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# Government as Client: Using Building Information Modelling on NZ Construction Projects

Peter Cunningham

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1222 Moonshine Rd,  
RD1, Porirua 5381  
Private Bag 50 908  
Porirua 5240  
New Zealand

[branz.nz](http://branz.nz)



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# Government as Client: Using Building Information Modelling on NZ construction projects

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# 1 Executive Summary

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This report was commissioned by the NZ BIM Acceleration Committee of the Productivity Partnership and funded by BRANZ with the specific requirement to engage with Government agencies in their use of Building Information Modelling (BIM) on public sector construction projects and explore the potential future use of BIM by Government agencies. Initial engagement was via three Government agencies that are either using BIM or planning to use BIM on large-scale construction projects and also proposing to use BIM more strategically across a programme of projects. This was with a view to exploring Government's role in accelerating the use of BIM across NZ construction projects, through the construction supply chain and addressing any barriers to the use of BIM.

As well as engaging with the Ministry of Justice, Ministry of Health and Ministry of Education, during the process of the project, opportunities were secured to consult with another Productivity Partnership initiative – the Auckland Infrastructure and Procurement Forum to gain further insight from Auckland based clients and construction supply chain organisations.

The climax of the project was a broader Government agency engagement workshop with 25 agencies participating in Wellington and via videoconference in Christchurch. This workshop included the involvement of David Philp, the UK Government BIM lead who provided a key insight into his experiences over the last 5 years and the benefits and challenges ahead for BIM adoption in New Zealand. The workshop concluded with an industry function that provided the environment for the Government agencies to interact with key industry stakeholders around the adoption of BIM.

The key lessons from Government and Industry are grouped around the following areas:

- Market maturity and existing entrenched behaviours – barriers to using BIM
- BIM adoption is still early in NZ – tender responses to date have been poor
- Opportunity to improve whole of life and asset management is being missed
- Opportunity to attract new young talent to the industry is being missed
- Technology driven responses – need to focus on processes, people & collaboration
- IP, vendor selection & interoperability
- Proposed changes required to tender and contract documentation

There are still significant barriers to the use of BIM – this is mainly driven by two key factors:

- Client capability and understanding of BIM in order to develop appropriate requirements in tender and contract documentation. This results in an appropriately poor response from the market
- Construction sector BIM capability is low and is on a steep learning curve with suppliers also learning as they go. There is little collaboration between suppliers and agencies have evidenced the use of BIM being used on projects to drive variations on contracts

The combined result is a poor outcome where clients feel they are being exploited and trust and collaboration is being eroded. This needs to be addressed and capability needs to be developed with clients and suppliers via the following next steps:

- Continue to raise awareness and promotion of BIM to Government agencies
- Active participation and engagement with Government agencies when implementing BIM on construction projects & programmes
- Enable agencies to access tender and contract information and forms of developed information & guidance
- Explore further the role of asset management & soft landings
- Address 'barriers to the use' of BIM identified in the workshop

## 2 Introduction

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### Background

The Building & Construction Productivity Partnership is developing a number of programmes and projects that are focused on improving industry performance and productivity with the objective of raising construction sector productivity 20% by the year 2020. The Productivity Partnership's Building Information Modelling (BIM) Acceleration Committee<sup>1</sup>.

### What is BIM?

BIM is the digital representation of the complete physical and functional characteristics of a built asset – everything from bridges to buildings. It involves creating a model with real life attributes within a computer and sharing that information to optimise the design, construction and operation of that asset.

### Context

Few things have the potential to impact as positively on the performance of New Zealand's building and construction sector as BIM. Of all the improvement initiatives investigated by the Productivity Partnership, BIM is the only one that holds the promise of a step-change, rather than an incremental, gain in productivity.

Because it is key to achieving this significant increase, accelerating the use of BIM in the construction process has become a priority. Our aim is to capture its many benefits, helping to provide affordable, quality buildings and infrastructure for New Zealanders at a time of high construction demand.

BIM adds value to the whole life of a built asset from pre-design to operation. It is a tool that allows the latest in digital technologies to be applied to the building management process. However, like all tools, it needs to be used well to get the best result.

### Government's role

The BIM Acceleration Committee identified that Government, as a client of construction activity, has a key role to play in the adoption of BIM across projects and as part of its procurement activities. In other countries, such as the UK, the use of BIM has been mandated on construction projects. The approach to date in New Zealand has not been to intervene through mandated use but to monitor projects that have used BIM in their delivery. These case studies are available via the BIM in NZ web page.

The Acceleration Committee also decided to research the role of Government agencies in more detail, which led to the development of this project.

## 2.1 Methodology

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The methodology for this project is based around four main phases of work:

- 3 initial Government agency meetings
- Auckland Infrastructure & Procurement Forum engagement (Inc. Technology workstream). This involved agency and market engagement
- Broader Government client engagement via a workshop with UK Government BIM lead, David Philp. This involved 25 Government Agencies
- Industry engagement throughout the project and via an industry function

The report summarises the outcomes of the above activity as well as identifying recommendation for potential future activity.

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<sup>1</sup> <http://www.buildingvalue.co.nz/BIM-in-NZ>

### 3 Government Agency Meetings

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Interviews with Government agencies were primarily focused on agencies that are either already using BIM or are thinking of using BIM on their construction projects or broader programmes of work. From the agencies that were interviewed, it became clear that different approaches were being developed and were dependent on individual client capability and the quality of advice being provided by construction professionals.

The approaches could be categorized into the following:

- **Use on major construction projects.** Typically reactive use of BIM on significant value construction projects after advice from construction professionals. This is focused on capital works delivery, co-ordination of the project, clash detection and stakeholder engagement using 3D model walk-throughs.
- **Strategic programme use.** A more strategic approach to the use of BIM across a broader programme of work being driven by a future asset management approach rather than focusing on the initial construction delivery. This recognizes the need for planning and how decisions made during the design and construction of a project have a long lasting impact on the operation and effectiveness of the built asset

The sections below provide more detailed summaries of the meetings conducted with the following Government agencies:

- Ministry of Justice – BIM use on the Christchurch Justice & Emergency Services Precinct
- Ministry of Health – BIM use on the Acute Services Building
- Ministry of Education – BIM used strategically across the national programme

#### 3.1 Ministry of Justice

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With the Christchurch Justice & Emergency Services Precinct (CJESP), the use of BIM was driven by the RCP, the project manager for the Precinct. Their view was that the market should adopt BIM but the selected contractor, Fletcher Construction, at the time had no appetite to use BIM.

As the Ministry went to market the tender responses demonstrated that there was a poor level of engagement and understanding of BIM across the market and even in the consultant community. This highlights that BIM adoption is still in its infancy in NZ and both clients and suppliers are learning as they deliver on projects.

The Ministry's approach had three simple objectives:

- To have a faster, more efficient and problem free build process
- To have a building asset management manual post completion
- Use the model for stakeholder engagement purposes

Now the project is well into the capital delivery phase, Fletcher Construction is now fully engaged with the use of BIM on the project and has since invested heavily in building their BIM capability and it is now planned to be offered to other Fletcher Construction clients as a standard offering from the firm.

Warren & Mahoney have also played an integral role in the development of the model and in the engagement with Fletcher Construction and the supply chain engaged in CJESP. Site meetings

have been used for problem solving across the project with time and money being saved via clash detection and improving buildability aspects.

A real success has been using the model for stakeholder consultation with the Judges. Typically the engagement with the Judge community has been challenging – by providing them with a walk through of the model they have become real advocates of the process. It has also been used with the tenants of the precinct too.

The benefits of using BIM to date on the Justice Precinct have been:

- Significant client benefits via engagement with the Judges (time and money savings)
- Contractor benefits – visible step change in delivery performance
- Training younger people to come into the industry will need to work on projects using the technology
- Integrating BIM into the asset management system and implementing soft landings
- Now reviewing designs for future projects

Lessons learned included:

- Should have used BIM from day one of the project – will do so in future
- Still issues with services design/consultant community – need to tighten up on contract conditions and tender requirements
- This issue has impacted on relationship and trust between the client and suppliers – it is also a barrier to the adoption of BIM on future projects
- Needs championing by Treasury more with visibility of BIM use across Better Business Case submissions for project funding
- There are still challenges with market maturity and clients need to build BIM capability to lead and manage suppliers in the use of BIM on projects
- Clients require upskilling in the briefs that they provide to suppliers and the associated content that is developed for the use of BIM in tender and contract documentation
- A common understanding between clients and suppliers needs to be developed in terms of what is required with regards to the use of BIM on construction projects

In summary, from the experience to date of CJESP, BIM is now being used on the Auckland Court Property Strategy and is initially being used on a \$4m court building refurbishment where the existing building is being retro-BIM'd where consultation with the Judges is going to be critical.

## **3.2 Ministry of Health**

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The Ministry of Health has proposed to use BIM on the Acute Services Building in Christchurch and on the Greymouth Hospital new build. The Ministry specified the use of BIM prior to both projects commencing due to the complex nature of services on health facilities. The Ministry of Health also had a similar issue as the Justice Precinct with the Judges in managing potentially difficult stakeholders with the hospital's clinical services teams.

The benefits the Ministry is seeking from using BIM on both projects is:

- A faster more efficient build with less clashes and issues on site
- Better outcomes with cost savings
- Associated stakeholder engagement and consultation
- Maintenance and FM manuals to pass to asset management team post completion
- Soft landings and whole of life operation driving the construction process

Response from the market has been good with 4 of 5 contractors expecting for BIM to be used. Both tenders are still in the market with contracts expected to be let later in 2015. Experience so far has demonstrated that the market is on a steep learning curve with the use of BIM with organisations across the supply chain struggling to collaborate and to share best practice – there appears to be a great deal of self interest in the market from both consultants and contractors.

Overall, BIM is required for hospitals. Typically DHBs are not well equipped to deliver large scale projects – there needs to be a shift towards standardization to future proof facilities for ongoing use. This requires a step change in how clinical services are delivered with different facilities being built for different requirements and sizes of hospitals but they all require similar designs and specifications.

The benefits of using BIM to date on ASB and Greymouth have been:

- Stakeholder engagement benefits with the clinical services teams
- NZ BIM acceleration documents have been key in the process
- International interest in contracts driven by BIM being specified and the size of the contract
- Ministry focused on next steps and asset management post project delivery
- Contractor professionalism has been improved by specifying the use of BIM

The lessons learned so far from both projects is as follows:

- Designers and contractors are on a steep learning curve
- As a result, BIM maturity with consultants and contractors is still very low which creates barriers for implementation on projects
- There is also little or no sector collaboration with the use of BIM which is a key factor in its successful use – to drive supply chain integration and effect collaborative working on projects
- Using BIM to address a step change in medical requirements of health facilities
- High fees and poor design management capability hindering progress
- Also issues around prescribed vendors and interoperability issues

In summary, it is still early days for the Ministry of Health with both projects in the tender stage. There are issues around sector capability but the industry is learning quickly. Further collaboration across the supply chain is required and issues around vendor models and interoperability of different systems is still a challenge. Strategically the opportunity of using BIM on health projects should meet future requirements and asset management needs.

### **3.3 Ministry of Education**

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The Ministry of Education is taking a slightly different approach to the use of BIM potentially across their national programme of work. The Ministry has recently been in the market for BIM consultancy services to validate the benefits of the use of BIM across the national schools

programme. This creates its own challenges with much smaller value projects and exposure to potentially smaller sized organisations in the construction supply chain.

Initially, the Ministry is seeking to:

- To obtain initial advice and guidance together with an understanding of requirements
- Specify what the Ministry wants to achieve from BIM – long-term benefits, implications of use, etc.
- Develop standard definitions and conditions
- Identify projects that can support the use of BIM – both large scale and more business as usual
- Implementation – procurement, contracts, resources, people & capability, integration in FM and asset management

This is a more planned and strategic approach to the use of BIM across a programme of work with the Ministry seeking to work backwards through the construction process, starting with asset management and then back into construction delivery and then into design with the key challenge of delivering better outcomes by creating more effective learning environments.

There has been a very high level of response from the market to the tender. The project will commence during June 2015 and Aecom has subsequently been appointed to this role.

The key learnings from this process were:

- For Government agencies to fully understand what it is that is required prior to going to market. This engagement with the market to consult and build understanding assisted in developing the Ministry's tender documentation and a clear brief
- Still a misconception from the consultant community that their company can do it better than anyone else and that most other consultants don't understand BIM
- There is no collaboration between consultants – this market approach for BIM services presented an opportunity for this to occur which was not taken by those suppliers that responded
- There is still too much focus on technology rather than the outcomes that the use of BIM enables. There should have been more focus on collaboration and achieving whole of life benefits
- It is still too early for suppliers to respond to a mature approach to market from a client

## **4 Government Agency Workshop**

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Around 25 central government construction clients attended a two-hour workshop that focused on the advantages of, and methods for, using BIM in construction projects. Attendees heard how BIM has been incorporated by two government agencies and had the opportunity to hear the experiences of David Philp, UK Government lead for the implementation of BIM.

The workshop brought together key Government procurement clients and gave examples of how BIM has been adopted by two Ministries. The approach was different for each, one is a large-scale project and the other is looking at BIM in a larger portfolio of work. The workshop gave an international context through David Philp.

Detailed commentary from the workshop presentations can be found in Appendix 1.

## 4.1 Workshop outcomes

A workshop followed the presentations asking the attendees in both Wellington and Christchurch (via videoconference) what the key barriers to Government agencies using BIM are on construction projects. These were then voted on and ranked as followed:

### BIM challenges for Government clients

|                                                                       |
|-----------------------------------------------------------------------|
| How to apply to smaller projects and on-going maintenance             |
| Entrenched behaviours                                                 |
| Cost / budget                                                         |
| Maturity of consultant chain                                          |
| Understanding client requirements                                     |
| Cost and benefit                                                      |
| Change management                                                     |
| Lack of awareness of BIM over whole of life                           |
| Data standards                                                        |
| Knowledge handover                                                    |
| Capability in the market                                              |
| Maintaining the system                                                |
| Lack of standards                                                     |
| Performance vs. actual                                                |
| Supply chain skills                                                   |
| Resources                                                             |
| Briefing and RfP process                                              |
| Buy in (lack of market knowledge)                                     |
| Continuing support                                                    |
| Continuity                                                            |
| Contractor buy in                                                     |
| Data requirements                                                     |
| Design vs. build                                                      |
| Finding the right expertise                                           |
| How to define requirements                                            |
| How to demonstrate benefits                                           |
| Inconsistency in naming convention / terminology of assets / metadata |
| Info-besity 'what do we do with the info'                             |
| Lack of portfolio information                                         |
| Ongoing opex costs to maintain                                        |
| Ownership of IP                                                       |
| Perception ("gold coated")                                            |
| Short term thinking                                                   |
| Stakeholder buy-in                                                    |
| Way forward on procurement strategy / project strategy                |



The top ranked issues support the common theme that has flowed through this report of low client and supplier capability to using BIM on construction projects. This will continue to be a significant barrier to the use of BIM if it is not addressed. Capability needs to be developed with both clients (in briefing and development of tender/contract documentation) and with suppliers in responding to client BIM requirements accordingly (irrespective of the quality of the information provided) and in collaborating with partner organisations throughout the construction supply chain.

## **5 Support to Government agencies**

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Throughout this project support has been offered to all the agencies that have been engaged with as part of the 'Government as a Client' project with a view to taking measures to addressing potential barriers to BIM adoption on construction projects. This included close engagement with the Ministry of Justice team in gaining a critical insight into the challenges and lessons learned on the Justice Precinct project via site visits and project team meetings with key strategic suppliers such as Fletcher Building and Warren & Mahoney.

The same approach was taken with the Ministry of Education – the first Government agency in New Zealand to utilise the role of BIM more strategically and proactively across their national programme of schools delivery. This included procurement advice and providing a sounding board role to the Ministry of Education as they embarked on their go to market strategy for BIM consultancy services and their overall strategy around the use of BIM on their national programme.

This project has remained close to these initiatives to enable them to gain maximum traction and to address considerations in the adoption of BIM through design, construction and operation of the asset.

Additional, outside of programme procurement support was provided to the Ministry of Education as they prepared their material and Request for Proposal documentation and acting in the role as MBIE observer for their tender evaluation meeting and associated shortlisted interview sessions. This has provided a key insight into a Government agency that is seeking to potentially utilise BIM strategically across their national property portfolio and associated learnings for other Government agencies seeking a similar strategy.

The in-depth agency engagement with Justice, Health and Education has provided a valuable insight to the operation of these agencies and the situations and challenges that they faced when adopting BIM on their construction projects and programmes of work.

What remains clear is that BIM adoption remains embryonic in New Zealand. Whilst significant advancements have been made in the duration of this project, there is much to be done in enabling agencies to use BIM on their construction projects. However, the signs are good – 25 agencies responding to an open invitation to attend the BIM workshop would suggest that the agencies are aware of BIM and want to know more but further engagement activity is required to get them and their supply chains into a position where BIM is actively being used on their projects. As a result, continued engagement with the agencies that attended the workshop is recommended.

There is also a requirement for continued sector engagement – to brief them on the intention of BIM use on Government projects and to create an opportunity to contribute to the process of developing work scopes, project briefs and Government agency capability in the use of BIM.

## 6 Lessons learned

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The rate of BIM adoption within Government agencies increased as this project progressed with agencies such as NZ Defence Force, Property Management Centre of Expertise and Housing New Zealand joined the Ministries of Justice, Health and Education in exploring opportunities to utilise BIM across their construction programmes. These agencies are seeking opportunities to:

- Have a faster, more efficient and problem free build process
- Are looking beyond construction delivery – how the BIM model can be integrated into asset management systems post completion
- Exploring the role of soft landings and whole of life approach post construction delivery
- Better outcomes with cost savings
- Enhanced stakeholder engagement experience

The key lessons learned from the Government agencies that were identified during this project for clients and the industry to resolve are:

- Use BIM from the start of the project rather than reactively using it during a project
- High fees and poor design management capability is hindering the adoption of BIM. This is also impacting on the confidence and trust agencies have with suppliers
- Can suppliers walk the talk – there is often not much substance to BIM in practice claims from consultants and contractors. How can we get behind these claims and see real capabilities?
- Consultant claims for additional work with BIM use not detailed specifically in the brief. Need to tighten up on conditions and tender requirements. This again affects trust between agencies and suppliers
- Should BIM be contractor driven? The best value engagement to date has been when the contractors have driven the process
- Addressing entrenched culture and behaviours – this relates to client capability and planning for a go to market (documentation, contracts, etc.) for the use of BIM and the maturity of the market to respond accordingly
- Sharing learning and collaboration to drive best practice – is the industry capable of doing this
- NZ is at the start of the process of implementing BIM – we have a significant steep learning curve to address – as a result BIM maturity with consultants and contractors is still very low
- This is about processes, behaviours and collaboration – NOT ABOUT TECHNOLOGY
- Associated impact on contracts – does 3910 accommodate the use of BIM?
- The role of the NZ BIM Acceleration Committee has been acknowledged along with specific outputs such as the case studies and the BIM manual
- Issues around ownership of IP
- Issues around data standards, interoperability and prescribed vendor selection
- Needs to be championed more by Treasury with BIM being identified as part of agency Better Business Case submissions
- Market responses for the Ministry of Justice and Health projects from New Zealand companies were generally poor when addressing and integrating BIM into their proposal documentation. Australian contractors showed more maturity in responding to tenders
- Market responses to the Ministry of Education were variable and often technology-led
- The importance of the role of the BIM manager – client representative and in the supply chain
- Opportunity to attract young talent to the industry with technology revolutionising construction delivery

## 7 Next Steps

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The next steps for this Government as a client initiative are detailed below:

### 7.1 Next steps

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- **Continue to raise awareness and promotion of BIM to Government agencies** commencing with continued engagement with the 25 agencies that attended and were actively involved in the workshop. This will assist in enabling these agencies to include the use of BIM on future projects
- **Active participation and engagement with Government agencies implementing BIM on construction projects** i.e. with agencies specifying the use of BIM. What should they be including in their tender documentation (e.g. which LOD should be requested, how should their contract documentation change, how they should be engaging the market, what should their expectations be, should they be targeting consultants or contractors, what happens around IP and vendor selection, how should proposals be evaluated, etc.) What is already available that they can access to assist with the above e.g. BIM manual, case studies, future resources (training, contract text, etc.)? Should also be capturing what is being done and what the lessons learned are, etc.?
- **Explore further the role of asset management & soft landings** and the potential implications for the use of BIM not just in construction delivery but also across the management and operation of the asset during its life. This would cover two key areas – the integration of the BIM model into the building’s asset management system post completion and how the building is used and managed post completion. This work should be undertaken with Treasury and Government agencies to realise through life benefits
- **Address barriers to use from the workshop** – utilise address the outputs from the workshop. Share the details with the agency participants and develop strategies to address the challenges. This should be a joint Government agency/construction sector initiative driven by the NZ BIM Acceleration Committee

### 7.2 Timing

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The following next steps are proposed to the NZ BIM Acceleration Committee to discuss and agree on the recommendations outlined above along with the following associated implementation timetable:

- Continued promotion of BIM to Government agencies – targeting workshop attendees (Aug 15 – Dec 15)
- Active participation with agencies using BIM (Aug 15 – ongoing)
- Asset management & soft landings engagement with Treasury (Aug 15 – Mar 16)
- Address barriers to use from workshop & feedback to attendees (Aug 15 – Oct 15)



## **8 Appendix 1**

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### **8.1 Government Agency Workshop Presentations**

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#### **8.1.1 Large scale project use: Christchurch Justice and Emergency Services Precinct**

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The Ministry of Justice and Warren and Mahoney presented on their approach to using BIM on CJESP which the largest multi-agency government co-location project in New Zealand. Construction is underway and the precinct will be fully operational in 2017.

##### **Advantages of using BIM**

The Ministry of Justice identified that significant advantages could be gained by using BIM at a Level of Development (LOD) 500 for design, user engagement, costing and construction with the intention to integrate the BIM model into the property management system and processes.

BIM increased stakeholder engagement and allowed optimisation in the design and better workflow. Users of the building, such as the Judges, were digitally walked through the model to see how it would look and enabled them to provide input from an early stage. BIM encouraged a more collaborative environment.

The BIM model led to an improved use of available space and the use of new construction methodologies. The accuracy and speed of setting out the construction paths were also vastly improved.

The construction phase is also well informed. There is improved awareness and ability to pinpoint where each of the systems and networks will be located and how these can be coordinated.

##### **Key lessons learned to realise the full advantages that BIM has to offer**

- It was important to define the Level of Development at the beginning of the project
- There are significant advantages beyond the design and build phases for the full lifecycle of the project, from inception to destruction
- To realise the true cost benefit of BIM the life cycle must be taken into account, particularly the facility and property management. To gain return of investment BIM must be integrated into the Asset management System
- The BIM manager role is vital to the implementation of BIM on projects
- A BIM client brief and BIM implementation plan are essential resources to be developed and used on projects
- The contractual arrangements need to incorporate BIM requirements
- “Plan for the end of the project from the start” – prepare for post project completion
- Early client engagement is key plus education and capability building

The Ministry is now investigating how to incorporate BIM into its property processes and the applicability of BIM to other projects, for example, the proposed retro-BIM in the Auckland Courts property Portfolio.

#### **8.1.2 Strategic portfolio approach to BIM**

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The Ministry of Education is considering how BIM could improve value for investment and improve transfer of building information into operations across their programme of work by driving asset management and operations back through construction delivery and design.

##### **Current and future stock**

The Ministry's building stock is large and often highly repetitive. The majority of its new builds, redevelopments refurbishments and maintenance are small projects yet there are a number of large projects on the horizon, particularly in Auckland and Christchurch.

### **Approach to BIM**

The Ministry will progress a BIM exemplar project to explore the challenges and benefits of BIM. This Ministry will adopt other approaches that support and are supported by the use of BIM to improve value of investment and the transfer of building information.

The challenges:

- Capability and capacity (split into client and market)
- Contract and commercial (capturing requirements)
- Value for \$
- Buy-in and change management – behaviour and cultural change
- Transition from delivery to operations
- Scalability (applicability of BIM to smaller projects and smaller suppliers)
- Time – will it take more time? Investment and selling to key stakeholders
- Focus on outcomes rather than products or software
- Project delivery is key
- Getting something meaningful out of BIM and knowing what that was = learn lessons and take forward what need to know to inform strategy moving forward

The Ministry is procuring BIM advisory services to support the development of a BIM specification and a value focused procurement and contracting approach. This will enable the effective assessment of outcomes and the integration of any lessons learned into future guidance and policy.

The advisory services will assist the Ministry to:

- Identify the opportunities, challenges and implications of the use of BIM by the Ministry
- Develop a BIM scope
- Plan for the effective transition into operations
- Support the delivery of the project and associated transition; and
- Monitor performance, lessons learned, benefits realisation to inform the Ministry's approach to the future use of BIM

The Ministry has received a significant number of responses the Request for Proposals to date.

### **8.1.3 An international context: David Philp**

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The UK has a four-year construction strategy for BIM implementation. BIM use by central Government agencies and private sector clients has increased BIM adoption in the UK.

The Government Construction Strategy is the framework for a broad range of work-streams, which have the ultimate objective of reducing the cost of government construction projects by 20% by the end of the current Parliament. It focused on delivering:

- Better outcomes
- Visualisation and digitisation of buildings
- Smarter procurement, soft landings and other contributors
- A focus on value
- Capex vs Opex approach – needed to break the cycle
- A learning outcome framework

The UK Government recognised the need for industry reform and the need to take the waste out of the design and construction process and start thinking about a carbon future. The aim is to reduce capital expenditure and for the UK to get the social and economic infrastructure it needs for the long-term through:

- Procurement / Lean Client
- Standards / Lean Supply
- Facilities Management / Soft Landings (a strategy adopted to ensure the transition from construction to occupation is 'bump-free' and that operational performance is optimised).
- Data and Benchmarking.
- BIM Strategy
- Performance Management

To do this the Government mandated level 2 BIM. A trial project delivery group was created and its success measured against targets. Soft landings were a key part of BIM implementation to ensure customers were getting what they want. The UK Government invested GBP4.8m total cost on the BIM approach – to date GBP840m capex savings have been unlocked through the use of BIM across the Government programme.

The strategy timeline is:

|      |                                                                                                                                                                                                                                                  |                                                                                               |
|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|
| 2011 | Government Construction Strategy launched                                                                                                                                                                                                        | BIM task group formed                                                                         |
| 2012 | (Publicly Available Specifications) PAS1192: 2 published<br>Contract BIM Protocols                                                                                                                                                               | Mobilise Government departments and support teams<br>Cookham Wood trial project commences     |
| 2013 | Launch of BIM Communities of Practice<br>Fiatech Global Award                                                                                                                                                                                    | Building Knowledge and Capacity in Government departments                                     |
| 2014 | Regular 20% savings cemented<br>£840M savings unlocked                                                                                                                                                                                           | PAS1192-2: 3 published<br>PAS1192-2: 4 published                                              |
| 2015 | Level 2 complete <ul style="list-style-type: none"> <li>- PAS1192: 5 published</li> <li>- Digital Plan of Works</li> <li>- Classification System</li> <li>- Learning Outcomes Framework</li> <li>- BIM Departmental Stewardship Group</li> </ul> | Level 2 Legacy starts<br>EU BIM Task Group launched<br>Launch of Level 3<br>Business as usual |
| 2016 | Successful handover to private sector                                                                                                                                                                                                            | Digital Built Britain mobilises                                                               |

To enable successful BIM implementation clients need to build capability and expertise in buying their digital data:

- Capability to deliver
- Defined info requirements
- Right to use the data
- Agreed model outputs
- Defined process for info delivery
- Agreed data exchange standard

The next stage in the strategy is to move to Level 3 BIM and the Digital Built Britain concept. With Level 2 there is limited functionality for delivery of operational data sets and integration of operational performance of buildings. Level 3 will address these in sector delivery and operational stages, with a focus on enabling total cost of building and operating assets and their associated carbon outputs.

David is also involved with BIM4EU, a group working towards Europe-wide convergence on the use and specification of BIM. This group is interested in consolidating activity, harmonising standards and achieving better value for money for Government clients. This group has three main areas of interest:

- Technical best practice
- Client leadership and
- Cultural and people issues

David observed the positive steps being taken in New Zealand to support BIM adoption and noted the introduction of the handbook, published case studies and the forthcoming training courses.

An industry function followed the workshop where David presented to Government agencies and construction industry representatives and BIM practitioners. This was followed by a question & answer session and networking.