National Digital Twin – An ecosystem of connected digital twins enabling better decisions faster across the built environment

What is it?
Why do we want it?
What is being done to deliver it?
This is Digital Built Britain

**Design**
Use best practice, secure by default, information management and digital techniques to get data right from the start and design better-performing homes, buildings and infrastructure.

**Build**
Exploit new and emerging digital construction, information management, and manufacturing technologies and techniques to improve safety, quality and productivity during construction.

**Operate**
Use effective information management to transform the performance of the built environment and the services it delivers.

**Integrate**
Understand how the built environment can improve citizens' quality of life and use that information to drive the design and build of our economic and social infrastructure and the operation and integration of the services they deliver.
Benefits of the National Digital Twin

Better outcomes for the public per whole-life pound

- **Benefits to society:** Improved stakeholder engagement. Better outcomes for the ultimate customers (the public – taxpayers/bill payers/fee payers/voters). Improved customer satisfaction and experience through higher-performing infrastructure and the services it provides.

- **Benefits to the economy:** Improved national productivity from higher-performing and resilient infrastructure operating as a system. Improved measurement of outcomes. Better outcomes per whole-life pound. Improved information security and thereby personnel, physical and cyber security.

- **Benefits to business:** New markets, new services, new business models, new entrants. Improved business efficiency from higher-performing infrastructure. Improved delivery efficiency, benefiting the whole construction value chain – investors, owners, asset managers, contractors, consultants, suppliers. Reduced uncertainty and better risk management.

- **Benefits to the environment:** Less disruption and waste. More reuse and greater resource efficiency – a key enabler of the circular economy in the built environment.
Water
Telecoms
Waste
Residential, commercial and industrial
Interface with the natural environment
Built environment
Digital twins

Physical twin

Digital twin

Outcomes

Data

Interventions

Insights

Decisions
Connected digital twins
Ecosystem of connected digital twins
Ecosystem of connected digital twins
Ecosystem of connected digital twins
Connectable digital twins
The background to the approach

Top down
(Authoritarian)

Bottom up
(Darwinian)
The emerging approach

Commons

A national resource, held in common, that unlocks effective information management across the industry; the minimum necessary open standards/methodologies; expert led – the “ministry of all the talents”

DT Hub

Collaborative, web-enabled, learning community that learns by doing; captures and shares emerging best practice; turns experience into guidance and guidance into standards; practitioner led – those who own or are developing digital twins.
The core streams of the Roadmap

- Approach
- Governance
- Commons
- DT Hub
- Enablers
- Change
**Guided by the Gemini Principles**

<table>
<thead>
<tr>
<th>Purpose: Must have clear purpose</th>
<th>Public good Must be used to deliver genuine public benefit in perpetuity</th>
<th>Value creation Must enable value creation and performance improvement</th>
<th>Insight Must provide determinable insight into the built environment</th>
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<tbody>
<tr>
<td>Trust: Must be trustworthy</td>
<td>Security Must enable security and be secure itself</td>
<td>Openness Must be as open as possible</td>
<td>Quality Must be built on data of an appropriate quality</td>
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<td>Function: Must function effectively</td>
<td>Federation Must be based on a standard connective environment</td>
<td>Curation Must have clear ownership, governance and regulation</td>
<td>Evolution Must be able to adapt as technology and society evolve</td>
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Thank you