



## Experience from the UK Government's BIM Programme

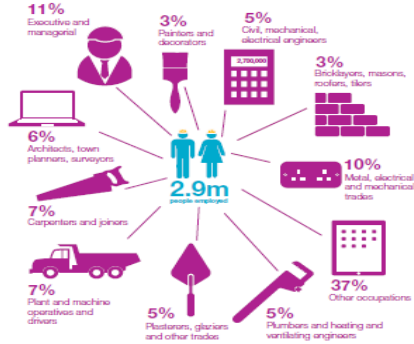
Tokyo, 13<sup>th</sup> October 2016

Adam Matthews  
Director of International Development  
UK BIM Task Group

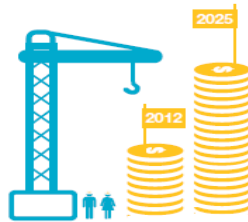


HM Government

## Construction



There are **2.9 million** jobs filled in the Construction Industry, circa 10% of all jobs (in over 280,000 businesses)



Global construction output is forecast to increase from around \$8.5 trillion today to **\$12 trillion in 2025\***

\*Source: Global Construction 2025



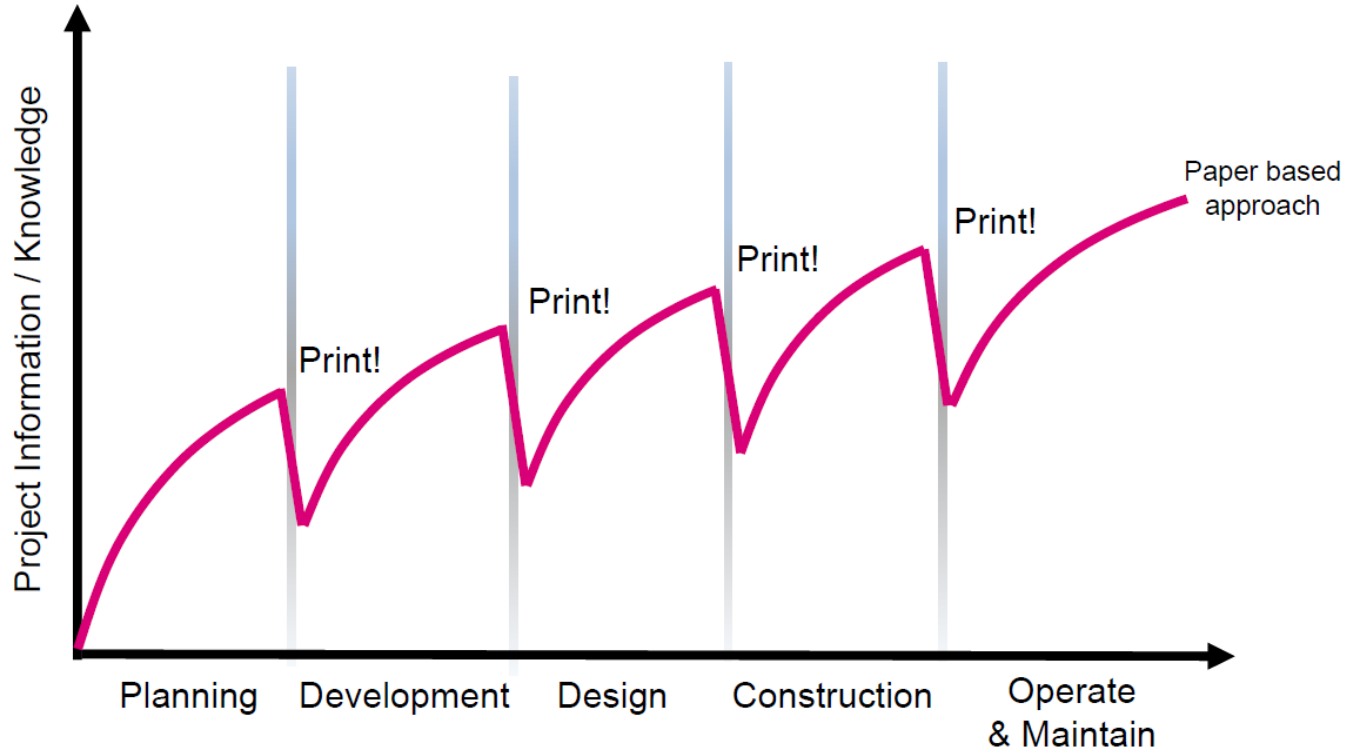
The **UK has the sixth largest green construction sector in the world**. Around 60,000 jobs are expected to be supported by the insulation sector alone by 2015

#indstrategy

# 35%

- Misunderstanding of client needs
- Miscommunication
- Rework and recreation of data
- Poor or no information management

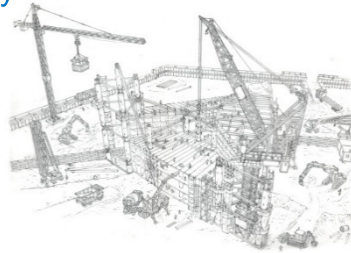
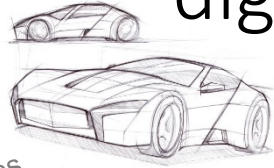
# Traditional Projects



# Paper based silos



# Declining productivity and low degree of digitalisation

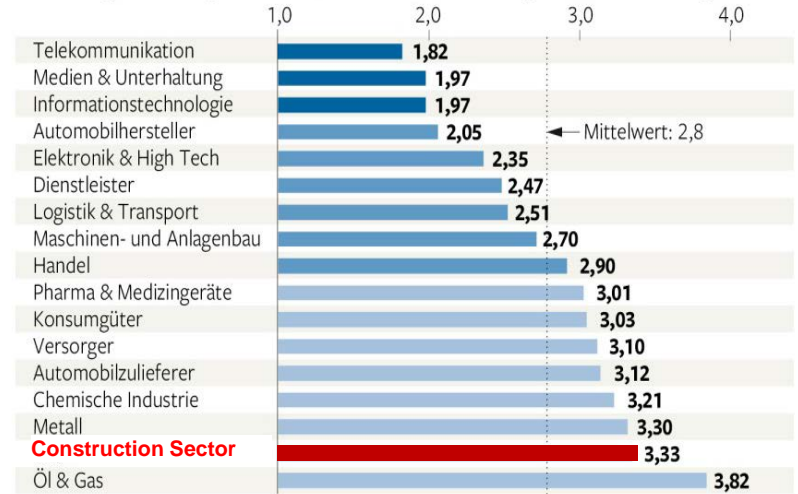


productivity

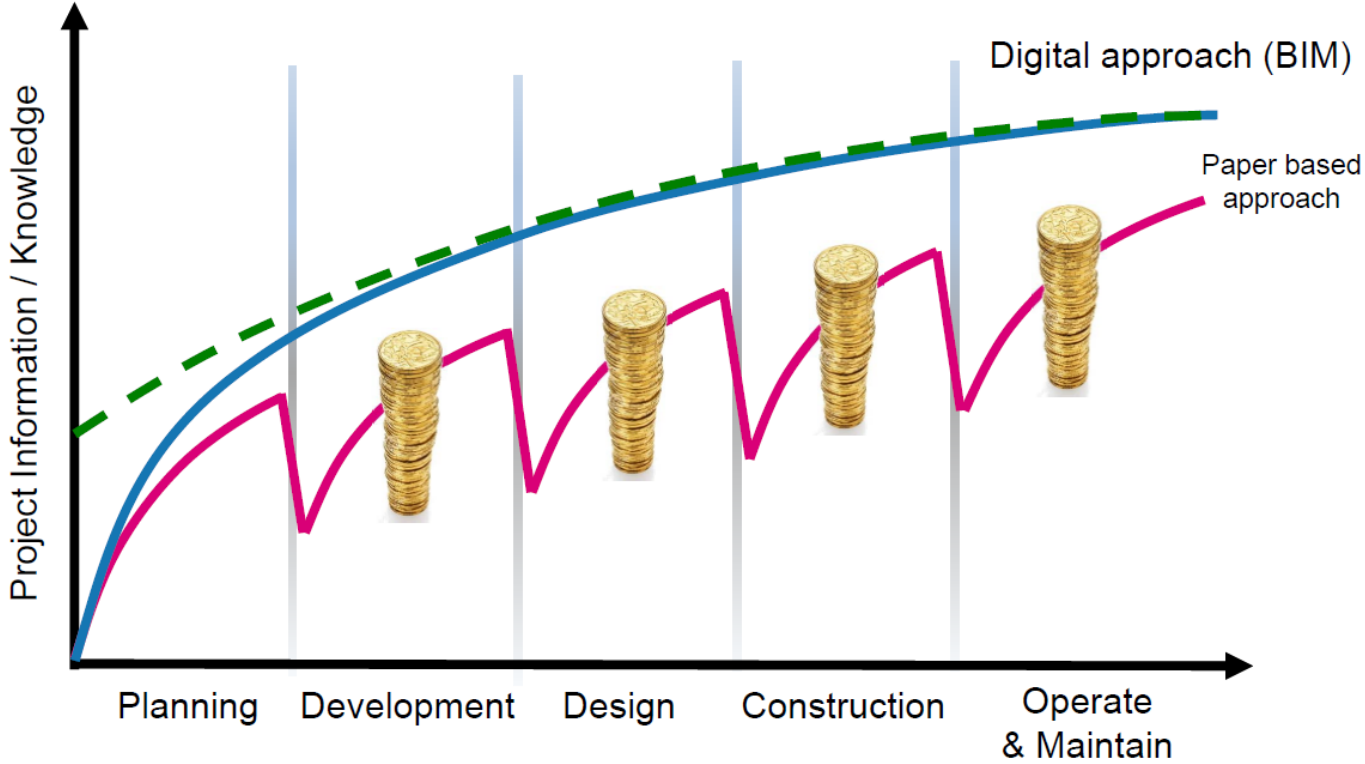
All other non-farm industries

Construction industry

Scale: 1 = mostly, 2 = partly, 3 = very little, 4 = rudimentary digitized



# Reduce waste - flow of data using BIM



# UK – Vision



## Lower costs

33%

reduction in the initial cost of construction and the whole life cost of built assets

## Faster delivery

50%

reduction in the overall time, from inception to completion, for newbuild and refurbished assets

## Lower emissions

50%

reduction in greenhouse gas emissions in the built environment

## Improvement in exports

50%

reduction in the trade gap between total exports and total imports for construction products and materials

# Government Budgetary Goals

## Strategy Objectives

### Leadership and leadership

represents a challenging change programme which will need significant engagement with Government and industry stakeholders. It should not be seen as a response to the challenges we face, and the strategy can only be implemented through the leadership of Government and industry alike.

Improvements in the procurement and delivery of construction projects have been a key focus of the Government's programme to use its scale in the construction sector to lead the process of change. The construction industry must play a leading role in this process, and focused effort will be required to build a new relationship between Government and the industry.

The reform of the programme of work in relation to the construction strategy, IUK's work on infrastructure, and wider work on the reform of Government procurement in relation to construction. This will be supported by additional Government clients, chaired by the Chief Construction Board ("the Board"). It will have the mandate to become the primary body for the delivery of the programme of work.

The primary of the Government Construction Standards ("the Standards") will be to set the standards and policies which will be mandated for all construction projects. The Standards will be a live document and will be regularly updated.

The Building Award will be redesigned in line with the strategy to ensure that it is a key driver of the delivery of value through the construction sector.

From autumn 2011 a rolling two year forward programme of work will be subject to change. Priorities change, just as the industry will make its own decisions on products and services aimed at that programme.

## 2 Strategy Objectives

2.7 The Cabinet Office will work with departments, reintegrate the Public Sector Construction Database ("the PSCD") to provide the basis of this information.

2.8 Once complete, the PSCD will also provide a basis for client led improvements – see Client Relationship Management.

**Progress to May 2011**  
The use of the PSCD for central Government departments was mandated in the Plan for Growth, published as part of the Budget 2011. A short programme to review its functionality is now under way to identify refinements and improvements.

### Governance and client skills

2.9 The range of skills shown in both the public and private sectors in the procurement and delivery of construction projects is comparable. Feedback from the supply side is that there are departments who show a high level of skill, but that this is not the case for all Government departments. Given the scale of the public sector construction programme, it is important to ensure that Government commissioning teams are consistently equipped with the necessary high level of skills appropriate to specific projects and programmes.

2.10 Working with the Board members, the Cabinet Office will ensure the establishment of appropriate governance structures for all construction projects consistent with the requirements of the Integrated Assurance and Assessment Process of the new Major Projects Authority, giving transparency to management accountability.

2.11 To this end, departments will make available on their websites details of project/programme governance structures for funded construction projects and the individuals accountable for them as Senior Responsible Owners and Project Sponsors. The Cabinet Office will adapt the PSCD to track departmental construction projects.

2.12 In collaboration with the Government Construction Board, the Cabinet Office will also define the necessary skills for given roles in the governance structure, with a view to rolling them out across Government and initiating the tracking of capability.

\* Details can be found at <http://www.cabinetoffice.gov.uk/information/procurement/authority>

**15-20% cost reduction** on all centrally procured government construction projects **within the 2010/15 parliament**

Government will require fully collaborative 3D BIM ..... as a minimum **by 2016**



**CabinetOffice**

**BIS** | Department for Business Innovation & Skills



# Construction Strategy



- Cost reductions
- Promote Early Contractor Involvement
- Improved Client Leadership
- Government imperative to use BIM (Building Information Modelling)**

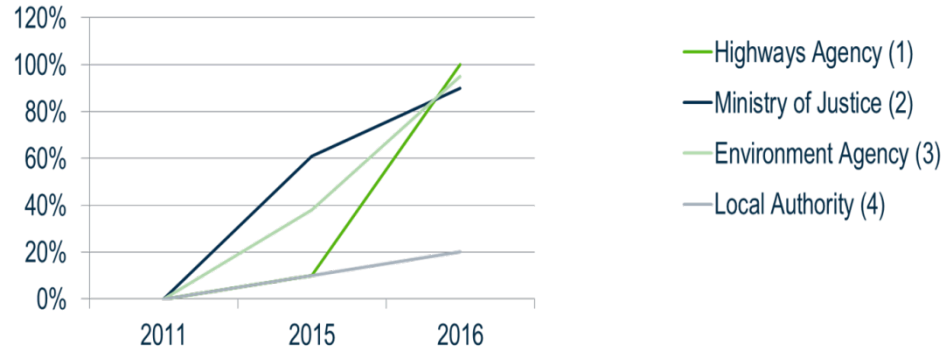
# BIM Strategy



**Government will require fully collaborative 3D BIM** (with all project and asset information, documentation and data being electronic) **as a minimum by 2016**

# £20bn/\$30bn

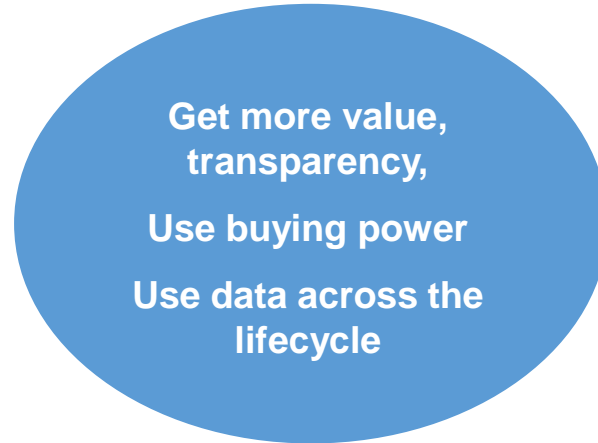
## Government purchasing power



Total project value c £9.6bn (2014)  
(Returns exclude , MOD, EFA, DoH, HS2)

# Strategy

## Industry Push



## Government Pull



Grow Industry Capacity

Communicate Vision &  
Foster Communities

Build a Common  
Collaborative Framework

## **Foundation of Public Leadership**

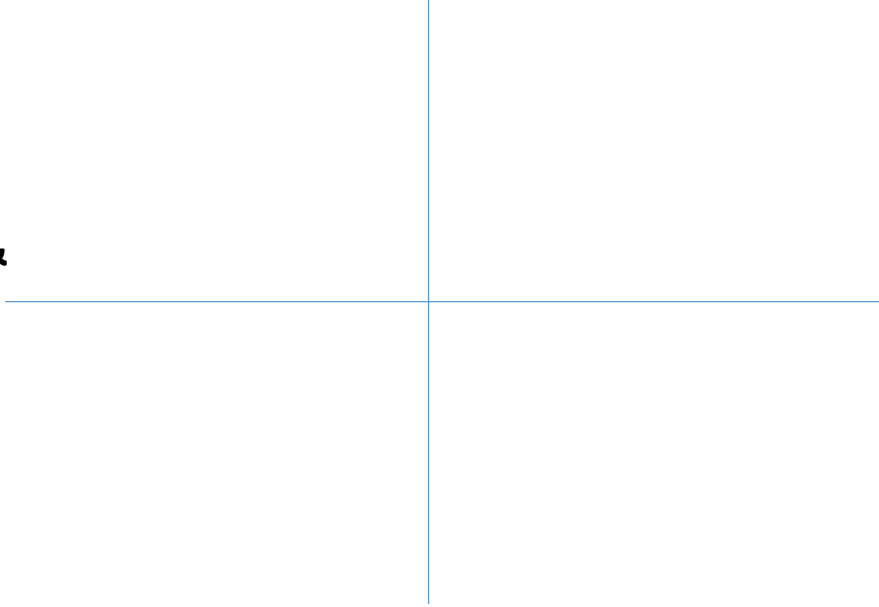
- Compelling drivers, vision and goals
- Aligned value proposition and strategy
- Sponsor, funded programme, stewardship team

**Grow Industry Capacity**

**Communicate Vision &  
Foster Communities**

**Build a Common  
Collaborative Framework**

**Foundation of Public Leadership**



Grow Industry Capacity

**Communicate Vision &  
Foster Communities**

- Engage industry stakeholders
- Create regional and focus networks
- Media, events, web, social media

Build a Common  
Collaborative Framework

Foundation of Public Leadership

# BIM4 COMMUNITIES CHARTER

## Purpose of the BIM4 communities

The BIM4 communities are a collaboration of specialist interests groups who will champion BIM in their respective specialist areas. Their purpose is to raise awareness of BIM, promoting a shared understanding of the value proposition and issues affecting the implementation of BIM in their respective areas of interests.

The BIM4 communities will seek to develop consistency of messaging in a clear and concise manner to support both new and existing professionals in their respective BIM journeys.

## What is BIM?

- BIM is a digital representation of the functional aspects of an asset and, as appropriate, its disposal and/or recycling.
- BIM is a process for creating and measuring cooperation; it enables greater levels of collaboration and better working practices across the industry and through the supply chain.
- BIM is an improved way of working; it reduces waste, mitigates risk and leads to tangible efficiency savings in both capital and operational expenditure.
- BIM is a shared knowledge centre for information about an asset and helps develop processes that cover the whole lifecycle of a building or asset.

## Values of the BIM4 communities

- BIM4 communities will focus on the goal of promoting BIM adoption and providing support on an industry-wide basis with no single bias to any one platform, group or company.
- BIM4 communities work will be mutually supportive and collaborative; they will share instances of best practice to benefit the greater good.
- BIM4 communities will be the forum for all specialist interest groups aiming to coordinate BIM activities; they will do this by working together and pooling resources to provide an effective and practical conduit that is both knowledge-based and current.

## Desired end result

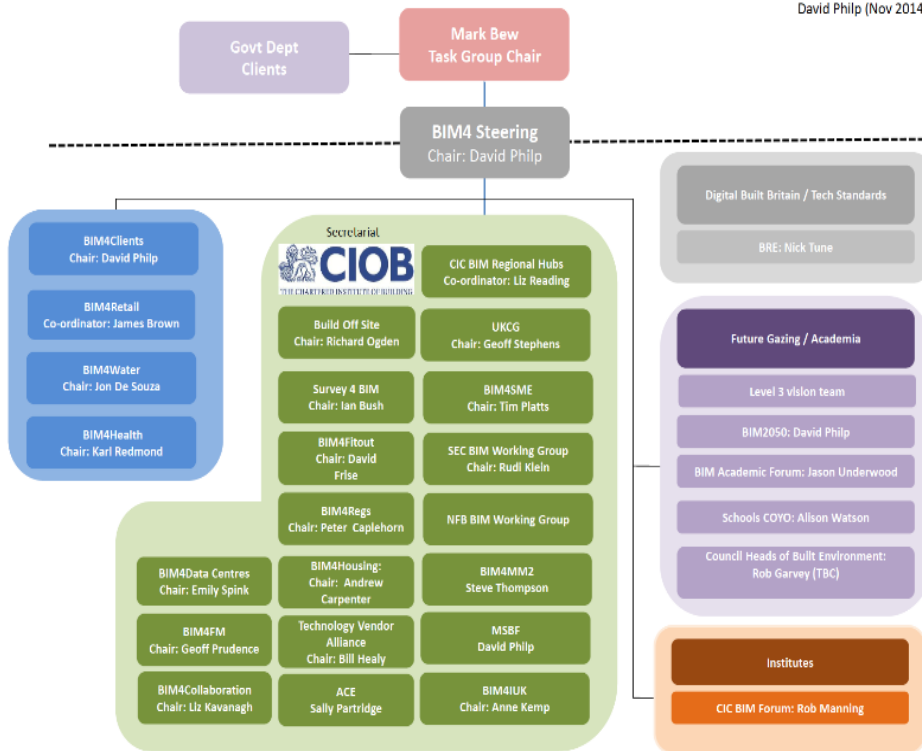
Instilling the adoption of BIM across the communities is as much a cultural challenge as a technical one. The BIM4 communities have a vital role in facilitating culture change whilst ensuring that the industry is equipped with the skills required to take up the BIM challenge as it spreads into the digital revolution that will be a transformation for the industry.



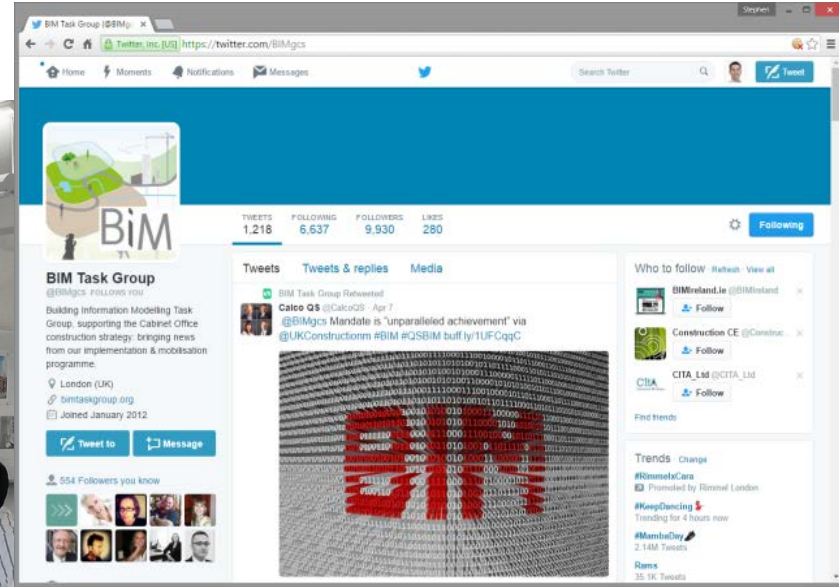
Building Information Modelling (BIM) Task Group

## BIM Task Group: BIM4Communities Organogram

David Philp (Nov 2014)



# Communication





Grow Industry Capacity

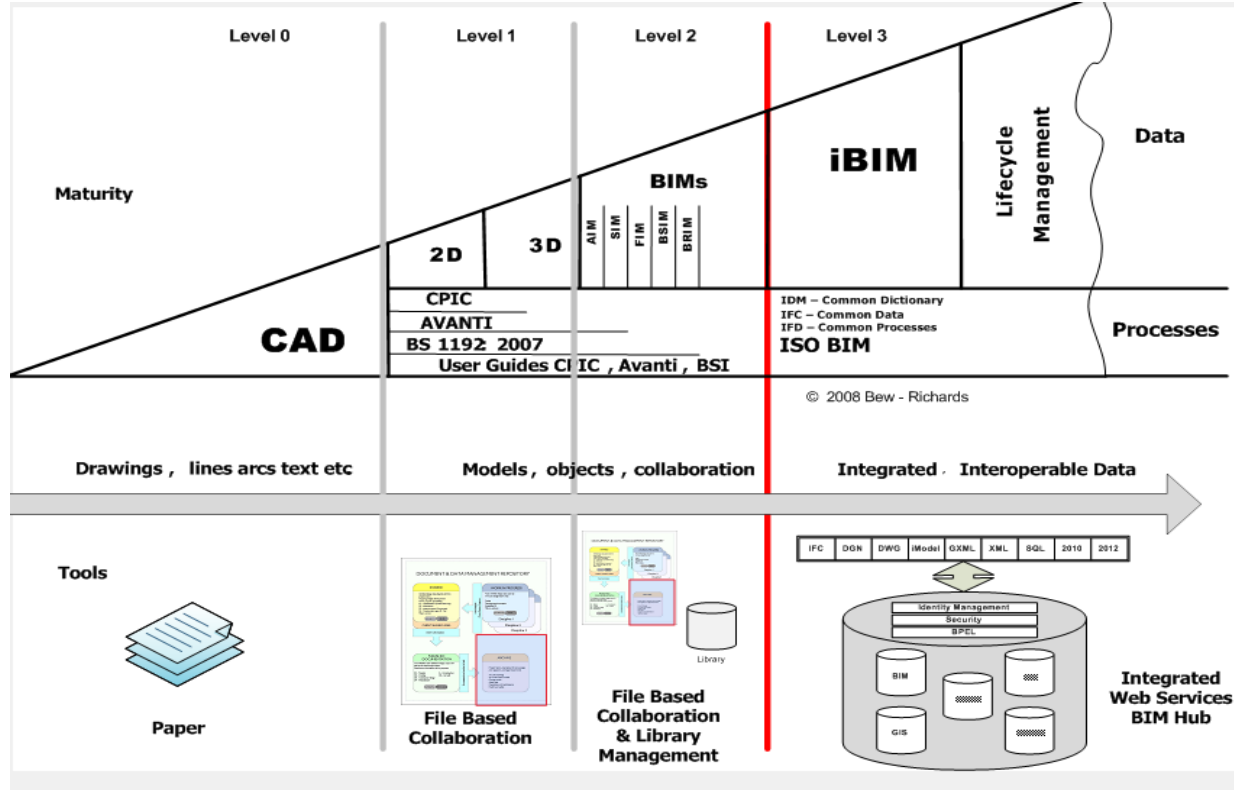
Communicate Vision &  
Foster Communities

**Build a Common  
Collaborative Framework**

- Legal and regulatory framework
- Data and process standards
- Skills, tools, guidance

Foundation of Public Leadership

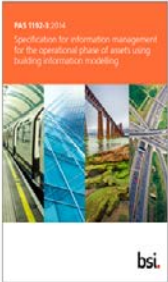
# What is BIM?



# UK's Framework for Collaborative BIM



PAS 1192-2



PAS 1192-3



BS 1192-4



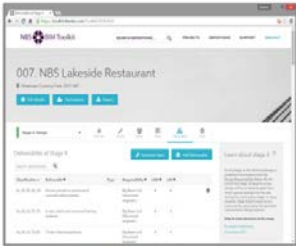
PAS 1192-5



BS 8536-1



CIC BIM Protocol



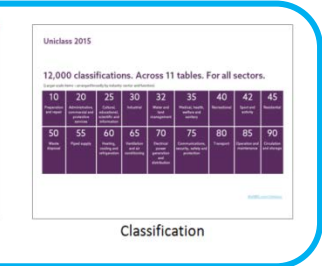
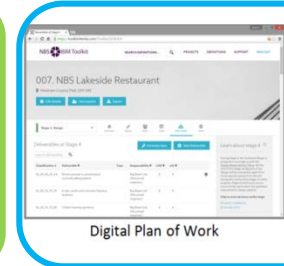
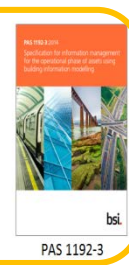
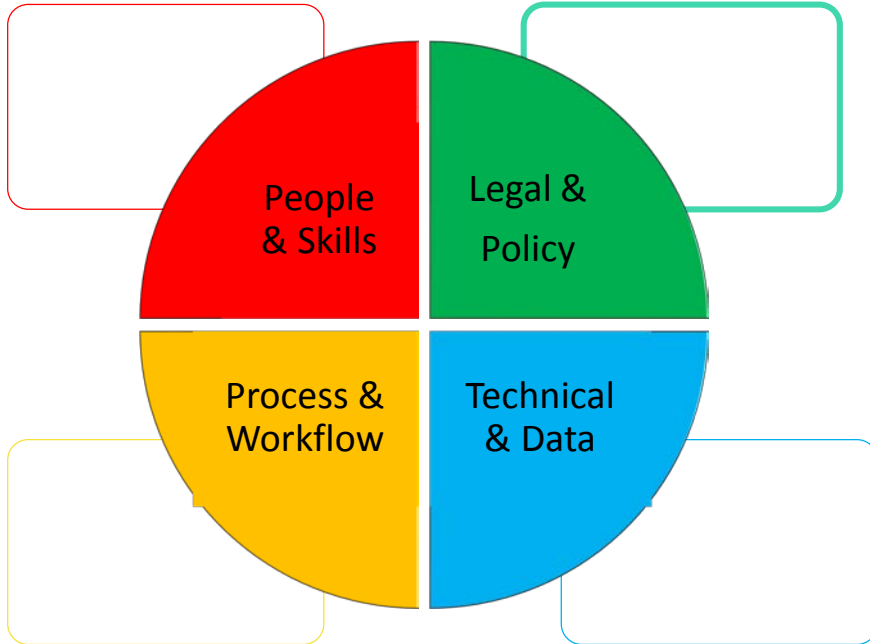
Digital Plan of Work



Classification

## Legal, Technical, Process & People

Source: BSI International Guide to UK BIM Programme, soon to be published on bim-level2.org



Source: BSI International Guide to UK BIM Programme, soon to be published on [bim-level2.org](http://bim-level2.org)

## Grow Industry Capacity

- Early wins, pilot projects, training
- Increasing use of strategic lever to grow capacity
- Measure and monitor, case studies, embed change

Communicate Vision &  
Foster Communities

Build a Common  
Collaborative Framework

Foundation of Public Leadership

Accreditations and Partnerships | BIM Task Group Learning Outcomes Framework Map

## BIM Task Group Learning Outcomes Framework Map for ICE BIM Training

**BIM Task Group Learning Outcomes Framework for BIM Level 2**

Understand what BIM is, the contextual requirement for BIM Level 2 and its connection to the Government Construction Strategy and Industrial Strategy 2025.

Knowledge requirements:	BIM FOR INFRASTRUCTURE	BIM IMPLEMENTATION
1.01 Background and the need for collaborative working (preventing waste, errors and poor quality/incomplete information)	✓✓✓	✓
1.02 The value of whole life and whole estate approach rather than capital-led and single asset	✓✓✓	✓
1.03 The concept of Soft Landings / Government Soft Landings (GSL)	✓	
1.04 Roles and responsibilities of the supply chain members and clients as part of Soft Landings 2 delivery (cultural / behavioural)	✓✓	✓✓
1.05 External context for BIM, global, national, standards and support communities	✓✓	✓
1.06 Core and extended suite of standards, documents and deliverables describing BIM Level 2	✓✓✓	✓✓
1.07 Barriers to successful adoption of BIM Level 2 and how to create the conditions for success	✓✓✓	✓✓✓
1.08 The value of high quality data and the principles of data management	✓✓✓	✓
1.09 The key vulnerability issues and nature of controls required to enable the trustworthiness and security of digitally built assets	✓✓✓	✓
2 Understand the implications and value proposition of BIM within your organisation		

QUICK ENQUIRY

Full Name

Phone Number

Email

Interested in

Your Enquiry

SUBMIT

citb.co.uk

Standards for 14 to 19 education

The advisory committee for 14 to 19 construction and the built environment education

Embedding Building Information Modelling (BIM) within the taught curriculum

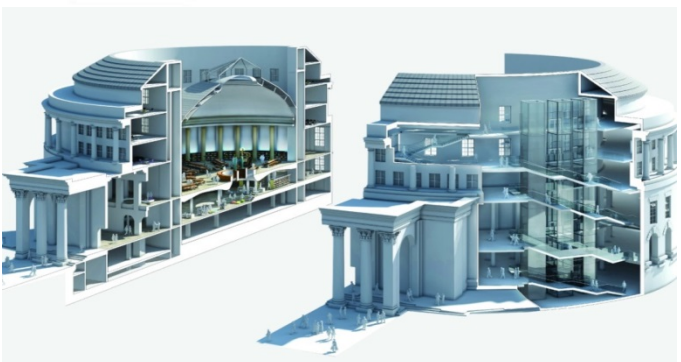
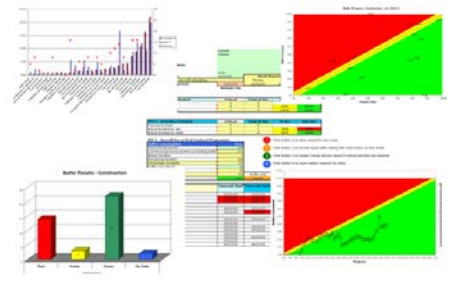
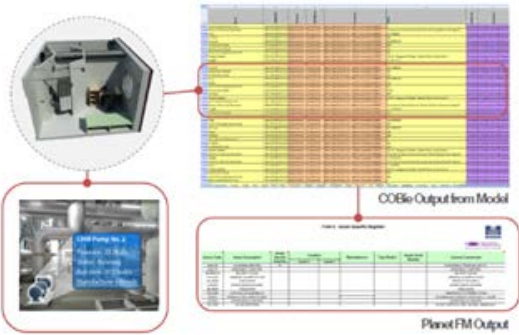
Supporting BIM implementation and adoption through the development of learning outcomes within the UK academic context for built environment programmes

June 2013

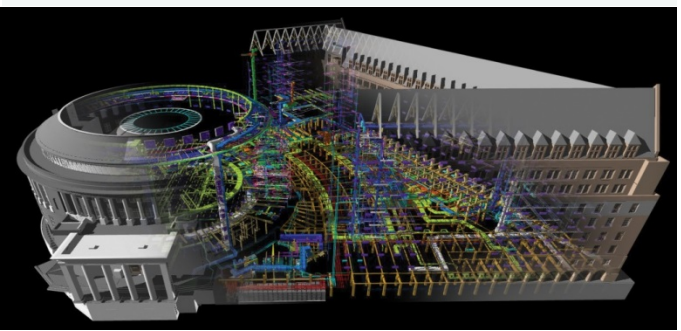
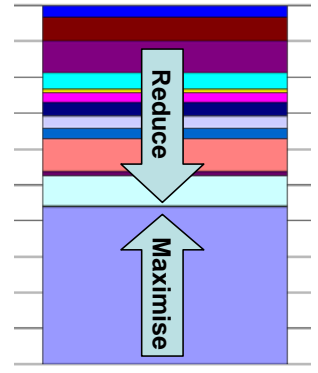
The Higher Education Academy

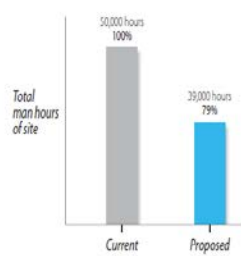
BAF BIM Academic Forum

Source: BSI International Guide to UK BIM Programme, soon to be published on bim-level2.org

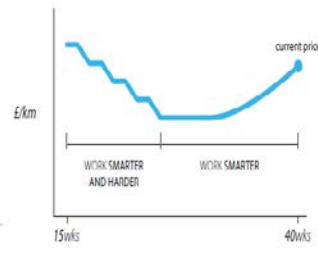


**Cost Component Breakdown**





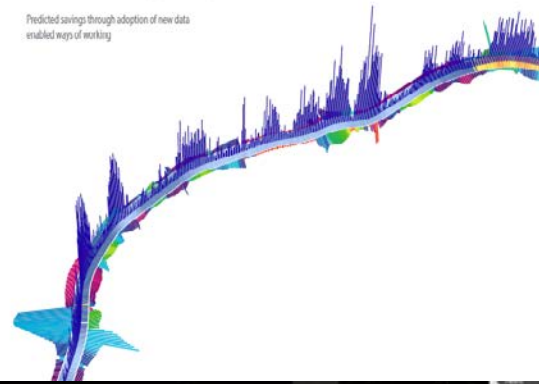
Reduced man hours on site therefore reduced exposure to danger



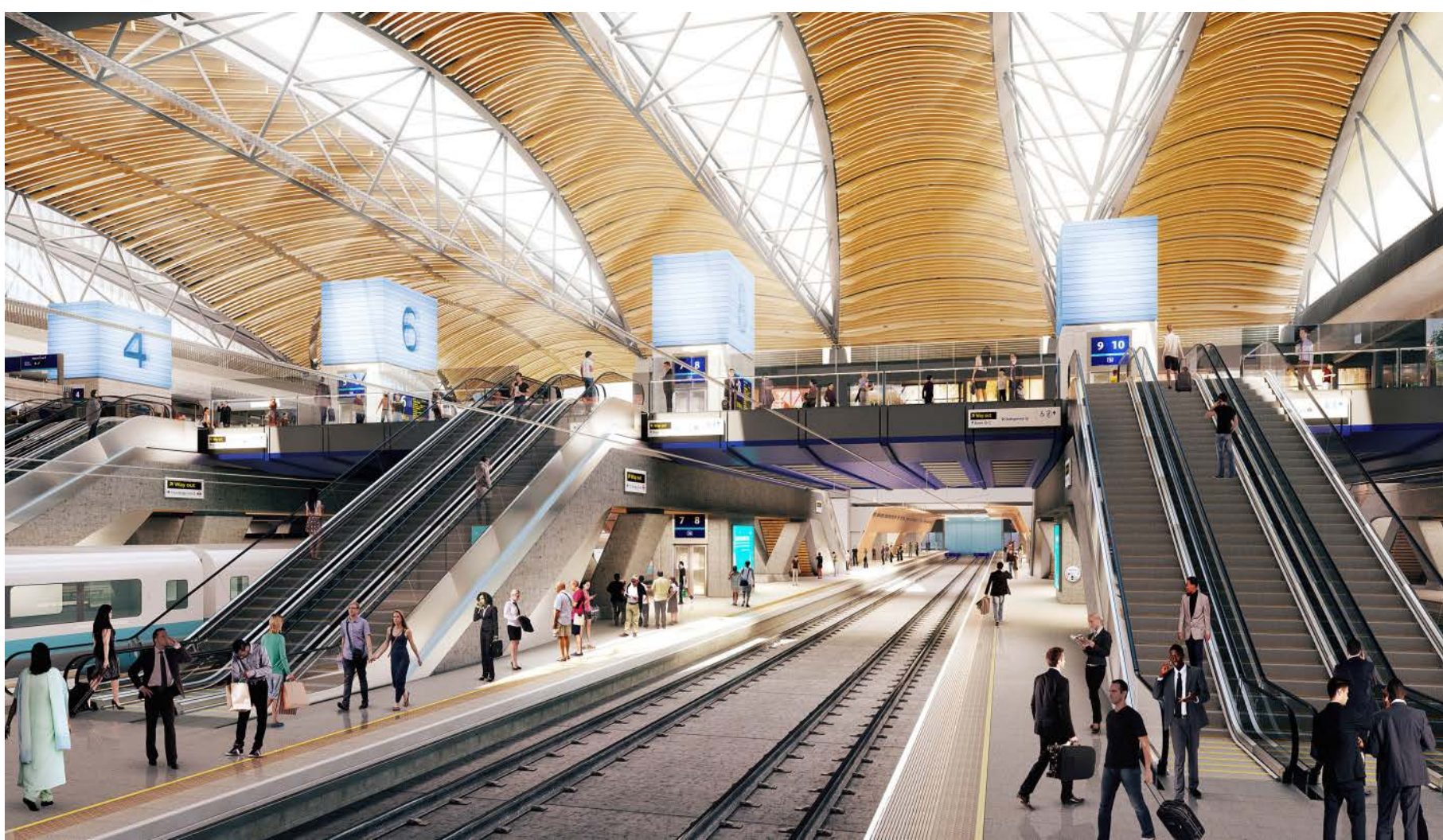
Predicted savings through adoption of new data enabled ways of working

Current - part of majorscheme	
Current - 4 km scheme	
Work smarter - 4 km scheme	22 wks
Work smarter & harder - 4 km scheme	16 wks

Period lane closure in p

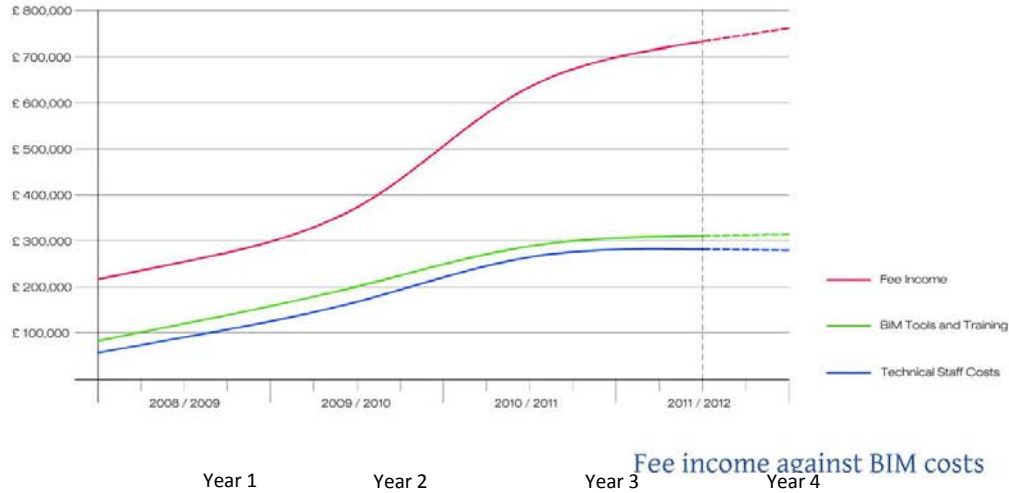




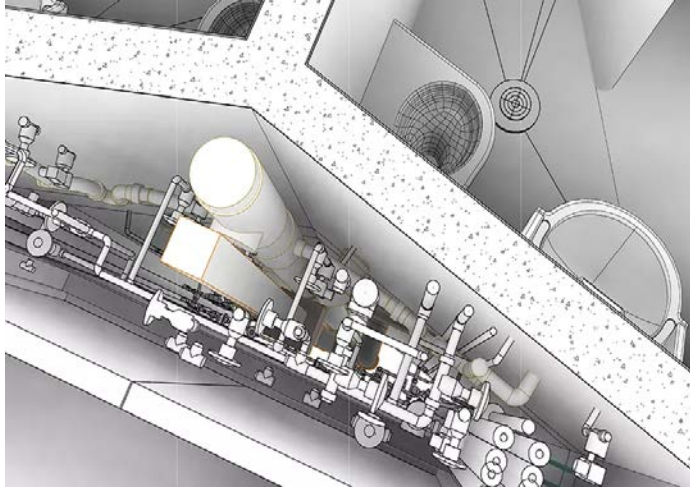


**HIGH SPEED 2**  
**£0.5BN SAVING**  
**LINKED TO BIM**

# Organisation productivity benefits SME



# MINISTRY OF JUSTICE



**Trial project:** Cookham Wood  
**New delivery model / procurement route:** Two Stage Open Book under PPC2000

**Cost savings achieved:** 20%  
**Other key benefits achieved:** Increased cost and programme certainty, innovation and reduced prospective operating costs

<b>Trial report sequence:</b>	Kick off meeting	Brief / Team Engagement	Decision to Build	Build and Occupy
<b>Cost saving basis:</b>	Outline saving aspiration	Challenging cost target	Award Cost	Outturn Costs

#### Trial project details

<b>Project title</b>	Cookham Wood Youth Justice Board New Build Young Offenders Institution
<b>Client department</b>	Ministry of Justice
<b>Project value</b>	£20 million (including construction cost, fees and escorts)
<b>Form of project</b>	New Build Young Offenders Institution
<b>Main contractor</b>	Interserve
<b>Lead designer</b>	Interserve supported by Arup
<b>Key suppliers</b>	SSC – Pre-Cast Volumetric Cell Provider EMCOR – Mechanical and Electrical Specialist Faithful & Gould – Client Representative HLN-Client architect/technical assessor Fob Deisgn Tier Consult Arup MJ Patch ICL

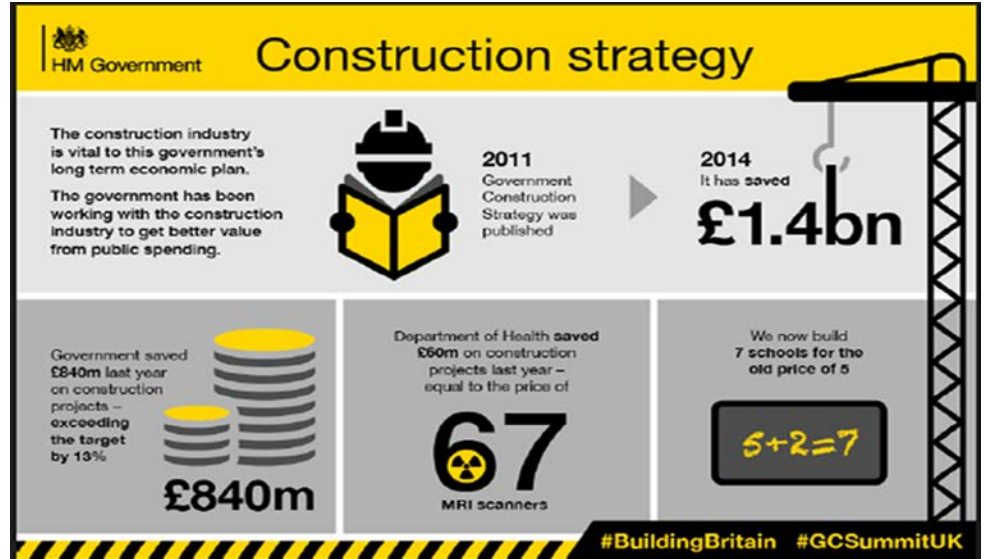


**20%**

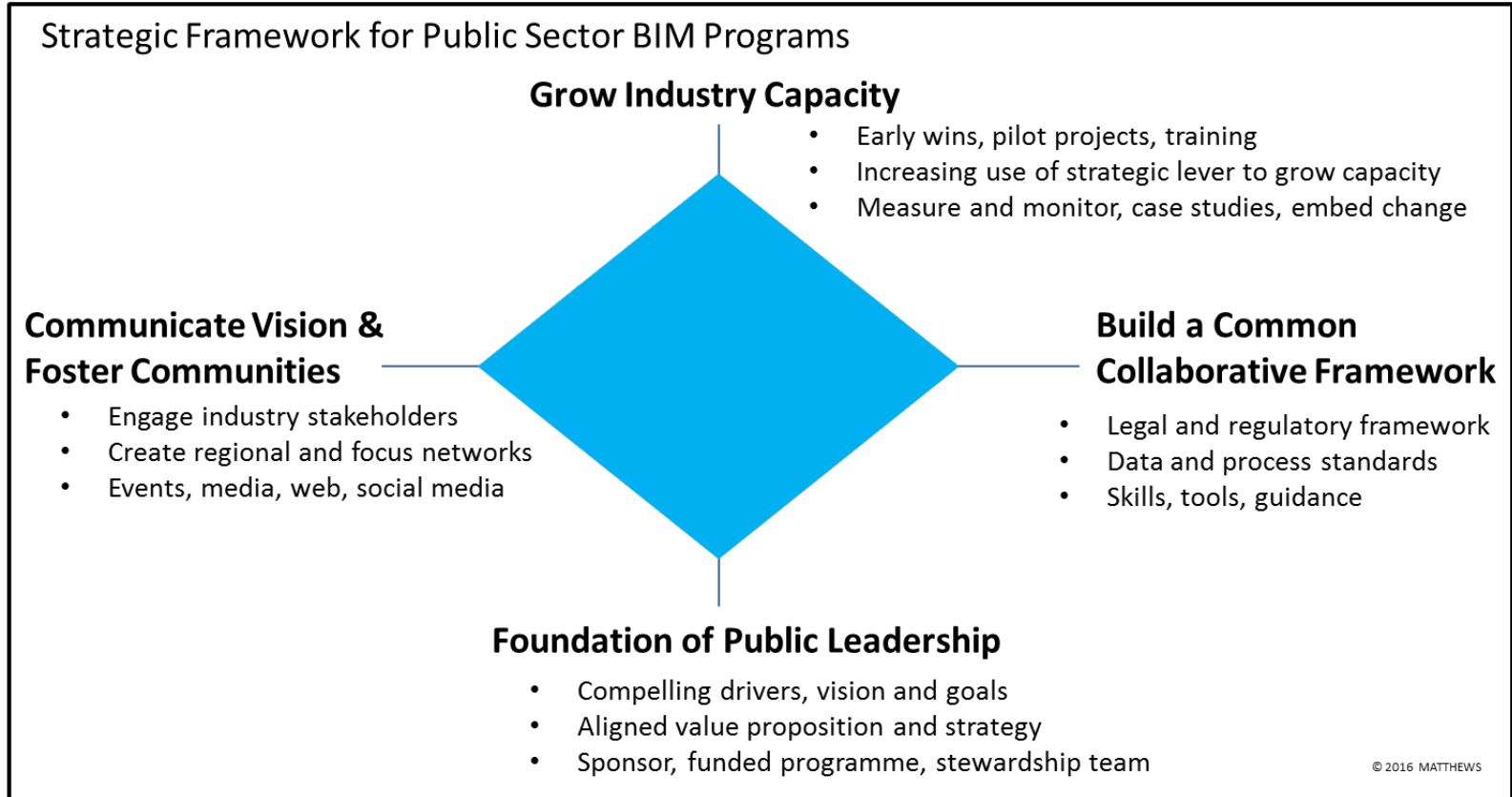
**Executive summary:**  
 Ministry of Justice have created a collaborative culture so as to bring together the consultants, Tier 1 and Tier 2 contractors at the earliest stage and to develop cost saving innovations and improved efficiency prior to start on site.  
 The Cookham Wood Trial Project combines collaborative working under Two Stage Open Book with the adoption of BIM, Project Bank Accounts and informal implementation of Government Soft Landings. A fully integrated team have worked to a tight timescale to commence delivery on site of a new build Young Offenders Institution that to date has exceeded cost saving targets.  
 Despite problems on site with severe weather, the originally contracted project works were completed within both the agreed timetable and the Agreed Maximum Price.

# Building More for Less

- Encourage collaborative working including early engagement of FM and Operation
- Visualisation & Lifecycle solution testing & preconstruction stage
- Accurate and complete data improving quality of bids, reducing risk allowances in target prices and lump sum bids
- 3D model input into the assessment of the impact changes at all stages in a project lifecycle
- Input of a populated asset data set into CAFM systems – saving time and avoid duplication



# Experience & Lessons Learned



## Rapidly evolving national digital programmes



Germany



Norway



Finland



Spain



France



UK



Netherlands

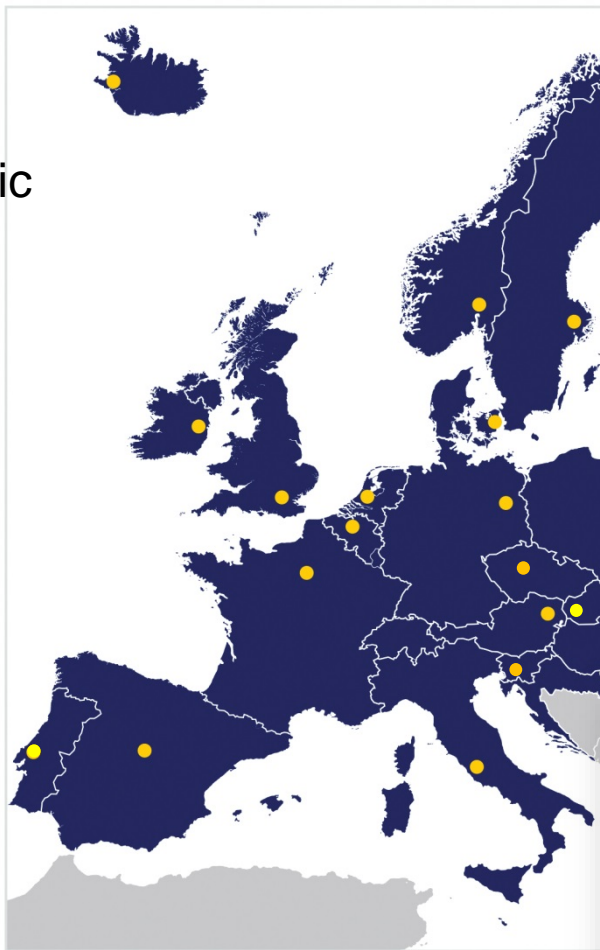


Denmark



Others including; Sweden, Estonia and Lithuania

Austria  
Belgium  
Czech Republic  
Germany  
Denmark  
Estonia  
Spain  
Finland  
France  
Ireland



Iceland  
Italy  
Lithuania  
Netherlands  
Norway  
Poland  
Portugal  
Slovakia  
Slovenia  
Sweden  
UK



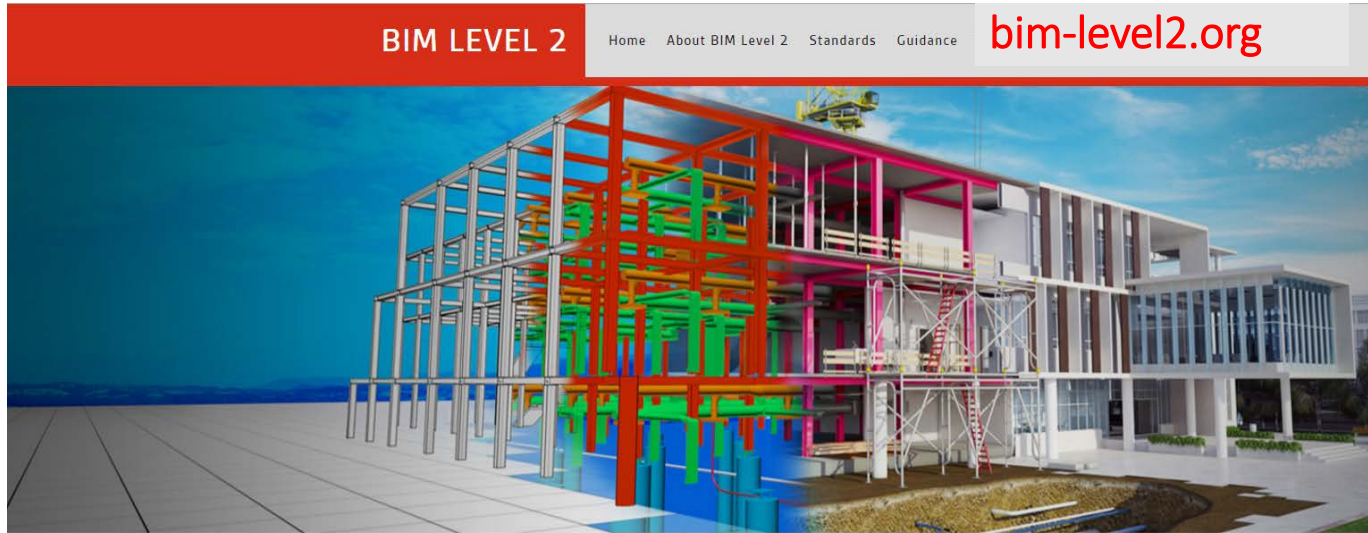


# International Collaboration & Next Steps

- Global public leadership
  - Consistent client demand
- Shared industry vision
  - Digital construction sector
- Principles of collaborative framework
  - Legal, technical and process
- Build industry capacity
  - Common skills to enable growth of global trade



# Thank You



Adam Matthews

UK BIM Task Group

[adam.matthews@innovateuk.gov.uk](mailto:adam.matthews@innovateuk.gov.uk)

[www.bim-level2.org](http://www.bim-level2.org)