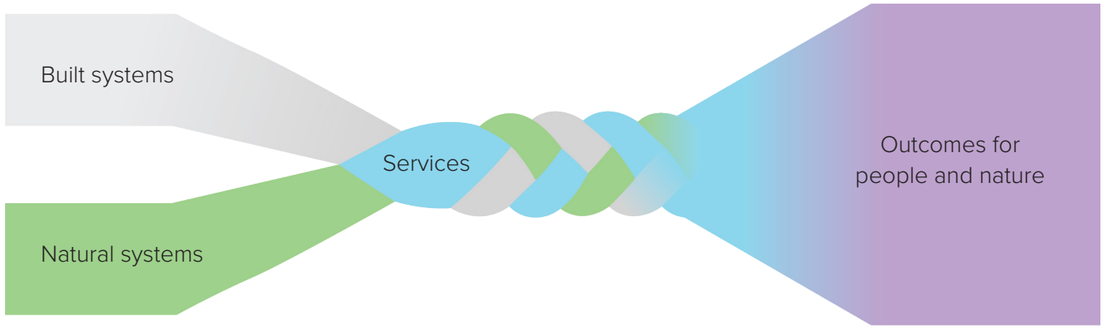
Who we are

We are people who care about the built environment and its impact.

Everyone who wants to make a difference in the built environment has a part in this Vision.

The Vision

Our Vision is for a built environment whose explicit purpose is to enable people and nature to flourish together for generations.



It is only when we shift our focus from creating the built environment to the **outcomes** enabled by it that people and nature can thrive together for the generations to come.

The built and natural environments are complex and interconnected **systems** that are essential for our wellbeing.

Improving outcomes for people and nature depends on the **services** that these systems provide and on coordinating the built environment as a whole, not just as individual parts.

We believe that we can make our Vision a reality, but only if we all play our part with energy, coordination and purpose, making use of the advanced array of **enablers** that we now have at our disposal.

Why now

The built environment is too big to ignore

We have reshaped our entire planet for our own needs. The total mass of the built environment today exceeds that of all living things on Earth[1], so we can no longer afford to ignore the impact of what we build.

The greatest challenges of our generation are systemic and interdependent

From addressing climate change to creating the circular economy, systemic challenges demand systems-based solutions. An intervention in one part of the system can have consequences in another. Systemic challenges cannot be solved in silos and we cannot just build our way out of the problem, particularly where unfettered building is the problem.

The pandemic has emphasised important realities:

Wellbeing is crucial
We now acknowledge that our wellbeing is both fragile and deeply tied to nature and our built environment.

Decisions have long-term consequences
We now see more clearly that good, early decisions prevent problems later on.

Change can happen quickly
We now know that social and digital change can move rapidly. And we recognise the need for the capacity to deal with the unexpected.

We need to get more from less
We now recognise more urgently the need to get more from the buildings, infrastructure and natural resources that we already have.

Choices in the built environment can last for generations because it has many overlapping lifecycles:

Millennia	Centuries	Decades	Years
Infrastructure corridors can last for millennia, like the routes of Roman roads that we still use today.	**Civil structures** can remain serviceable for centuries, like Victorian bridges and tunnels, or post-war tower blocks.	**Mechanical components** require repair or replacement within decades, like lifts and pumping stations.	**Software developments** can be annual or even more frequent.

Just as we live with the choices that our predecessors have made for the built environment, the decisions we make now will impact the generations to come.
We therefore need to focus on outcomes for future generations as well as for the people using the built environment today.

Improving outcomes

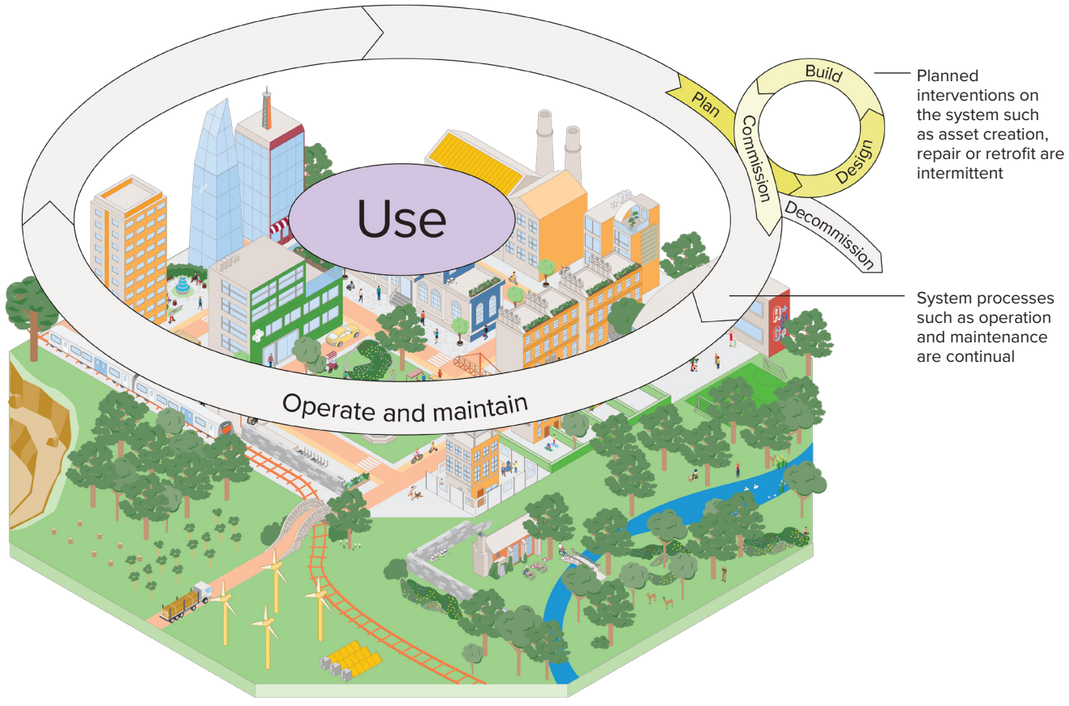
The purpose of the built environment

Achieving better outcomes for people and nature must be the focus of the existing built environment, and of its future development.

This means recognising that the **use** of the existing built environment is of primary importance - and that this is supported by key processes such as operation, maintenance, planning, design, construction and reuse.

We must develop processes to understand the needs of users, communities and nature in order to identify and articulate desirable outcomes that are relevant to each particular context and place.

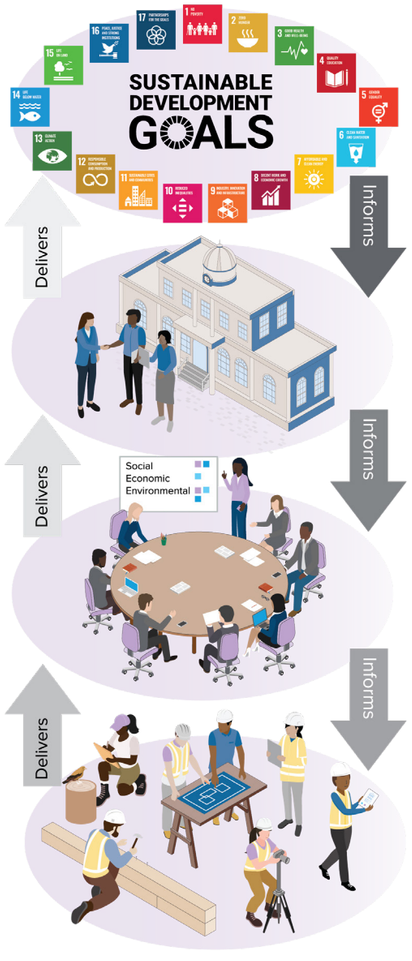
This approach to the built environment recognises that an understanding of existing systems, including how both people and nature fit within them, will provide opportunities to achieve the desired outcomes through better management of what we already have. Where new assets are required, it ensures we integrate them effectively with the existing system, in balance with the needs of people and nature over the long-term.



Developing aligned outcomes

Development of the built environment must take place within a context where outcomes are aligned from top to bottom: from global and national strategic priorities, through local requirements, to investment decisions for individual interventions.

Our role is to contribute to these aligned outcomes at whichever level we have influence. This line of sight can provide a real sense of purpose and better outcomes for people working in the industry, as well as inspiration for the next generation to get involved and contribute.



Global outcomes

At the global level, the Sustainable Development Goals provide a blueprint to achieve a better and more sustainable future for all - a balance between environmental, social and economic outcomes.

Strategic priorities

The strategic priorities of national governments should align with global goals, informing, for example, ‘net zero’ targets and built environment strategies.

Local requirements

Decision-makers in the built environment must satisfy national priorities and address local requirements - the needs of the users, the communities and the environment. Participatory processes empower individuals and communities to shape their ‘place’.[2]

Effective interventions

Investment decisions for individual interventions (whether for operation, maintenance, asset creation, repair or retrofit) are more effective when they are aligned with delivering outcomes at the local, national and global levels. Environmental, social, and governance (ESG) frameworks can assist with tracking alignment.

Systems

The built environment as a system of systems

The built environment has become a complex system of connected assets and networks.

We can expect to see further interconnections as digitalisation progresses and we link up the physical and digital worlds. Add to this the many interfaces with the natural environment and we can see that the built environment is a deeply interconnected **system of systems**.

Currently, our built systems are resource-hungry and wasteful, vulnerable to environmental, social and economic pressures, at risk from accidental or malicious security breaches and system-wide shocks. They must become sustainable, secure and resilient.

Therefore we must develop systems-based policies and strategies that enable us to understand and coordinate the built environment as a system of systems.

System of systems

The built and natural environments

The natural environment is even more complex and interconnected than the built environment.

The services it provides are more essential for our wellbeing, from the air we breathe to the food we eat.

For as long as we want people and nature to flourish together, we must keep built and natural systems working healthily in balance. It will become impossible to meet our evolving needs unless we address the challenges of finite resources, pollution, biodiversity loss, the impacts of climate change and transition of the whole economy to net zero greenhouse gas emissions. The built environment must work with and within the natural environment.

The natural environment can manage itself perfectly well, but not where it is over-constrained by the built environment. We need to shift towards consciously making a positive environmental impact with everything we do in the built environment, including integrating regenerative and biophilic design, ecosystem services, natural infrastructure and nature-based solutions.

Services

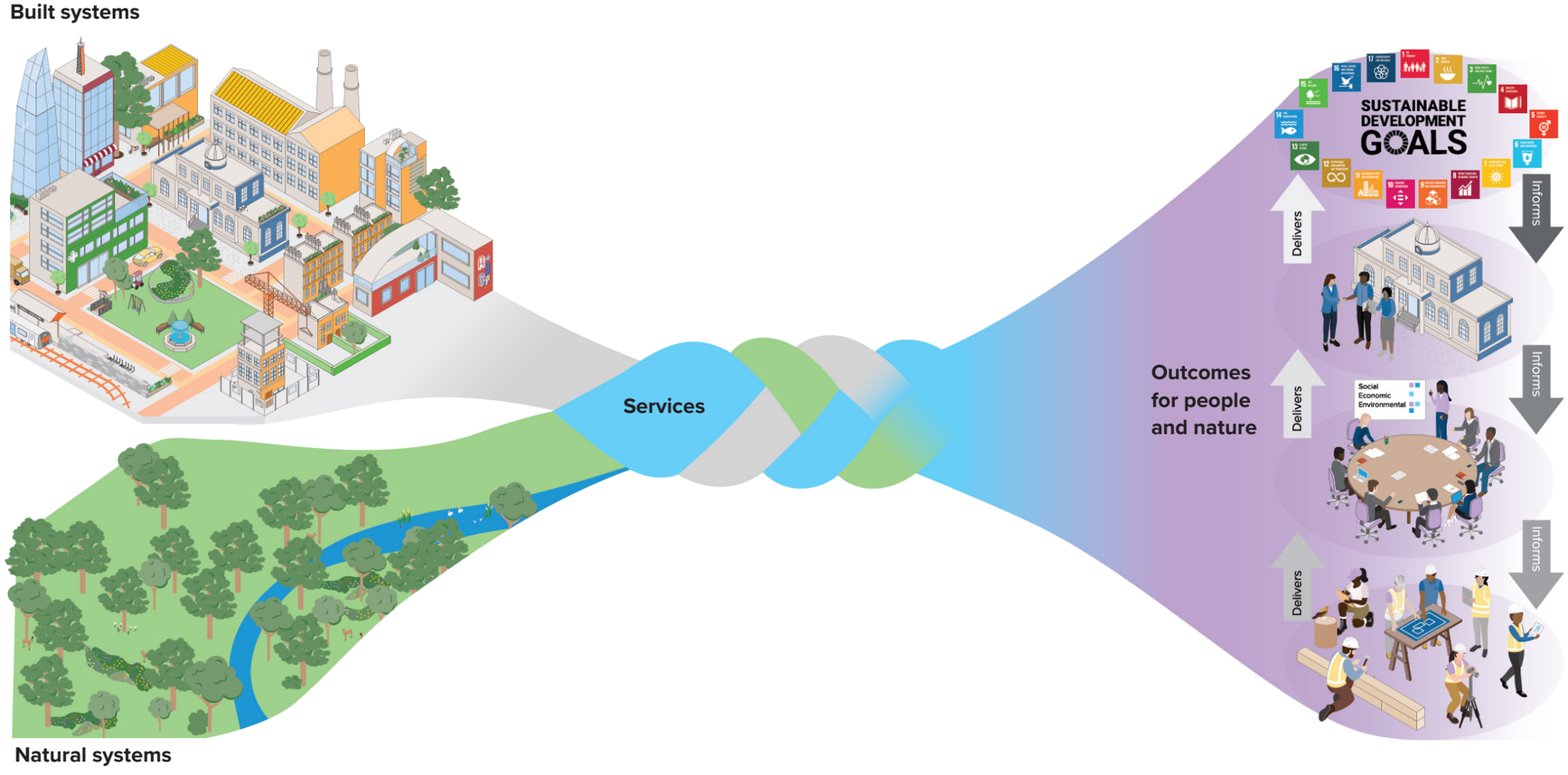
The built environment as a service

The services that the built environment provides are the connection between the outcomes we desire and the systems we use to achieve them. They are essential for our wellbeing.

Built systems, not individual projects or assets, provide the shelter, mobility, sanitation and other services on which we rely.

The users of these services are best-placed to judge how the built environment is performing as a service.

We must actively seek feedback to help enhance the services and shape interventions that improve the systems. We need metrics that address the performance of the built environment.



The **built environment** is everything we've built – all the residential, industrial and commercial buildings and the hospitals, prisons and schools that make up our 'social infrastructure'; all the networks for energy, transport, water, waste, telecoms and flood defences that make up our 'economic infrastructure', whether above or below ground; all the urban spaces and managed landscapes between and around buildings and infrastructure.

The **natural environment** is everything we have not built – all the living and nonliving things that occur naturally, including the interaction of all living species, climate, weather and natural resources that affect human survival and economic activity.

Outcomes are the changes experienced by people, communities and the environment when a service is provided (and in this Vision we are focusing on those that are enabled by the built environment). This includes social, environmental and economic outcomes.

Systems are connected collections of interrelated and interdependent parts, where the value of the whole may be more than the sum of its parts. A system is influenced by its environment, defined by its structure and purpose, and is experienced through its function.

Services are about supplying needs for people or nature. Services are intangible; they are not manufactured, transported or stocked; they cannot be stored for future use; they are produced and consumed simultaneously.

Enablers

Increasing integration

Managing the built environment as a system of systems with a focus on delivering better outcomes requires greater integration across the industries that serve the built and natural environments.

Working more closely together requires new skills, capabilities and more collaborative ways of working. It requires the sharing of processes and information across traditional silos. We need dynamic partnerships between government, industry, academia and the users of the built environment.

We also need approaches to the delivery of interventions that are able to deal with complexity, and enable effective integration of new assets into the existing systems. Outcome-focused collaborative delivery models leverage input from across the supplier ecosystem, bringing together engineering and technology to deliver intelligent solutions.

Industrial revolutions

First
Late 18th and 19th century - steam and water power; mechanisation

Second
Early 20th century - electrification; mass-production

Third
Late 20th century - computerisation; IT and communication technology systems; automation

Fourth
Early 21st century - cyber-physical systems; internet of things; artificial intelligence; digital twins

Driving digitalisation

The fourth industrial revolution is built around the concept of bringing physical and digital worlds together.[3]

These data-driven 'cyber-physical systems' are now possible because of advances in computing power and digital communications that have led to huge reductions in the unit-cost of collecting, transmitting, processing and storing data. However, we need to minimise their carbon emissions. It is our responsibility to apply the fourth industrial revolution to the built environment in a way that will benefit generations to come.

As the built environment becomes increasingly cyber-physical, we need to improve capabilities and tools to understand and intervene effectively in complex systems.

- **Capabilities** - systems engineering, complexity science, information management and data science.
- **Tools** - internet of things, artificial intelligence, virtual reality, robotics and connected digital twins.

Applying the fourth industrial revolution to the built environment is a socio-technical change, and the social aspect of the change is at least as important as the technical. Therefore, **digitalisation must be guided by our values**. It must be fair, inclusive, democratic, ethical, just and compassionate.

Digitalisation is fundamentally about enabling people:

- to manage information effectively
- to improve processes
- to apply technology wisely.

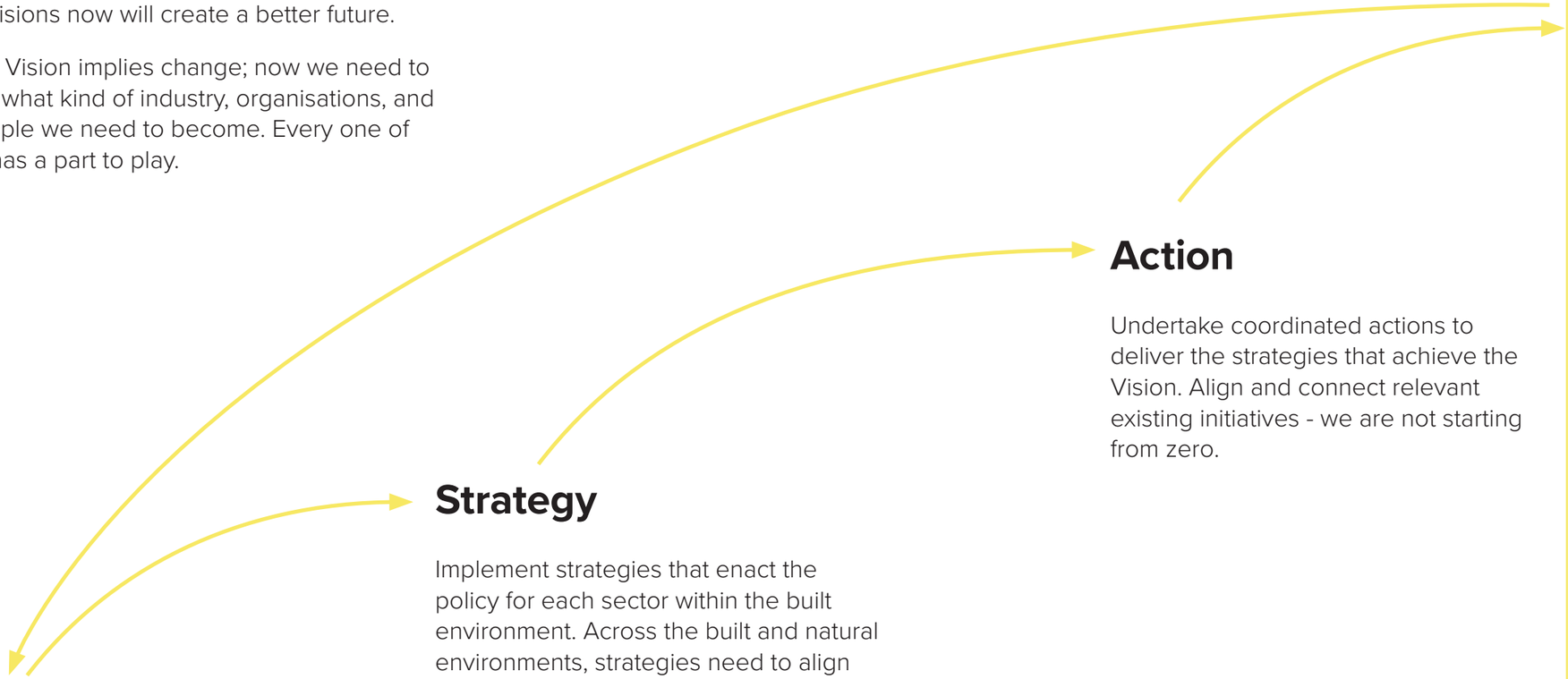
Technology alone is not the solution to the challenges we face, but technology applied wisely is a key enabler. We need purpose-led technology, not technology-led change.

Effective information management requires the right people to have the right information at the right time to make better decisions. And better decisions lead to better outcomes.

Realising the Vision

Our Vision describes a desirable destination; now we need to backcast and work out how to get there. Making better decisions now will create a better future.

Our Vision implies change; now we need to ask what kind of industry, organisations, and people we need to become. Every one of us has a part to play.



Policy

Develop systems-based, outcome-focused policy for the built environment that is directed towards achieving the Vision.

Strategy

Implement strategies that enact the policy for each sector within the built environment. Across the built and natural environments, strategies need to align with the shared Vision.

Action

Undertake coordinated actions to deliver the strategies that achieve the Vision. Align and connect relevant existing initiatives - we are not starting from zero.

Learning from others

Both New Zealand's Living Standards Framework[4] and Amsterdam's City Doughnut[5] present examples of places that have created tools to help them to flourish as a society and to live within their planetary boundaries, providing valuable learning as they seek to put theory into practice.

Vision

Our Vision lays out principles that provide direction and enable alignment

We need to make the destination ever clearer as we move forward.

The benefits of coordinating the built environment this way means we can...

1. Deliver desirable outcomes for people and nature
2. Integrate new assets properly into the existing system
3. Unlock value from what we have already built
4. Provide the resilience and capacity for regeneration that society requires of its infrastructure
5. Encourage innovation and unlock the potential of digital transformation across the built environment
6. Inspire greater trust between our interconnected systems, and earn the trust of people and communities who engage with the built environment

Acknowledgements

With many thanks to the contributors:

Sir John Armitt CBE, National Infrastructure Commission
Sister Margaret Atkins, Canoness of St Augustine
Nick Baveystock, Institution of Civil Engineers
Sarah Beale, Construction Industry Training Board
Ann Bentley, Rider Levett Bucknall
Richard Beresford, National Federation of Builders
Brian Berry, Federation of Master Builders
Simon Blanchflower CBE, East West Rail
Alexandra Bolton, Centre for Digital Built Britain
Steve Bratt, Electrical Contractors Association
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Amelia Burnett, Clementine Consulting
Peter Caplehorn, Construction Products Association
Dr Richard J Carter, University of Bristol
Tim Chapman, Arup
Vincent Clancy, Turner & Townsend
Keith Clarke CBE, Edge
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Dr Peter El Hajj, Mott MacDonald
Mark Enzer OBE, Mott MacDonald and Centre for Digital Built Britain
Dale Evans, Project 13
Simon Evans, Arup and Institution of Mechanical Engineers
Mark Farmer, Cast
Dr Tanya Filer, StateUp and University of Cambridge
Ian Fletcher, British Property Federation
Michael Gilmont, University of Oxford
Prof Jim Hall, University of Oxford
Fergus Harradence, Department for Business, Energy & Industrial Strategy
Jonathan Hart, Pinsent Masons
Sarah Hayes, Independent consultant
Lucy Howard, Turner & Townsend
Alice Hunt, Alice Hunt Designs
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Sarah Jardine, Health and Safety Executive
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Simon Lawrence, Infrastructure and Projects Authority
Greg Lawton, Nodes & Links
Jo Lucas, Co.Cre8
David McKeown, Institute of Asset Management
Andrew McNaughton, aczel&co
Andy Mitchell CBE, Thames Tideway Tunnel and Construction Leadership Council
Kevin Murphy, Openreach
Andy Murray, Major Projects Association
Alan Muse, Royal Institution of Chartered Surveyors
John Newcomb, Builders Merchants Federation
Robin Nicholson CBE, Edge
Carmen Ogilvie, International Project Finance Association
Richard Petrie, buildingSMART International
David Pinder, Green Construction Board
Simon Rawlinson, Arcadis UK
Mark Reynolds, Mace Group Ltd
Sarah Rock, Fladgate LLP
John Russon, Environment Agency
Dr Jennifer Schooling OBE, Centre for Smart Infrastructure and Construction
Dale Sinclair, AECOM
Rachel Skinner, WSP
John Slaughter, Home Builders Federation
Prof Simon Spooner, Atkins
Sam Stacey, UK Research and Innovation
Scott Steedman CBE, British Standards Institution
Richard Threlfall, KPMG
Jason Tucker, Anglian Water Services
Eddie Tuttle, Chartered Institute of Building
Will Varah, Infrastructure and Projects Authority
Prof Liz Varga, University College London
Hannah Vickers, The Association for Consultancy and Engineering
Keith Waller, Construction Innovation Hub
Graham Watts OBE, Construction Industry Council
Phil Wilbraham, Independent consultant
Clare Wildfire, Mott MacDonald
May Winfield, Buro Happold
Melissa Zanocco, Infrastructure Client Group

Endnotes

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DOI: https://dx.doi.org/10.17863/CAM.68205

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Our Vision for the built environment

Why?

The central purpose of this Vision is to secure better **outcomes** from the built environment for the long-term, creating the future we want: wellbeing for people and the planet.

Who?

All of us, whatever our gender, race, age, or background, can make a difference in the built environment. We must provide purpose-driven leadership and opportunity at every level within government, academia, industry and civil society to achieve this Vision.

What?

The built and natural environments are complex **systems** that are essential for our health, wellbeing, and resilience. The route to improving outcomes is via the **services** that these systems provide. Therefore the built environment must be managed as the deeply interconnected system that it is.

When?

The change needs to start now in order to get out of current damaging and unsustainable pathways. There are positive examples we can follow, but we need to do more and we need to do it now.

How?

We potentially have the **enablers** we need to create the future we want, but only if we are intentional about it. Wise application of the fourth industrial revolution to the built environment could help us to understand and coordinate it in a way that benefits people and nature.

So what?

We stand at a crossroads between the opportunity of systems-thinking and digitalisation and the threat of the climate emergency, habitat loss and resource depletion. If we do not define and intentionally create the future we want, then we are at the mercy of the future we get.

What now?

We need to turn the language of Vision into the language of policy, strategy and action across the industries that serve the built environment - and make this Vision a reality.