THE SUCCESSFUL DELIVERY OF INFRASTRUCTURE PROJECTS—A LEGAL OR A LEADERSHIP ISSUE?

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INTRODUCTION

Australia and most of the world have a poor track record in delivering major infrastructure projects on time and on budget.[1] With infrastructure projects expected to be a key aspect of the economic recovery following the COVID–19 pandemic,[2] the need to adopt a different project delivery model is more pressing than ever. Prior to the pandemic, New South Wales had already scheduled over $40 billion worth of mega infrastructure projects for the next few years.[3] These projects include the Sydney Gateway to Kingsford Smith Airport, the M6 though the southern suburbs of Sydney, the West Harbour Tunnel and the Metro West.[4]

In response to the pandemic, the New South Wales government has established a Planning System Acceleration Program.[5] Under this program, 24 projects including thousands of new homes, new industrial complexes and six schools will be fast tracked.[6] The $4.6 billion Snowy 2.0 Hydro project tops the list of 24 projects.[7]

The Victorian government has established a taskforce to identify projects that may be fast tracked for approval and commencement. Four residential, commercial and mixed use projects have already been identified to date to be fast tracked.[8]

Similarly, the Federal and Queensland governments have brought forward a series of construction and upgrade works in the Roads of Strategic Importance initiative pipeline. Under the new agreement, works to seal roads, build overtaking lanes, upgrade intersections and improve safety are now set to start sooner on 22 jointly funded regional road projects, with a combined value of $185 million.[9]

The Western Australian government has announced that it will establish a state–wide Construction Panel to streamline and expedite the awarding of transport related construction contracts worth less than $20 million. The Western Australian government says contracts in respect of 24 projects worth a combined value of up to $140 million and generating more than 1,000 jobs will be brought forward under this initiative.[10] In addition, Main Roads is fast–tracking tendering processes for several large–scale road projects worth a combined total of $2.37 billion and generating around 13,000 construction jobs in Western Australia.[11]

With so many projects in the pipeline, it is more critical than ever to find a delivery model that will deliver in terms of time, cost and quality. It is in the interests of the owners, financiers, consultants, contractors and subcontractors for this to happen. It is the thesis of the author that successful delivery of a project does not lie in a delivery model under which all risk is borne by the contractor and ultimately its subcontractors and consultants. Instead, a successful project requires collaboration and a sensible allocation of risk based upon the Abrahamson principles so that risk is allocated to the party best placed to manage that risk.[12]

In many construction contracts, the allocation of risk does not reflect the Abrahamson principles. Instead, the risk allocation often reflects the relative bargaining power of the parties so that the contractor is invariably prevailed upon to assume latent risks that it has no control over.

An infrastructure project ought to be viewed and run as a business with all key stakeholders working together to achieve the common goal of delivery of a quality project on time and on budget. This is particularly important if the stakeholders wish to foster and develop long term relationships with a view to the joint delivery of future projects. It is suggested that collaborative contracting, in the form of alliance contracting, may be the appropriate project delivery model.

THE PROBLEM DEFINED

In September 2017, McKinsey & Company released the McKinsey report. McKinsey had reviewed a dataset of more than 500 global projects above US$1 billion in resource industries and infrastructure. McKinsey concludes that the performance of large capital projects has been historically poor and prone to overruns.

Only five per cent of projects were completed within their original budget and schedule. In the completed projects, the average cost overrun was 37 per cent and average schedule overrun was 53 per cent.[13] As the table below shows, large capital projects that are completed on schedule and within budget are the exception, not the rule.[14]

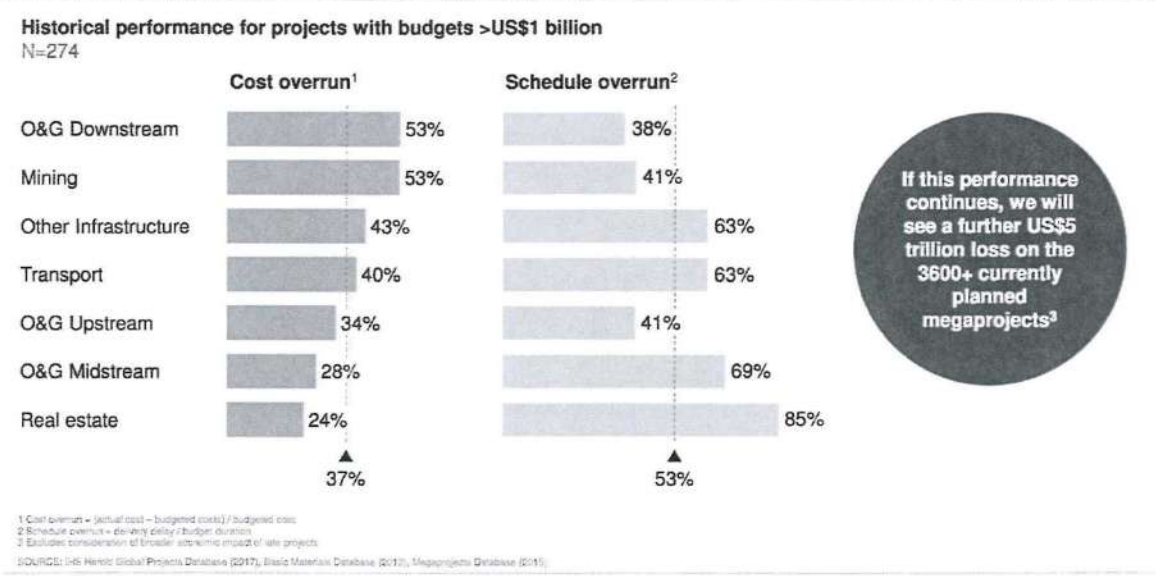

Figure 1—Megaprojects are prone to overruns[15]

Anecdotal evidence gathered at industry forums[16] indicate that at least in Victoria and in New South Wales, contractors and consultants share common grievances in respect of the procurement and delivery of public infrastructure projects. These include:

(1) the excessive cost of tendering with the state agencies responsible for procurement arising from the documentary requirements in terms of complexity and duplication of tasks; and

(2) risk allocation with all risk being pushed down to the contractor which in turn pushes the risk down to the consultants and subcontractors.

Arising from widespread concerns in New South Wales about procurement, the New South Wales government convened an inquiry into world's best practice with regard to the procurement of government infrastructure projects. However, the inquiry was focused on systems and processes and did not address the allocation of risk.[17]

Projects typically run into difficulty during the delivery phase. The contractor may not have fully appreciated or otherwise properly priced the risks. In its haste to secure the project, it may have disregarded and downplayed exposure to not only 'the known unknowns' but 'the unknown unknowns'.[18] In the author's experience, the cases that end up in dispute, contractors also typically have not complied with contractual mechanisms for extensions of time and claims for variation during the delivery phase of the project in the hope that all will work out at the end of the project with the principal paying their claims on a *quantum meruit* basis.[19]

Instead, the contractor ultimately discovers that the principal will not pay their claims and its only option for recovery is to engage in costly litigation or arbitration. The mindset of the owner appears to be that an infrastructure project is not a joint initiative or a partnership between the owner, the contractor, subcontractor and consultants. There is an 'us and them' mentality. While a strict adherence to the black letter of the contract may theoretically place the owner ahead, this approach does not lead to the successful delivery of a project.

THE SYDNEY LIGHT RAIL PROJECT

The lessons of the Sydney Light Rail project are instructive. The project involved the construction of a light rail service that runs through the central business district of Sydney and through to the eastern suburbs of Sydney. The project ran into difficulty with a cost overrun of over $1 billion, delays of over one year and involved the contractor and the consortium commencing proceedings in the Supreme Court of New South Wales against the New South Wales government for damages for misleading or deceptive conduct.

In June 2019, the New South Wales government settled the proceedings for a further payment on terms for $576 million.[20] The Sydney Light Rail project ultimately cost the New South Wales government in excess of $1 billion more than the initial budget for the works.[21]

The Light Rail project was beset by problems from the outset. Planning for the project commenced in August 2011 and ended in a contract in February 2015 for $2.1 billion. The Auditor–General concluded in a report published

in on 30 November 2016 that the assurance framework for the Light Rail project had been inadequate. In addition, the planning and governance arrangements, albeit approved by the New South Wales government, skipped important assurance steps.

Tight timeframes also meant that planning had been inadequate. Critically, key third party agreements (presumably a reference to the utility providers) that affected the design and scope of works were not finalised before tenders were issued and the contract was signed. The Auditor–General concluded that this had increased the project's complexity and risks, and reduced value for money.[22] The initial budget for the works had been $1.6 billion.

However, the capital budget for the works increased by $549 million to $2.1 billion partly due to scope changes and planning modifications. Most of the increase in costs was caused by mispricing and omissions in the business case.[23]

As at the date of publication of the Auditor–General's report, the design and scope of the project had still not been finalised.[24] It was envisaged that it was likely that there would be further increases in cost before the end of the project.[25] A capital blow out of a further $450 million would render the benefit to cost ratio for the Light Rail project from 1.4 to less than 1. Given the agreement reached to pay the contractor a further payment of $576 million, the benefit to cost ratio for the Light Rail project is well below 1. The project would presumably not have progressed if this had been known at the outset.

The Sydney Light Rail tale is a cautionary one, but it is not unique. It is typical of many infrastructure projects.[26] The consortium and the contractor were lucky to secure a further payment from the New South Wales government for the project. This outcome was maximised when the contractor made its claim mid project rather than at the end of the project when its bargaining power would have evaporated.

A DIFFERENT PROJECT DELIVERY MODEL IS NEEDED—THE CURRENT MODEL IS UNSUSTAINABLE

The current model of procurement and delivery of projects is unsustainable. It is not a sustainable model for states to undertake projects that suffer such significant cost blowouts. The litigious nature of Australia and the long tail nature of construction claims has also placed the insurance market in Australia under stress. Australia represents one per cent of the world's insurance premiums but account for five per cent of the world's insurance claims.[27] Global insurers have been leaving the Australian market and are no longer offering professional indemnity or construction risks policies.[28]

Mr Karalis, Head of Major Clients & Complex Risk—Construction of Willis Towers Watson, says that while he is still able to procure sufficient cover for his clients, he has to spread the risk between multiple insurers in order to obtain the requisite limit of indemnity. It is his experience that procurement practices have already started to change because the 'naive capital' that was available for the Sydney Light Rail and Sydney Metro projects are no longer available. According to Mr Karalis, contractors have learned from their mistakes and are no longer prepared to tender on the same basis as they had for those projects.[29] It remains to be seen whether this will translate into a more successful delivery of project in terms of time, cost and quality.

The COVID–19 pandemic also highlights the difficulty with a strict adherence to the black letter of the design and construct project delivery model. Contractors may have committed themselves to contracts where they may be entitled to extensions of time for any delays suffered by reason of the pandemic but not be entitled to any extra costs. For example, in AS 2124–1992, which remains a widely used form of contract, there is likely to be an entitlement to an extension of time for delays arising from the COVID–19 related delays pursuant to clauses 35.5(a) or 35.5(b)(v) or (vi). This entitlement will relieve the contractor from being liable for liquidated damages. However, the default position in AS 2124–1992 (unless stipulated otherwise in Annexure A of the contract or by other amendment) is that extra costs are not payable pursuant to these delay events. It is likely that a strict adherence to the contractual rights of principal and contractor will result in contractors suffering significant losses that are not recoverable. This may ultimately impact upon financial and long term viability of the contractor. If a strict adherence leads to the insolvency of the contractor, then this will not benefit the owner.

WHAT THEN ARE THE FUNDAMENTALS FOR A SUCCESSFUL PROJECT?

A successful project starts with upfront planning on the part of the principal and contractor so that design issues are addressed. Project scope has to be defined clearly which can only be achieved by sufficient upfront investment in a detailed design.[30] This should involve the contractor and the right expertise at an early stage to understand constructability and rigor in scope management of contractors. This is fundamental to the success of any project, large or small.

With infrastructure projects expected to be a key aspect of the economic recovery following the COVID–19 pandemic, the need to adopt a different project delivery model is more pressing than ever.

Also fundamental to the successful delivery of a project is a sensible allocation of risk based upon the Abrahamson principles.[31] This might mean that in relation to risks that fall into the 'known unknowns' or 'unknown unknowns' baskets, risks are shared between the owner and contractor.

In relation to these risks, a contractor's contingency for such risks may not only be inadequate but an application of the Abrahamson principles indicates that it may be inappropriate for these risks to be always borne by the contractor.

It is important to remember that projects are not delivered by legal teams defending contractual positions. Successful owners thoughtfully delegate only those risks that the contractor is better positioned to manage.[32]

It is suggested that a pivot turn towards the principles of collaborative contracting is required to successfully deliver significant projects. In order to succeed, the contractual framework, leadership and process for the project have to be aligned within a clearly defined job to be done framework.[33]

Collaborative contracting requires equal parts of leadership, strategy and negotiation.[34] It also requires regular health checks carried out during the delivery phase of the contract to ensure that the project is on track in terms of time, cost and quality.

Delays must be identified so that additional resources may be applied to neutralise the delays and any claims for additional time and cost are resolved as and when they arise when the interests of the stakeholders to ensure the timely delivery of a quality project and the preservation of a good working relationship are aligned.[35]

WHAT IS COLLABORATIVE CONTRACTING?

There are several definitions of collaborative contracting.[36] In a nutshell, collaborative contracting requires parties to work together to achieve a common goal. The Australian Department of Defence defines:

...[c]ollaborative contracting is where parties work together to achieve common outcomes. Collaborative contracts are underpinned by parties working together in good faith, focussing on fixing problems and not blame, managing risk equitably and jointly where appropriate, promoting transparency, and avoiding disputes.[37]

The Defence Better Practice Guide recommends the use of collaborative contracts where the procurement risks are high in circumstances where:

(1) annual contract values are high;

(2) the contract duration is sufficiently long enough to justify the investment in collaborative contract arrangements;

(3) there is high strategic importance in the relationship with the suppliers;

(4) competition or substitution opportunities are low or non–existent; and

(5) multiple parties are involved in capability delivery.[38]

Complex mega infrastructure projects would appear to satisfy all of these criteria.

Better practice collaborative contracting often includes joint decision making; partnering charters; target cost or gainshare/painshare remuneration; no blame/no–liability frameworks; jointly managed program risk; transparency and open book financial reporting; fair and timely

dispute resolution processes; shared financial, configuration management, and decision support systems; agility and flexibility; and senior executive participation.[39]

There are many types of collaborative contracting. The Americans have developed an Integrated Project Delivery model which has three elements—a business model, a contractual mode pursuant to which parties are bound by a single agreement, and enabling behaviours. Within the contractual framework, the goals and incentives of the parties are aligned while they work towards a common goal of successful project delivery.[40]

The characteristics of an Integrated Project Delivery model include shared risk and reward, a jointly developed project targets criteria, early involvement of key stakeholders, open sharing of information, joint project control and decision making, and reduced liability among risk/reward members.[41] An example of reduced liability is the inclusion of a no blame, no disputes clause in the contract which precludes the parties from bringing legal actions against each other except in very limited circumstance of a wilful default by another participant.[42]

In Australia and New Zealand, collaborative contracting takes the form of alliance contracting where a public sector agency (owner) works collaboratively with private sector parties to deliver major public assets. All participants are required to work together in good faith, acting with integrity and making best-for-project decisions. Working as an integrated, collaborative team, unanimous decisions are made on all key project delivery issues. The alliance structure capitalises on the relationships between the participants, removes organisational barriers and encourages effective integration with the owner.[43]

New Zealand has successfully delivered infrastructure projects using alliance contracting.[44] The Grafton Gully project was the first alliance project for highway construction in New Zealand. The alliance was between the New Zealand Transport Agency, a single design consultant and two contractors.

The project was governed by the project alliance board with representative of each participant. The alliance charter required all decisions to be unanimous. The project value was NZ$67 million and it was completed between January 2002 and February 2004. The alliance model was chosen because it was a complex project that required a high performance team to undertake it.

A traditional measure and value contract would not have provided the necessary incentives for the contractors to innovate to cut costs whereas a profit share model would. The non-adversarial approach was attractive to New Zealand Transport Agency and New Zealand was aware that the public private partnership had worked in Victoria, Australia for highway projects.[45] The project was completed six weeks ahead of schedule and on budget.[46]

The Northern Gateway Toll Road Alliance was completed between December 2004 and February 2009 and had a value of NZ$354 million. The Toll Road was a technically challenging project which had significant engineering risk associated with the scale of the project and the steep and difficult terrain. The project had large earthwork operations and many bridges and tunnels.

Construction had to go through an environmentally sensitive area and there were unresolved regulatory planning issues. Direct and indirect costs as well as profits were calculated and paid on a monthly basis. Indirect costs were based upon the contractor's costs for the last five years and an average margin was added to direct costs. Gainshare/painshare was based on savings or costs overruns. Savings were split equally between the owner and the alliance partners. Cost overruns were also split equally but were capped so that the contractor was never placed in the position of losing money. A bonus pool was created so that bonuses were paid when certain key performance indicators were met. At the end of the day the project actual outturn cost[47] was in line with the target outturn cost[48] and the project was finished early.[49]

The Manukau Harbour Crossing project in Auckland involved the construction of the Western Ring Route that links the cities of Manukau, Auckland, Waitakere and North Shore. It was the first time that New Zealand had adopted the competitive alliancing concept. This was done so that the New Zealand Transport Agency could demonstrate that it was obtaining best value for money.

The Beca Infrastructure, Fletcher Construction and the Higgins consortium won the competitive tender to join the New Zealand Transport Agency in the alliance. The alliance partners had been formed several years earlier on the Grafton Gully project and this prior experience was a factor in the consortium winning the tender.

The project had to be completed in time for the Rugby World Cup in 2011 and it involved the modification and rebuilding of several existing motorway bridges, foot bridges and the construction of a duplicate bridge over Manukau Harbour. A new interchange also had to be constructed. The project was delivered within budget and six months ahead of schedule.[50]

In Victoria, the Port of Melbourne Corporation delivered the Channel Deepening project using alliance contracting. The project involved the dredging and disposal of more than 22 million cubic metres of sand and silt. It also included berth upgrades, installation of navigational aids, and the protection of utility services in the channel. The major challenge was to comply with environmental regulation during the dredging process. The other challenge involved sequencing the work so that there were minimal operational conflicts with cargo traffic entering and departing from the Port. Direct and indirect costs, profit share and pain/gain sharing were structured in the same way as the Northern Gateway Toll project.[51] The project was delivered $251.5million under budget mainly due to the unused $137 million contingency. The AOC was $717.3 million.[52]

THE ART OF PROJECT LEADERSHIP

System, processes and technical mastery alone do not deliver projects. McKinsey says the 'art of project leadership' is needed.[53] The critical elements of the art of leadership are synthesised into four discrete mindsets and eight practices. Four practices are relevant to the project setup phase and four are relevant to the project delivery phase. By embracing these mindsets and practices project leaders can dramatically increase the chance of successful delivery of ultra-large projects.[54]

Fundamental to these concepts is that issues must be addressed as they arise. Not only will this contribute to the smooth on time delivery of the project and the maintenance of relationships, it will also help avoid costly litigious disputes at the end of the project. The key to achieving these outcomes is effective leadership.[55]

MINDSETS

Constructive mindsets lead to good decisions and strong trust-based relationships, which in turn lead to high team morale and excellent performance. The four identified mindsets are:

(1) Lead as a business, not as a project. The owner should treat the contractor as a business partner and not as a vendor.[56]

(2) Take full ownership of outcomes. The project owner must be fully accountable for delivery because it is the owner's responsibility if the project is late, over budget or fails to achieve the predicted performance.[57]

(3) Make your contractor successful. Owners must recognise that in the end, any project problem will ultimately become their problem. The focus of the parties' energies and efforts should be placed on solving project problems, rather than allocating blame.[58]

(4) Trust your processes but know that leadership is required.[59]

PRACTICES

The setup phase of the project is key to establish healthy management practices that deliver successful project outcomes. The four practices that require 'artful' application that leaders should uphold as crucial are:

(1) define purpose, identity and culture through clear articulation and transparency to create a culture of mutual trust and collaboration;[60]

(2) assemble the right team that can collaborate effectively, adapt to change and is resilient under stress and uncertainty;[61]

(3) carefully allocate risk and align incentives;[62] and

(4) work hard on relationships with stakeholders, invest in stakeholder management, set realistic expectations with the community and meet them, all while erring on the side of transparency.[63]

Whilst many of the key decisions have been made once the project enters the delivery phase, project leaders must focus upon the following four practices throughout the delivery phase:[64]

(1) Invest in your team, by defining development plans and providing formal training and coaching.

(2) Ensure timely decision making, avoid bottlenecks, and delegate to the lowest possible level.

(3) Adopt forward looking performance management, base performance discussion in fact, and ensure performance meetings are forward focused and action orientated.

(4) Drive desired behaviours consistently, reinforce an atmosphere of trust and take time to connect with team members on a personal level. Project leaders should define, communicate, and role model expected attitudes and behaviours.

THE WESTCONNEX PROJECT AND THE ART OF PROJECT LEADERSHIP

The $16.8 billion WestConnex road infrastructure project in New South Wales which involves 33 km of upgraded and new motorways may be instructive. The project director for stages 1, 2 and 4, a fan of the art of leadership, said in March 2018 at an event hosted by Allens Linklaters that the WestConnex project was running on budget and on time. That was certainly true of stage 1 of the project at the time.

However, in May 2018, newspaper reports said[65] that the contractor was going to claim $1 billion for variations to stage 2 of the project. This claim appears to have fallen away and the writer suspects that this claim was rolled up and

resolved in the sale of WestConnex to a private consortium led by the Transurban Group.

Perhaps the overrun in time and cost is not surprising given that the Auditor-General's report[66] found that the project had not complied with the Major Projects Assurance Framework of the New South Wales government during the concept[67] and pre-tender[68] stage of the project. The final business case had also not complied with the Major Projects Assurance Framework.[69] However, the report stated that the WestConnex Delivery Authority had indicated that it planned to follow the Major Projects Assurance Framework.[70] It seems that in the haste to get projects off the ground, red flags were ignored.

CONCLUSION

Around the world but perhaps not in New Zealand, owners are not getting their projects delivered on time and on budget. The 'us and them' mentality, an unmanageable allocation of risk and a strict adherence to the black letter of the contract is not delivering results. The existing model of project delivery in Australia is not sustainable. The litigious nature of Australia has led to global insurers pulling out of the Australian market and rising costs of insurance. If costs continue to blow out on every mega infrastructure project with each project ending in costly dispute, then it is inevitable that states and territories will not be able to deliver all their planned projects. The money will eventually run out.

It is time for project owners to consider using a different delivery model. A willingness to view the delivery of an infrastructure project as a business is the first step. Collaborative contracting, incorporating proper systems, processes and the art of project leadership, is the key.

The theory and the precedents exist. Collaborative contracting has worked in New Zealand and in Victoria. Australia would do well to learn from these lessons. There is everything to gain from adopting this shift in mindset.

REFERENCES

1. McKinsey & Company, The Art of Project Leadership: Delivering the World's Largest Projects, September 2017 at p 10 (McKinsey).

2. Michael Bleby, Kick-starting NSW: Snowy Hydro tops list of projects, *AFR*, 28 April 2020.

3. In the 2019 Federal budget, the Federal government budgeted for $100 billion of national infrastructure projects for the next 10 years. Funds for the projects are provided to each state and territory and the responsibility for the procurement and delivery of each project lies with each state and territory.

4. Matt Wade, Pandemic re-think: is $40 billion in mega projects best way out of slump, *SMH*, 2 May 2020.

5. NSW Government's Planning Acceleration Program, https://www.planning.nsw.gov.au/Policy-and-Legislation/COVID19-response/Planning-System-Acceleration-Program.

6. Branko Miletic, NSW goes on historic never-to-be-repeated building binge, 29 April 2020, https://www.architectureanddesign.com.au/news/nsw-goes-on-historic-never-to-be-repeated-building#.

7. Bleby, above n 2.

8. Ted Tabet, Victoria Green Lights Mega Projects to Boost Economy, 24 April 2020, https://theurbandeveloper.com/articles/victoria-green-lights-mega-projects-to-boost-economy

9. Kim Ho, Federal and Queensland Governments Fast Track Projects, 1 May 2020, https://infrastructuremagazine.com.au/2020/05/01/federal-and-queensland-governments-fast-track-road-projects/.

10. Government of Western Australia, Major projects fast-tracked to support jobs during COVID-19 media release, 30 April 2020, https://www.mediastatements.wa.gov.au/Pages/McGowan/2020/04/Major-projects-fast-tracked-to-support-jobs-during-COVID-19.aspx.

11. Government of Western Australia, Major projects fast-tracked to support jobs during COVID-19 media release, 30 April 2020, https://www.mediastatements.wa.gov.au/Pages/McGowan/2020/04/Major-projects-fast-tracked-to-support-jobs-during-COVID-19.aspx.

12. Max Abrahamson, 'Risk management' (1984) 1 *International Construction Law Review* 241. The Abrahamson principles provide that a party should bear the risk where: the risk is within the party's control; the party can transfer the risk, e.g. through insurance and it is most economically beneficial to deal with the risk in this fashion; the preponderant economic benefit of controlling the risk lies with the party in question; to place the risk upon the part in question is in the interests of efficiency, including planning, incentive and innovation efficiency; and if the risk eventuates, the loss falls on that party in the first instance and it is not practicable or there is no reason under the above principles, to cause expense and uncertainty by attempting to transfer the loss to another.

13. McKinsey, above n 1, at p 10.

14. McKinsey, above n 1, at p 10.

15. McKinsey, above n 1, at p 11.

16. The author has attended industry forums organised by Consult Australia, the Society of Construction Law Australia and the Australian Construction Industry Forum in the last five years where the issue of risk allocation was discussed.

17. Legislative Assembly Committee on Transport and Infrastructure Report on Procurement of Government Infrastructure Projects, Report 2.56, February 2017. See the revised NSW Public Private Partnership Guidelines 2017, NSW Treasury, TPP17–07 prepared in response to the Report.

18. Donald Rumsfeld, February 2002.

19. This approach has been curtailed by the approach of the High Court in *Mann v Paterson Constructions Pty Ltd* [2019] HCA 32, (2009) 93 ALJR 1164.

20. Matt O'Sullivan, Sydney Light Rail cost blows out to at least $2.7b after settlement, *SMH*, 3 June 2019.

21. NSW Auditor–General's Report Performance Audit on the CBD and South East Light Rail Project: Transport for NSW, 30 November 2016 at p 3.

22. NSW Auditor–General's Report, above n 21, at p 2.

23. NSW Auditor–General's Report, above n 21 at p 3.

24. NSW Auditor–General's Report, above n 21, at p 2.

25. Matt O'Sullivan, above n 20.

26. There has been significant blow out in costs in the order of $3 billion for the Sydney Metro which may impact other infrastructure projects in NSW: see Tom Rabe, "Pressure on everything': Forces behind Metro blowout pose wider concerns', *SMH*, 11 March 2020. There has also been a costs blowout of $370 million for the next stage of the Monash Freeway upgrade, with the cost of the project blowing out to $1.1 billion: see Leith van Onselen, 'Costs blow–out as infrastructure lags mass immigration', 5 September 2019, https://www.macrobusiness.com.au/2019/09/costs–blow–out–as–infrastructure–lags–mass–immigration/ and Timna Jacks, 'PM and Premier agree to stump up extra $370m to pay for a wider Monash', *The Age*, 4 September 2019. The West Gate Tunnel Project in Melbourne has also been thrown into disarray with the discovery of contaminated material during excavation that has caused the subcontractor joint venturers, CIMIC's CPB Contractors and China Communications Construction Company's John Holland, to terminate the design and construct subcontract but continue work on a *quantum meruit* basis: see Liam Walsh, 'West Gate Tunnel contract 'axing' lifts spat to rare level', *AFR*, 29 January 2020 and Michael Bleby, 'Governments will have to take more risk on big projects: John Holland', *AFR*, 16 April 2020.

27. Alan Wilson, speaking at the Warren Centre Annual Fire Safety Engineering Seminar on 4 February 2020.

28. See Jenny Wiggins, Infrastructure projects getting too risky for insurers: AECOM, *AFR*, 23 July 2019.

29. The author interviewed Mr Karalis on 24 February 2020.

30. See example of the WestConnex project and the comments of Mr Chapman which are set out below.

31. Max Abrahamson, above n12.

32. McKinsey, above n 1, at p 3.

33. Clayton Christensen, 'Know your customers' 'Jobs to be done'' [2016] *HBR* (Sept) 1.

34. Peter F Drucker, 'What makes an effective executive', in *HBR*, HBR's 10 Must Reads on Leadership, Harvard Business School Publishing Corporation, 2011 at p 33; David Yoffie, Strategy Rules: Five Timeless Lessons from Bill Gates, Andy Groves and Steve Jobs, Harper Collins, 2015 at p 195.

35. Michael Wheeler, *The Art of Negotiation—How to Improvise Agreement in a Chaotic World*, Simon & Schuster, 2013 at 15. Max H Bazerman and Margaret A Neale, *Negotiating Rationally*, The Free Press, 1993 at p 103.

36. See for example, the definitions in Australian Government Department of Infrastructure and Regional Development, National Alliance Contracting Policy and Guidelines, Guidance Note 6, Early Contractor Involvement and Other Collaborative Procurement Methods, September 2015 at p 11 and in South Australian Department for Manufacturing, Innovation, Trade, Resources and Energy, A Guide to Business Collaborative Contracting at p 3.

37. Australian Government Department of Defence, Collaborative Contracting Better Practice Guide Version 1.0, 28 September 2017 (Defence Better Practice Guide) at p 5[13].

38. Defence Better Practice Guide, above n 37, at p 10[14].

39. Defence Better Practice Guide, above n 37, at p 11[2].

40. Ashcraft H, 'Integrated project delivery—A prescription for an ailing industry', (2014) 9(4) *Construction Law International* 21.

41. Ashcraft, above n 40, at 26.

42. See Australian Government Department of Infrastructure and Regional Development, National Alliance Contracting Policy and Guidelines, Guidance Note 1, Language in Alliance Contracting:

A Short Analysis of Common Terminology at p 10 and clause 94.1 in the NEC4 Alliance Contract.

43. Australian Government Department of Infrastructure and Regional Development, National Alliance Contracting Guidelines, September 2015 at p 9.

44. See table 7 in Gransberg, Scheepbouwer and Loulakis, *Alliance Contracting—Evolving Alternative Project Delivery*, The National Academies Press, 2015 at p 17.

45. See Appendix 6 in Office of the Auditor–General (OAG), Achieving Public Sector Outcomes with Private Sector Partners, OAG, New Zealand, 2006 and Gransberg, Scheepbouwer and Loulakis, above n 44, at p 23.

46. Gransberg, Scheepbouwer and Loulakis, above n 44, at p 24.

47. The actual outturn cost is actual cost of the project calculated at completion (AOC): Australia Government Department of Infrastructure and Regional Development, Developing the Target Outturn Cost in Alliance Contracting, Guidance Note 5 September 2015 at p 89.

48. The agreed target cost set at the start of the project (TOC). In the project the AOC is compared with the TOC to determine cost underrun or overrun. An AOC close to the TOC demonstrates value for money: Australia Government Department of Infrastructure and Regional Development, Developing the Target Outturn Cost in Alliance Contracting, Guidance Note 5 September 2015 at p 20.

49. Gransberg, Scheepbouwer and Loulakis, above n 44, at pp16–19.

50. Gransberg, Scheepbouwer and Loulakis, above n 44, at pp 30–31.

51. Gransberg, Scheepbouwer and Loulakis, above n 44, at pp 31–32.

52. Victorian Auditor–General, Port of Melbourne Channel Deepening Project: Achievement of Objectives, November 2012 at p 34.

53. The 'art' refers to the blend of soft leadership and organisational skills, mind–sets, and behaviours that complement the science: McKinsey, above n 1, at p 15.

54. McKinsey, above n 1, at p 10.

55. Drucker, above n 34 at p 33.

56. McKinsey, above n 1, at p 19.

57. McKinsey, above n 1, at p 23.

58. McKinsey, above n 1, at pp 25–26.

59. McKinsey, above n 1, at pp 27–29.

60. McKinsey, above n 1, at pp 33–35.

61. McKinsey, above n 1, at pp 35–38.

62. McKinsey, above n 1, at pp 38–40.

63. McKinsey, above n 1, at pp 40–42.

64. McKinsey, above n 1, at pp 45–52. The deadly sins of delivery are set out at p 53.

65. Report by Andrew Clennell, WestConnex builder to seek $1bn extra fee, *The Australian Newspaper*, 18 May 2018 and report by Lisa Visentin & Matt O'Sulllivan, WestConnex contractor claiming M5 $700 million over–budget and one year late, *SMH*, 3 May 2018 which reported that leaked confidential documents revealed that the project was running one year late and $700 million over budget.

66. NSW Auditor–General's Report, Performance Audit on WestConnex: Assurance to the Government: Roads and Maritime Services, WestConnex Delivery Authority, Infrastructure NSW, Transport for NSW, NSW Treasury, Department of Premier and Cabinet,18 December 2014.

67. NSW Auditor–General's Report, above n 66, at p 17,

68. NSW Auditor–General's Report, above n 66, at p 34.

69. NSW Auditor–General's Report, above n 66, at p 32.

70. NSW Auditor–General's Report, above n 66, at p 36.

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