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24 June 2015

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Research Director
Infrastructure, Planning and Natural Resources Committee
Parliament House
George Street
Brisbane Qld 4000

Via email: ipnrc@parliament.qld.gov.au

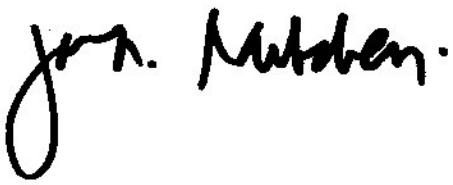
Dear Research Director

Thank you for the opportunity to make a submission to the Inquiry into Building Queensland.

Members of buildingSMART are available to appear at the Inquiry to expand on the points set out in this submission and to answer any questions the Committee may have.

Please find the submission attached.

Sincerely,



JOHN MITCHELL

CHAIRMAN, buildingSMART AUSTRALASIA

Submission to Parliamentary Inquiry into Building Queensland Bill 2015

Submission summary: buildingSMART believes that the Building Queensland Bill should be amended to reflect Building QLD's role at the centre of innovation and best practice in the field. For several years, Australian jurisdictions have adopted a passive approach to increasing international BIM regulation and pioneering. With the introduction of this new legislation supporting the Building QLD entity, Queensland can re-ignite its "smart state" reputation by leading in this important area of national capability.

The Bill should be amended to state that innovation should be sourced from around the world. This innovation should provide the best value-for-money, be sustainable and be clearly related to tangible and measurable benefits.

In this context, once established, buildingSMART submits that Building Queensland should exercise leadership by requiring the adoption of BIM in all Queensland Government infrastructure projects, and mapping the improvements provided – just as the Australian Department of Defence has been given this responsibility by the Commonwealth. This would place Queensland at the centre of innovation and global best practice in this area.

Introduction and overview

This Submission provides a response to the Committee's call for submissions for its Inquiry into the provisions of the Building Queensland Bill 2015 ('the Bill') which was introduced into Parliament on 19 May 2015.

buildingSMART contributes its views in the interests of promoting the policy settings that best support and improve construction and building industry standards, productivity and competitiveness in Australia.

As stated by the Committee, the Bill proposes the establishment of Building Queensland, which is intended to ensure a whole-of-government perspective is brought to major infrastructure planning and investment in Queensland. buildingSMART welcomes the opportunity to submit its views to the Committee on these important issues, and to offer its guidance into the adoption of Building Information Modelling (BIM) processes and the potential benefits we believe Queensland Government and Building Queensland should consider.

Background – buildingSMART

buildingSMART is a not-for-profit industry group consisting of organisations committed to seeing BIM adopted nationally. The overriding objective of buildingSMART is that we want to produce much better built infrastructure - buildings and other facilities that the community values, that meet real needs, that perform better, that impact the environment less, that take less time and money to build and to use. To that end, buildingSMART promotes collaboration across the industry through the development and adoption of open standards for sharing BIM data.

Our members are drawn from across the industry, including:

- Building owners and developers (both Government and private);
- Architects, engineers and related design, planning and authority professionals;
- Buildings, sub-contractors, product and materials suppliers; and
- Related service providers.

Our Board includes industry experts and academics. We do not seek to make a profit, but rather provide our services to buildingSMART pro-bono and in addition to our day-to-day businesses – each of us simply have a personal commitment to seeing the production of better buildings and infrastructure across Australia.

We are part of an international organisation, with almost 20 chapters across the globe.

Background – BIM

The construction industry is one of the last sectors of the economy to adopt digital technologies that have revolutionised car production, aerospace and advanced manufacturing. The move from traditional documentation to the new digital modelling and vastly improved collaboration and enhanced deliverables is a major worldwide focus, and one that Australia needs to play a major role.

buildingSMART is the only global standards setting body focussed solely on building and infrastructure.

BIM facilitates the creation of an accurate prototype which can contain attributes data at all stages of the construction lifecycle. Originally, the term applied only to the delivery of building construction, but it is now being successfully used on many types of infrastructure and benefiting end users and asset owners through its ability to greatly improve operations and maintenance controls.P

BIM is a process that can integrate the data during the design, construction and maintenance of a project to be shared amongst all partners. Where some designers, constructors and their consultants still rely on two-dimensional drawn plans to advance their project, those at the forefront of BIM have moved through 3D modelling, 4D (adding time or staging to 3D), 5D (adding cost data to 3D) and 6D (where the 3D data is populated with future asset information).

This is achieved through a mutual exchange of data, resulting in a complete digital description of a project. The BIM digital description is then available for the entire life cycle of a project, providing the client or owner with a perfect, updated "as-built" digital file of their asset.

BIM is based on the idea that a building is constructed twice: virtually first and physically second. This integrated approach resolves many of the inefficiencies that take place throughout the industry by improving collaboration to help identify issues during the design phase, allowing service coordination and clashes to be managed and virtually resolved prior to commencing actual construction works.

The need for vendor-neutral (non-proprietary) methods of exchanging information throughout a project has been recognised through the adoption of *OpenBIM*, common data exchange protocols in BIM. This will allow users to work seamlessly with other *OpenBIM* solutions.

There is widespread agreement that digital technology offers enormous benefits when used to develop effective ways of representing the physical world in a digital form. The building, infrastructure and construction industries all understand the value of the BIM process in improving efficiency, quality and cost of project delivery.

Around the world, Governments are driving this new level of efficiency in their procurement of major projects by setting core standards for BIM implementation. In 2011, the United Kingdom Government announced that it would require fully collaborative 3D BIM as a minimum on all Government construction projects by 2016. Through this, the UK Government is expecting to achieve a 20% reduction in procurement costs for government buildings compared with traditional practices. Schools, hospitals, utility plants, railway stations – all being built in a digital model, shared with all stakeholders, tested for longevity and purpose and ensuring surety of delivery, before ground is broken or the first brick is laid on site.

Australia needs to introduce reform to construction methods to achieve similar savings. The 2014 Productivity Commission report into Public Infrastructure is highly complementary of BIM and devotes a specific recommendation to endorsing it.

buildingSMART – a volunteer association of industry leaders – believes the market will eventually adopt BIM for all infrastructure and building projects in Australia. Indeed, it is already being used on a number of significant government and private projects throughout Australia. However, it would be short-sighted for government not to seek to accelerate, or indeed "own", that development.

The benefits from introducing BIM are extensive. Businesses at all levels in the construction supply chain working on a Government project would collaborate and openly share plans. This would help to strip out waste, mistakes and lost time.

Analysis

International context

Other nations around the world provide a framework, guidance and lessons learned for Australia, including the need for government involvement. In the Western world there is already a leader and great advocate in the use of BIM in the UK Government. The UK Government has provided leadership in telling the market what the Government wants; not how to do it. Tying Queensland to the UK's success in this field will drive reform, improve projects and set a new reputation for infrastructure delivery in Australia.

In 2011, the United Kingdom Government announced that it would require fully collaborative 3D BIM as a minimum on all Government construction projects by 2016. The UK Government believes that BIM is not about a specific technology or product, but a process to give clients all the data that is of use to manage the facility after handover.

Other government jurisdictions that already require the use of BIM for government building procurements include the United States, Norway, Finland, Denmark, Germany and France. In our region, China, including Hong Kong (SAR), South Korea and Singapore have taken steps to achieve BIM implementation through a planned approach. For example, the Singaporean Government is well into applying a mandate for BIM, offering incentives to those willing to be the early pathfinders towards a goal of increased industry adoption, and ultimately full BIM submissions. The UK, France and Singapore all have Ministers who are responsible for BIM.

Australian Context

BIM in Australia

There are a number of examples of BIM being implemented across Australia which provide useful guidance and highlight the significant benefits to be gained from implementing this technology.

- The Commonwealth Government Department of Defence is already using BIM and is looking to implement the 'early contractor involvement model' as standard practice by 2016.
- The Sydney Opera House is currently introducing a BIM asset management system. This has been a very complicated project given the Opera House's location and history. The introduction of this system will change their facilities and operations management from reactive to proactive.
- In NSW, Transport for NSW is another leader in Australia's BIM adoption. This year they will create a seven-person BIM implementation team. Digital Engineering is being used on a range of transport projects, but to this point is has mostly been led by industry, not Government. Transport for NSW have also included BIM requirements on their latest major projects such as North West Rail Link as a part of the Sydney Metro and elements of Westconnex.
- NSW Health is also developing its own BIM protocols.

Given the rapid uptake of elements of BIM in Australia, it is also now becoming 'business as usual' for a large number of contractors seeking to create savings and efficiencies, and drive greater collaboration, on projects. Projects that have used elements of digital engineering include:

- Royal Adelaide Hospital Project
- Moorebank Intermodal Terminal Project
- Barangaroo development, including Wynyard Walk
- North West Rail Link
- Southern Freight Link
- Regional Rail Link Victoria
- South West Rail Link
- Auburn Stabling Yard
- Sydney CBD light rail
- Perth Children's Hospital
- Perth Stadium
- Perth Museum

Productivity Commission report into Public Infrastructure 2014

The Productivity Commission report, published in 2014, report is strongly supportive of BIM and devotes an entire recommendation to it (rec 12.5), suggesting that the Government should lead its development in Australia.

> *Recommendation 12.5*
> *For complex infrastructure projects, government clients should provide concept designs using Building Information Modelling (BIM) to help lower bid costs, and require tender designs to be submitted using BIM to reduce overall costs.*
>
> *To facilitate the consistent use of BIM by public sector procurers, Australian, State and Territory Governments should:*
> - *facilitate the development of a common set of standards and protocols in close consultation with industry, including private sector bodies that undertake similar types of procurement; and*
> - *include in their procurement guidelines detailed advice to agencies on the efficient use of BIM.*

The Productivity Commission's report outlines how, given the benefits that can stem from the use of BIM, some government clients have mandated its use for building and infrastructure works, for example in the UK and Singapore.

Status of Government involvement

buildingSMART believes the market will eventually adopt BIM for all infrastructure and building projects. However, it would be short-sighted for the Government not to seek to accelerate that development, to proactively exploit the immediate benefits, better outcomes, cost savings and industry improvements available through early adoption via government procurement. In Australia and New Zealand, BIM is currently being driven strongly by BIM user communities using proprietary solutions, rather than existing common protocols and standards. There is a need for Government to take a strong stand to ensure national consistency at this early stage, for the benefit of both government and industry.

Without government leadership, different states, government departments and industry players could adopt different standards – potentially the 21st century equivalent of states adopting different rail gauges, leading to missed opportunities and a loss of productivity.

There are currently no policies to drive the effective use of BIM across the whole of the infrastructure asset lifecycle in Queensland. This is the role that Building Queensland could play.

Benefits of adopting BIM

BIM changes the way people work together: BIM enables different parties to understand each other's data, creating more informed and unified teams. When a whole team is linked by a single data source, the previously siloed functions, consultants and subcontractors can see beyond their own interests to a more holistic view. BIM provides all involved with a 'single source of truth' with which to collaborate more successfully.

Better design and solutions: BIM enhances performance. It makes possible swift and accurate comparison of different design options, enabling development of more efficient, cost-effective and sustainable solutions.

Savings on time and cost: Substantial time savings can be achieved by agreeing the design concept earlier in project development to eliminate late stage design changes, avoiding clashes and using standard design elements when practicable.

Community responsibilities: Particularly beneficial for Government projects or those with a major public interface, BIM can be used to bring local community members, workers, or other high-profile stakeholders into the detail of the project before it is delivered.

In addition, crowd behaviour and fire modelling capability enable designs to be optimised for public safety.

Trade and Industry: If we do not pursue BIM in Australia now, foreign investors will, and Australia will lose a valuable opportunity. Equally, BIM has the potential to become a valuable export for Australia.

Environmental benefits: BIM is a low-carbon technology that reduces waste. It involves less material waste, more efficient design from an energy consumption perspective, low carbon consumption, the use of passive design and the use of sustainable materials. Importantly, materials are not over-ordered, reducing waste.

BIM and facilities management: Facility managers are continually faced with the challenge of improving and standardising the quality of the information they have at their disposal. There is no one-size-fits-all application, as the requirements of facilities management practices are widely diverse. BIM for facility managers offers a new level of functionality for the management of buildings and the physical assets within them. BIM provides a unified digital repository of all building components, which can become an electronic owners manual.

BIM and the digital built environment: Using BIM to create a digital built environment will ultimately form a new piece of 'infrastructure': a complete digital model of the natural and built environment. It will be a permanent and ever-changing asset of the community and Government. It will be used to manage our transport, energy and water flows, as well as for emergency services and disaster recovery.

In this context, the use of BIM will enable us to plan, design, test, communicate and approve all new activities within our cities before the perfected ideas are manifested in the real world. This will deliver better outcomes, more quickly at less cost and with lower risk.

Financial issues

All Australian Governments are facing challenging fiscal environments. BIM is a money-saving concept that will improve the budget, drive productivity and make Australian businesses more efficient and competitive.

There are no funding requirements. buildingSMART is simply requesting the Government's support by way of changes to its procurement practices only, which in our opinion would be cost neutral.

Building Queensland legislation

In a report released last year, the Queensland Department of Transport and Main Roads outlined how they expected professional engineers to evaluate risks and benefits of innovation that lead to 'value for money' solutions.[1]

buildingSMART submits that Building Queensland should adopt the same principle, including seeing innovation as an opportunity to improve Queensland's future. Building Queensland should actively encourage innovation that provides the best value-for-money.

The Bill could be amended to state that innovation should be sourced from around the world. It should be sustainable and clearly related to tangible and measurable benefits.

This should including testing value propositions in overseas procurement models and methods. Building Queensland should be given a specific reference to be at the forefront of international infrastructure procurement to ensure Queenslanders get the best value for their money. buildingSmart is confident this would set a national benchmark, acknowledging Queensland's role at the leading edge of infrastructure development.

[1] *Engineering Innovation In the Department of Transport and Main Roads*, September 2014, p 5.

Conclusion

buildingSMART thanks the Committee for the opportunity to provide its views in relation to the Bill. buildingSMART would be pleased to provide further information or context at the Committee's request:

John Mitchell

Chairman, buildingSMART