

RISK ALLOCATION ON TRANSPORT MEGAPROJECTS: A CASE FOR AN INSTITUTIONAL THEORY LENS

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This paper explores institutional theory as a novel lens to examine the praxis of risk allocation on transport megaprojects. A case study of Australia's largest transport megaproject, Suburban Rail Loop Project, has been conducted using institutional theory to provide a better understanding of the dynamics and decision-making process in relation to risk allocation on megaprojects. The research findings identify how institutional instruments were used to shape the front-end of a transport megaproject and allocate risk. An example is the creation of a new and dedicated Minister for the Suburban Rail Loop Project, resulting in the approval powers to streamline and sometimes fast-track the decision-making processes. This paper contributes to the extant knowledge of megaproject management by providing a novel perspective on the praxis of risk allocation on transport megaprojects through the lens of institutional theory.

Keywords: front-end; institutional theory; risk allocation; transport megaprojects

INTRODUCTION

Australia, the geographical focus of this study, is currently experiencing a 'transport infrastructure boom' due to unprecedented transport infrastructure investment. In the 2020-21 Australian Commonwealth budget, a record \$110 billion has been committed to the land transport infrastructure program over the next ten years as part of 'Securing Australia's Recovery' (Commonwealth of Australia, 2020). Despite the Australian government's willingness to use transportation infrastructure as a stimulus tool, numerous projects have encountered significant cost overruns for the public and private sectors (Love *et al.*, 2020). According to a study published by the Grattan Institute, Australian governments have spent \$34 billion more on transportation infrastructure than expected over the last two decades (Terrill *et al.*, 2020). A damning response by the Australian Contractors Association in 2020 states that "the infrastructure industry is facing a crisis.

The way infrastructure is currently procured and delivered is not sustainable... The government's response to this - transferring even more risk to the private sector - is making the situation worse" (Davies and Laslett, 2020). Consequently, the construction sector now wants governments to be responsible for more risks that lead

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to some individual projects costing more than expected (Terrill *et al.*, 2021). In research conducted by Love *et al.* (2020), it is emphasised that State governments have a proclivity to adopt procurement approaches that allocate too much risk onto the contractors, and in turn, unforeseen costs are not included in their accepted bid. Thus, Love *et al.* (2020) go on to note that there is a growing perception that risks are 'deflected' onto tier-one contractors, which places an unreasonable financial burden on the sector. Ryan and Duffield (2017) found that while shifting more risks to the construction sector may appear to benefit the public sector in the short term, and it continues to harm the construction industry as projects grow larger and private sector losses become unsustainable.

A deeper examination of the systemic deficiencies associated with project management theories employed on megaprojects has identified that a growing corpus of academics is advocating for more novel and progressive approaches to megaproject management. Transport megaprojects are elaborate, complex, temporally backed sociotechnical undertakings embedded in institutional frameworks (Biesenthal *et al.*, 2018, Esposito *et al.*, 2021). Compared to traditional projects, organisational issues within megaprojects are significantly more complex (Li *et al.*, 2019). Therefore, they cannot be planned and executed in a predictable world where cause and effect are evident (Alfalla-Luque *et al.*, 2015). Thus, reliance on the application of technical project management principles fails to address the complex institutional and organisational pressures that need to be considered in megaproject management (Li *et al.*, 2019). Accordingly, it is becoming increasingly clear that the challenges encountered by these projects extend beyond technical concerns; they must also be viewed as sociotechnical endeavours rooted in complicated institutional frameworks (Biesenthal *et al.*, 2018).

A rising body of project management research emphasises the importance of moving beyond the application of traditional project management techniques and considering the broader institutional environment in which megaprojects are conceptualised and delivered (Biesenthal *et al.*, 2018; Dille and Söderlund, 2011; Matinheikki *et al.*, 2021; Morris and Geraldi, 2011). Accordingly, examining the praxis of risk allocation on transport megaprojects through the lens of institutional theory will help us understand how projects can build back wiser and more cost-effectively. This research seeks to answer the following question 'How can institutional theory provide a more holistic understanding of the praxis of risk allocation on transport megaprojects?' The exploratory nature of this research has been addressed through a critical literature review with a focus on the underpinning theoretical background. Insight into traditional project management theory is provided by examining the inherent limitations in its application to megaproject management. The literature review also examines institutional theory and highlights the benefits of this theory in megaproject management by responding to the institutional environment.

Traditional Project Management Theory

We live in an era of megaprojects, in which the ambition, scale, cost, and risk exposure of projects on a global scale have all expanded dramatically over time (Chapman, 2016). According to Flyvbjerg (2014, 9), megaprojects are "large-scale, complex ventures that typically cost USD 1 billion or more, take many years to build, involve multiple public and private stakeholders, are transformational, and impact millions of people". The performance of megaprojects has a long history of being problematic in terms of being delivered within budget and to schedule, with many

studies questioning whether they even deliver their intended benefits (Brookes, 2015; Terrill *et al.*, 2020).

Ahiaga-Dagbui *et al.* (2017, 88) offer insight into that "major infrastructure projects, particularly those funded by the public sector, routinely make news headlines, not for being remarkable engineering accomplishments that will support and stimulate economic growth and social integration of communities, but rather for being poorly managed and often over budget". Megaproject failure is not a new field of study, but it has not moved very far beyond this initial focus, with the idea that correcting structural flaws would increase the likelihood of future project success (Pelham-Bomar, 2019). Traditional project management theories tend to focus on the technical application while failing to adequately address the complex institutional environment in which they are shaped and delivered (Biesenthal *et al.*, 2018; Dille and Söderlund, 2011; Engwall, 2003).

Furthermore, project management research has frequently been criticised for handling projects in isolation and uniformly, with prominent researchers arguing that more imaginative and novel approaches to project management research are required (Biesenthal *et al.*, 2018; Engwall, 2003; Morris and Geraldi, 2011). Thus, there is a renewed focus on exploring more progressive and novel project management approaches to advance the body of knowledge in this area. Notably, the application of institutional theory is gaining interest in megaproject management research with recent publications seeking more innovative approaches to project management by exploring the institutional environment in which megaprojects are delivered (Biesenthal *et al.*, 2018; Dille and Söderlund, 2011; Esposito *et al.*, 2021). Engwall (2003) investigated the view that project management theories are intrinsically dominated by a singular perspective on projects, treating the unit of analysis as a lone entity. Consequently, this closed system thinking fails to consider the broader context in which projects are delivered. Morris and Geraldi (2011) have acknowledged project management theories in their research 'Managing the institutional context for projects' by taking a deeper examination of the first principles of project management. This investigation proposes that project management theory can be defined in three contexts:

1. Technical - Operational and delivery orientated
2. Strategic - Managing projects as holistic organisational entities, including their front-end development and definition with a focus on value and effectiveness
3. Institutional - The institutional level at which management is focused on fostering and supporting projects, both within the parent organisation and in the external environment

The key findings draw the project management community to consider the institutional level at which management is focused on fostering and supporting projects, both within the parent organisation and in the external environment. Thus, this philosophy argues that project management practices need to consider the external context in which projects are delivered (Morris and Geraldi, 2011).

Institutional Theory and Megaprojects

Institutional theory and analysis address the processes by which social structures, including both normative and behavioural systems, are established, become stable and undergo changes over time (Scott, 2012, 27). In essence, institutional theory

investigates the external influences that lead organisations to adopt specific organisational practices. According to Scott (2005), contemporary institutional theory has attracted the attention of a diverse spectrum of social science scholars and has been applied to systems ranging from micro interpersonal interactions to global macro frameworks. Tina Dacin *et al.* (2002, 45) notes that "institutional theory has risen to prominence as a popular and powerful explanation for both individual and organisational action. Institutional theory is predicated on the assumption that institutions are influenced by other organisations and is used to examine how institutions respond to external pressures". Thus, institutional theory examines the external influences that cause organisations to adopt organisational practices.

Institutional theory in organisation studies is sometimes referred to as neo-institutionalism or organisational institutionalism and is increasingly being used in research on project management (Matinheikki *et al.*, 2021). According to Meyer and Rowan (1977), institutional theory assumes that organisations are not rational production functions but rather seek social acceptance (i.e., legitimacy), and so their behaviour is influenced by socially built and frequently irrational institutions. Accordingly, institutions shape organisational behaviour because organisations must appear legitimate to a variety of referent audiences (e.g., clients, competitors, regulators, statutory authorities, non-governmental organisations, and the public) to succeed and survive (Matinheikki *et al.*, 2021).

According to Scott *et al.*, (2000), an organisational field consists of three constituents: (a) actors, which include both individuals and organisations, (b) institutional logics, which include the values and norms, ideas, beliefs, and meaning systems that guide actor behaviour, and (c) governance structures, which include the regulative and normative frameworks that exert control both within individual organisations and at the field level. Yang and Su (2014) propose that institutions are viewed as the repository for the 'rules of the game'. Thus, understanding the institutional environments enables firms to compete effectively in the market. Megaprojects are exposed to a dynamic and highly complex institutional environment that has the potential to impact a project's progress severely. According to Qiu *et al.* (2019, 425), "institutional complexity stems from both external environments (macro-level) and internal actors (micro-level environments), and consists of regulatory, political, and social complexity".

According to Biesenthal *et al.* (2018), institutional elements must be carefully managed in megaprojects due to their complexity, the multitude of their logic, and, on occasion, the dishonesty of its entrepreneurs. Furthermore, a clearer understanding of how different actors within megaprojects respond to institutional complexity is also needed. Qiu *et al.* (2019) suggests that actors within megaproject organisations choose different responses when faced with different types of institutional complexity. To this extent, Esposito (2021) argues that actors can utilise various institutional instruments that contribute to the growth of the megaproject (Table 1). Participants in megaprojects might employ these instruments to execute various types of institutional activity that help shape the front-end of a transport megaproject.

METHOD

A case study examination of Australia's largest transport megaproject, the Suburban Rail Loop (SRL) Project, has been completed. A case study approach was chosen because it allows for a deep, contextual investigation of institutional theory to support a narrative account of how this novel lens will provide insight into the praxis of risk

allocation. Case study research is especially applicable as it focuses on one aspect of a problem, the problems drawn will not be generalised, but related to one event (Naoum, 2003, 46). Gerring (2016) also notes that case study research is appropriate where an in-depth knowledge of an individual example is more useful than ephemeral and superficial knowledge about a larger number of examples.

Table 1: Institutional Instruments

Institutional Instrument(s)	Utility and Application
Defining	Through a defining process, actors can change the regulatory environments in which they operate and build new institutions. Defining can thus be viewed as an institutional process of "macro-shaping," in which non-business actors create demand, as well as the megaproject itself, by establishing the overarching policy framework, time frames, and available resources.
Embedding and Routinizing	Embedding and routinising is a type of institutional work in which actors intentionally infuse an institution into the participants' daily routines and organisational processes. Through the employment of agreements, actors' megaprojects can be integrated into national actors' day-to-day routines and organisational practices. These agreements are eventually utilised to set the working agendas of other megaproject actors.
Enabling	The focus of enabling work is on actors engaging with formal rules to enable, augment, and support institutions. This may include overriding local government planning powers to expedite planning approvals and fast-track construction works.
Policing	Policing is a type of institutional work employed to preserve and reproduce institutions in megaproject shaping. Compliance and enforcement through auditing and monitoring.
Disconnecting Rewards	This purposeful use of legal tools to derail megaprojects possesses significant shaping potential. Local communities within the vicinity of megaprojects may have the ability to influence and shape execution through support or overt opposition and resistance.

Informed by Esposito *et al.*, (2021).

This case study explores, using publicly available data, how a transport megaproject traversed the early stages of the institutional environment to inform the risk allocation process. This was accomplished by mapping the institutional environment and assessing the institutional logic and regulatory mechanisms that shaped the project's front-end. In response to the research question "how can institutional theory provide a more holistic understanding of the praxis of risk allocation on transport megaprojects" the following analysis has been completed: (a) examination of SRL's front-end timeline mapped against the institutional environment; (b) analysis of the regulatory framework to identify instruments used by project actors to inform the institutional environment; and (c) an assessment to determine how institutional shaping can inform the risk allocation process.

Case Study - Suburban Rail Loop Project

The Suburban Rail Loop is a city-shaping transport megaproject providing a polycentric solution to Melbourne's radial network that will transform travel around Melbourne. The 90 km rail line will link every major rail line from the Frankston line to the Werribee line via Melbourne Airport, better connecting Victorians to jobs, retail, education, health services and each other. Stage 1 of SRL (SRL East), Cheltenham to Box Hill includes the construction of six stations, one stabling yard and approximately 26 km of a twin-bore tunnel with a \$34 billion budget announced in the government's Business and Investment Case. SRL was chosen because it is Australia's largest transport megaproject. In addition, the scope of this project necessitates an ambitious start from initial concept, business and investment case development, design development, approvals, and construction delivery commencement. Furthermore, SRL is exposed to a rich environment of stakeholders and is being delivered in a diverse institutional setting.

Thus, effective front-end planning is critical as many projects fail because of the decisions made during the early stages of development (Beckers *et al.*, 2013). Responding to this environment at the front-end phase is essential in shaping the project and presents opportunities to inform the risk allocation decision-making

process. According to Locatelli (2018), ineffective risk allocation contributes to megaproject failure, noting that risks are frequently underestimated and assigned to parties lacking the necessary knowledge, resources, and capabilities to manage them effectively during project delivery. Consequently, SRL pursued regulatory mechanisms to ensure the project had sufficient power to traverse the institutional environment and inform the risk allocation decision-making process. Notably, in 2021 Parliament of Victoria passed the Suburban Rail Loop Bill 2021. This Bill facilitates the following (Bailey, 2021):

- Establishes a new statutory authority to develop and deliver the Suburban Rail Loop Project
- Makes several essential modifications to the Major Transport Projects Facilitation Act 2009 (Vic) and the Planning and Environment Act 1987 (Vic) to improve and streamline the planning and execution of current and future Victorian Government transportation projects.

FINDINGS

An analysis of front-end risk allocation and project shaping on the Suburban Rail Loop project revealed the following findings:

Complex Institutional Environment

Megaproject professionals (actors) must deal with a variety of institutional logic and drivers to achieve successful project coordination, including national laws, legal agreements with funding firms, municipal legislation, and company hierarchies (Esposito *et al.*, 2021). Figure 1 provides a visual mapping of Suburban Rail Loop Authority's (SRLA) key milestones and institutional environment characterised by competing political, regulatory, and social logic. It highlights the extensive regulatory environment comprised of municipal councils, accredited rail operators, asset owners and statutory bodies - all of which have approval mechanisms to cause potential project delays. As a result of this complex institutional setting, SRLA encountered conflicting logic among key stakeholders who opposed certain project planning decisions. For example, Kingston City Council opposed the Delta site location proposed to be used for a train stabling yard, instead expressing council and community expectations of the delivery of a long-awaited Chain of Parks².

Institutional Shaping Analysis

Esposito *et al.*, (2021) suggest that actors involved in megaprojects struggle to exert influence over final decision-making outcomes within administrative and legal processes. The research findings for this paper suggest that if a megaproject is proactive in macro-shaping the front-end to respond to institutional complexity, actors are well positioned to exert influence over the final decision-making outcomes. SRLA achieved this by recognising the inherent institutional complexity faced by the project and implementing institutional instruments to support effective decision-making. Morris and Geraldi (2011) highlight the importance of the two-way interaction between actors and their environment in shaping the enterprise's structure, designing processes, promoting its practices and behaviours, shaping policy and standards, and influencing stakeholders and decision-making with the objective of

² <https://www.kingston.vic.gov.au/council/news/latest-news/bold-vision-for-suburban-rail-loop-advanced-by-kingston>

improving project management practices. The key findings in Table 2 (below) highlight the prominent institutional instruments used during the front-end shaping process.

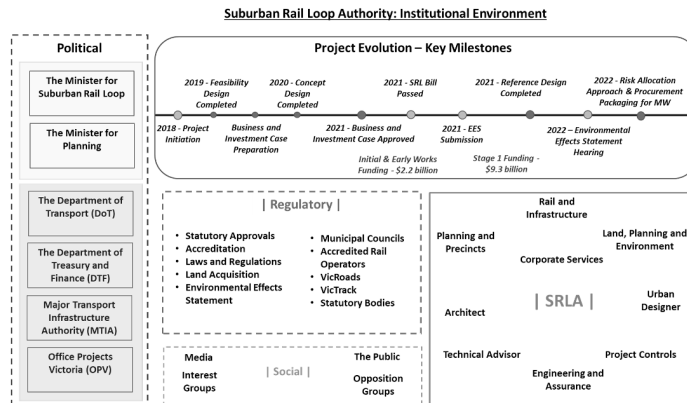


Figure 1: SRL's Institutional Environment (developed by the author)

Table 2: Institutional Shaping Analysis (developed by the author)

Institutional Instrument	Mapping	Front-end Shaping	Attributes That Aid in The Praxis of Risk Allocation
Enabling	Part 7 of the Bill	SRL was established as a Statutory Authority, providing SRL with the power to act as a Planning Authority. Minister for Suburban Rail Loop appointed.	Overriding statutory approvals to streamline the process. A dedicated Minister introduces greater decision-making power.
Enabling	Part 3	Provides the Suburban Rail Loop Minister with the power to declare areas of land that are proposed to accommodate the Suburban Rail Loop infrastructure and related precincts as Suburban Rail Loop planning areas	Access to critical land can be streamlined. Interface risk exposure is reduced as land will be available for Construction delivery.
Defining	Part 4 of the Bill	The Suburban Rail Loop program will be planned, developed, and delivered progressively in stages.	Project risk exposure can be progressively managed. Facilitates risk allocation and procurement staging.
Embedding and Routinizing	The Bill	Governance arrangements for the new Authority, including the Board of Directors, Chief Executive Officer (CEO), corporate planning requirements and financial cost control.	Sound governance positions the organisation to effectively respond to institutional logics.

'Enabling' was used to override local government planning powers to expedite planning approvals and fast-track construction works. This was achieved by making essential modifications to the Major Transport Projects Facilitation Act 2009 (Vic) (MTPFA) and the Planning and Environment Act 1987 (Vic). Furthermore, a Suburban Rail Loop Minister was appointed, who has specific powers under the Bill, introducing greater decision-making powers. To our knowledge, this is the first time such a role has been created anywhere in Australia to facilitate the delivery of a transport megaproject. This enabling function potentially allows SRL to reduce its risk exposure and uncertainty, especially in relation to interface definition, land access, and statutory approvals.

'Defining' was used as an institutional process of "macro-shaping" by facilitating SRL to be delivered progressively in stages. For example, the procurement of an Initial and Early Works Package to conduct essential enabling works prior to main works on SRL East. Notably, the Initial Works, which include minor road modifications, service relocates and site establishment, can be conducted prior to the Early Works, which are subject to approvals as part of the Environmental Effects Statement assessment. This approach means risk exposure can be progressively managed and facilitate effective risk allocation decision-making and procurement approaches. 'Embedding and

Routinizing supported SRLA to quickly establish organisational governance, allowing the Statutory Authority to effectively respond to institutional logic.

Institutional Shaping Can Inform the Risk Allocation Process

When investigating the function of risk allocation, Xu *et al.* (2018, 20) suggest that "effective risk allocation aims to compensate the Contractor for potential losses incurred during the project's implementation, thereby reducing the Contractor's opportunistic behaviour". Common perceptions of contractual risk allocation are predicated on a harmonious, effective, and efficient construction project (Loosemoore and McCarthy, 2008). However, this is rarely the case, given that most megaprojects experience cost blowouts and schedule overruns resulting in adversarial behaviour. Xu *et al.* (2018, 16) note that "a proper risk allocation scheme suggests that the owner is willing to share risks with the contractor in the implementation of a project and that the owner is not forcing the contractor to take all the risk". As discussed in the introduction, the construction sector is now pushing back on the amount of risk they are willing to accept following a series of megaproject failures and financial losses (Terrill *et al.*, 2021).

Accordingly, SRLA's approach to reducing uncertainty and institutional complexity through the application of institutional shaping has positioned the project to be more informed when allocating risk to the construction sector. SRLA, for example, has performed extensive upfront geotechnical investigation work to inform the reference design and provide the construction sector with a higher level of confidence than is common on a transport megaproject. An optimised geotechnical baseline report also limits the Contractor's risk exposure to geotechnical uncertainty through contractual measures.

The findings of this case study reveal that SRLA actors institutionally shaped the project's front-end phase via regulative mechanisms. These instruments enabled the project to have greater decision-making power and expedite upfront works. This institutional shaping is arguably a critical phase in the project that has facilitated detailed upfront investigations and design. In turn, this facilitated SRLA to be more effective in its ability to allocate risk by enhanced decision-making power, thus reducing the need to deflect risks onto the construction sector. However, this strategy may elicit objections from statutory authorities who believe their approval mechanisms and ability to influence the project have been undermined.

CONCLUSION

The critical literature review highlights that institutional theory is gaining interest as a theoretical lens to examine megaprojects. The case study provides useful insight into the critical front-end phase of a transport megaproject and how institutional instruments informed the risk allocation process. Thus, this paper makes a case that institutional theory can help us understand the praxis of risk allocation on transport megaprojects as a novel approach to megaproject management. Given the early nature of this research, it is acknowledged that industry engagement is required to conduct detailed case studies and interviews with industry professionals to gain further insight into the topic.

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