

Introduction

The provision of both efficient and effective road infrastructure – and transport infrastructure more generally — is clearly vital to economic development. Increasingly, both national and sub-national governments have actively explored alternative funding and ownership arrangements for such economically vital transport infrastructure investments (Withers, et al., 1995; Worsey, 1999). Thus, the private sector has actively been encouraged by such governments to take the lead role in building, operating, 'owning', and subsequently transferring (hence the acronym, BOOT) economic rights to massive road infrastructure projects back to the sponsoring government. To date, there are five major toll roads that have been completed in Sydney and Melbourne: the M2, the M4 and the M5 Motorways and the Eastern Distributor all in Sydney, NSW, and City Link in Melbourne. Each of them is a BOOT project.

This paper's over-arching aim is to objectively review and analyse the impacts — economic, financial, and social — of the private sector in the construction, operation, and maintenance and quasi ownership of major toll roads in Australia. More specifically, it seeks to shed some light on the question of whether such private and public sector 'partnerships' are in the Australian community's overall best interests; or alternatively whether they are self-defeating, in that the solution they deliver is no more productive than the 'problem' they seek to solve.

Given the space limits, the analysis will focus on the M2 in Sydney, and City Link in Melbourne. The rest of this paper is divided into three main sections:

- a summary of arguments for and against private sector involvement;
- an assessment in respect of their economic, financial , and social consequences; and
- some overall findings and an outline of future research.

Summary of arguments for and against private sector involvement

Over the last decade or so, there has been almost a bifurcation of views on the most effective and efficient means of financing and delivering major road infrastructure projects in Australia. This section aims to present both sides of this crucial debate.

Arguments in support of private sector involvement

Executives of the actual private sector organizations directly involved in BOOT projects in Australia have been unequivocal in their support. For instance, a senior executive of Transfield, one of the primary private sector organizations involved in BOOT projects in Australia, put this view to the House of Representatives standing committee on federal road funding (1997).

The advantages to both Victoria and New South Wales of the BOOT approach, we believe, are significant. The risk of design and construction is

Private / Public Sector Australian Road Infrastructure Development: Is It Self Defeating?

J Odgers

passed to the private sector; no longer is the taxpayer saddled with the possibility of cost and time overruns. All of the BOOT road projects to date have come in ahead of schedule or on schedule and well within the time frame set by the public sector. Even so, if there are overruns, the private sector pays.

... Furthermore, the risk and responsibility for operations and maintenance is with the private sector (Australian Federal Government, 1997: CTMR 50; emphasis added)

This same executive then boldly asserts the inherent comparative efficiency of the private sector as compared to the public sector in terms of the actual 'delivery' of 'public goods'.

It is quite correct that governments can borrow more cheaply, *but the advantage of private sector delivery is that we can deliver it more cheaply and the cost of delivery and the efficiency of the operation far overwhelm any savings in the funding of the projects by government means.* Of course, when the government does fund something, it just looks at the cost of its debt and does not look at the cost of the risk. How does the government value a time or cost overrun on a project it is funding? How does it value a patronage shortfall on a project it is funding? If the government added to its cost of finance the cost of risk, then it might find it is quite close to the private sector cost of finance (Australian Federal Government, 1997: CTMR 52-53; emphasis added).

Another equally strong supporter of BOOT schemes is the senior management cadre of Macquarie Bank and its multiplicity of wholly owned subsidiaries. One of Macquarie Bank's senior corporate finance executives put these views to the House of Representatives Standing Committee (1997).

When you go through step by step—and we are happy to go through those—the case comes up pretty clearly that the private sector is much better, much more efficient, at providing these services as it is more efficient in providing steel, food, motor cars or anything else.

... Sydney's arteries are clogged. If you build a road, people are going to go on it. Network risk might be a theoretical problem but, when you look at the situation of the roads in Sydney, there has clearly been underspending over a number of years and it really is a practical area of concern. (Australian Government, 1997: CTMR 68).

Another senior executive senior from Macquarie Bank offered this explanation when questioned about the complex legal structure that Macquarie Bank has developed in respect of the four most recent Australian BOOT toll roads.

The reason we did that, unfortunately, was driven by the tax rules we have which, of course, had been set up in an environment before private sector

became involved in infrastructure. The problems we have are 51AD, 16D, 6C—that is, the taxation of trusts and whether they carry on businesses versus owning land. (Australian Government, 1997: CTMR 70).

Another positive supporter of BOOT projects is the Public Accounts Committee of the New South Wales government, which concluded that

public-private partnerships are in most cases the only way to go to meet NSW's infrastructure needs over the next six years, provided three important principles are borne in mind:

1. There should be maximum transparency in all public-private sector deals.
2. There should be maximum competition in bidding for such deals.
3. Private participation in such deals should result in a net benefit to the public (PAC, NSW, 1994: 5-6).

Arguments against private sector led road infrastructure projects

Several independent observers have strongly questioned both the private sector's motives and the economic validity of its leading role in road infrastructure arrangements.

Withers et al (1995) of EPAC note that 'private ownership of infrastructure can sometimes lead to further efficiencies and thereby help the community to get more from its investments' and private financing of projects will also

allow greater spending on infrastructure without the need to increase government borrowing *this should not be a compelling reason for private financing, as the macroeconomic effects are broadly similar whether the public or the private sector borrows the money.* However, governments do not always feel free to increase borrowing, even if the money is earmarked for good investments (EPAC, 1995: x; emphasis added).

Withers et al (1995) of EPAC conclude:

... the Task Force remains of the view that, in the broad, BOOT-type structures are likely to be least advantageous for urban roads. In reaching this conclusion, it considers that the incremental efficiencies from private ownership are likely to be smaller in roads than in other sectors and the private financing penalty more pronounced owing to greater network risk and higher transaction costs (EPAC, 1995: 45).

Harris (1996) as New South Wales Auditor General registered a strong concern about undesirable income re-distribution consequences of several BOOT projects.

However, in the audit of these transactions, we have seen a number of issues that lend support to the view that the private sector's profits from the provision of infrastructure have often been based on public sector losses.

These issues relate: to the appropriateness of private sector ownership; to the role of the private sector and the balance of risks and rewards; to the competence of the public sector in negotiating balanced deals and to the appropriate pricing of finance that is underwritten by the State. These issues have arisen to a greater or lesser extent in all of the complex financing deals with the State that we have audited since 1992 (Harris, 1996: 1).

Another observer who echoes the concerns of Harris (1996) about the public sector's relative naivete in negotiating such complex deals is noted economist, Professor Gordon Mills.

In the course of the negotiations, my feeling about it is—and I have to say that this ‘seems’ to be the case because the great unwashed public is not privileged to have the inside information—that *typically the company outsmarts the government people and ends up with rather generous terms, which may include fairly substantial subsidies for the project, either in cash or in kind in terms of the use of the land and so on.*

Again, the final contract at the end of those negotiations contains concessions that were, as far as I can gather, not offered in the original invitation to tender, in at least some cases. In particular, that final package, the one that comes out of all of those negotiations, is not tested in the marketplace to see if it would be accepted by another tenderer at a lower price and, hence, giving a better deal to the public sector. (Mills, in Australian Federal Government, 1997: CTMR : 126; emphasis added)

Perhaps the most damning of all critics of such BOOT projects are Walker and Walker (2000), both self-proclaimed economic rationalists. First, they state that the main reason for the establishment by State governments in Australia of the ‘financial arrangements for private sector involvement in infrastructure development were ... to enable governments (or individual agencies) to embark on major capital projects while avoiding borrowing restrictions imposed by the Loan Council (Walker and Walker, 2000: 190).’ Later they note the following impact.

In effect, the new Loan Council arrangements reduced the restrictions on private sector involvement in infrastructure construction projects, while creating positive incentives for governments to get involved in such deals. They had more to do with concealing the extent to which governments were (in substance) borrowing than on revealing the scale and cost of financing (2000: 197).’

Walker and Walker (2000) are equally blunt in their overall conclusions about such new road infrastructure funding arrangements:

The new arrangements:

- are very popular with both governments and the private sector;
- have concealed the full scope and scale of financial dealings of governments from both taxpayers and financial markets (Walker and Walker, 2000: 202).

Walker and Walker further argue that 'any surrendering of rights (to future cash flows or profits) in situations where the government could have financed and managed projects themselves amounts to a loss to the community (Walker and Walker, 2000: 202).' In passing, this is a crucial yet apparently unheeded argument against the continuing use of such financially 'engineered' and less than totally transparent private-public sector 'partnerships'. A little later, Walker and Walker state quite alarmingly that

... the public sector is essentially underwriting the financial returns of private sector investors. If investors have not enjoyed the cumulative rates of return specified in a BOOT contract, the public sector must defer its share of the revenues -- or take a smaller slice -- until the private sector investors have been accommodated. If the contract has not delivered the promised cumulative real rates of return as originally promised in the contract, then the term of the contract may be extended until it does (Walker and Walker, 2000: 215; emphasis added).

Yet, without proper controls and scrutiny, the finances of a government could be burdened by guarantees and the loss of revenue which might otherwise be going to government coffers ... Unfortunately, it may take a decade or more before the impact of lost revenues is discernible in the finances of state governments in Australia, and even then such analysis will be partial (because all governments have indulged in privatisation to some extent in the quest for short term financial flexibility)' (Walker and Walker, 2000: 216; emphasis added).

In brief overall summary, the supporters of such BOOT schemes base their endorsements around three main grounds. First, that government-funding restrictions create a significant impediment to the timely completion of much needed large scale road infrastructure projects. Second, the private sector is inherently more efficient than the public sector, and therefore able to deliver more efficient outcomes. Third, private sector leadership in such high cost, and high risks projects alleviates the potential financial burden of taxpayers who fund public sector financed projects. Opponents of these projects refute each of the advocates arguments. The resolution of this dilemma is becoming more urgent. What then, empirical data is available to assess the impacts of these massive private-public sector road infrastructure projects? It is to these data our comments can now be turned.

Assessment in respect of their economic, financial, and social policy consequences

Economic assessment

Economic assessment of infrastructure projects can either be at the macro level, that centres on assessing the optimal economic allocation of government resources to road projects and the distribution of these resources to specific projects, or at the micro (or project specific) level. Of the usefulness of the macro-level approach, the conclusion advanced by Kinhill Economics (as cited in Webber, 1994) is that negative ‘the econometric studies it reviewed were subject to two main criticisms.’

First, the results were very sensitive to the selection and specification of the data, which the studies employed. Secondly, the results did not establish causality ...

...Kinhill (further) stated

The results of the (computer) simulations do not appear to be useful for the determination of either the total budget appropriate for roads expenditure in each category, or of where or when such expenditure should take place (Kinhill Economics, 1994, p.18)

Perhaps then, the more useful means of assessing such private-public sector partnerships is to compare their actual economic outcomes against those economic objectives framed at the start of their economic ‘lives’ on a case-by-case basis.

This paper’s focus is on Melbourne’s City Link and the M2 Motorway in Sydney. In respect of City Link, the project’s eleven objectives from the State’s perspective were detailed in the Melbourne City Link Act (MCLA) (1995) at Section 2 of Schedule 1. Of most relevance to this paper are that the Victorian government aimed to ensure that:

- (iii) road and infrastructure programs be implemented on a competitive basis;
- (vii) greater competitiveness in Victorian industry be promoted;
- (viii) economic benefits be optimised and financial costs be minimised.

It is imagined that the act that was passed in the New South Wales Parliament for the M2 Motorway, some time earlier had similar objectives. Discussion now turns to a brief assessment of these two BOOT projects against these three objectives.

The M2 and City Link are, in respect of objective (iii) above extremely hard to assess, given the nature in which they were conceived, legislated, and kept well away from public scrutiny (Baragwanath, 1996; Harris (1994; 1996); Odgers, 1999). Overall, however, both the NSW Auditor General and the Victorian Auditor General gave them a qualified ‘tick’ in respect of the tendering and selection processes.

Assessing either of them in respect of either objective (vii) or objective (viii) are equally hard, given the just noted limitations of macro econometric assessments. One would be at least partially convinced of the success of the M2 and City Link in achieving both these objectives were the actual toll way usage figures at least equal to the those detailed in the

relevant prospectus. In this respect, The NSW Audit report (2000) of M2 presented some disturbing findings.

The ... actual traffic was 48 per cent below that forecast in the Base Case Model for the first month of operation. *As at the end of May 2000, traffic was approximately 15 per cent below that forecast in the Base Case Model.*

The traffic projections used in the debt re-financing financial model are on average approximately 19 per cent lower than the traffic projections reported in the original Base Case Model over the period 1999 to 2019 (New South Wales Auditor General, 2000: emphasis added).

Figure 1 details the impact of this 19% reduction in projected daily traffic volumes on the M2. Based on these figures, it would appear that both to date, and over the next two decades, then, the M2 has fallen and will continue to fall rather short of its projected delivery of economic benefit to the NSW economy. This is because the major component of the projected economic benefits of all BOOT road projects is the value of travel time savings.

Figure 1: Average daily traffic (ADT) : M2 Motorway.

Year	Original Base Case Estimates	Estimated ADT Under Financial Restructuring
1999	76,621	60,294
2000	78,267	64,287
2001	79,989	67,006
2002	81,691	69,046
2003	83,383	70,659
2004	85,094	71,942
2005	86,794	72,821
2006	88,496	73,558
2007	90,200	74,182
2008	91,902	74,713
2009	93,740	75,530
2010	94,659	76,289
2011	95,576	76,999
2012	96,497	77,666
2013	97,416	78,295
2014	98,335	78,891
2015	99,254	79,458
2016	100,173	79,997
2017	101,092	80,513
2018	101,598	81,007
2019	102,103	81,481

(Source: New South Wales Auditor General (2000): Review of M2 Motorway Documentation, report to the NSW Legislative Council, 21 June : downloaded from HYPERLINK <http://www.audit.nsw.gov.au> on 23/06/00

Recent research has shown that the average travel distance to work in Sydney 'has changed very little, with the average [work] trip duration being 32 minutes in 1991 as

compared to 32 minutes in 1997 (Battelino and Mendigorin (1999): 637).’ That is, the construction of toll roads in the late 1980s and early to mid 1990s, has not reduced average work trip duration time. These data are totally consistent with the Constant Travel Time Budget theory, which reveals that ‘the constant travel time budget of an average half hour journey to work applies in every city no matter how it invests in infrastructure, and it was found in the UK to apply to cities there over the past 600 years (SACTRA, 1994). Newman and Kenworthy (1999) use these data to refute the claimed time savings generated by the increasing development of high speed freeways.

Other studies have shown that cities are always about "1 hour wide" regardless of how people travel, whether on foot or on high speed freeways (Marchetti, 1994). Thus the time savings claimed by the models are never real but are transferred into land use change which means people just travel further in the same time (Newman and Kenworthy, 1999: 430).

One plausible conclusion from such international data is that vehicular travel demand is both essentially a type of *derived* and *stimulated* demand (Wigan and Morris, 1981: 64). That is to note that the more and faster roads which are built and made available to the travelling members of large cities, the greater the use (or demand) for them, in order to be able to travel further in the 'budgeted' amount of travel time (Newman and Kenworthy, 1999). Such a conclusion is especially concerning when it has been calculated that the cost per kilometre travelled (KMT) for cars in Sydney has been estimated at 61 cents for the force flow case, compared with 28 cents per KMT for buses and 39 cents per PKT (1999: 283) for trains. (Diesendorf, Hutabarat and Banfield, 1999: 280; 283).

The situation in relation to City Link’s ‘economic benefits and financial costs’ as specified in objective (viii) of the Melbourne City Link Act (1995) is also less than clear. Given the need for brevity, the following sketch will have to suffice. First, the official cost-benefit analysis undertaken by Allen (1996) is limited by both conceptual or statistical weaknesses (Odgers and Wilson, 1999). Second, the ‘ramp up’ rate on which the cost-benefit study and the Prospectus were both predicated has been subsequently shown to be optimistic. The evidence comes from several sources. One is the following statement released by City Link’s private sector ‘owner.

The prospectus projections have therefore been modified to take into account the facts that all sections of the Link are not yet open and usage patterns have not yet been stabilised. The actual transaction volumes set out above, represent 87 per cent and 96 per cent respectively of these modified projections (Transurban City Link limited and Controlled Entity Annual Report, Year ending 30 June 2000: pp. 25-6).

A second piece of supporting evidence come from this writer’s analysis of the month by month traffic usage figures for City Link provided to the Australian Stock Exchange by Transurban Limited. *In brief, actual average weekday vehicle movements on City Link at*

the end of calendar year 2000AD are in total some 30% less than those volumes forecast in the 1996 City Link Prospectus. The actual negative variances for the City Link in the year ending December 2000 are:

Western Link: -19.6% below prospectus forecast
Southern Link: -41.4% below prospectus forecast
Aggregate -30.1% below prospectus forecast .

In sum, then, City Link has not, thus far, yielded the economic benefits on which it was originally justified.

Financial analysis

The appropriate balance of balance of risks and rewards, which is critical to the economic outcomes of BOOT projects, is extremely difficult to credibly assess. Internationally, Worsey (1999) concludes 'that although great strides have been made over the last ten years to transfer risk from the public to the private sector, the public sector will always remain the bearer of the ultimate risk of project failure, especially with flagship [transport infrastructure projects in the UK] projects (1999: 507)'. If such is the case, then EPAC's conclusion about the potential risk to the traffic flows on privately owned roads from non tolled road alternatives becomes even more concerning, at least from the 'public interest' perspective.

All of the BOOT projects covered in this paper are funded by a combination of private sector contributed debt and equity, coupled with direct government financial contributions. Bank debt and CPI bonds provide the most substantial component of their finance. For instance, total debt finance of some \$1,605 million was reported in the M2 Prospectus (1994) and the Transurban City Link Prospectus (1996). Equity is the other component. According to the prospecti, the total amount of private sector funded equity required was \$640 million (185 million for the M2 and \$455 million for City Link). In addition, the respective state governments of New South Wales and Victoria, through the Road Transport Authority (RTA) and the Melbourne City Link Authority (MCLA) have financially contributed to the tune of some \$312 million to the construction phases. In sum, then, these two BOOT projects required estimated total funding around \$2.5 billion.

Another common and most important aspect of both the M2 and Melbourne's City Link toll roads is the nature of the contractual obligations and rights of the private sector BOOT 'partners' *vis a vis* the respective state governments. In summary, both the enabling acts of parliament placed great accent on the nature and length of the Concession period on which the ultimate financial fate of the projects rested. During this period, the private sector owners and operators are legally entitled to secure revenue from users through the imposition of tolls, and obliged to compensate the State for this economic transfer of privilege via the payment of concession fees over the life of the concession. For the M2 this concession period was legislated at a 'maximum period of 45 years (M2 Prospectus, 1994: 4); for City link an estimated 33.5 years. The actual encashment of these concession fees is however contingent on the actual achievement of

Private / Public Sector Australian Road Infrastructure Development: Is It Self Defeating?

J Odgers

a pre-tax internal rate of return, of some 12.5% for the M2 (M2 Prospectus, 1994: 22); and 17.5% for City Link (Transurban City Link Prospectus, 1996:).

A recent report by the New South Wales Auditor-General (2000) on the M2 Motorway in Sydney is therefore worth considering in some detail.

The financial return to Government is in the form of base rent and incentive rent ... The payment of base rent can be made at Hills' option by cash or by issuing negotiable non-interest bearing promissory notes to the RTA.

..

The rate of return shown in the Base Case Model, combined with the 'cash flow smoothing' rationale outlined below indicates that the State may not receive these payments until the end of the contract. Hills may not perceive any commercial incentive to repay, earlier than obliged, what is in effect an interest-free loan.

The impact of traffic risk on the State is that the RTA may not receive any incentive rent, and may not receive the base rent as cash until the end of the project term. A further risk to the State is that Hills may not have, for any reason, sufficient funds to pay the rent owed to the RTA at the end of the project term (NSW Auditor General, 2000: emphasis added).

Tanner (1999), a former member of the Australian Stock Exchange Limited, has raised very serious concerns both about the accuracy and the probity of the financial statements prepared for the M2 AND City Link alike. In respect of the M2, he declares that

The Trust has paid out two 'dividends' to shareholders of 4.0 cents and 1.9 cents from non-existent profits to avoid tax liabilities. The Group is now involved in serious dispute with the Australian Taxation Office since the amount of "dividend" is essentially the value of the promissory note issued to the NSW Roads and Traffic Authority of NSW in lieu of payment of leasehold rent (Tanner, 1999: 2).'

Tanner later notes that the 'ATO is refusing to recognise this unpaid amount as an expense of the Trust for which a tax deduction is being claimed (Tanner, 1999: 8)'. If this were to crystallise, the Trust, according to Tanner would be required to make a further tax payment of \$10.9M.'

The financial situation with City Link is even more concerning. Between 1995 and 30 June 1999, Transurban has claimed as deductions the full face value of these promissory notes (ie, \$319.6m). The Melbourne City Link Authority on other hand has reported them at a discounted value of \$75.9m. Thus there is a difference of some \$240m b/n the tax deduction claimed and today's value of these Promissory Notes to Victorian community. At a tax rate of 33%, this equals \$80m foregone tax revenue.

The other potential financial loss to the public sector is a 'basic risk that governments may be surrendering extremely valuable rights to the private sector which, where these

Private / Public Sector Australian Road Infrastructure Development: Is It Self Defeating?

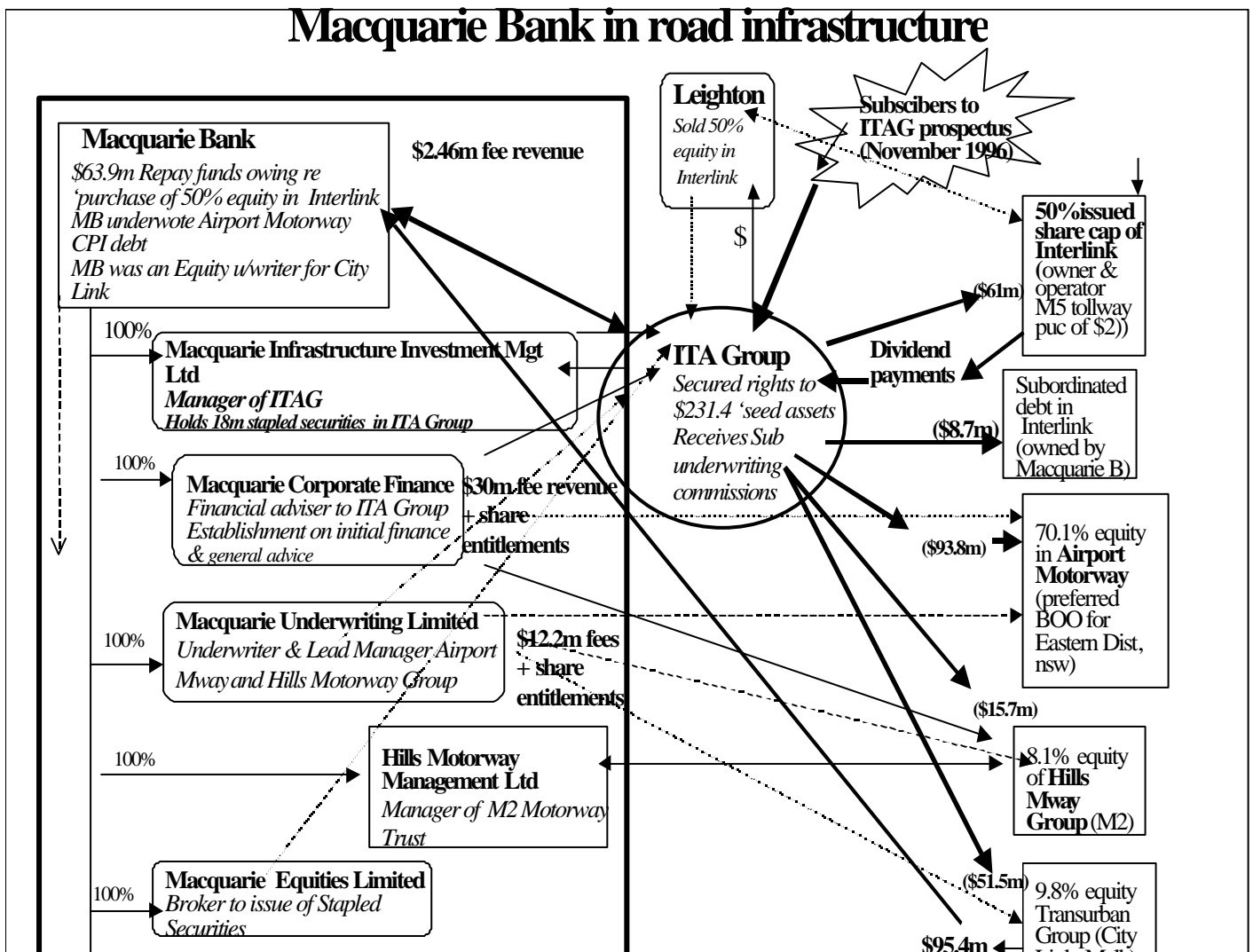
J Odgers

projects could have been directly financed by government 'amounts to a loss to the community (Walker and Walker, 2000:202). For City Link, based on information provided in the 1996 Transurban prospectus, the total money value of these surrendered but valuable rights, specifically revenue from tolls paid, amounts to over \$10 billion between now and the end of the 33.5 year concession period.

Another element of the financial analysis of these five BOOT projects undertaken was to investigate the scope of the involvement of the major financial corporation, Macquarie Bank, involved in securing the billions of dollars of capital they required. **Figure 2** shows, Macquarie Bank is at the very core of the complex funding and ownership arrangements that are central to the private sector's increasing role in Australian road infrastructure provision.

For a start, Macquarie and its subsidiaries earned close to \$50 million, exclusive of a range of underwriting commissions and share entitlements, during the finance-raising phase of the toll roads in question.

Figure 2: Macquarie Bank's involvement on BOOT projects in Australia



Macquarie's potential income generating capacity is additionally augmented by its direct ownership of the managers of the trusts established for the M2 (Hills Motorway Management Ltd) and City Link (City Link Management Ltd) as shown in **Figure 2**.

Based on an analysis of the respective prospecti, the aggregate of such on-going management fees is some several million dollars per annum in management fees over the period of the government provided 'concession'. Thus, during the next three to five decades, Macquarie Bank will earn additional fee income in the tens of millions of dollars.

Third, Macquarie, through its subsidiary, Macquarie Infrastructure Investment Management Limited, issued a prospectus inviting applications by the public to purchase securities in Infrastructure Trust of Australia Group (ITA), to permit ITA to be floated on the Australian Stock Exchange. As specified in **Figure 2**, ITA Group purchased 'a 50% equity interest in Interlink, the owner and operator of the M5 Motorway for \$61.6 million (ITAG Prospectus, 1996: 22)'. ITA also purchased 70% of the equity of Airport Motorway (the preferred Build, Own and Operate tenderer for the Eastern Distributor); and it acquired 8.1% of the equity of the Hills Motorway Group (the successful bidder for the M2 Motorway); and it secured 9.8% of the equity of Transurban Group Limited (the successful bidder for Melbourne's City Link). The ITA Group will accordingly share in the dividend streams of each of these BOOT projects, as well as potentially earning substantial capital gains on its investments.

Lastly, **Figure 2** demonstrates the very complex cross-transference of both equity and debt capital both within the Macquarie legal structures and between this financial empire and its private-sector borrowers and savers alike. At the time of writing, the Transurban City Link Limited Unit Trust Annual Report for the year ended 30 June 2000 provides more recent evidence of such mutual financial transactions:

The Trust loaned \$94.5 million to Macquarie Bank Limited (MBL) to enable external investors to invest in Land Transport Notes issued by the Company [Transurban City Link Limited and Controlled Entity]. The Trust receives

interest on the loan at 8.5 per cent per annum from MBL (Transurban City Link Limited Unit Trust Annual Report for the year ended 30 June 2000: Note 18, p. 13).

More recently still, a senior executive from Macquarie Bank, has been appointed to the new Victorian Government's recently established Private-Public Sector Infrastructure Planning Committee (see News release, Office of the Premier, May 16 2000).

Social policy consequences

The Melbourne City Link Act (1995) clearly specified the following further objective for City link: '(xi) adverse environmental and social impacts along the Link and its feeder roads be minimised. (MCLA, 1995: 138)'.

Unfortunately, the chance of this eventuating was questioned right from the outset. The Editor of The Age on 3 November 1995 put these concerns strongly:

Now that the long-awaited details have been placed before Parliament - and we applaud the disclosure - we discover that the true toll of Australia's most costly road project could be measured in terms of social sacrifice as well as money.

... when announcing the project three months ago, Mr Kennett assured Victorians that the state was not underwriting it. There are grounds for believing that the latest plan impinges on this promise.

In conclusion the Editor (1995) offers this comment.

It is to Mr Kennett's credit that he attempted to spare the taxpayers these risks by transferring them out. It would be a great pity if any guarantees given to Transurban compromised these intentions. It would be an even greater problem if Melbourne was forced to go into the first half of the next century with its entire transport policy hamstrung by the need to ensure that a private developer is assured of a profit (The Age, 3 November 1995: Editorial Opinion).

The last comment about the need to ensure a private developer a profit is most telling. Indeed, at least some Melburnian motorists in the North and western parts of that city, since the introduction of tolling on the Western link of City Link on 3 January 2000, have chosen to use alternative, non tolled routes rather than pay the toll. Cauchi and Costa (2000) briefly report on the findings of a report prepared for the Moonee Valley Council by Cox, a transport-planning specialist. This report stated that:

Traffic on the Tullamarine freeway had fallen from 150,000 vehicles a day to 90,000 a day since tolls were imposed south of Moreland Road.

Private / Public Sector Australian Road Infrastructure Development: Is It Self Defeating?

J Odgers

[The Mayor of Moonee Valley] said that in some sections of mount Alexander Road, traffic had increased by up to fifty per cent since tolls started on 3 January.

The City of Moonee Valley has supplied the following table (see **Figure 3**), based on actual traffic counts within its municipal borders both before and after the imposition of tolls on the Link's western section. It clearly depicts a substantial increase in traffic volumes along the first zone of the Western link of City Link. Such growth in traffic through both arterial and more alarmingly residential streets has significant social costs, in terms of such issues as loss of local amenity, increased road maintenance costs that have to be borne by local communities through their local councils, and increased potential for major traffic accidents and injuries. Such external costs need further and substantive research.

At a macro-level, such massive private sector led BOOT road infrastructure projects are also socially divisive. All economic cost-benefit analyses that are done to justify these projects must use a weighted average value of travel time savings (VTTS) to achieve the simplifying assumption of identical users, or *homo economicus identicus*. However, here has been a wide range of specific monetary values given to this weighted average VTTS. For instance, Pisato and Robinson (1999: 691) employ two different average weighted VTTS values of \$9.75/hr for valuing household timesaving, and \$12.85 for valuing network timesaving. The Allen Consulting Group (1995; 1996) used a figure of \$19.15 /hour (Allen Consulting Group, 1995: 22). This lack of consensus is most disturbing when one acknowledges that the major proportion of the benefits estimated for any road infrastructure investment proposal is the monetary VTTS. If no consensus is possible, then the projected VTTS must always be subject at least to sensitivity analysis. In addition, there is 'still debate about whether small time savings should be valued (eg Meyer and Gomez-Ibanez, 1981, as cited in Pisato and Robinson, 1999: 698)'. This debate is relevant to the value of travel time savings, especially on high speed motorways, since the average length of a single trip in Sydney is some 7.5 kilometres.

Figure 3: Increased traffic volumes on alternative major roads after tolling started

Location	Pre toll volume	toll % Change in Av. Week 24 hr volumes since start of tolling						
	Average week 24 traffic volumes	Jul-99	Mar-00	Apr-00	May-00	June 2000	Jul-00	Aug-00
Buckley St (east of Milleara Rd)	13700		-1%	-2%	-5%	-7%	-11%	-7%
Bulla Rd (sth of Fway on/off ramps)	33400		13%	15%	14%	13%	10%	10%
Mt Alexander Rd (nth of Thistle St)	24200		20%	21%	17%	14%	15%	18%
Mt Alexander Rd (at Debney Park)	17900		61%	60%	55%	53%	48%	46%

Private / Public Sector Australian Road Infrastructure Development: Is It Self Defeating?

J Odgers

Pascoe Vale Rd (sth of Loeman St)	19800	18%	22%	19%	18%	15%	17
Racecourse Rd (east of Stubbs St)	28700			13%	16%	9%	8
Canning St (at Teagarden Reserve)	24000	5%	4%	3%	1%	3%	-2
Milleara Rd (sth of Keilor Park Dve)	29800	2%	4%	1%	3%	2%	1
TOTAL	191500						10.9

Another substantial criticism of the *homo economicus identicus* assumption is that it totally disregards any economic (income) distribution effects. Sapkota (1999) for instance, criticises this 'traditional analysis' of cost-benefit. Using a deterministic user-equilibrium route choice model to stimulate the behaviour of drivers in response to road toll charges, wherein

drivers in different income classes are assumed to have different trade-off between paying a price versus saving a minute of travel time, the simulation reveals significantly different traffic diversions, and consequently different toll patterns in the case of non-identical road users. In terms of welfare implications, the results indicate that lower-income groups are the most affected by pricing. When all routes are subject to marginal cost pricing, low income drivers are more worst (sic) off. On the other hand, the higher income groups are the likely winners, particularly when pricing is only applied on portion of the urban road network (Sapkota, 1999: 773).

The OECD (1997) delivers a much broader criticism of conventional economic cost-benefit studies.

... social indicators should be evolved to monitor trends and impacts, and to provide a system of early warning of growing imbalances, social disbenefits, dissatisfactions and emerging social needs. Major efforts should be stimulated to devise social indicators that will permit social components to be fully taken into consideration when evaluating cost and benefit in technological innovation (OECD, 1997):

Even putting aside such broad, social equity issues, there is evidence of large-scale cross-subsidisation of business travellers on the five toll roads discussed in this paper by 'private' toll road users. Odgers and Wilson (1999: 926), for instance, in their analysis of City Link, concluded that 'private users are cross-subsidising commercial and business users to the tune of \$549 million (in 1993 dollars), or 44% of their hypothetical savings over the course of the toll (concession) period.'

Overall findings and an outline of future research

The force of the arguments advanced by both supporters of private-public sector 'partnerships' in road infrastructure projects and opponents thereof that have been reported is, to this writer's mind, ultimately based on one's position in respect of several highly contentious issues. These are about such issues as (i) the most appropriate roles of

Private / Public Sector Australian Road Infrastructure Development: Is It Self Defeating?

J Odgers

governments and the private sector in such large infrastructure projects; (ii) the actual or perceived limitations on governments' ability to raise new development equity / debt; (iii) the claimed efficiency 'dividend' that private sector leadership and project responsibility delivers; and (iv) the net community benefits that occur when the direct users of infrastructure, rather than taxpayers *in toto* pay for the benefits they receive in its use. One area of future research is clearly then to further investigate and analyse each and all of these broad issues.

At a more specific level of argument, it is still too early to tell whether such massive, economic resource-intensive, and enduring private-public sector road infrastructure projects are effective and efficient solutions to traffic congestion problems, or whether they are ultimately self-defeating. However, this paper's evidence and analysis strongly supports the view that such private-public sector road infrastructure projects are at best self-serving, and at worst economically marginal and socially inequitable. In sum, the quest for a long-term, economically responsible 'solution to the traffic problems that justified them *ab initio*, indeed qualify for inclusion in the genre of 'wicked' problems, that is those in which 'attempts to solve them lead to unforeseen consequences, often exacerbating the original problem itself (Rittel and Webber, 1973, as cited by Batty (1980: 431).'

The following observation offered by Newman and Kenworthy (1999) is thus perhaps a fitting overall conclusion to this paper:

The past few decades of transport decision-making have been based on approaches that suggest that the provision of faster flowing road traffic will be an overall benefit to the urban economy, whilst the provision of infrastructure for mass transit (especially rail systems) will inherently be a drain on the economy. However, our data show the reverse to be true. Cities with the most roads have the highest proportion of their city wealth needed for transport, whilst those with the most rail have the least proportion of their wealth absorbed by transport (1999: 427).

Another clear area definitely requiring further research is that mentioned by Newman and Kenworthy — namely, what are the real and sustainable economic benefits of the provision of 'fast flowing road traffic' as compared with the provision of funds for the large-scale development of mass transit systems. Another clearly needed research area is a far more complete and sophisticated quantification of the dollar value that road users put on their 'travel time savings', given the noted problems with the extant methodology, and robustness of the constant travel time budget theorem. A third required research agenda is the undertaking of credible, both cross-sectional and longitudinal research on the 'external costs' of very large, private-public sector road infrastructure projects.

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J Odgers

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J Odgers

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Private / Public Sector Australian Road Infrastructure Development: Is It Self Defeating?
J Odgers