Department of Infrastructure

Northern Central City Corridor Study

Transport Specialist Study

Economic Appraisal of Strategy Scenarios

September 2002

SINCLAIR KNIGHT MERZ

Department of Infrastructure

Northern Central City Corridor Study

Transport Specialist Study

Economic Appraisal of Strategy Scenarios

September 2002

SINCLAIR KNIGHT MERZ

Sinclair Knight Merz Pty Limited
ACN 001 024 095
ABN 37 001 024 095
590 Orrong Road
Armadale VIC 3143
PO Box 2500
Malvern VIC 3144
Australia
Telephone: +61 3 9248 3100
Facsimile: +61 3 9248 3460

Contents

1. Introduction

1.1 Report Scope

This report describes the economic evaluation results for the strategies tested as part of Northern Central City Corridor Study (NCCCS). An earlier report documented the economic evaluation framework in terms of the cost/benefit categories, the evaluation methodology and the specific valuation parameters used. This report focuses on the specific application of the framework to the NCCCS strategies and the economic results. The purpose of the report is to present the economic evaluation outcomes, for incorporation in the wider Triple Bottom Line evaluation.

1.2 The Strategies Tested

The agreed strategies to be tested are, in order:

- Strategy A – Improved Public Transport.
- Strategy B – Reduced Traffic on Local Streets.
- Strategy C – Improved Pedestrian and Bicycle Networks.
- Strategy D – Reduced Car Dependency.
- Strategy E – Land Use Changes to Reduce Travel.
- Strategy F – Rapid Transit on Eastern Freeway Corridor.
- Strategy G – Improved Arterial Road Network.

The economic evaluation has been applied to those strategies and elements applied in the ZENITH transportation model. Strategies C and E were not applied in the model testing and have been assessed separately to the economic evaluation before their incorporation into the final TBL evaluation.

Accordingly Table 1-1 identifies those strategy components (with a '1') included in the ZENITH model runs listed in the first row of the table. The later strategies were applied with previous strategies included. Veitch Lister provided detailed descriptions of the schemes coded in each strategy run.

Â **Table 1-1 : Strategy Elements Tested**

		Zenith model run IDs								
Strategy Elements	**Cost Item**	**A**	**B/C**	**D**	**F**	**F1**	**F2**	**G**	**G1**	**G2**
A1 – Upgraded Signalling**	A1	1	1	1	1	1	1	1	1	1
A2 – Station Access Improvement	A2	1	1	1	1	1	1	1	1	1
A4 – Route 109 Upgrades	A4	1	1	1	1	1	1	1	1	1
A9 – Modal Interchanges in Study Area	A9	1	1	1	1	1	1	1	1	1
A14 – Hoddle Street Bus Priority	A14	1	1	1	1	1	1	1	1	1
B1 – Area Wide Traffic Management	B1		1	1	1	1	1	1	1	1
C1 – Pedestrian Network Improvements	C1		0	0	0	0	0	0	0	0
C2 – Bicycle Network Improvements	C2		0	0	0	0	0	0	0	0
D1 – Changes to Local Parking	D1			1	1	1	1	1	1	1
D2 – Behavioural Changes	D3			0	0	0	0	0	0	0
F1a – Doncaster Area Rapid Transit Busway	F1A									
F1b – Doncaster Area Rapid Transit Light Rail	F1B				1	1		1	1	1
F1c – Doncaster Area Rapid Transit Heavt Rail	F1C						1			
F2 – Hoddle Street Priority	F2				0	0	0	0	0	0
F3 – Bus Lanes on Alexandra/Princess	F3				0	0	0	0	0	0
F4 – Shopping Town Modal Interchange	F4				0	0	0	0	0	0
F5 – Park and Ride	F5				1	1	1	1	1	1
F6 – Melbourne University Modal I/C	F6				0	0	0	0	0	0
F8 – Congestion Charge on Eastern Fway	F8					1				
G1 – Tunnel, Eastern Fway – Elliott Ave	G1							1	0	0
G2 – Supplementary Roadworks	G2							1	0	0
G3 – Tunnel to CBD	G3									1
G4 – Tunnel, E Fway – Elliott Ave No Ryl Parade Ramps	G4								1	

Note: 1 = tested using Zenith model run, 0 = tested outside Zenith

The ZENITH model run labels seen as row headings in Table 1-1 above are shown below in Table 1-2 and these are used in later chapters when describing the strategy costs and benefits.

Â **Table 1-2 : ZENITH Model Run Label Descriptions**

Strategies	Model ID	Elements Included
Improved Public Transport	A	A
Traffic on Local Streets	B/C	A + B/C (Bikes & Peds not modelled)
Reduce Car Dependency	D	B/C + D
Eastern Freeway Transit (LRT)	F	D + F
Eastern Freeway Transit (LRT with Toll)	F1	D + F1 (No economic results)
Eastern Freeway Transit (Heavy Rail)	F2	D + F2
G – Tunnel, Eastern Fway – Elliott Ave	G	F + G
G1 – Tunnel as G but no ramps Royal Pde	G1	F + G1
G2 – Tunnel to CBD	G2	F + G2

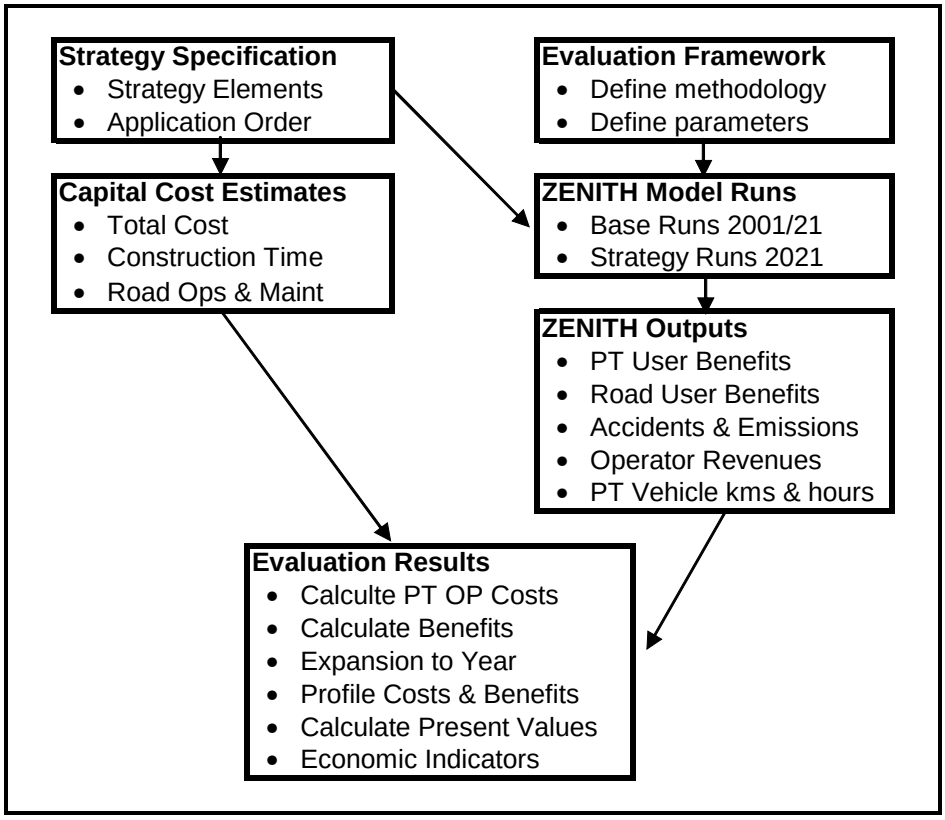
1.3 Report Structure

Chapter 2 describes the evaluation approach, Chapter 3 covers the strategy cost estimates input to the evaluation, Chapter 4 reports the strategy benefits and Chapter 5 brings these costs and benefits together in a review of the economic evaluation results.

2. The Evaluation Approach & Assumptions

Figure 2-1 provides an overview of the evaluation application to the NCCCS strategies. The stages on the Strategy Specification, Evaluation Framework, Capital Cost Estimates and Zenith Model Runs have been covered in detail elsewhere in the NCCCS study documentation. This report concentrates on the conversion of the ZENITH outputs and the capital cost estimates into the evaluation results.

Â **Figure 2-1 : Application of Evaluation Framework**



2.1 Evaluation Assumptions

The earlier Economic Evaluation Framework report documented, in some detail, the evaluation parameters and their application. However, the method used to determine the stream of benefits and costs over time using weekday benefit estimates are specific to each application and are documented below.

2.1.1 Expanding Impacts from Weekday to Year

Table 2-1 summarises the expansion factors used to convert weekday-modelled outputs to annual amounts.

Â **Table 2-1 : Annual Expansion Factors Used**

	Car	CV	Bus	Rail	Tram
Patronage / Use	280	280	300	300	300
Revenue	280	280	300	300	300
Benefits	280	280	300	300	300

The evaluation framework report also summarised factors for use with the ZENITH model. This proposed the assumption that weekday impacts would be reproduced on a Saturday and that Sunday impacts should be factored by 0.5. Assuming 250 typical weekdays, 58 Saturdays and 58 Sundays (with public holidays allocated equally to both) an expansion factor of 337 was implied.

Further reflection gave rise to the expansion factors shown in Table 2-1 above. These accord with the values used for the evaluation of Scoresby Corridor schemes in Melbourne and amend the earlier factor for the following:

- reduction of PT expansion factors to 300 to acknowledge that the factor on Saturday benefits are likely to be less than for a weekday because of reduced travel activity and less congestion), and
- road related expansion factors of less than 300 to reflect the presence of less congestion on Saturday and Sundays.

2.1.2 The Evaluation Period

Each of the strategies tested contain multiple elements with different implementation timescales. An implementation plan would provide a detailed commissioning timetable recognising the connections between elements. For the purpose of the strategy evaluation several simplifying assumptions have been made. These may be summarised as follows:

- assume capital spending starts in 2005 and is completed in 2009 (except for recurrent spending on public transport vehicles where this is within the evaluation period);
- evaluation period with significant capital spending (in year 2005);
- evaluation period ends with 30 complete years at the end of 2034

2.1.3 Cost and Benefit Profiles

Table 2-2 shows the time profiles assumed for the evaluation.

Â **Table 2-2 : Assumed Cost and Benefit Profiles**

Milestone	Year	Capital	Bus Vehs	Train Vehs	Tram Vehs	PT Operations	Potential Benefits	Benefits
	2002	0%	0%	0%	0%	0%	77%	0%
	2003	0%	0%	0%	0%	0%	78%	0%
	2004	0%	0%	0%	0%	0%	79%	0%
Eval Start	2005	10%	0%	0%	0%	0%	81%	0%
	2006	30%	10%	10%	10%	10%	82%	8%
	2007	30%	30%	30%	30%	40%	83%	33%
Open Year	2008	20%	30%	30%	30%	70%	84%	59%
	2009	10%	20%	20%	20%	90%	85%	77%
	2010	0%	10%	10%	10%	100%	87%	87%
	2011	0%	0%	0%	0%	100%	88%	88%
	2012	0%	0%	0%	0%	100%	89%	89%
	2013	0%	0%	0%	0%	100%	90%	90%
	2014	0%	0%	0%	0%	100%	92%	92%
	2015	0%	0%	0%	0%	100%	93%	93%
	2016	0%	0%	0%	0%	100%	94%	94%
	2017	0%	0%	0%	0%	100%	95%	95%
	2018	0%	0%	0%	0%	100%	96%	96%
	2019	0%	0%	0%	0%	100%	98%	98%
	2020	0%	10%	0%	0%	100%	99%	99%
Model Results	2021	0%	30%	0%	0%	100%	100%	100%
	2022	0%	30%	0%	0%	100%	101%	101%
	2023	0%	20%	0%	0%	100%	102%	102%
	2024	0%	10%	0%	0%	100%	104%	104%
	2025	0%	0%	0%	0%	100%	105%	105%
	2026	0%	0%	0%	0%	100%	105%	105%
	2027	0%	0%	0%	0%	100%	105%	105%
	2028	0%	0%	0%	0%	100%	105%	105%
	2029	0%	0%	0%	0%	100%	105%	105%
	2030	0%	0%	0%	0%	100%	105%	105%
	2031	0%	0%	0%	0%	100%	105%	105%
	2032	0%	0%	0%	0%	100%	105%	105%
	2033	0%	0%	0%	0%	100%	105%	105%
Eval End	2034	0%	0%	0%	0%	100%	105%	105%

Information on capital costs was supplied by Sinclair Knight Merz. The information used to calculate benefits and PT operating costs was sourced from the ZENITH model outputs run for the year 2021.

Capital Cost Profile

Capital spending for all strategies is assumed to take place over a five-year period between 2005 and 2009 according to the profile shown in Table 2-2.

PT Vehicle Purchase

The new buses, trains and trams required are based on the outputs from the 2021 ZENITH model run. It has been assumed that these vehicles will be required in full when the strategies are fully implemented from 2021 onwards. Implementation is in proportion to the capital spend with a one year lag.

Trains and trams with an assumed 30 year life require no further replacement provision. However, the bus profile builds in provision for replacement 15 years after the original purchase.

PT Operating Costs

These costs increase in to their 2021 levels in line with the capital spending component but with a one year time lag. Again it has been assumed that on full strategy implementation, 2021 service levels would be provided.

Potential Benefits

The model provided an estimate of the benefits of each strategy compared to a Base model run in 2021. The approach to determining a benefit profile was as follows:

- benefits were assumed to be correlated with the growth in travel between 2001 and 2021 (30%) and a 'potential benefit profile' was set in line with this growth (therefore 2002 equivalent to 77% of the 2021 benefits giving an increase to 2021 of 30%: (23%/77%)), and
- the 'benefit profile' was then calculated by taking the product of the 'potential benefit profile' and the 'PT operations' profile percentages; the realisation of the potential benefits then is assumed to depend on the ramp up of operational spending.

3. Estimating Strategy Costs

3.1 Capital Costs

The capital cost estimates have been documented in the report 'Strategy Costs6.doc'. Table 3-1. The capital costs used in the evaluation include all those elements included in the ZENITH model.

Â **Table 3-1 : Strategy Elements Tested in the Zenith Model**

Strategy Elements	Cost Item	$millions	A	B/C	D	F	F1	F2	G	G1	G2
A1 – Upgraded Signalling**	A1	$ 28.75	1	1	1	1	1	1	1	1	1
A2 – Station Access Improvement	A2	$ 203.24	1	1	1	1	1	1	1	1	1
A4 – Route 109 Upgrades	A4	$ 336.80	1	1	1	1	1	1	1	1	1
A9 – Modal Interchanges in Study Area	A9	$ 50.16	1	1	1	1	1	1	1	1	1
A14 – Hoddle Street Bus Priority	A14	$ 0.23	1	1	1	1	1	1	1	1	1
B1 – Area Wide Traffic Management	B1	$ 18.16		1	1	1	1	1	1	1	1
C1 – Pedestrian Network Improvements	C1	$ 30.01		0	0	0	0	0	0	0	0
C2 – Bicycle Network Improvements	C2	$ 33.86		0	0	0	0	0	0	0	0
D1 – Changes to Local Parking	D1	$ 8.94			1	1	1	1	1	1	1
D2 – Behavioural Changes	D3	$ 39.11			0	0	0	0	0	0	0
F1a – Doncaster Area Rapid Transit***	F1A	$ 114.65									
F1b – Doncaster Area Rapid Transit****	F1B	$ 167.06				1	1		1	1	1
F1c – Doncaster Area Rapid Transit*****	F1C	$ 430.12						1			
F2 – Hoddle Street Priority	F2	$ 0.23				0	0	0	0	0	0
F3 – Bus Lanes on Alexandra/Princess	F3	$ 0.58				0	0	0	0	0	0
F4 – Shopping Town Modal Interchange	F4	$ 61.78				0	0	0	0	0	0
F5 – Park and Ride	F5	$ 9.00				1	1	1	1	1	1
F6 – Melbourne University Modal I/C	F6	$ 50.16				0	0	0	0	0	0
F8 – Congestion Charge on Eastern Fway	F8	$ 9.27					1				
G1 – Tunnel, Eastern Fway – Elliott Ave	G1	$ 722.88							1	0	0
G2 – Supplementary Roadworks	G2	$ 0.21							1	0	0
G3 – Tunnel to CBD	G3	$ 369.46									1
G4 – Tunnel, E Fway – Elliott Ave No Ryl Parade Ramps	G4	$ 591.58								1	
TOTAL COST ($millions)			$ 619	$ 637	$ 646	$ 822	$ 832	$ 1,085	$ 1,545	$ 1,414	$ 1,192

3.2 PT Costs

3.2.1 PT Cost Parameters

Table 3-2 shows the cost parameters applied to the resource changes to determine weekday operating costs per vehicle kilometre and hour and annual operating costs per vehicle (to cover stabling etc) and per track KM to cover maintenance. The weekday costs were expanded to annual estimates by applying a factor of 300.

Â **Table 3-2 : PT Operating and Maintenance Cost Parameters**

	Bus	Tram	Train	Period
Per Km	$ 0.78	$ 1.31	$ 5.85	pa
Per Hour	$ 25.7	$ 43.2	$ 66.2	pa
Per Vehicle (Ops)	$ 21,560	$ 23,860	$ 87,500	pa
Per Track Km	$ -	$ 17,050	$ 59,000	pa

Source: DOI Investment Evaluation Guidelines

3.2.2 PT Service Operating and Maintenance Costs

These costs were estimated by applying the cost parameters specified in the evaluation framework to the number of vehicle kilometres, vehicle hours, number of peak vehicles and (for train and tram) the number of track kilometres.

Table 3-3 shows the change in operating resources, with the weekday vehicle kilometres and vehicle hours and track kilometres taken directly from the ZENITH model outputs. The number of peak vehicles was calculated using the AM peak vehicle hours and kilometres on each PT route as follows:

- determine the average speed using the total kilometres and hours in the period;
- calculate the round trip time by applying the average speed to the route length (multiplied by 2) and adding a further 5 minutes to allow for layover time, and
- divide this time by the peak headway to estimate the vehicle requirements and sum across the Metropolitan area.

Table 3-3 : Changes in PT Operating Resources (Comparison with Base)

	Bus				Train				Tram			
	Weekday		Track	Peak	Weekday		Track	Peak	Weekday		Track	Peak
Strategy	VKMs	VHRS	KMs	Vehs	VKMs	VHRS	KMs	Vehs	VKMs	VHRS	KMs	Vehs
Base Total	266,976	10,024		678	64,437	1,497	3,164	129	70,871	4,177	3,326	308
Change from Base												
A	47,058	1,388	-	197	35,579	877	0	70	41,571	2,383	285	169
B/C	47,111	1,419	-	198	35,579	877	0	70	41,631	2,434	287	172
D	47,111	1,379	-	190	35,579	877	0	70	41,631	2,416	287	168
F	18,952	460	-	80	35,579	877	0	70	52,410	2,838	307	199
F2	18,952	459	-	80	45,870	1,063	84	83	41,631	2,413	207	167
G	18,952	430	-	78	35,579	877	0	70	52,410	2,825	307	198
G1	18,952	435	-	79	35,579	877	0	70	52,410	2,826	307	198
G2	18,952	470	-	80	35,579	877	0	70	52,410	2,812	307	197

Table 3-4 shows the annual operating costs based on the ZENITH model outputs for 2021.

Table 3-4 : Changes in Annual PT Service Operating Costs ($ million)

	Bus			Train			Tram		
Strategy	Peak Vehicle	Track KM	VKM + VHR	Peak Vehicle	Track KM	VKM + VHR	Peak Vehicle	Track KM	VKM + VHR
A	$ 4.25	$ -	$ 22	$ 6.14	$ 0.01	$ 80	$ 4.03	$ 4.86	$ 47
B/C	$ 4.27	$ -	$ 22	$ 6.14	$ 0.01	$ 80	$ 4.09	$ 4.90	$ 48
D	$ 4.11	$ -	$ 22	$ 6.14	$ 0.01	$ 80	$ 4.00	$ 4.90	$ 48
F	$ 1.72	$ -	$ 8	$ 6.14	$ 0.01	$ 80	$ 4.74	$ 5.23	$ 57
F2	$ 1.72	$ -	$ 8	$ 7.23	$ 4.95	$ 102	$ 4.00	$ 3.53	$ 48
G	$ 1.68	$ -	$ 8	$ 6.14	$ 0.01	$ 80	$ 4.73	$ 5.23	$ 57
G1	$ 1.70	$ -	$ 8	$ 6.14	$ 0.01	$ 80	$ 4.73	$ 5.23	$ 57
G2	$ 1.74	$ -	$ 8	$ 6.14	$ 0.01	$ 80	$ 4.69	$ 5.23	$ 57

3.2.3 Rolling Stock Costs

Table 3-3 above reported the additional PT vehicle requirements of each strategy compared to the Base. The assumed cost and asset life of additional vehicles are as follows:

- Bus: $350,000 and 15 year life;
- Train: $12,000,000 and 30 year life;
- Tram: $ 3,000,000 and 30 year life.

The additional fleet costs required to run the service levels assumed in 2021 are shown in the table below.

Table 3-5 : Additional Fleet Costs ($ million)

	Bus	Train	Tram
A	$ 69	$ 842	$ 506
B/C	$ 69	$ 842	$ 515
D	$ 67	$ 842	$ 503
F	$ 28	$ 842	$ 596
F2	$ 28	$ 992	$ 502
G	$ 27	$ 842	$ 595
G1	$ 28	$ 842	$ 595
G2	$ 28	$ 842	$ 590

The train and tram costs were applied once during the evaluation period and the bus costs twice given an assumed asset life for buses of 15 years.

3.2.4 Modal Interchange Maintenance and Operations

Two major modal interchanges at Melbourne University and Doncaster Hill form components of some of the Strategies. For each the building maintenance and operational costs (beyond the normal costs of improved PT services) were assumed as follows:

- annual building maintenance equivalent to 2.5% of the capital construction costs, and
- increased operations costs of $200,000 for each modal interchange (this is an approximate allowance for an additional two staff and the related overhead costs).

3.3 Road Related Recurrent Costs

These costs relate to the operation and maintenance costs associated with the tunnel elements and the costs of operating the toll system applied to the Eastern Freeway as a variant to the DART light rail strategy.

Estimates of these costs were supplied by SKM as follows:

- east-west tunnel O&M costs = $5 million pa;
- CBD tunnel O&M costs = $3.5 million pa, and
- toll operation costs = $1.5 million pa based on CityLink experience and taking account of this relatively simple extension.

3.4 Cost Application

The cost profiles shown in Table 2-2 were applied to the costs documented in this section to determine the stream of costs across the evaluation period. These costs were then discounted to arrive at a Present Value of Costs for each of the strategy options.

4. Estimating Strategy Benefits

4.1 Introduction

The Evaluation Framework Report documented the parameters used to determine different benefits and the method of application. This section reports the results.

4.2 Summary of Benefits

Table 4-1 summarises the full year benefits derived from the ZENITH model weekday outputs and expanded to full year estimates.

Â **Table 4-1 : Estimated Annual Benefits 2021 ($ million)**

Strategy	PT User Benefits	CV Benefits	Car Benefits	Greenhouse + Accs	PT Revenues	Other Revenues	TOTAL
A	$ 1,136	$ 54	$ 221	$ 57	$ 102	$ -	$ 1,570
B/C	$ 1,136	$ 31	$ 169	$ 57	$ 107	$ -	$ 1,501
D	$ 1,160	$ 9	$ 66	$ 67	$ 121	$ -	$ 1,424
F	$ 1,174	$ 7	$ 62	$ 68	$ 126	$ -	$ 1,437
F2	$ 1,178	$ 11	$ 73	$ 67	$ 126	$ -	$ 1,455
G	$ 1,173	$ 25	$ 106	$ 76	$ 131	$ -	$ 1,511
G1	$ 1,174	$ 24	$ 105	$ 76	$ 124	$ -	$ 1,503
G2	$ 1,177	$ 14	$ 75	$ 71	$ 125	$ -	$ 1,461

The benefits are substantial and between 70% and 80% of these benefits accrue to PT users. This reflects the substantial service improvements implemented as part of Strategy A including reduced journey times, improved service frequencies, new services and reduced modal interchange costs extending beyond the NCCCS study area.

Remaining car users and CV trips also benefit significantly from the decongestion resulting from the diversion of trips to PT. However, these benefits are reined in with the introduction of traffic management measures (Strategy B/C) and increased parking charges (Strategy D) and extended with the introduction of major road infrastructure (Strategies G, G1 and G2).

It should be noted that the Zenith model does not reduce road space available to other traffic in order to achieve the assumed public transport running time improvements. A more realistic representation of this is likely to reduce the benefits to car users, thus reducing the total benefits. However car user benefits typically represent 10-15% of total benefits, so any reduction is unlikely to have a major effect on the results.

5. Evaluation Results

5.1 Summary of Results

Table 5-1 contains the summary evaluation results and Appendix A provides the detailed costs and benefits for each of the strategies modelled using the ZENITH model.

Â **Table 5-1 : Economic Evaluation Results**

Strategy	Description	Discounted Costs	Discounted Benefits	NPV	EIRR	BCR	Incr BCR
A	PT improvements	$ 3,173	$ 14,826	$ 11,653	84%	4.7	4.7
B/C	PT + B Area wide TM	$ 3,204	$ 14,172	$ 10,968	76%	4.4	NA
D	B/C + CBD parking charge	$ 3,192	$ 13,446	$ 10,254	71%	4.2	NA
F	D + LRT DART	$ 3,300	$ 13,568	$ 10,268	61%	4.1	1.1
F2	D + HEAVY RAIL DART	$ 3,694	$ 13,788	$ 10,094	51%	3.7	0.7
G	F + City Link tunnel	$ 3,888	$ 14,209	$ 10,320	44%	3.7	1.1
G1	F + no Royal Pde ramps	$ 3,790	$ 14,196	$ 10,406	47%	3.7	1.3
G2	F + CBD tunnel	$ 3,606	$ 13,806	$ 10,200	50%	3.8	0.8

5.2 Commentary

The results for each Strategy compared to the Base may be summarised as follows:

- the Net Present Value (NPV) – discounted benefits minus discounted costs – ranges between $10.1 (F2) billion and $11.6 billion (A);
- the Economic Internal Rates of Return (EIRR) range between 44% (G) and 84% (A), and
- the ratio of discounted benefits to costs (BCR) range between 3.7 (F2, G, G1) and 4.7 (A).

These returns are very high and are highly dependent on the Strategy A impacts. The extensive PT improvements in Strategy A cost $3.173 billion and generate benefits of $14.826 billion.

The impacts of strategies built upon Strategy A are best viewed in terms of the incremental BCR ratio. These figures are stated in the final column of Table 5-1 and are summarised below compared to Strategy A:

- Strategy B/C:
  - costs increase because of a small reduction in running times on some PT routes raising the PT rolling stock requirement;
  - benefits fall due to the increased costs on motorists imposed by the area wide traffic managements;
  - the incremental BCR would be negative and therefore is not quoted;
- Strategy D compared to Strategy B/C:
  - costs are slightly lower compared to strategy B/C due to somewhat improved PT running times and hence lower PT rolling stock requirement;
  - benefits fall due to the impact of parking charges;
  - the incremental BCR is negative (but excludes the revenue from parking charges or levies);
- Strategy F compared to Strategy D:
  - the addition of LRT to Doncaster Hill gives an incremental BCR of 1.1;
- Strategy F2: compared to Strategy D:
  - the addition of the heavy rail scheme to Doncaster Hill gives an incremental BCR of 0.7;

- East-West tunnel runs compared to Strategy F
  - Strategy G: results in an incremental BCR of 1.1;
  - Strategy G1: the removal of intermediate ramps improves the incremental BCR to 1.3
- CBD Tunnel compared to Strategy F:
  - this results in an incremental BCR of 0.8.

Appendix A Detailed Evaluation Outputs

ECONOMIC APPRAISAL OF STRATEGY A ($'000s at 2001 Prices)

Key Dates	Year	Rate	ECONOMIC COSTS: Capital Costs	Vehicle Purchase	PT Ops & Maint	Other Road Costs	TOTAL COSTS	ECONOMIC BENEFITS: PT User Benefits	CV Benefits	Private Car Benefits	Greenhouse + Accidents	PT, Parking, Toll Revenues	TOTAL BENEFITS	NET BENEFIT FLOW
	2002	1.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	2003	0.94	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	2004	0.89	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Eval Start	2005	0.84	$ 62	$ -	$ -	$ -	$ 62	$ -	$ -	$ -	$ -	$ -	$ -	-$ 62
	2006	0.79	$ 186	$ 142	$ 17	$ -	$ 344	$ 93	$ 4	$ 18	$ 5	$ 8	$ 128	-$ 216
	2007	0.75	$ 186	$ 425	$ 67	$ -	$ 678	$ 377	$ 18	$ 73	$ 19	$ 34	$ 522	-$ 157
Open Year	2008	0.70	$ 124	$ 425	$ 118	$ -	$ 667	$ 670	$ 32	$ 130	$ 34	$ 60	$ 926	$ 259
	2009	0.67	$ 62	$ 283	$ 151	$ -	$ 497	$ 874	$ 42	$ 170	$ 44	$ 79	$ 1,208	$ 711
	2010	0.63	$ -	$ 142	$ 168	$ -	$ 310	$ 984	$ 47	$ 191	$ 50	$ 89	$ 1,361	$ 1,051
	2011	0.59	$ -	$ -	$ 168	$ -	$ 168	$ 998	$ 48	$ 194	$ 50	$ 90	$ 1,380	$ 1,212
	2012	0.56	$ -	$ -	$ 168	$ -	$ 168	$ 1,012	$ 48	$ 197	$ 51	$ 91	$ 1,399	$ 1,231
	2013	0.53	$ -	$ -	$ 168	$ -	$ 168	$ 1,026	$ 49	$ 199	$ 52	$ 92	$ 1,418	$ 1,250
	2014	0.50	$ -	$ -	$ 168	$ -	$ 168	$ 1,039	$ 50	$ 202	$ 52	$ 94	$ 1,437	$ 1,269
	2015	0.47	$ -	$ -	$ 168	$ -	$ 168	$ 1,053	$ 50	$ 205	$ 53	$ 95	$ 1,456	$ 1,288
	2016	0.44	$ -	$ -	$ 168	$ -	$ 168	$ 1,067	$ 51	$ 207	$ 54	$ 96	$ 1,475	$ 1,307
	2017	0.42	$ -	$ -	$ 168	$ -	$ 168	$ 1,081	$ 52	$ 210	$ 54	$ 97	$ 1,494	$ 1,326
	2018	0.39	$ -	$ -	$ 168	$ -	$ 168	$ 1,094	$ 52	$ 213	$ 55	$ 98	$ 1,513	$ 1,345
	2019	0.37	$ -	$ -	$ 168	$ -	$ 168	$ 1,108	$ 53	$ 215	$ 56	$ 100	$ 1,532	$ 1,364
	2020	0.35	$ -	$ 7	$ 168	$ -	$ 175	$ 1,122	$ 54	$ 218	$ 56	$ 101	$ 1,551	$ 1,376
	2021	0.33	$ -	$ 21	$ 168	$ -	$ 189	$ 1,136	$ 54	$ 221	$ 57	$ 102	$ 1,570	$ 1,381
	2022	0.31	$ -	$ 21	$ 168	$ -	$ 189	$ 1,149	$ 55	$ 223	$ 58	$ 103	$ 1,589	$ 1,400
	2023	0.29	$ -	$ 14	$ 168	$ -	$ 182	$ 1,163	$ 56	$ 226	$ 59	$ 105	$ 1,608	$ 1,426
	2024	0.28	$ -	$ 7	$ 168	$ -	$ 175	$ 1,177	$ 56	$ 229	$ 59	$ 106	$ 1,627	$ 1,452
	2025	0.26	$ -	$ -	$ 168	$ -	$ 168	$ 1,191	$ 57	$ 231	$ 60	$ 107	$ 1,646	$ 1,478
	2026	0.25	$ -	$ -	$ 168	$ -	$ 168	$ 1,191	$ 57	$ 231	$ 60	$ 107	$ 1,646	$ 1,478
	2027	0.23	$ -	$ -	$ 168	$ -	$ 168	$ 1,191	$ 57	$ 231	$ 60	$ 107	$ 1,646	$ 1,478
	2028	0.22	$ -	$ -	$ 168	$ -	$ 168	$ 1,191	$ 57	$ 231	$ 60	$ 107	$ 1,646	$ 1,478
	2029	0.21	$ -	$ -	$ 168	$ -	$ 168	$ 1,191	$ 57	$ 231	$ 60	$ 107	$ 1,646	$ 1,478
	2030	0.20	$ -	$ -	$ 168	$ -	$ 168	$ 1,191	$ 57	$ 231	$ 60	$ 107	$ 1,646	$ 1,478
	2031	0.18	$ -	$ -	$ 168	$ -	$ 168	$ 1,191	$ 57	$ 231	$ 60	$ 107	$ 1,646	$ 1,478
	2032	0.17	$ -	$ -	$ 168	$ -	$ 168	$ 1,191	$ 57	$ 231	$ 60	$ 107	$ 1,646	$ 1,478
	2033	0.16	$ -	$ -	$ 168	$ -	$ 168	$ 1,191	$ 57	$ 231	$ 60	$ 107	$ 1,646	$ 1,478
Eval End	2034	0.15	$ -	$ -	$ 168	$ -	$ 168	$ 1,191	$ 57	$ 231	$ 60	$ 107	$ 1,646	$ 1,478
	2035	0.15	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	2036	0.14	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	2037	0.13	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	TOTAL		$ 619	$ 1,486	$ 4,560	$ -	$ 6,665	$ 30,128	$ 1,438	$ 5,857	$ 1,516	$ 2,711	$ 41,650	$ 34,985
	PV		$ 466	$ 1,029	$ 1,678	$ -	$ 3,173	$ 10,725	$ 512	$ 2,085	$ 540	$ 965	$ 14,826	$ 11,653

Economic Internal Rate of Return %	**84%**
Net Present Value @ 6%	**$ 11,653**
Benefit - Cost Ratio	**4.7**
Benefit - Capital Ratio	

ECONOMIC APPRAISAL OF STRATEGY B_C ($'000s at 2001 Prices)

Key Dates	Year	Rate	ECONOMIC COSTS: Capital Costs	Vehicle Purchase	PT Ops & Maint	Other Road Costs	TOTAL COSTS	ECONOMIC BENEFITS: PT User Benefits	CV Benefits	Private Car Benefits	Greenhouse + Accidents	PT, Parking, Toll Revenues	TOTAL BENEFITS	NET BENEFIT FLOW
	2002	1.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	2003	0.94	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	2004	0.89	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Eval Start	2005	0.84	$ 64	$ -	$ -	$ -	$ 64	$ -	$ -	$ -	$ -	$ -	$ -	-$ 64
	2006	0.79	$ 191	$ 143	$ 17	$ -	$ 351	$ 93	$ 3	$ 14	$ 5	$ 9	$ 123	-$ 228
	2007	0.75	$ 191	$ 428	$ 68	$ -	$ 687	$ 377	$ 10	$ 56	$ 19	$ 36	$ 499	-$ 188
Open Year	2008	0.70	$ 127	$ 428	$ 119	$ -	$ 674	$ 670	$ 18	$ 100	$ 33	$ 63	$ 885	$ 211
	2009	0.67	$ 64	$ 285	$ 152	$ -	$ 501	$ 874	$ 24	$ 130	$ 44	$ 83	$ 1,154	$ 653
	2010	0.63	$ -	$ 143	$ 169	$ -	$ 312	$ 985	$ 27	$ 147	$ 49	$ 93	$ 1,301	$ 989
	2011	0.59	$ -	$ -	$ 169	$ -	$ 169	$ 999	$ 27	$ 149	$ 50	$ 94	$ 1,319	$ 1,150
	2012	0.56	$ -	$ -	$ 169	$ -	$ 169	$ 1,012	$ 28	$ 151	$ 51	$ 96	$ 1,337	$ 1,168
	2013	0.53	$ -	$ -	$ 169	$ -	$ 169	$ 1,026	$ 28	$ 153	$ 51	$ 97	$ 1,355	$ 1,186
	2014	0.50	$ -	$ -	$ 169	$ -	$ 169	$ 1,040	$ 28	$ 155	$ 52	$ 98	$ 1,373	$ 1,204
	2015	0.47	$ -	$ -	$ 169	$ -	$ 169	$ 1,054	$ 29	$ 157	$ 53	$ 99	$ 1,392	$ 1,222
	2016	0.44	$ -	$ -	$ 169	$ -	$ 169	$ 1,067	$ 29	$ 159	$ 53	$ 101	$ 1,410	$ 1,240
	2017	0.42	$ -	$ -	$ 169	$ -	$ 169	$ 1,081	$ 29	$ 161	$ 54	$ 102	$ 1,428	$ 1,259
	2018	0.39	$ -	$ -	$ 169	$ -	$ 169	$ 1,095	$ 30	$ 163	$ 55	$ 103	$ 1,446	$ 1,277
	2019	0.37	$ -	$ -	$ 169	$ -	$ 169	$ 1,109	$ 30	$ 165	$ 55	$ 105	$ 1,464	$ 1,295
	2020	0.35	$ -	$ 7	$ 169	$ -	$ 176	$ 1,122	$ 31	$ 167	$ 56	$ 106	$ 1,482	$ 1,306
	2021	0.33	$ -	$ 21	$ 169	$ -	$ 190	$ 1,136	$ 31	$ 169	$ 57	$ 107	$ 1,501	$ 1,310
	2022	0.31	$ -	$ 21	$ 169	$ -	$ 190	$ 1,150	$ 31	$ 172	$ 57	$ 109	$ 1,519	$ 1,329
	2023	0.29	$ -	$ 14	$ 169	$ -	$ 183	$ 1,164	$ 32	$ 174	$ 58	$ 110	$ 1,537	$ 1,354
	2024	0.28	$ -	$ 7	$ 169	$ -	$ 176	$ 1,177	$ 32	$ 176	$ 59	$ 111	$ 1,555	$ 1,379
	2025	0.26	$ -	$ -	$ 169	$ -	$ 169	$ 1,191	$ 32	$ 178	$ 60	$ 112	$ 1,573	$ 1,404
	2026	0.25	$ -	$ -	$ 169	$ -	$ 169	$ 1,191	$ 32	$ 178	$ 60	$ 112	$ 1,573	$ 1,404
	2027	0.23	$ -	$ -	$ 169	$ -	$ 169	$ 1,191	$ 32	$ 178	$ 60	$ 112	$ 1,573	$ 1,404
	2028	0.22	$ -	$ -	$ 169	$ -	$ 169	$ 1,191	$ 32	$ 178	$ 60	$ 112	$ 1,573	$ 1,404
	2029	0.21	$ -	$ -	$ 169	$ -	$ 169	$ 1,191	$ 32	$ 178	$ 60	$ 112	$ 1,573	$ 1,404
	2030	0.20	$ -	$ -	$ 169	$ -	$ 169	$ 1,191	$ 32	$ 178	$ 60	$ 112	$ 1,573	$ 1,404
	2031	0.18	$ -	$ -	$ 169	$ -	$ 169	$ 1,191	$ 32	$ 178	$ 60	$ 112	$ 1,573	$ 1,404
	2032	0.17	$ -	$ -	$ 169	$ -	$ 169	$ 1,191	$ 32	$ 178	$ 60	$ 112	$ 1,573	$ 1,404
	2033	0.16	$ -	$ -	$ 169	$ -	$ 169	$ 1,191	$ 32	$ 178	$ 60	$ 112	$ 1,573	$ 1,404
Eval End	2034	0.15	$ -	$ -	$ 169	$ -	$ 169	$ 1,191	$ 32	$ 178	$ 60	$ 112	$ 1,573	$ 1,404
	2035	0.15	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	2036	0.14	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	2037	0.13	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	TOTAL		$ 637	$ 1,495	$ 4,589	$ -	$ 6,721	$ 30,142	$ 821	$ 4,496	$ 1,506	$ 2,846	$ 39,812	$ 33,091
	PV		$ 480	$ 1,035	$ 1,688	$ -	$ 3,204	$ 10,730	$ 292	$ 1,600	$ 536	$ 1,013	$ 14,172	$ 10,968

Economic Internal Rate of Return %	76%
Net Present Value @ 6%	$ 10,968
Benefit - Cost Ratio	4.4
Benefit - Capital Ratio	

ECONOMIC APPRAISAL OF STRATEGY D ($'000s at 2001 Prices)

Key Dates	Year	Rate	ECONOMIC COSTS: Capital Costs	Vehicle Purchase	PT Ops & Maint	Other Road Costs	TOTAL COSTS	ECONOMIC BENEFITS: PT User Benefits	CV Benefits	Private Car Benefits	Greenhouse + Accidents	PT, Parking, Toll Revenues	TOTAL BENEFITS	NET BENEFIT FLOW
	2002	1.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	2003	0.94	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	2004	0.89	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Eval Start	2005	0.84	$ 65	$ -	$ -	$ -	$ 65	$ -	$ -	$ -	$ -	$ -	$ -	-$ 65
	2006	0.79	$ 194	$ 141	$ 17	$ -	$ 352	$ 95	$ 1	$ 5	$ 6	$ 10	$ 117	-$ 235
	2007	0.75	$ 194	$ 424	$ 67	$ -	$ 685	$ 385	$ 3	$ 22	$ 22	$ 40	$ 473	-$ 212
Open Year	2008	0.70	$ 129	$ 424	$ 118	$ -	$ 671	$ 684	$ 5	$ 39	$ 40	$ 72	$ 840	$ 169
	2009	0.67	$ 65	$ 282	$ 152	$ -	$ 499	$ 892	$ 7	$ 51	$ 52	$ 93	$ 1,095	$ 597
	2010	0.63	$ -	$ 141	$ 169	$ -	$ 310	$ 1,005	$ 8	$ 57	$ 58	$ 105	$ 1,234	$ 924
	2011	0.59	$ -	$ -	$ 169	$ -	$ 169	$ 1,019	$ 8	$ 58	$ 59	$ 107	$ 1,251	$ 1,083
	2012	0.56	$ -	$ -	$ 169	$ -	$ 169	$ 1,033	$ 8	$ 59	$ 60	$ 108	$ 1,269	$ 1,100
	2013	0.53	$ -	$ -	$ 169	$ -	$ 169	$ 1,047	$ 8	$ 60	$ 61	$ 110	$ 1,286	$ 1,117
	2014	0.50	$ -	$ -	$ 169	$ -	$ 169	$ 1,061	$ 8	$ 60	$ 62	$ 111	$ 1,303	$ 1,135
	2015	0.47	$ -	$ -	$ 169	$ -	$ 169	$ 1,076	$ 8	$ 61	$ 63	$ 113	$ 1,320	$ 1,152
	2016	0.44	$ -	$ -	$ 169	$ -	$ 169	$ 1,090	$ 8	$ 62	$ 63	$ 114	$ 1,338	$ 1,169
	2017	0.42	$ -	$ -	$ 169	$ -	$ 169	$ 1,104	$ 9	$ 63	$ 64	$ 116	$ 1,355	$ 1,186
	2018	0.39	$ -	$ -	$ 169	$ -	$ 169	$ 1,118	$ 9	$ 64	$ 65	$ 117	$ 1,372	$ 1,203
	2019	0.37	$ -	$ -	$ 169	$ -	$ 169	$ 1,132	$ 9	$ 64	$ 66	$ 119	$ 1,389	$ 1,221
	2020	0.35	$ -	$ 7	$ 169	$ -	$ 175	$ 1,146	$ 9	$ 65	$ 67	$ 120	$ 1,406	$ 1,231
	2021	0.33	$ -	$ 20	$ 169	$ -	$ 189	$ 1,160	$ 9	$ 66	$ 67	$ 121	$ 1,424	$ 1,235
	2022	0.31	$ -	$ 20	$ 169	$ -	$ 189	$ 1,174	$ 9	$ 67	$ 68	$ 123	$ 1,441	$ 1,252
	2023	0.29	$ -	$ 13	$ 169	$ -	$ 182	$ 1,188	$ 9	$ 68	$ 69	$ 124	$ 1,458	$ 1,276
	2024	0.28	$ -	$ 7	$ 169	$ -	$ 175	$ 1,202	$ 9	$ 68	$ 70	$ 126	$ 1,475	$ 1,300
	2025	0.26	$ -	$ -	$ 169	$ -	$ 169	$ 1,216	$ 9	$ 69	$ 71	$ 127	$ 1,493	$ 1,324
	2026	0.25	$ -	$ -	$ 169	$ -	$ 169	$ 1,216	$ 9	$ 69	$ 71	$ 127	$ 1,493	$ 1,324
	2027	0.23	$ -	$ -	$ 169	$ -	$ 169	$ 1,216	$ 9	$ 69	$ 71	$ 127	$ 1,493	$ 1,324
	2028	0.22	$ -	$ -	$ 169	$ -	$ 169	$ 1,216	$ 9	$ 69	$ 71	$ 127	$ 1,493	$ 1,324
	2029	0.21	$ -	$ -	$ 169	$ -	$ 169	$ 1,216	$ 9	$ 69	$ 71	$ 127	$ 1,493	$ 1,324
	2030	0.20	$ -	$ -	$ 169	$ -	$ 169	$ 1,216	$ 9	$ 69	$ 71	$ 127	$ 1,493	$ 1,324
	2031	0.18	$ -	$ -	$ 169	$ -	$ 169	$ 1,216	$ 9	$ 69	$ 71	$ 127	$ 1,493	$ 1,324
	2032	0.17	$ -	$ -	$ 169	$ -	$ 169	$ 1,216	$ 9	$ 69	$ 71	$ 127	$ 1,493	$ 1,324
	2033	0.16	$ -	$ -	$ 169	$ -	$ 169	$ 1,216	$ 9	$ 69	$ 71	$ 127	$ 1,493	$ 1,324
Eval End	2034	0.15	$ -	$ -	$ 169	$ -	$ 169	$ 1,216	$ 9	$ 69	$ 71	$ 127	$ 1,493	$ 1,324
	2035	0.15	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	2036	0.14	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	2037	0.13	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	TOTAL		$ 646	$ 1,478	$ 4,567	$ -	$ 6,692	$ 30,770	$ 238	$ 1,751	$ 1,790	$ 3,223	$ 37,772	$ 31,080
	PV		$ 487	$ 1,024	$ 1,681	$ -	$ 3,192	$ 10,953	$ 85	$ 623	$ 637	$ 1,147	$ 13,446	$ 10,254

Economic Internal Rate of Return %	71%
Net Present Value @ 6%	$ 10,254
Benefit - Cost Ratio	4.2
Benefit - Capital Ratio	

ECONOMIC APPRAISAL OF STRATEGY F ($'000s at 2001 Prices)

Key Dates	Year	Rate	ECONOMIC COSTS					ECONOMIC BENEFITS						NET BENEFIT FLOW
			Capital Costs	Vehicle Purchase	PT Ops & Maint	Other Road Costs	TOTAL COSTS	PT User Benefits	CV Benefits	Private Car Benefits	Greenhouse + Accidents	PT, Parking, Toll Revenues	TOTAL BENEFITS	
	2002	1.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	2003	0.94	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	2004	0.89	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Eval Start	2005	0.84	$ 82	$ -	$ -	$ -	$ 82	$ -	$ -	$ -	$ -	$ -	$ -	-$ 82
	2006	0.79	$ 247	$ 147	$ 16	$ -	$ 410	$ 96	$ 1	$ 5	$ 6	$ 10	$ 118	-$ 292
	2007	0.75	$ 247	$ 440	$ 65	$ -	$ 752	$ 390	$ 2	$ 21	$ 23	$ 42	$ 477	-$ 275
Open Year	2008	0.70	$ 164	$ 440	$ 114	$ -	$ 719	$ 693	$ 4	$ 36	$ 40	$ 74	$ 847	$ 129
	2009	0.67	$ 82	$ 293	$ 147	$ -	$ 523	$ 903	$ 5	$ 48	$ 52	$ 97	$ 1,105	$ 583
	2010	0.63	$ -	$ 147	$ 163	$ -	$ 310	$ 1,018	$ 6	$ 54	$ 59	$ 109	$ 1,245	$ 935
	2011	0.59	$ -	$ -	$ 163	$ -	$ 163	$ 1,032	$ 6	$ 54	$ 60	$ 111	$ 1,263	$ 1,099
	2012	0.56	$ -	$ -	$ 163	$ -	$ 163	$ 1,046	$ 6	$ 55	$ 60	$ 112	$ 1,280	$ 1,117
	2013	0.53	$ -	$ -	$ 163	$ -	$ 163	$ 1,060	$ 6	$ 56	$ 61	$ 114	$ 1,298	$ 1,134
	2014	0.50	$ -	$ -	$ 163	$ -	$ 163	$ 1,075	$ 6	$ 57	$ 62	$ 115	$ 1,315	$ 1,151
	2015	0.47	$ -	$ -	$ 163	$ -	$ 163	$ 1,089	$ 7	$ 57	$ 63	$ 117	$ 1,332	$ 1,169
	2016	0.44	$ -	$ -	$ 163	$ -	$ 163	$ 1,103	$ 7	$ 58	$ 64	$ 118	$ 1,350	$ 1,186
	2017	0.42	$ -	$ -	$ 163	$ -	$ 163	$ 1,117	$ 7	$ 59	$ 65	$ 120	$ 1,367	$ 1,204
	2018	0.39	$ -	$ -	$ 163	$ -	$ 163	$ 1,132	$ 7	$ 60	$ 65	$ 121	$ 1,384	$ 1,221
	2019	0.37	$ -	$ -	$ 163	$ -	$ 163	$ 1,146	$ 7	$ 60	$ 66	$ 123	$ 1,402	$ 1,238
	2020	0.35	$ -	$ 3	$ 163	$ -	$ 166	$ 1,160	$ 7	$ 61	$ 67	$ 124	$ 1,419	$ 1,253
	2021	0.33	$ -	$ 8	$ 163	$ -	$ 172	$ 1,174	$ 7	$ 62	$ 68	$ 126	$ 1,437	$ 1,265
	2022	0.31	$ -	$ 8	$ 163	$ -	$ 172	$ 1,188	$ 7	$ 63	$ 69	$ 127	$ 1,454	$ 1,282
	2023	0.29	$ -	$ 6	$ 163	$ -	$ 169	$ 1,203	$ 7	$ 63	$ 69	$ 129	$ 1,471	$ 1,302
	2024	0.28	$ -	$ 3	$ 163	$ -	$ 166	$ 1,217	$ 7	$ 64	$ 70	$ 130	$ 1,489	$ 1,323
	2025	0.26	$ -	$ -	$ 163	$ -	$ 163	$ 1,231	$ 7	$ 65	$ 71	$ 132	$ 1,506	$ 1,343
	2026	0.25	$ -	$ -	$ 163	$ -	$ 163	$ 1,231	$ 7	$ 65	$ 71	$ 132	$ 1,506	$ 1,343
	2027	0.23	$ -	$ -	$ 163	$ -	$ 163	$ 1,231	$ 7	$ 65	$ 71	$ 132	$ 1,506	$ 1,343
	2028	0.22	$ -	$ -	$ 163	$ -	$ 163	$ 1,231	$ 7	$ 65	$ 71	$ 132	$ 1,506	$ 1,343
	2029	0.21	$ -	$ -	$ 163	$ -	$ 163	$ 1,231	$ 7	$ 65	$ 71	$ 132	$ 1,506	$ 1,343
	2030	0.20	$ -	$ -	$ 163	$ -	$ 163	$ 1,231	$ 7	$ 65	$ 71	$ 132	$ 1,506	$ 1,343
	2031	0.18	$ -	$ -	$ 163	$ -	$ 163	$ 1,231	$ 7	$ 65	$ 71	$ 132	$ 1,506	$ 1,343
	2032	0.17	$ -	$ -	$ 163	$ -	$ 163	$ 1,231	$ 7	$ 65	$ 71	$ 132	$ 1,506	$ 1,343
	2033	0.16	$ -	$ -	$ 163	$ -	$ 163	$ 1,231	$ 7	$ 65	$ 71	$ 132	$ 1,506	$ 1,343
Eval End	2034	0.15	$ -	$ -	$ 163	$ -	$ 163	$ 1,231	$ 7	$ 65	$ 71	$ 132	$ 1,506	$ 1,343
	2035	0.15	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	2036	0.14	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	2037	0.13	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	TOTAL		$ 822	$ 1,494	$ 4,430	$ -	$ 6,746	$ 31,152	$ 186	$ 1,641	$ 1,799	$ 3,337	$ 38,116	$ 31,371
	PV		$ 619	$ 1,051	$ 1,630	$ -	$ 3,300	$ 11,089	$ 66	$ 584	$ 641	$ 1,188	$ 13,568	$ 10,268

Economic Internal Rate of Return %	61%
Net Present Value @ 6%	$ 10,268
Benefit - Cost Ratio	4.1
Benefit - Capital Ratio	

ECONOMIC APPRAISAL OF STRATEGY F2 ($'000s at 2001 Prices)

Key Dates	Year	Rate	ECONOMIC COSTS					ECONOMIC BENEFITS						NET BENEFIT FLOW
			Capital Costs	Vehicle Purchase	PT Ops & Maint	Other Road Costs	TOTAL COSTS	PT User Benefits	CV Benefits	Private Car Benefits	Greenhouse + Accidents	PT, Parking, Toll Revenues	TOTAL BENEFITS	
	2002	1.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	2003	0.94	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	2004	0.89	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Eval Start	2005	0.84	$ 109	$ -	$ -	$ -	$ 109	$ -	$ -	$ -	$ -	$ -	$ -	-$ 109
	2006	0.79	$ 326	$ 152	$ 18	$ -	$ 496	$ 96	$ 1	$ 6	$ 5	$ 11	$ 119	-$ 376
	2007	0.75	$ 326	$ 457	$ 72	$ -	$ 854	$ 391	$ 4	$ 24	$ 22	$ 44	$ 485	-$ 369
Open Year	2008	0.70	$ 217	$ 457	$ 125	$ -	$ 799	$ 695	$ 6	$ 43	$ 39	$ 77	$ 861	$ 62
	2009	0.67	$ 109	$ 304	$ 161	$ -	$ 574	$ 906	$ 8	$ 56	$ 51	$ 101	$ 1,123	$ 549
	2010	0.63	$ -	$ 152	$ 179	$ -	$ 331	$ 1,021	$ 10	$ 63	$ 58	$ 114	$ 1,266	$ 934
	2011	0.59	$ -	$ -	$ 179	$ -	$ 179	$ 1,035	$ 10	$ 64	$ 59	$ 115	$ 1,283	$ 1,104
	2012	0.56	$ -	$ -	$ 179	$ -	$ 179	$ 1,050	$ 10	$ 65	$ 60	$ 117	$ 1,301	$ 1,122
	2013	0.53	$ -	$ -	$ 179	$ -	$ 179	$ 1,064	$ 10	$ 66	$ 60	$ 118	$ 1,319	$ 1,139
	2014	0.50	$ -	$ -	$ 179	$ -	$ 179	$ 1,078	$ 10	$ 67	$ 61	$ 120	$ 1,336	$ 1,157
	2015	0.47	$ -	$ -	$ 179	$ -	$ 179	$ 1,092	$ 10	$ 68	$ 62	$ 122	$ 1,354	$ 1,175
	2016	0.44	$ -	$ -	$ 179	$ -	$ 179	$ 1,107	$ 10	$ 69	$ 63	$ 123	$ 1,372	$ 1,193
	2017	0.42	$ -	$ -	$ 179	$ -	$ 179	$ 1,121	$ 10	$ 70	$ 64	$ 125	$ 1,389	$ 1,210
	2018	0.39	$ -	$ -	$ 179	$ -	$ 179	$ 1,135	$ 11	$ 70	$ 64	$ 126	$ 1,407	$ 1,228
	2019	0.37	$ -	$ -	$ 179	$ -	$ 179	$ 1,149	$ 11	$ 71	$ 65	$ 128	$ 1,425	$ 1,246
	2020	0.35	$ -	$ 3	$ 179	$ -	$ 182	$ 1,164	$ 11	$ 72	$ 66	$ 130	$ 1,442	$ 1,260
	2021	0.33	$ -	$ 8	$ 179	$ -	$ 187	$ 1,178	$ 11	$ 73	$ 67	$ 131	$ 1,460	$ 1,273
	2022	0.31	$ -	$ 8	$ 179	$ -	$ 187	$ 1,192	$ 11	$ 74	$ 68	$ 133	$ 1,478	$ 1,290
	2023	0.29	$ -	$ 6	$ 179	$ -	$ 185	$ 1,206	$ 11	$ 75	$ 69	$ 134	$ 1,495	$ 1,311
	2024	0.28	$ -	$ 3	$ 179	$ -	$ 182	$ 1,221	$ 11	$ 76	$ 69	$ 136	$ 1,513	$ 1,331
	2025	0.26	$ -	$ -	$ 179	$ -	$ 179	$ 1,235	$ 12	$ 77	$ 70	$ 137	$ 1,531	$ 1,352
	2026	0.25	$ -	$ -	$ 179	$ -	$ 179	$ 1,235	$ 12	$ 77	$ 70	$ 137	$ 1,531	$ 1,352
	2027	0.23	$ -	$ -	$ 179	$ -	$ 179	$ 1,235	$ 12	$ 77	$ 70	$ 137	$ 1,531	$ 1,352
	2028	0.22	$ -	$ -	$ 179	$ -	$ 179	$ 1,235	$ 12	$ 77	$ 70	$ 137	$ 1,531	$ 1,352
	2029	0.21	$ -	$ -	$ 179	$ -	$ 179	$ 1,235	$ 12	$ 77	$ 70	$ 137	$ 1,531	$ 1,352
	2030	0.20	$ -	$ -	$ 179	$ -	$ 179	$ 1,235	$ 12	$ 77	$ 70	$ 137	$ 1,531	$ 1,352
	2031	0.18	$ -	$ -	$ 179	$ -	$ 179	$ 1,235	$ 12	$ 77	$ 70	$ 137	$ 1,531	$ 1,352
	2032	0.17	$ -	$ -	$ 179	$ -	$ 179	$ 1,235	$ 12	$ 77	$ 70	$ 137	$ 1,531	$ 1,352
	2033	0.16	$ -	$ -	$ 179	$ -	$ 179	$ 1,235	$ 12	$ 77	$ 70	$ 137	$ 1,531	$ 1,352
Eval End	2034	0.15	$ -	$ -	$ 179	$ -	$ 179	$ 1,235	$ 12	$ 77	$ 70	$ 137	$ 1,531	$ 1,352
	2035	0.15	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	2036	0.14	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	2037	0.13	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	TOTAL		$ 1,085	$ 1,550	$ 4,852	$ -	$ 7,488	$ 31,249	$ 292	$ 1,938	$ 1,775	$ 3,479	$ 38,733	$ 31,245
	PV		$ 818	$ 1,091	$ 1,785	$ -	$ 3,694	$ 11,124	$ 104	$ 690	$ 632	$ 1,238	$ 13,788	$ 10,094

Economic Internal Rate of Return %	51%
Net Present Value @ 6%	$ 10,094
Benefit - Cost Ratio	3.7
Benefit - Capital Ratio	

ECONOMIC APPRAISAL OF STRATEGY G ($'000s at 2001 Prices)

Key Dates	Year	Rate	ECONOMIC COSTS: Capital Costs	Vehicle Purchase	PT Ops & Maint	Other Road Costs	TOTAL COSTS	ECONOMIC BENEFITS: PT User Benefits	CV Benefits	Private Car Benefits	Greenhouse + Accidents	PT, Parking, Toll Revenues	TOTAL BENEFITS	NET BENEFIT FLOW
	2002	1.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	2003	0.94	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	2004	0.89	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Eval Start	2005	0.84	$ 155	$ -	$ -	$ -	$ 155	$ -	$ -	$ -	$ -	$ -	$ -	-$ 155
	2006	0.79	$ 464	$ 146	$ 16	$ 1	$ 627	$ 96	$ 2	$ 9	$ 6	$ 10	$ 123	-$ 504
	2007	0.75	$ 464	$ 439	$ 65	$ 2	$ 970	$ 390	$ 8	$ 35	$ 25	$ 41	$ 500	-$ 470
Open Year	2008	0.70	$ 309	$ 439	$ 114	$ 4	$ 866	$ 692	$ 15	$ 63	$ 45	$ 73	$ 887	$ 22
	2009	0.67	$ 155	$ 293	$ 147	$ 5	$ 599	$ 903	$ 19	$ 82	$ 58	$ 96	$ 1,157	$ 559
	2010	0.63	$ -	$ 146	$ 163	$ 5	$ 314	$ 1,017	$ 21	$ 92	$ 66	$ 108	$ 1,304	$ 990
	2011	0.59	$ -	$ -	$ 163	$ 5	$ 168	$ 1,031	$ 22	$ 93	$ 67	$ 109	$ 1,322	$ 1,154
	2012	0.56	$ -	$ -	$ 163	$ 5	$ 168	$ 1,046	$ 22	$ 95	$ 68	$ 111	$ 1,341	$ 1,173
	2013	0.53	$ -	$ -	$ 163	$ 5	$ 168	$ 1,060	$ 22	$ 96	$ 69	$ 112	$ 1,359	$ 1,191
	2014	0.50	$ -	$ -	$ 163	$ 5	$ 168	$ 1,074	$ 23	$ 97	$ 69	$ 114	$ 1,377	$ 1,209
	2015	0.47	$ -	$ -	$ 163	$ 5	$ 168	$ 1,088	$ 23	$ 99	$ 70	$ 115	$ 1,395	$ 1,227
	2016	0.44	$ -	$ -	$ 163	$ 5	$ 168	$ 1,102	$ 23	$ 100	$ 71	$ 117	$ 1,413	$ 1,245
	2017	0.42	$ -	$ -	$ 163	$ 5	$ 168	$ 1,117	$ 23	$ 101	$ 72	$ 118	$ 1,432	$ 1,264
	2018	0.39	$ -	$ -	$ 163	$ 5	$ 168	$ 1,131	$ 24	$ 102	$ 73	$ 120	$ 1,450	$ 1,282
	2019	0.37	$ -	$ -	$ 163	$ 5	$ 168	$ 1,145	$ 24	$ 104	$ 74	$ 121	$ 1,468	$ 1,300
	2020	0.35	$ -	$ 3	$ 163	$ 5	$ 171	$ 1,159	$ 24	$ 105	$ 75	$ 123	$ 1,486	$ 1,316
	2021	0.33	$ -	$ 8	$ 163	$ 5	$ 176	$ 1,173	$ 25	$ 106	$ 76	$ 124	$ 1,504	$ 1,328
	2022	0.31	$ -	$ 8	$ 163	$ 5	$ 176	$ 1,188	$ 25	$ 108	$ 77	$ 126	$ 1,523	$ 1,346
	2023	0.29	$ -	$ 5	$ 163	$ 5	$ 173	$ 1,202	$ 25	$ 109	$ 78	$ 127	$ 1,541	$ 1,367
	2024	0.28	$ -	$ 3	$ 163	$ 5	$ 171	$ 1,216	$ 26	$ 110	$ 79	$ 129	$ 1,559	$ 1,388
	2025	0.26	$ -	$ -	$ 163	$ 5	$ 168	$ 1,230	$ 26	$ 111	$ 80	$ 130	$ 1,577	$ 1,409
	2026	0.25	$ -	$ -	$ 163	$ 5	$ 168	$ 1,230	$ 26	$ 111	$ 80	$ 130	$ 1,577	$ 1,409
	2027	0.23	$ -	$ -	$ 163	$ 5	$ 168	$ 1,230	$ 26	$ 111	$ 80	$ 130	$ 1,577	$ 1,409
	2028	0.22	$ -	$ -	$ 163	$ 5	$ 168	$ 1,230	$ 26	$ 111	$ 80	$ 130	$ 1,577	$ 1,409
	2029	0.21	$ -	$ -	$ 163	$ 5	$ 168	$ 1,230	$ 26	$ 111	$ 80	$ 130	$ 1,577	$ 1,409
	2030	0.20	$ -	$ -	$ 163	$ 5	$ 168	$ 1,230	$ 26	$ 111	$ 80	$ 130	$ 1,577	$ 1,409
	2031	0.18	$ -	$ -	$ 163	$ 5	$ 168	$ 1,230	$ 26	$ 111	$ 80	$ 130	$ 1,577	$ 1,409
	2032	0.17	$ -	$ -	$ 163	$ 5	$ 168	$ 1,230	$ 26	$ 111	$ 80	$ 130	$ 1,577	$ 1,409
	2033	0.16	$ -	$ -	$ 163	$ 5	$ 168	$ 1,230	$ 26	$ 111	$ 80	$ 130	$ 1,577	$ 1,409
Eval End	2034	0.15	$ -	$ -	$ 163	$ 5	$ 168	$ 1,230	$ 26	$ 111	$ 80	$ 130	$ 1,577	$ 1,409
	2035	0.15	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	2036	0.14	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	2037	0.13	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	TOTAL		$ 1,545	$ 1,491	$ 4,418	$ 136	$ 7,590	$ 31,133	$ 653	$ 2,819	$ 2,013	$ 3,296	$ 39,915	$ 32,325
	PV		$ 1,164	$ 1,049	$ 1,625	$ 50	$ 3,888	$ 11,083	$ 233	$ 1,004	$ 717	$ 1,173	$ 14,209	$ 10,320

Economic Internal Rate of Return %	44%
Net Present Value @ 6%	$ 10,320
Benefit - Cost Ratio	3.7
Benefit - Capital Ratio	

ECONOMIC APPRAISAL OF STRATEGY G1 ($'000s at 2001 Prices)

Key Dates	Year	Rate	ECONOMIC COSTS: Capital Costs	Vehicle Purchase	PT Ops & Maint	Other Road Costs	TOTAL COSTS	ECONOMIC BENEFITS: PT User Benefits	CV Benefits	Private Car Benefits	Greenhouse + Accidents	PT, Parking, Toll Revenues	TOTAL BENEFITS	NET BENEFIT FLOW
	2002	1.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	2003	0.94	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	2004	0.89	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Eval Start	2005	0.84	$ 141	$ -	$ -	$ -	$ 141	$ -	$ -	$ -	$ -	$ -	$ -	-$ 141
	2006	0.79	$ 424	$ 146	$ 16	$ 1	$ 587	$ 96	$ 2	$ 9	$ 6	$ 10	$ 123	-$ 464
	2007	0.75	$ 424	$ 439	$ 65	$ 2	$ 931	$ 390	$ 8	$ 35	$ 25	$ 41	$ 499	-$ 431
Open Year	2008	0.70	$ 283	$ 439	$ 114	$ 4	$ 840	$ 692	$ 14	$ 62	$ 45	$ 73	$ 887	$ 47
	2009	0.67	$ 141	$ 293	$ 147	$ 5	$ 585	$ 903	$ 18	$ 81	$ 58	$ 96	$ 1,156	$ 571
	2010	0.63	$ -	$ 146	$ 163	$ 5	$ 314	$ 1,018	$ 21	$ 91	$ 65	$ 108	$ 1,303	$ 989
	2011	0.59	$ -	$ -	$ 163	$ 5	$ 168	$ 1,032	$ 21	$ 92	$ 66	$ 109	$ 1,321	$ 1,153
	2012	0.56	$ -	$ -	$ 163	$ 5	$ 168	$ 1,046	$ 21	$ 94	$ 67	$ 111	$ 1,339	$ 1,171
	2013	0.53	$ -	$ -	$ 163	$ 5	$ 168	$ 1,060	$ 22	$ 95	$ 68	$ 113	$ 1,358	$ 1,190
	2014	0.50	$ -	$ -	$ 163	$ 5	$ 168	$ 1,074	$ 22	$ 96	$ 69	$ 114	$ 1,376	$ 1,208
	2015	0.47	$ -	$ -	$ 163	$ 5	$ 168	$ 1,089	$ 22	$ 98	$ 70	$ 116	$ 1,394	$ 1,226
	2016	0.44	$ -	$ -	$ 163	$ 5	$ 168	$ 1,103	$ 22	$ 99	$ 71	$ 117	$ 1,412	$ 1,244
	2017	0.42	$ -	$ -	$ 163	$ 5	$ 168	$ 1,117	$ 23	$ 100	$ 72	$ 119	$ 1,430	$ 1,262
	2018	0.39	$ -	$ -	$ 163	$ 5	$ 168	$ 1,131	$ 23	$ 101	$ 73	$ 120	$ 1,449	$ 1,281
	2019	0.37	$ -	$ -	$ 163	$ 5	$ 168	$ 1,146	$ 23	$ 103	$ 74	$ 122	$ 1,467	$ 1,299
	2020	0.35	$ -	$ 3	$ 163	$ 5	$ 171	$ 1,160	$ 24	$ 104	$ 75	$ 123	$ 1,485	$ 1,314
	2021	0.33	$ -	$ 8	$ 163	$ 5	$ 176	$ 1,174	$ 24	$ 105	$ 76	$ 125	$ 1,503	$ 1,327
	2022	0.31	$ -	$ 8	$ 163	$ 5	$ 176	$ 1,188	$ 24	$ 106	$ 76	$ 126	$ 1,521	$ 1,345
	2023	0.29	$ -	$ 6	$ 163	$ 5	$ 174	$ 1,202	$ 24	$ 108	$ 77	$ 128	$ 1,540	$ 1,366
	2024	0.28	$ -	$ 3	$ 163	$ 5	$ 171	$ 1,217	$ 25	$ 109	$ 78	$ 129	$ 1,558	$ 1,387
	2025	0.26	$ -	$ -	$ 163	$ 5	$ 168	$ 1,231	$ 25	$ 110	$ 79	$ 131	$ 1,576	$ 1,408
	2026	0.25	$ -	$ -	$ 163	$ 5	$ 168	$ 1,231	$ 25	$ 110	$ 79	$ 131	$ 1,576	$ 1,408
	2027	0.23	$ -	$ -	$ 163	$ 5	$ 168	$ 1,231	$ 25	$ 110	$ 79	$ 131	$ 1,576	$ 1,408
	2028	0.22	$ -	$ -	$ 163	$ 5	$ 168	$ 1,231	$ 25	$ 110	$ 79	$ 131	$ 1,576	$ 1,408
	2029	0.21	$ -	$ -	$ 163	$ 5	$ 168	$ 1,231	$ 25	$ 110	$ 79	$ 131	$ 1,576	$ 1,408
	2030	0.20	$ -	$ -	$ 163	$ 5	$ 168	$ 1,231	$ 25	$ 110	$ 79	$ 131	$ 1,576	$ 1,408
	2031	0.18	$ -	$ -	$ 163	$ 5	$ 168	$ 1,231	$ 25	$ 110	$ 79	$ 131	$ 1,576	$ 1,408
	2032	0.17	$ -	$ -	$ 163	$ 5	$ 168	$ 1,231	$ 25	$ 110	$ 79	$ 131	$ 1,576	$ 1,408
	2033	0.16	$ -	$ -	$ 163	$ 5	$ 168	$ 1,231	$ 25	$ 110	$ 79	$ 131	$ 1,576	$ 1,408
Eval End	2034	0.15	$ -	$ -	$ 163	$ 5	$ 168	$ 1,231	$ 25	$ 110	$ 79	$ 131	$ 1,576	$ 1,408
	2035	0.15	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	2036	0.14	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	2037	0.13	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	TOTAL		$ 1,414	$ 1,492	$ 4,419	$ 136	$ 7,460	$ 31,146	$ 635	$ 2,791	$ 2,005	$ 3,305	$ 39,881	$ 32,420
	PV		$ 1,065	$ 1,049	$ 1,626	$ 50	$ 3,790	$ 11,087	$ 226	$ 993	$ 714	$ 1,177	$ 14,196	$ 10,406

Economic Internal Rate of Return %	**47%**
Net Present Value @ 6%	**$ 10,406**
Benefit - Cost Ratio	**3.7**
Benefit - Capital Ratio	

ECONOMIC APPRAISAL OF STRATEGY G2 ($'000s at 2001 Prices)

Key Dates	Year	Rate	ECONOMIC COSTS: Capital Costs	Vehicle Purchase	PT Ops & Maint	Other Road Costs	TOTAL COSTS	ECONOMIC BENEFITS: PT User Benefits	CV Benefits	Private Car Benefits	Greenhouse + Accidents	PT, Parking, Toll Revenues	TOTAL BENEFITS	NET BENEFIT FLOW
	2002	1.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	2003	0.94	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	2004	0.89	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Eval Start	2005	0.84	$ 119	$ -	$ -	$ -	$ 119	$ -	$ -	$ -	$ -	$ -	$ -	-$ 119
	2006	0.79	$ 358	$ 146	$ 16	$ 0	$ 520	$ 96	$ 1	$ 6	$ 6	$ 10	$ 120	-$ 401
	2007	0.75	$ 358	$ 438	$ 65	$ 1	$ 862	$ 391	$ 5	$ 25	$ 23	$ 42	$ 486	-$ 376
Open Year	2008	0.70	$ 238	$ 438	$ 114	$ 2	$ 793	$ 694	$ 8	$ 44	$ 42	$ 74	$ 862	$ 69
	2009	0.67	$ 119	$ 292	$ 147	$ 3	$ 561	$ 905	$ 11	$ 58	$ 54	$ 97	$ 1,124	$ 563
	2010	0.63	$ -	$ 146	$ 163	$ 4	$ 313	$ 1,020	$ 12	$ 65	$ 61	$ 109	$ 1,267	$ 955
	2011	0.59	$ -	$ -	$ 163	$ 4	$ 167	$ 1,034	$ 12	$ 66	$ 62	$ 110	$ 1,285	$ 1,118
	2012	0.56	$ -	$ -	$ 163	$ 4	$ 167	$ 1,048	$ 12	$ 67	$ 63	$ 112	$ 1,303	$ 1,136
	2013	0.53	$ -	$ -	$ 163	$ 4	$ 167	$ 1,063	$ 13	$ 68	$ 64	$ 113	$ 1,320	$ 1,154
	2014	0.50	$ -	$ -	$ 163	$ 4	$ 167	$ 1,077	$ 13	$ 69	$ 65	$ 115	$ 1,338	$ 1,171
	2015	0.47	$ -	$ -	$ 163	$ 4	$ 167	$ 1,091	$ 13	$ 70	$ 65	$ 116	$ 1,356	$ 1,189
	2016	0.44	$ -	$ -	$ 163	$ 4	$ 167	$ 1,105	$ 13	$ 71	$ 66	$ 118	$ 1,373	$ 1,207
	2017	0.42	$ -	$ -	$ 163	$ 4	$ 167	$ 1,120	$ 13	$ 72	$ 67	$ 119	$ 1,391	$ 1,224
	2018	0.39	$ -	$ -	$ 163	$ 4	$ 167	$ 1,134	$ 13	$ 72	$ 68	$ 121	$ 1,409	$ 1,242
	2019	0.37	$ -	$ -	$ 163	$ 4	$ 167	$ 1,148	$ 14	$ 73	$ 69	$ 122	$ 1,426	$ 1,260
	2020	0.35	$ -	$ 3	$ 163	$ 4	$ 169	$ 1,162	$ 14	$ 74	$ 70	$ 124	$ 1,444	$ 1,275
	2021	0.33	$ -	$ 8	$ 163	$ 4	$ 175	$ 1,177	$ 14	$ 75	$ 71	$ 126	$ 1,462	$ 1,287
	2022	0.31	$ -	$ 8	$ 163	$ 4	$ 175	$ 1,191	$ 14	$ 76	$ 71	$ 127	$ 1,479	$ 1,304
	2023	0.29	$ -	$ 6	$ 163	$ 4	$ 172	$ 1,205	$ 14	$ 77	$ 72	$ 129	$ 1,497	$ 1,325
	2024	0.28	$ -	$ 3	$ 163	$ 4	$ 169	$ 1,219	$ 14	$ 78	$ 73	$ 130	$ 1,515	$ 1,345
	2025	0.26	$ -	$ -	$ 163	$ 4	$ 167	$ 1,234	$ 15	$ 79	$ 74	$ 132	$ 1,533	$ 1,366
	2026	0.25	$ -	$ -	$ 163	$ 4	$ 167	$ 1,234	$ 15	$ 79	$ 74	$ 132	$ 1,533	$ 1,366
	2027	0.23	$ -	$ -	$ 163	$ 4	$ 167	$ 1,234	$ 15	$ 79	$ 74	$ 132	$ 1,533	$ 1,366
	2028	0.22	$ -	$ -	$ 163	$ 4	$ 167	$ 1,234	$ 15	$ 79	$ 74	$ 132	$ 1,533	$ 1,366
	2029	0.21	$ -	$ -	$ 163	$ 4	$ 167	$ 1,234	$ 15	$ 79	$ 74	$ 132	$ 1,533	$ 1,366
	2030	0.20	$ -	$ -	$ 163	$ 4	$ 167	$ 1,234	$ 15	$ 79	$ 74	$ 132	$ 1,533	$ 1,366
	2031	0.18	$ -	$ -	$ 163	$ 4	$ 167	$ 1,234	$ 15	$ 79	$ 74	$ 132	$ 1,533	$ 1,366
	2032	0.17	$ -	$ -	$ 163	$ 4	$ 167	$ 1,234	$ 15	$ 79	$ 74	$ 132	$ 1,533	$ 1,366
	2033	0.16	$ -	$ -	$ 163	$ 4	$ 167	$ 1,234	$ 15	$ 79	$ 74	$ 132	$ 1,533	$ 1,366
Eval End	2034	0.15	$ -	$ -	$ 163	$ 4	$ 167	$ 1,234	$ 15	$ 79	$ 74	$ 132	$ 1,533	$ 1,366
	2035	0.15	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	2036	0.14	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	2037	0.13	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	TOTAL		$ 1,192	$ 1,488	$ 4,421	$ 95	$ 7,196	$ 31,215	$ 369	$ 1,995	$ 1,873	$ 3,330	$ 38,783	$ 31,587
	PV		$ 898	$ 1,046	$ 1,627	$ 35	$ 3,606	$ 11,112	$ 131	$ 710	$ 667	$ 1,186	$ 13,806	$ 10,200

Economic Internal Rate of Return %	50%
Net Present Value @ 6%	$ 10,200
Benefit - Cost Ratio	3.8
Benefit - Capital Ratio	