Comment – Mr Gerard de Valence

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This submission does not address the request for information for every reform direction, nor every element of each request. It focuses on five of the 12 reform directions, with responses to those elements of the requests for information addressed given under a sub-heading.

Submission to the Queensland Productivity Commission

Response to the Interim Report's request for information

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Construction Economics Research

Introduction

There are many issues that affect productivity. Some are long-term, such as innovation, R&D, and education and training systems. Others are structural, like the number of micro and small firms, or institutional, like state based occupational licensing and building codes. However, for Australian industry by far the most important factor in low productivity growth is the lack of business investment in intellectual and physical capital, the amount of machinery, equipment, buildings, structures, software and R&D, and the skills of the workforce.

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The reform directions and requests for information addressed in this submission, and the topics discussed, are:

- Reform direction 1 - Project selection and sequencing
  - Project Selection and Reference Class Forecasting
  - Project Sequencing
  - Industry Capacity

- Reform direction 2 - Queensland government procurement policy
  - Project Sizing and Access
  - Additions to the Pre-Qualification System

- Reform direction 4 - Improving tendering and contracting
  - Adoption of Digital Technologies
  - Collaborative Contracting and Risk Allocation
  - Bundling of Projects
  - Management Capabilities
  - Target Cost Contracts

- Reform direction 5 - Planning and development approval processes
  - Alternative Development Assessment Pathway
  - Pre-Approved Housing Designs

- Request for information – Modern methods of construction
  - Lack of Information as a Barrier to Uptake of MMC
  - Regulation and the NCC
  - MMC Certification

Reform direction 1: Governance and oversight of infrastructure decisions

Request for information - Project selection and sequencing

Project Selection and Reference Class Forecasting

A significant reason for poor decisions on projects is unwarranted optimism about outcomes and the time needed to complete tasks. Planners underestimate project time, costs, risks due to size, gestation and time taken to deliver, and overestimate the benefits. In some cases there is strategic misrepresentation of costs and benefits, where project promoters produce biased appraisals at the approvals stage. After a

project has started there are the risks of escalated commitment and lock-in, scope changes, and conflicting interests.

Project selection and decision-making can be improved by using the performance of previous projects to inform those decisions. Clients collecting and using data from previous projects in the evaluation and definition stages of new projects makes for better decisions. Bent Flyvbjerg[1] proposed a system called Reference Class Forecasting that has three steps:

1. Identification of a relevant reference class of past, similar projects;
2. Establishing a probability distribution for the reference class;
3. Comparing the specific project with the reference class distribution.

Reference Class Forecasting allows project time and cost estimates to be compared and evaluated against previous similar project outcomes and performance. The data on comparable completed projects provides a range of probable outcomes for a proposed project, with realistic and more accurate time and cost estimates for major projects.

Another example is Independent Project Analysis (IPA), established by Charles Merrow in 1987 for industries like oil and gas, petroleum, minerals and metals, chemicals, power, LNG and pipelines. Depending on the project, between 2,000 and 5,000 data points are collected over the initiation, development and delivery stages. From the IPA database companies can compare their project with other, similar projects, across a wide range of performance indicators. Merrow argues defining and planning a major project should cost 5% of the total, and the cost of not spending that money is much more. Merrow's projects are mostly private sector resource developments like oil and gas projects, and he notes they have different dynamics to public sector projects.

[1] See Flyvbjerg, B., Bruzelius, N. and Rothengatter, W. 2003. *Megaprojects and Risk: An Anatomy of Ambition*, Cambridge, Cambridge University Press. A more recent and less academic book is Bent Flyvbjerg and Dan Gardner, 2023. *How Big Things Get Done: The Surprising factors Behind Every Successful Project, From Home Renovations to Space Exploration*. New York, Currency Press. From that book, in Flyvbjerg's database of 16,000 projects 91.5% go over time and budget. The risk of a project going disastrously wrong (not 10%, but 100% or 400% or more over budget) is surprisingly high.

Project Sequencing

Merrow also argues the best form of project delivery is what he calls 'mixed': hiring engineering design contractors on a reimbursable contract and construction contractors on a separate fixed price contract. The evidence from the IPA database is that this is the most effective form of project organization, and is basically traditional construction procurement where consultants are appointed to do the design and a competitive tender is held for one or more contractors to execute the works on site against a complete design.[2]

Unbundling design and construction for major projects has a number of advantages. Breaking a project into smaller, sequential contracts spreads the cost out over time, and does not incur interest costs on finance for design work. It makes quality control easier and more effective, by being focused on each stage, an important risk management tool. Completion of design and documentation before tendering significantly reduces contractor risk and therefore total project cost.

Design and construction of major projects should be contracted separately to spread the cost over time and reduce project costs and risks. As far as possible, design and documentation should be complete or nearly complete before tendering. The success or failure of the great majority of projects is determined during definition, planning and development.

Industry Capacity

There are significant capacity constraints in construction, as the experience of cost increases and schedule slippage with major projects in Australia shows. Industry capacity is the limit on production, a theoretical maximum of what can be produced in a single period. In some cases this is straightforward, based on the installed capacity of

[2] Merrow. E.W. 2011. *Industrial Megaprojects: Concepts, Strategies and Practices for Success*, Hoboken, N.J.: Wiley. Second ed. 2024.

machinery, plant and equipment, adjusted for the utilization rate and maintenance requirements, that produce a set amount day after day, week after week. Construction is not like this, it is geographically dispersed and brings together many suppliers at many sites. Shipbuilding for example brings together many suppliers at a few sites, automobile manufacturing has a small number of specialist suppliers, often co-located.

Separating design and construction allows sequencing of major projects. As the design work is completed a project can be added to a pipeline of projects and released for tender when conditions are appropriate, or when other projects are approaching completion. Suppliers and contractors can use the pipeline of projects to build capacity in the knowledge that there will be ongoing opportunities for their staff and equipment, reducing the set-up costs incurred by re-establishing project teams.

Construction is much more labour intensive than industries it is typically compared to such as manufacturing or mining. This makes the number of people employed one of the key constraints on construction industry capacity. As well as a pipeline of work, developing industry capacity is a long-term strategy based on providing training and skills, improving management practices, and support for SMEs.

Construction industry capacity and productivity will be improved by increased investment in the capital stock. Traditional policy instruments to increase investment are tax incentives like instant write-offs, accelerated depreciation, and financial incentives like production subsidies, grants and loan guarantees.

Business investment can also be promoted by development of industry technology strategies, revising public procurement methods, and advanced market commitments for products like prefabricated buildings and services like digital twins. Industry investment in physical and intellectual assets is essential for building capacity and upgrading technology.

Reform direction 2: Pre-qualification

Request for information - Queensland government procurement policy

Project Sizing and Access

Competition can be limited for major construction projects, for several reasons: procurement costs can be excessive; high technical complexity is sometimes an important factor; and for contractors outside the first tier access to finance for large projects can be difficult. Projects can benefit from economies of scale and scope, but large contracts restrict competition if potential bidders are constrained by technical skills and other resources.

Therefore, dividing a large project into a number of smaller contracts is an important policy decision. Having the design complete before tendering facilitates the division of a large project into sub-projects, for example a road or highway project can be done as stages that link up on completion. This creates opportunities for local contractors, particularly in regional areas. Increased competition for work contains costs as well.

Where possible, a major project should be broken into sub-projects to reduce barriers to entry for tenderers, create opportunities for local contractors and suppliers, and increase competition. This can also reduce project costs by removing a layer of management on projects where a large contractor wins the work then subcontracts it out to smaller local contractors, but charges a project management fee.

Additions to the Pre-Qualification System

Ther are two potential additions to the pre-qualification system the QPC could investigate. The first is the NSW ICIRT system[3] for assessing contractor and consultant capability and performance. There is good evidence of the effectiveness of the system in NSW in improving building quality and addressing the problems of building defects

[3] https://www.icirt.com/about.html

and phoenixing by developers and contractors.[4] The second is the 10 year latent defects insurance scheme for residential building that has also started in NSW.

Developed by Equifax, a credit rating firm, ICIRT ratings are based on a relative risk ranking. Getting a rating is voluntary, as is making it publicly available once acquired. Businesses are assessed relative to others that share the same role (i.e. builders are compared with builders) and size (i.e. small firms with small firms) and a Development Risk Index compares a business to the industry average. These ratings are based on six criteria:

- *Character:* the business, its directors and key persons, the holding company, related parties, shareholders and owners;
- *Capability:* the tenure and trading history of the business and officeholders experience, licences and qualifications, the track record on previous projects and insurance and claims history;
- *Conduct:* includes the commercial history, court judgments and litigation, industrial disputes, tribunal decisions, payments to employees and subcontractors, and any regulatory intervention;
- *Capacity:* the project pipeline and capacity to meet commitments, business solvency and ongoing sustainability;
- *Capital:* capitalisation and funding sources, access to funding and borrowing capacity; and
- *Counterparties:* the exposure of the business to related parties in the supply chain and capacity to withstand disruptions.

Decennial liability insurance (DLI) is an insurance product that enables owners corporations to have a serious defect fixed up to ten years after an apartment building is first occupied. With DLI the work is done without litigation to establish fault, removing a major barrier for owners corporations.

[4] https://www.nsw.gov.au/departments-and-agencies/building-commission/building-and-construction-resources/research-on-serious-building-defects-nsw-strata-communities

DLI increases involvement of insurers in the design and construction of projects as they take an active role in monitoring projects through technical inspections, site investigations or due diligence. Regular, independent technical inspections are the basis of DLI.

Reform direction 4: Improving tendering and contracting

Request for information – Improving tendering and contracting

Adoption of Digital Technologies

BIM mandates are important because the use of BIM unlocks the potential of digital construction and affects all suppliers of materials, products and services. The ISO 19650 standards for BIM and digital twins provide a framework for creating, managing and sharing data on built assets, establishing consensus on what is to be done and how. There is evidence from surveys that BIM increases efficiency, reduces rework, and improves productivity and workload capacity.[5]

The Queensland Department of State Development and Infrastructure has had a BIM mandate for public projects over $50 million since 2019. The QPC should assess the costs and benefits of the BIM mandate, or ask the Department for their assessment, publish the results, and recommend the retention and/or extension of the mandate.

The experience of overseas jurisdictions with BIM mandates is that BIM use increases over time. The UK is a good example.[6] There has been a significant increase in the use of BIM in the UK since 2011 when a BIM mandate for public construction was introduced. In 2018 a BIM Framework based on ISO 19650 provided a roadmap for firms and clients, and the government developed clauses in construction contracts covering contentious

[5] https://damassets.autodesk.net/content/dam/autodesk/www/industry/aec/bim/aec-bim-study-smart-market-synopsis-ebook-en.pdf

[6] https://medium.com/specter-automation-insights/bim-adoption-case-study-the-uk-bim-mandate-dece65c7e4

issues such as intellectual property and data ownership. The UK is now a leading user of BIM, along with other early movers with BIM mandates like Singapore and Norway.

In the UK BIM maturity levels are defined as:

- No BIM: Information generated manually by hand;
- Level 0: 2D Computer-Aided Design (CAD) and no or minimal collaboration;
- Level 1: 2D CAD for documentation and 3D CAD for specific elements;
- Level 2: Collaborative 3D CAD models with a Common Data Environment, this is required for UK public projects;
- Level 3: Shared 3D cloud-based model of the project, with the team working collaboratively in real-time.

Industry has a collective action problem because the cost of adopting a new technology is significant and skills are typically in short supply. Firms will invest in BIM if they believe that they will profit by it, but legitimately fear future technical progress could make today's investments unprofitable as change makes today's technologies obsolete. Paradoxically, when innovation and technological progress is rapid, uncertainty can hold back investment by firms because there may be a better, cheaper technology available tomorrow. Why invest today if there will be a competing technology that is half the price in a few years' time?

Therefore, BIM mandates from government and private sector clients are needed to promote BIM use. For small and medium size firms the initial software and training costs are a barrier to adopting BIM. There should be grants and subsidies to provide financial support to get SMEs to level 2 BIM, with a limit of 50% of these costs.

Collaborative Contracting and Risk Allocation

Contractual relationships are more tactics than strategy, and cannot address any fundamental weaknesses in the client's management of the project. While risk can be managed by contracts, it cannot magically be made to disappear. An important point on

final costs is that a fixed price contract for a project is a floor, not a ceiling. Contractors will allow for the extra risk a poorly documented tender involves, and have a range of contractual provisions available to make claims and cover cost increases during delivery.

Simple or standardised projects are low risk with minimal technical requirements. These commodity-type projects have well-known structural features and components, their design and location do not present any particular challenges and the construction methods and project management requirements are not exceptional in any way. Examples are car parks and some industrial and commercial buildings. These projects can be accurately estimated, precisely documented and have little uncertainty about what is to be produced and how it is to be done, and should be awarded through competitive tendering on a fixed-price contract.

Complicated and complex projects are challenging, each in its own specific way, because of the many characteristics that can cause complexity, such as design, materials, technology, location or site issues, logistics, non-traditional project organisation, or significant coordination and integration issues. Complicated projects require significant development and will benefit from early contractor involvement or have to be well documented before tendering.

Complex projects require more collaborative implementation with early involvement by designers, contractors and suppliers. These have significant uncertainty about their final form, and should be awarded through negotiation with some form of cost-plus or incentive contract.[7] It may also be advantageous to look for innovative ideas or design options, so for these projects an incremental approach allows contractors and suppliers the opportunity for input during the development of the design.

[7] Bajari, P. and Tadelis, S. 2006. Incentives and award procedures: Competitive tendering versus negotiations in procurement, in Dimitri, N., Piga, G. and Spagnolo, G. (Eds.) *Handbook of Procurement*, Cambridge UK: Cambridge University Press, 121-139.

Traditional forms of project organisation and procurement are designed for delivering well documented commodity projects and making repetitive decisions in a stable, predictable environment. By contrast, complicated and complex projects are not fully documented and have significant uncertainty about their final form, and should be awarded through negotiation with a qualified supplier on some form of cost-plus or incentive contract. What will be an appropriate procurement strategy for a simple project will be inappropriate for more complicated or complex projects.

Bundling of Projects

Bundling of projects into a series of similar buildings is particularly important for prefabricated and modular buildings, because this provides the continuity of work needed to make factory production viable.

If framework agreements, serial tenders or multiple projects are involved the arguments for relational forms of contracting become more relevant.

Management Capabilities

The public sector should invest in the development of internal capabilities as a client of the construction industry, with the aim of reducing reliance on consultants. Client teams are responsible for project shaping and definition, a necessary prerequisite for creating value. Importantly, they need not and should not be responsible for construction project management, which is the contractor's role.

The Australian Major Projects Leadership Academy (AMPLA) was established to build public sector project capability by the Office of Projects Victoria in collaboration with Stanford University's Centre for Professional Development and management consultants McKinsey & Co. After five years of the program there are 200 graduates across the states and territories. The QPC could consider recommending a cohort of Queensland managers for this or similar programs such as the Queensland University

of Technology Executive MBA on Strategic Procurement for Olympics and other government projects.

Target Cost Contracts

A target cost contract (TCC) is an incentive-based procurement strategy that rewards a contractor for savings, using an agreement on cost with an incentive fee. The three components of a TCC are the design, with reimbursable cost with an agreed margin, a lump sum amount as an incentive for the contractor to reduce construction cost below the agreed estimate, and a compensation mechanism for major design changes (not design evolution).

Under a TCC, the actual cost of completing the project is compared to an agreed target cost. If the actual cost exceeds the target cost, some of the cost overrun will be borne by the contractor, known as the 'painshare', and the rest by the client following an agreed formula. Conversely, if the actual cost is lower than the target cost, then the contractor will share the savings with the client, known as the 'gainshare'. This painshare/gainshare mechanism is intended to align the interests of contractors and clients, and is the distinguishing feature of these contracts.

Claims under a TCC can be difficult to manage if there are changes in the target cost. These can be cost reductions due to contractor input (through design revisions for example) and cost increases due to client design changes. The challenge is to preserve the incentives while resolving disagreements about the extent and effect of target cost changes.

While incentives might be an effective way to reduce cost, improve project delivery and increase productivity on major projects, the actual operation of the painshare/gainshare mechanism is not straightforward. The sharing formula can vary from simple to complex systems of benefit and risk sharing, and can involve more than one supplier.

Because the agreement and the painshare/gainshare mechanism is between the client and the contractor and typically does not include designers, subcontractors and other suppliers. This is a weakness in these contracts, as the contractor can attempt to shift risks down the supply chain to maximise their profit.

Rather than the client sharing the gain from improved performance, this share could be used to provide an incentive through the supply chain, and thus allow subcontractors and suppliers to benefit as an incentive to increase their productivity.

Target cost contracts can be used to provide incentives to reduce cost, improve project delivery and increase productivity on major projects. However, significant investment in planning, estimating, and preparing detailed designs is required. The potential of BIM and digital twins to improve project design documents is a factor. With the digitisation of design there are more opportunities for target costing and performance-based contracts.

Reform direction 5 - Planning and development approval processes

Request for information - Planning and development approval processes

Alternative Development Assessment Pathways

The QPC recommends an alternative development pathway for significant developments. The Productivity Commission suggested states should consider establishing coordination bodies to speed up the process and address delays, and gave as an example the Queensland State Assessment and Referral Agency. In the Interim report the agency got two mentions but no discussion, and the QPC could investigate the effectiveness and performance of the agency.

There are other examples that could be considered. The QPC does not refer to the NSW Housing Development Authority, established in January 2025 to approve State Significant Developments and rezonings. By August it had approved 187 projects with over 70,000 dwellings.

Pre-Approved Housing Designs

NSW has introduced a Pattern Book of six low and mid-rise housing designs with a 10 day approval pathway. Victoria has a Single Home Code for deemed-to-satisfy houses that need no further approvals, following the Townhouse and Low-Rise Code introduced earlier in 2025. The applicability of these approaches to Queensland could be investigated.

Request for information – Modern methods of construction

Barriers to MMC that have resulted from market or regulatory failures.

Lack of Information as a Barrier to Uptake of MMC

A major barrier to use of MMC is lack of information about the productivity of MMC and the performance of prefabricated and modular buildings. There are too many unsubstantiated claims about the time and cost of MMC, however the QBuild MMC program has produced over 500 houses. The QPC should use the opportunity to report data from QBuild on MMC productivity, costs and time performance.

The QPC could also get feedback from occupants on the build quality and liveability of their houses, and from users Queensland's many modular or prefabricated public buildings like schools and hospitals. If the QPC was to decide not to collect this information, it could outsource the research or recommend the government commission the research.

Regulation and the NCC

The interim report notes 'significant regulatory hurdles that are preventing more common use of MMC' and argues for 'regulatory neutrality.' The QPC could draw on the

section on Queensland in the Building 4.0 CRC *Project 21* report[8], which found a regulatory gap in the integration of off-site construction with on-site construction. The report discusses the problems building certifiers and inspectors have, as they are unlikely to know what to do or how to deal with the risk variables for off-site construction, because of the lack of standards in the NCC.

Standards and codes establish allowable tolerances and how much variation is allowed for products and processes. They underpin quality control and are the basis of inspections to verify work being done, so a standard is a document structured around requirements for conformity and measures that certify meeting those requirements. Multiple standards can be combined to make them easier to manage.

MMC Certification

There is no industry quality assurance accreditation system for Australian modular and prefabricated buildings. A certification scheme is needed for MMC producers both to encourage use of MMC and to ensure product quality for clients. The QPC could investigate and potentially recommend a certification system for Queensland.[9]

In the UK the Buildoffsite Property Assurance Scheme (BOPAS) was developed to address the risks associated with MMC. It provides firms independent third party accreditation to industry standards and allows access to mortgage financing and insurance for MMC projects. The scheme was developed by MMC industry association Buildoffsite with insurance companies and finance industry associations input, and started in 2013. More recently the Cast Consultancy introduced a Certified by Cast scheme for MMC producers.

[8] Building 4.0 CRC, 2025, *Project 21: Regulatory Reform For Industrialised Construction Final Report*.

[9] The Australian Building Codes Board includes an international review of certification schemes in their issues paper https://www.abcb.gov.au/news/2025/consultation-open-national-voluntary-certification-scheme-manufacturers-modern-methods-construction