

The misallocation of public money for both public and private transport infrastructure

Submission to the Productivity Commission

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ABSTRACT

The purpose of this submission is to:

- (a) expose the widespread misuse of cost-benefit analysis (CBA) to obtain funding for uneconomic infrastructure projects
- (b) explain certain features of risk allocation

The steps in the process that lead to uneconomic infrastructure projects in NSW are as follows

- The CBA of the project as required under the NSW Environmental Planning and Assessment Act 1979 is falsified by the proponent.
- The false CBA is accepted and endorsed by the NSW Department of Planning and Infrastructure.
- This endorsement of the false CBA is potentially illegal because it contravenes section 283 of the Regulation 2000 to the 1979 Act which states that it is an offence to use false and misleading information in any document relating to project consent.
- The Minister for Planning declares that a project is State Significant Infrastructure (SSI). This declaration means that the Minister is of the opinion that the project is essential for the State for economic, environmental and social reasons, pursuant to section 115V of the E P & A Act. This declaration of SSI essentially allows evasion of responsibility for economic performance.

Four case studies illustrate this process in practice.

- (1) Expansion of the Northern Sydney Freight Corridor (NSFC), a public sector project
- (2) Widening of the M2 Motorway, a private sector project.
- (3) NorthConnex, a public private partnership currently in development.
- (4) WestConnex, a proposed public private partnership to be announced.

Three examples of risk allocation are given in relation to the financing of the above cases

- (1) Patronage risk involved in road projects
- (2) Financial risk due to failure to take into account the time value of money.
- (3) Financial risk to the State and Federal governments through an alliance with the private sector

The submission concludes with comments on the probity issue raised by the Productivity Commission in its recent Draft Report (page 381). A new Infrastructure Act is proposed with penal provisions which would have the effect of removing consent powers from the States in the provision of infrastructure whether public, private or in partnership arrangements.

1. Detailed examination of four cases of the misuse of CBA

1.1 Expansion of the Northern Sydney Freight Corridor (NSFC) between North Strathfield and Broadmeadow

This project illustrates the process that has been used to obtain sovereign funds for a project which is uneconomic and likely to cause operational difficulties on the main Northern rail line as the projected freight demand will exceed the system capacity.

Transport for NSW, proposed an expansion of the Northern Sydney Freight Corridor (NSFC) by adding a third track to the railway line between Epping and Thornleigh. An increment of line capacity of about 4% was to be obtained by adding 6.1 km of new track between Epping and Thornleigh in parallel to the existing northern railway line of total length 151.94km between North Strathfield and Broadmeadow. Three additional segments consisting of two passing loops and an underpass added an extra 5.6% to the increase in capacity. Thus the overall increase was 9.6%. The total cost of the four segments was estimated to be \$1.1 billion

However, figures provided to the author by the NSFC have claimed¹ that this relatively small increase in capacity would be capable of carrying an additional amount of freight of 4.65 million gross tonne/annum by 2030. The current usage of the corridor was therefore checked by the author using Rail Corp data obtained under GIPA (FOI) and it was found that in 2012, 6.7 million gross tonne was moved. The additional amount therefore represents an increase of approximately 70% in tonnage for an increase in capacity of only 9.6%.

Also, according to the NSFC program, by 2030 the main Northern line will be carrying an additional 108 interstate container freight trains per week to move this freight despite the constant capacity limitation. If this forecast is correct, it suggests the likelihood of future operational difficulties for the entire Northern rail system.

No transportation modelling has ever been presented to support the concept which appears to be a costly ad hoc attempt to increase capacity similar to the localised widening of a main road.

As pointed out in an earlier submission to the Commission (Goldberg, 2014, submission no.084), to provide economic justification for the project,

¹ Letter from the NSFC Program (Transport for NSW) 28 May 2013. Reference 2480560_1

a cost benefit analysis was commissioned by Transport for NSW from the accounting firm Deloitte. This analysis derived a benefit-to-cost ratio (BCR) of 3.0. The author's audit of the Deloitte analysis showed that this value was not credible as it was nearly 5 times the value of 0.63 obtained by the author using the same data.

This audit was the substance of the author's earlier submission (no. 084) referred to above. The author's doubts about the validity of the Deloitte result were emphasised by a peer reviewed cost benefit analysis of road widenings (Goldberg, 2010). This analysis showed that increasing the capacity of an existing facility does not result in a proportionate increase in benefits

In these calculations "benefits" are defined as the differential cost savings obtained by using rail instead of road transport. Thus the meaning of the Deloitte result is that it is cheaper to use rail freight than road transport, whereas the author showed that the opposite is true. The Deloitte analysis would have created the bias needed in favour of rail and the rail expansion.

On the basis of the Deloitte result, the Commonwealth contributed about \$800m and the NSW government about \$200m. Such a large sum has been misallocated.

It is unfortunate that the Commonwealth Minister for Infrastructure and Regional Development accepted the Deloitte result and ignored attempts by the author to set the record straight². The author believes it is in the public interest to place on record certain aspects of the unsatisfactory process connected with this project.

Access to the Deloitte analysis was denied to the author under GIPA on the grounds that the Department of Planning and Infrastructure did not have a copy despite the fact that this Department was the consent authority and was bound to have had access to it.

A different reason was given to the author by Transport for NSW for withholding the Deloitte document. It was claimed that the document contained "sensitive commercial information" which could not be released until the contract was signed. On inspection this "sensitive" information appeared to be nothing more than inflated freight demand figures which were used to obtain the benefit-to-cost ratio needed for economic justification.

² Letter from the author 14 December 2013, the Minister's reply 21 January 2014,

The Minister for Planning and Infrastructure had declared that the NSFC program was “State Significant Infrastructure” (SSI) under section 115V of the E P & A Act. This meant that the project was essential for the state for “economic, environmental and social reasons” Why was such a declaration necessary? The first reason is that the Deloitte result could be used to justify the SSI declaration; this would be a classic case of a “work back”. The second is related to the requirement under the administrative rule of the Nation Building Program (NBP2) that requires a proper cost-benefit analysis to be carried out to justify funding of a project.

In summary, a very large sum of public money amounting to over \$1 billion has been misallocated for an uneconomic and incompetent project. It should also be placed on record that the construction contract was awarded to Leightons before development consent was granted.

The case emphasises the need for serious attention to probity issues as raised by the Productivity Commission in its recent Draft Report (2013). The author believes that the matter is serious enough to warrant the introduction of an Infrastructure Act with penal provisions. Such an Act would have the effect of removing the consent authority for large projects involving public money from NSW government departments.

1.2 The widening of the M2 Motorway

Although this project was a private venture, it is included for two reasons:

- (a) It illustrates the improper approach of the private sector to economic evaluation, because it is aware that a favourable economic outcome is an important factor to encourage investment, and to ensure the approval of the NSW Department of Planning and Infrastructure for development consent. This consent must satisfy the provisions of the Environmental Planning and Assessment Act 1979, but as already shown such approval is likely to be given irrespective of the outcome of any economic assessment.
- (b) It illustrates the finding (Goldberg, 2010) that a relatively large expansion of existing infrastructure, in this case 50%, does not result in a proportional increase in benefits. This result has already been shown to have relevance for the NSFC rail project and for other proposed road projects such as WestConnex discussed below. This study also showed the importance of taking account of uncertainties in all key variables, not only the discount rate

1.2.1 The Transurban economic analysis for the M2 upgrade

The cost benefit analysis (CBA) for the M2 upgrade was prepared by Transurban and is published at Appendix E of the M2 Upgrade EIS. (Hills M2, 2010)

The results of the author's peer reviewed analysis (Goldberg, 2010) cannot be reconciled with the Transurban result. The detailed reasons for the very large discrepancy [BCR = 0.27 (Goldberg)] as against [BCR = 3.4(Transurban)] have now been analysed in detail and reveal a systematic attempt by Transurban to incrementally misrepresent all key numerical factors in the analysis. In legal terms such misrepresentation could be termed "innocent", but the overall intention is unmistakable.

The results of the two analyses are tabulated in Table 1 below. The results of the author's analysis and its uncertainties are qualified statistically. Transurban's unqualified results are given as they appear in its Road User Cost Benefit Analysis (RUCBA). The detailed reasons for the gross differences are given in the notes related to the specified quantities in Table 1. .

TABLE 1. Comparison of Transurban's results with those of the author.

Quantity	Author's value over 36 years (95% fiducial limits)	Authors mean value	Transurban's value (over 30 years)	Notes (see below)
Travel time savings	\$77.1m to \$299,1m	\$188.1m	\$1609.0m	(1)
Savings in accident costs	\$0.27m to \$1.05m	\$0.65m	\$33.0m	(2)
Savings in vehicle operating costs	-\$8.36m to -\$69.3m	--\$39.6m	\$41m	(3)
Total		\$149.15m	\$1683.00m	
CAPEX=\$500m	BCR	0.29	3.4	

Transurban's value of \$1683m for total savings is at least ten times greater than the author's mean value of \$149m. The reason for this very large discrepancy, amounting to an order of magnitude is now analysed. The BCR generated by Transurban did have the effect of

ensuring acceptance of the project under the NSW Environmental Planning and Assessment Act 1979.

The then Minister for Planning, Kristina Keneally had announced on 27/2/2009 that the M2 upgrade was “critical infrastructure” and that the project was “essential for the state for economic (author’s emphasis), environmental and social reasons”.

The environmental impact statement (EIS) issued 9 months later (20/11/2009) included the cost-benefit analysis by Transurban which justified the declaration that the project was economic, despite the author’s peer reviewed analysis which showed that it was not. This strongly suggests that the economic performance of the project was predetermined and then the Transurban CBA was developed to satisfy the predetermination. We see here a very similar modus operandi to that which was used to justify the NSFC rail project as described above.

1.2.2 Travel time savings (note 1)

- Transurban’s valuations of travel time savings did not take any account of actual traffic density data on the existing M2. Nor was there any reference to the properties of the local area road network which supplies traffic to the M2.
- Transurban’s modelling of traffic flows has a fundamental weakness. It is impossible to predict (or validate) with any confidence the usage that will occur on new links in a road traffic system from a calibrated model even though that model can reproduce with reasonable accuracy the pre-existing traffic flows and speeds.
- There is a profound difference between calibration and validation. Transurban was unable to show how it arrived at a mean speed increase of 40km/h on the widened M2. A study by the author of the statistical distribution of traffic densities on the existing M2, showed that the probability of such an increase in mean speed is zero and the most probable value is 10km/h.³
- Transurban claimed that the road user would value his time at \$23.08/hour. Transurban failed to understand that a motorist in congested traffic would consider that his time is more valuable than would be the case in free flowing traffic. The higher valuation of time it has used is therefore inappropriate because it is incompatible with the free-flowing traffic which is the basis of Transurban’s CBA. The

³ This matter was dealt with by Andrew West in the SMH 10 September 2010.”Review disputes benefits from widening of M2”.

- generally accepted value used by competent consultants in the Sydney region is \$14.00/hour (Masson, Wilson, Twiney, 2000).
- Transurban clearly had problems with choosing an appropriate discount rate to calculate its present values over 30 years. Transurban is operating a toll road, not a public road. A toll road has a limited concession life and carries a financial risk. By treating the M2 as a public road and adopting the widely accepted social discount rate of 7%pa⁴, Transurban was able to multiply its cost savings by approximately a factor of two compared with the author's use of the value of 13.7%pa (Goldberg, 2009) based directly on the calculation of Transurban's financial performance. Transurban's sensitivity analysis based around the 7%pa discount rate is therefore meaningless.
 - In summary, the factors used by Transurban in its economic fabrication are (1) = 4 times; (2) = 1.65 times; (3) = 2 times. The cumulative factor is 13.2 times. When this is applied to Transurban's benefit-to-cost-ratio (BCR) of 3.4 the result is 0.26 whereas the author's value for BCR is 0.29. The relatively small difference in mean values could be attributed to the different evaluation periods (30 years for Transurban and 36 years for the author)

1.2.3 Savings in accident costs (note 2)

- Transurban has claimed that widening the M2 Motorway has resulted in a "favourable risk profile". But this claim is unconvincing for a number of reasons. Transurban claimed that the savings in accident costs would amount to \$33m over 30 years. The actual value calculated by the author was only \$0.65m over 36 years a value derived from 13 years of actual RTA crash data on the M2 together with accident cost data from the Bureau of Infrastructure, Transport and Regional Economics (BITRE, 2006).
 - The Transurban result has clearly been fabricated because there is no reference whatsoever to the RTA M2 Motorway data base of which Transurban must have been aware, or to the BITRE (2006) results. Moreover, the Transurban result for relatively large savings in accident costs is being misinterpreted by that organisation as evidence of a "favourable accident profile" for the widened road. This claim is not supported by the results of the author's analysis.
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1.2.4 Savings in vehicle operating costs (note 3).

Abelson (1988) using NAASRA data showed that vehicle operating costs are a function of speed as the main parameter. The relationship is U-shaped. At low speeds the operating costs are very significantly lower than at higher speeds. The negative sign in the author's results reflects this situation. The savings are actually costs. Transurban's result is inconsistent with reality, as it calculated the savings in costs on the basis of an "average speed of 40 km/h". But as shown in note (1) this claimed average speed is four times as great as it should be if it were properly based on the actual M2 traffic densities.

1.3 The proposed NorthConnex road tunnel

This project was an unsolicited proposal by Transurban, a toll collecting conglomerate. Acceptance by the NSW government would have the effect of raising its profile as an infrastructure provider of substance despite its financially impaired state (Goldberg, 2013).

The National Infrastructure Coordinator in 2012 reported⁵ that the benefit to cost ratio (BCR) for this project stood at somewhere between 0.57 and 0.74. In the words of the Coordinator, the current proposal would "destroy" economic value. The discount rate for this evaluation was unstated, but it is possibly 7%pa, the usual social discount rate used in RUCBA.

A second evaluation by the consulting organisation Sinclair Knight Merz (SKM) (2004) gave a BCR for the type. A tunnel option of 1.2 (tolled) and 1.4 (untolled). SKM is assumed to have used the social discount rate (SDR) of 7% pa. However, this SDR is inappropriate for the private sector which involves tolling as discussed below.

If a discount rate is used which includes a risk component such as that provided by the Capital Asset Pricing Model (CAPM (Adcock and Clark, 1999), then this higher discount rate would very likely reveal that the project is uneconomic. (Goldberg, 2009). The presence of a private partner in an alliance with sovereign funders as shown in Table 2 below would require this higher discount rate to be used. (Goldberg, 2009, 2010).

⁵ National Infrastructure Co-ordinator-Report to Minister for Infrastructure and Transport on Private Financing Options for Upgrades in Sydney M5 and F3-M2 Corridors-March 2012

TABLE 2. Funding for the NorthConnex road tunnel

Contribution source	Amount (\$billion)
NSW government	0.405 (capital)
Federal government	0.405(capital)
Transurban	0.6 (equity)

But the economic non-viability is only one factor to be taken into account. The second important factor is the need to recognise the impaired financial position of the Transurban partner in any decision to fund this project.

An examination of the accounts over the 13 year period 2000-2012, shows that the total annual toll revenue from all Transurban's roads over the 13 years from 2000 to 2012 was \$5.79 billion. With other sources of revenue the total came to \$9.59 billion, but the total expenses were \$10.43 billion leaving a total loss of \$0.84 billion. Moreover, in 2012 the long term debt was \$4.49 billion.

Yet Transurban managed to pay distributions of \$2.1 billion over the 13 year period despite this loss. Up to the year 2008 the distributions were paid out of increased borrowings. A different arrangement to pay distributions was entered into post-2008 and is described in the author's submission to the Senate Inquiry into the Australian Securities and Investments Commission (ASIC) (Goldberg, 2013) A key element in Transurban's financial position is the asset valuation. By 2013, 82.6% of the total assets were intangible and therefore unrealisable.

Moreover, the capital used for the construction of a road is "sunk" and the valuation of the completed project depends on its profitability only. A road cannot be used for any other purpose except to carry traffic which may or may not ensure its profitability (Goldberg, 2009). A building on the other hand has real estate value even if it is unoccupied.

The implication of the above comments is that Transurban has no adequate collateral to offer capital providers. Therefore the \$600m of equity which it will provide to assist in funding NorthConnex has to have a proper asset base which it lacks.

The problem therefore is to determine whether there is an artificial price in play for its securities. A High Court decision in June 2013 (AFR, 28/6/13)⁶ has broadened the legal definition of artificial price to include securities where previously it applied only to commodities.

The origin of the Transurban security prices has been examined in detail by the author in his submission to the Senate Inquiry into ASIC (Goldberg, 2013). The Senate submission is complex and for the purposes of this submission a more simple explanation is considered appropriate. The graph in Figure 1 below shows the relationship between the average market capitalisation values of Transurban securities versus the number of securities on issue over a 12 year period. The correlation between the two variables is statistically significant (Pearson R = 0.9).

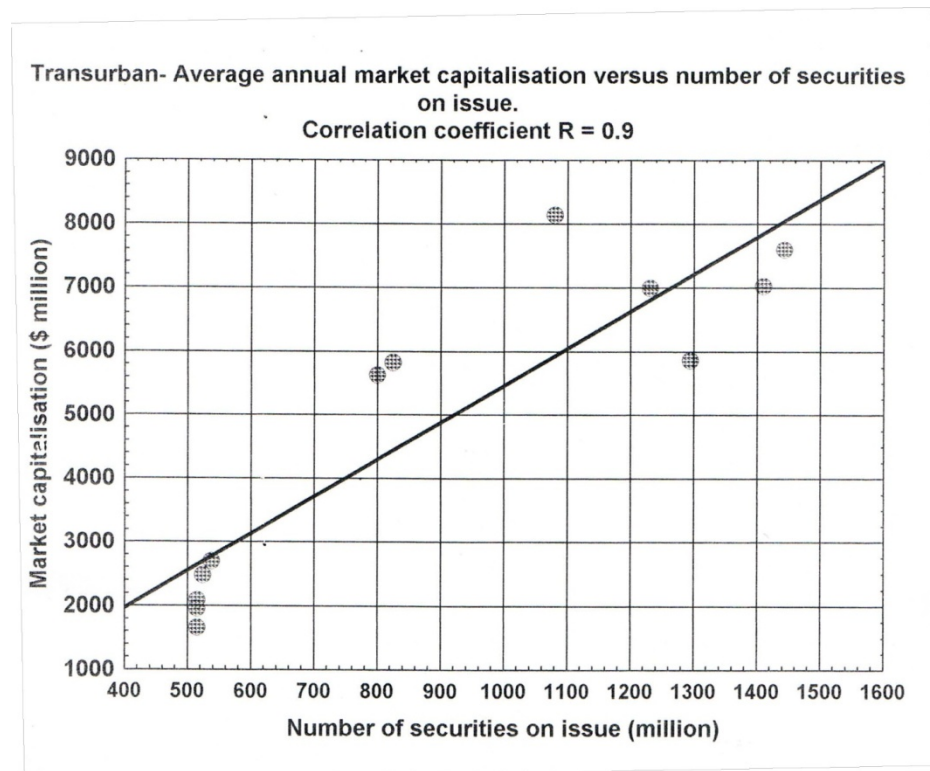


Figure 1

The relationship shown in Figure 1 reveals the potential for manipulating the market capitalisation (and therefore the security price) by increasing the number of securities on issue.

⁶ Director of Public Prosecutions (Cth) v JM [2013] HCA 30

The Australian and NSW governments therefore need to recognise the financial risk of partnerships of this type as they may be required in the future to fund shortfalls which they did not anticipate. This is discussed below.

1.4 The WestConnex road tunnel proposal

A BCR of 2.55 is claimed for the WestConnex motorway (WestConnex Business Case, 2013). As a substantial part (9-10km) of the motorway is to be constructed by widening the M4 motorway by one lane, or an increase in capacity of 16%, the claimed BCR is suspect. As previously discussed, widening existing roads does not result in increased benefits in proportion to the capacity increase. On the contrary, it only increases benefits by a relatively small percentage. (Goldberg, 2010)

Moreover, increasing capacity will generate traffic by induction (Litman, 2009) and the gains in productivity for businesses and freight may be cancelled by increasing congestion. Traffic flows in the Sydney region strongly suggest that it is impossible to beat demand for road space by increasing the road supply. Increasing the capacity will almost certainly result in traffic induction which will reduce the travel time savings claimed to amount to a discounted value of \$15, 410m.

The business case for the WestConnex includes benefits from increases in reliability (\$2,603m) and productivity (\$3,402m). These inclusions have artificially inflated the BCR but their quantification by the NSW government is suspect for the following reasons.

- Reliability. has to be measured in terms of journey time variability. It is a function of the mean speed of traffic on the motorway and the variance of speeds about the mean. It cannot therefore be specified by a single quantity as claimed by the proponents.
- Productivity can only result from the development of what is known as an “agglomeration economy”. Benefits can accrue to businesses from being near one another. (Haughwout, 2000)

but an investment in a roadway development such as WestConnex is really subsidising the dispersion of jobs and has the potential to reduce productivity.

- The paradoxical situation described above makes it more difficult to accept the quantification presented in support of this road. Moreover, reliability and productivity are non-standard items in CBA usage. It is therefore suggested that WestConnex may well prove to be yet another case where public money will have been misallocated for illusory benefits

2. Comments on risk and its allocation

The Productivity Commission in its Draft Report (2014) has drawn attention to the consequences of inefficient risk allocation. At page 381 of the Report, the matter is canvassed of placing certain probity related obligations on potential suppliers, such as an obligation not to be involved in potentially corrupt activities.

In the author's experience such an obligation has been systemically evaded not only by suppliers of infrastructure but also by government agencies such as the NSW Department of Planning and Infrastructure as already described above in this submission.

Some examples are given in the following section.

2.1 Patronage risk in relation to road infrastructure.

The author has forecast the financial collapse of a number of road projects (Goldberg, 2006). The most recent example is the Brisconnections Airport Link tunnel which collapsed in November 2012 (Goldberg, 2012). The analysis (Appendix A) used probability theory to show that the patronage figures were consistent with a work back from the promised returns to equity investors⁷. A total of about \$4.8 billion was liquidated in the collapse involving debt and equity. A class action for \$450m was instituted against the traffic forecasters Arup

⁷ The correlation coefficient (Pearson R) between the equity internal rate of return and forecast traffic volumes was 0.96.

2.2 Financial risk due to failure to take into account the time value of money

Money received or paid in the future does not have the same value as at present because of the existence of positive interest rates. Only if the prevailing interest rate was zero would future values be the same as present values. A positive interest rate means that today's dollars will become more valuable in the future; hence future payments are worth less now; just as a distant building looks tiny.

Therefore when funding a project is partly dependent on user payments collected in the future, the value of these future payments has to be discounted to present values. The funding of the WestConnex proposal is said to involve such user charges in an attempt to provide partial funding for the project.

2.3 Financial risk to the State and Federal governments through an alliance with the private sector.

This risk is illustrated by the case of the NorthConnex road proposal already referred to which involves the financially impaired Transurban toll road owner and operator in a partnership with the Australian and NSW government. The method of equity raising by Transurban and the real value of its securities (Goldberg, 2013) should be carefully canvassed by the two governments.

As described above, there is potential for Transurban and any other partner to create an artificial price for its securities by market manipulation. When considered in relation to a lack of tangible asset backing, a financial risk is created that cannot be readily hedged. A default by Transurban will place additional financial stress on the governments. There is also a similar financial risk involved with funding the WestConnex road proposal.

3. Concluding remarks

The cases given in this submission illustrate how cost benefit analysis has been used to justify the funding of uneconomic projects by public and private money, either separately or in combination.

The Productivity Commission has canvassed this probity issue in its Draft Report (page 381). The Commission suggests the greater use of codes of practice which

“set obligations on the businesses that deliver projects on behalf of government clients”.

It also suggests that the scope of codes of practice be extended

“to place certain probity related obligations on potential suppliers...such as an obligation not to be involved in potentially corrupt activities”.

The author suggests that the case studies described in this submission should create serious doubts that such an approach will be effective in reducing the misuse of cost-benefit analysis.

As expressed by the Chairman of the Productivity Commission there is a potential for a reduction in Australia’s AAA rating and this decline in Australia’s financial standing would have serious flow-on consequences. (Australian Financial Review, 2014)⁸

The author suggests instead that a Commonwealth Infrastructure Act be introduced with force in all states for major infrastructure projects. It should contain penal provisions for any contravention that misleads or misrepresents any matter that is in the public interest in relation to infrastructure.

The powers of consent for any project using Australian Government funding would thus be removed from organisations such as the NSW Department of Planning and Infrastructure which has misused these powers. The suggested model is the NSW Independent Commission Against Corruption Act 1988. This Act is based on the idea that the public interest is paramount.

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⁸ “Project spree risks AAA rating”. (Joanna Heath) Australian Financial Review Thursday 13 March 2014

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Goldberg, J. L. (2013) The failure of the Australian Securities and Investments Commission to undertake an enforcement action in a case of market rigging involving the securities of the Transurban Group. Submission to the Senate Inquiry into ASIC (Submission No, 148). (PDF copy attached-Appendix B)

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Appendices

Appendix A

Goldberg, J.L. (2012) The Brisconnections Airport Link: the inevitable financial collapse of a five billion dollar megaproject. Submission to the Super System Review 2009 (Updated, 2012). (PDF copy attached).

Appendix B

Goldberg, J. L. (2013) The failure of the Australian Securities and Investments Commission to undertake an enforcement action in a case of market rigging involving the securities of the Transurban Group. Submission to the Senate Inquiry into ASIC, submission no.148. (PDF copy attached.

This submission has full parliamentary privilege granted by the Senate Economic References Committee.