Avoiding harm or creating benefit? How a risk focus sidelines social considerations in early decisions for Australian infrastructure projects

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Abstract

There is a growing need to maximise the social benefits achieved from public investment in infrastructure, particularly with the transition to net zero economies. Infrastructure projects around the world contractually define roles and responsibilities for project partners via Project Delivery Models (PDMs). PDMs can underpin social benefit realisation, but the processes used to select them are largely opaque. This paper explores how social considerations inform PDM selection and how this is facilitated by policy. We interviewed senior procurement professionals about how social benefits and risks are considered, and analysed auditing guidance documents to examine how the regulatory environment supports social considerations. We found that decisions are based on risk minimisation rather than benefit creation, but social risks are inadequately considered. This situation is linked to an entrenched gap in social expertise and inadequate information handover between different teams over project lifecycles, often resulting in an operational disconnect between project phases. This 'compartmentalisation' presents challenges for inclusion and transparency in decision-making. Current auditing processes provide little incentive for social benefit consideration and reinforce a risk focus. We offer important insights into this early project stage and distil five recommendations for improving social benefit creation from infrastructure investments, particularly in developed economies.

Keywords

Community Engagement; Project Delivery Model; Public Policy; Social Benefit; Social Risk; Infrastructure

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1. Introduction

Infrastructure projects aim to fulfill societies' fundamental needs, including transport, health and education, water and sanitation, energy and telecommunications, and are also critical to climate adaptation and the transition to net zero (Davis et al. 2018). The historically public nature of much of this investment also drives a growing focus on delivering better outcomes for people and place (Bice 2024; Raiden et al. 2018; Dobson et al. 2020; Infrastructure Australia 2022). Despite this context, community backlash, project delay (Bice et al. 2019) and cancellation (e.g. Harris et al. 2003; De Martinis and Moyan 2017) indicate that these large investments do not necessarily meet community needs or create commensurate social benefit. However, there is little information available about how key early decisions are made that underpin project outcomes. One such key decision area is the Project Delivery Model (PDM) which determines how responsibilities and risks will be shared and embedded in contractual arrangements. There is a lack of information about whether and how social benefits and risks are considered in PDM selection (Martinsuo et al. 2019), and also whether and how these social considerations are encouraged through policy approaches or approvals requirements (Laursen and Svejvig 2016). This paper aims to address this gap by exploring PDMs as an internationally common and major early decision-making point.

The concept of social benefit or value has existed for decades but is loosely defined given it is socially constructed and context dependent (Raiden et al. 2018). The UK government refers to social value as the net impact that a policy, organisation or project has on the wellbeing of people in society (Fujiwara et al. 2021). In Australia, social benefit is more nascent, with policy attention burgeoning in recent years, illustrated for example by the 2024 Green Building Council's framework for measuring social value in the built environment (Hassell and GBCA 2024). The contextual nature of social benefit and the associated lack of measurable social indicators (Morrison-Saunders et al. 2015) have been cited as reasons for their poor representation in sustainable procurement practices and governance internationally, (Hueskes et al. 2017; Montalbán-Domingo et al. 2021) and are important considerations for impact assessment.

Social benefit creation is a long-standing principle in major project delivery, visible in government rhetoric concerning project investments (Ninan et al. 2022), the values underpinning social impact assessment (SIA) to support project approvals/delivery (Vanclay 2024) and in growing concerns for First Nations Peoples and vulnerable groups (O'Faircheallaigh 2023). The steps necessary to achieve social benefits through major project investment and delivery are well documented. Decades of socially focused impact assessment literature, for example, distil the principles (Vanclay 2024), ethics (Baines et al. 2013) and approaches that can mitigate social harms and improve social benefits. Practices

including community-led assessments (Bice 2020), benefit-sharing agreements (O'Faircheallaigh 2009; Vanclay 2020) and free, prior and informed consent (Hanna and Vanclay 2013) all demonstrate ways to create social benefits in tandem with project delivery. Related community engagement practices (Bice et al. 2019), participatory planning (Legacy 2023) and collaborative governance approaches (Ansell et al. 2020) offer further insights into social benefit creation. We argue, however, that the full potential for socially focused practices and assessments to advance social benefit has not yet been systematically realised in major project delivery, despite these important tools, guidelines and practices.

Most international standards and financial institutions encourage benefit-sharing in all projects although this is not always clearly stated or mandated (Vanclay 2024). Government regulation and policy is key to the uptake of best practice in social benefit creation. For example, social impact assessment (SIA) that can deliver socially sustainable and equitable outcomes is inconsistently mandated in legislation and infrastructure planning processes, even in established democracies (Mottee 2022). Australia offers a relevant example of this situation, which is common internationally. In Australia, no single jurisdiction has comprehensively translated international SIA principles and guidelines into statutory provisions (Parsons et al. 2019). Instead, state or territory-based Gateway Review processes are the primary quality assurance process governing major Australian infrastructure projects, and so provide a key mechanism by which social benefit can be created. Gateway reviews are required for projects valued at AU$30 million or more, and for programs with estimated values of over AU$50 million that are delivered by non-corporate Commonwealth entities, such as state departments or parliamentary departments. The reviews are mandated by the state/territory's relevant finance and treasury portfolios and provide assurance for optimal project delivery or advice for improvement or correction (Department of Finance 2023). Aside from achieving the government's strategic objectives through major projects (NSW Treasury 2017; VIC Treasury and Finance, 2019), these reviews are designed to ensure that investments achieve value for money (QLD Treasury 2013). The scope of the Gateway Review process over all key phases of the project lifecycle mean they have the potential to support social benefit creation by stipulating social factors be considered in key decisions on project delivery such as selection of the PDM .

In this paper we contribute a novel and helpful perspective on the internationally important and complex issue of social benefit creation from major infrastructure project investment. We unpack the factors that influence decision-making in the early phase of infrastructure project development by focusing on the selection of PDM to consider how improved social benefit creation through major projects might be possible. Our research questions test a theoretical framework for best-practice decision-making, specifically: 1) How and to what extent do social considerations inform the selection of PDMs?; 2) What types of evidence and

expertise are drawn upon in PDM selection?; 3) How inclusive and transparent are the processes of PDM selection?; and 4) What, if any, requirements exist in auditing processes, for proponents to consider social benefit creation in their procurement decisions?

The paper proceeds by defining key terms and briefly outlining the significance of investment in the infrastructure sector to contextualise our empirical study. Section 3 reviews both the public policy and impact assessment discourses to ground our theoretical frame regarding the key factors that support best practice decision-making in infrastructure to enable social benefit creation. Section 4 explains our study design, and Section 5 reports on the key findings related to the research questions. We discuss how our insights can improve understanding of how key decision-making processes such as PDM selection can create social benefit and conclude with five evidence-based recommendations to enrich policy and practice.

2. Background to the infrastructure sector

Infrastructure investment is at an all-time high world-wide. An estimated US$79 trillion is currently invested globally, with a further US$15 trillion investment gap to meet world-wide needs to 2040 (Global Infrastructure Hub 2024). Australia exemplifies the current infrastructure environment in Western developed economies with a record, five-year public infrastructure commitment recently valued at more than AU$218 billion (Infrastructure Australia 2023). Consideration of social benefit creation in major infrastructure is becoming more pressing with the shift to private investment and consequent public–private sector arrangements including the use of market mechanisms, such as contracting out and application of the 'user pays' principle (Makin 2003). In low- and middle-income countries, the World Bank estimates 67% of investment in infrastructure in 2023 came from private sources representing an 18% increase from 2022 (Saha et al. 2023), while in the EU there is emphasis on accelerating investment in infrastructure by moblising public and private sector finance (European investment Bank 2021). In Australia, projects are regularly financed and delivered with the private sector. For example, Public-Private Partnerships (PPPs) account for 10-15% of all major projects delivered in Australia each year (Infrastructure Partnerships Australia 2023b). This means that governments delivering infrastructure need to decide how they will procure services from the private sector, and how they will effectively collaborate across public and private concerns, including sharing and allocating risk.

The delivery of public infrastructure projects by the private sector around the world requires legal agreements or contracts between the proponent/client/owner and the contractor who carries out the work (Loots and Charrett 2022). These agreements can encompass design, construction and operation of infrastructure and result in different contractual manifestations or models (e.g. design and

construct, public-private partnerships, etc). Models vary according to which elements of a project are conducted by the private sector and how risks are shared or transferred. For example, Public-Private Partnerships typically transfer risk to the private sector while Alliances share delivery risks (Department of Infrastructure and Regional Development 2008). The terminology that describes how the public and private sectors work together is inconsistent and includes terms such as "contract strategy', 'procurement system' and 'project delivery system' (Awuzie and McDermott 2016; Engebø et al. 2020; Molenaar 2010). Here we adopt the term 'Project Delivery Model' (or 'method') - PDM. As defined by Engebø (2020, p.278), PDMs are 'a system for organizing and financing design, construction, operations and maintenance activities that facilitates the delivery of a good or service'. While there will be different legal requirements for PDMs across jurisdictions, the need to select a particular model by which risks are shared and benefits created is a regular consideration of major projects internationally. The issues identified here from the Australian context are therefore worth consideration in major infrastructure projects around the world.

Work to date suggests the PDM can greatly influence project cost and efficiency, as well as the delivery of social benefit (Awuzie and McDermott 2016; Hosseini et al. 2016). The type of PDM can, for example, influence the degree of communication and collaboration among project partners, thereby affecting inter-organisational relationships and successful social benefit implementation (Awuzie and McDermott 2016). In Australia, federal guidelines state that PDM choice should balance project cost and risk against achieving project outcomes (Department of Infrastructure and Regional Development 2008). An international review of PDM selection methods for infrastructure projects (Hosseini et al. 2016) indicates the criteria used fall into three categories: project characteristics (e.g., timing, cost, innovation); owner characteristics (e.g., willingness to take on risk); and external environment (e.g., market feasibility, regulatory feasibility, etc). The methods themselves rely on digital analytical approaches like multivariate analysis, analytical hierarchy processes, etc. (Hosseini et al. 2016). With the possible exception of innovation, none of the PDM selection criteria relate to social benefit creation. At the same time, the analytical methods are likely to disadvantage consideration of social risk and benefit, given they are often hard to quantify and measure (Hueskes et al. 2017; Montalbán-Domingo et al. 2021).

3. Theoretical frame: Best practice decision-making

3.1 Use of evidence

There is an extensive literature on the factors underpinning robust decision-making, particularly in the public sector. One common demand is for evidence-informed policy—in contrast to evidence-based policy—which recognises that decisions take account of evidence, professional judgements, stakeholder interests and political contexts (Head 2013). When considering what constitutes evidence in the public sector, certain work suggests there is a privileging of statistical data, policy evaluation, economic modelling, and expert knowledge while lay knowledge or information from public engagement is considered less important (Maddison and Denniss 2013). In the context of infrastructure development, the planning and business case stages rely heavily on engineering expertise to 'solve problems' and economic analyses to assess benefits (Mottee 2022). Beyond documented instances of infrastructure investment decisions for political advantage (e.g. De Martinis and Moyan 2017), subsequent decisions on the nature of project design and delivery appear to incorporate a combination of fact-based engineering and ad-hoc judgments based on previous experience (Engebø et al. 2020; Hosseini et al. 2016; Willumsen et al. 2019). The limited available information currently suggests that both experience and empirical evidence inform early decision-making in infrastructure development, with social expertise playing a more minor role (Hosseini et al. 2016; Mottee et al. 2020).

3.2 Inclusivity and transparency

Inclusivity and transparency are the other common and related principles for best practice decision-making in public policy (Dryzek 2012) and private investment in infrastructure (Ruggie 2011). Normative goals in democratic decision-making are founded on representative inclusion of communities or citizens (Rowe et al. 2004). Inclusive processes are seen as necessary to avoid rejection of the process and its outputs by people who are affected but ignored (Schroeter et al. 2016). Implicit within this idea of inclusion is that it comes with the capacity to influence decisions (IAP2 2015) or risk being tokenistic. There should be room for those involved to be able to question the underlying assumptions of the policy or investment but also the participation process itself (Stilgoe et al. 2013). Inclusive processes that allow different actors to work together are also the foundation for establishing common ground and building trusting relationships (Burdett 2024). In the infrastructure sector, inclusive practice may build relationships both among project partners and with communities.

Acceptance of decisions arising from inclusive processes also requires transparency to understand how and why decisions were made (Morrison-

Saunders et al. 2023). In infrastructure, transparency and accountability can help address the political nature of public investment decisions (De Martinis and Moyan 2017). Emerging evidence suggests, however, that democratic principles are not always a neat fit within the private sector. For example, in their analysis of value creation through risk management Willumsen et al. (2019) describe how risks may be deliberately hidden by consultants to win a tender and create strategic benefit. Transparency was not the norm, rather it was benchmarked against creating value for personal, project, strategic or organisational outcomes. The question this raises is whether lack of transparency by private entities involved in public infrastructure delivery is compatible with social benefit creation?

3.3 The need for community engagement

Finally, community engagement or public participation is the mechanism by which to achieve inclusion and underpins best practice decision-making in the public sector (Burdett 2024). Involving communities in decision-making is not a formal requirement for social impact assessment but it is a strong expectation and a requirement of all international financial institutions (Vanclay and Hanna 2019). Engagement with community and stakeholders is multi-purposive (André et al. 2006) but in the early stages of infrastructure projects holds the promise of enabling project proponents to identify and minimise social risk while optimising social benefit. Engagement also enables businesses to assess their human rights impacts accurately by understanding the concerns of those affected by infrastructure developments (Ruggie 2011). In practice, engagement may be avoided when procurers view it as expensive, risky or unimportant (Fitton and Moncaster 2022; Mottee 2022). There is also an issue around when engagement occurs. For example, involvement of stakeholders is not a part of Australian contracting and procurement guidelines (Department of Infrastructure and Regional Development 2008, 2015) where it is assumed that stakeholder needs and risks have been identified during business case development. Standards for excellence in infrastructure engagement (Bice and Jones 2022) recognise the importance of internal engagement within large project teams in addition to externally facing community engagement. Internal communication across different teams and contractors promotes alignment and organisational buy-in which is important for major projects with extended life cycles (Awuzie and McDermott 2016; Willumsen et al. 2019.)

4. Methods

Our approach used multiple, reinforcing methods to generate a comprehensive understanding of PDMs in major Australian infrastructure projects, especially as they relate to decision-making. This involved targeted, in-depth expert interviews, a policy analysis of the major project approvals processes (i.e., Gateway Reviews)

and iterative refinement with our 'Standards Working Group', comprised of members of our research team and industry experts with whom we regularly tested and refined our findings and interpretations. Interviews were appropriate to explore PDM selection given our interest in how decisions were made—qualitative and exploratory considerations—and the paucity of documented guidance. In contrast, the policy environment has detailed written guidance documents in the form of Gateway Review workbooks that our industry collaborators confirmed are the key regulatory levers by which projects are assessed and proceed.

4.1 Interviews with senior procurement professionals

Pilot interviews with infrastructure delivery teams on how contract development and management can support positive social and project outcomes indicated early decisions about the type of procurement model and engagement responsibilities are important. However, delivery teams generally lacked awareness as to how those decisions had been made. In Australia, this knowledge sits with specialised senior professionals who often sit in executive positions in the public or private sector. Our target cohort was by definition, therefore, a small group so we adopted expert sampling as a purposive method (Etikan et al. 2016). We relied on the 25+ years' sector experience of our research institute's Industry Director—a specialised role that connects our research work directly to industry—to identify and contact participants. Snowballing with these first order contacts then yielded two extra participants. Our final sample included eight men and one woman who generally had at least 20 years' experience in infrastructure delivery across Australia and sometime overseas. They were experienced in delivering a variety of infrastructure from transport to utilities and were working in a range of advisory, executive and management roles for government and private agencies.

Nine individual, in-depth interviews of 43-69 minutes duration were conducted in a semi-structured format by the lead author. This format allowed the interviewer to change question sequence according to responses and ask follow-up questions to significant replies. All interviews were conducted online and were recorded and transcribed. De-identified quotes are tagged PPROC01-09 in the results. Data collection took place between August and November 2022. The interview guide was informed by both our literature review and the engagement practitioner expertise of our Industry director. Practitioner experience identified three key aspects of early decision-making for focus: a) how was the project delivery model chosen; b) how was risk allocated (closely linked to previous) and c) how was community engagement prioritised in contracts. We applied a mixed deductive and inductive approach to data collection and analysis (Elo and Kyngäs 2008). Deductive from our literature review that identified use of best available evidence, inclusivity and transparency of decision processes to support optimal outcomes. Inductive by asking open questions to potentially reveal unpredicted themes and drivers and coding emergent themes. For example, open question 'In your experience how are decisions about procurement model generally made?' versus

a theory-based prompt ‘What types of information are drawn upon to make decisions about procurement model?’.

We applied qualitative content analysis (Schreier 2012) using QSR International's NVivo 12 Pro Software to analyse interview transcripts. This approach allowed us to condense the data while identifying the key themes within the dataset. An iterative approach was used to develop the coding frame starting initially with the key themes in the interview guide. We started by coding two of the transcripts while noting any relevant emergent ideas that could constitute new nodes. We then updated the coding frame and applied this final framework to all the transcripts.

4.2 Documentary analysis Gateway Reviews

We focussed on 19 Gateway Review workbooks from three of Australia’s eight states and territories, which represent the majority of Australia’s current major infrastructure commitment (Infrastructure Partnerships Australia 2023a): seven from New South Wales (NSW Treasury, 2017), six from Queensland (QLD Treasury 2013), and six from Victoria (VIC Treasury & Finance 2019). Each workbook covers a specific stage of infrastructure projects that vary slightly from state to state. The workbooks guide the work of reviewers as they assess the readiness of projects to proceed to the next stage of development. Other states, such as South Australia, have similar processes, but these three jurisdictions were chosen because they had the largest infrastructure investment (notably road and rail related expenditure) in recent years (BITRE 2023).

For the interpretive analysis of how social value and community needs are supported through quality assurance, we searched the workbooks for the proxy words: ‘impact, ‘stakeholder’, ‘mitigation’, ‘risk’, ‘community’, and ‘engagement’ using QSR International's NVivo 12 Pro Software. These words were chosen based on the likelihood that their use could include contexts involving social issues and community concerns in project delivery that may induce engagement activities. These references were then interpreted as to whether community engagement was included, omitted, or latent in the documents. Community engagement was considered included when it was explicitly referenced in a way that required reviewers to probe it. For example, ‘...continue community engagement throughout the project to monitor the community's experiences of social impacts and respond as necessary’. Community engagement was considered to have been omitted with references that could have included community engagement but did not, for example, when ‘stakeholder engagement’ only refers to project owners and end-users or when ‘risk’ only refers to business or operational risks. Latent references to community engagement occurred when proxy words were used in a way that did not explicitly refer to community engagement but were used in a way that could suggest it. For example, when stakeholder engagement referred to ‘internal and external stakeholders’ or when community engagement was optional, such as ‘engagement with stakeholders’. This suggests that the inclusion

of communities in engagement is at the discretion of the reviewer. There were 862 references relevant to the analysis. There were instances when proxy words appeared several times in the same sentence or paragraph while referring to the same concept or phenomenon. In such cases, multiple words were only interpreted once in the analysis.

5. Results

5.1 Selection of Project Delivery Model: Description of process

The interviews demonstrated that while details vary among state jurisdictions, the considerations and steps for project initiation and selection of PDMs are broadly similar. Specifically, after the need for a piece of infrastructure is identified, a business case is developed involving the gathering of a wide range of data with a focus on economic analyses. If the project is approved, a different group of people do detailed procurement and delivery planning. Complex projects may be split into different 'packages' that are delivered in a particular sequence through separate contractual arrangements and potentially different PDMs. A recent change in these processes linked to the uptick in infrastructure investments has seen an increased emphasis on market sounding: *'Ten years ago the economy was such that it was a buyer's market. The industry was not busy. Today, the industry is flooded with work. It's a contractor's market*' [PPROC03]. In other words, proponents regularly have conversations with prospective contractors as early as the business case stage to understand what degree of risk contractors are willing to take on '*we now look at the contract model as to what will give us the best value for the client and the contractor and also to increase market participation'* [PPROC06]. Unreasonable risk allocation can result in low market participation (i.e., few bids) which is undesirable for the proponent.

Interview responses suggest, therefore, that the earliest conversations about contractual arrangements with potential project partners are focussed on risk management and sharing, not on social benefit creation (Table 1). In addition, within the context of risk management discussions, technical risks are prioritised over social risks. Some interviewees reflected that this may relate to challenges around evaluating social risks in an environment that focuses on quantitative risk evaluation, as well as around the question of whether governments can effectively outsource risk management on the project components the private sector delivers. Unlike the risks that are emphasised, such as geotechnical or financial risk, it appears difficult for governments to 'pass on' reputational risks associated with community backlash. In these instances, '*One way or another, government is always going to wear the risk'* [PPROC01]. While a contractor may be carrying out works, the government as decision-maker is held responsible for things going

wrong. In sum the process of PDM selection is focused on how to share risks, but because social risks are difficult to measure and outsource, they tend to be sidelined.

5.2 Use of evidence in selection of Project Delivery Models

The inability to pass on certain social risks is not the only factor minimising their consideration in PDM selection. The selective use of evidence described by interviewees is also a likely factor. There are generally two major steps involved in PDM selection, the first involving a group of people who identify and prioritise risks to the project. This step was often described as being aided by some form of multi-criteria analysis: '*As far as decision making goes it really is a big assessment matrix. What're the criteria, the different options, and for the most part, big workshops'* [PPROC04]. The criteria for model selection are weighted and ranked with low-ranking criteria having little to no influence on decisions about appropriate PDM. Despite the use of semi-quantitative methods like MCA during infrastructure procurement, our experts still felt that the choice of PDM was strongly influenced by the previous experience of key individuals (Table 1). In the second step the recommended model(s) may then require sign off at executive or ministerial level (depending on size of project/jurisdiction) '*They'll recommend but the decision will take into account the governance that's appropriate. Whether that's project director, executive, authority, the minister, whatever'* [PPROC04].

***Table* 1**: *Summary of interview results regarding how social considerations inform the selection of Project Delivery Models. Source: Authors.*

CHARACTERISTICS OF BEST PRACTICE DECISION-MAKING	RESULTS	INDICATIVE QUOTES
CONSIDERATION OF BEST AVAILABLE EVIDENCE UNDERPINS EXCELLENCE IN DECISION-MAKING	Social considerations do not generally drive PDM selection. There is a high reliance on prior experience in PDM selection. PDM selection privileges a narrow range of expertise that excludes social expertise.	'*There are some circumstances where I've seen it* [social considerations] *as still there but not one of the key assessment criteria*.' [PPROC04] '*90% of the time it's prior experience.*' [PPROC01] '*My experience is it* [range of expertise] *tends to be reasonably narrow, weighted more towards commercial and legal people and probably some project director kind of input.*' [PPROC02]
INCLUSIVE PROCESSES ARE THE FOUNDATION FOR PROFESSIONAL RELATIONSHIPS, THEY BUILD TRUST AND BUY-IN TO PROJECTS	Compartmentalisation of projects means delivery teams (including engagement professionals) are not generally involved in planning processes and decisions. Contractors are included early in conversations about risk via market sounding, but social experts are generally excluded.	'*…what sometimes happen is business case gets finished, wrap it up, team disbands, business case gets approved, new team comes along and off they go. You lose so much knowledge from the business case to the delivery*' [PPROC08]. '*Unless it's blindingly obvious that stakeholder and community engagement has to be a central piece to delivery, it would often be relegated into some kind of secondary consideration, if it would appear at all in market soundings*.' [PPROC02].
TRANSPARENCY IN DECISION-MAKING BUILDS UNDERSTANDING AND TRUST AMONG PROJECT PARTNERS AND WITH THE COMMUNITY	Key project stages like the business case are well documented. Voluminous documentation impacts accessibility of information, particularly in the context of staff turnover and project compartmentalisation. Transparency and trust suffer when decision-making is politicised.	'*We're overrun with documentation at every level. Part of that speaks to our aversion to risk*' [PPROC01]. '*You need to have a transition through the development into the delivery to make sure that the right information is in the possession of the delivery people so that they understand why they're doing what they're doing. So, knowledge transfer is a key issue*' [PPROC03]. '*Often things are announced before they've been fully defined and understood for political reasons. The consequence of that is best practice isn't always achieved*' [PPROC01].

So, the first stage of PDM selection draws on evidence but in practice is influenced by the 'prior experience' of those involved. Prior experience was equated with seniority and when we probed about who 'senior people' were, the responses did not include people with community engagement or social impact experience: '*there's project management people, design people, commercial, legal… But senior people*.' [PPROC08]. The most mentioned 'experts' were financial advisors, legal experts and engineers. Even when social risks are identified for projects, they

tend to get a low weighting, meaning they are not considered in detail and do not drive model selection: '*you can't assess against all 20* [risk criteria] *or you'll never get there'* [PPROC04]. It is difficult to assess whether the omission of social risks accurately reflects their significance or is a by-product of the lack of community and social expertise drawn upon in these processes.

Our data suggests, therefore, that use of evidence in selecting PDMs is selective rather than rigorous and privileges particular types of expertise: '*I think the only thing that's consistent is that it's not consistent. The difficulty is developing a really objective analysis to determine what the delivery model should be'* [PPROC02]. Knowledge of local communities or social impact is given low weighting because the knowledge-holders in those roles/disciplines do not generally hold senior positions and are therefore usually excluded from these conversations and decision-making processes. The focus on risk also means that rather than communities being considered as infrastructure beneficiaries or knowledge holders they, themselves, are framed as a source of risk.

5.3 Inclusivity of the PDM selection process

The type of people who have a say in key decision-making is not only significant in terms of what types of evidence and experience are drawn upon, it also has implications for how trust, relationships and buy-in are built among partner agencies and with communities who are the intended beneficiaries of projects. The interviews highlighted that inclusive decision-making is fundamentally compromised because projects are highly fragmented and compartmentalised. What we refer to here as 'project compartmentalisation' or the splitting of projects into different phases from inception and planning, through construction to operation and closure, is a standard feature of infrastructure projects. It is reflected in the structure of the Gateway Reviews where the auditing 'gates' represent the completion of these different phases. What this compartmentalisation means in practice is that different cohorts of people come and go over the project lifecycle, particularly between planning/design phases and delivery/construction (Table 1). This means that the people who deliver projects (including engagement and impact assessment professionals) may not be known at the planning stage and so are unable to be involved in early decision-making. Even in situations where proponents do community engagement in-house, engagement professionals are not directly involved in PDM selection: '*So, we don't have* [engagement lead] *sitting at the procurement table, but we have some very, very experienced project delivery folk in that procurement team*' [PPROC07]. Community engagement teams may be consulted for input on social criteria for the multi-criteria assessment process, but they are not present in the discussions to lend weight to the importance of those criteria. These results suggest that the compartmentalisation of large infrastructure projects and possibly an under-valuing of social and community expertise, mean those who work with

communities on project delivery are generally excluded from early decision-making, including PDM selection.

5.4 Transparency and communication in relation to the PDM selection process

Processes such as business case development are generally well documented, marking a positive aspect of transparency in the early stages of major infrastructure projects – particularly if those documents are in the public domain. However, this bulk of documentation was identified as a barrier in time-constrained environments where voluminous documents are essentially inaccessible to delivery teams (Table 1). Project compartmentalisation and associated staff turnover can negatively impact transparency and communication when the reasons for key decisions are lost over long projects. Transparency is also compromised through the politicisation of decision-making with flow on effects for project quality and therefore efficient delivery of social benefit (Table 1). Our findings indicate, therefore, that communication of the foundations of PDM selection is often inadequate in the face of project compartmentalisation, which, when combined with politicised decision-making, can lead to loss of transparency in PDM decision-making.

5.5 Documentary analysis of auditing documents: Omission of community needs and social benefit

Turning now to the documentary analysis of the Gateway review documents, a notable finding from the analysis of the Gateway Reviews was that the term 'community engagement' was not explicitly referenced in any of the nineteen workbooks. Instead, there was a clear focus on outcomes, specifically: successful project delivery and completion (New South Wales); cost efficiency (Queensland); and program or project success (Victoria). This is consistent with the policy framework of Gateway Reviews that is focused more on successful project delivery than on the quality of processes by which this delivery is achieved, including community engagement. Aside from finding no explicit inclusion of community engagement, there were also 563 instances among the nineteen workbooks where community engagement was potentially relevant to project delivery but was omitted (Figure 1).

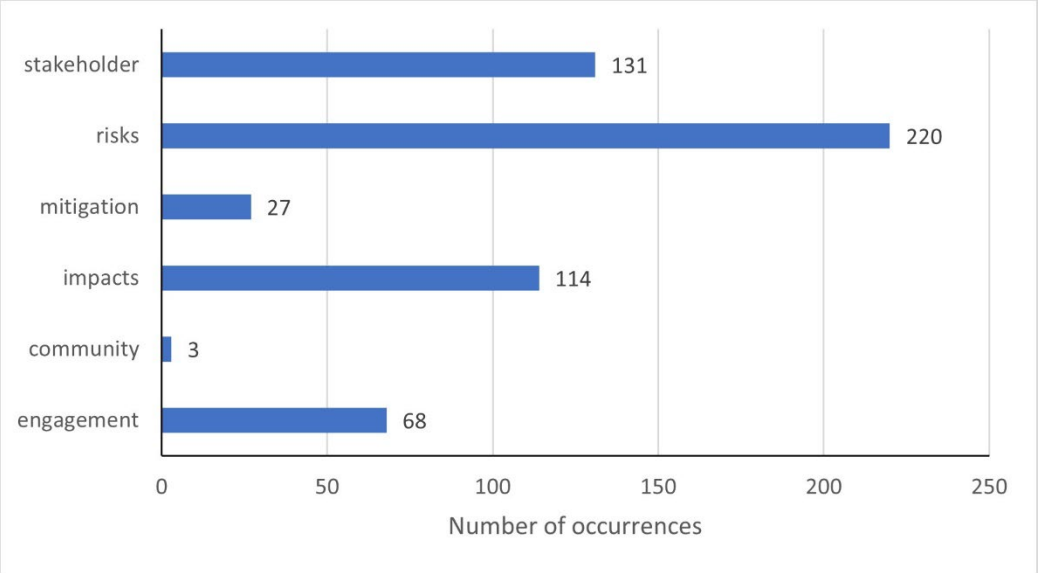

***Figure 1**: Frequency of proxy words for community engagement in Gateway Review workbooks.*

Among the proxies used for analysis, the word 'risk' had the greatest number, making up nearly half of the total for all proxies (Figure 1). Omitted opportunities for community engagement are illustrated in our discussion of examples of how 'risk' is used in the workbooks. In the NSW workbook for Gate 2 Business Case, for instance, specific stakeholders were identified when considering risks: 'Demonstrated consideration of issues and risks pertaining to the asset manager, operator and end users' (Infrastructure NSW 2021, p. 27). Risk considerations were limited to groups that were deemed important for the business case. This is confirmed with questions on risk management that specifically identify regulatory, legislative, and commercial risks (Infrastructure NSW 2021, p. 34), but not social risks that could affect community members, apart from end users.

Similarly, the Queensland workbook for Gate 2 Business Case narrowly considers risks in a business, commercial, or financial sense. For example, reviewers are asked to probe if risks involved in the procurement procedure have been evaluated, with examples given being 'impact on timeframes and bid cost for suppliers' (QLD Treasury, 2020, p. 6). Business Case reviewers are also asked to probe risks related to the 'whole-life value for money' of the project. However, this is narrowly framed as 'sensitivities and financial implications of handling major risks and assessment of their effect on project return' (QLD Treasury 2020, p. 9). There is little to suggest that these risks are considered in a broader social sense. There is potential for social considerations with questions about stakeholder support and endorsement of the project (QLD Treasury 2020, p. 10), but the overall context is presented in business terms, for instance, key stakeholders' support for project funding, which would likely limit the notion of stakeholders to investors, suppliers, or end-users.

In Victoria, the same pattern of prioritising commercial considerations continues. For Gate 1, Concept and Feasibility, reviewers ensure that the preliminary business case has a clear problem and benefits, adequate strategic options, and a preferred indicative solution. Risks associated with implementing the indicative solution include strategic, political and/or reputational, environmental, and legislative risks (VIC Treasury and Finance 2019). While those risks could overlap with social risks and so warrant community engagement, further probing indicates that Gate 1 is focussed on the financial impact of these risks. On the indicative solution, reviewers are asked to assess if the risk register identifies risks both to the procurement process and to the business if an appropriate solution is not available. In sum, the main policy instrument to promote social considerations in major infrastructure delivery does not specify the need for community engagement while risks are predominantly framed in financial terms.

5.6 Documentary analysis of auditing documents: Latent references to community needs and social benefits

Our analysis of latent references in the workbooks identifies where there is potential for social considerations. The documentary analysis identified 299 latent references to community engagement. The majority of these (243 out of 299) were in the early stages of the project lifecycle, an opportune period for incorporating social benefits in project delivery. These latent references to community engagement are further illustrated below in how 'stakeholder' and 'risk' are used in certain Gateway Review process workbooks. In NSW, for example, while the main purpose of the review is to ensure the timely and cost-efficient delivery of the project, there are texts that could be interpreted broadly to accommodate community engagement. From the early stages of the project, the NSW Gateway Review supports the main purpose of the review by ensuring that 'economic and social impacts have been considered, and stakeholder groups have been engaged in developing the optimum solution to address the service need or problem' (Infrastructure NSW 2024). In this case, social impacts and engagement with stakeholder groups are used in a general sense such that reviewers could include community engagement in the review.

In Victoria's Gate 1: Concept and Feasibility, reviewers are prompted to investigate if the list of key stakeholders allowed for the inclusion of community members. Early on, reviewers are required to investigate if the preliminary business case identified stakeholders (which could include community stakeholders) and their needs, and if they were supportive of the project (VIC Treasury and Finance 2019, p. 10). In both the NSW and Victorian guidance documents, community is considered latent in the way stakeholder engagement is used, such that community engagement could be a discretionary practice.

For the Queensland Government's Gate 0: Strategic Assessment, reviewers are required to probe if major risks were identified in the early stages of planning the

program. These were identified as strategic, political or reputational, and legislative risks (QLD Treasury 2020, p. 12). Political or reputational risks could include community concerns that may require engagement between project owners or contractors and concerned community members. Further, the context in which these risks were specified is not confined to business purposes. Overall, our analysis of the Gateway Review process workbooks showed minimal requirements to consider social benefit creation or formalise requirements for community engagement. At best, they are suggestive of social considerations or the discretionary inclusion of communities in stakeholder engagement.

6. Discussion

With regard to our first research question, the interview data suggests social considerations rarely inform the selection of PDMs. One of the key reasons social benefits, in particular, are not considered relates to the focus of PDMs on sharing and managing risks (Makin, 2003; Department of Infrastructure and Regional Development 2008), rather than on creating social benefit. While it can be argued that the ultimate rationale of public-private arrangements is value for money (European Investment Bank 2021), this should encompass social benefit creation. Centring social benefit creation in early project decision-making aligns with government commitments (Infrastructure Australia 2022) and guards against backlash from impacted communities who perceive little benefit from projects (Liu et al. 2018). Creating social benefit from public infrastructure, particularly in the context or private financing of projects, also aligns with international best practice guidance, such as the OECD guidelines for multinational enterprises (OECD 2023), which encourage positive contributions to economic, environmental, and social progress.

Our results show that not only are social benefits sidelined in early project decisions, but social risks are also inadequately considered. While social risks may be identified during the procurement process, they are generally given low weighting and are not rigorously assessed. These findings accord with those of the Hosseini et al. (2016) review of the international literature that illustrated social risks and values are omitted from selection criteria for PDMs. The authors also did not recommend their consideration, highlighting the ongoing issues for inclusion of social considerations in infrastructure decision-making. The current infrastructure auditing process in Australia is not equipped to address this shortfall. While risk is a focus in the Gateway Review workbooks, procurement risks are audited against evaluations based on timeframes and cost for suppliers rather than explicitly referencing social risk. This means that current decision-making with its focus on risk neither centres on social benefit creation nor rigorously considers social risks associated with major infrastructure delivery.

Social risk considerations have also been neglected when considering the sustainability of infrastructure projects. Inadequate consideration of social

sustainability has been linked to difficulties in formulating assessment criteria (Hueskes et al. 2017). When it comes to how projects are procured with the private sector in Australia however, a higher-level issue appears to be insufficient use of social expertise and data. In terms of our second research question, financial and technical expertise are privileged over social expertise in PDM selection. Selective rather than rigorous use of evidence in infrastructure projects is likely not confined to the Australian infrastructure sector (Engebø et al. 2020; Mottee 2022) but this bias or epistemic narrowing was hidden in our results by the framing of decision-makers as 'senior' and 'expert' by interviewees. This is similar to the findings of Willumsen et al. (2019) about risk management where evidence was side-lined in favour of 'gut-feel' based on seniority and experience. This rhetorical appeal to ethos rather than logos (credibility rather than logic) works against social scientists and community engagement professionals whose expertise is not commonly recognised by the sector and who do not generally hold senior positions. This lack of recognition is starkly illustrated by the exclusion of these occupations from a recent government assessment of Australia's infrastructure workforce capacity, in which 'community engagement' was not recognised as a role, despite the employment of thousands of these professionals in the sector (Infrastructure Australia 2021). It is hard to argue that social risks are less important than others when there is inadequate gathering and consideration of evidence about their potential impact on infrastructure projects.

There is also likely a gender bias that works against the consideration of social risk in Australian infrastructure procurement decisions. Engagement professionals are predominantly female but high-level decision-makers are generally male. This is reflected both in the gender mix of our senior industry interviewees (8:1 male:female) and gender equity data showing construction has the lowest proportion (15.4%) of women managers among all categories of Australian companies (Duncan et al. 2023). In other words, a nexus of evidence privileging, structural and historical barriers to promotion, and gender intersect to exclude social and community experts from early decisions in infrastructure projects. The significance of this evidence-privileging will likely vary with context and how fit-for-purpose the chosen delivery model is to community needs. For example, social dimensions and performance seem to be more important in Alliance contracts (Engebø et al. 2020) and so may make social benefit realisations and social risk management easier.

Auditing processes might be expected to address the expertise gap by requiring proponents to consider social benefit and community needs, as per our fourth research question. However, it appears one reason social benefit creation does not underpin PDM selection in Australia is that current auditing and quality assurance processes do not require it. Gateway reviewers are not required to investigate community engagement needs and practices of State-significant projects. Instead, the focus is on timely completion (Infrastructure NSW 2021, p. 7), preventing

unnecessary costs (QLD Treasury 2020, p. 3) or achieving business aims (VIC Treasury & Finance 2019). Our results also highlight that the current Australian policy environment is out of step with international guidelines for social benefit creation that specify they should 'drive, support, and promote responsible business practices' (OECD 2023, p.10).

It is also unclear whether the actual cost of community pushback is being adequately considered, even though this may be the precursor of project delay and cost blow-outs (De Martinis and Moyan, 2017; Bice et al. 2019;). Investigation of social considerations could also provide information about community willingness to pay to use new infrastructure, such as toll roads or more expensive electricity or water, with unwillingness to pay being shown to be a cause of project cancellation (Harris et al. 2003). Beyond a better capacity to identify and manage social risk, the lack of engagement requirements for auditing also means community needs and values may not be incorporated in the design of projects which can limit social benefit creation (Raiden et al. 2018; Fitton and Moncaster, 2022). Auditing through the Gateway Review, therefore, contributes to a narrow risk focus and provides little incentive for proponents to consider social value and community needs, creating a 'double whammy' for social benefit realisation.

While lack of transparency in decision-making is a well-described barrier for maintaining community trust (Morrison-Saunders et al. 2023), our work highlights that it can also limit social benefit realisation across project lifecycles. Poor transparency regarding project decisions like the type of PDM selected is driven less by concealing information for corporate advantage (e.g. Willumsen et al. 2019) and more by the simple logistics of regular staff turnover as each allotted project activity is completed. The breaking up of large infrastructure projects into phases like planning and delivery is a fundamental feature of the 'project lifecycle' and provides a broad template for contract design, for example 'design and construct' (Loots and Charrett 2022). In practice, this project compartmentalisation contributes to a loss of corporate knowledge and 'project narrative', particularly between planning/design phases and construction/delivery phases. This loss of narrative and communication across the project lifecycle is problematic given people with different responsibilities on projects believe discussing issues with each other is the main contributor to project success (Willumsen et al. 2019). Staff turnover between project stages also means social considerations that already have low priority can be de-prioritised at the delivery stage by teams that assume these matters have been 'covered' in the business case. Assuming benefit creation is being addressed in infrastructure projects may be valid in well-regulated and legislated contexts (Montalbán-Domingo et al. 2018) but it is problematic in Australia where the primary infrastructure auditing process does not require community input about their needs.

7. Conclusion

Our work highlights a mismatch between the stated aims of major public infrastructure investment in Australia to deliver social benefits for community and business, and the processes that determine and audit infrastructure delivery. Infrastructure delivery is currently focussed on risk which investors will always need to consider. At the same time, social risks—which can be precursors of project delay—are either ignored or downplayed due to entrenched evidence privileging. The compartmentalisation of major projects, which is also in part a legacy of government proponents wanting to share risk, means the rationale for early decisions is lost across the project lifecycle, creating inefficiencies at best and risking social benefit creation at worst. Even with a greater consideration of social risk, we maintain that a risk focus to the exclusion of social benefit creation in early infrastructure decision-making is problematic. Consideration of social benefit creation solely at the business case is unlikely to deliver the desired outcomes on its own given the current lack of social auditing in Gateway Review processes. We are unlikely to see a shift in emphasis from risk to benefit without regulatory frameworks such as Gateway Reviews also shifting to guide and enforce these practices.

There are several reasons to think the hurdles to social risk management and delivery of social benefit from infrastructure development occurring in Australia are playing out globally. The first is that PDM selection is a standard activity in public infrastructure projects involving the private sector around the world (Loots and Charrett 2022). Documented lack of social benefit delivery to project-affected communities globally (Vanclay 2024) and the lack of legislative and regulatory requirements related to social considerations are also global in nature (Bice and Fischer, 2020) even though the specific policy levers and social aspects, such as gendered roles in the sector may vary from country to country. In light of our findings, we recommend a number of actions that could improve the management of social risk and social benefit creation in major infrastructure projects:

1. Social benefit creation is explicitly considered and evaluated in trade-off to risk in PDM selection as well as in the business case;
2. Where absent, national guidelines be developed for social risk identification to inform PDM selection for major projects;
3. Support the inclusion of social impact and engagement experts in key decision-making at *all* project stages to promote consideration of these issues, increase capacity and encourage promotion of people with these skill sets;
4. Reduce project compartmentalisation or better manage transparency and communication between project stages through staffing consistency across the lifecycle;
5. In Australia, confer with social and community experts in the sector to update Gateway workbooks with requirements for appropriate

consideration of social benefit creation, social risk and community engagement to inform decisions.

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