



# Building Information Modelling (BIM) Implementation Plan

September 2015

Collaborative, Efficient, Sustainable and  
Outcomes Focused Procurement in Construction



SCOTTISH  
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*Scottish Futures Trust*

*11-15 Thistle Street*

*Edinburgh*

*EH2 1DF*

*E-mail - [bimdeliverygroup@scottishfuturestrust.org.uk](mailto:bimdeliverygroup@scottishfuturestrust.org.uk)*

## Executive Summary

This implementation plan sets out how the public sector within Scotland, should adopt BIM level 2, where appropriate, within construction by April 2017. This is in response to the recommendations of the [Review of Public Sector Procurement in Construction](#). As Scotland moves towards a digital built environment, BIM is seen as a key tool for the Scottish construction industry going forward. BIM uses digital technology to improve the sharing and analysis of data within both the construction and operational phases of projects. By improving data management and collaboration within projects, the industry will be supported in delivering greater efficiencies through the design, construction and operational stages of a project.

In order to implement BIM Level 2, the plan considers the current BIM maturity of the Scottish public sector, the criteria to establish which projects should adopt BIM level 2 by April 2017 and finally how this will be implemented through a combination of focused actions including: pathfinder projects, guidance, awareness and training. The plan adopts the approach that the implementation of BIM within Scotland should align and build upon the existing British Standards and draw from work already undertaken nationally and internationally..

The plan has been divided into 5 horizons which encompass specific workstreams and is summarised below:



Diagram 1: Summary of BIM Implementation Plan

## Executive Summary (Cont)

The implementation plan sets out a framework for the implementation of BIM level 2. Aspects of this plan will be developed in further detail during each horizon and will respond to feedback and consultations with stakeholders. The key objectives for this implementation plan will be to:-

- Provide a roadmap to the implementation of BIM Level 2 by April 2017 on Public Sector Projects.
- Address the recommendations of the Review of Procurement in Construction report in relation to BIM.
- Support the public sector and demonstrate the benefits of adopting BIM .
- Provide experienced leadership and direction nationally, in the adoption of BIM for public sector projects within Scotland.
- Prepare and publish guidance for procuring authorities to better equip them in adopting BIM Level 2.
- Demonstrate to procuring authorities the benefits of adopting BIM.

In considering the key horizons to deliver BIM, the diagram below outlines the high level programme.

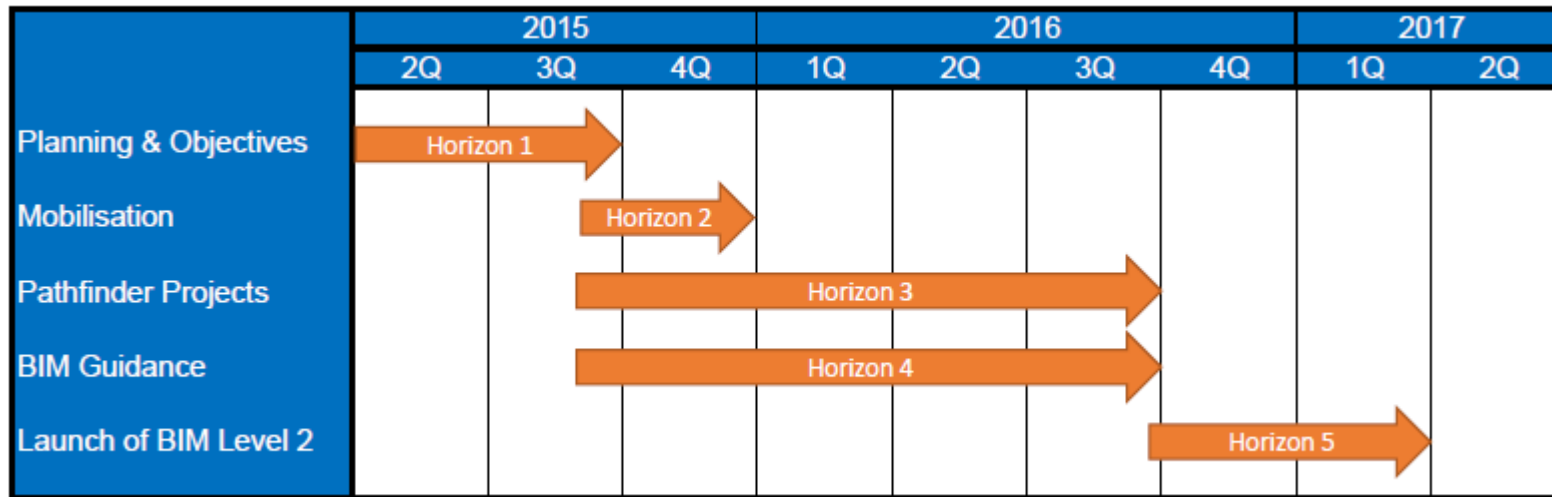


Diagram 2: Programme Summary – BIM Implementation



## 1.0 Horizon 1 – Plan & Launch

Horizon 1 has been divided into the following 6 workstreams:-

- **The BIM strategy** – High level strategy approved by the Construction Review Delivery Group.
- **Scottish BIM Implementation Plan** – Detailed approach to implementation of BIM Level 2.
- **Assessment of Current BIM Maturity** – Assess current BIM capability within Scottish public sector through capability questionnaire.
- **Project Launch** – Publicise BIM implementation and deliver launch forums.
- **Define BIM Level 2 Requirements** – Launch BIM Level 2 definition aligned to the Scottish public sector.
- **Define Qualifying Projects** – Clarify which projects will adopt BIM Level 2 by April 17.

### 1.1 BIM strategy

The BIM Implementation Strategy provides an overarching approach for the implementation of BIM Level 2. The strategy also sets out how the BIM recommendations within the Review of Public Sector Procurement in Construction will be addressed. The strategy has been approved by the [Construction Review Delivery Group](#) who report to the Ministerial Strategic Group on Procurement.

### 1.2 Development of the Implementation Plan

The implementation plan sets out a structured approach for delivering the BIM strategy and how BIM Level 2 will be implemented. This plan will be developed in further detail during each horizon. A detailed programme will be refined and developed during horizon 1. Key dates are as follows:-

Horizons	Date
Concluding Planning Stage – Horizon 1	Oct 2015
Conclude Mobilisation – Horizon 2	Dec 2015
Commence Pathfinder Project(s) – Horizon 3	Nov 2016
Publish Draft Guidance – Horizon 4	Jun 2016
Consultation on Draft Guidance Complete	Aug 2016
Publish Final Guidance	Oct 2016
Launch Level 2 BIM to Public Sector Projects – Horizon 5	30 <sup>th</sup> April 2017.

Progress against the delivery of the plan will be monitored by the Scottish BIM Delivery Group who report to the Construction Review Delivery Group. Refer to section 2.1 for a summary of the governance arrangements.

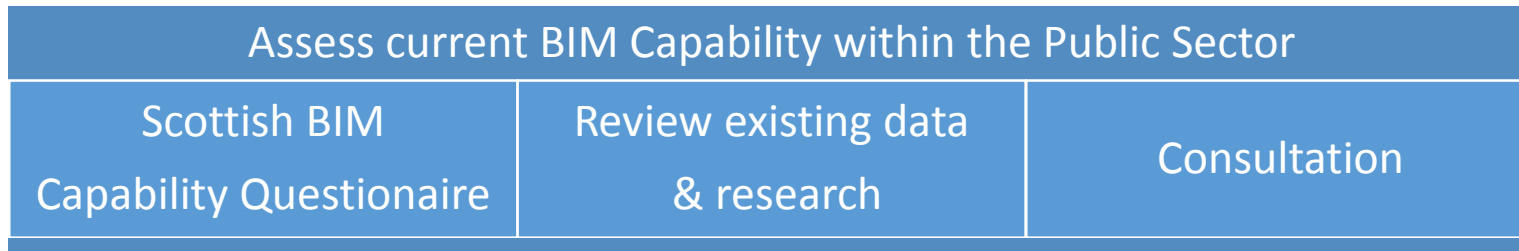
## **1.2 Development of the Implementation Plan (Cont)**

The implementation plan will adopt the following principles:-

- Open:** The implementation plan should encourage all stakeholders to participate irrespective of size or experience.
- Benefits:** The implementation plan should support the public sector to identify the benefits on BIM adoption and the value added.
- Understandable:** The Scottish BIM implementation plan will be mobilised and communicated in an understandable manner for both the asset procurer and the supply chain community.
- Non Proprietary:** All requirements will be non-proprietary as to software applications and as to the required formats of deliverables. It is imperative that the supply chain be allowed to innovate and make their own technology choices that best suit their business.
- Adaptable:** The implementation plan will provide a solution which can be adapted to different procurement routes, funding solutions, sectors and types of projects across the public sector.
- Competitive:** Wherever possible there are at least two solutions or methods available as to minimise market influence in terms of anti-competitive behaviour.
- Clear Purpose:** Early within Horizon 1, the plan should clearly set out the criteria for projects which should adopt BIM Level 2 by April 2017. By doing this we will provide clear direction to industry to develop working practices to embrace this change.
- Innovation:** In the delivery of the implementation plan, the BIM Delivery Group will consider opportunities for innovation which may include awareness and alignment of the plan to the long term objective of achieving BIM Level 3. Remain mindful of linkages of BIM to other recommendations within the procurement review including whole life costing.

### 1.3 Assessment of Current BIM Maturity within Scotland

The second action within Horizon 1 is the assessment of current BIM capability and capacity within the public sector in Scotland. This will be addressed through three key areas which include a BIM capability assessment questionnaire, consultation with key public sector stakeholders and a review of existing research.



**Diagram 3: BIM capability assessment of the public sector in Scotland**

#### **BIM Capability Questionnaire**

This questionnaire will be issued to all public sector procuring bodies and will look to identify their current BIM capability, their level of adoption to date and what information they currently procure within construction projects. The response to the questionnaire, will inform how the implementation plan will be delivered and which projects will qualify for BIM level 2 adoption by April 2017. (Refer to section 1.6)

#### **Review Existing Research**

Additionally the BIM Delivery Group will review existing research to assess the current BIM capability and capacity. This may include:-

- Liaison with National Building Specification regarding their National BIM Survey.
- Liaison with High Speed 2 regarding recent BIM survey.
- Reviewing work of BIM 4 regional group.
- Assessing other sources of research and BIM surveys.

#### **Consultations**

The BIM Delivery Group will consult with key stakeholders to further inform the current BIM capability within the Scottish public sector. This will include but not limited to:-

- Engagement with a number of professional and trade bodies.
- Liaison with BIM 4 Groups
- Hold launch forums with key procuring authorities.

### 1.3 Assessment of current BIM maturity within Scotland (Cont)

The BIM Delivery Group will hold launch workshops with key procuring authorities to assess their current BIM readiness and capability. The launch workshops will offer an opportunity to share the approach of the implementation plan but also better understand from the procuring authorities their data requirements and current common data environments.

#### Determining Data Requirements

It is imperative that the public sector makes use of the information it has procured therefore early understanding of what information informs the asset management system, organisational functions and decision making process will have a marked impact on time savings, reducing waste and adding to the quality of the decision making process throughout the whole project process. The launch workshops with procuring authorities will consider the following:-

- Their digital information requirements at the earliest opportunity
- How they buy or gain the rights to use the data.
- Agree model outputs (who needs what information and when)
- Understand existing data exchange standards.

Early analysis should be undertaken to understand the typical information needs and data exchange points plotted against key development stages.

#### Common Data Environment

The Common Data Environment (CDE) is the foundation of Level 2 BIM. It is used to collect, manage and disseminate project data, models and documents between multi-disciplinary teams in a structured and managed process. The CDE provides a means of achieving a collaborative working environment where project and asset data is stored within the CDE. Delivery teams can provide project or asset data quickly and simply, with everyone having access to the same data. The CDE can be implemented via a server, extranet, or a file based retrieval system., The implementation plan will develop clear guidance as to how the procurer can set up the CDE. Any CDE solution should be also able to link project data to their Asset Management System (AMS).

### 1.4 Project launch & awareness

Within Horizon 1, there will be a need to publicise the implementation of BIM Level 2. Key messages and activities include:-

- 1 Issuing press statement on the BIM group and its formation.
- 2 Developing website for the collation and publication of key documents. Upload BIM Implementation Plan to the website.
- 3 Holding launch forums & Stakeholder events with procuring authorities to publicise our work and the implementation plan.

The key messages within these early activities will include:-

- Publicising the BIM implementation plan to ensure stakeholders understand the approach and timescales.
- Providing industry with clarity on the role and mandate of the Scottish BIM Delivery Group.
- Communicating April 2017 date for implementation of BIM level 2.



### 1.5 Define BIM Level 2 components

This workstream will clarify the BIM Level 2 requirements that are to be implemented by April 2017. The overarching approach is that the existing BIM Level 2 component documents developed by the UK BIM Task Group should be used as the base point and refined for the Scottish construction industry.

#### 1.5.1 BIM Level 2 Components for April 2017

Level 2 BIM can be defined as follows:-

*“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.”*

This definition has been taken from the UK BIM Task group and reflects a definition consistent with the intentions of Scottish BIM Implementation.

As of August 2015 the [Level 2 BIM components](#) will be complete and will comprise of the following elements which can be configured to suit a project’s data requirements:-

<a href="#">BS 1192:2007</a>	Soft Landings (BS8536 standard being developed)
BS 7000-4:1996A	Construction Industry Council Protocol
<a href="#">PAS 1192-2:2013</a>	Information Management – Construction Industry Council guidance
<a href="#">PAS 1192-3:2014</a>	Digital Plan of Works
<a href="#">BS 1192-4</a>	Core Classification: Uniclass (latest format)
<a href="#">PAS 1192-5</a>	Learning outcomes framework V2.0

The above packaging, supported by the British Standards Institute (B/555 roadmap) is being used both nationally and internationally and forms the basis for a forthcoming ISO standard. The Scottish Implementation Plan will review, build upon and ensure alignment to these standards.

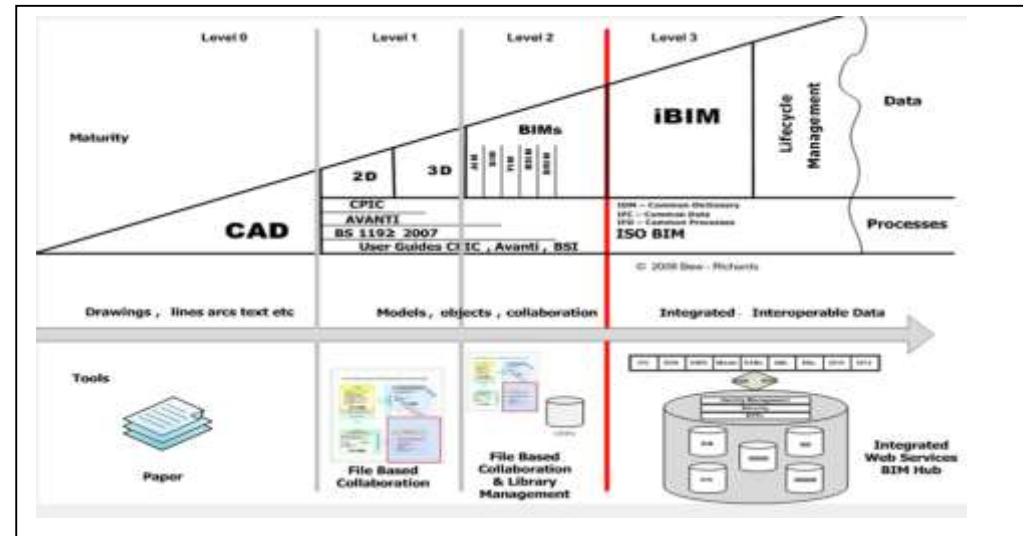


Diagram 5: BIM Levels of Maturity

### 1.5.2 Align Scottish BIM Level 2 to international standards

The Scottish BIM implementation plan should, as far as is reasonably practical, harmonise with developing international standards taking into account the developing ISO 19650 specification for information management for the capital / delivery phase of construction projects using building information modelling which is expected to be available in 2017.

These International draft standards derived from the BSI Public Available Specifications (PAS) 1192-2 and 3, will emphasize how the briefed employer's information requirements (or conditions), should be configured and specified by the clients.

European Parliament voted to modernize European public procurement rules by recommending the use of electronic tools such as building information electronic modelling, or BIM, for public works contracts and design contests. The EU asked their member states to consider the use of technology to modernise and improve the public procurement processes. The article that refers to BIM is Article 22(4) below:

***“4. For public works contracts and design contests, Member States may require the use of specific electronic tools, such as of building information electronic modelling tools or similar....”***

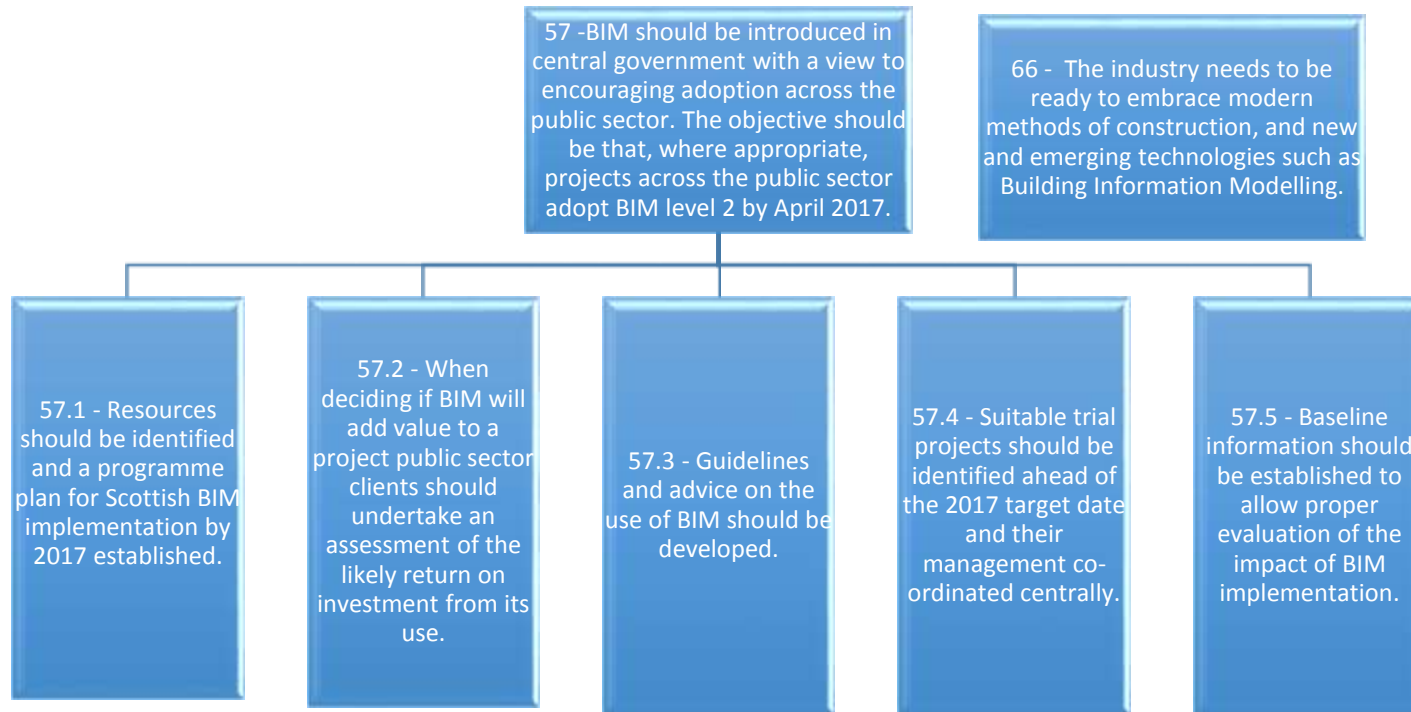
Scotland has not adopted this EU directive and will not place BIM adoption within statutory regulation. However the directive was a significant footstep for the EU and its member states to widen the adoption of BIM across the European construction sector and increase EU industry's global effectiveness especially in securing international contracts. The BIM Delivery Group intends to work closely with and participate in the European BIM working group to draw on a variety of sources and ensure that the plan is compatible with the ISO development and international best practice.

**1.6 BIM adoption by April 2017**

This workstream looks to clearly define what public sector projects will be recommended to adopt BIM Level 2 by April 2017. A decision matrix will be developed to support a procuring authority when deciding to adopt BIM Level 2.

**1.6.1 BIM Recommendations endorsed by Scottish Ministers**

In October 2012, the Scottish Government launched a review of public sector construction procurement. The review, led by Robin Crawford and Ken Lewandowski, published its report the [Review of Scottish Public Sector Procurement in Construction](#) on 22 October 2013. The review identified the benefits in adopting BIM and made the following recommendations in how the Scottish Government and procuring authorities should adopt BIM. These recommendations included:-



**Diagram 6 : Summary of BIM recommendations**

### **1.6.2 Decision matrix for BIM Level 2 adoption**

The recommendation endorsed by Scottish Ministers was that public sector projects where appropriate should adopt BIM level 2 by April 2017. When deciding if a project is appropriate for BIM adoption, procuring authorities should consider multiple criteria including value of project, data requirements and return on investment. To address this, the BIM Delivery Group will develop a BIM decision matrix which procuring authorities will utilise to understand if their project would benefit in adopting BIM.

This decision matrix will be included within the Scottish BIM guidance and will be included within the Scottish Construction Procurement manual for use by relevant procuring authorities.

The draft assumptions that will inform this decision matrix are as follows:-

- Assessing projects for BIM Level 2 adoption will be a requirement for relevant procuring authorities on or after the 30<sup>th</sup> April 2017.
- The decision matrix will recommend BIM level 2 for all projects above the OJEU threshold (currently £4.32m).
- Projects below the OJEU threshold (£4.32m) will be subject to an assessment of the project specific criteria to determine whether BIM will offer benefits to that project.

These draft assumptions are initial proposals and will be tested against the feedback provided through the capability questionnaire and consultation process during Horizon 1. The BIM Delivery Group within Horizon 1 will communicate clearly the ongoing adoption of BIM to industry and support this with a considered and proportionate decision matrix for BIM adoption by April 2017.

## **2.0 Horizon 2 – Mobilisation**

The key objective of Horizon 2 is a readiness phase to put in place key delivery tools to support the implementation plan. These include:-

- Governance arrangements and reporting.
- Communication plan
- Research plan
- Education and training plan
- Resource & appointment plan

### **2.1 Governance**

#### **2.1.1 Monitoring & Reporting**

##### Monitoring Of Progress

The progress in delivering the implementation plan will be monitored by the Construction Review Delivery Group. At the end of each Horizon, the BIM Delivery Group will report and attend the Construction Review Delivery Group. The BIM Delivery Group will seek endorsement for the outputs delivered for that Horizon. The BIM Delivery group will liaise with the Construction Procurement Review Core Team prior to submission to the Construction Review Delivery Group.

##### Risk Management

The BIM Delivery Group will develop, manage and update a project wide risk register. This will consider all key risks for the implementation of BIM and shall ensure these risks are monitored and managed during the development process.

##### Programme Reporting

The BIM Delivery Group will develop, manage and update a project programme. This will be updated and monitored to assess progress on a monthly basis.

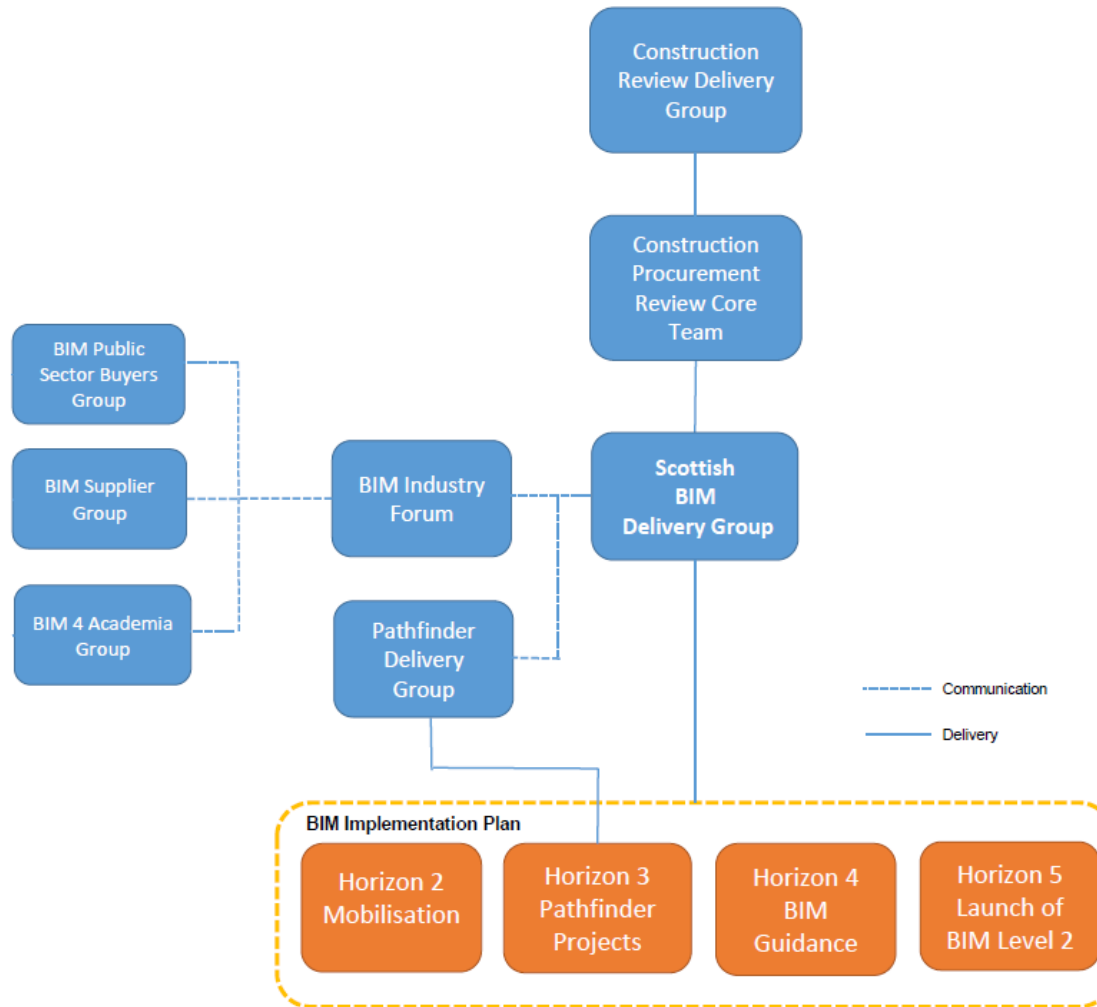
##### Reporting

The BIM delivery Group will report to the Construction Procurement Review Core Team on a monthly basis. This will include updates in relation to progress, key issues, risk management, forthcoming communications and activities.



**2.1.2 Governance Structure**

The governance and organisational structure for the implementation of BIM Level 2 is outlined within the diagram below:-



**Diagram 7: Governance of BIM during implementation**

### 2.1.2 Governance Structure (Cont)

#### **Construction Procurement Review Core Team**

The Construction Procurement Review Core Team is an existing team formed between Scottish Government(SG) & Scottish Futures Trust (SFT). This group are tasked with co-ordinating the delivery of the recommendations of the Review of Public Sector Procurement in Construction. The BIM Delivery Group will share outputs with the Core Team prior to submission to the Construction Review Delivery Group.

- Membership – SFT & SG
- Frequency – Fortnightly

#### **BIM Delivery Group**

The Scottish BIM Delivery Group (BIM DG) has the remit – to lead, manage, co-ordinate and deliver the BIM implementation plan on a day to day basis. This group will report progress and outputs to the Construction Procurement Review Core Team. The group will also co-ordinate the liaison, feedback and interface with the other BIM groups.

- Meeting Frequency – Weekly
- Membership
  - SFT, Chair – David Philp
  - SFT Construction Procurement Review Members
  - Project Management Support

#### **BIM Industry Forum**

The Building Information Modelling (BIM) Industry Forum (BIM I.F.) is a group of the various communities who are supporting the BIM Delivery Group. The BIM I.F. will provide a platform to meet with and manage the interface between the various industry groups and the BIM Delivery Group. This forum will be tasked with providing integrated feedback and raising potential issues affecting the implementation of the BIM strategy and its objectives. This group consists of representation from the BIM Delivery Group and representation from the buyers, suppliers and academia groups.

- Meeting Frequency –Quarterly
- Membership Organisations
  - BIM Delivery Group – D Philp Chair
  - BIM Supplier Group – Organisation TBC
  - BIM Public Sector Buyer Group – Organisation TBC
  - BIM Academia Group - Organisation TBC

### 2.1.2 Governance structure (Cont)

#### **BIM Public Sector Buyers Group**

The Building Information Modelling (BIM) Public Sector Buyers Group (BIM PSBG) is a collaboration of public sector organisations. The BIM PSBG is a vehicle to allow the BIM Delivery Group to convey updates on the Scottish BIM strategy, progress and information as it arises. This group will be tasked with providing feedback, disseminating information through their organisations and acting as a communication platform across the Scottish public sector organisations.

The BIM PSBG is a collaboration of public sector procuring organisations who will champion the Scottish BIM strategy in their respective organisations. Their purpose is to raise awareness of the BIM strategy, promote a shared understanding of its value proposition and raise potential issues affecting the implementation of the BIM strategy in their respective areas of interests.

- Meeting Frequency –quarterly
- Member organisations invited:
  - BIM Delivery Group
  - BIM 4 Local Government
  - Transport Scotland
  - Scottish Prisons
  - Scottish Water
  - Housing
  - Scotland Excel
  - Health Facilities Scotland
  - APUC
  - Scottish Government Departments
  - BIM 4 Clients
  - Others -TBC

#### **BIM Supplier Group (Scotland)**

The Building Information Modelling Supplier Group Scotland (BIM SGS) is a forum of supply side organisations, institutes and other bodies. The BIM SGS will provide a vehicle for the Scottish BIM Delivery Group to deliver updates on progress and information as it arises. This forum will be tasked with providing feedback, disseminating information through their organisations and acting as a communication platform to the Scottish supply chain. The BIM SGS is a collaboration of contractors, consultant and supplier professional bodies who will champion the Scottish BIM strategy in their respective specialist areas and communities. Their purpose is to raise awareness of the BIM strategy, promote a shared understanding of its value proposition and raise potential issues affecting the implementation of the BIM strategy in their respective areas of interests.

- Meeting Frequency –quarterly
- Member Organisations. This is subject to agreement and by invitation and acceptance by industry organisations.

#### **Pathfinder Project Delivery Group**

This group is to co-ordinate, manage, measure and deliver the pathfinder projects and ensure lessons are linked to the Scottish Government guidance. Report to BIM Delivery Group on progress on a regular basis. (Refer to section 3.3 for details of their role.)

- Membership – Procuring Authority, BIM Consultant

### 2.1.2 Governance structure (Cont)

#### **BIM 4 Academia**

Building Information Modelling (BIM) 4 Academia Group (BIM4 AG) is a forum of Scottish academic providers and training boards. The BIM4AG is a forum to share knowledge, guidance and feedback as to how BIM can be pragmatically implemented in a structured manner at apprentice, undergraduate and post-graduate level. The group will explore opportunities for research and sharing of knowledge. The group should also consider and respond to skill requirements for BIM adoption and opportunities within the implementation programme to promote learning within construction institutions and schools.

- Meeting Frequency –Quarterly
- Members
  - BIM Delivery Group
  - Others
  - BIM 4 Group
  - Universities
  - Colleges

In addition to the identified groups above, the BIM Delivery Group will also consult with various bodies, organisations and institutes as is required to deliver this implementation plan.

### 2.2 Communication Plan

A structured communication plan will be developed to ensure consistent and cohesive communication to all stakeholders and should:-

- Set out key messages for communication by the BIM Delivery Group to wider market and procuring authorities.
- Prepare a detailed consultation plan to identify key parties and organisations.
- Adopt and utilise the BIM website portal as a central platform for communications.
- Create a social media plan to sign post towards any new activities or events.
- Publish a quarterly newsletters promoting programme progress and early adopter project lessons learned.
- Develop structured roadshows and stakeholder engagement events.
- Identify key points at which communication is required.
- Effectively promote coverage within selected Scottish press.
- Ensure an effective feedback conduit to the BIM Delivery Group.

### 2.3 Research

During Horizon 2, the BIM Delivery Group will engage with organisations who are conducting research on current BIM practice national and internationally. With most countries looking towards a digitised construction sector all over the globe, there are recent examples of BIM adoption and new methods of working. The BIM Delivery Group will review various programmes and link any good practice to the outcomes of the Scotland wide BIM delivery programme.

### 2.4 Education & training

An education & training plan will be developed to support procuring authorities' upskill and develop capacity to meet BIM level 2 launch. This plan will address:-

- Education requirements and programmes – aligned with the BIM Level 2 Learning Outcomes Framework (LOF) V2.0.
- Training and upskilling requirements informed by capability survey.
- Development of a Private Sector self-assessment tool. This will be a simple “where are we now?” on-line capability assessment tool for the supply chain to assess their BIM point of departure and determine up-skilling needs.
- What type of training should be promoted? (Accreditation, Certification, RICS etc).
- Dissemination of standards, best practice and knowledge sharing.
- Liaison with Scottish academia and training providers to establish current offerings and gaps.

### 2.5 Resource & commissions

Resourcing for the project must be considered to ensure the project has sufficient resource to deliver the implementation plan. The organisations involved in the governance arrangements, will be required to make specific commitments to the project. In addition some consultancy support for individual exercises will be required which may include but not limited to:

Potential Commissions	Strategy
Appointment as chair to BIM Delivery Group	Direct Appointment – David Philp, AECOM
Review of Level 2 BIM components and amend for Scotland	Strategy to be confirmed
Managing, monitoring and reporting on outcomes of pathfinder projects	Strategy to be confirmed
Appointment resource for BIM Delivery Group	Strategy to be confirmed



## **3.0 Horizon 3 – Pathfinder Projects**

### **3.1 Selection of pathfinder projects**

The aspiration of this work-stream is that a minimum of three pathfinder projects are delivered. A Pathfinder Project Delivery Group will be formed to manage, monitor, and report on the progress and lessons learnt from the projects. In deciding upon the pathfinder projects the following considerations should be made:-

- Project Status – As well as new projects, partly developed BIM projects moving into a construction phase could be adopted to test certain data exchanges?
- Type of projects – New build, infrastructure and refurbishment contracts to be considered.
- Project Value – Consideration as to value of projects and ability to demonstrate BIM is deliverable on smaller value projects would be advantageous.
- Project Sector – Consider projects against pipeline value and sector. (Education, Transport, Health, Water).Supply chain involvement.
- Consider opportunities for adopting outcome based digital data aligned with COBIE for interim (pre-handover) data exchanges?
- Consider opportunities for adopting Industry Foundation Classes (IFC) model, in lieu of COBIE for operation the asset model?
- Consider level of dimension deliverables within the pathfinders and case studies. (3D parametric modelling, 4D-time simulation and 5D-cost dimension?)
- Propose one refurbishment project to demonstrate the benefits of laser scanning and reality data capture of existing buildings into the model environment.
- Project programme – consider any projects proposed programme timescales.

Early discussions, has identified willing procuring authorities, who would volunteer projects as pathfinders. The final decision on pathfinder projects, will be restricted by the projects available at the time of delivery. Through regular reporting by the Pathfinder Project Delivery Group, the pathfinders will inform the development of the Scottish Government BIM guidance and provide suitable case studies.

### **3.2 Form Pathfinder Delivery Team**

A Pathfinder Project Delivery Team is to be appointed to manage the monitoring of BIM pathfinder projects. This will be through a consultancy appointment and will be a direct appointment with SFT. The scope for this appointment will be developed but will include but not limited to the items referred to in section 3.3 of this plan.

### **3.3 BIM Pathfinder Delivery**

#### **3.3.1 Readiness Workshops**

Once a pathfinder project has been identified, a series of readiness workshops should be held by the Pathfinder Project Delivery Group. The workshops should allow an opportunity to assess:-

- The Procuring Authorities BIM readiness and capability.
- The Project Team BIM readiness and capability.
- Process and implementation procedures.
- Prepare gap analysis of appropriate support and structure required. Define education and training needs.
- Define base line data/ benchmark data to measure against.
- Prepare and issue BIM Readiness checklist.
- Supply chain capabilities, capacity and needs.
- Client's BIM lead and Soft-landing champion identified.

The associated monitoring and management should be completed by a Pathfinder Project Delivery Group.

#### **3.3 Benefits Realisation**

The Pathfinder Project Delivery Group and stakeholders within the project should be clear on the method of benefit realisation and methods of measurement. This will be initiated in the readiness workshop and then developed during the pathfinder project. Areas that will be considered in the monitoring of projects include:-

- Return on investment analysis.
- Benefits of collaboration and communication throughout project lifecycle.
- Programme benefits/time Savings.
- Cost Benefits (capital and revenue savings).
- Improved communications and information handover.
- Transfer of data from construction to operation systems.
- Demonstrate better outcomes in the design, quality and eventual service delivery? Improving safety within construction and operational phase.

Where possible, the pathfinder should also identify any dis-benefits associated with the project to inform future BIM guidance and approaches.

Consideration should be given to the pathfinder projects and their results being validated by outside parties such as Construction Excellence or academic partners.

### 3.4 Pathfinder lessons linked to guidance

The pathfinder projects will offer valuable experience and lessons learned as to the implementation of BIM to level 2. This process is a key part of the implementation plan and a Lessons Management System should be considered.

All lessons are to be captured and shared with the BIM Delivery Group to inform the Scottish Government BIM Guidance for future work practices. The pathfinder projects can also be adopted as case studies within the finalised guidance.



Diagram 8: Lessons from Pathfinder linked to Guidance

## **4.0 Horizon 4 – Scottish Government BIM Guidance**

### **4.1 Developing the Level 2 components for Scotland**

The first steps in the development of Scottish Government BIM Guidance is a review of the current BIM Level 2 Components as described within section 1.5.1. These documents will be reviewed and configured to suit the needs of the Scottish public sector.

### **4.2 Guidance Development**

#### **4.2.1 Objectives – Scottish Government Guidance**

The Scottish Government BIM guidance will support and offer clarity to procuring authorities who are adopting BIM Level 2. The guidance will align to the existing BIM Level 2 definitions and components as summarised in section 1.5 and will be refined for the Scottish Construction Industry. Therefore the guidance should:-

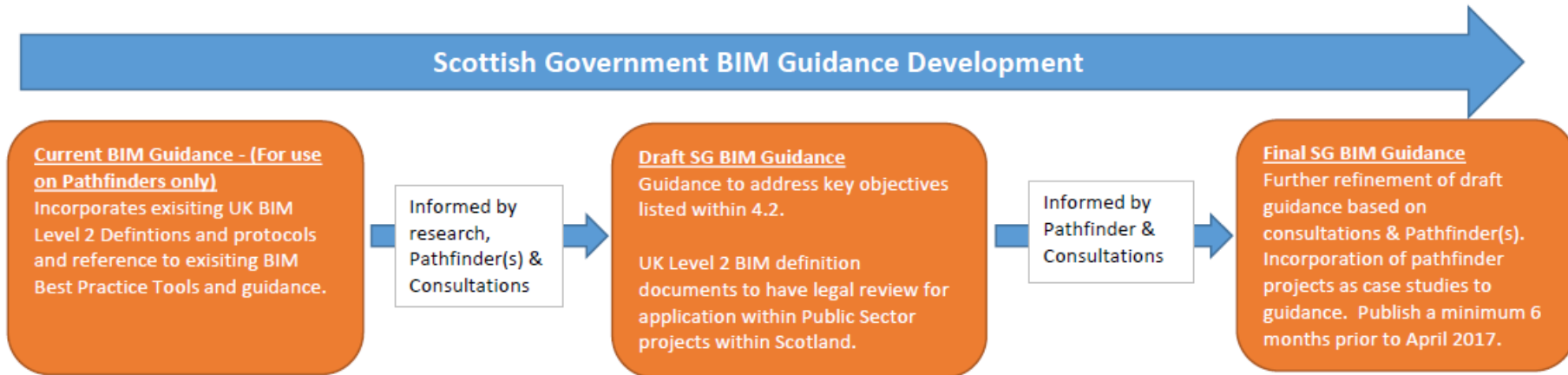
- Offer a plain language approach in describing BIM (in the context of Level 2 maturity) and its adoption.
- Provide a procurer overview guide to mobilising and implementing Level 2 BIM, including benefits cases and make-ready checklists.
- Support the public sector in the procurement of BIM within projects. Example wording for PQQ or ITTs.
- Support in the specifying of procuring authorities requirements effectively and data requirements.
- Clearly outline the technical and information exchange processes and terminologies. (CDE)
- Support procuring authorities in demonstrating the benefits of BIM to the public sector and development of businesses cases to invest.
- Incorporate case studies. A worked example of an exemplar Level 2 BIM project, including sample data set.
- Standard templates for consistency of approach, including: Employers Information Requirements (EIRs), Task and Master Information Delivery Plans (TIDP and MIDP).
- A suite of standard Scottish procurement “Plain Language Questions” (PLQs) and data exchanges that can be refined to suit the needs of each department or authority.
- Common Data Environment (CDE) guidance for public sector clients

The guidance will be accessible to all and will be published in the updated Scottish Government’s Construction Procurement Manual.

**4.2.2 Scottish Government Guidance Development**

The Scottish BIM guidance will be developed in three stages. The priority of the BIM Delivery Group is to share and offer best practice early within the implementation process to support the public sector and industry mobilise effectively to BIM Level 2 adoption.

1. Stage 1 – Early document to inform ways or working on pathfinder. To include existing UK BIM Task Group BIM Level 2 components.
2. Stage 2 – Draft Scottish Government BIM Guidance addressing objectives above and informed by research, pathfinders and consultations.
3. Stage 3 – Final Scottish Government BIM Guidance. Refined further by consultations, pathfinder feedback and incorporating case studies.



**Diagram 9: Stage Guidance Development**



## **5.0 Horizon 5 – Launch of BIM Level 2**

### **5.1 Communications prior to launch**

In the lead up to the launch of BIM level 2, procuring authorities should be made aware the following aspects:-

- Published Scottish Government BIM Guidance.
- Existing areas of expertise, knowledge sharing and collaboration.

Through effective ongoing communication to industry and the public sector, the level of communication prior to launch will be assessed at that point.

### **5.2 Preparing for launch**

Prior to January 2017, the BIM Delivery Group through the delivery of the implementation plan should have the following outputs completed:-

- Publication of Scottish BIM guidance.
- Publication of BIM project decision matrix.

Completion of the above represents the required position by January 2017. Ahead of the launch it is recommended that a BIM Champion network should be set up to offer a forum for procuring authorities to share knowledge and expertise in the delivery of BIM within projects. This group should continue to drive adoption and knowledge share across the procuring authorities.

### **5.4 Monitoring BIM Level 2 implementation**

After the launch of BIM Level 2, there should also be an active role in monitoring the level of BIM adoption, efficiency gains and identify subsequent challenges and issues as they arise to inform future guidance.

Once BIM Level 2 has been implemented, a comprehensive lesson learned exercise should be completed and this should address:

- Lessons in the implementation of BIM.
- Review of actual benefits either achieved or demonstrated.
- Identify areas not achieved/implemented and assess reasons for this and future actions required.
- Consider areas of further education and training going forward.
- Discussion and recommendation on if/how the public sector continue to develop their BIM maturity. Consider next steps to BIM Level 3.

The lessons learned exercise should be managed by the BIM delivery Group with involvement of key stakeholders as required. This should be submitted to the Construction Review Delivery Group for approval.

Scottish Futures Trust  
1st Floor  
11-15 Thistle Street  
Edinburgh  
EH2 1DF  
T +44 (0)131 5100800  
E [mailbox@scottishfuturestrust.org.uk](mailto:mailbox@scottishfuturestrust.org.uk)  
W [scottishfuturestrust.org.uk](http://scottishfuturestrust.org.uk)