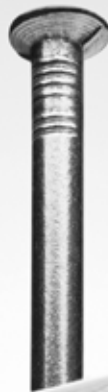


# NAILING CONSTRUCTION PRODUCTIVITY

A BLUEPRINT FOR REFORM



AUSTRALIAN  
CONSTRUCTORS  
ASSOCIATION

## About the Australian Constructors Association

The Australian Constructors Association is the only representative body for contractors delivering vertical and horizontal construction projects, as well as undertaking infrastructure asset management. Our members construct and service the majority of major infrastructure projects built in Australia every year. Our goal is to create a more sustainable construction industry.

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NAILING CONSTRUCTION PRODUCTIVITY  
A blueprint for reform

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# CEO foreword

Poor productivity is the single most important issue facing the construction industry. Despite record levels of construction activity, the industry's productivity has gone backward over the last three decades.

This should concern us all. If we cannot fix construction's productivity problem, we will soon be unable to deliver all the housing and infrastructure Australia needs to accommodate its growing population, not to mention the new energy assets required to meet our decarbonisation commitments. Oxford Economics Australia estimates that raising construction productivity to the economy-wide average will unlock an additional \$56 billion in construction capacity every year. This would be enough to deliver over 1,000 new schools, 10,000 kilometres of road or 25,000 extra hospital beds.

Construction's productivity problem reflects a broader problem in the economy. The Productivity Commission highlights that Australia is experiencing the worst productivity growth in 60 years. If we stay stuck on the current course, our living standards will go backward, with Australians working longer hours for less money. The importance of construction to the economy means this national priority cannot be addressed without solving construction's productivity problem.

□ If we cannot fix construction's productivity problem, we will soon be unable to deliver all the housing and infrastructure Australia needs to accommodate its growing population, not to mention the new energy assets required to meet our decarbonisation commitments.

There is no shortage of solutions available to drive a step-change in construction productivity. Our challenge is not to identify the magic bullet. We have the ammunition. The challenge is one of adoption and proliferation—how do we stitch these solutions into the DNA of construction?

The construction industry needs a new operating system. One that is more compatible with the wide range of solutions already available in the market to drive productivity growth. The industry's current model drives all the wrong behaviours - a myopic focus on the short term with little bandwidth for innovation. The commercial environment of construction actively discourages the longer-term planning and decision-making needed to drive productivity growth.

Unlocking productivity requires creating the space for industry to innovate. We need to start incentivising contractors and consultants to invest in and adopt innovative solutions. Clients equally need to be encouraged and empowered to solicit innovation in tenders.

Government is in a strong position to lead this productivity transformation. Governments broadly accept a responsibility for leveraging public spending for higher goals, including training, indigenous participation and diversity. Productivity should be among these social performance objectives as it underpins our standard of living.

This report provides the outline of a plan to drive a step-change in construction productivity. We propose a concerted national approach to construction productivity reform—a National Construction Strategy. Our plan is a genuinely national and tripartite Strategy accountable to the highest level of national policy oversight—the National Cabinet—and underpinned by a shared responsibility between all levels of government, industry and the unions.

Australia's construction industry has been too inefficient for too long. Improving construction productivity is now a nation building priority requiring national commitment and leadership.

» **Jon Davies**  
Chief Executive Officer



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# The productivity imperative

There are two reasons why we should care deeply about the productivity of the construction industry.

Firstly, Australia has a well-known productivity problem. The Productivity Commission's latest five-year review reveals the worst productivity growth in 60 years. The Commission projects future incomes will be 40 per cent lower and the working week five per cent longer.<sup>1</sup> In short, Australian living standards face a long period of decline unless this trend can be turned around.

As one of the largest centres of value in the Australian economy, the construction industry is pivotal in this story. Its businesses directly add around \$150 billion in value to the economy annually while creating a further \$300 billion in value throughout the construction supply chain. This translates into direct employment for over one million full-time equivalent (FTE) workers and half again as many in the supply chain. No other Australian industry compares to this level of combined value and job creation.<sup>2</sup>

It is therefore no exaggeration to say, where goes construction, goes the nation. A turnaround in national productivity will not be possible without moving the needle on construction. While broad macroeconomic initiatives are important, policy has for too long ignored the real opportunities for productivity gains within specific industries. And construction is the tip of the productivity spear.

The second reason we should care about the productivity of construction relates to the sheer ambition of Australia's plans for the built environment. Over the coming decades we intend to deliver a net zero transition, an Olympics and associated infrastructure, all while providing for a rapidly growing and ageing population. The forward pipeline of committed works is already outstripping the rate of actual construction activity (**Figure 1**).

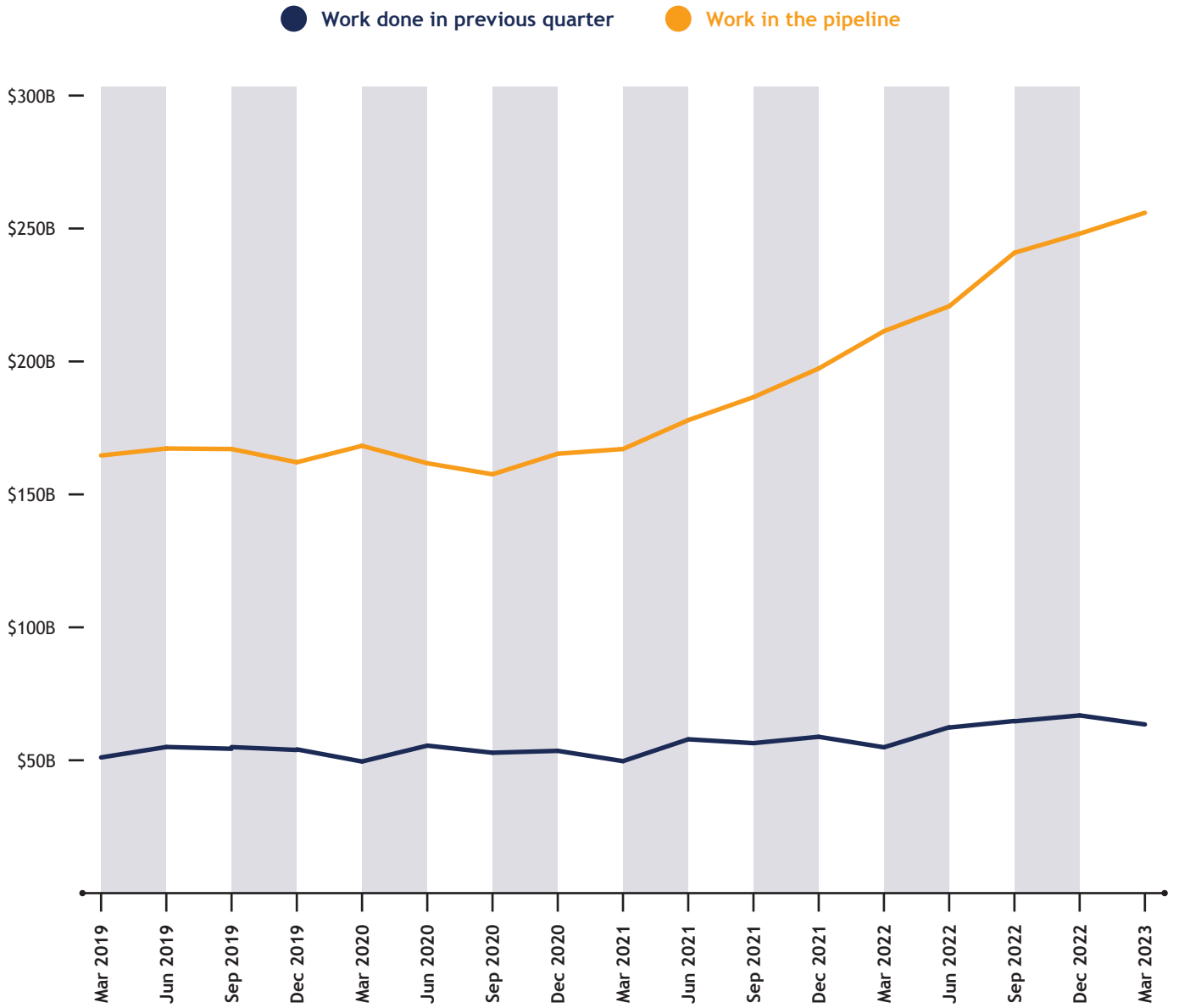
## WHAT IS PRODUCTIVITY?

Productivity is about doing more with less. Technically speaking, productivity is a measure of economic performance that compares the amount of goods and services produced (output) with the amount of inputs used to produce those goods and services. Depending on the measure, inputs may include labour, capital (such as plant and equipment) and intermediate services. The more output that can be produced by a given unit of input, the more productive the entity. Productivity can be measured at the firm, industry or whole-of-economy level.



# NOT KEEPING UP

Figure 1: Construction activity indicators, Australia



Source: ABS

This future demand profile would be challenging enough in isolation; however, it is compounded by an opposite dynamic on the supply side. Like most developed countries, Australia's population is ageing. The share of Australians aged 65 and over has doubled since 1970—a 'grey march' that will continue inexorably over the coming decades (Figure 2a). This carries a key economic consequence: in the 1980s, there were six people aged 18-64 for every person aged 65 and over. By 2040, that ratio will be halved. We are simply running out of prime working-age labour.<sup>3</sup>

This structural shortage of labour is a problem for every industry but is particularly acute in construction where there is a heavy reliance on younger, mainly male, workers. Construction has been holding back the tide of the ageing workforce (Figure 2b), but this levy will not hold forever. Soon enough, the ever-growing demands of Australia's built environment will overwhelm construction's heavy dependence on large numbers of young workers.

One way to solve this structural labour shortage is to divert increasing numbers of workers from other industries or demographic segments into construction. This presents obvious challenges for an industry already grappling with an 'image problem' and so heavily reliant on only one-half of the potential

labour pool. That is to say nothing of the moral hazard inherent in seeking to out-compete other industries for increasingly scarce labour resources—at the whole-of-economy level, this is a zero-sum game.

The reality is construction must come to terms with a future of relatively fewer workers in the face of a relentless increase in the demand for built environment assets.

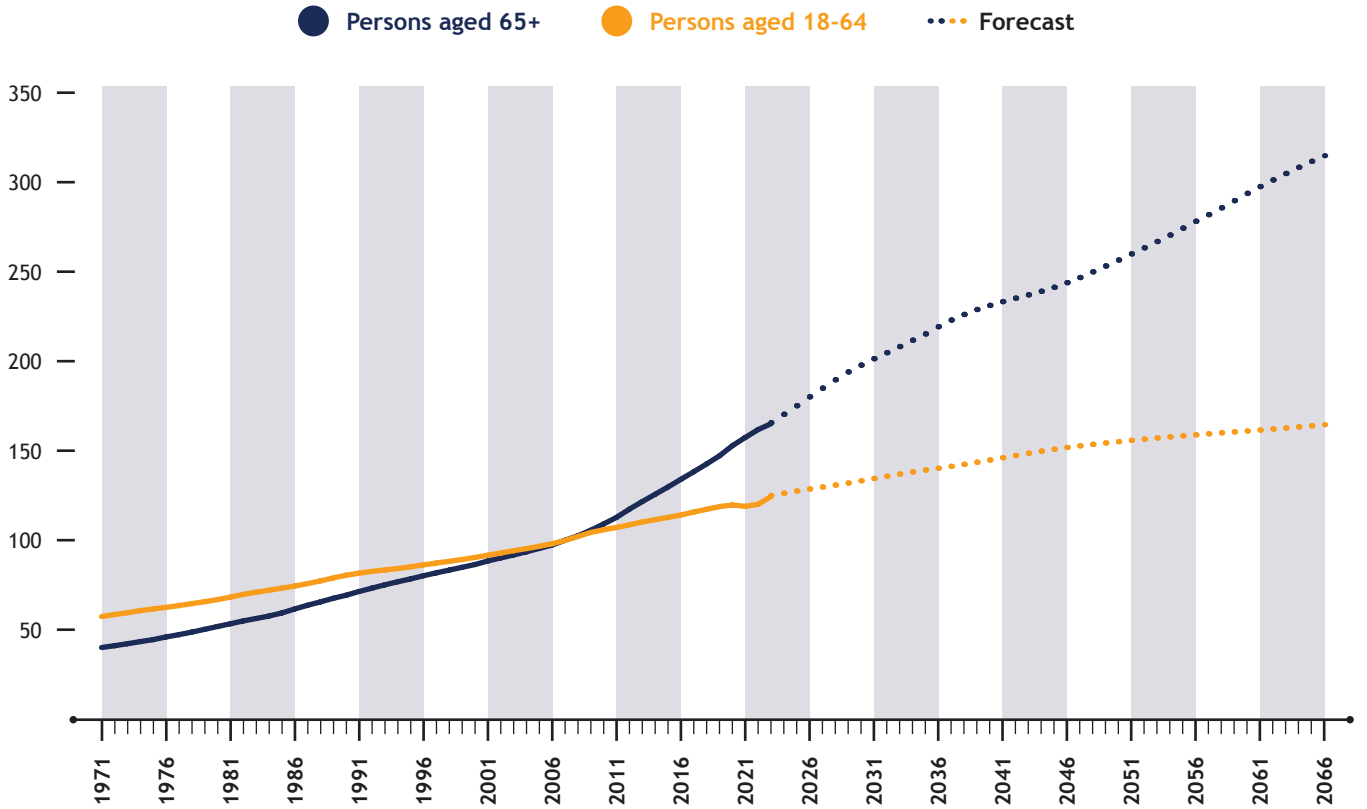
The only sustainable path through this future is productivity growth. We simply need to find ways to produce more buildings and infrastructure with less labour. Yet construction has one of the worst productivity records in the economy. Construction industry wages have risen more than 85 per cent since 2001-02 (Figure 3a), while productivity fell -8 per cent over the same period (Figure 3b).

□ The reality is construction must come to terms with a future of relatively fewer workers in the face of a relentless increase in the demand for built environment assets. The only sustainable path through this future is productivity growth.



# DEMOGRAPHIC DISRUPTION

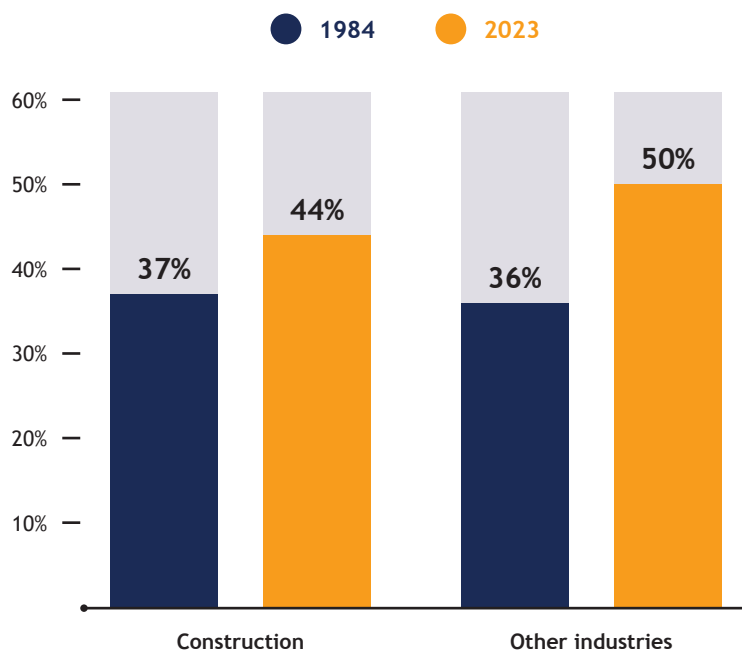
Figure 2a: Population growth, Australia



Note: Data indexed (2007=100); forecast based on ABS series C population projection.

Source: ABS, ACA

Figure 2b: Share of workers aged 15-44, Australia

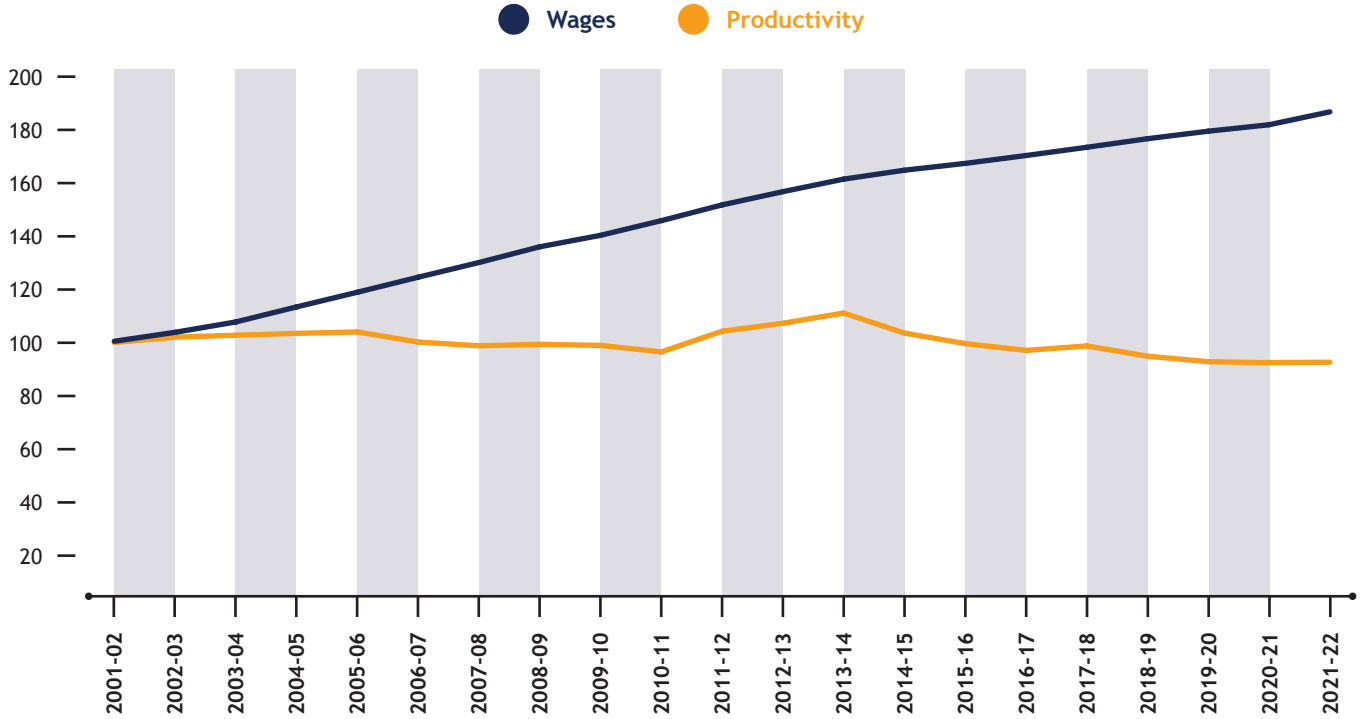


Source: ABS, ACA



# DOING LESS WITH MORE – AND PAYING FOR IT

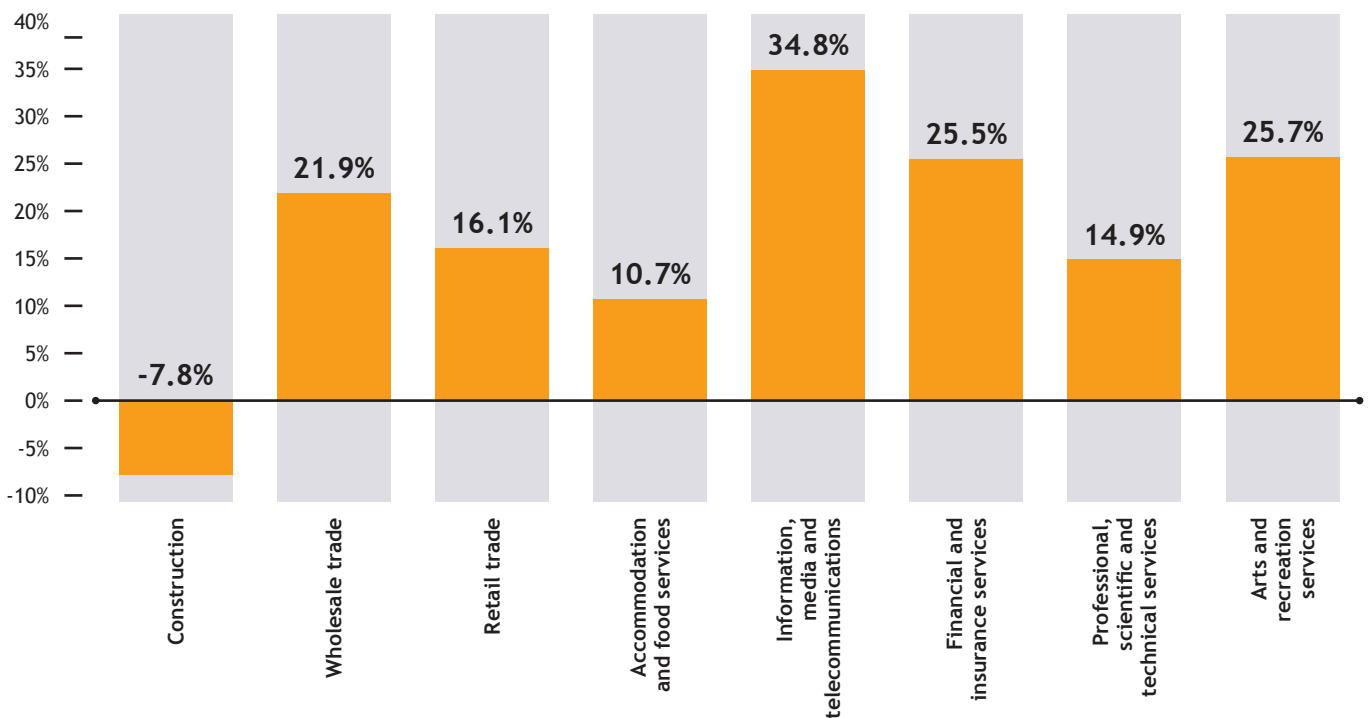
Figure 3a: Construction industry wage and productivity growth



Note: Data indexed (Jun 2002=100); productivity is the annual quality adjusted hours worked GVA-based multifactor measure; wages is the Wage Price Index, total hourly rates of pay excluding bonuses, private and public, Financial Year.

Source: ABS, ACA

Figure 3b: Productivity growth, 2001-02 to 2021-22



Note: Based on the annual quality adjusted hours worked GVA-based multifactor measure.

Source: ABS, ACA

# The productivity opportunity

The potential upside of improving construction's productivity performance is enormous.

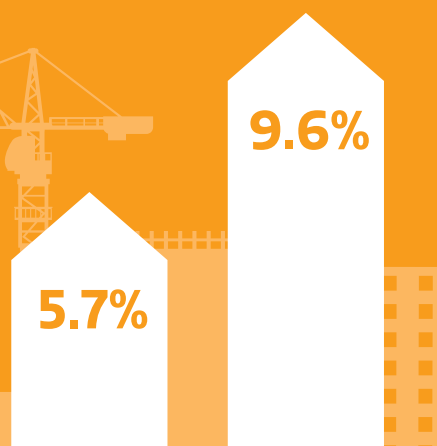
An ACA commissioned report from Oxford Economics Australia estimates that bringing construction productivity growth into line with the economy-wide average would unlock an additional \$56 billion in construction capacity every year. This would be enough to deliver over 1,000 new schools, 10,000 kilometres of road or 25,000 extra hospital beds with no increase in the workforce.

Furthermore, closing the construction productivity gap would likely increase national productivity growth materially. All else equal, had construction simply matched the average of other industries, the nation's productivity growth over the last decade would have increased from its meagre 5.7 per cent to 9.6 per cent.<sup>4</sup> This additional impulse from construction would have restored the nation's productivity performance to levels not seen since the 1990s.

Construction productivity growth is good for the overall economy, for the companies in the industry and their workforce, as well as for the delivery of much needed infrastructure and services. The scale of the opportunity on a state-by-state basis is provided in **Figure 4**. The full Oxford Economics Australia report is available on the ACA [website \(www.constructors.com.au\)](http://www.constructors.com.au).

Construction productivity growth is good for the overall economy, for the companies in the industry and their workforce, as well as for the delivery of much needed infrastructure and services.

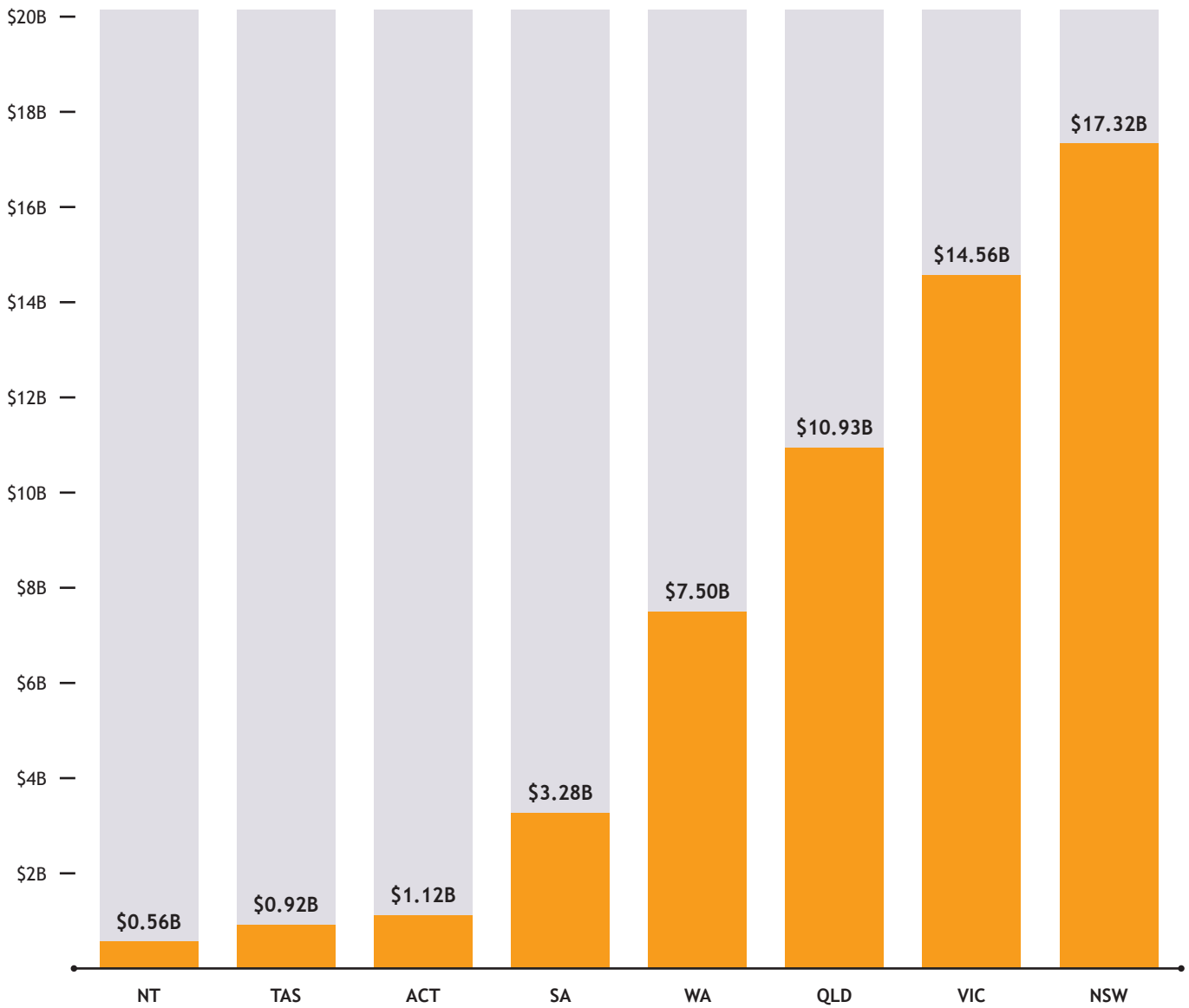
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This additional impulse from construction would have restored the nation's productivity performance to levels not seen since the 1990s.

## THE PRODUCTIVITY OPPORTUNITY

Figure 4: Estimated opportunity cost in FY2022 from poor construction industry productivity



Note: 2020-21 constant prices

Source: Oxford Economics Australia for ACA

# Pathways to productivity

There is no shortage of opportunities to radically improve the productivity of the construction industry. **Appendix A** details a range of specific examples. Some of the most significant gains are to be found in the way we procure and manage projects. There is simply too much waste and duplication in current processes. More efficient procurement, standard forms of contract, better approaches to information reliance, and greater use of performance-based specifications would all unlock significant capacity across the industry.

There is of course also enormous potential for new and emerging technologies to drive productivity improvement. Three groups of technology stand-out as candidates for rapid adoption over the coming decades: Design for Manufacture and Assembly (DfMA) and offsite construction, automation and robotics, and digitisation and data analytics.

Discussions about construction's productivity problem often focus on the industry's poor track record in adopting new technologies. The conventional wisdom is that construction firms are laggards, lacking in sophistication and appetite for change. But it is easy to exaggerate construction's resistance to technological change. There is no doubt that construction firms and workers are willing to adopt new technologies when they show benefit. It is often forgotten that construction contractors were among the earliest adopters of mobile phones. Overwhelming, construction workers welcome new tools that make them more productive and safer.

Linking construction's productivity problem to an entrenched resistance to change simply does not stand up to scrutiny. If a lack of appetite for new technology was all that is preventing the industry from realising a step-change in productivity,

entrepreneurs would have displaced the old methods long ago. Yet Elon Musk has struggled to get traction with his *Boring Company*. The technology-driven building disruptor, *Katerra*, closed its doors after raising nearly \$2 billion. No less than Thomas Edison failed in his own attempt to disrupt the home building industry through prefabrication. If capitalism has not yet solved construction's productivity problem, there is clearly more to the story than a simple-minded resistance to change.

The real reasons for construction's stagnant productivity growth run much deeper.

There is simply too much waste and duplication in current processes. More efficient procurement, standard forms of contract, better approaches to information reliance, and greater use of performance-based specifications would all unlock significant capacity across the industry.

# Barriers to construction productivity

The wide range of opportunities seemingly available to dramatically lift construction productivity begs a simple question: Why has the industry consistently failed to realise the promise of these solutions? The answer lies deep in the fundamentals of the construction industry - it fails to deliver the outcomes of a healthy competitive market because it is ultimately a failed market.

Construction is fundamentally different to other industrial sectors. The industry is fragmented with a preponderance of small firms. The financial realities of the construction business limit the ability of firms to make significant investments, including in new technology. Access to working capital is severely constrained—even for large players—which leads to a lack of flexibility.

These conditions are deeply rooted in the commercial structure of the industry, particularly the tendency to contract projects on fixed price terms. Fixed price contracts work well for transactions where product requirements and the cost of production are well known. In these circumstances, markets deliver win-win outcomes that deliver value to customers and profits to sellers.

By contrast, fixed price contracts are not suited to transactions where the production costs are highly uncertain - as in construction. In these situations, an excessive burden of risk is placed on the seller. If and when these risks are realised, sellers are forced to fund them out of profits. When this pattern of total risk transfer becomes entrenched, it results in a deeply unstable industry.

This is the situation in which construction now finds itself. ACA's report, *All Risk, No Reward*, finds the risk of insolvency for builders is now twice as high as in other industries, profit margins are often in the order of 1 per cent, and half of all firms carry current liabilities in excess of current assets—a technical definition of insolvency.<sup>5</sup> These precarious financial

conditions translate into an industry with a myopic focus on short-term survival and little bandwidth for innovation.

This suggests construction's productivity problem runs far deeper than a simple resistance to technology adoption. The key issue we need to address has much less to do with technology than with the industry's basic operating system. The commercial environment of construction actively disincentivises the longer-term planning and decision-making needed to drive productivity growth.

Our focus must therefore be on creating the conditions under which opportunities for productivity growth can be harnessed. Construction firms and professionals know where the opportunities are and are hungry to implement them. While it is important to set standards and clear the path for adoption, our main challenge is to reset the commercial environment in a way that unleashes the urge to invest in productivity-enhancing innovations.

Construction is fundamentally different to other industrial sectors. The industry is fragmented with a preponderance of small firms. The financial realities of the construction business limit the ability of firms to make significant investments, including in new technology.

# Unlocking construction productivity

Unlocking productivity requires creating the space for industry to innovate and adopt existing technologies. We need a new framework that incentivises contractors and consultants to invest in and adopt innovative solutions. We need a framework that encourages clients to demand innovative solutions in their tenders. The default approach to contracting is stifling productivity—prescriptive specifications, design conservatism, commercial considerations and legacy standards are key barriers. Unless clients actively solicit innovation, contractors will continue to be operating with one arm tied behind their backs.

The private sector clearly has an important role to play in maturing Australia's approach to productivity. It is responsible for commissioning around 75 per cent of construction in Australia.<sup>6</sup> However, the private sector is highly fragmented and subject to market forces that make it difficult for individual clients to change practices in isolation. This is particularly the case for highly-levered clients with limited freedom to finance projects on innovative terms.

While a smaller aggregate buyer, government is best positioned to lead the way. Public sector clients are less constrained by the market and present a much more consolidated group of buyers. The government, as sovereign, also accepts a responsibility to leverage its spending for higher goals. This 'fiduciary' role is well accepted in other areas of public policy such as indigenous participation, diversity and training. Productivity should be among all governments' social performance objectives as it underpins our standard of living.

The Australian Constructors Association calls on all governments to commit to driving a step-change in construction productivity through a concerted national approach to construction productivity reform—a National Construction Strategy. The Strategy should reflect a shared responsibility between all levels of government, industry and the unions to drive productivity reform. It should be accountable to the highest level of national policy oversight - the National Cabinet.

Productivity should be among all governments' social performance objectives as it underpins our standard of living.



# A National Construction Strategy

Led by the Commonwealth, all key industry stakeholders should come together to develop a 10-year National Construction Strategy (NCS) with the express aim of increasing construction industry productivity to reach or exceed the rest-of-economy rate of annual productivity growth by 2033.

The NCS should be focussed on the following key priorities:

## 1 OPTIMISATION AND HARMONISATION OF PROCUREMENT

The primary focus of the NCS should be on optimising and harmonising how projects are procured. A common, nationally consistent set of procurement principles should be developed that not only improves the efficiency of how projects are procured but also provides an environment for productivity improvements through their delivery, management and operation. Consideration should also be given to developing a nationally agreed suite of standard contracts. The NCS could also play a useful role in promoting certainty in the national project pipeline.

**Appendix B** suggests a number of principles that could be considered in any harmonised national procurement approach. These principles have been selected for their ability to drive, directly or indirectly, improvements in the productivity of the construction industry.

The Commonwealth should also explore all opportunities to embed these best practice principles into all construction-exposed funding agreements with jurisdictions and the private sector. This should include the forthcoming 2024 Federation Funding Agreements for transport infrastructure, as well as other investment vehicles such as the Clean Energy Finance Corporation and Rewiring the Nation.

## 2 CREATION OF A NATIONAL DIGITAL ALLIANCE

There is wide agreement that digital technologies are one of the best ways for industries to become more productive. Improving the efficiency of construction processes through digital technologies has the potential to significantly reduce cost and schedule risk through data-driven methodologies such as ‘should cost modelling,’ Building Information Modelling (BIM) and process optimisation. Yet it is proving extremely difficult to align all stakeholders on the digital opportunity in the highly decentralised and project-driven world of construction.

Construction projects create an immense amount of data. Tools for leveraging this data into process efficiencies are now widely available and will become increasingly powerful with the advent of generative artificial intelligence. The key barrier to realising this digital opportunity will be the lack of a consistent approach to collecting and organising this data. The fragmented and project-driven nature of the industry makes it very difficult to meet this challenge on a firm-by-firm basis—construction data must be treated as a ‘common good.’

A national approach to construction data collection should be established that collates deidentified data on all government projects from across jurisdictions in a common format and in a secure environment. The data should then be made securely available to both government and industry to leverage the latest analytical tools to reform how projects are costed, managed and delivered.<sup>7</sup>

### 3 IMPROVING INDUSTRY SKILL LEVELS

Increasing the skill intensity of the workforce is a widely accepted precondition of productivity growth and should be a core priority. Human capital is an engine of technological innovation and diffusion - more productive firms employ a more skill intensive workforce.

As technology drives productivity improvements, new job families are created. Looking forward, employers will come to expect that the workforce is comfortable and equipped to operate in a data-rich environment. Construction jobs of the future are more likely to require skillsets that emphasise cognitive and digital capabilities over raw physical attributes such as strength, endurance and coordination.

The NCS should articulate a national strategic framework for lifting the overall skill level of the construction industry, including re-skilling to enable the workforce to quickly and flexibly adapt to new construction technologies and methodologies. This should be undertaken in close consultation with relevant bodies such as Jobs and Skills Australia and Buildskills Australia.

Increasing diversity across the construction skills base is equally important to improving productivity growth. The NCS should seek to integrate the work of the Construction Industry Culture Taskforce with other initiatives to promote a more aligned approach to developing a more diverse construction talent pool.

## Governance

It is proposed that the NCS be overseen by the existing inter-governmental Infrastructure and Transport Ministers Meeting (ITMM) under the auspices of National Cabinet. ITMM is an imperfect vehicle for this work as it only includes infrastructure ministers, but it is the only construction-related committee within the National Cabinet architecture.<sup>8</sup> National Cabinet may wish to consider the merits of establishing a new, more holistic construction committee.

The ITMM could be supported in this work through the establishment of a tripartite (government-industry-unions) National Construction Strategy Committee (NCSC). The NCSC could consist of senior officials from government delivery agencies (both building and infrastructure) alongside relevant employer and employee representatives. It is important that the NCSC represents all sectors of the industry, including contractors, consultants and the supply chain.

The newly formed National Construction Industry Forum (NCIF) provides a ready template upon which to model the NCSC, but its membership would need to be expanded as it does not include, among others, representatives of State and Territory governments. However it is constituted, the NCSC should be tasked by the ITMM with developing dedicated action plans for each of the three NSC priorities proposed above. All jurisdictions should seek to align all relevant agencies with the objectives of the NCS and agreements made at the ITMM.

## Reporting and monitoring

The ITMM could report annually to the National Cabinet on progress against key performance indicators, encompassing:

- 1 The extent of adoption and application of procurement best practice across jurisdictions and sectors.
- 2 Evidence of innovation and productivity improvements on projects across jurisdictions and sectors, which could be shared through a national online portal.
- 3 Top-line project performance (cost and schedule) across jurisdictions and sectors.
- 4 Measures of collaboration and integration between client, contractor and consultant across jurisdictions and sectors.
- 5 Key actions taken by each jurisdiction throughout the year to implement the aims of the NCS.





# Conclusion

There is no time to waste. National productivity growth is slowing and budget pressures are increasing but we cannot afford to reduce investment in infrastructure.

Firm commitments have been made to support global decarbonisation that will require the construction of new energy infrastructure. Geopolitical events are necessitating increased spending on defence infrastructure. Investment in new transport infrastructure must continue to cope with increased migration and the need to keep the nation's economy competitive relative to the rest of the world.

Australia's construction industry has been too inefficient for too long. Improving construction productivity is now a nation-building priority requiring Commonwealth leadership to create a National Construction Strategy.



# Appendices

## Appendix A: Opportunities to become more productive

There is no shortage of opportunities to achieve improved productivity in the construction industry and, contrary to popular thinking, many of these opportunities are associated with how projects are procured and governed rather than how they are physically constructed. In fact, simple changes in processes could achieve some of the quickest productivity gains.

In this appendix, we have identified 10 opportunities to improve the productivity of the construction industry. We have deliberately chosen not to discuss the barriers to their realisation or how they might be removed. We believe there needs to be a coordinated focus on this issue and have made recommendations on how this can be achieved in the body of our report.

There are of course many more opportunities to improve productivity than just the 10 discussed here but they provide a sample of what could be achieved, in many cases, with comparatively little effort given the potential reward.

### 1: MORE EFFICIENT PROCUREMENT PROCESSES

Traditional procurement processes for large projects are expensive and resource intensive exercises that require more than just a contractor estimating how much a project will cost, applying their mark up and submitting a tender.

For large projects, a contractor will generally first need to be shortlisted to tender by responding to a request for Expression of Interest (Eoi), a seemingly benign process that has, in recent times morphed into a significant logistical exercise to comply with the Client's ever-increasing requests for information. In essence, these requests may be considered a form of contractor pre-qualification but they exist alongside numerous other Federal, State and Agency prequalification / registration requirements and are required to be undertaken for every project a contractor wishes to bid.

Once shortlisted and tender documents have been received, a contractor will typically be required to verify information provided by the Client (see reliance information). They are then required to prepare numerous draft operational management plans, even though they have been selected based on their competence. Additionally, they need to identify candidates for key roles and develop CVs in a prescribed format. The contractor must also identify key project risks and how to mitigate them, including sourcing subcontractors to transfer the risk. Furthermore, they must seek a legal review of the proposed bespoke form of contract, all before working out how much it will all cost and whether it can be done by the proposed completion date.

After a tender is submitted, the contractor will need to keep their proposed delivery team on ice and the bid team ready to respond to queries until the Client decides who to award the project to. In many cases, this process can take longer than the tender preparation period itself with Clients reluctant to shortlist tenderers for fear of losing competitive tension. A decision to award can then be further delayed and teams kept waiting whilst approvals are sought from funders and other interested stakeholders.

The whole procurement process can take many months and involve a contractor team not much smaller than that

required to actually construct the project. The average cost of preparing a tender for a large infrastructure project is generally considered to be around 1 per cent of the estimated project value. So, for a \$100M project, the cost for each contractor participating in the procurement process would be \$1M. Multiply this by a minimum of three contractors and add on the cost for the Client's team and associated advisors and that cost is likely to exceed \$5M or 5 per cent of the total cost of the project.

Assuming an annual government spend on infrastructure of \$63.75 billion<sup>9</sup>, even a modest 15 per cent reduction in the cost of tendering would result in annual savings of \$0.5 billion pa for government projects alone.

Perhaps more importantly, resources could be allocated to activities that could generate even more savings and efficiencies such as by value engineering the design or developing alternative more innovative ways to deliver the project.

A recent ACA survey found that improving procurement processes was the single biggest opportunity for improving industry productivity.

### 2: STANDARD FORMS OF CONTRACT

Early standard forms of construction contract were developed over 100 years ago to save on the significant time and money spent drafting a bespoke contract for every project or negotiating based on one party's own terms. The standard forms were developed by industry bodies and amended over time to reflect changes in legislation and industry practices.

Assuming an annual government spend on infrastructure of \$63.75 billion<sup>9</sup>, even a modest 15 per cent reduction in the cost of tendering would result in annual savings of \$0.5 billion pa for government projects alone.

In recent times there has been an increasing tendency for construction Clients to use either heavily modified standard forms or to revert to drafting bespoke contracts for individual projects.

All efficiency gains resulting from the introduction of standard forms of contract have now essentially evaporated. Even worse, the complexity of these modified/bespoke forms has led to additional inefficiencies and disputes arising from their interpretation.

If Clients reverted to standard forms of contract the saving in costs for legal advice alone would be substantial, not to mention the time that all parties would save during project procurement. There is also the matter of disputes. Whilst

not all disputes arise from differing interpretations of contract provisions, many do. In 2018, an industry survey<sup>10</sup> identified that, on average, industry professionals spend nearly 5 hours a week just dealing with disputes!

If we were just to consider Construction Managers as a cohort, the latest government statistics show that there are 92,900 Construction Managers employed in the Australian construction industry earning an average of \$3,497 a week<sup>11</sup>. Using these figures and assuming a 50hr working week, the annual cost of Construction Managers alone dealing with disputes can be estimated at \$1.7 billion.

### 3: ACCURACY OF RELIANCE INFORMATION

During the project development phase, project owners will normally undertake preliminary investigation work, such as geotechnical studies, to ensure that a project is viable. This information is typically provided to tenderers, but they are required to assume risks for the accuracy of this information. Subsequently, tenderers cannot rely on this information and have no opportunity for relief where the information is inaccurate.

As a consequence of not being able to rely on this information, all tenderers are required to either engage their own consultants to undertake further investigations, where this is possible. Otherwise, they must take on (price) the risk that the information provided might not be accurate.

This issue is described in more detail in a report published under the banner of 'Partnerships for Change' by ACA and Consult Australia.<sup>12</sup>

If information provided to tenders was able to be relied upon there would be a significant amount of savings in the time and expense of engaging additional consultants to verify information or in the amount of risk contingency being included in tenders. There would also potentially be a reduction in disputation as liability for information provided at tender is a common cause of disagreement between contracting parties irrespective of how liability is defined in the contract.

### 4: IMPROVED RISK ALLOCATION

Construction is a risky business; there are risks involved in the construction of every project. These risks include things like abnormally inclement weather, unforeseen ground conditions, input price volatility, material availability, equipment breakdown and much, much more. Some of these risks can be estimated, mitigated and managed by the contractor but many cannot, and it is not appropriate to expect them to do so.

The mantra of 'the party best able to manage the risk should bear the risk' is premised on the false notion that being able to manage a risk, for example by having the expertise and site presence, equates to being able to bear the financial cost of dealing with the risk if it eventuates. On even small projects this liability could run into many millions of dollars.

Inappropriate risk allocations impact productivity in several ways. In a competitive procurement process where the lowest tender wins at the exclusion of all other criteria, contractors are essentially encouraged to risk their own businesses by pricing unquantifiable risk. When these risks eventuate and allowances are realised to be inadequate, time and resources are wasted on disputes and claims to avoid potential substantial losses. This time and these resources could be more productively spent working collaboratively to find ways to address the risks that have eventuated to deliver the best possible project outcome in the circumstances.

Another casualty of inappropriate risk sharing is the open and transparent sharing of project information. Such information sharing is critical for the adoption of many productivity-enhancing digital technologies. Information is unlikely to be shared if it can be used to prepare or defend claims for additional money related to the realisation of inappropriately transferred project risk.

Risks that cannot be quantified and priced should be dealt with openly and transparently, encouraging collaboration and innovative thinking rather adversarial behaviour and disputation.


### 5: DIGITAL BY DEFAULT

Adoption of digital technologies is often cited as one of the best ways for industries to become more productive. It is perhaps unsurprising that only the hunting and fishing industry has a worse track record than construction when it comes to adoption of digital technologies.<sup>13</sup>

In its 2021 Infrastructure Plan, Infrastructure Australia noted, "Implementing best technology practices could result in a productivity improvement up to 15 per cent and more than 5 per cent in cost efficiencies. If proven digital tools and practices are used now, the sector can realise benefits rapidly."<sup>14</sup>

The problem is not a lack of available technology to adopt. The Construction Technology Club is a global community of construction technology start-ups. There are currently 350 members of the club globally, of which 40 are based in Australia.<sup>15</sup>

In addition to inappropriate risk allocation, preventing the open and transparent sharing of information required by many digital technologies, ACA and Consult Australia's *Partnership for Change* thought leadership focused on Digital Technology also identified a lack of government policy and maturity on digital transformation as being a barrier to progress in adopting digital technologies.<sup>16</sup>

 Risks that cannot be quantified and priced should be dealt with openly and transparently, encouraging collaboration and innovative thinking rather adversarial behaviour and disputation.

Consult Australia has done further work in this area, recently publishing a green paper designed to promote discussion on initiatives that will result in a 'Digital by Default' approach to construction.<sup>17</sup>

They note that a digital by default approach across infrastructure and construction will, amongst other things, deliver better value for money outcomes and support pathways to net zero.

### 6: GREATER USE OF PERFORMANCE SPECIFICATIONS

Project owners use specification documents to define what a contractor must deliver. On large projects these specifications run into multiple volumes and thousands of pages. They can, and often do, detail the work required down to the size, material and origin of the last nut and bolt, as well as the experience required for key project personnel.

Detailed specifications may ensure a uniform product, but they are also the reason why we are still constructing roads largely like the Romans constructed roads and why contractors are required to chase project management unicorns in a constrained labour market.

An alternative approach would be to more simply define how the end asset is required to perform. For example, in the case of a bridge, this could include the size, quantity and weight of vehicles the bridge is required to carry, where the bridge must start and finish and the design life of the bridge. Contractors would then be able to compete against each other to propose the best solution that meets the brief rather than just competing on price of a fixed product. They would also be able to develop agile and diverse projects teams to deliver the project rather than having to find people with experience of building the status quo.

**Detailed specifications may ensure a uniform product, but they are also the reason why we are still constructing roads largely like the Romans constructed roads and why contractors are required to chase project management unicorns in a constrained labour market.**

The contractor could be required to give a suitable performance guarantee to provide the asset owner with an appropriate recourse if the bridge does not perform as required. Alternatively, a more integrated delivery approach could be taken that also involves the Client and designer where security for performance is obtained by taking out project specific professional indemnity insurance.

#### 7: DESIGN FOR MANUFACTURE AND ASSEMBLY (DFMA)

DFMA is a process where structural elements or entire parts of buildings are designed to be manufactured off site in factories before being brought to site for assembly. DFMA seeks to capitalise on ‘modern methods of construction’ (MMC). MMC are focused on better products and processes. They aim to improve business efficiency, quality, customer satisfaction, environmental performance, sustainability and the predictability of delivery timescales.

Whilst off site manufacture of pre-cast concrete beams and viaduct sections is now commonplace on civil infrastructure projects, an example of DFMA use in social infrastructure is the NSW schools program that has used both volumetric modules and kits of parts to construct new schools.<sup>18</sup>

Schools Infrastructure NSW has identified the following benefits of DFMA

- » *We save time - around 30 per cent faster on the construction site.*
- » *There are great sustainability gains, including reduced carbon emissions, material waste and water waste on sites.*
- » *We are making a social impact, creating new jobs, expanding opportunities for local training and upskilling and harnessing inherent productivity and safety gains to improve working conditions in the construction industry.*
- » *It's safer to manufacture building parts in purpose-built spaces and the assembly requires less interface on sites.*
- » *Manufacturing in a controlled factory environment virtually eliminates the impact of adverse weather and site conditions on the total build time.*
- » *School capacity can be more responsive to local demographics and housing developments in areas of rapid growth.*
- » *Faster construction reduces the risk of disruption to important school events, such as exams or celebrations.*

Governments should be encouraged to showcase these investments and share the lessons with industry. There is also an opportunity for governments to adopt a ‘common good’ approach to DfMA that would see the public sector investing in and operating DfMA facilities that can be used by industry.

#### 8: INTEGRATED PROJECT DELIVERY

On traditional construct only projects, the contractor and asset owner will each assemble their own team to undertake the project. For the contractor, the team will be required to manage the construction of the project. For the asset owner, the team will largely be required to design the project and ensure that the contractor completes the project on time and in accordance with the design. Project risk is assigned to either the owner or, more usually, the contractor which can create a mis alignment of the interests of the parties and ultimately to disputes.

An integrated project delivery approach employs a different philosophy—the project participants accept and manage design and construction risks as a team. Interests are aligned to ensure reduced disputes and improved project outcomes. All the key parties involved in the design, fabrication, and construction aspects of a project are joined together under a single agreement.

The integrated approach provides an environment conducive to the open and transparent sharing of information needed by many new productivity enhancing digital technologies such as Building Information Modelling (BIM).

This approach also requires far fewer people to manage the project as project roles are filled by the best person for the job, regardless of whether they are ultimately employed by the owner, designer or contractor. There is no need to supervise what the other party is doing and no need to have large commercial teams focused on claim preparation/ defence.

Efficiency is improved even further by all project personnel being located in the same office, making communication easier and allowing quicker resolution of issues.

#### 9: STREAMLINED DESIGN REVIEWS

As the names suggests, under a Design and Construct contract, the contractor is responsible for the project in its entirety and must commission the design as well execute the build. This form of procurement was originally designed to increase the speed with which projects can be commenced, leverage contractor experience to optimise the design for ease of construction and reduce disputes between the asset owner and contractor regarding the suitability of the design.

The asset owner usually engages design consultants to prepare a concept or preliminary design to help clarify the project requirements and the contractor uses these preliminary designs as a base to develop and complete the design before carrying out the work in accordance with the final design documentation.

In recent times, the design prepared by the contractor has been subjected to an increasing number of reviews beyond just a review to ensure that the design meets the brief prepared by the asset owner. This could include reviews by stakeholders who are solely focused on specific project components and have no responsibility for its overall delivery. This can lead to extensive comments that can increase both the cost and time required to construct the project and therefore contractual disputes, thus negating many of the benefits of this form of procurement. A report

on the issue of multiple design reviews, published under the banner of *Partnership for Change* by ACA and Consult Australia<sup>19</sup> identifies that:

“The contractual design process has become increasingly inefficient with excessive reviews that are not enhancing project outcomes or providing value to the clients.”


The report identified that “By streamlining the process, skilled resources in short supply can focus on other work, improving productivity across projects.

### 10: IMPROVED WORKPLACE PRACTICES

Whilst the majority of opportunities in this appendix focus on project governance functions, there are many opportunities to improve how projects are physically constructed in the field.

As identified at the start of the report, construction worker pay increases have historically outstripped inflation meaning real pay has risen steadily whilst overall productivity has reduced. This cannot continue. Future wage rises need to be conditional on removal of enshrined work practices that reduce project flexibility and therefore productivity. A prime example is the practice of obliging all workers to take rostered days off on the same day, thus forcing a project to shut down.

Another way to improve workplace operations is by adopting lean (efficient) construction practices, adapted from the manufacturing industry. It is possible to achieve 10 to 30 percent reductions in expected completion time of projects and cost savings of 10 to 25 percent by using lean construction tools and processes on projects.<sup>20</sup> In one notable comparison of the benefits of lean, Baker concrete constructed the foundations for two identical steel rolling mills in the United States. One was constructed using traditional methods of planning and supervision and one was constructed using lean methods. The latter was completed 19 per cent faster than the plan with a 12 per cent improvement in productivity and 29 per cent reduction in equipment rental.<sup>21</sup>

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## Appendix B: National procurement principles

This document outlines a set of key principles that ACA recommends should underpin the procurement of major construction projects in Australia. The principles have been designed with productivity in mind. By adopting these standards of best practice, clients and industry together will reduce the unnecessarily complex and lengthy procurement procedures and undesirable contracting behaviours which hinder Australia’s economic growth.

### 1: ASSESS FOR ‘BEST VALUE’

Delivering ‘best value’ for government is the cornerstone of these procurement principles. Best value is about more than the lowest cost at the tender box. Indeed, the lowest initial price offered for a project is often a very misleading guide to its actual price, much less its return on investment.

A true measure of best value must incorporate a wide range of non-price criteria. While each client will develop its own set of criteria for specific projects, they may include:

- » Local supply chain engagement
- » Indigenous and other diversity targets
- » Workforce development
- » Innovation and productivity
- » Previous performance and experience of the project team
- » Experience with project scope and parameters
- » Depth of organisational capability
- » Sovereign capability
- » Sustainability and decarbonisation objectives

Whatever the mix of non-price criteria and their weighting, it is critical that they are not overwhelmed in the final analysis by price criteria. Clients should ensure that

assessment frameworks are sufficient to making meaningful distinctions between bids across all criteria.

### 2: ENGAGE INDUSTRY EARLY

Industry participants should be involved at the earliest opportunity, regardless of the contract form. This provides for the fullest assessment of the project’s risk profile and, by extension, the most accurate cost estimate. Early contractor involvement also allows those best placed to provide constructability and value engineering input to the design.

For larger projects, clients should make use of market sounding exercises to elicit industry’s views on the best procurement pathway and develop an understanding of market capacity.

### 3: CONTRACT RELATIONALLY, NOT TRANSACTIONALLY

Rather than asking the contractor to provide a guaranteed fixed price based on minimal information, the overriding goal of contracting should be to establish the rules by which the parties will jointly manage these risks as they inevitably arise throughout delivery.

Separate from the delivery contract, clients should utilise mechanisms that engage contractors with consultants to jointly develop the design and an accurate price. The client may then let the delivery contract on more conventional terms. ‘Best and Final Offers’ requests should be eliminated.

Clients should consider promoting even greater collaboration by using the design and planning phase to progressively develop a ‘target cost’ with all parties. A ‘painshare/ gainshare’ regime can then be implemented whereby any difference between the target and actual cost is shared among the parties. This is an excellent way to incentivise performance on the client’s non-price criteria.

#### 4: FOCUS ON OUTCOMES—INCENTIVISE INNOVATION

The dominant procurement processes contain inherent barriers to innovation and productivity growth. Procurement should contain clear signals to industry to bring forward and adopt innovative approaches. The most important opportunity here is to remove excessively prescriptive specifications and tender processes designed to compare identical bids. Clients should instead make greater use of performance-based specifications and tender processes able to assess and value innovation against a reference design.

#### 5: DIGITAL BY DEFAULT

All procurements should embed a digital by default approach, with a view to all projects incorporating a digital twin under a harmonised framework. An explicit goal of all projects should be to contribute to transitioning away from ‘digital by exception’ towards ‘digital by default’ underpinned by common standards and approaches. All projects and programs should identify minimum critical data sets across the full lifecycle of design, construct and operate.

#### 6: STANDARDISE CONTRACTS AND PROCUREMENT METHODS

Clients should adopt a standard and common library of contracts that can be applied with minimal variation. Contract variations should be applied in rare circumstances and used only where strictly necessary and by agreement with bidders.

A standard suite of contracts could draw on best international practice—such as the NEC suite of contracts—and be supported by a range of guidance materials on key procurement and contract delivery approaches.

#### 7: STREAMLINE PROCUREMENT AND DELIVERY

Clients should seek to maximise the amount of industry capacity available for truly value-adding design and delivery functions. This should include considering:

- » Streamlining internal client approval processes to reduce unnecessary delays in procurement.
- » Eliminating bid processes altogether through programmatic approaches.
- » Releasing unsuccessful bidders pending contractual close.
- » Using digital technologies to reduce documentation and streamline information flows.
- » Reducing credential requirements and relying more heavily on prequalification schemes.
- » Allowing tenderers to rely on information provided as part of the tender documents.
- » Eliminating excessive design reviews.

#### 8: CREATE A SUSTAINABLE INDUSTRY

All public procurement should strive to promote a more sustainable and healthy construction industry. Governments generally accept a responsibility to leverage public spending for higher goals, including to promote indigenous economic participation, local supply chain development, and a more diverse workforce. This commitment to social policy objectives should extend to achieving an industry that is capable of investing in the future of the industry and the workforce.

Public sector projects should always be contracted on the fair and reasonable ‘model client’ terms.<sup>22</sup> Practices that preserve industry liquidity, such as bid reimbursements, fair and reasonable stipends, and fast payment terms should all be standard. Practices that undermine the commercial sustainability of contractors, such as multiple requests for Best and Final Offers, adversarial ‘take it or leave’ negotiations and unreasonable risk transfers, should be eliminated.

By committing to these practices, government clients will not only improve their relationships with the supply chain but will also drive positive change in one of the economy’s most important and troubled industries. Adopting ‘model client’ practices will create the conditions for improved productivity and a healthier industry. Value for money, in the fullest sense of the word, will be significantly enhanced for the taxpayer. A profitable construction industry is in everyone’s interests and should be a key priority for all governments.

# Endnotes

- 1 *Advancing Prosperity: 5-year Productivity Inquiry report*, Australian Government Productivity Commission, 2023.
- 2 ACA analysis of ABS, *Australian National Accounts: Input-Output Tables*, Tables 5 and 20.
- 3 ACA analysis of ABS, *Population Projections, Australia* (Table C9) and ABS, *National, state and territory population* (Table 59).
- 4 ACA calculations of a counterfactual scenario where construction matched the historical productivity performance of other selected industries (Divisions A to K and R) based on the GVA-weighted average percentage growth of multi factor productivity. The calculation does not incorporate any dynamic factors so should be interpreted only as a general indication of construction's influence on national productivity.
- 5 *All Risk, No Reward*, ACA, 2023.
- 6 ABS, *Engineering Construction Activity, Australia* and ABS, *Building Activity, Australia*.
- 7 Data governance will be a key consideration in this initiative to ensure commercially or personally sensitive information is not shared. It is worth noting that a similar, industry-led approach has been successfully adopted in the UK but suffers from a lack of strong Government sponsorship ([www.datatrust.construction](http://www.datatrust.construction)).
- 8 The Building Ministers Forum may also be considered but this forum excludes infrastructure ministers and is not within the National Cabinet architecture.
- 9 <https://infrastructure.org.au/australian-infrastructure-budget-monitor-2022-23/#:~:text=A%20total%20of%20%24255%20billion,on%20top%20of%20the%20rankings>.
- 10 [https://pg.plangrid.com/rs/572-JSV-775/images/Construction\\_Disconnected.pdf](https://pg.plangrid.com/rs/572-JSV-775/images/Construction_Disconnected.pdf)
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- 19 <https://www.constructors.com.au/wp-content/uploads/2022/06/ACA-CA-Multiple-Design-Reviews.pdf>
- 20 <https://www.mckinsey.com/capabilities/operations/our-insights/lean-construction>
- 21 <https://vimeo.com/52961759>
- 22 *Partnership for Change: Model client*, Australian Constructors Association and Consult Australia, 2021.





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