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CROSS CITY TUNNEL

Analysis of traffic projections and financial viability

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DRAFT SUMMARY OF FINDINGS

1. TRAFFIC PROJECTIONS

There are two sets of traffic projections for the Cross City Tunnel (CCT). The first set is given in the Environmental Impact Statement (EIS) [1] and is properly based on demography and land use/transport interaction. The projections are reasonably consistent with the trends observed in the RTA screenline counts (SL6) on the eastern side of the tunnel location. The second set of traffic projections is concealed within the Base Case Financial Model, part of the CCT contract... As shown below, these latter projections are very much greater than those given in the EIS. The origin of these projections and their significance is as follows.

The financial model can be shown to be based on an algorithm similar to that used by the Macquarie Bank in promoting investment in privatised road infrastructure, such as the Hills M2 Motorway and Transurban City Link [2]. The author(s) of the CCT model are for some reason not stated in the Summary of Contracts document. The only information given [3] is that:

"The RTA had received and was satisfied with an audit of the Trustee's and Company's base case model for the project".

The general scheme of the algorithm is as follows. Having specified an internal rate of return (IRR) for equity investors, the traffic volumes and tolls necessary to produce sufficient revenue to pay these investors the promised dividends are obtained by a work back process.

This approach enables the promoters of these toll road schemes to explain deficiencies in dividend payouts as due to "traffic risk", whereas the false traffic volumes had been created by the work back in the first place. In the case of the Hills Motorway M2 and Transurban City Link, dividend deficiencies are compensated simply by increasing the long-term debt of the projects.

Such large traffic volumes also create the false perception that there will be a high future demand for the new road space. This is another factor that would tend to mislead investors.

[1] Masson Wilson Twiney (2000) Technical Paper No.8 Traffic and Transport. Cross City Tunnel Traffic Flows. p.61.

[2] Goldberg, J.L. (2005) Toll road operations in Australia: A critical examination of the financial and economic realities. 28th Australasian Transport Research Forum 05. September.

[3] Cross City Tunnel: Summary of contracts. (2003) Conditions precedent. Page 18.

The projected AADT traffic volumes for the CCT as derived from the financial model data are as follows.

YEAR	2006	2016	2034
VOLUME	88,791	109,239	197,043
TOLL ($)	2.75	3.06	3.49

In the AM two hour peak period, the level of service for motorists in the year 2016 for example, would correspond to extensive queuing and delays in the four-lane tunnel These conditions would make the facility unusable as an effective bypass road and is therefore highly unlikely to attract toll paying motorists.

From economic data[4] it is estimated that the value of the time saved would be less than 5% of the toll paid. In other words, the CCT financial model shows that as conditions deteriorate for road users in the form of increased congestion, the road user will pay more for the privilege of using the facility. This situation defies the general economic relationship between supply and demand.

On the other hand, the traffic projections for the tunnel given in the EIS are very different as these are properly based on the interaction of land use, demography and transport.

The EIS data shows the following trend:

YEAR	2006	2016
VOLUME	52,720	59,472
TOLL ($)	2.50	2.50

The EIS projections can be shown to correspond to an acceptable level of service in the AM peak period. It has proved impossible to reconcile these traffic projections in the financial model with those in the EIS that are properly based on the interaction of land use and transport.

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[4] Spiller Gibbins Swan Pty. Ltd (2000) Economic Assessment. Technical paper No. 22. p.43

Figure 1 summarizes the sets of traffic projections, highlighting the very large discrepancies .between the sets.
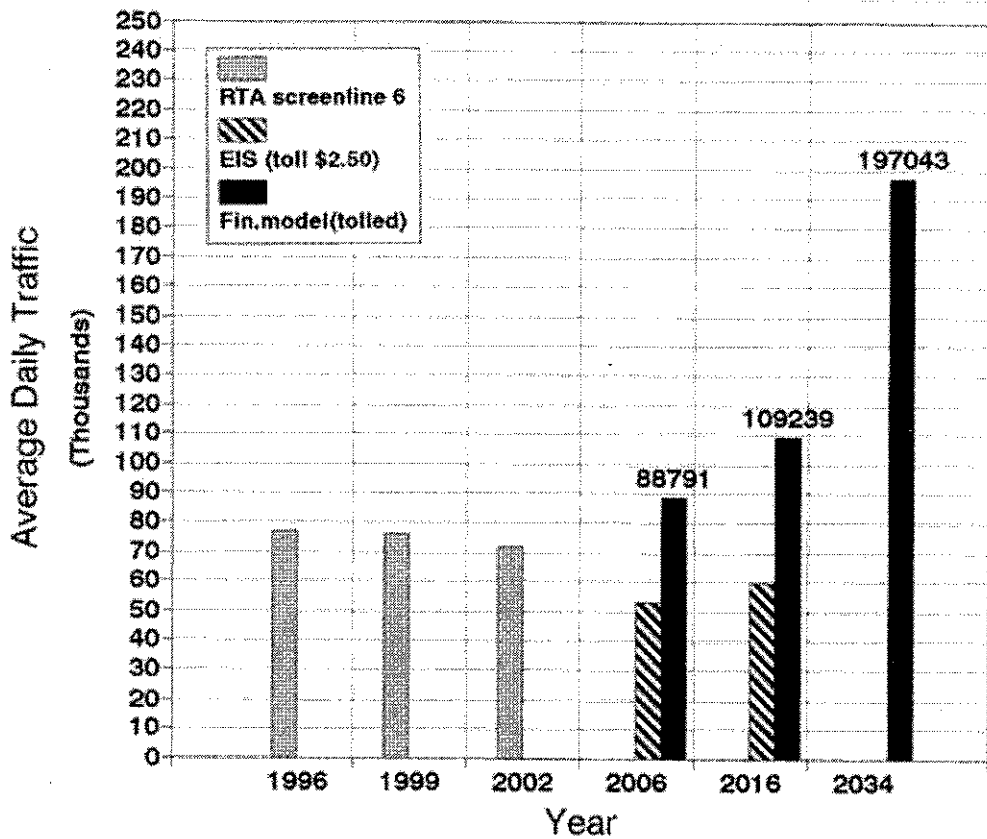

Figure 1. This diagram shows the magnitudes of the traffic
projections for the Cross City Tunnel. The EIS
projections are compared with those derived from the
Base Case Financial model. Also shown are the
traffic trends established earlier by the RTA from
actual traffic counts across the screenline no. 6 on the
eastern side of the tunnel.

2. FINANCIAL VIABILITY

According to the economic assessment by Spiller Gibbins Swan, the RTA claimed financial viability for the CCT on the basis of the EIS traffic volumes and toll of $2.50.

Analysis of the Base Case Model shows that there is no financial viability even if the traffic volumes were somehow to reach nearly 200, 000 vehicles/day.
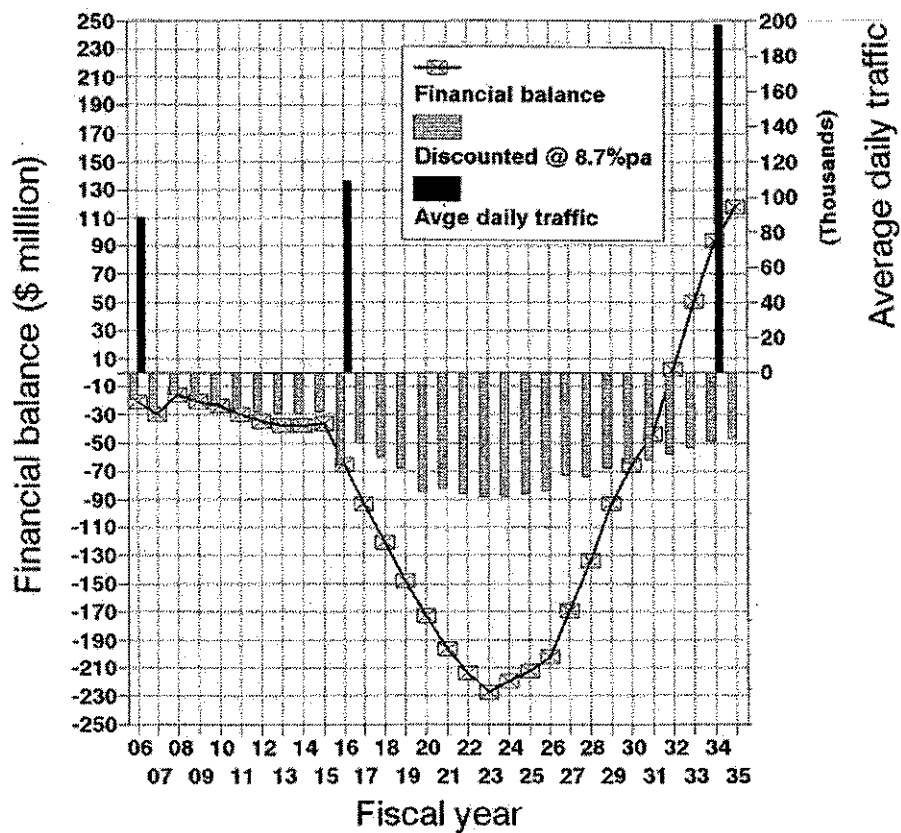

Figure 2. This graph shows the carried forward financial balance derived from the differences between the net profit after tax (NPAT) and the equity dividends paid to investors . After discounting at 8.7% pa, the net financial balance is negative even if the traffic volumes were to reach nearly 200 000 vehicles/day. It is concluded that the projected equity dividends cannot be paid and that the CCT project is not financially viable.

Figure 2 summarizes this situation. The financial balance was obtained from the model by subtracting the equity dividends from the net profit after tax (NPAT). The differences are carried forward over the entire concession period. It will be seen that financial balance is zero at 2032 and becomes positive, reaching $117m approximately at 2034. It so happens that this surplus is the same as the senior debt amount, on which interest has been paid throughout the concession period. But the author(s) of the model have failed to discount the balances to obtain their real or present value which is actually negative (approximately $48m).

This result shows that equity dividends of the amount specified in the model cannot be paid. Also, it is impossible to see how debt can be amortized. The entire debt of $605m is claimed to amortized between the year 2025 and the year 2035. Also there is no evidence that debt service charges are to be paid for any debt in excess of the senior debt. This is just one more factor that emphasises the financial futility associated with this project.

It is possible that the Cross City Motorway (CCM) Group has doubts about the viability of the project. One notes for example, on page 15 of the Summary of Contracts document that CCM consists of the company **"Cross City Motorway Pty. Ltd.** and the trust, **Cross City Motorway Property Trust..** If Cross City Motorway were a single entity with limited liability the profit and loss account for the company would determine its financial status. But the existence of the Trust which holds most of the equity capital, would mean that failure of the company might transfer the onus to the trust unit holders. What Cross City Motorway would hope is that limited liability of the company might extend to the trust as well. A court may find, on the other hand, that the company/trust arrangement is a sham and order the lifting of the "corporate veil". To the writer's knowledge, there has never been a legal test of this matter in the courts. The risk for CCM remains.

There does not appear to be any compensating financial mechanism which would ensure a satisfactory equity return At least in the case of Transurban City Link for example, the lack of profit to pay dividends is compensated by increasing the long-term debt. It needs to be emphasized that this overall negative result is occurring at a time when the traffic is nearly 200 000 vehicles/day. This result shows conclusively that the CCT project is not financially viable.

3. Concluding remarks

In the Summary of Contracts document the RTA declared its satisfaction with the audit of the base case model developed by the Trustee and Company of Cross City Motorway. This is the only reference to ther financial model in the entire document and is dated December 2002.

But as shown in this submission, the Base Case financial model is false and misleading. The traffic projections have little or no connection with those based on the interaction of transport and land use. They are shown objectively to have been derived by a work back process from the dividends promised to equity investors. When these dividends are not forthcoming this outcome will be blamed on the traffic shortfall (this is the so-called "traffic risk").

This methodology has been used in the financial arrangements for Australian toll roads since 1994. It will be used again for the Lane Cove Tunnel which according to the released documents for the CCT, *"is subject to a tender and financial evaluation substantially similar to that adopted for the Cross City Tunnel"*.

As the CCT has been shown to be not financially viable even if the traffic volumes were to reach nearly 200 000 vehicles/day, It therefore seems pointless to continue its financial protection by restricting the usage by motorists of alternative surface routes.

APPENDIX: <u>STRUCTURE OF THE CCT FINANCIAL MODEL</u>

The financial model is structured so that the traffic volumes and tolls necessary to ensure a required internal rate of return (IRR) for equity investors is obtained. The traffic volumes are however obtained by working back from the equity IRR and are essentially artefacts not related to the normal interaction of transport and land use. The steps in the process are as follows.

Assume that the D_i are the series of equity dividends paid out over the entire concession period as a result of a total equity investment E in the project..

Then, D_i must satisfy two conditions:

$$E = \sum D_i / (1 + IRR)^i \qquad \text{(i)}$$

$$F_i = \sum (NPAT_i - D_i) = 0 \qquad \text{(ii)},$$

where F_i is the cumulative financial balance[5], $NPAT_i$ is the net profit after tax in the period i .

If T_i is the toll revenue in the period i and EX_i is the total expense[6] in the same period, consisting of debt service charges, operating and maintenance expenses, etc., then:

$$NPAT_i = (T_i - EX_i) \qquad \text{(iii)}$$

T_i are adjusted so that eqs. (i), (ii) and (iii) are simultaneously satisfied.

The traffic volumes V_i can then be calculated from the relation

$$V_i = T_i/TOLL_i. \qquad \text{(iv)}$$

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[5] Accountants call this quantity "retained earnings". But if the quantity is negative the term can be considered inappropriate.

[6] It is interesting to note that depreciation, a non-cash item, appears in the profit and loss account as a cash item. This artefact appears in the M2 Base Case Model prepared by the Macquarie Bank. So far authorship of the CCT model has not been revealed.
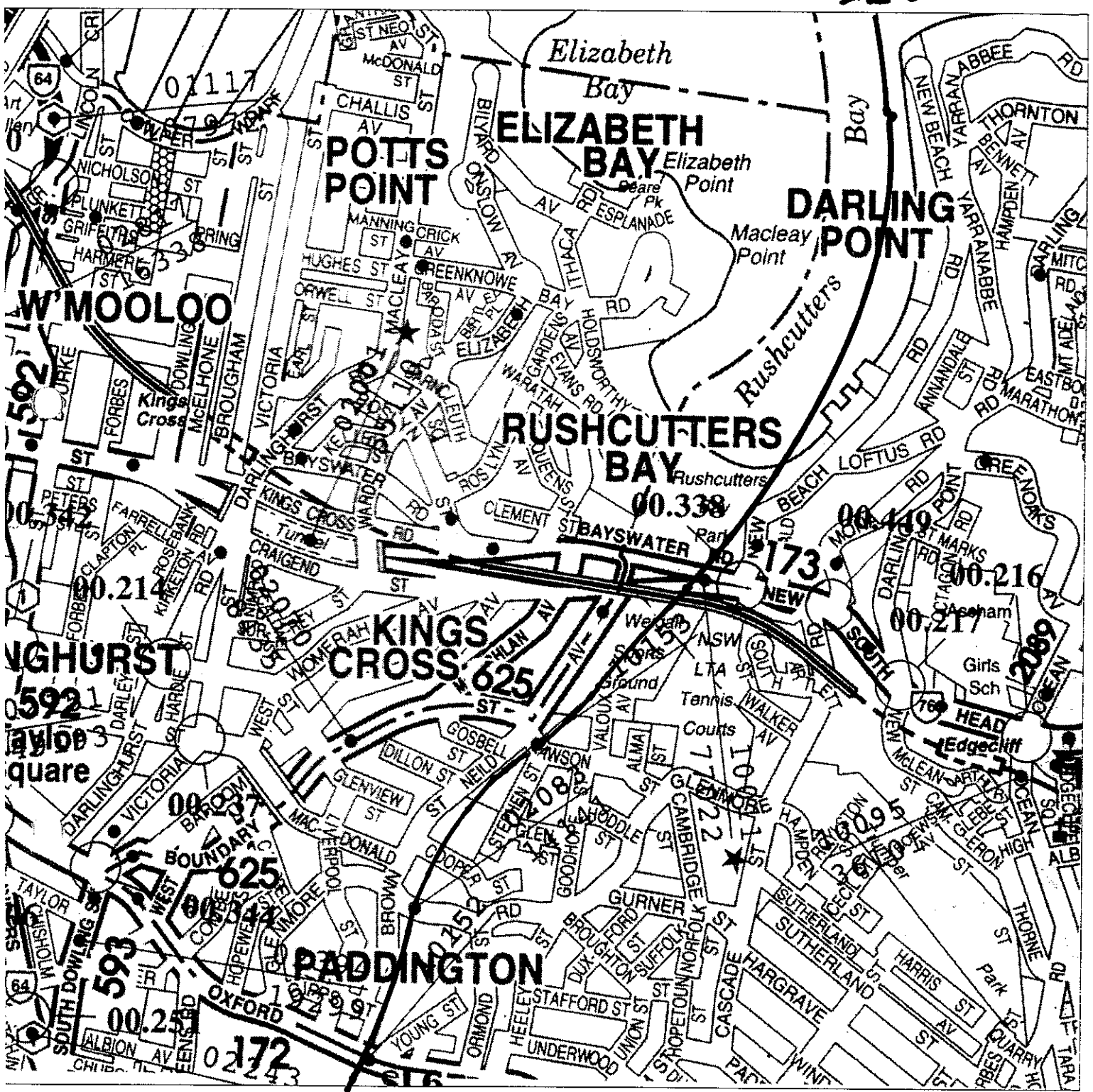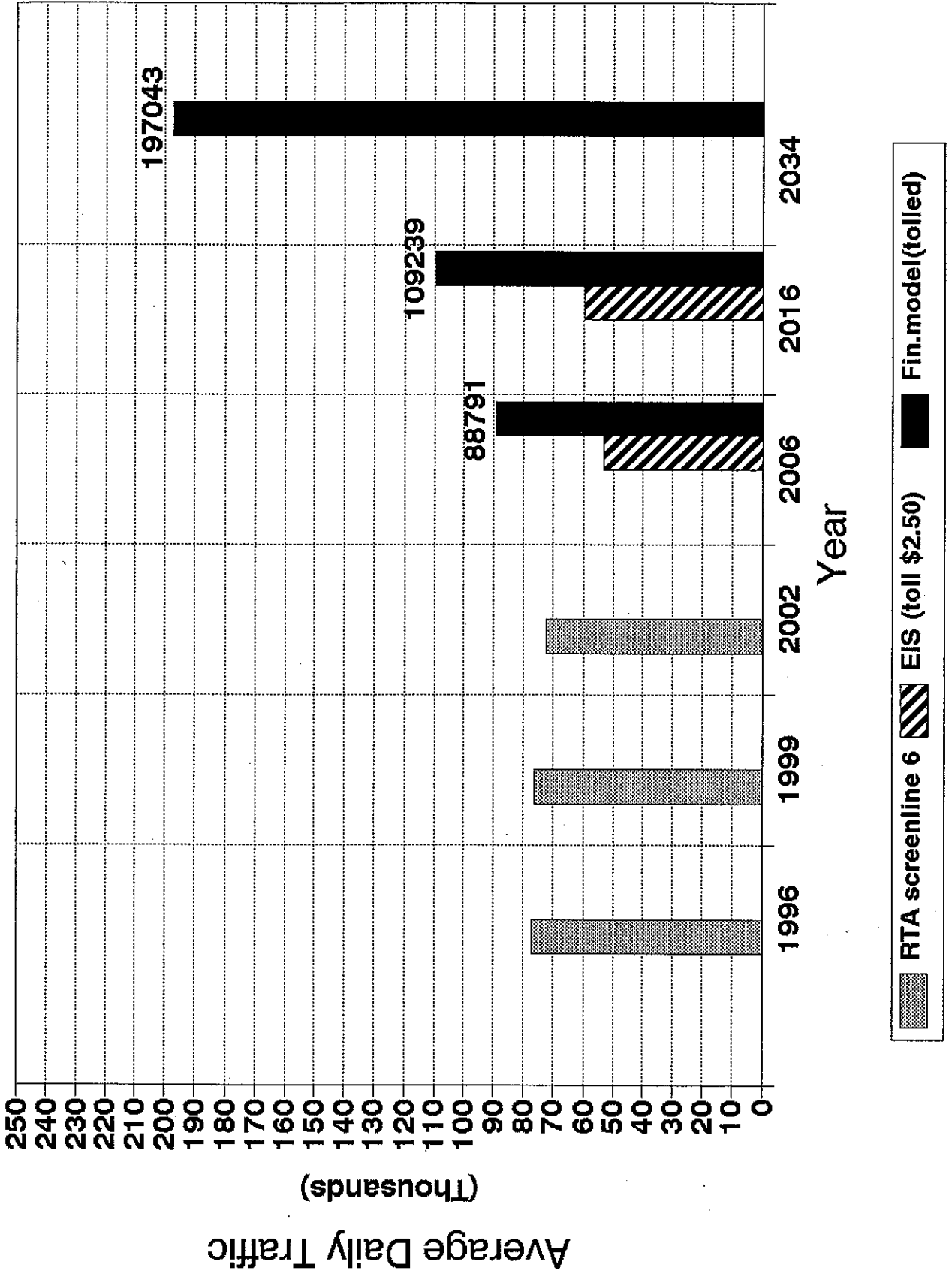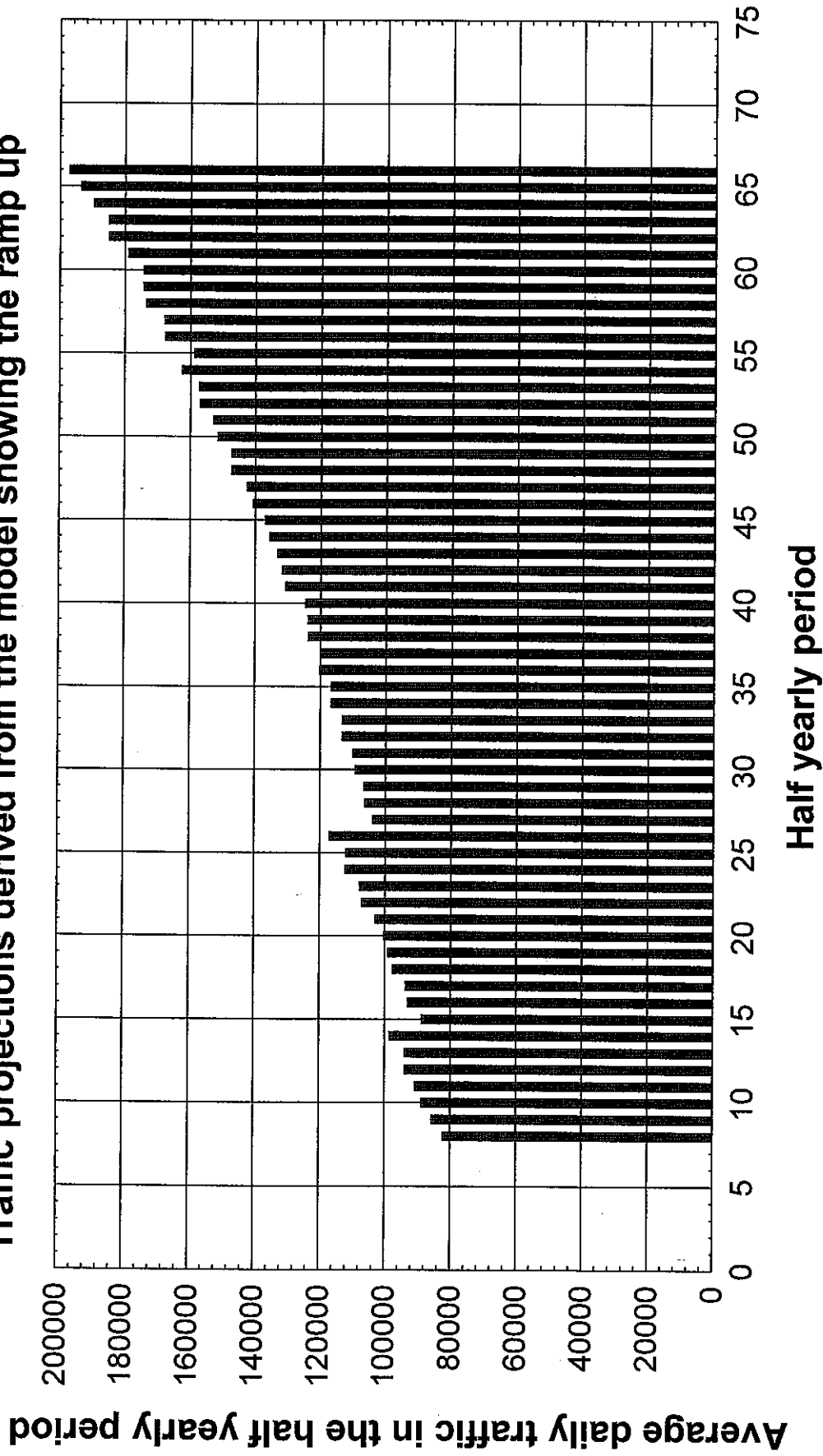
CROSS CITY TUNNEL TRAFFIC PROJECTIONS
EIS,Financial model,RTA (no tunnel)

Data: CROSS CITY TUNNEL FINANCIAL MODEL.STA 19v * 76c

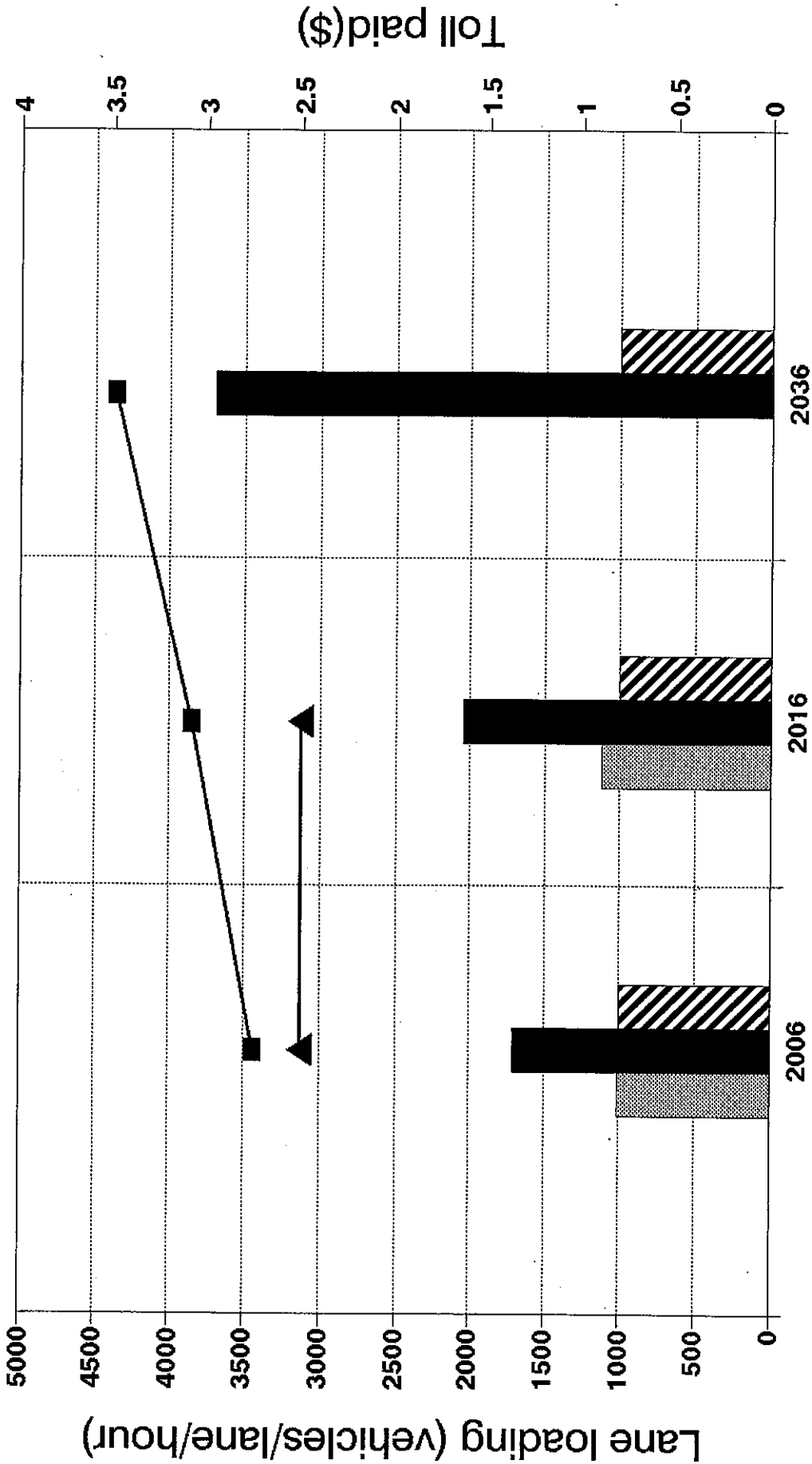**Traffic projections derived from the model showing the ramp up**

Half yearly period

(8 ends 31 December 2005, 66 ends 31 December 2036)

Average daily traffic in the half yearly period

CROSS CITY TUNNEL FINANCIAL MODEL
Lane loadings & tolls(EIS & Fin Model)

ILLUSTRATION OF THE WORK BACK METHOD OF DERIVING TRAFFIC VOLUMES

The financial model is structured so that the traffic volumes and tolls necessary to ensure a required internal rate of return (IRR) for equity investors is obtained. The traffic volumes are however obtained by working back from the equity IRR and are essentially artefacts not related to the normal interaction of transport and land use. The steps in the process are as follows.

Assume that D_i is the series of equity dividends paid out over the entire concession period as a result of a total equity investment E in the project.

Then, D_i must satisfy two conditions:

$$E = \sum D_i / (1 + IRR)^i \qquad \text{(i)},$$

$$F_i = \sum (NPAT_i - D_i) = 0 \qquad \text{(ii)},$$

where F_i is the cumulative financial balance[1], $NPAT_i$ is the net profit after tax in the period i.

If T_i is the toll revenue in the period i and EX_i is the total expense[2] in the same period, consisting of debt service charges, operating and maintenance expenses, etc., then:

$$NPAT_i = (T_i - EX_i) \qquad \text{(iii)}$$

Values of T_i are adjusted so that eqs. (i), (ii) and (iii) are simultaneously satisfied. The necessary numerical adjustments to satisfy these equations have to be carried out on a spreadsheet computer.

The traffic volumes V_i can then be calculated from the relation

$$V_i = T_i / TOLL_i. \qquad \text{(iv)}$$

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[1] Accountants call this quantity "retained earnings". But if the quantity is negative the term can be considered inappropriate.

[2] It is interesting to note that depreciation, a non-cash item, appears in the profit and loss account as a cash item. This artefact appears in the M2 Base Case Model prepared by the Macquarie Bank. At the time of writing, authorship of the CCT financial model has not been revealed.

CROSS CITY TUNNEL FINANCIAL MODEL
Fin. balance,its present value &traffic

Average daily traffic
(Thousands)

Financial balance ($ million)

Fiscal year

Financial balance — Discounted @ 8.7%pa — Avge daily traffic