Subject:	**Adopting building information management**
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Proposal

We propose to:

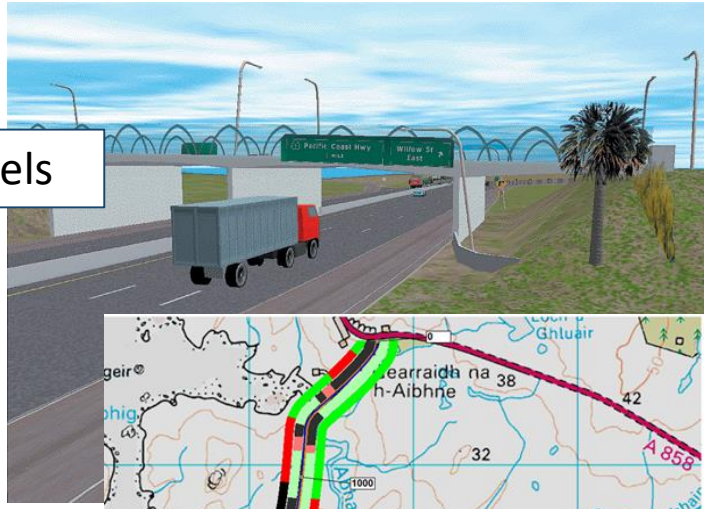
- adopt building information management as a key asset management information framework and toolset across its whole build, operate and maintain, dispose asset lifecycle for road asset management, subject to a supporting business case being approved
- Take a proactive approach to develop a culture of digital collaboration with the Transport Agency's partners and across its supply chain
- promote sector-wide adoption of building information management and consistent open data and communication standards.

Building information management is about capturing, sharing and providing electronic information to decision makers

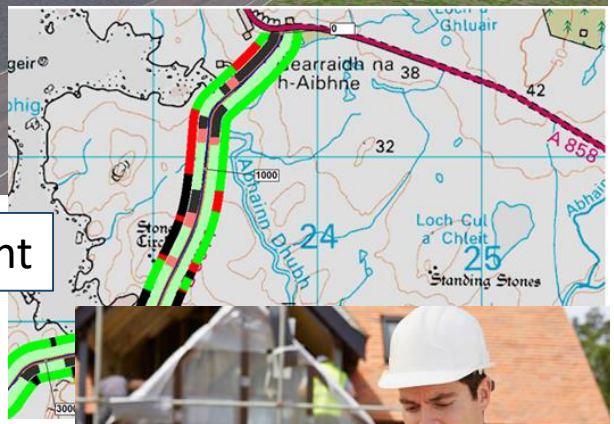
- Building information management is a collaborative way of working, using digital processes and smart tools, to enable more productive methods of delivering well-informed services when planning, designing, constructing, operating and maintaining assets:
  - Creating digital information models that can present information on top of a 3 dimensional image of a road
  - Using readily accessible, real time information, whatever the type of information, irrespective of its source, wherever the decision maker is, on site, in the office, with customers …
  - Using real-time data and impact forecasts, eg models forecasting floods based on rain forecasts and river flow readings so the Transport Agency can respond with information to its customers about potential road closures and undertake preventive works ahead of a predicted flood
  - Capturing data once as the source of the truth, and using it many times
  - Capturing data that is useful and managing it as an asset
  - Replacing paper-based plans and manuals with digital models and documentation

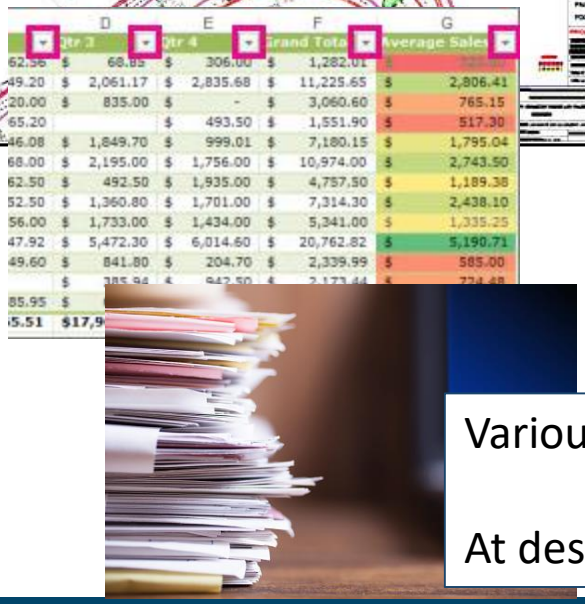
Building information management will change how and where the Transport Agency accesses information

Plans → Digital models



Data → Spatial insight

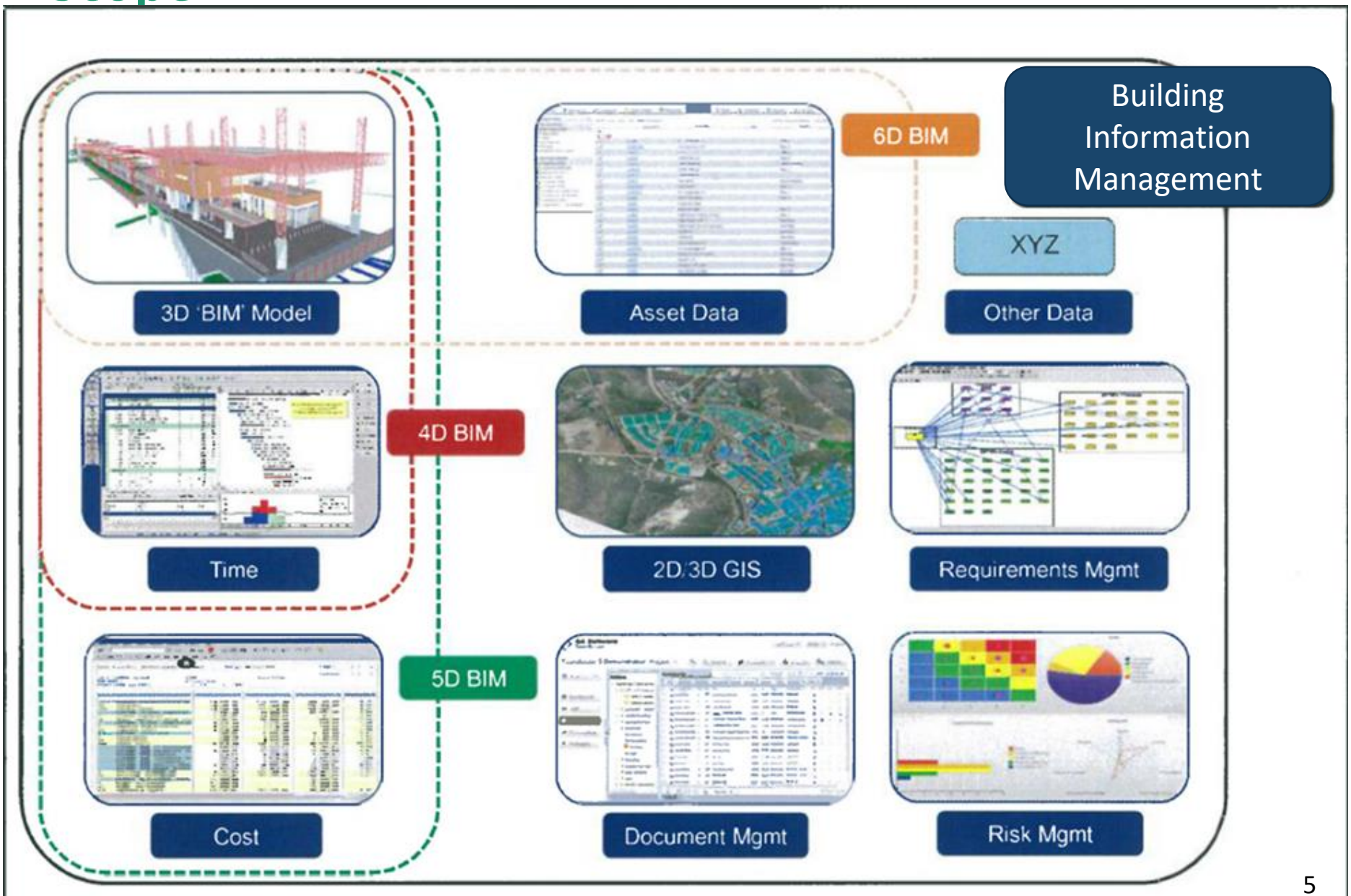




Various media → Integrated information

At desk, reported → On site, current

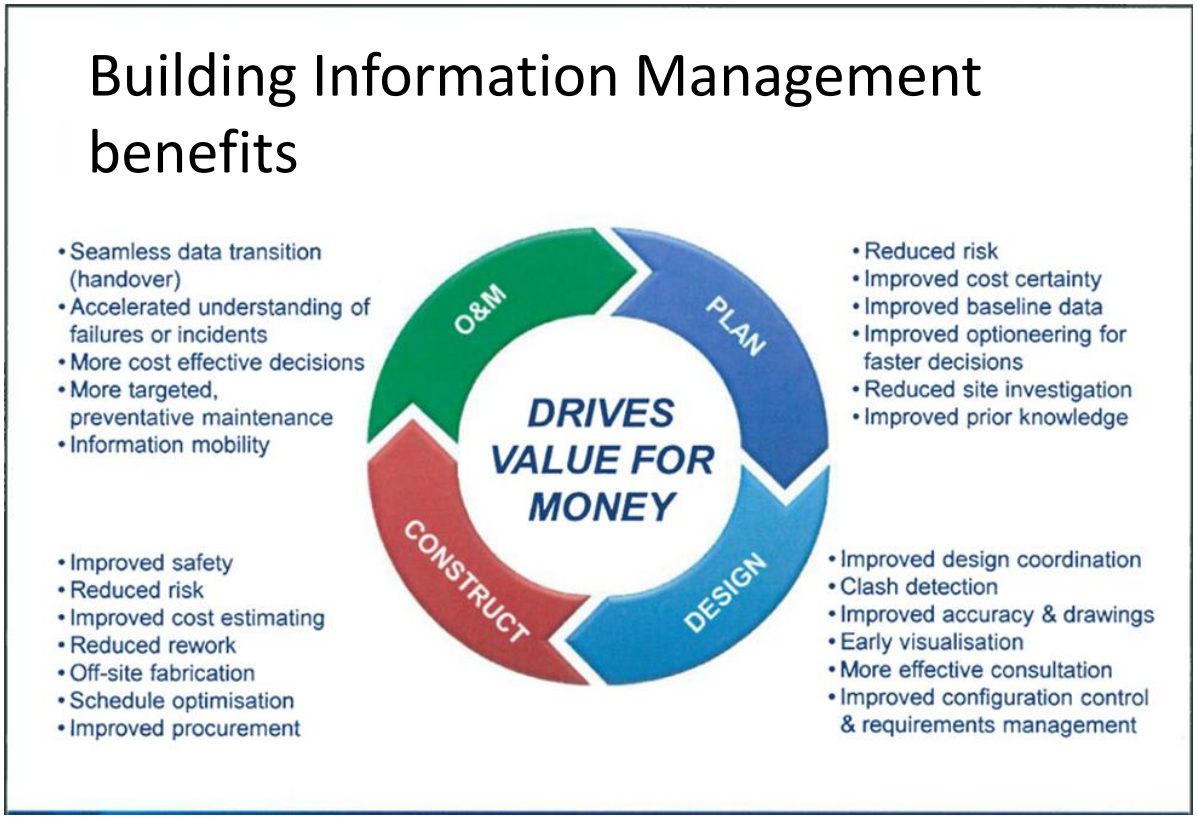
Building information management has a broad scope



The benefits are better customer service and lower cost

Using building information management leads to

- **better customer service** decisions because of a better information base using integrated data
- **lower costs** because information transactions are electronic and information created once is used many times



Greater benefits, and risks, would come with implementing building information management across the whole road asset life cycle

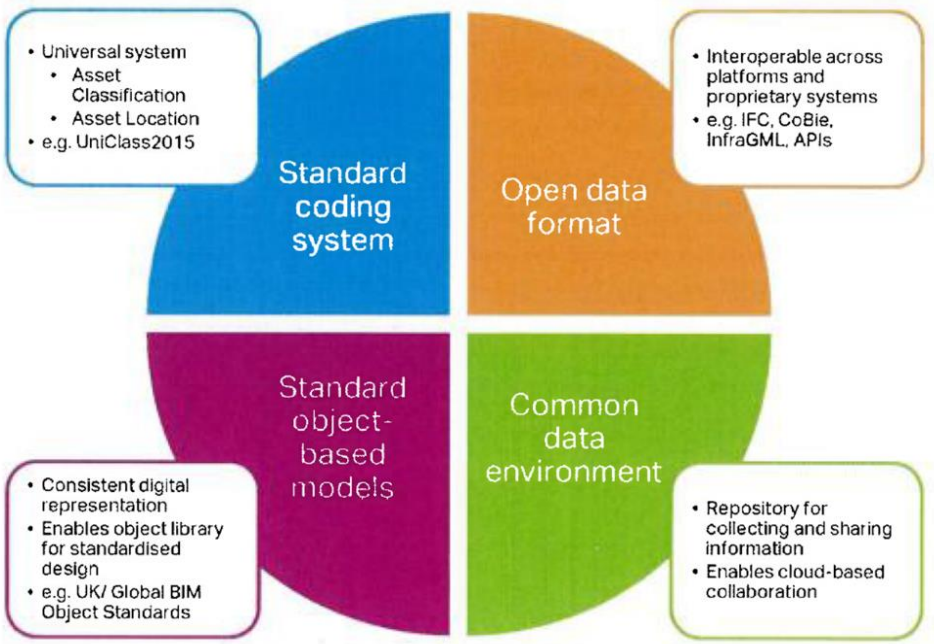
- International estimates are that there would be five times the benefits from implementing building information management across the **build : operate & maintain : dispose** asset life cycle as those from applying it to the build component alone
- The operate & maintain components have more relevance to most transport agencies (particularly smaller local authorities) as many have infrequent significant construction projects or new infrastructure from third party subdivision construction
- Applying building information management to the operate & maintain component is more challenging because:
  - While the Transport Agency could exploit the international learnings from use of building information management through the build phase there is very little similar experience beyond that for horizontal infrastructure
  - The information requirements are broader because they encompass service performance, asset condition, demand, and maintenance works over time when needs will change, to a greater depth than is needed for most build projects
  - International data standards and practices for these components are only being developed now

Building information management has specific requirements

Building information management requires an ecosystem of:

- Data and electronic communication standards to enable business to business communications and data integration
- Integrated, open data sources
- Business intelligence analytics and insight
- 2d and 3d spatial models and tools to capture, manipulate, analyze and present information

This would use existing technology, though some would be new to the Transport Agency



Building information management supports achievement of the Transport Agency's strategy

- Building information management:
  - Is a key element of the digital transformation of transport
  - Would enable the Transport Agency to share information and insights with its partners and suppliers through common data standards and shared information models
  - Improves productivity and the achievement of collaborative and contractual relationships - thereby furthering both the One Connected Transport System and the Partnerships for Prosperity strategic responses
  - Supports new collaborative ways of working by enabling the sharing of knowledge and by providing a common data set for decision makers – supporting the new DNA of the Transport Agency

Adoption of building information management is consistent with Government priorities

- The New Zealand National Infrastructure Plan promotes the adoption of compatible data standards for public infrastructure: roads, 3 waters, buildings
- The Ministry of Business Innovation and Employment is promoting the implementation of building information management
- The Transport Agency, through its membership of Austroads, is leading development of the road data standard with significant support and input from Auckland Transport, the Wellington and Christchurch City Councils and RATA (the Waikato local body asset management collective)
- The New Zealand parties initiated development of this standard two years ago
- The standard should be released in a working form in mid 2017 - Version 1 is currently being trialled by Christchurch City Council

Continued …

Adoption of building information management is consistent with Government priorities continued

- Similar draft data standards have been developed in New Zealand for 3 waters and buildings
- The emerging Austroads standard is seen as the de facto equivalent for roads
- The Transport Agency has taken action to ensure that the road standard is compatible with the 3 waters and buildings standards and will continue to do so as development of the those standards and the road standard progress
- The Government has recently agreed to pursue finalisation of the 3 waters and buildings standards, and to develop a business case and implementation plan
- The Transport Agency has engaged with the new project team at Land Information New Zealand and anticipates being part of the Land Information New Zealand led steering group, and any New Zealand governance group created to manage standards and implementation

It is the right time to develop a consistent approach to digital building information management in New Zealand

- Building information management is being used by a number of the Transport Agency's suppliers to reduce costs and improve construction scheduling
- Its use is currently inconsistent and unsystematic across projects - hindering fluent electronic capture of new assets and subsequent asset information management and valuation
- Many client agencies, such as Auckland Transport, are trialling the use of building information management and considering broader adoption of building information management through their businesses, a common approach is better for New Zealand

Continued …

It is the right time to develop a consistent approach to digital building information management in New Zealand continued

- If client agencies, like the Transport Agency, take the lead New Zealand can consistently adopt and use open data and communication standards
- Conversely, if client agencies do not insist on open standards, vendor-supplied standards will be used, and this will create reliance on private intellectual property
- Big data analytics are maturing bringing improved opportunities for evidence-based decision making, with the benefits enhanced if the data and tools are systematically managed
- Improved customer services and efficiency rely on improved business to business communication, real time information from increasingly able and cheaper remote sensors, and the use of standard data and analytics to enrich data, fuel insight and optimise investment

A collaborative approach will deliver better results for New Zealand

- A collaborative approach to implementing building information management should:
  - Improve quality, alignment, and buy-in, and, hasten and ease implementation across the Transport Agency's partner agencies and supply chain
  - Assist the development of consistent standards across transport agencies and suppliers, and within councils that manage a variety of infrastructure
- Experience in the Netherlands has shown that engagement with suppliers, and seconding their experts to participate in standards and process development has increased buy-in and accelerated implementation - this has been associated with a publically-stated intent to require use of standards in future contracts
- The Transport Agency proposes to replicate that approach across the supply chain with road agency partners if they agree

Continued …

A collaborative approach will deliver better results for New Zealand continued

- The New Zealand transport sector has a mature approach to the development and implementation of common standards because of its unique history of inter-dependent and collaborative working on a frequent basis
- The parties who initiated the development of the road standard in New Zealand have also indicated interest in extending that collaboration to digital engineering, as have some suppliers, however this intent needs to be formalized at a high level

Digital building information management requires a focus on people and processes to produce a positive change

The adoption of digital building information management requires as much of a cultural change as a technical change because it:

- Requires (1) the use of consistent practice over personal preference; (2) a whole of life asset management approach; and (3) significant investment in information models early in the project lifecycle if the greatest benefits are to accrue as projects progress
- Democratises access to information, thereby enhancing the value-add from decision-making over the value add from the creation or analysis of information
- Enables:
  - more extensive and exacting benchmarking and performance management and, therefore, greater scrutiny
  - better practice to be more rapidly adopted across a business

  (However, while this improves the benefit realisation of new approaches it challenges the perceived independence of local decision makers)

A staged approach is being taken to implementing building information management so that the risks and impacts may be managed

- The Transport Agency is confident that building information management is a critical enabler of its success and, whether the Transport Agency takes action or not, elements of it will support its future
- It is not yet known what the cost of adoption will be, although peers are budgeting tens of millions of dollars
- Around $2M will be invested over the next year to develop a business case for a proposed implementation strategy - this can be funded from current National Land Transport Programme budgets
- Implementation may cost in the order of $20M, however that is a crude estimate which will be refined over the next year before any commitments are made.
- The greatest risks are around whether
  - The Transport Agency's partners and supply chain support the approach, and take timely supporting action
  - The Transport Agency can effect the necessary culture change

In 2017 the Transport Agency should …

- Engage a project team and, potentially, second subject matter experts from partners
- Engage with:
  - The Land Information New Zealand projects for 3 waters and building standards, and the Ministry of Business Innovation and Employment's building information management acceleration committee to ensure compatibility of standards, approach and subsequent standards governance
  - Its partners and suppliers to agree goals and approach (early engagement with key partners suggests there would be willing sector participants)
- Develop enabling data and communication standards, contract terms and conditions, and business process design and capability development proposals, preferably with experts seconded from its partners
- Trial approaches and develop processes on selected projects
- Agree the strategic approach to digital building information management and develop an implementation plan and budget with its partners and suppliers

In 2018 the Transport Agency would …

- Commence implementation with rollout through pilot capital projects to test, refine and enhance standards and processes
- Deliver 2d and 3d model requirements to significantly enhance the capability of the spatial aspect of data capture, analysis and presentation

After 2018 it is anticipated that the Transport Agency would …

- Target the inclusion of building information management requirements in the forthcoming maintenance contracts that will replace the current Network Outcomes Contracts, and in capital projects
- Go live with digital building information management across maintenance and operations nationwide once critical capability is available and when a critical mass occurs that warrants complete adoption of new standards