

# Platform Design Programme

## Defining the Need

Summary report

December 2020



# Summary

The movement to bring standardised, repeatable platform systems found in the manufacturing sector to construction has been growing. Both automotive and aerospace industries have shown that demand and standardisation give the market confidence to invest in new solutions, training and upskilling at scale. Construction, however, has been held back by a lack of clear, consistent processes and standards that allow platform solutions to work across multiple projects and building types and by a lack of confidence in a forward pipeline for these solutions.

The government has created the right conditions to build this missing confidence and accelerate the market for platform construction systems through the new policies set out in the Construction Playbook. In parallel, the Construction Innovation Hub is now developing the processes and standards that support platform solutions and will develop, manufacture and assemble a proof of concept building using platform components and assemblies that follow these new processes and standards.

In 2020, the Hub's Platform team partnered with the Department for Education (DfE), Department of Health and Social Care (DHSC), Ministry of Housing, Communities and Local Government (MHCLG), Ministry of Justice (MoJ), and the Ministry of Defence (MoD) to collate a cross-departmental data set of future requirements against a £50 billion five-year new build pipeline.

**Analysis of this data set, combined with stakeholder interviews with clients and end users, has identified a clear and defined market opportunity for platform design for manufacture and assembly systems, across social infrastructure. Of the £50 billion pipeline analysed, around £35 billion has been identified as being suitable for delivery in whole or in part through a platform solution.**

This initial activity conducted under the banner of 'Defining the Need', serves as evidence in support of policies in the Construction Playbook — the UK government's Commercial Guidance on sourcing and contracting public works projects and programmes.

With a comply or explain principle, the Playbook clearly signals government's move towards procuring construction projects based on:

- Platforms comprising of standardised interoperable components and assemblies;
- Driving improvements in setting clear and appropriate outcome-based specifications; and
- Enabling innovation and Modern Methods of Construction through aggregated and standardised demand.

A report titled 'Defining the Need' is due to be published this winter. This takes forward these themes and starts to define the potential benefits of pan-government harmonisation, standardisation and rationalisation of requirements across construction projects, programmes and portfolios.

# About the Platform Design Programme

Funded through UKRI's Transforming Construction Challenge, the Construction Innovation Hub is collaborating with government and industry across its four key themes of Value, Manufacturing, Digital and Assurance. The Hub aims to create better outcomes for current and future generations by driving the adoption of manufacturing and digital approaches that improve the delivery, resilience and performance of infrastructure. Its work supports the ambitions of the Construction Leadership Council's strategy and the Roadmap to Recovery.

The Platform Design Programme (PDP) is a core element of the Hub's programme. Applying systems engineering and manufacturing techniques, the project team will develop processes, rules and interface standards that will create a market for buildings made from platform construction systems. Following these processes, rules and standards, the Hub will develop, prototype, test and demonstrate an open platform construction system that can:

- Be implemented at scale across a pan-government pipeline of social infrastructure works;
- Reduce project cost, delivery time and lifetime carbon emissions;
- Boost productivity and increase the asset whole life value;
- Offer an opportunity to integrate active renewable energy systems; and
- Be used flexibly to create beautiful buildings and spaces that reach high design standards.

This project embodies all the challenges of building design while adding the complexity of co-ordinating the demands of multiple departments, to provide a high level of standardisation — without compromising flexibility and performance requirements.

# Defining the Need

‘In order to encourage the adoption and implementation of the P-DfMA approach, each relevant government department must first examine its own technical standards... Having a consistent and streamlined set of standards and components in this way would enable the market to respond more effectively, particularly if the industry is brought into the process early.’

Institution of Civil Engineers (Open Call for Evidence – P-DfMA Submission, Feb 2019)

The initial project phase – ‘Defining the Need’ – has captured customer needs and objectives, across a social infrastructure portfolio, to develop a brief for the platform strategy and architecture. This has included collation and aggregation of a forward pipeline for DHSC, MHCLG, MoJ, MoD and DfE — analysing the total demand to assess economies of scale and scope.

To inform the platform strategy by identifying points of commonality and differentiation, a detailed functional review of sample room types across the government estate was also completed. The exercise found that each department applies its own nomenclature for spaces and assets, and its own way of predicting and publishing its forward pipeline. Aligning this data into a granular and consistent format has been an important step. The work demonstrates how government can harmonise, digitise and rationalise demand in line with the policies of the Construction Playbook.

This qualitative and quantitative data was analysed to identify areas of commonality and difference across the cross-departmental pipeline to identify the characteristics of the platform system/s with the overall greatest applicability to the public sector estate.

This exercise was pioneering in both breadth and scale. It represents the first time that space-level information has been brought together across government departments, with a five-year pipeline of circa £50 billion analysed.

# Key insights

Findings from the Hub’s analysis of a £50 billion DfE, DHSC, MoD, MHCLG and MoJ’s five-year new build pipeline:

c£35bn

the estimated value of the pipeline that could be delivered with a defined range of mid-span (~8m) platform construction systems, based on geometry alone.

c£13bn

the estimated value of the pipeline that could be delivered with the Hub’s Platform Construction System.

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different names for toilet spaces across the estate. This highlights the need for a common, machine-readable, way of naming spaces to accurately analyse and harmonise future demand.

50%

More than 50 percent of space types across the pipeline are not department specific — hallways, bathrooms and storage areas could be delivered with a standardised platform solution.

38%

of spaces across the new build pipeline will be ‘Residential Spaces’, presenting a secondary market for the private sector. If the Hub’s Platform Construction System demonstrates how it can be used to deliver ‘more beautiful, more sustainable, better quality homes in all parts of the country<sup>1</sup>’, it could potentially be used to deliver private sector homes, student accommodation, and hotels domestically and internationally.

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The majority of departmental specifications are open to interpretation. Units can vary across departments — . dB or NR are both used for acoustic performance. Improved standardisation of requirements — not least nomenclature — is needed to unlock the potential for solutions that deliver pan-government.

# Trends

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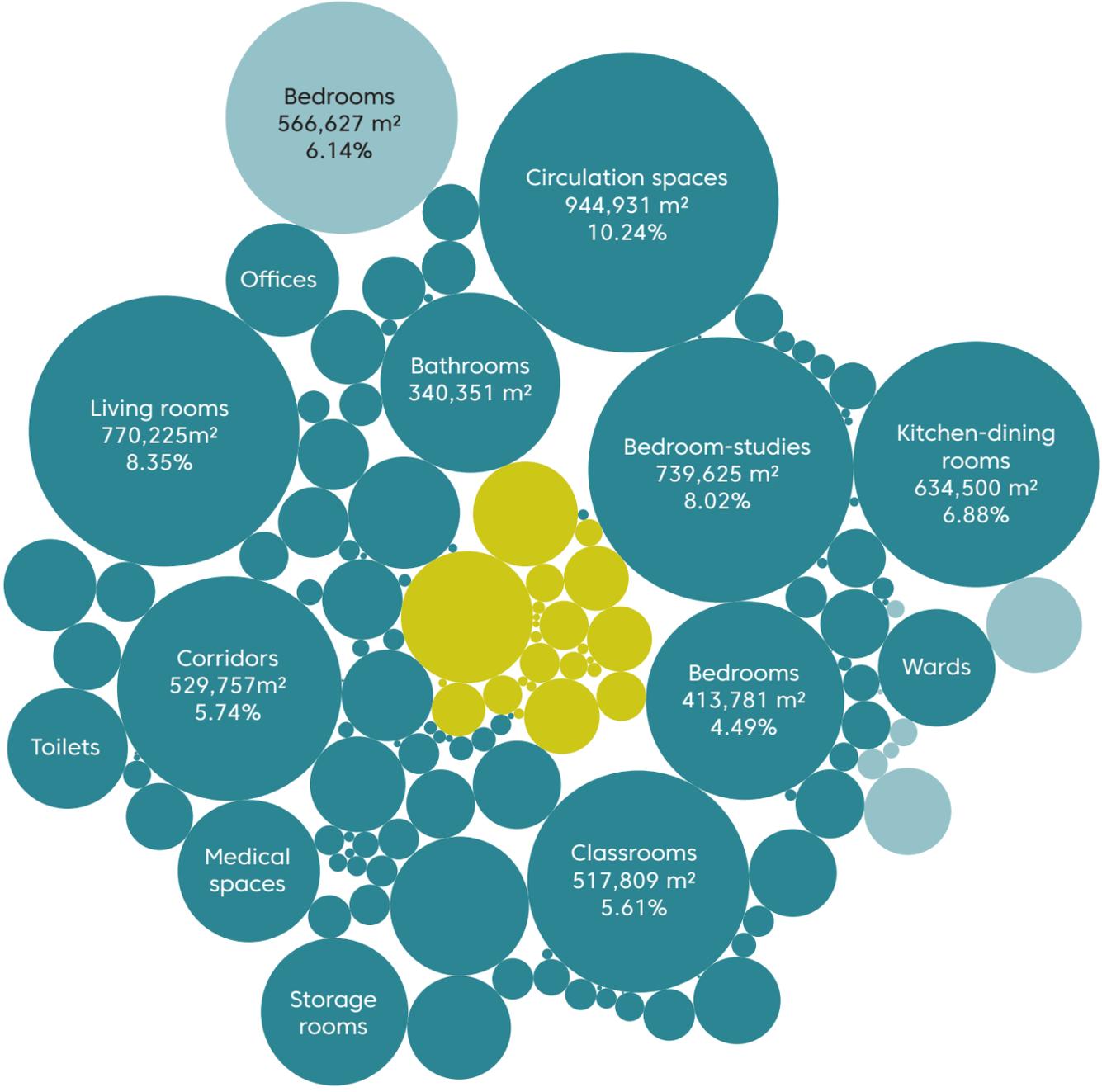
The government is committed to bringing all greenhouse gas emissions to net zero by, or ahead of, 2050. Platform construction systems must understand and minimise their GHG emissions footprint throughout their lifecycles.



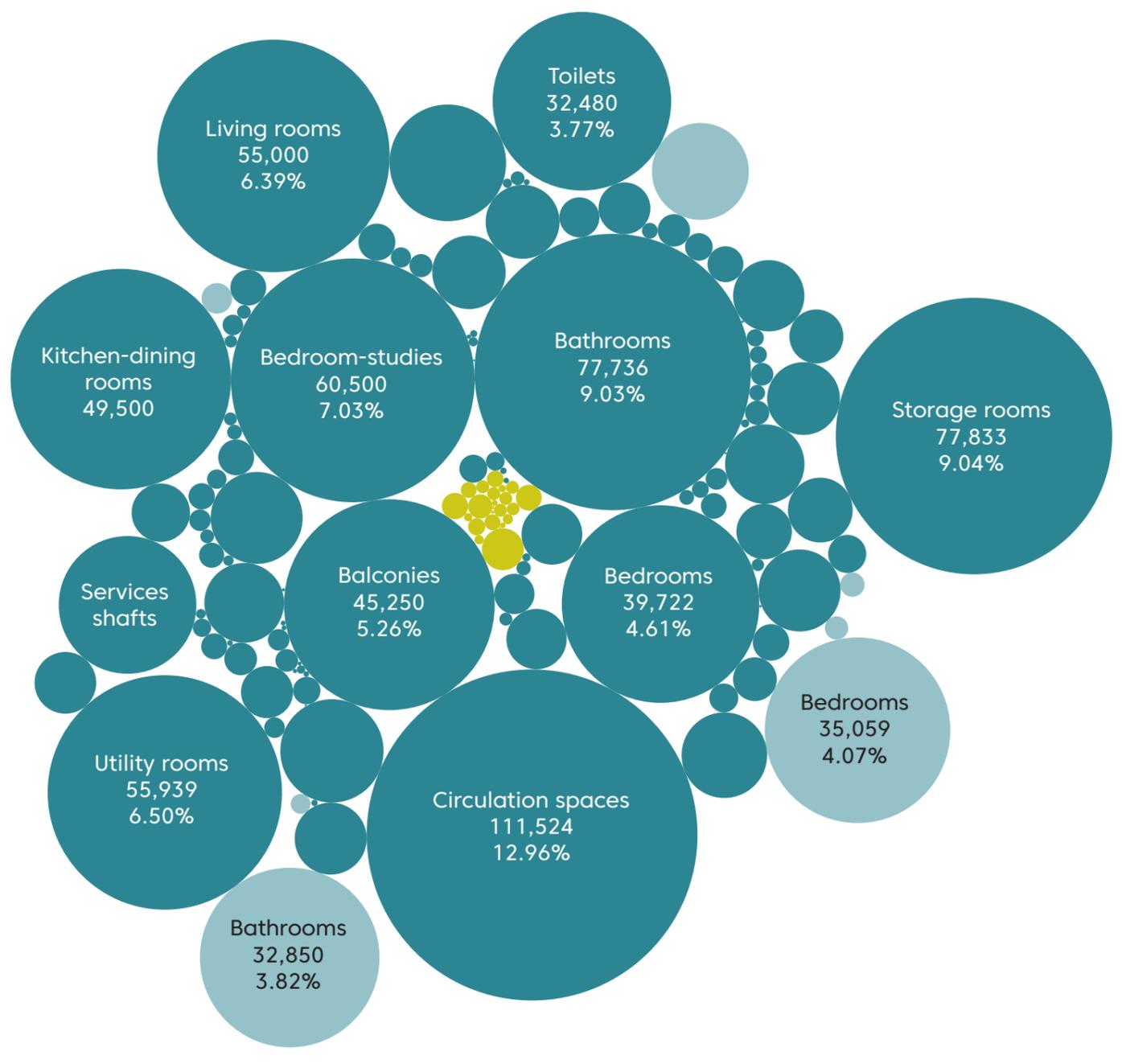
Buildings need to be highly adaptive so that they can be reconfigured/repurposed across the required 60-year service life.

<sup>1</sup> <https://www.gov.uk/government/speeches/robert-jenricks-speech-to-chartered-institute-of-housing-cih-2020>

# Area of spaces



# Frequency of spaces



- Large
- Mid
- Small

**Fig1. Government pipeline categorised by span size**  
 Triangulating spatial data with each department's pipeline data illustrates that c.70% of space types across the collective government pipeline require a mid-span framing solution.

# Conclusion

The 'Defining the Need' phase has demonstrated an objective, evidenced-based approach to understanding the requirements of the public sector estate. It serves as a proof of concept for the Construction Playbook's mandate to harmonise, digitalise and rationalise demand across new build projects and programmes. While the results are insightful, the process of gathering and analysing the data has also proven to be revealing.

With a cross-departmental pipeline analysed, the top three most common space types by area were circulation, storage and bathrooms. Together they constitute approximately 30 per cent of the government's estate. This shows there is significant opportunity to harmonise pan-government pipelines and produce standardised, repeatable platform construction systems that meet the requirements of multiple departments.

This would allow departments and their teams to focus their design resource on optimising spaces that are specific to their department or communities – providing value where it realises greatest return.

Combined with the Construction Playbook's policy for longer-term contracts, this pipeline of demand shows the scale of the potential public sector market for platform approaches, standard products, and components.

# Next steps

'Many [respondents to the P-DfMA Open Call] suggested that the government should undertake research, in collaboration with the supply chain, to design and implement standard but flexible interfaces and joints between building components and building systems.'

Infrastructure Projects Authority P-DfMA Open Call consultation – Dec 2020<sup>2</sup>

Based upon the data collated, the Platform team have begun to develop a platform strategy and architecture that satisfies the requirements of the addressable market. From this, the project team plan to progress:

- A Rulebook – with defined rules and interface standards of how technologies and building components can be integrated;
- A Value Proposition – applying the Value Toolkit to define the characteristics, competitive differentiation, cost structure and life cycle of the platform;
- A Kit of Parts – the components of the platform, that can be varied within certain constraints; and
- Enablers – resources to support adoption. A platform construction system approach necessitates new methods of working and new relationships that may require a change to the way organisations need to be structured. The success of a platform approach relies as much on clear definition of roles, responsibilities and process, as it does the kits of parts.

The processes and standards developed by the Platform Design Programme will be made openly available. In 2022 the PDP will demonstrate how the Platform Construction System can be applied in practice, by showcasing the work undertaken with a proof of concept training building at the Manufacturing Technology Centre in Coventry.

<sup>2</sup> <https://www.gov.uk/government/consultations/proposal-for-a-new-approach-to-building-call-for-evidence/outcome/proposal-for-a-new-approach-to-building-call-for-evidence-summary-of-evidence>

# Opportunities for clients and the supply chain

To learn more about the Hub's Platform Design Programme and pre-register for a copy of the Defining the Need report, please visit [www.constructioninnovationhub.org.uk](http://www.constructioninnovationhub.org.uk)

Our PDP offers opportunities to the broader market at three distinct levels:

- In demonstrating the potential for platforms and its applicability to the construction sector;
- In stimulating the creation of a new platform marketplace; and
- Through learning of the process, enable others to procure, develop and apply platforms to develop better, faster and greener outcomes.

The original remit for the Platform Design Programme was to enhance delivery of social infrastructure.

The forthcoming Defining the Need report shows how platform construction systems could address a significant proportion of the social infrastructure pipeline and revealed potential private sector residential applications. The report also shows that there is enough demand to support a range of platform systems and that the economies of scope and scale will offer advantages to clients, contractors, and the supply chain.

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