


# The Current Status and Future Trend of Construction in Australia

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2014 ASIA CONSTRUCT CONFERENC

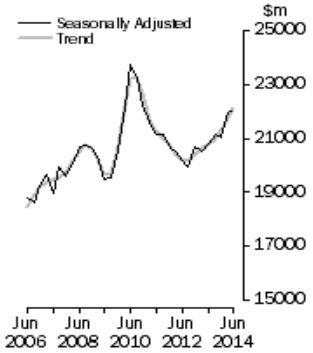
# Building Activity in Australia, June 2014

## JUNE KEY FIGURES

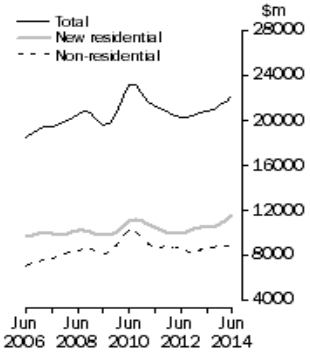
| | Jun qtr 14<br>$m | Mar qtr 14 to Jun qtr 14<br>% | Jun qtr 13 to Jun qtr 14<br>% |
|---|---|---|---|
| **TREND ESTIMATES(a)** | | | |
| **Value of work done** | **22 095.4** | **1.8** | **6.2** |
| New residential building | 11 609.1 | 3.9 | 11.2 |
| Alterations and additions to residential building | 1 753.5 | -0.1 | 1.4 |
| Non-residential building | 8 734.8 | -0.5 | 1.1 |
| **SEASONALLY ADJUSTED ESTIMATES(a)** | | | |
| **Value of work done** | **22 054.3** | **0.4** | **6.0** |
| New residential building | 11 601.8 | 1.8 | 10.9 |
| Alterations and additions to residential building | 1 727.0 | -3.0 | -2.9 |
| Non-residential building | 8 725.5 | -0.6 | 1.9 |

(a) Reference year for chain volume measures is 2011-12.

**Value of work done,** Chain volume measures



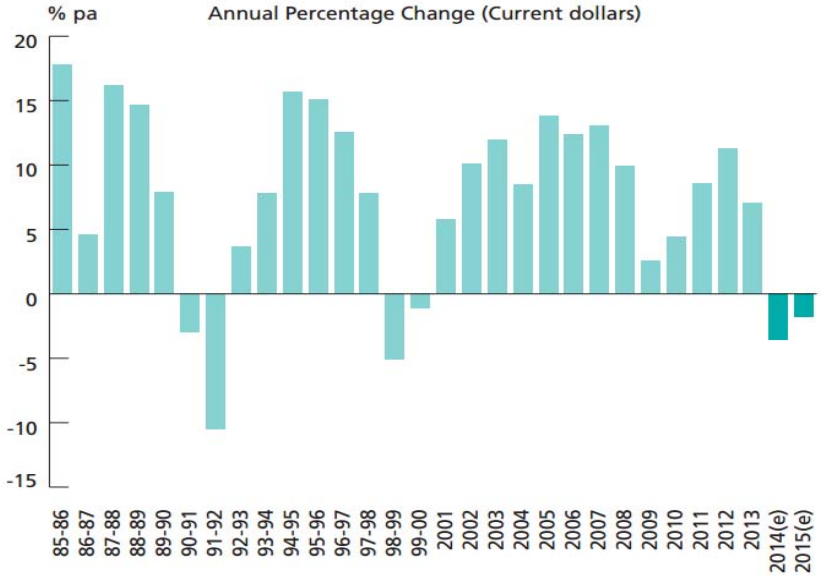

**Value of work done,** Chain volume measures - Trend estimates




Information Source: Australian Bureau of Statistics

# Australia Construction Outlook

**TURNOVER FROM CONSTRUCTION WORK**




**CONSTRUCTION TURNOVER – AUSTRALIA OUTLOOK BY MAIN SECTOR AT A GLANCE TO 2015**

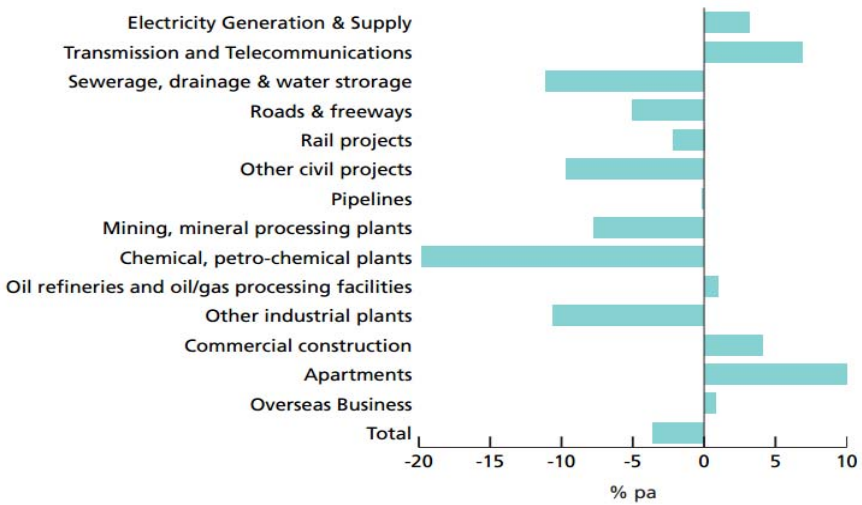
| | % Change p.a. | | |
|---|---|---|---|
| **Sector** | **2013** | **2014(F)** | **2015 (F)** |
| Infrastructure | 9.2 | -4.6 | 1.6 |
| Mining | 10.0 | -7.7 | -12.5 |
| Heavy Industrial Construction | 6.2 | -3.6 | -12.7 |
| **Total Engineering** | **9.0** | **-5.1** | **-2.9** |
| **Non-Residential Building (Commercial Construction)** | -1.8 | 4.1 | 3.5 |
| – Private sector | -3.0 | 2.8 | 5.1 |
| – Public sector | -1.0 | 5.1 | 2.3 |
| **Apartments** | 2.1 | 10.0 | 9.6 |
| **Overseas Business** | -1.8 | 0.8 | 0.5 |
| **Total Construction** | **7.1** | **-3.6** | **-1.8** |

- Australia's leading construction companies are forecasting a decline in total non-residential construction work through the 2014 and 2015 calendar years.
- Total employment is also forecast to decline through to mid-2015 in response to the weakening in resources and total infrastructure project activity.
- Mining related construction is expected to weaken through 2014 and 2015.
- Other notable declines are forecast in other civil projects and heavy industrial resource abased project, including oil and gas processing.
- Commercial construction sector is forecast to gain some momentum over the next two years.

Information Source: Australia contractors association

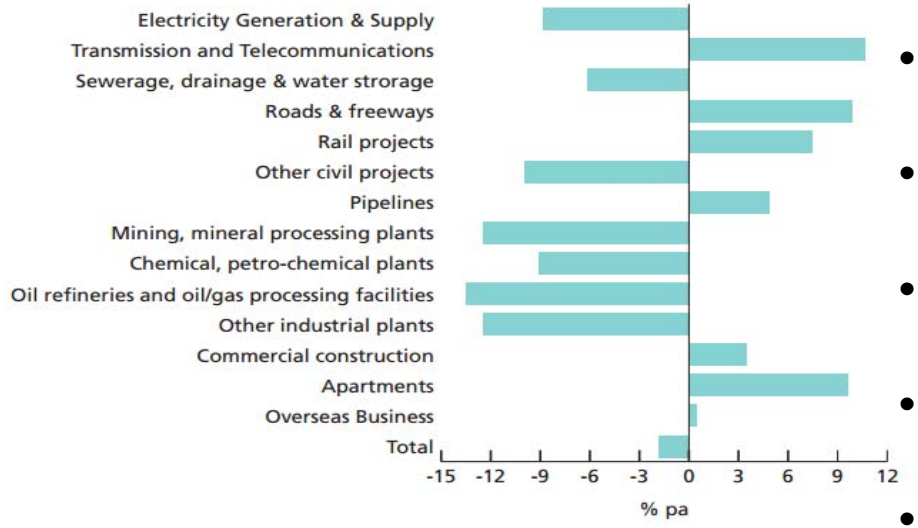
# Australia Construction Outlook:2014 and 2015

**2014 FORECAST ANNUAL PERCENTAGE CHANGE (CURRENT DOLLARS)**




- Growth in total turnover from construction work is forecast to decline by 3.6% p.a.
- Total infrastructure construction is expected to turn down by 4.6% p.a.
- The value of mining sector work is expected to contract by 7.7% p.a. as mining investment reduces from peak levels.
- Work on oil and gas processing projects (+1.0% p.a.) is forecast be sustained at a high level underpinned by major LNG facilities still under construction.

**2015 FORECAST ANNUAL PERCENTAGE CHANGE (CURRENT DOLLARS)**




- The total value of construction turnover is forecast to decline by a further 1.8% p.a. during 2015.
- The value of infrastructure work is expected to remain broadly unchanged over the year.
- Consistent with a slowing resource projects pipeline, a further decline in mining
- related construction work of 12.5% p.a. is expected in 2015.
- A weaker outlook is also predicted for heavy industrial construction in 2015.
- Growth is forecast in turnover from commercial construction activity of 3.5% p.a.

formation Source: Australia contractors association

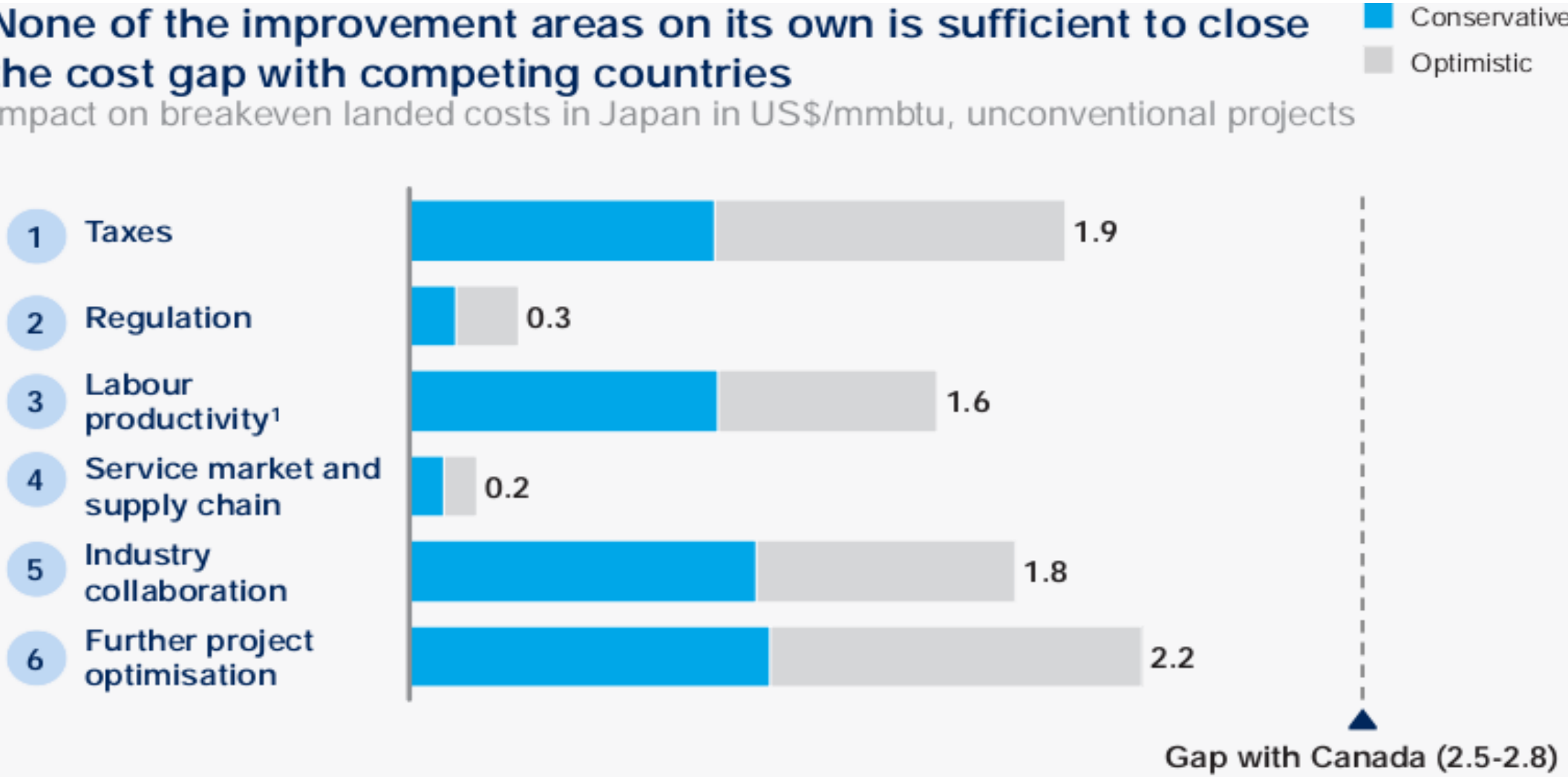
*“However, the cost of building new LNG (Liquefied Natural Gas) projects is now about 20–30 percent higher than that of the competition in North America and East Africa. ”*

*“Australia needs to reduce costs of LNG projects by 20–30 percent to remain competitive ” .*

— McKinsey & Company “Extending the LNG boom: Improving Australian LNG productivity and competitiveness”， May 2013

## None of the improvement areas on its own is sufficient to close the cost gap with competing countries

Impact on breakeven landed costs in Japan in US$/mmbtu, unconventional projects




[1] Includes improvements to productivity (output per manhour) and stabilising labour rate increases to be in line with wage growth in other industries

SOURCE: McKinsey LNG-OMG model, IHS

# FLOWLINE

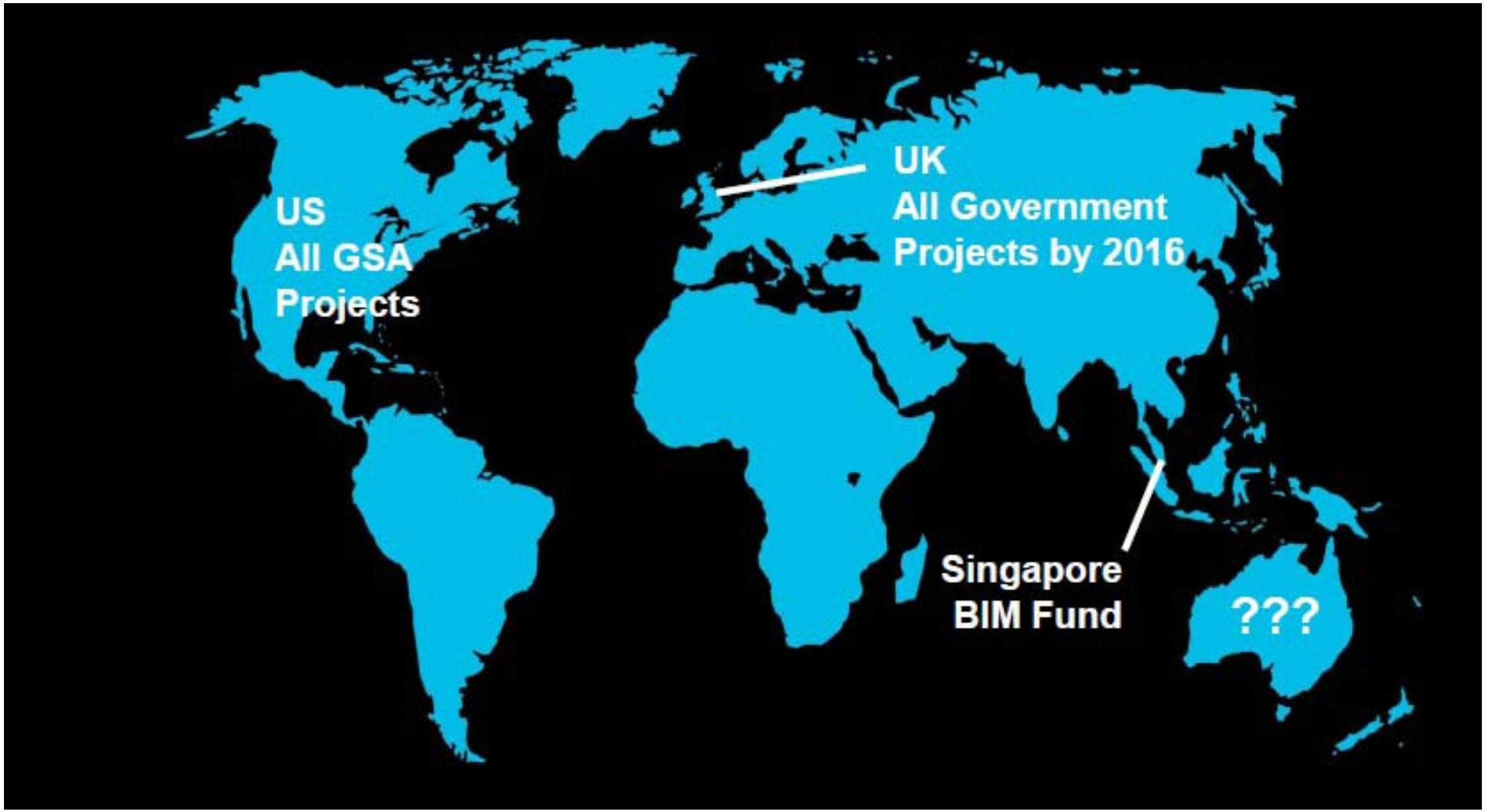

Australian LNG can only realise its potential if government policy and project cost pressures are managed effectively. To keep the investment pipeline flowing, industry and government must work together.

"Industry must invest in innovation and technology to work smarter, more efficiently and more competitively," Mr Krzywosinski says.

# Main Research Streams in Construction Informatics in Australia

- Building Information Modelling (BIM)/ Green BIM
- Internet of Everything
- Big Data

# Mandated BIM –The trend has begun



# BIM in Australia

- BEIIC (Built Environment Industry Innovation Council) established Digital Modelling Working Group:
  - –BIM was identified as key priority area
  - –BIM will transform business processes, and is more than enhanced visualisation and automatic scheduling. BIM will improve decision-making at each stage of the construction and operation process.
  - – Report "*Productivity in the Building Network : Assessing the impacts of BIM".*

# BIM in Australia

- Governments of the United Kingdom, Singapore, United States of America, Norway, France, Denmark and Finland are driving the use of BIM through government procurement and facility management processes.
- Australian construction sector cannot afford fragmented approach to BIM.
- In order for Australian construction sector for internationalization requires Australian firms to adopt BIM as a new competitive advantage.

Information Source: BEIIC

# Report: “Productivity in the built environment: Assessing the impacts of BIM”

- The first survey report about BIM in Australia

Information Source: Allen Consulting Group

# Report: “Productivity in the built environment: Assessing the impacts of BIM”

- Buildings network is a vital and significant part of the economy
- Accounts for around 12% of Australia’s total production (equivalent to around $355 billion)
- Accounts for around 10-13% of total employment
- Lower productivity growth, compared with the aggregate productivity in Australia


Source: Allen Consulting Group analysis based on Productivity Commission 2010.

The Allen Consulting Group

Information Source: Allen Consulting Group

# BIM in Australia: BIM survey 2010

- 18%-75% of firms use BIM (across different user groups)
- On average, BIM is used in 36% (engineers) to 59% (architects) of projects
- Most respondents said the costs of BIM are balanced by its benefits
- While loss of productivity during the learning period is cited as a key cost, 72% of respondents said they became productive in using BIM within 2 years

Information Source: Allen Consulting Group

# Benefits of change: national impacts

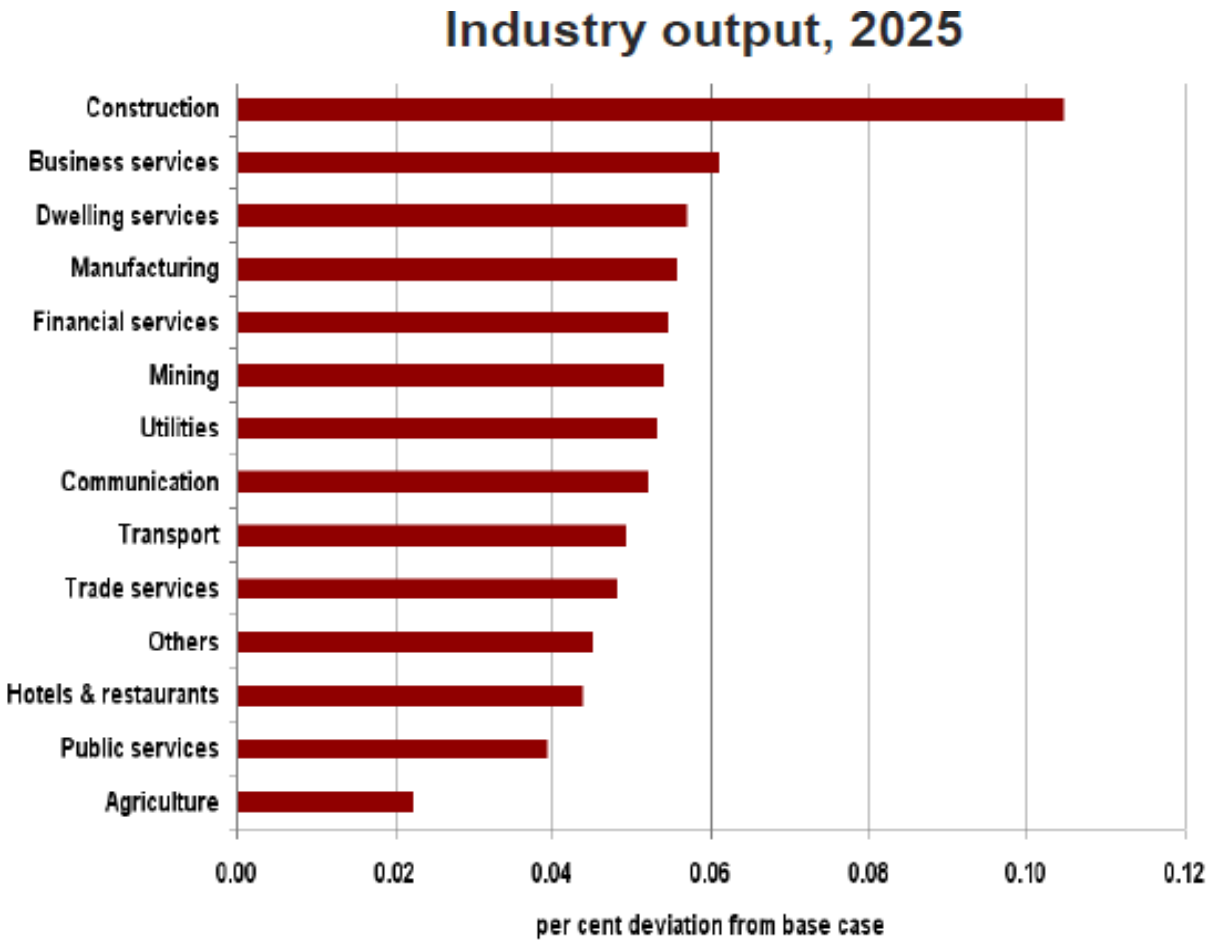
- Widespread BIM adoption would boost national output (GDP), community wellbeing (consumption) and expand the productive capacity of the economy (investment)

| *Absolute deviations from BAU* | In 2025 | NPV (2011-2025) |
|---|---|---|
| GDP ($, M) | $1,005 | $4,794 |
| Private consumption ($, M) | $377 | $1,446 |
| Investment ($, M) | $497 | $3,022 |
| Employment (jobs) | 366 jobs | N/A |

Information Source: Allen Consulting Group

# Benefits of change: industry impacts

- Production increases across all industries
- Biggest gains concentrated in the business services and construction sectors




Information Source: Allen Consulting Group

# Benefits of Change: BIM Impacts in Perspectives

- Gains to the economy (GDP impacts)
- BIM (long term): 0.05% p.a.
- Reform of the energy sector: 0.05%p.a.
- Ports infrastructure reforms: 0.02% p.a.
- Steam technology (UK): 0.38% p.a.
- Average labour productivity growth in Australia (last 3 decades): 1.50% p.a.

Information Source: Allen Consulting Group

# *“Productivity in the Building Network: Assessing the impacts of BIM Report”*
# Key findings:

- There is a compelling economic case for encouraging greater use of BIM in Australia -widespread adoption would make a significant difference to national economic performance, thus BIM has macroeconomic significance.
- BIM requires new ways of collaborating and interacting in what is historically a very fragmented sector –Integrated Project Delivery.
- There are a number of market failures affecting the uptake of BIM, including split incentives and commercial constraints of IP ownership, security of data and multi-user access.

Information Source: Allen Consulting Group

## *“Productivity in the Building Network : Assessing the impacts of BIM Report” - Recommendations*

- Develop new contractual frameworks that encourage collaboration when using BIM.
- Develop a national strategy for BIM implementation including plans, targets and guidelines.
- Encourage the development of national standards for BIM.
- Encourage the creation and maintenance of intelligent object libraries that comply with national BIM standards.
- Reduce BIM related skills gaps in the current and future Buildings Network workforce.

Information Source: Allen Consulting Group

# BEIIC Recommendations Report 2010

- Outlines ten recommendations across four themes, Better Practice; Cooperative Research, Design Leadership, Enabling Regulation and Procurement.
- Recommendation 2: Encourage industry-wide use of BIM and support pilot projects that demonstrate the benefits of applying new technologies.
- Recommendation 10: Consider BIM as a key part of the Government procurement process.

Information Source: BEIIC

- Productivity in the Buildings Network: Assessing the Impacts of Building Information Models Report;
- BEIIC 2010 Recommendations Report;
- Report URL: www.innovation.gov.au/beiic

Information Source: BEIIC

# Existing BIM Initiatives in Australia

- NATSPEC has first draft of National BIM Guidelines incorporating the Project BIM Briefand the BIM Reference Schedule. -Air-conditioning and Mechanical Contractors Association BIM MEP AUS program of work for mechanical, electrical and plumbing services sector.
- Australian Procurement and Construction Council and Australian Construction Industry Forum are developing Guidelines for Integrated Project Teams, and developing policies for the involvement of contractors in the design phase.
- Building Smart which is proposing the establishment of a National Technology Implementation Program to implement building information model technology and improved information networks in the construction sector.
- Queensland Dept of Public Works is piloting integrated project delivery with early engagement of specialist trade and services contractors in the

Information Source: BEIIC

# National BIM guidelines and case studies for infrastructure

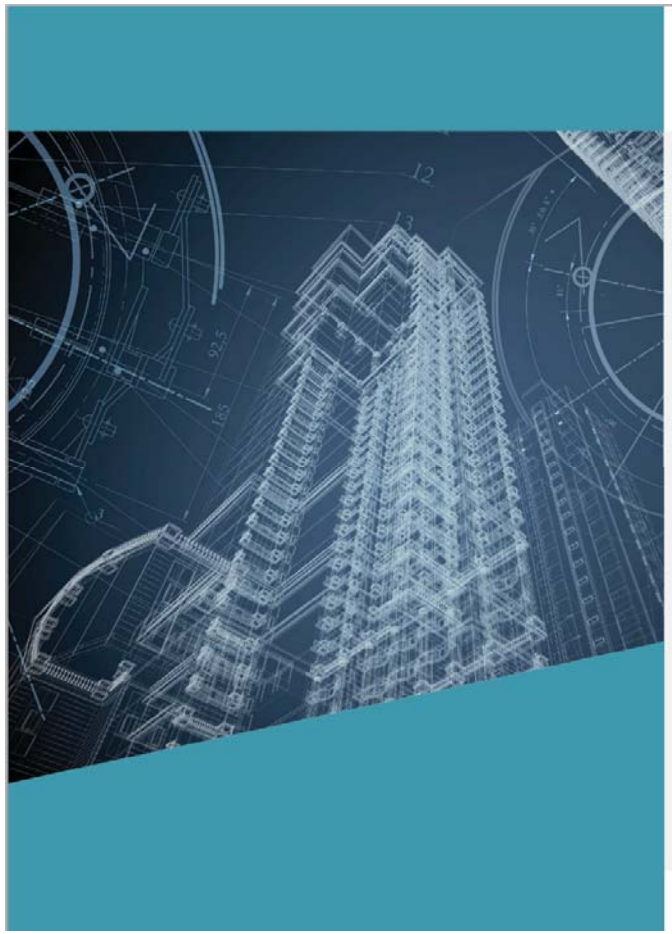

Sustainable Built Environment National Research Centre

- Main roads
- Highways
- Bridges
- Tunnels
- Railways

ENGINEERS AUSTRALIA

NATSPEC Construction Information

# National BIM guideline and case studies for Infrastructure





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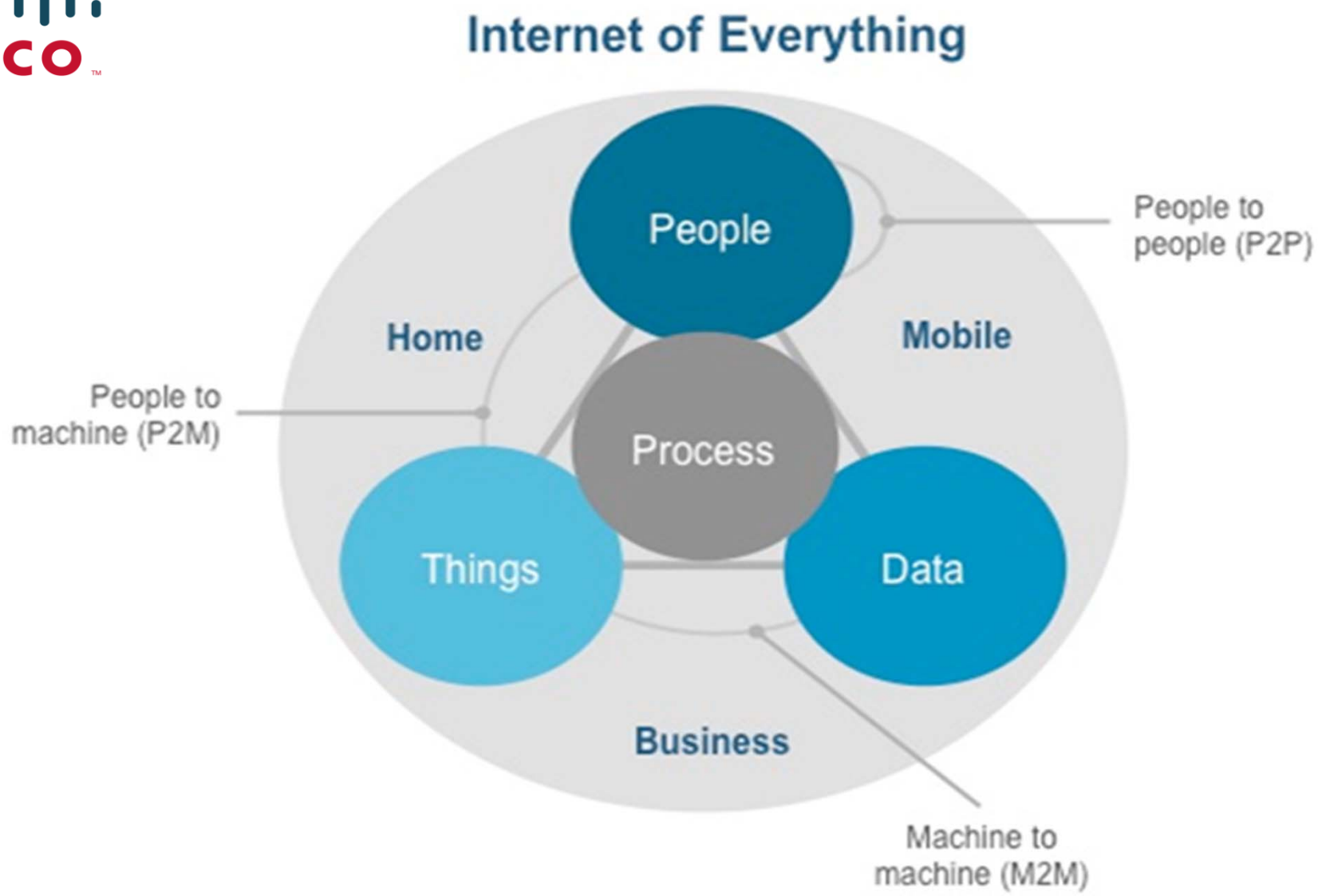
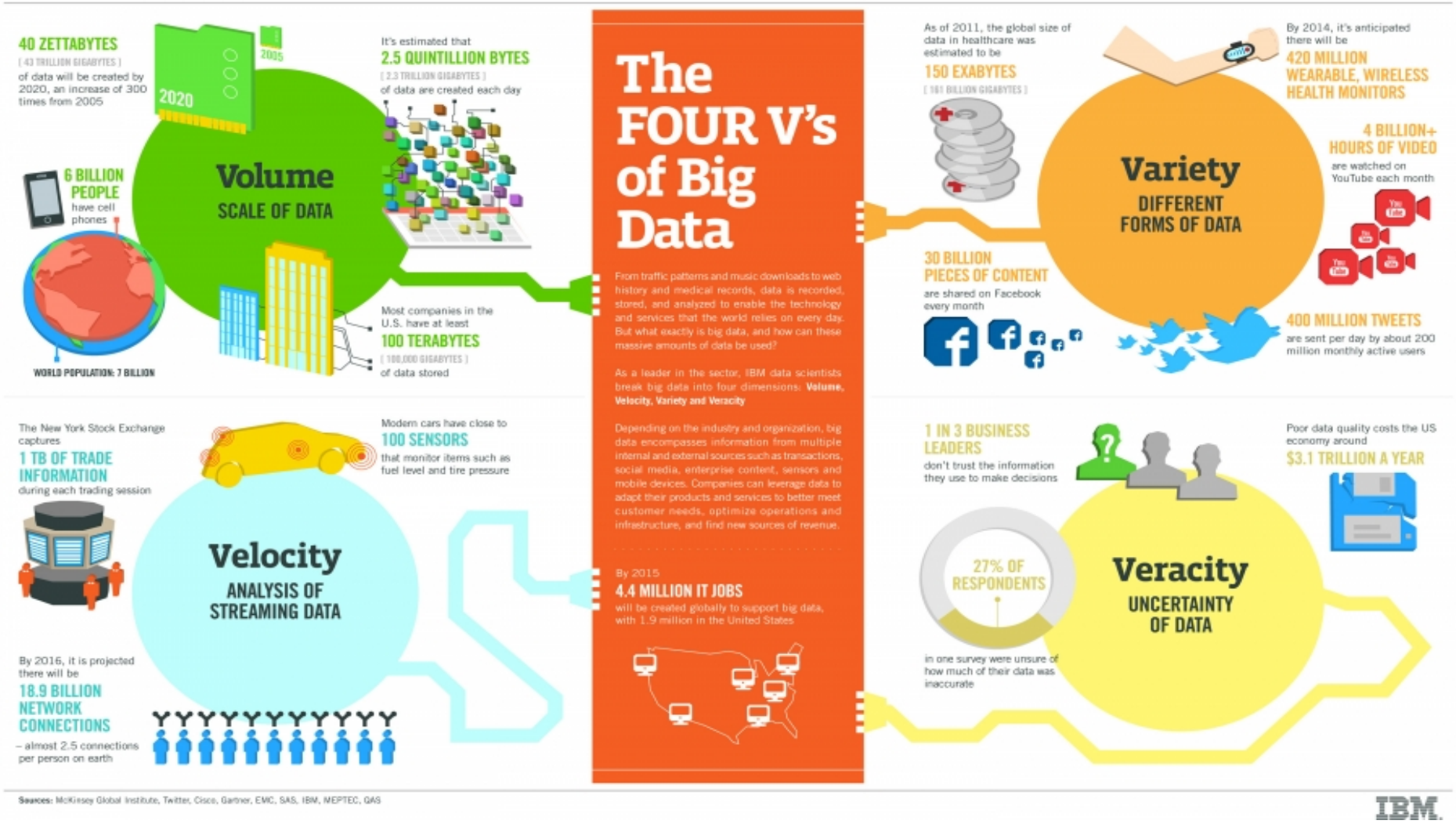
## Contents (continued)

# Internet of Everything (IoE)



# Big Data

Big Data becomes a key basis of competition, underpinning new waves of productivity growth and innovation



Curtin University

# PROJECT ECHO
# LEAN CONSTRUCTION RESEARCH



## CONTACT

**Please direct all enquiries and Expressions of Interest to:**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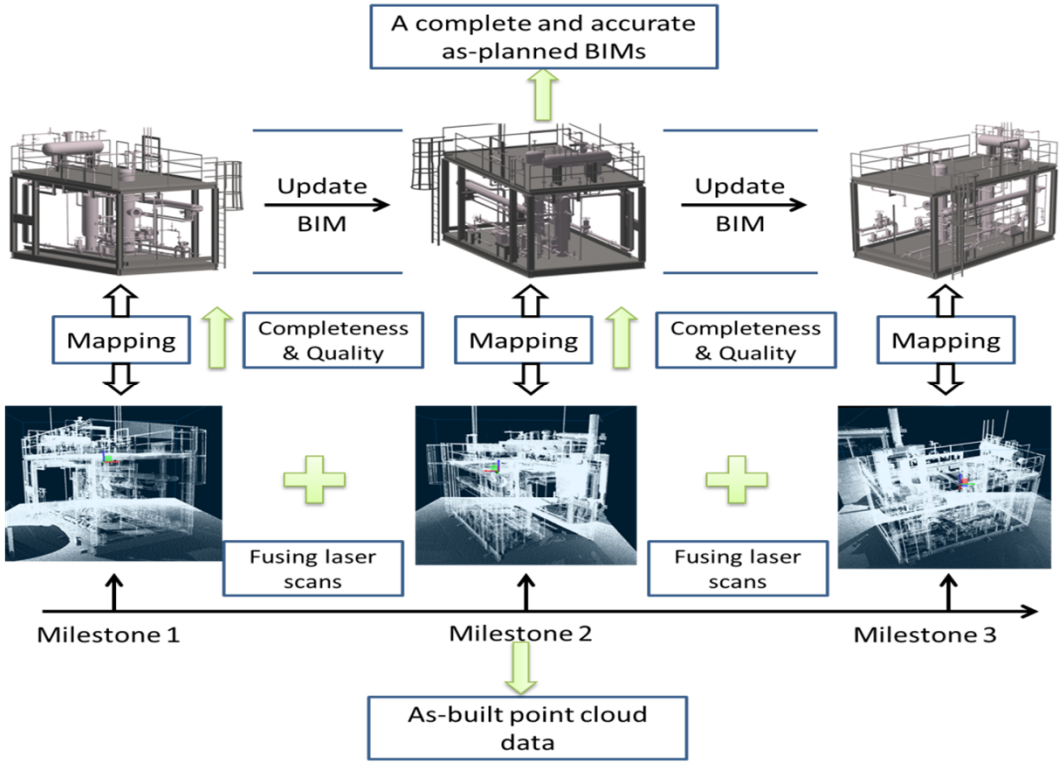
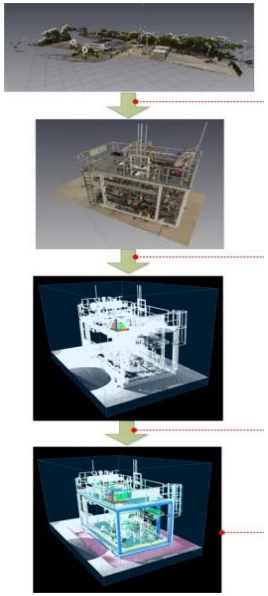
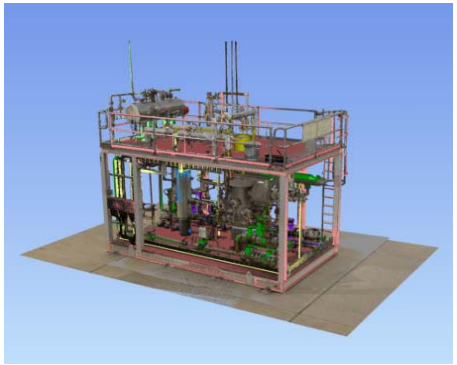
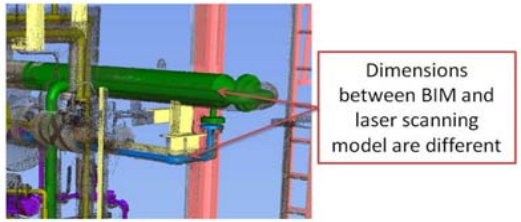
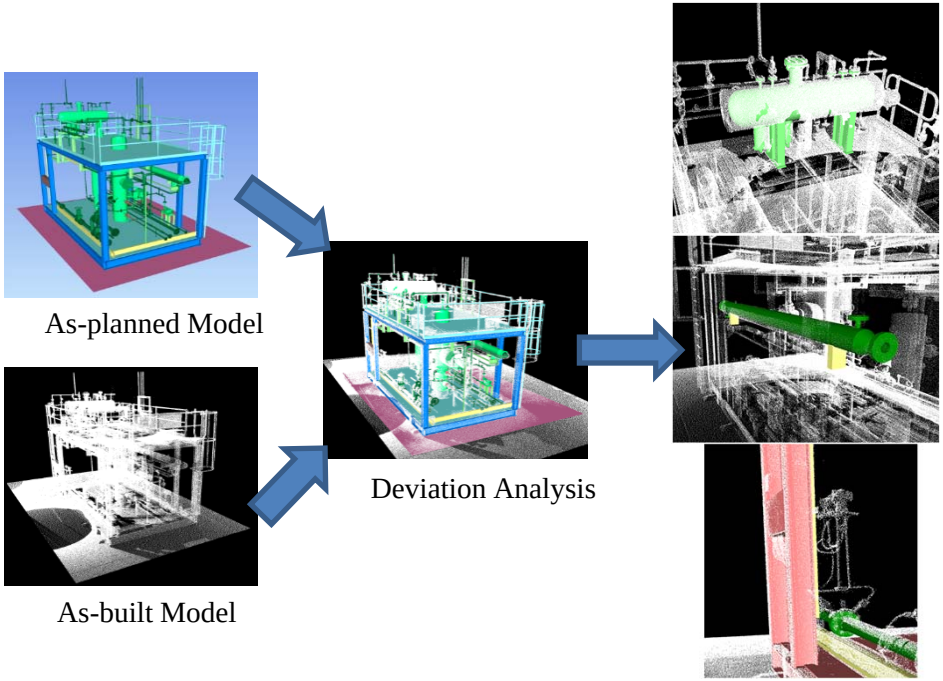
# Quality and Progress Checking (Laser Scanning + BIM)



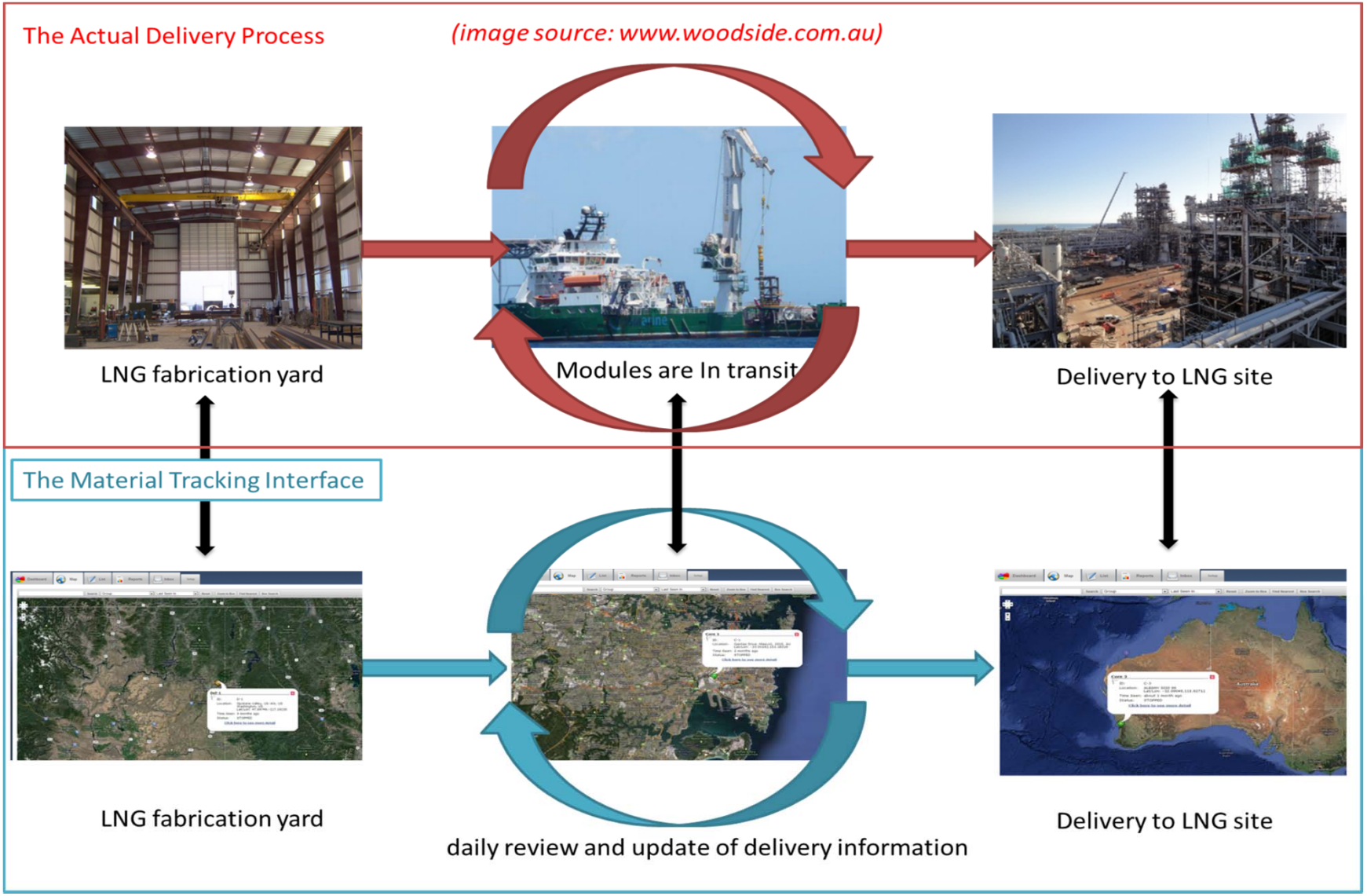





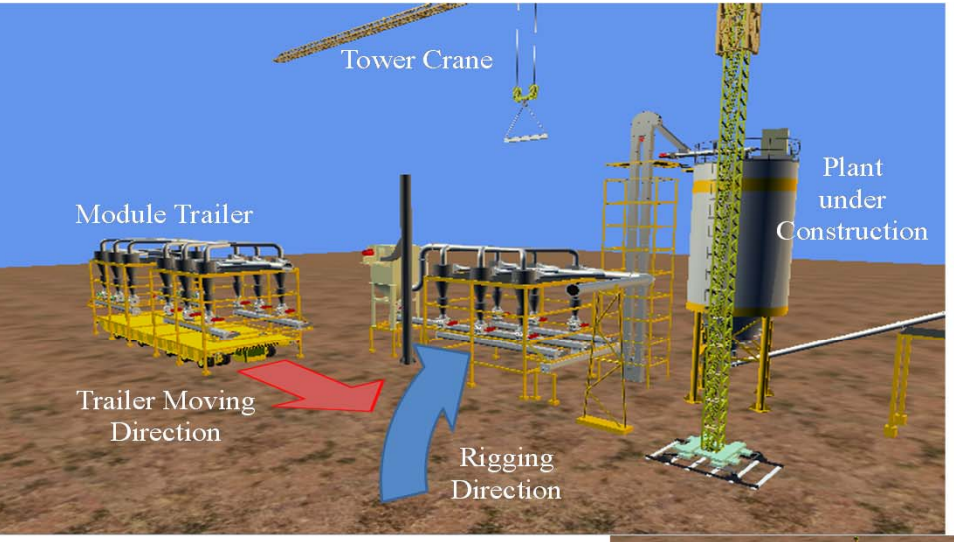


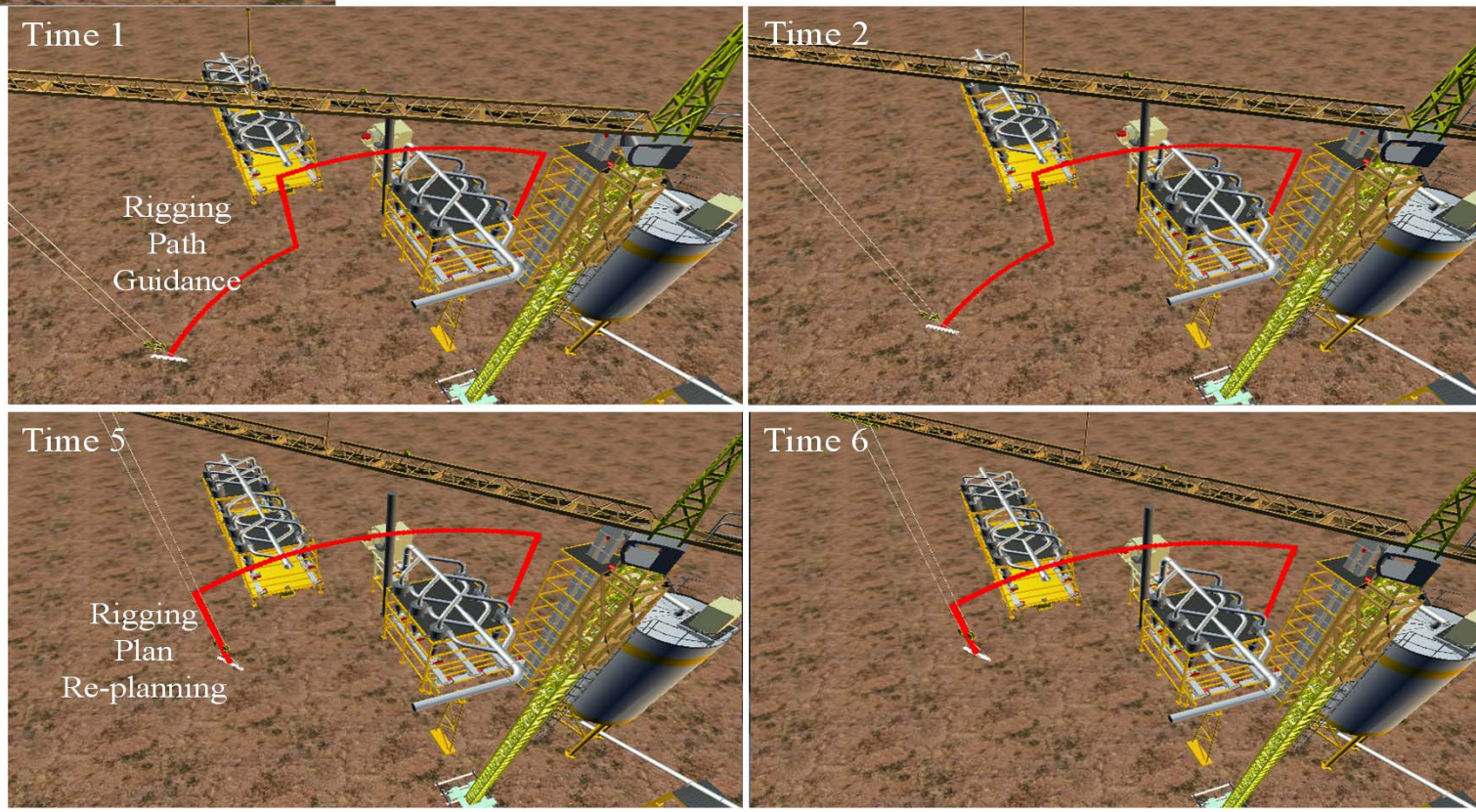



# Real Time Materials Tracking (GPS+GIS+BIM+RFID+Barcoding)



# Real-time Path Re-planning of Operations in Construction



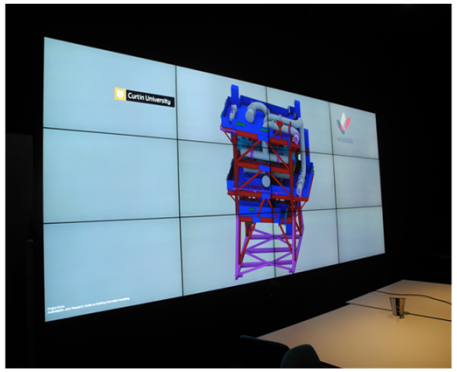



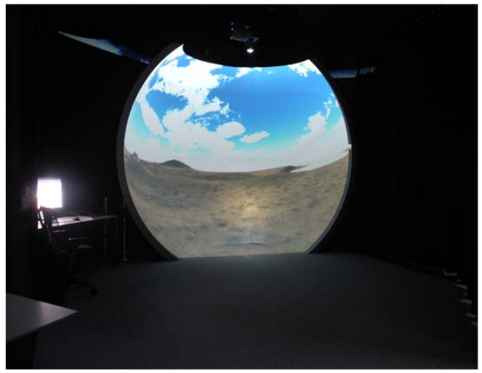
# The Australasian Joint Research Centre for BIM

**The Australasian Joint Research Centre for BIM** at Curtin University is the first and strongest university-based BIM centre in Australia. It consists of a physical BIM research suite/lab, an advisory board and large research team.

The BIM Centre also has privileged access to the **Hub for Immersive Visualisation and eResearch**

***The BIM Research Centre at Curtin***





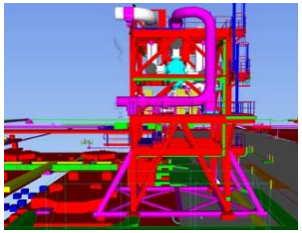
**Hub for Immersive Visualisation and eResearch**

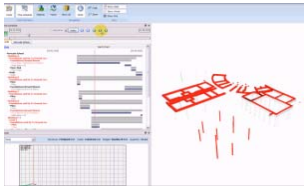
# Key Facts of the BIM Centre

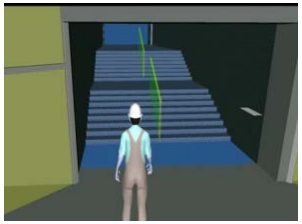
- **40 full time academic positions**
- **AUD $6 million research funding for three years, including two ARC linkages**
- **200 technical journal articles over the past five years**
- **Connections with over 50 overseas universities**
- **30 industry partners**
- **Industrial test beds at various scales**

# Australasian Joint Research Centre for Building Information Modeling (BIM)

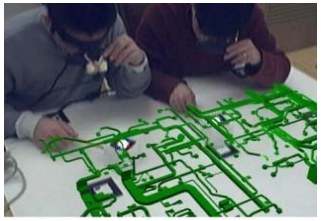
## Group 1: BIM



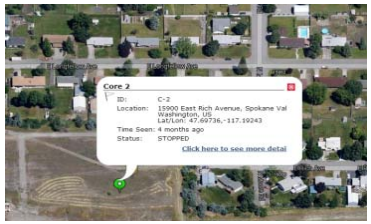


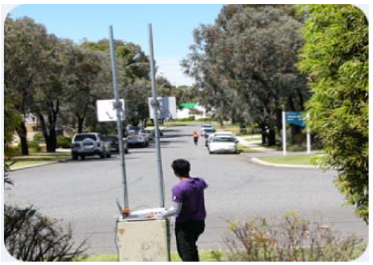


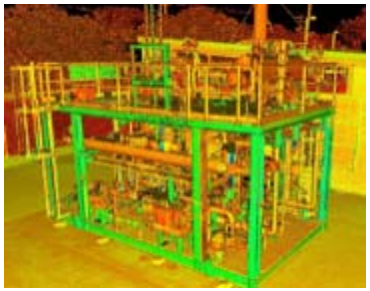
## Group 2: Visualization and Interaction



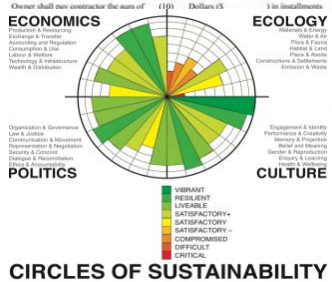

## Group 3: Sensing and Tracking





## Group 4: Innovation Management

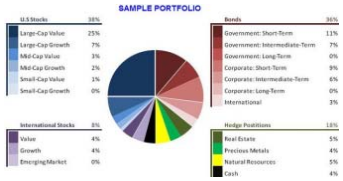



CIRCLES OF SUSTAINABILITY

Lean Construction

## Group 5: Operation Study

| CPM | Spent | Reach |
|---|---|---|
| Auto | $72.70 | 55,657 |
| Auto | $43.48 | 24,937 |
| Auto | $40.98 | 35,963 |
| Auto | $35.33 | 0 |
| Auto | $31.80 | 33,850 |
| Auto | $27.54 | 12,934 |
| Auto | $27.46 | 32,029 |
| Auto | $20.60 | 19,311 |
| Auto | $20.52 | 0 |
| Auto | $17.51 | 0 |
| Auto | $16.85 | 0 |



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