Ainslie McLaughlin
Director
Scottish Procurement and Commercial Directorate
Scottish Government Purpose:

“To focus government and public services on creating a more successful country, with opportunities for all of Scotland to flourish, through increasing sustainable economic growth.”

Scottish Government,
National Performance Framework
Scottish Government National Outcomes

• Our public services are high quality, continually improving, efficient and responsive to local people's needs

• We realise our full economic potential with more and better employment opportunities for our people

• We live in well-designed, sustainable places where we are able to access the amenities and services we need

• We value and enjoy our built and natural environment and protect it and enhance it for future generations

• We live in a Scotland that is the most attractive place for doing business in Europe
Review of Scottish Public Sector Procurement in Construction

• Public Sector Construction Spend
  – In excess of £4bn
  – Creates £3 for every £1 spent for Scottish economy

• Infrastructure
Building Information Modelling

Why?

- **Construction Industry**: Maintain pace with international markets
- **Designers**: efficient and accurate collaboration and coordination
- **Cost consultants**: instant access to quantities and specs, faster and more accurate cost estimates
- **Contractors**: co-ordinated design, better clash detection and supply chain collaboration and quantities
- **Clients**: 3D modelling, scenario planning, building management
So What?

BIM is important.

Get involved

Start getting ready for it now

Level 2 from April 2017
LAUNCH OF
SCOTTISH BIM IMPLEMENTATION PLAN:
Digitised Scottish Built Environment

David Philp
Scottish BIM Delivery Group Chair
A Digitised Scottish Built Environment
Health Facilities Scotland – BIM Journey

We are delighted to have commenced the BIM journey for NHS Scotland and to have worked in partnership with Glasgow Caledonian University and in particular David Philp to develop a suite of professional BIM documentation and comprehensive training programme. We look forward to piloting the BIM Level 2 approach with NHS Greater Glasgow and Clyde on the National Pain Management Centre being delivered through Frameworks Scotland 2 and evidencing tangible improvements and benefits through both the construction and operational life cycle phases.

Stuart Brown
Capital Projects Advisor, Health Facilities Scotland
Procurement, Commissioning & Facilities
Level 2 BIM: a British standard

“Level 2 BIM maturity is a series of domain and collaborative federated models, consisting of both 3D geometrical and non-graphical data, prepared by different parties during the project life-cycle within the context of a common data environment. The project participants provide defined, validated outputs via digital data transactions using proprietary information exchanges between various systems in a structured and reusable form.”
The level 2 Suite: standards, tools and guides
The Scottish BIM Wrapper
Best after: April 2017
BIM Delivery Group

EIR - General (Framework) & specific (Project) Employers Information Requirements for a service supply, design or construction contract

PLQ – Plain Language Questions: Simple & clear questions informing business decisions; defining digital asset information requirements to be provided and/or procured at each POW stage.

OIR – Organisation Information Requirements to meet department PLQ

AIR - Asset Information Requirements for each managed asset at each POW stage

Shared Information - for collaboration & information; with no implied liability. Published Information – to be relied on for a published purpose at a pow stage.

CDE – Common Data Environment single point of managed coordinated & clash resolved information truth as Project Information Model PIM and/or Employers Asset Information Model AIM

The value of BIM

Significant time, cost and quality construction delivery improvements – quicker, cheaper, better. More for Less!

Digital information to become a key enabler of stakeholder engagement, decision making and estate planning – more reliable engagement

Information delivered to enable organisation to acquire, operate and maintain the asset estate portfolio more effectively – assets that fulfil stakeholder requirements.

Level 2 BIM

BIM L2 Information Model: Geometric 3D Models, Documents, Non Geometric Data as COBie exchanged as files to Employers Information Requirements

COBie – Construction Operations Building information exchange: open standard asset master data schema for briefing, design, construction, operations & performance data

AMS – Asset Management System to plan, manage and maintain the Estate Asset Portfolio; integrated with the Employers Asset Information Model AIM

BEP – BIM Execution Plan: Suppliers pre & post contract proposal to manage project information to meet the requirements of the Employers Information Requirements.

Digital POW – Industry standard stage plan, gateway decision points and information exchanges.
BIM Level 2 Implementation

Digital Information Exchange
Procured via the EIR
Delivered to the EIDP with COBie transmittal validation

access points in secure organisation information boundary

The Digital Built Asset Estate

BIM Delivery Group

Client Organisation

AMS – Asset Management System

Project Information Model

PIM – Project Information Model

AIM – Asset Information Model

Open Asset Master Data Schema

BIM L2 Information Models, Documents, Data exchanged as files

Digital Information Exchange

Informal Manger

Information Manager

CDE – Common Data Environment

S – Supplier (or Stakeholder)
Current levels of UK BIM Maturity

HS2 BIM Supply Chain Upskilling Study

CURRENT BIM MATURITY

71% make financial provision within their organisation for BIM
60% have a BIM strategy with defined goals

INCREASING BIM IMPLEMENTATION

94% are already using BIM

CURRENT BIM MATURITY

LEVEL 0  LEVEL 1  LEVEL 2

57% use PAS 1192:2:2013
60% work within common data environment
76% have used open data standards

LEVEL 2 BIM A MINIMUM STANDARD

- store
- use
- transact
- predict

COLLABORATION IS KEY

BIM ROAD MAP

HS2 will implement Building Information Modelling to an unpredicted scale, digitizing its entire asset lifecycle.

- Prof. David Philp
BIM a journey not a destination

Delivery 20%

Operate 80%

Organisational Performance – 300% Multiplied through portfolios

Social Performance 3000% Multiplied through society

Concept Design Build Operate Organisational Business Operation Social Outcomes

Level 2

Level 3

Level 4
Level 2 a staging post

With level 2 there is limited functionality for delivery of operational data sets and integration of telemetry. Level 3 will address these in sector delivery and operational stages, with a focus on enabling total cost and carbon outputs.

Outcome based:
Performance and operation of assets
Intelligent buildings & Infrastructure
### Level 2 BIM will bring value to the Scottish Procuer and their Supply Chain

<table>
<thead>
<tr>
<th>Accelerated decision making based on verified, reliable information</th>
<th>£</th>
<th>Plan</th>
<th>Design</th>
<th>Build</th>
<th>Operate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information can be trusted to be of the right quality (validated)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Improved sharing and collaboration with supply chain</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Support collection, storage and access to data throughout projects</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>More outcomes focused – more quickly and cost effectively</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>De-risked delivery of projects - better quality data, improved co-ordination and less variation.</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Improved health &amp; safety through better information &amp; visualisation</td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Handover info requirements clearly defined and assured at the start of a project</td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Improved margin for the supply chain</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
SPM Asset Management Database showing Room Components and their associated condition
Drivers for Adopting BIM Level 2 by April 2017

BUILDING INFORMATION MODELLING (BIM) PROJECT IMPLEMENTATION PLAN
Key Drivers for BIM Adoption

- Scottish Government endorsement to adopt BIM Level 2
- Benefits of BIM to Public Sector Procurement & Industry
- National & International Momentum in BIM Adoption
1st Key Driver for BIM Adoption

Scottish Governments Endorsement for BIM Level 2
Findings of the Review

“BIM offers the opportunity to adopt a new collaborative approach which has the potential to achieve more efficient and effective ways of working through all stages of the construction project life-cycle”

“We do not deny the challenge that this may offer for both public sector and industry but we believe that the savings being suggested both initially and throughout the life cycle of the structure make a compelling case for its adoption.

Finding of the Review of Scottish Public Sector Procurement In Construction
“BIM should be introduced in central government with a view to encouraging adoption across the public sector. The objective should be that, where appropriate, projects across the public sector adopt BIM level 2 by April 2017.”
Scottish Public Sector Adoption

Apply BIM Decision Matrix to determine BIM adoption for new projects from April 2017

Encouraged to Adopt BIM from April 2017 and ability to adopt all SG guidance.

Universities

Local Authorities
2nd Key Driver for BIM Adoption

Benefits of BIM To Public Sector Procurement
Key Benefits of BIM
Key Benefits of BIM

Benefits through Whole Asset Life Cycle

Improved Management, Exchange & Analysis of Data

3D Modelling
4D Programming
5D Estimating
6D Sustainability
7D Facility Management

Design

Disposal
Supporting Challenges & Strategy

www.gov.scot/economicstrategy
Benefits of BIM

Mayfield School, Dagenham
Benefits of BIM
3rd Key Driver for BIM Adoption

National & International Adoption
BIM British Standards

- **BIM Level 2 standards**
- **UK Gov targeting 2016.**
- **BIM community in place.**
- **Driver to maintain competitiveness of UK construction industry.**
“We also asked those who are aware of BIM whether they will adopt it on the coming years. 92% expect to be using BIM in three years.”

NBS National BIM Report 2015
National BIM Adoption

### BIM awareness and usage

<table>
<thead>
<tr>
<th>Year</th>
<th>20%</th>
<th>40%</th>
<th>60%</th>
<th>80%</th>
<th>100%</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>13%</td>
<td>45%</td>
<td>43%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2011</td>
<td>31%</td>
<td>48%</td>
<td>21%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2012</td>
<td>39%</td>
<td>54%</td>
<td>6%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2013</td>
<td>54%</td>
<td>41%</td>
<td>5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2014</td>
<td>48%</td>
<td>48%</td>
<td>5%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Aware and currently using BIM**
- **Just aware of BIM**
- **Neither aware nor using BIM**
International BIM Adoption

Nordics - Developed their own BIM standards & strategy

Singapore - BIM adopted for planning & building standard assessments

New Zealand – BIM adopted for rebuilding Canterbury

Spain - Have recently set up task group and roadmap for BIM.