Rethinking transport infrastructure delivery

Practical reforms to boost Australia's productivity

Acknowledgement of Country

Roads Australia acknowledges Aboriginal and Torres Strait Islanders as the Traditional Owners and Custodians of this land and waterways. We acknowledge and pay respect to their ancestors and Elders both past and present. Roads Australia is committed to reconciliation amongst all Australians.

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Roads Australia thanks the following organisations involved in consultation and peer reviewing of this report.

Roads Australia is the peak body for roads within an integrated transport system. Our members work across the transport infrastructure sector, representing all levels of the supply chain. In developing this report, we engaged deeply with members through policy focus groups, one-on-one consultations and peer review.

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Executive summary

This report presents a strategic roadmap for boosting productivity in Australia's transport infrastructure delivery. As government budgets tighten and demand for new infrastructure continues to grow, it is increasingly essential to deliver better value, faster outcomes, and improved industry capacity.

At the heart of this report is a recognition that time is one of the most valuable commodities in infrastructure delivery. Delays not only drive-up costs – by as much as 30 per cent on large projects[1] – they also reduce capacity and productivity across the sector. In the past decade alone, delays and cancellations have cost Australia over $21 billion[2].

The construction sector is facing a steep productivity decline. This slump has placed strain on governments and contractors alike. Yet the sector remains one of Australia's largest economic contributors, employing 1.25 million people and contributing nearly 8 per cent of GDP.[3] A productivity boost would therefore deliver outsized national benefits.

This report identifies practical reforms that are within the control of Australian Commonwealth, state and territory governments as well as industry. Reforms include, but aren't limited to, greater use of collaborative procurement models, effective management of risks relating to utilities and contamination, harmonisation of standards, an improved process to update standards and steps to minimise disruptions to labour productivity.

Since 2020, Roads Australia has led sustained advocacy to boost productivity in transport infrastructure delivery, with our Procurement reform report and Procurement reform report update. By convening government and industry, we have fostered collaboration on solutions to streamline procurement.

This work has already delivered tangible progress, with several reforms being partially adopted across jurisdictions, including greater pipeline transparency, use of early contractor involvement and incentivised risk-sharing. However, despite good progress, challenges remain.

This report sets a forward agenda for Roads Australia and its partners to continue facilitating reform through ongoing dialogue, policy development and industry engagement. Governments must continue to invest in infrastructure, but relies on industry for smarter delivery. A more productive sector will drive greater value, reduce bottlenecks, and build the modern, efficient transport system Australians need.

[1] Roads Australia. 2025. Address infrastructure productivity or risk a legacy of poorer living standards
[2] Infrastructure Australia. 2021. A National Study of Infrastructure Risk
[3] Australian Government DTIRDCA. 2024. Transport and Infrastructure Net Zero Consultation Road Map

Summary of recommendations

Procurement

1.1 Implement or increase bid cost contributions to incentivise competition and mitigate the cost of preparing a bid

Bid cost contributions should be increased to incentivise competition and ensure tenders are properly priced. These stipends help mitigate the high cost of preparing bids, which can otherwise be absorbed into project delivery costs. By compensating unsuccessful tenderers, governments can encourage broader participation and better-quality submissions.

1.2 Engage the construction sector in optioneering to optimise constructability

Early engagement of contractors during optioneering can optimise constructability and reduce design-phase risks. This approach enables practical, cost-effective solutions. It also fosters collaboration and innovation, even under traditional contract models. Projects benefit from reduced rework and improved delivery certainty.

1.3 Pick the appropriate procurement model for the project

Selecting the right procurement model is essential to achieving best value and productivity. Each project has unique characteristics, such as complexity, site conditions, and client priorities, that should inform model selection. Engaging contractors early can help identify the most suitable model, whether it be alliance, incentivised target cost, or construct-only.

1.4 Implement appropriate risk management contracts relating to utilities and contamination to reduce the likelihood of delays and disputes

Utilities and contamination are among the most common causes of project delays and disputes. Clients should engage with utility providers early and adopt model clauses that clearly allocate risk. Contamination risks, whether known, unknown, or migrating, should be scoped and priced using collaborative mechanisms like pain-share/gain-share.

1.5 Reduce required information in the tender process to avoid duplicative efforts across different tenders

Tender processes should be streamlined by reducing duplicative documentation and introducing annual prequalification schemes. This would allow contractors to focus on project-specific responses rather than repeating compliance information. A leaner process supports better tenders and reduces administrative burden across the industry.

1.6 Minimise contract award time and announce preferences as early as possible to maximise industry capacity

Long contract award times limit industry capacity and inflate costs. Contractors must hold teams on standby, while material and labour costs continue to rise. Clients should aim to meet published timeframes and announce preferred contractors early to unlock market capacity.

1.7 Engage with industry on best value local content requirements to identify potential implications for project time and cost

Local content requirements must be balanced with cost and resource availability to ensure best value. Early engagement with industry can identify supply chain constraints and avoid setting unrealistic targets. While supporting local economies is important, rigid requirements can hinder project efficiency.

1.8 Develop a national register of procurement dates to maximise market capacity

A national register of procurement dates, maintained by Infrastructure Australia and updated regularly by state and territory governments, would improve pipeline visibility. This would allow industry to plan resources, scale capacity, and identify workforce needs.

Design

2.1 Harmonise standards nationally where appropriate to increase efficiency in the design process and leverage modern methods of construction

Inconsistent standards across jurisdictions are a major barrier to design efficiency. Harmonising technical and process standards would reduce duplication, enable resource sharing, and support modern construction methods.

2.2 Investigate options to improve the process of updating standards to ensure they are up-to-date and accommodate innovations

An improved process for reviewing and updating standards would unlock productivity and support sustainability and safety outcomes. Governments have the greatest control over their own standards, but collaboration with bodies like Austroads and Standards Australia is needed.

2.3 Use outcome-based standards to accelerate innovation and identify which standards should be updated

Outcome-based standards encourage innovation by focusing on desired results rather than prescriptive methods. This approach allows designers to challenge existing standards when better alternatives are available. Embedding these standards alongside a process for updating prescriptive ones will boost productivity and environmental performance.

2.4 Retain project Intellectual Property and share with industry to realise the maximum benefit of innovations

Governments should retain project IP and share it across industry to maximise the benefits of innovation. Contract models and bid cost policies should incentivise the development of new technologies and processes. A more open approach to IP fosters collaboration and accelerates adoption of best practice.

2.5 Optimise the design review process to expedite the design process and optimise designs

Design review has become overly burdensome, with excessive comments and unclear scopes adding time and cost. Jurisdictions should adopt best-practice principles to streamline the process, including early stakeholder engagement, defined review scopes, and use of digital tools. Limiting reviewers and setting clear comment categories can reduce inefficiencies.

Construction

3.1 Invest in Modern Methods of Construction to increase efficiencies in construction

Modern construction methods can significantly improve speed, quality, and sustainability. Investment should be led by industry and supported by government. Harmonised product standards will further leverage these investments.

3.2 Create flexible working arrangements to increase workforce capacity and diversity

Flexible work practices are essential to increasing workforce diversity, wellbeing, and capacity. Traditional construction hours are a barrier to participation, particularly for women and carers.

3.3 Minimise severe disruptions to labour productivity to avoid critical path delays

Recent revelations of violence, intimidation and coercion on public infrastructure work sites requires a more proactive approach. Stronger regulation and integrity checks, similar to those used on nationally significant projects, should be extended to major transport infrastructure. A zero-tolerance culture for unsafe behaviour is needed to protect workers and ensure delivery certainty. Safety and inclusivity must be central to resetting site expectations.

3.4 Empower and incentivise Construction Administrators to enable quick decision-making on-site

Construction Administrators should be empowered to make timely decisions on-site, especially when issues arise. Structural and cultural changes within procurement teams will be needed to support this shift and improve project outcomes.

Time is money

Time is one of the most crucial and consequential factors of transport infrastructure projects. During delivery, a single day delay on a major project can cost more than $10 million and ongoing delays can push up total delivery cost by 30 per cent.[4] It is estimated that between 2011-2021 infrastructure project delays and cancellations in Australia cost upward of $21 billion.[5]

This report focuses on ways to reduce time in procurement, design and delivery of major transport infrastructure projects without compromising on quality. The goal is to boost productivity in the sector while maintaining quality and delivering value for money. Our recommendations point to opportunities for efficiency gains.

While many external and indirect factors influence cost and productivity, we can have significant impact addressing specific aspects of project delivery that take longer than they need to. From years-long contract award times, to uncollaborative contracts, to overbearing design review processes and standards that stifle innovation, there are many opportunities to reduce time costs in transport infrastructure delivery.

In our view, it is possible for governments and industry to deliver value for money by striking the right balance between time, cost and quality. A more productive sector will create a positive feedback loop, with better value for money, increased market capacity and transformative transport infrastructure for all Australians.

At a time of constrained budgets and inflationary pressures, boosting productivity in transport infrastructure delivery should be a central focus of governments. We cannot simply restrict spending on transport infrastructure because our population, regions and cities continue to grow. Instead, we need to continue investment and optimise delivery.

The lens of time focuses this report on reform levers that are in the control of the industry, including government. While political cycles can cause major disruption and delays to major projects, these impacts are considered outside the scope of this report.

This report recognises that external and indirect factors also affect productivity in the sector, including geopolitical uncertainty and conflicts, but does not address these. Importantly, this report's recommendations focus on factors that are the within the control of local jurisdictions and industry.

[4] Roads Australia. 2025. Address infrastructure productivity or risk a legacy of poorer living standards
[5] Infrastructure Australia. 2021. A National Study of Infrastructure Risk

Construction productivity is in steep decline

The transport industry and sector employs more than 1.25 million Australians, with a total contribution to the economy in 2020-21 of $164.4 billion – equivalent to 7.9 per cent of GDP.[6] The productivity and viability of the sector is therefore directly linked to Australia's economic outlook, standard of living and the quality and accessibility of the transport network.

Multifactor productivity (MFP) of Australia's construction sector has been in steep decline over the last decade and is now lower than it was in 1998-99. Although the sector's MFP was traditionally much higher than the aggregate of all industries, it has experienced more volatility and overall decline. This shows that avoiding shocks – such as delays, or changes in investment or the cost of materials and labour – is key to establishing higher productivity.

It is worth noting that the 'construction' productivity data analysed here includes all types of infrastructure construction, not just transport infrastructure. See opposite table for ABS data definitions. Where possible, ANZIC subdivisions have been analysed to compare transport infrastructure construction (heavy civil and engineering, and road and bridge) with other types of construction, such as buildings and residential buildings.

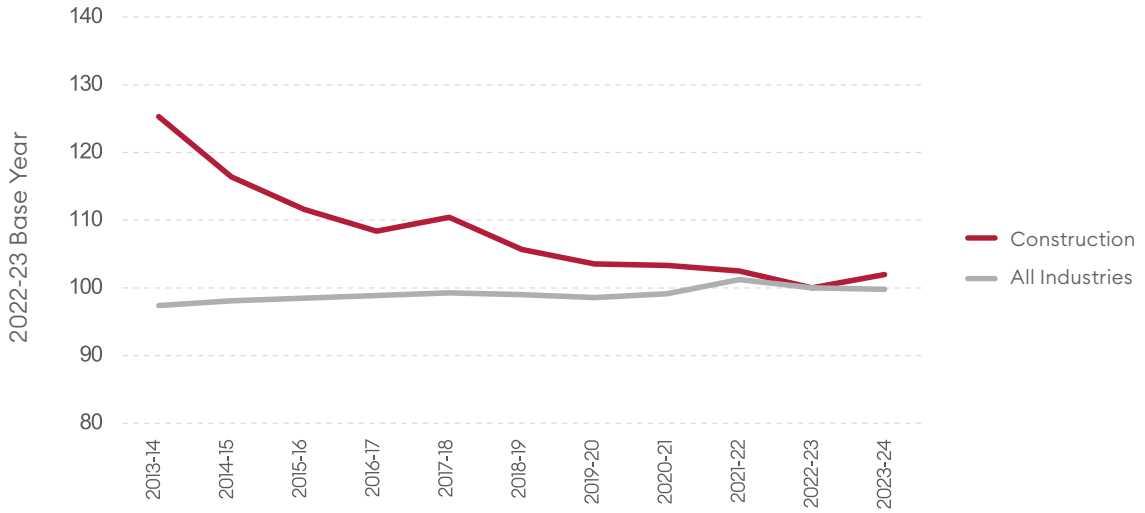
It is worth highlighting that construction productivity is not simply a measure of productivity on construction sites. A range of inputs and decisions affect productivity in construction, from political cycles to project announcements, through to site conditions, inflation and supply chain shocks. This report focuses on inputs and decisions during procurement, design and construction.

[6] Australian Government DTIRDCA. 2024. Transport and Infrastructure Net Zero Consultation Road Map

ABS Definitions	
Multifactor productivity	Multifactor productivity is defined as a ratio of output to combined labour and capital inputs. It is often expressed in terms of a growth rate, that is, the growth rate of output minus the growth rate of inputs. At the aggregate and industry level, MFP is defined as the ratio of gross value added (GVA) to the combined inputs of capital and labour. It reflects the growth in GVA which is not explained by the combination of capital and labour inputs and is a measure of technological progress and enhanced efficiency.
Capital productivity	Capital productivity is defined as the ratio of output to capital input, which is essentially the output per unit of capital. This measure reflects how effectively capital is being used to produce goods and services.
Labour productivity	Labour productivity is defined as the ratio of output to labour input, typically expressed as output per unit of labour (e.g., output per hour worked). This means it's a measure of how much output is produced for each unit of labour used.
Gross value added	Gross Value Added (GVA) is a measure of the value of goods and services produced by an industry or region, minus the intermediate costs used to produce them. It represents the contribution of labour and capital to the production process and is a key indicator of economic performance.
Construction	'Construction' includes units mainly engaged in the construction of buildings and other structures, additions, alterations, reconstruction, installation, and maintenance and repairs of buildings and other structures. This division contains the following ANZSIC subdivisions: • 30 Building Construction • 31 Heavy and Civil Engineering Construction • 32 Construction Services
Building Construction	Building construction subdivision contains the following ANZSIC groups: • 301 Residential Building Construction • 302 Non-Residential Building Construction
Heavy and Civil Engineering Construction	Heavy and civil engineering construction subdivision contains the following ANSZIC groups: • 3101 Road and Bridge Construction • 3109 Other Heavy and Civil Engineering Construction
Construction Services	Construction services subdivision contains the following ANZSIC groups: • 321 Land Development and Site Preparation Services • 322 Building Structure Services • 323 Building Installation Services • 324 Building Completion Services • 329 Other Construction Services

Construction productivity is in a steep 10-year decline

Construction MFP index compared with all industries, Australia

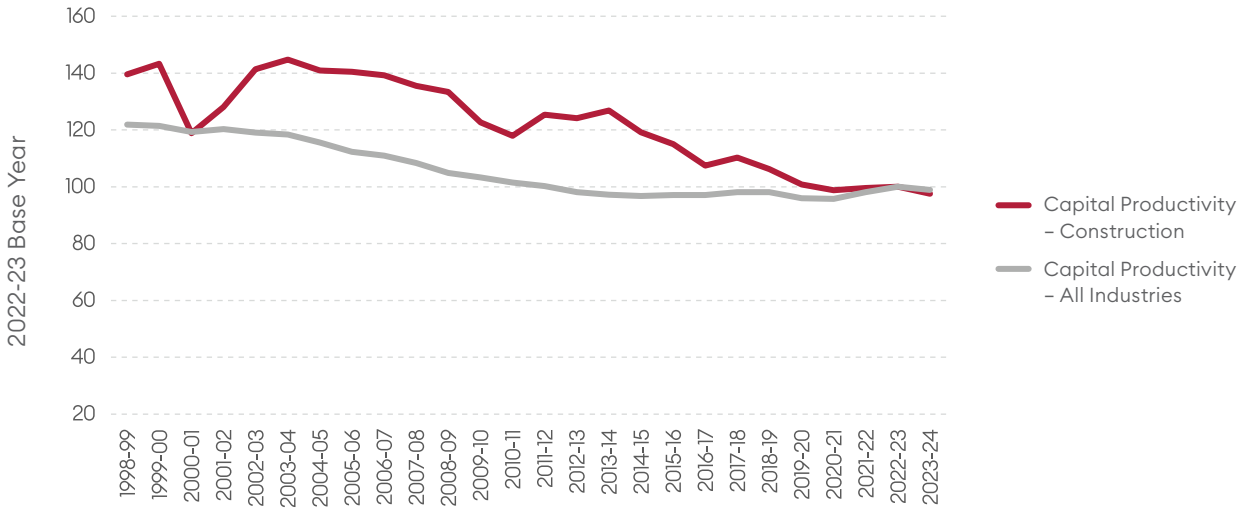


Source: ABS

The decline in construction MFP is largely due to a decades long slump in capital productivity – which means we're paying more for infrastructure. While capital productivity has declined across the aggregate of all industry sectors, the percentage change in the construction sector has been more profound with a series of peaks and deep troughs.

Capital productivity in construction is in a decades long decline

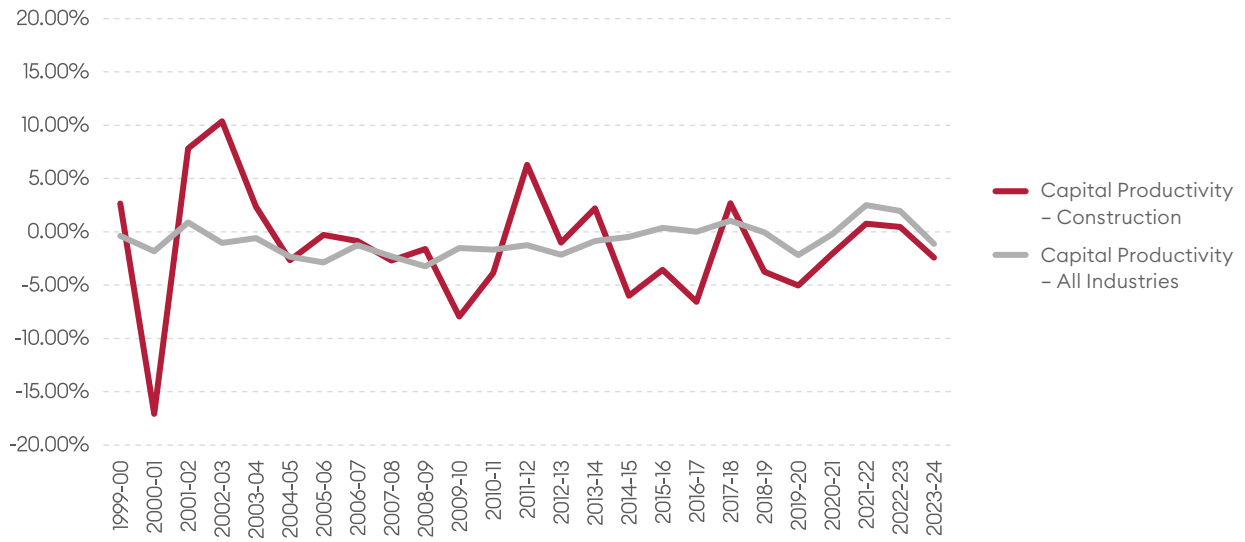
Construction capital productivity index compared with all industries, Australia



Source: ABS

Capital productivity in construction has experienced greater recession than all industries

Construction capital productivity year-on-year percentage change compared with all industries, Australia

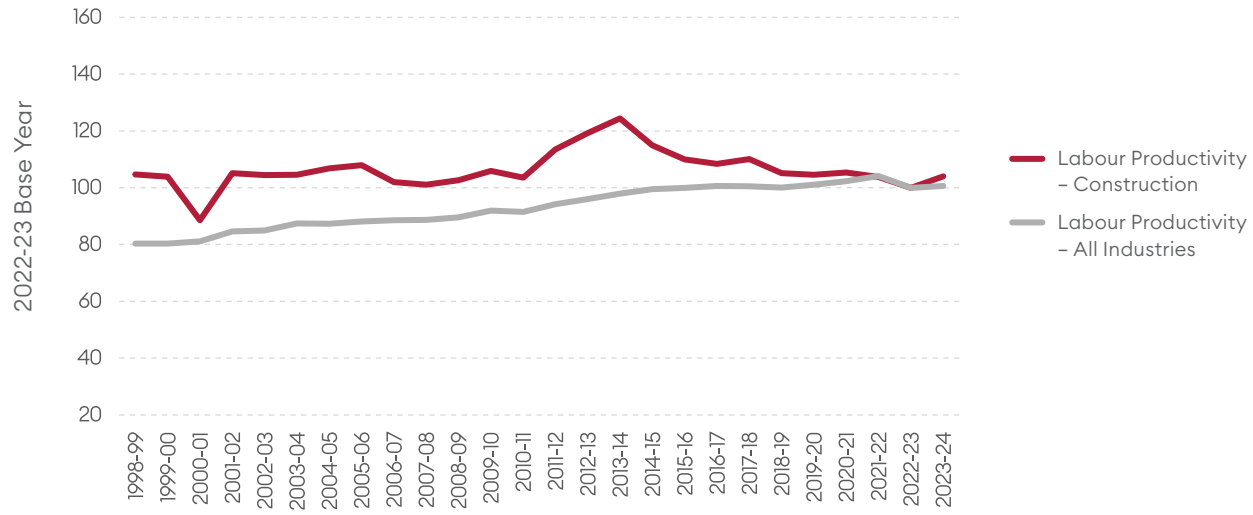


Source: ABS

As well as declining capital productivity, the construction sector has also experienced declining labour productivity, with labour productivity now the same as it was in the late 1990s and early 2000s. This contrasts with the aggregate of all industries, which has seen a steady increase in labour productivity over the last two decades, despite a slowing growth rate.

Labour productivity in construction has declined and is now the same as it was in 1998

Construction labour productivity index compared with all industries, Australia



Source: ABS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Construction cost over time

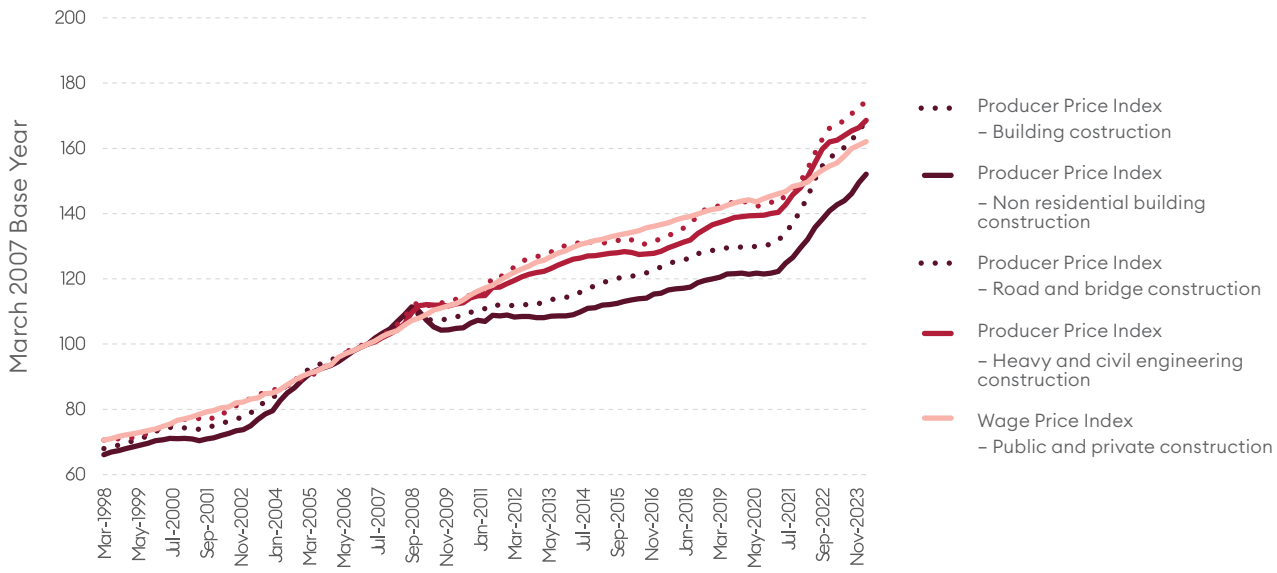
With declining capital and labour productivity it is no surprise producer price indexes for transport infrastructure are on an upward trend. The growth in producer price indexes for road and bridge and heavy and civil engineering construction is closely linked to the wage price index for construction.[7]

Labour accounts for about one quarter of total expenses for these types of construction, whereas labour accounts for only 10 per cent of total expenses in residential and non-residential building construction.[8]

Because labour costs contribute to a greater portion of total expenses for heavy and civil engineering construction, and construction services, those producer price indexes for those subdivisions show a stronger relationship with movements in the wage price index, compared to in the building and non-residential building construction subdivisions (as shown below) – in which labour only accounts for around 10 per cent of total costs.

The cost of transport infrastructure delivery is more dependent on the cost of wages than other construction sectors

Producer price indexes by construction subdivision compared with wage price index of construction, Australia



Source: ABS

It is worth highlighting that the growing cost of transport infrastructure delivery cannot be put down to contractors raising prices to make more profit. In fact, the profit margin for heavy civil and engineering construction is relatively slim and is the lowest of all construction subdivisions, with operating profit before tax being equivalent to just 2.3% of total expenses in 2020-21. Building construction has slightly higher profit equivalent to 9% of total expenses in the same year, with construction services – that work across building and infrastructure construction, taking home the most, with their profit being at 19% of total expenses in 202-21.[9]

[7] ABS Price Indexes
[8] ABS 'Tradies continue to lead the way in $568b Construction industry'
[9] ABS Operating profit before tax construction subdivisions

Principles of a collaborative approach

Government, industry and industry bodies – including Roads Australia – frequently cite the need for greater collaboration to help address the productivity challenge. But what do we really mean by 'collaboration'? For the purposes of this report, it is worth defining our use of the term as it is applied in various contexts, including contracting, culture and common industry methods and practices.

Collaborative contracting

Collaborative contracting is a mode of project delivery that fosters early and ongoing cooperation between project owners, contractors and other key stakeholders. It is characterised by shared objectives, transparent communication, equitable risk allocation (for example shared exposure to cost overruns) and joint decision-making processes. This approach often includes mechanisms such as Early Contractor Involvement (ECI), open-book cost models and performance-based incentives to align interests and improve outcomes.

Collaborative culture

While collaboration can be promoted through the procurement model, it is not necessarily incompatible with fixed-sum or fixed-term contracts. For collaboration to be achieved where these models are employed, there needs to be commitment to a collaborative culture on both the client and contractor side.

Fostering a collaborative culture will require a high degree of trust between client and contractor, which can take time to build. Roads Australia members have reported examples where an open-book approach to costs – which is not typical in this procurement model – has been used to collaboratively resolve cost disputes in fixed-sum contracts.

Another example of how culture can help improve collaboration is the empowerment of contract administrators. Because transport infrastructure projects are complex, decision makers typically sit at various levels on the client side. When contract administrators are unable to make quick decisions – especially when things go wrong – this can cause a breakdown of both collaboration, trust and productivity on a project.

Collaborative industry

The nature of procurement incentivises industry to showcase the technical know-how and proprietary information that gives them their competitive edge, but to do so in a way that minimises the extent to which their competitors can replicate it. However, during recent Roads Australia events and engagements with members, this unwillingness to share has been referred to as a barrier to productivity.

Industry is becoming increasingly aware that to improve productivity there is a need to share innovative methods and practices – and further, to adopt each other's innovations to realise the productivity benefits of a common approach. The Level Crossing Removal Project and Major Roads Projects Victoria are key examples where shared innovation and common approach led to productivity gains.

This type of industry collaboration is likely to be difficult to foster, especially given the competitive nature of tenders. However, there is an opportunity for clients to catalyse collaboration through certain procurement models, or by retaining project intellectual property to be shared back with industry – as recommended later in this paper (see recommendation 2.4).

Pick the right model for the right project

There are many different types of procurement contracting models that are used for transport infrastructure delivery. While government and industry often call for greater use of collaborative contracting models for procurement, they also both recognise that different models are suited to different types of projects.

As detailed above, collaboration can be incentivised through the procurement model, but a collaborative culture between client and contractor, and between contractors, can still be achieved in fixed-sum and fixed-term contracts.

Each transport infrastructure project will have different factors – some of which are determined by the client and others that are determined by site conditions, the size or complexity of the project. As such, different procurement models will be more suited – and therefore more productive – for different projects, depending on these factors.

Below we detail some of the most common types of procurement contracting models. It is also worth noting that for large projects with repeatable elements, project packaging can be utilised with most contracting models to boost productivity. Project packaging is a procurement strategy where a large project is split into a series of smaller contract packages, allowing for efficient planning and delivery by a variety of contractors and subcontractors.

Alliancing

Alliance contracting is a procurement model where client and contractors work as an integrated and collaborative team to deliver a project. The model includes incentives such as 'pain-share' and 'gain-share' on costs. Alliancing promotes a no-blame culture, where all parties work together to solve problems. Project information and innovations are shared among all alliance members, including contractor's costs on an open-book basis.

Incentivised Target Cost

Incentivised Target Cost contracting is a procurement model where actual costs are reimbursed up to a target, with risk and reward sharing. The model includes 'pain-share' and 'gain-share' incentives and open-book transparency, like alliance models, but lacks the "no-blame" framework of that model. Early competition payments are used to incentivise completion where delivery timeframes are paramount to the client, like in Traditional Lump Sum models.

Managing Contractor

Managing Contractor contracting is a procurement model where the contractor's primary role is management, with design and construction sub-contracted out. Sub-contractor selection is usually controlled by the client, who also reimburse sub-contracting costs – meaning the managing contractor takes on less risk on time and cost.

Traditional Lump Sum

Traditional Lump Sum contracting is a procurement model where the contractor's role is to design and build the project for a fixed sum, generally within a fixed time period. During contracting, both client and contractor may agree on entitlements to extra time and cost for certain events.

Early Contractor Involvement

Early Contractor Involvement is a procurement model where the client selects a contractor while the project is still in the early stages of design. The client and contractor then collaborate on the design phase, with the contractor sometimes performing physical works such as site investigations, ordering of long-lead items or other preparatory tasks.

Once design has reached an appropriate level of maturity, the contractor submits a proposal for the delivery of the project. The delivery phase contract can be under any of the contracting models discussed in this section.

Construct Only

Construct Only is a procurement model where the contractor's sole role is to build the project, based on the completed designs provided by the client. Construct only contracts are for a fixed sum within a fixed time period – subject to entitlements for extra time and cost agreed upon during the contracting phase.

1. Recommendations for boosting productivity in procurement

Procurement is the first and arguably most influential phase in the lifecycle of a transport infrastructure project. It determines how risk is allocated, how innovation is incentivised, and how quickly and effectively a project can move from planning to delivery.

This chapter explores targeted actions that clients can take to streamline procurement while maintaining probity, competition, and value for money. These include implementing or maintaining bid cost contributions, engaging early with contractors during the optioneering phase, reducing the amount of required information at tender, and announcing preferred contractors earlier.

It also examines smarter ways to manage risk, particularly in relation to utilities and site contamination – two of the most common causes of project delays and disputes. By embedding collaboration and fairness in procurement models, clients can not only accelerate delivery but also build industry confidence and capacity.

1.1. Implement or increase bid cost contributions to incentivise competition and mitigate the cost of preparing a bid

Bid cost contributions are a financial incentive – that can vary between jurisdiction, project value and contract model – whereby unsuccessful tenderers are paid up to a certain threshold, usually between 0.2-1.5 per cent of the total project cost.

Current bid cost contributions do not cover the total cost of preparing a bid. To incentive contractors to invest more time and money into the tender process – to ultimately improve the value of tenders – jurisdictions should increase bid cost contribution stipends.

Bid cost contributions aim to avoid bid costs being absorbed in the project cost and ensure tenders are being properly priced, which can reduce issues and associated delays arising during delivery. They incentivise participation which creates greater competition, helping achieve value for money. Further, they typically require transfer of intellectual property to the client – which we've recommended in section 2.4, to realise the maximum benefit of innovations.

Lower bid cost contributions should be balanced by clients taking on a bigger role in project development to reduce the tender response burden. For example, the client could be responsible for concept designs, contamination reports, geotechnical and utility investigations, survey models, heritage impact studies and where appropriate, relaxation in standards.

Some state governments, including New South Wales, Western Australia and Victoria, already have a bid cost contribution policy in place for major non-residential projects. We recommend that all jurisdictions negotiate a bid cost contribution policy with industry and that ideally these are aligned.

1.2. Engage the construction sector in optioneering to optimise constructability

Where appropriate, construction contractors should be engaged in the optioneering process, through Early Contractor Involvement or Early Tender Involvement to optimise the constructability of a project. This is critical for ensuring optimal pre-site planning and constructability, which ultimately reduces the risk of delays or design changes during the construction phase.

Case study: Early Tender Involvement (ETI)

Project: Isle of Capri Bridge
Location: Queensland

Summary

- The project involved construction of a new 140m-long 6-span super T-girder bridge and associated approach works forming part of a replacement bridge link over the Nerang River.
- During the ETI phase, Georgiou determined there were significant construction challenges with the piling design – bored piers with 40mm thick steel liners – and associated risks using heavy impact drivers and cranes within 10 metres of sensitive receptors and PUA assets.

Outcomes

- As piling works accounted for 50 per cent of the total construction cost, Georgiou partnered with Caporn Piling, to investigate alternative designs and present cost effective, practical solutions to the client during each ETI workshop.
- Following the assessment of geotechnical reports, Georgiou proposed to reduce the pile liner thickness to 16mm and investigated several piling methodologies to address the Designer's perceived risk of buckling.
- The reduction in pile liner thickness offered substantial savings in supplier costs, permitted the use of lighter and more manoeuvrable plant equipment, and mitigated several safety and environmental concerns.
- The project won the CCF Collaborative Project of the Year 2023.

How it worked

- Despite the construct only contract model, the client accepted the alternate proposal with the provision that Georgiou assumed the risks of the amended design and driving methodology.
- Post award, Georgiou integrated several key personnel from Caporn into their project team to refine and finalise the piling methodology based on the IFC design.
- To minimise the risk of buckling, Georgiou undertook a progressive pre-drill and vibration installation technique which reduced the impact from striking the cobbles in the Riverbed. As a result, all pile liners were drilled with no quality or environmental incidents.

1.3. Pick the appropriate procurement model for the project

Each transport infrastructure project will have different factors – some of which are determined by the client and others that are determined by site conditions, the size or complexity of the project. As such, different procurement models will be more suited – and therefore more productive – for different projects, depending on these factors. Where there are number of unknown factors clients should engage with contractors to help identify the best model for the best value.

1.4. Implement a tailored approach to management of utilities and contamination to reduce the likelihood of delays and disputes

Disputes with utilities are often the cause of major delays for projects across Australia. Currently, a lack of clarity and accountability around decision making and risk allocation relating to utilities is causing uncertainty, delays and reworks.

Clients should appropriately engage with utilities prior to the procurement phase to adequately scope any associated risk. A model clause for the allocation of risk relating to utilities could be developed and implemented in procurement contracts to ensure disputes or design requirements relating to utilities are resolved prior to design and construction.

There are three types of risks that can occur in infrastructure projects relating to utilities:

1. Non-contestable works– where utilities must be moved by a certain authority
2. Contestable works – where a contractor or client can move utilities with authority approval, once design is finalised
3. Betterment works – where utility companies either want or require an upgrade of their assets

Contamination risk allocation also needs to be managed effectively. Pain-share gain-share agreements are an effective way to incentivise collaboration and cost savings in relation to contamination.

There are several types of contamination risks for infrastructure projects:

1. Known contamination
2. Unknown contamination
3. Occurring contamination – which may result from a change of law or policy (e.g. engineered stone)
4. Migrating contamination – where contamination may go outside a site boundary

These risks should always be managed appropriately in contracts and clients should never go to tender unless reliance information on potential risks is sufficient. Principals should be responsible for moving contamination because it is a result of the project.

There are multiple ways each of these possible risks can be managed in contracts – the important point is that a tailored approach is used. The below case studies identify examples of appropriate risk management.

Case study: Managing risk relating to non-contestable utility works

Project: Undisclosed

Location: Sydney

Summary

- All non-contestable utility works were priced on a provisional sum basis within the project contract.
- A subset of critical non-contestable utility works had an additional agreement which dealt with the risk of delays. These seven critical non-contestable utility works related to Jemena, Ausgrid and Telstra assets.

Outcomes

- The contractor was incentivised to proactively manage the utilities and try to minimise delay due to risk-sharing.
- The client was incentivised to assist the contractor to ensure there were no delays with the critical non-contestable works and that these works stayed off the project's critical delivery path. In particular, the client assisted the contractor with variations and discussions with the utility owners.

How it worked

- The contract made clear how to ascertain and measure whether critical non-contestable utility works were delayed. The method differed for each utility:
  - For Ausgrid, it was a set period of time which commenced from when Ausgrid notified the contractor that it has accepted the prior work carried out by the contractor (that was needed for the commencement of Ausgrid's works).
  - For other utilities, it was the period allowed in the contractor's contract close program (plus any float on that activity) that commenced from the date the contractor had requested the utility to commence the works. This was provided the contractor had adhered to the utility's notification requirements.

Case study: Managing risk relating to contamination

Project: Undisclosed

Location: Sydney

Summary

A Collaborative Target Budget in relation to contamination was used within a fixed-price contract to incentivise the contractor to reuse materials on-site rather than dispose off-site and allow contamination risk to be shared and priced with best value-for-money. Cost underruns and overruns were shared 50:50 between client and contractor.

Outcomes

- The contractor was incentivised to reuse materials on-site and prioritise design to save on disposal. The client was incentivised to adopt a flexible approach to considering design changes.
- Off-site disposal was substantially under the cap. The on-site cap was significantly exceeded, and the total volume cap was also exceeded (so the contractor could not claim over the total volume cap).
- The final cost was only around 50 per cent of the Baseline Cumulative Target Budget (BCTB). Therefore, a sizeable incentive payment of 50 per cent of this saving was paid to the contractor.
- The client's total cost was approximately 25 per cent lower than the initial budget, as they only paid 50 per cent of the Baseline Cumulative Target Budget for the works and another 25 per cent for the incentive.

How it worked

- A Target Budget contamination incentive was initially proposed by the contractor during tender. The detailed agreement was developed once the client agreed with the proposal.
- The contractor took on volume risk (caps on both total volume and off-site disposal volume) and risk on its tendered schedule of rates. Outside of this agreement there were some additional entitlements for specific contamination – including per- and polyfluoroalkyl substances (PFAS).
- The contract allowed the contractor to move whatever dirt it wanted to move, wherever it wanted, and it would get paid per month on the surveyed quantity of dirt placed or disposed, provided that:
  - **the contractor did not exceed the offsite volume cap** - once the contractor exceeded the offsite volume cap, the contractor was not paid any more for off-site; and
  - **the contractor did not exceed the total volume cap** - once the contractor exceeded the total volume cap, the contractor was not paid for any more on-site or off-site.
- If the Baseline Cumulative Target Budget was exceeded there was a 50:50 pain-share. If the final cost ended up under the Baseline Cumulative Target Budget, the contractor received 50 per cent of the delta, as an incentive KRA payment (known as the Cost Saving Sharing).

Lessons learned

- The agreement was administratively intensive for both parties. Future applications should consider how to simplify administration for the contractor, client and the Independent Verifier.

1.5. Reduce required information in the tender process to avoid duplicative efforts across different tenders

To streamline the tender process, principals should consider options to reduce the required information at tender, such as through annual prequalification schemes, or by requesting some information (as detailed in the final paragraph below) post-award.

This will remove the need to ask duplicative questions with each company that clients engage with, in each tender process. If an annual pre-qualification scheme is introduced there should no longer be a need to ask compliance questions during tender. This will help industry put their best tender forward, by allowing them more time in the tender process and reducing how often they need to report.

Documentation that could be assessed on an annual basis in a prequalification scheme could include financial reports, ISO Certifications and base management reports on quality, environment and sustainability, Indigenous participation, reconciliation action plans, human resources and industrial relations.

1.6. Minimise contract award time and announce preferences as early as possible to maximise industry capacity

Long contract award times, of around two years, hamstring industry and push up delivery costs. Once contractors have submitted their tender, they place a project team on standby – limiting the capacity of their organisation and the market.

At the same time, the cost of materials and labour typically goes up each year. A one-to-two-year contract award time therefore has a significant negative impact on productivity and cost. Clients should endeavour to minimise contract award times as much as possible and meet published timeframes to enable business to plan appropriately.

One way for clients to reduce the time, productivity and financial burden of long contract award times is to announce preferred contractors as early as possible. This limits the broader impact to industry, freeing up capacity for other tender applications or project delivery.

Case study: Early contractor involvement

Project: Bruce Highway Upgrade Program, Edmonton to Gordonvale
Location: Far North Queensland

Summary

- Edmonton to Gordonvale involved a short Expression of Interest and dual Early Contractor Involvement through a Collaborative Project Agreement with the Department of Transport and Main Roads, Queensland.
- The project was delivered through a Design and Construction Joint Venture, which is an innovative approach compared to the traditional method of engaging a designer as a consultant.

Outcomes

- The short Expression of Interest and Early Contractor Involvement meant unsuccessful bidders did not have to hold teams on standby for a long period of time.
- The contract model drove quick decision making and allowed all parties to manage risk collectively and no disputes arose.
- The Joint Venture tied the designer's profit to the overall project profit, which directly incentivised an efficient design process and optimal design for construction.

1.7. Engage with industry on best value local content requirements to identify potential implications for project time and cost

Early contractor involvement to understand any supply chain or labour constraints could avoid time and costs associated with settling on Project requirements too early. Governments should be open to making some allowances to local content requirements where industry has identified a significant impact to cost.

While local content requirements are important for state and federal sovereignty, and economic development, they can in some instances hinder best value for money. Local content requirements need to be carefully balanced with availability and cost of resources to at once preserve and support local industry, while ensuring the timeliness and best value for money of a project.

Australia's transport infrastructure sector needs the same resources and materials. Different states and territories have different economic advantages, either due to their geographic location or historical industries. A national economic strategy should be spatially planned to maximise geographic and industry advantages, while sharing their economic benefit.

1.8. Develop a national register of procurement dates to maximise market capacity

A national register of procurement dates should be developed by Infrastructure Australia to increase national pipeline visibility. Each state and territory government should be responsible for keeping their pipeline of works up to date – ideally updates should be required every 3-6 months. A national register of procurement dates will help industry maximise their capacity and identify where capability uplift or workforce attraction may be required.

2. Recommendations for boosting productivity in design

This chapter explores opportunities to improve productivity in the design phase of transport infrastructure projects. It advocates for nationally harmonised standards to reduce duplication across jurisdictions, and for streamlining the design review process to avoid unnecessary rework and delays. It also highlights the importance of outcome-based approaches and updating outdated technical standards.

Embedding flexibility, collaboration, and innovation into the design phase is critical to unlocking productivity across the entire infrastructure lifecycle. Design teams must be empowered with opportunities to share and scale innovation across projects. When done right, good design doesn't just create better infrastructure, it enables smarter, faster and more cost-effective delivery from contract close.

2.1. Harmonise standards nationally where appropriate to increase efficiency in the design process and leverage modern methods of construction

Commonwealth, state and territory governments need to recognise and create a plan to address the mounting issue of discrepant standards across jurisdictions. The efficiency of the transport infrastructure industry, that works across jurisdictions, is being significantly hampered by different technical and process requirements in each state and territory.

Roads Australia recognises that nationally harmonising technical and process standards for the transport infrastructure sector is an enormous task. However, in our view it is critical to boosting sector productivity. Harmonisation will require a staged approach over many years and intergovernmental cooperation and coordination.

Where possible, consistent standards would increase the sharing of resources and reduce cost and time of design. Harmonised standards would also leverage investments in modern methods of construction. Any process undertaken to review and harmonise standards should involve deep and ongoing engagement with industry.

Case study: Inconsistent standards across jurisdictions

Standard: Austroads Road Design Guide, Queensland Supplement

Location: Queensland

Summary

- Austroads Road Design Guide partitions standards to suit each state and territory (there are six differences for QLD, one for WA). Each state and territory also adopts and implements supplements to this Guide, which typically include standards that supersede standards in the Guide.
- The QLD Department of Transport and Main Roads (QTMR) supplement to the Austroads Road Design Guide is 88 pages long (see Road planning and design manual - 2nd edition (Department of Transport and Main Roads).

Outcomes

- To understand which standards apply for a project, contractors need to read three documents at the same time:
  1. Scope of Works & Technical Criteria (SWTC) or Project Scope & Technical Requirements (PSTR)
  2. Austroads Design Guides
  3. State or territory supplements
- If there is a conflict between them, the higher standard applies.
- Having to read three documents to determine which standard applies creates inefficiencies in design, with designers who typically are not constrained by state boundaries and work across multiple states, needing to understand numerous conflicting design standards.
- As a result, additional time (and cost) is spent on early / concept design and getting everyone up to speed. This productivity challenge can be exacerbated by tight timeframes for design during EOIs and Tenders.

2.2. Investigate options to improve the process of updating standards to ensure they are up-to-date and accommodate innovations

An intergovernmental approach is needed to improve the process and frequency of updating technical and process standards. Improving these processes presents a significant opportunity for a step-change in infrastructure delivery productivity – as well as other desirable outcomes such as sustainability, resilience and safety.

Because standards tend to be reviewed and updated infrequently, many don't recognise advances in technology and rely on outdated methods. For example, Victorian Sight Distance Standards have not been updated in decades and therefore do not consider advances in vehicle technology and Driven Pile Testing Standards still rely on manual reading of temperature compression.

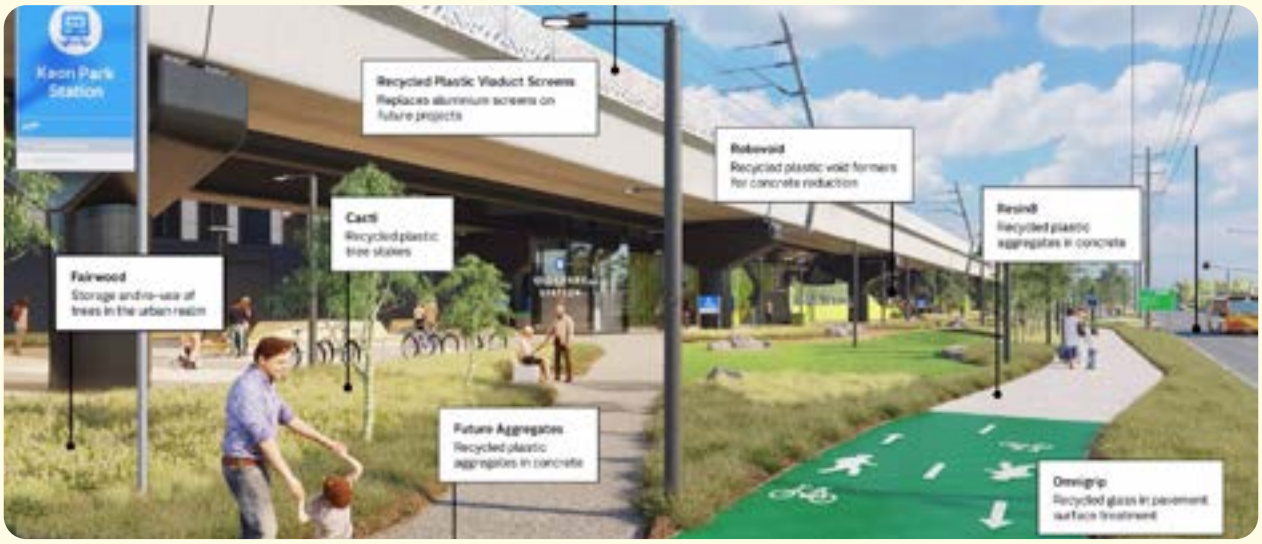
The outcome is often overengineered infrastructure, which is more expensive and time consuming to design and build. Reviewing and understanding the impact of current processes to update standards should be a national cabinet priority to boost productivity and ensure Australia's infrastructure sector remains viable and up-to-date internationally.

The process of updating standards varies depending on who owns and sets the standard. In some cases, standards are set by government departments, other times they are set by associations or organisations such as Austroads or Australian Standards. Standards are advisory and become mandatory through legislation or contracts. State and territory governments have greatest control over the process of reviewing and updating standards set by their own departments, but less influence over standards set by Austroads or Standards Australia.

2.3. Use outcome-based standards to accelerate innovation and identify which standards should be updated

Outcome-based standards should be used more frequently, alongside prescriptive standards, to foster innovations in design and process – while still achieving desired safety, quality or consistency outcomes. Outcome-based standards encourage technical and process standards to be challenged, when a better alternative is available.

The Victorian Infrastructure Delivery Authority's initiative EcologiQ – and their associated Recycled First Policy – has proven that setting outcome-based standards alongside a process for reviewing and updating internal prescriptive standards can boost innovations and productivity in infrastructure delivery.



Case study: Outcome based standards to accelerate innovation

Project: Project Beacon, Level Crossing Removal Project
Location: Melbourne

Summary

- Project Beacon was a competition run by the Level Crossing Removal Project (LXRP) North Western Project Alliance, designed to develop and approve innovative and sustainable products for LXRP projects.
- The project challenged industry and suppliers to develop new products, with the desired outcome of new products being made of recycled materials with lower embodied carbon than existing products.

Outcomes

- The creation of a 'Recycled First Precinct' at Keon Parade LXRP.
- Approval of five new recycled products for ongoing use across Metro Trains Melbourne network – all of which significantly reduce waste and or carbon.
- Project outcomes and innovations have been shared widely with industry.

How it worked

- Project Beacon was initiated by the LXRP Joint Coordination Committee, which directed a new Strategic Blueprint for implementing the 'Five Greats' across the LXRP Alliance Framework. The new Blueprint allocated a Strategic Theme to each LXRP Alliance, who would implement an industry changing initiative aligned with that theme.
- North Western Project Alliance was allocated the 'Sustainability' theme and was asked to develop an industry changing beacon-project for best practice. The 'Project Beacon' solution of a Recycled First Competition was developed in partnership with EcologiQ, Metro Trains Melbourne, Urban Design Advisory Panel and Darebin City Council to help deliver innovative sustainable use products in LXRP projects.

2.4. Retain project Intellectual Property and share with industry to realise the maximum benefit of innovations

Contract models or bid cost contribution policies should incentivise innovation. Intellectual property should then be retained by government and shared back with industry. This will advance the adoption of modern technology, designs and processes by industry and boost productivity.

Major Road Projects Victoria (MRPV) has led the way in terms of sharing innovation, allowing projects and teams to learn from each other. The Level Crossing Removal Project (LXRP) has a similar approach – but if you are not part of delivering LXRP you do not get access to innovations. Sharing innovations with the rest of the industry would improve efficiency and productivity more generally.

2.5. Optimise the design review process to expedite the design process and optimise designs

The design review process should be optimised based on a set of best-practice principles. Design review has become overly burdensome and inefficient, adding unnecessary time and cost to major projects.

For example, a major transport project in Victoria received more than 100,000 comments during design review. To reduce time and costs, each jurisdiction should develop an approach based on the following principles:

1. Engage with and brief stakeholders early
2. Limit reviewers to only those necessary, with a maximum of one reviewer per discipline across the project
3. Review the need for standard waivers early in the project lifecycle
4. Clearly define a list of artefacts required for each design submission
5. Establish a scope for reviewer's comments and audit comments early to ensure in scope
6. Set a review duration – of a reasonable timeframe
7. Define comment categories and triage
8. Establish an escalation process for issues that cannot be resolved between designer and reviewer
9. Where possible, use digital tools to expedite design reviews

These principles and approach align with ACA and Consult Australia's report, Partnership for change: multiple design reviews, which estimates that streamlining the process could reduce cost by 2.5 per cent excluding detailed design.

Once design review is complete and endorsed any further design changes should be subject to rigorous change management processes. This should include appropriate sign-off to avoid preferential optimisation of design that can impact time for delivery without delivering corresponding value saving.

3. Recommendations for boosting productivity in construction

Construction is where the rubber hits the road, where plans and models are transformed into the physical infrastructure that communities use every day. It is also where inefficiencies can become most visible and costly. Delays during construction not only inflate budgets and undermine public trust, but they also ripple through the entire sector reducing capacity and stalling follow-on projects.

This chapter focuses on practical actions needed to support more efficient, inclusive, and resilient construction practices. Boosting productivity in construction is not just about speed, it's about making smarter choices, fostering a better culture, and delivering infrastructure that's built to last. A productive construction sector is one that is empowered, diverse, inclusive and innovative.

3.1. Invest in modern methods of construction to increase efficiencies in construction

Investment in modern methods of construction should be led by industry and suppliers to boost productivity in construction. Growing Australia's modern methods of construction capabilities should continue to be supported through financial incentives from government, such as in Future Made in Australia. As detailed earlier in the report, national harmonisation of product standards will further leverage investments in modern methods of construction.

Modern methods of construction include off-site construction, prefabrication, modular construction, advanced technologies and design for manufacturing and assembly. These methods are known to increase the speed and efficiency of construction while also improving quality and provision and reducing waste and costs.

Case study: Modern methods of construction

Project: Metro West

Location: Sydney

Summary

- Sydney Metro West established a dedicated precast facility at Eastern Creek to manufacture over 70,000 concrete tunnel-lining segments.[10]
- The project involved two 11 km twin tunnels between The Bays and Sydney Olympic Park, delivered using Tunnel Boring Machines (TBMs).

Outcomes

- Accelerated construction timelines and reduced on-site labour requirements.
- Improved precision and durability, with tunnel segments designed to last up to 120 years.
- Minimised material waste and environmental impact, with over 31,000 tonnes of excavated spoil recycled on-site.
- Supported continuous TBM operations, reducing the risk of delay.
- Boosted local employment and manufacturing in Western Sydney.

How it worked

- Segments were manufactured in a large 24/7 precast yard using laser-cut moulds for millimetre-level accuracy.
- Facility included parallel production sheds to match TBM pace, with secure storage and logistics coordination.
- Pre-fabrication ensured quality control in a controlled environment, reducing safety risks on-site.

[10] Sydney Metro. 2025. Precast Facilities

3.2. Create flexible working arrangements to increase workforce capacity and diversity

Where possible, enabling flexible working arrangements in construction will boost diversity and inclusion, which is known to address workforce shortages and increase productivity. Construction typically has rigid and long work hours and weeks, which is now being recognised as a key barrier to increasing workforce satisfaction, diversity and productivity.

This should be led by industry and governments can play a supporting role by incentivising contractors to pilot new flexible working arrangements designed to attract and retain a more diverse workforce, as well as boost wellbeing and job satisfaction of the existing workforce.

There is now a range of government and industry initiatives across Australia being developed, or already implemented, to address the matrix of wellbeing, diversity and productivity in construction.

This includes but is not limited to:

- The Culture Standard, Construction Industry Culture Taskforce
- The National Construction Strategy, Commonwealth Government
- Flex from the start, John Holland Group
- MyTime, Seymour White Constructions
- Mental Health Strategy, Fulton Hogan
- Wellbeing conversations, Laing O'Rourke

Case study: Flexible working arrangements

Initiative: Flex from the start, John Holland
Location: NSW

Summary

- John Holland's 'Flex from the Start' initiative, funded by the NSW Government's Women in Construction Industry Innovation Program, trialled flexible working options on projects like the M7-M12 Integration project to break down employment barriers and promote diversity and inclusion in the construction industry.

How it worked

- One of the largest barriers for women joining the construction industry is the hours of work, traditionally 6:45am start time.
- The 'Late Start' program was implemented as part of the initiative, which saw 11 women from diverse backgrounds graduate from a four-week paid training program that prepares them for an apprenticeship in civil construction.
- This initiative introduces a second rostered pre-start of 8:45am – complementing the standard 6:45am session – meaning women, other parents and carers, and those with varying morning commitments can now pursue a career in construction.

Case study: Flexible working arrangements

Initiative: MyTime, Seymour Whyte Constructions
Location: National

Summary

- Seymour Whyte introduced MyTime – a pilot initiative launched at the Mulgoa Road Upgrade Project.
- MyTime pioneers flexibility, wellbeing, and inclusivity for a sustainable workforce and industry success.

How it worked

- The initiative centres on creating MyTime Plans, tailored to the individual needs of each team member. These plans promote flexible schedules to accommodate personal priorities such as fitness, childcare, professional development, and community involvement.
- The initiative began with a workshop designed to educate employees about the importance of work-life balance and the benefits of flexibility.
- The team collaborated to establish ground rules for how flexible arrangements could be implemented, with each participant developing a personalised plan that is prominently displayed on the worksite.
- This ensures that flexibility is discussed and actively practised daily. Regular reviews allow the team to adjust these plans as needed, ensuring they remain responsive to the changing needs of employees.
- Workers have expressed high satisfaction with management's support for flexible work practices.

3.3. Minimise severe disruptions to labour productivity to avoid critical path delays

Stronger regulation and compliance is needed to ensure labour productivity is not severely disrupted during construction of major transport infrastructure. Recent revelations of violence, intimidation and coercion on public infrastructure work sites requires a more proactive approach.

To achieve this, we need to treat major transport infrastructure projects as we do other critical infrastructure. That means workers should be required to complete a detailed integrity check and companies should have their shareholding evaluated to ensure their owners are not tied to criminality.

Currently, company checks are limited to those required under the Corporations Act, which includes basic requirements such as maintaining accurate financial records and lodging annual returns with ASIC. There are existing processes around conducting more stringent individual and company checks on nationally significant projects – these need to be extended to major transport infrastructure projects.

It is essential that we have an industrial relations environment that is productive and provides certainty of time and cost. We know from other industries that this is not incompatible with fair remuneration and conditions. This is particularly critical in the transport infrastructure sector, which delivers public assets funded by the taxpayer.

Roads Australia is aware of one example where the direct cost of just one day of industrial action was $5 million, with indirect costs being an additional $6 million. We know that on some major projects, the cost escalation of these delays and the poor working environment is up to 30 per cent.

Severe disruptions to labour productivity on construction sites affects productivity and value for money, as well as people's safety and wellbeing – which in turn affects the industry's ability to attract and retain staff. We must re-set expectations about acceptable behaviour on construction sites and establish a zero-tolerance culture for violence and intimidation. Safety and inclusivity must be at the heart of this reset.

3.4. Empower and incentivise Construction Administrators to enable quick decision-making on-site

Contract administrators should be empowered to make quick decisions when things go wrong on-site and incentivised to ensure the timely completion of a project. This will require cultural and structural change within client procurement teams.

Industry reports there is often a lack of clarity around who is accountable for client decisions when things go wrong on-site. Contract Administrators are required to go up through a chain of command to receive a decision. This process is both indirect and opaque for construction contractors and is often lengthy in which time costs escalate quickly.

Clients should consider incentives that encourage Construction Administrators and procurement teams to collaborate with contractors to make efficient decisions that help projects run on schedule.

Conclusionary remarks

Australia's transport infrastructure sector stands at a critical juncture. With mounting fiscal pressures and a decade-long decline in construction productivity, there is an urgent need to shift how projects are procured, designed, and delivered.

This report has identified practical reforms across procurement processes, design development, and construction practices that can help governments and industry work more efficiently and more collaboratively.

Many of the time and cost pressures facing the sector stem from processes that are within our collective control. By tackling these head-on we can create a more resilient, innovative, and efficient infrastructure delivery system.

Roads Australia will continue to act as a bridge between industry and government, facilitating dialogue, sharing innovation, and advocating for evidence-based reform. This report is not the final word, it is a starting point for coordinated action.

Through ongoing engagement, policy development, and implementation support, we can unlock the productivity potential of Australia's infrastructure sector to deliver better outcomes for the community, economy, and environment.

Image sources

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