

# **Cost Benefit Analysis: The State of the Art in Australia**

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## **Abstract**

Cost benefit analysis is the economic appraisal of project proposals, it is a tool for assessing and comparing a range of public policy and infrastructure projects to inform decision makers as to their net social benefits and help determine priorities based on marginal costs and benefits. A review of recent cost benefit analyses, supported by Auditors General reports, academic literature and media reports provides some evidence of a number of issues for further investigation. In particular, the controversial and large-scale projects WestConnex and the East West Link provide examples of the issues under consideration. The novel approach taken here is to focus on practice, procedural and institutional issues, rather than the technical application of cost benefit methodologies. While some of the issues considered have appeared frequently in the literature, the article provides new insights the innovation bias towards increasing benefit estimation, and the alignment of risks and rewards within the appraisal industry.

This article is not intended to be a cost benefit analysis of CBA; it reviews and discusses contemporary issues with project appraisal and business cases for major infrastructure projects. By focusing on recent critiques, some of the discussion may appear to be biased towards a critical rather than balanced perspective. It provides a foundation for further research and considered debate on the role of CBA and the processes by which major infrastructure decisions are being made in this country.

## **1.Introduction**

In recent years, CBAs application to major transport proposals in Australia has been controversial, with criticisms including methodological issues, aspects of the processes of development and the public institutions and private sector providers who commission and prepare analyses. To some extent, these criticisms reflect a usurping of rational decision making processes by politics. In the lead up to the 2018 Victorian election where both major parties have announced major infrastructure projects prior to any economic appraisal, and leaked documents show that in the forthcoming election campaign the Commonwealth was planning on announcing \$7 billion in infrastructure spending in marginal seats (Harris 2018). This marginalization of economic appraisal in the infrastructure decision process means that changes to gateway review processes, as recently published in New South Wales, have limited capacity to change the process and outcomes of infrastructure decisions.

This paper does not provide a balanced consideration of the practice of CBA in Australia; instead it provides an introduction to critiques across the practice, procedural and institutional aspects of transport infrastructure appraisal. The institutional section considers the roles and relationship between the public service and private sector consulting in the development of business cases and CBA for major transport projects. The politicisation of CBA and risk and rewards in the CBA industry are fundamentally the same problem from different viewpoints, as if unbiased and forthright project appraisals are the most highly regarded by all actors within this sector, then the rewards and risks within the industry would align with public good. It should be noted that this discussion is not concluding that these issues are prevalent within public and private practice, but that there is enough evidence to indicate that further research is warranted. Recent business cases, Auditors' General reports, media coverage, and academic literature are used to illustrate the issues at hand and to provide the foundation for further research and discussion regarding how major infrastructure decisions are made in this country.

Even though the Commonwealth and State Governments regularly update and renew process for transport infrastructure appraisal, such as the 2016 ATAP Guidelines and guidance notes on Optimism Bias and Urban Liveability published this year (Transport and Infrastructure Council), and the recent New South Wales' update of the gateway review processes, the contention made here is that as McDougall (2017) opined of the ATAP Guidelines, they don't "address the core issues". This provides an introduction to previous commentary, including the warning that:

... evaluation may become an empty bureaucratic procedure unless we understand the institutional context and the conflicting objective functions of the agents involved. The understanding of the different levels of government usually involved in major projects and policies, as well as the implication of a menu of contracts for private participation, is a fundamental step if we want to avoid the conversion of cost-benefit analysis into a useless administrative procedure instead of an economic tool for rational decision taking (De Rus 2010, p. 178).

Ergas and Robson (2009, p. 2) suggest that this may be because "high quality project evaluations will not be made if governments do not see value in them". Or, as Keynes quipped in 1937, the problem may be that "(t)here is nothing a government hates more than to be well-informed; for it makes the process of arriving at decisions much more complicated and difficult" (cited in Skidelsky 1992, p. 630). The role of cost benefit analysis in infrastructure decision making and the risk that it may become an 'empty bureaucratic procedure' is the central concern of this article.

## **1.1 Cost benefit analysis and its application in Australia**

Cost benefit analysis is a method for appraising project proposals, it is a tool for assessing and comparing a range of public policy and infrastructure projects to inform decision makers as to their net social benefits and help determine priorities based on marginal costs and benefits. Its purpose is to answer the question "how should society in general, and government agencies in particular, assess the value of the vast array of social policy interventions that are either proposed or operating?" (Vining & Weimer 2013, p. 25). In theory, it is a comprehensive account of costs and benefits to

society of a proposal, including social and environmental effects as well as economic considerations, however in practice it is as much ‘art’ as ‘science’ a result of the decisions and assumptions of analysts. An essential benefit of CBA over other methods of appraisal, such as multi-criteria analysis, is that by monetization of costs and benefits, it enables the comparison of widely different options, in terms of scale and project type (Ergas 2009, p. 33). This is also reflected in the use of opportunity costs in Cost Benefit Analysis, as the economic cost of the project is “is the social benefit in the best available alternative, which has been lost in order to undertake the project” (De Rus 2010, p. 57).

### ***CBA in Australia***

The appraisal of the rail gauge standardization undertaken at the turn of the twentieth century is seen as an early example of CBA in Australia. The result of the appraisal that indicated that it was not worthwhile to proceed with standardization, which contradicted conventional wisdom at the time and supports the notion that “there is no substitute for rigorous economic analysis as an input into informed decision-making” (Dobes 2008, p. 7). At the time of making that statement, Dobes was arguing for greater use of CBA in policy and infrastructure decisions in Australia yet in the intervening decade criticisms of its practice have mounted, as outlined in the following discussion in this paper. By 2017, Dobes (p.2) was referring to a ‘post-truth era’, noting the “growing dissonance between expert opinion, principally in the form of rigorous economic analysis of major project proposals, and the decision-making approaches adopted by post-war Australian federal and state governments”. This indicates the need for a review of more than the technical aspects of CBA, the surrounding processes, tacit understandings and interactions between consultancies and the public sector need further scrutiny as well.

This malaise is evident in the decisions as to what transport infrastructure we invest in, which is made all the worse by the current levels of infrastructure spending in Australia, at 1.6 per cent of GDP it is the most of any OECD country (Terrill & Coates 2016). The question is not whether we are spending enough on transport infrastructure, but whether the right projects are being selected, or even good ones, and there is a widespread opinion that we are not (Fraser 2017; Keys 2016; Martin 2017b; Terrill & Coates 2016; Terrill, Emslie & Coates 2016). This is the purview of CBA, to provide the basis for sound decisions for the use of public resources.

In recent years there have been a number of infrastructure projects committed to by Australian governments that have benefit cost ratios (BCRs) than one, indicating that they are not of net benefit to society unless there are other significant, non-monetised factors. The Victorian Government endorsed Melbourne’s East West Link in April 2013, however the subsequently released CBA indicated from March of that year included a BCR of 0.45, rising to 0.84 with wider economic benefits (WEBs) included. A revised business case from June 2013 indicated an increase in the BCR to 1.4 including WEBs (Budget and Expenditure Review Committee 2013; PwC 2012; Victorian Auditor-General's Office 2015), however the Victorian Auditor General’s noted “June 2013 business case did not fully explain the basis for these increases in claimed benefits” (Victorian Auditor-General's Office 2015, p. 25). The Productivity Commission (2014, p. 95) uses the ACT’s Light Rail project as an example of a project with a low BCR. The estimated BCR of the rail option was 1.02, while the bus alternative was estimated at 1.98. Regardless of this, the ACT Government proceeded with the rail option. The business case for the Victorian Government’s Level

Crossing Removal Program resulted in a core benefit cost of less than 1 using the standard 7 percent discount rate, including the standard benefits of travel time savings and accident reduction, as well as WEBs and additional benefits (Level Crossing Removal Authority 2017, p. 214).

There are also non-transport projects that are proceeding in spite of low BCRs. The New South Wales Government's contentious plans to rebuild the Sydney Football Stadium and Stadium Australia were estimated to have negative BCRs for all options considered (Infrastructure NSW 2018a, 2018b). The NBN proceeded without a thorough CBA, with the responsible minister at the time, Senator Conroy, indicating that it was a "time-wasting ... cost-benefit analyses have been performed into broadband networks all round the world and all had been overwhelmingly positive" (anon. 2010), in contrast to the low rates of return indicated by an unsolicited analysis of the project (Ergas & Robson 2009). Another notable example was the relocation of the Australian Pesticides and Veterinary Medicines Authority to Armidale, where Barnaby Joyce, the Deputy Minister at the time, stated "If you're going to premise it on the cost-benefit analysis, we wouldn't do it" (Towell 2016). While Ergas (2009) suggests in these instances the projects are either not of net benefit to the community or that there are significant factors not included in the appraisal, it could also be argued that there is a willingness to ignore the outcomes of CBA or sideline the results, even if it remains a prominent input into the policy process.

## 1.2 Two examples

Two recent examples broadly illustrate the issues with CBA discussed in this report, Sydney's WestConnex project and Melbourne's East West Link. The appraisals of these projects and the publicly available reviews and criticisms provide examples of the practice, procedural and institutional issues considered.

### *WestConnex*

Infrastructure Australia (2016) added the WestConnex project to the High Priority List in April 2016, as:

The benefit-cost ratio for WestConnex as a whole stated by the proponent is 1.7 (excluding wider economic benefits) and 1.9 (including wider economic benefits) ... Infrastructure Australia is confident the benefits of the project in its entirety will exceed the costs.

Almost concurrently, SGS Economics and Planning (2016, p. 2) were commissioned by the City of Sydney, who's mayor, Clover Moore is a noted opponent the project, to review the business case. Their conclusion was that given the issues with the appraisal:

... the project is likely to be marginal at best. When considering the number of benefits that are likely to be overestimated and costs that may have been underestimated, it is quite possible that the actual BCR for WestConnex is less than one. New South Wales taxpayers will be exposed to the risk of the project not succeeding in the short to medium term.

At face value, these opposing conclusions illustrate that CBA is not an exact science, it is a result of decisions and choices made by the analyst (Dobes, Leung & Argyrous 2016). The contrasting conclusions also raise questions about where is the capacity to

analyse highly complex CBA reports, as well as the possibility of bias towards the views of commissioning agencies.

### ***East West Link***

The East West Link was one of the most contentious and widely debated infrastructure projects in Melbourne's history: including the decision to cancel the construction contract as well as the initial decision to proceed.

The Victorian State Government announced the construction of the East West Link in May 2013 (Naphine, O'Brien & Mulder 2013). Two versions of the business case for the project have since emerged, one dated March 2013, with a BCR of 0.84 including WEBS and one dated June, after the announcement, with the BCR increased to 1.4. The Victorian Auditor-General's Office (2015, p. 24) found little reasoning to support such as significant increase particularly as between the two versions, costs increased by 2 per cent for the additional project works, and benefits increased by 65 per cent, from \$3.358 billion to \$5.555 billion. Travel time savings for public transport users increased from \$5 million to \$240 million, and agglomeration benefits increased from \$1.514 billion, already high, to \$2.153 billion, approximately 40 per cent of the total benefits.

The Auditor General concluded that the decision to proceed was based on flawed advice aimed at meeting political requirements of the 2014 State Election, with a similar view of the decision to cancel the project by the incoming government after that election. In a damning conclusion, the report spells out the issue clearly:

The bedrock of our system of public administration is that the public service is apolitical, impartial and has a fundamental obligation to provide frank and fearless advice to the government of the day. Frank and fearless advice should be complete - it is not sufficient for public servants to avoid providing advice or recommendations simply because they believe the government of the day does not want to hear them (Victorian Auditor-General's Office 2015, p. vii).

These examples illustrate practice, procedural and institutional issues with CBA, such as: benefit innovations; risk and reward misalignments in CBA practice; optimism bias; government's commitment to projects prior to appraisal; policy capture; and, transparency. The point of itemising the issues with CBA in Australia is to provide the basis for a program of research.

## **2. Critiques of Australian CBA**

There have been a number of critiques of technical aspects of CBA in Australia, including wider economic benefits, transport modelling and discount rates (Dobes & Leung 2015; Evans, Burke & Dodson 2007; Terrill & Batrouney 2018). Searle and Legacy (2018) have identified problems with the appraisals of East West Link, WestConnex and Cross River rail, including inconsistency in the costs and benefits included, which reduces comparability between projects and indicates a bias towards favourable results in the CBA process.

While these technical arguments are of merit, the criticisms put forward in this article consider CBA as a subjective and political process, rather than an empirical and economic one. An argument could be made that some of the technical issues of CBA

are a result of the practice, procedural and institutional issues outlined in the following discussion.

## 2.1 Practice Issues

### *Options*

The prioritisation of projects and the closely related selection of alternatives for assessment has also been a feature of criticisms of CBA. A regularly cited advantage of CBA over other forms of appraisal is its usefulness in comparing different categories of projects and proposals, as all benefits and costs are estimated in monetary terms diverse projects such as defence, roads and health should be comparable (Brent 2007; Dobes 2008; Mishan 1982). However, in practice the range of options included in CBA for transport proposals in Australia is limited.

According to documents obtained through freedom of information requests, Transport for NSW have excluded rail projects from consideration for the transport improvements between Wollongong to Sydney, even though the journey time could be reduced from 90 to 60 minutes, with an estimated \$10bn in lower costs (Martin 2017a). Transport for Victoria (2018) has released the Melbourne Airport Rail Link: Sunshine Route Strategic Appraisal, a multi-criteria analysis of options for a rail service to the Melbourne airport. The analysis recommends that the Government's preferred route, through Sunshine, as the option that proceeds to a full business case, however at the three stages other options were ruled out even though they were close enough that a full CBA analysis may change the decision: the Sunshine route rated at 4.3 compared to the Craigieburn route at 4.1 for example (ibid., 22). Other examples of this omission of alternatives include the Western Distributor in Melbourne and the F6 Extensions and Western Harbour Tunnel and Beaches Link in Sydney (Martin & O'Sullivan 2017; McDougall 2017).

A possible justification for the exclusion of a diverse array of options from CBA may reflect the judgment of practitioners, that resources are better used on assessing and refining the proposal that is most likely to present the strongest case than comparing alternatives that are unlikely to provide the greatest return. When employed in the way that the literature suggests appraisal of transport proposals would consider a range of viable alternatives and result in a preferred option, as monetization of all costs and benefits provides comparability, opportunity costs reflect the value of alternatives, and the comparisons of NPV or BCRs ensure the best proposal is selected.

### *Innovations Bias*

Recent innovations that have been employed in Australian CBAs increase the estimated benefits of a project. The most widely known and used of these are Wider Economic Benefits (WEBs), which include agglomeration, labour market sorting and output change in competitive market and change in competition (KPMG 2015a, 2017; Vickerman 2007, 2008). WEBs are generally listed separately to conventional benefits, reflecting that the methodology for estimating is not completely settled and the application questioned (Dobes & Leung 2015). More recent additions include the use of congestion stress loadings in addition to travel time savings, and the first forays into modelling land use changes as a result of infrastructure as seen in the North East

Link Business Case (Ernst and Young 2018; Level Crossing Removal Authority 2017; PwC 2015).

However, there seems to be no similar rush to innovations that increase costs. For major projects such as WestConnex, the East West Link and Brisbane's Cross River Rail, the costs of traffic disruption during construction are not included (Searle & Legacy 2018). Given the result is increased travel time in the early years of the project; they are not significantly discounted, indicating the likelihood of significant impact on BCRs. For the Victorian Level Crossing Removal Project, disruption due to construction was included as a negative benefit, but were estimated at less than 1% of the total project costs (Level Crossing Removal Authority 2017, p. 214). Even standard costs associated with induced travel demand are frequently omitted or not covered in their entirety within transport appraisals (Infrastructure Australia 2016; SGS Economics and Planning 2016; Victorian Auditor-General's Office 2011, 2015). It is of note that induced demand theory is not new, the formative work is the triple convergence of routes times and modes from 1992 (Downs).

A primary example of this innovation issue is optimism bias, which has been a frequent topic in CBA literature over recent years but is rarely accounted for in Australia. The UK Government describes the problem as:

There is a demonstrated, systematic, tendency for project appraisers to be overly optimistic. This is a worldwide phenomenon that affects both the private and public sectors. Many project parameters are affected by optimism — appraisers tend to overstate benefits, and understate timings and costs, both capital and operational (Her Majesty's Treasury 2011, p. 29).

Flyvbjerg (2008, p. 4) recommends reference class forecasting to mitigate optimism bias as well as strategic misrepresentation, whereby a forecast “is based on knowledge about actual performance in a reference class of comparable actions already carried out”. The ATAP Guideline on optimism bias under the national places some emphasis on the analytical rigor to provide reasonable results. Given the issues raised in this paper, the recommendation that “policy settings providing incentives for project proponents to submit accurate and realistic benefit and cost estimates (Transport and Infrastructure Council 2018, p. 3) may prove a more fruitful approach.

It is also interesting to note that there is a case that innovations are reinforcing the notion that transport appraisal methods are biased towards roads. One example is the research indicating public transport journeys are more productive than those taken in cars (Lyons & Chatterjee 2008; Lyons & Urry 2005) has not been translated into benefit monetisation, even though as noted before, congestion loadings for road projects are beginning introduced.

In a system where plausible alternatives are rarely considered within a project appraisal, the effect of innovations biased towards increasing benefits is that it makes it easier to obtain positive net present values. When the benchmark is a benefit cost ratio of one rather than an alternate project that may have the same innovations applied, it is likely that the outcome of benefit innovations is that we more frequently go ahead with lesser projects instead of meeting the central CBA purpose of providing

insight to decision makers as the best economic option available. Whether innovations are leading to better decisions, the core purpose of CBA, is a pertinent question as each additional estimation method included within CBA comes at additional cost.

## 2.2 Procedural Issues

### *Timing and Transparency*

If CBA is intended as an input into decision making processes, then ideally it should be undertaken prior to funding announcements. However, politicians announce projects in the lead up to elections and prior to the completion of business cases, indicating the increasing use of infrastructure as a means of differentiation, as well as suggesting pork barrelling (Harris 2018; Terrill, Emslie & Coates 2016). This indicates a political advantage in announcing projects without the possibility of leaks, as well as opposition parties' lack of access to resources for project appraisal. For WestConnex, federal funding commitments were made by both major parties in the lead up to the 2013 election (Australian National Audit Office 2017). Construction commenced in January 2015 (Briggs & Gay 2015), 10 months prior to the completion of the WestConnex Full Scheme Economic Appraisal (KPMG). Infrastructure Australia upgraded WestConnex from 'Threshold' to 'High Priority Project' in April 2016, indicating that it is a project the Commonwealth should support, over a year after construction commenced and three years after funding commitments.

Along with timing, one of the most frequent critiques of CBA is the lack of transparency in the process, particularly the reluctance of governments to make appraisals public (Dobes, Leung & Argyrous 2016; Ergas 2009; Ergas & Robson 2009; Infrastructure Australia 2018). Calls for greater transparency are generally met with replies concerning the commercial in confidence aspects of the process, including costs as well as proprietary modelling and methodologies. The Productivity Commission (2014, pp. 92,3) were strongly in favour of making CBAs public, for projects that proceed as well as those that do not, as:

Making cost–benefit analyses public (with clearly documented assumptions) for both projects that have been selected, and those that have been rejected, greatly improves the transparency of decision making. Such transparency strengthens the incentives for decision makers to focus on the overall net benefits of projects. It also allows particular estimates (for example, of construction costs or patronage) to be debated and testing done on how the use of different estimates would affect the projects net benefits. Transparency can help to improve the quality of analyses because proponents and practitioners know that any flaws are likely to be exposed.

The connection is that both transparency and the timing of CBA are integral to providing opportunities for experienced practitioners, academic and the interested community to question, contribute to and influence infrastructure decisions. If projects are funded, announced and construction commenced prior to the completion and publication of CBA, then the result is a disenfranchised populace as there is little opportunity for critique and change. In light of the concept of greater public engagement in political processes, Denniss (2018, p. 65) calls for the Productivity Commission and its focus on costs and benefits to be replaced with a National Interest Commission, which would report on advantages and disadvantages not “to make such



big decisions, but to ensure that the parliament and the public are aware of the consequences of them”.

### ***Ex-Post Reviews***

Ex-post reviews are rarely carried out in Australia (Infrastructure Australia 2018), which means “there is no systematic and objective collection of lessons learned from past projects, to better inform the planning and execution of future projects” (Victorian Auditor-General's Office 2018, p. 8). The dearth of ex-post reviews of CBA is a “weak link” in transport appraisals, as they provide important bases for the development of methodologies, the refinement of parameters, the selection of viable options and be used to communicate and build consensus in decision making (Dobes 2017; Ergas & Robson 2009; Worsley 2015). These critiques indicate that without ex-post review CBAs claims to be rational can be questioned, as the continual calibration of theory against real results is central to rational decision making processes.

One example is the recent ex-post review of CBAs for Australian transport projects was undertaken by the Bureau of Infrastructure Transport and Regional Economics (2018a, 2018b). Twelve infrastructure projects across were included in the review, with the purpose of improving CBA processes, which provides four observations: the net present value (NPV) was over-estimated by significant margins in most of the selected case study projects; over-estimation in NPV was largely caused by over-estimation of road user benefits, with errors in travel time cost saving estimates accounting for 60 per cent of the total absolute variation between the NPV from the ex-ante CBA and that from the ex-post CBA; inaccurate traffic forecasts and methodology errors were mostly responsible for the over-estimated road user benefits; however, there was no systematic evidence of cost overruns for the projects selected for ex-post review (Bureau of Infrastructure Transport and Regional Economics 2018a, p. 1).

## **2.3 Institutional Issues**

### ***The politicisation of CBA and the decline of ‘frank and fearless advice’***

There is a question as to whether CBA is used to analyse projects, or as a tool to affirm and promote those already decided. This can be seen as the politicisation of external consultants engaged in policy analysis, which may occur with the use of ‘hired guns’ to provide analysis to support predetermined policy decisions (Perl & White 2002, p. 63). The victory of politics over economics can be seen in the evidence that transport infrastructure spending is predominantly occurring in swing states and marginal seats (Terrill, Emslie & Coates 2016). This politicisation was also noted by Dobes (2008, pp. 15, 6), who observed that “(i)t is often at the political level where the findings of an objective cost-benefit analysis can be the least welcome when a government has a specific, predetermined agenda”. Similarly, following an investigation into the effectiveness of CBA in Australian the public service, Sudiana (2010, pp. 28, 9) noted “it seems that public managers only use CBA when the analysis can support policy decisions that they want to produce”. The Victorian Auditor-General's Office (2015) report on the East West Link provides evidence of the decline of frank and fearless advice in transport infrastructure, and it is notable that the report indicates that it occurred under the Liberal Government in the lead up

to signing the contracts prior to the 2014 election as well as the cancellation of the project under the Labour Government following the election. This suggests the decline is not associated with political allegiance, but is embedded within the job regardless of the party in power.

Senior staff from Infrastructure Australia have also recognized this issue. On announcement of extended leave, Michael Deegan, the inaugural head of Infrastructure Australia lamented the “(g)rand announcements, 'funding commitments', glossy brochures, and project websites do not change these reasons ... Many proposals lack merit" (cited in Saulwick 2014a). Philip Davies, current Infrastructure Australia CEO, has called for a greater emphasis on CBA in project appraisal, but acknowledged that “this does not fit well when infrastructure investment is a vehicle for redistributing taxes back to the states and territories and winning political favour” (cited in Jewell 2018).

### ***Risk and Reward in the CBA Industry***

The banking royal commission indicates the problems that may arise when reward structures are not in alignment with community expectations. For agents within the CBA industry, including consultants, public servants and politicians, similar questions need to be asked as to what behaviours receive the greatest reward. The central question is whether for public servants and private practitioners, are the rewards greater for a unbiased appraisal of a project more or less than one that uses inflated values and dubious assumptions to achieve the preferred answer of the project proponent. For policy assessments such as CBA there is a tendency for “individuals and firms engaged in policy consulting could build close ties to decision-makers and work symbiotically with those in power (Perl & White, 2002, p. 62), indicating that objectivity may be at risk.

The example of the East West Link project, and subsequent Westgate Tunnel proposal indicates that the risks of poor assessments are low. A submission to the Senate Economics Reference Committee by transport planner previously engaged on the Western Distributor project provides an example of this problem, where there was ‘surprise’ that the same public servants and consultants who had worked on the East West Link business case, transport modelling and CBA were working on the subsequent Western Distributor project. The surprise is that the incoming Andrews government, as well as an Auditor General report, had been highly critical of the East West Link and the business case (Carbonell 2014; McDougall 2017; Victorian Auditor-General's Office 2015). Shortly after raising concerns with the Western Distributor transport modelling, McDougall was “taken off the (Western Distributor) review work without explanation”. Also of note is the Head of NSW Traffic Modelling has been cited as saying in relation to developing the business case for WestConnex:

I am tired of traffic being misinterpreted and misrepresented at meetings by other workstreams ... I am expected to take responsibility for traffic outcomes and yet I seem to have no say about what work is done and how the results are interpreted ... This creates enormous risk for the project ... and because if numbers are misrepresented this can have large design, economic and financial consequences and I won't be putting my name to incorrectly

interpreted numbers. There is already enough risk in traffic forecasting without the risk that the numbers will be used incorrectly (cited in Saulwick 2014b).

There are risks in traffic forecasting, as consultants have been sued when private roads do not meet the expectations of investors. ARUP was sued for overly optimistic Brisbane's Airport Link tunnel projections, and Parsons Brinckerhoff and Booz Allen were sued over traffic forecasts for Sydney's Lane Cove tunnel, and settled in 2014. Clem Jones Tunnel is another example, where AECOM settled for a \$2m payment out of court as a result of inflated patronage projections following the bankruptcy of the private operator, RiverCity Motorway (Wiggins 2016). Of these companies, ARUP no longer provides transport projections, Parsons Brinckerhoff and AECOM are currently working on WestConnex and Booz Allen has been taken over by PwC, who also provide CBA services. However, three consulting firms, PwC, KPMG, Ernst and Young, most frequently carry out CBAs in Australia. Internationally, questions are being raised about the Big 4 and the oligopolistic market in accounting and consultancy services, with the risks of regulatory capture and distorted markets (Brooks 2018; Dingwall & McIlroy 2017; Pai & Tolleson 2012).

Taleb and Sandis (2013, p. 3) refer to the need for people providing predictions in the socioeconomic domain to have 'skin in the game', that is have a personal stake in the outcomes, including reputational costs. If applied to CBA, the result may be that "(t)he odds go up that people will make consistent and well-informed choices when active institutions exist that reward reliable and punish unreliable choices" (Hanley & Shogren 2005, p. 14). These ideas about risk and reward with public and private sector policy assessment and CBA are integral to the problems identified in this paper. Greater responsibility and accountability in the public and private sector would be an important step in improving transport infrastructure decisions.

### ***Public and Private Sector Capacity***

As noted above, the provision of CBA services is concentrated in a small number of consulting firms. There has also been research indicating that there has been a decline in the capacity to assess CBA within the public service. With particular relevance to this discussion, Edwards (2009) reviewed the impact of New Public Management regimes, essentially a corporatisation of public service, on the federal Department of Transport finding an increase in strategic capacity coinciding with a reduction in analytical capacity and therefore the capacity to analyse and review CBAs. Dobes (2017, p. 2) concurs, considering that "a lack of formal standards, combined with the hollowing out of public sector expertise in economic analysis, now leaves Australian federal and state governments largely bereft of in-house capability to appraise reports produced by commercial consultants". While this is leavened in this context as transport is seen as an area where some expertise has been retained (Dobes et al., 2016), the complexity and size of transport infrastructure CBAs, as well as the 'black box' reporting of transport models provided by commercial providers are barriers to overcome in the assessment of externally prepared analyses.

Senator Nick Xenophon questioned the Commonwealth's spending on consultants, led to a Senate inquiry into Big 4 consulting firms, where a suggestion has been made that they see the Government as a dairy, as they are 'milking' it (Belot 2018). The Abbott Government reduced the public service by 15,000 jobs between 2013-14 and

2015-16, during this time contracts with the Big 4 consulting firms more than doubled from \$196.4 million to \$420.3 million, and total payments from 2013-14 to 2015-16 reached almost \$1 billion (Dingwall & McIlroy 2017). This doesn't include State Governments, but the trajectory is likely to be similar as the cost of CBAs is escalating: an appraisal of six route options for Sydney's North West Link cost \$150,000 in 2006, in 2012 the Ernst and Young business case for the same project was budgeted at \$1.4 million and ended up costing \$4.1 million (Douglas & Brooker 2013, p. 15). Earlier research in Canada indicated a negative correlation between the public service and consulting fees for policy analysis, supporting the 'hollowing out' of public services hypothesis (Perl & White 2002, pp. 53, 4). These examples reflect the observation of Vesely (2012), that the comparable salaries available in the private sector are a factor in externalization within certain aspects of government: economic analysts can be more handsomely remunerated by the consulting firms.

To increase the economic appraisal capability within the public sector, Ergas and Robson (2009, p. 5) recommended an independent centre of excellence for CBA, either a stand-alone body or within the Productivity Commission. Dobes (2017) points out that there is not an association of or professional accreditation for economists, anyone can take on the title and prepare a CBA, and recommends professional standards for the industry. While there is obviously highly experienced and diligent assessments of CBA taking place within government, the contrasting assessments of the WestConnex business case discussed in the introduction to this paper suggest that the private sector 'know where to hide the bodies', as one experienced practitioner put it in a recent conversation. This returns the discussion to the recurring theme of this paper, that politicians have control of the decision making process, they need to want to change and also invest in developing the capacity of the public sector to objectively scrutinize and question CBAs.

### **3. Conclusion**

CBA can be seen as an art, based on the decisions of analysts as much as the parameters and methods included in the ATAP Guidelines (Transport and Infrastructure Council 2016) or the various State gateway review processes. The critiques presented here a starting point for further research focused on obtaining greater value from CBA and the decisions regarding infrastructure in Australia at a pivotal juncture. The recent history of infrastructure development in Australia indicates that the rational, technocratic and objective decision making principles of CBA, have been subjugated to political imperatives, indicating the problems are not in techniques and methodologies, but in the decision making process. Our State Governments, with support from Commonwealth funding, are taking part in an infrastructure boom, we need greater assurance that the projects being undertaken are not just of value to the politicians making the announcement, but are the best option for the long-term transport needs of our communities.

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