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NZTA BRT Cost-benefit analysis model

Prepared by PricewaterhouseCoopers

Final model 30 July 2015

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In the course of our assessment we have had access to information provided by NZTA, Greater Wellington Regional Council (GWRC) and Wellington City Council (WCC), but we have not carried out anything in the nature of an audit, nor have we considered the reasonableness of the assumptions supplied to us in any way. Accordingly, we express no opinion on the reliability, accuracy or completeness of the information provided to us and upon which we have relied. Responsibility for the reliability, accuracy and completeness of such information therefore remains with NZTA, GWRC and WCC.

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In our financial modelling, we have relied upon assumptions and projections supplied to us. We are unable to express an opinion as to whether actual results will approximate those projected because the projections are based on estimates and assumptions regarding future events, which, by their nature, are not able to be independently substantiated. Some assumptions inevitably will not eventuate and unanticipated events and circumstances will occur. Therefore, the actual results will vary from the projections.

We reserve the right (but will be under no obligation) to review our analysis and if we consider it necessary, to revise our model in the light of any information existing at the date of this model which becomes known to us after that date.

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INTRO SECTION: INSTRUCTIONS

Instructions for users

This workbook contains the cost-benefit analysis workings of the Bus Rapid Transit (BRT) proposal. It should be read alongside the final report.

Broadly, this workbook flows from left-to-right, there are six sections: (i) background and assumptions, (ii) GWRC modelling inputs, (iii) model outputs, (iv) benefits, (v) costs, (vi) summary

The results of the analysis are contained in the "Summary" tab (contains the option results using the original option numbering) and the "Summary (renumber)" tab (contains the option results using the numbering that matches the final report)

The option definitions are contained in the final report.

The majority of the inputs for this analysis are from the PTSS modelling report. Alternative sources are stated.

A complete list of assumptions is outlined in the final report.

Key model parameters (eg discount rate, evaluation period) can be changed in the "Summary" tab. These are highlighted yellow. You cannot change the parameters in the "Summary (renumber)" tab.

Other model inputs are also highlighted yellow in their respective tabs.

INTRO SECTION: RENUMBERING

Instructions for users

The options were renumbered towards the end of the work. The analysis in this workbook pertains to the initial option numbering

For clarity, the table below summarises the option numbers as reported in this workbook ('workbook') and the options numbers summarised in the final report ('final report')

	Targeted bus priority and other modes improvement	Peak bus lanes & priority			Targeted bus lanes & priority			Full bus lanes & priority, targeted Kilbirnie branch		Full bus lanes & priority			Physically separated lanes & full priority, targeted Kilbirnie		Physically separated lanes & full priority		
Workbook	1a	2a	2b	2c	3a	3b	3c	4a	4b	5a	5b	5c	6a	6b	7a	7b	7c
Final report	1	2b	2	2a	3b	3	3a	4c	4ac	4b	4	4a	5c	5ac	5b	5	5a

The "Summary" tab (Section 6) shows the analysis of the options as they were developed by the Working Group.

The "Summary (renumber)" tab (Section) shows the concordance of the options to the final report.

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1 BACKGROUND SECTION TAB 1: ASSUMPTIONS

- Assumption number Assumption
- 1 Linear interpolation between modelled years and extrapolation beyond modelled years
- 2 Growth rates in regional patronage used to proxy growth rates along Spine routes

Notes and calculations
As per EEM guidance

<http://www.gw.govt.nz/assets/Transport/Regional-transport/PT-Spine-Study/PTSS-Final-Reports-2013/FINAL-PDF-Public-Transport-Spine-Study-Compilation-Report.PDF>

Table 4 Changes in regional patronage during the morning peak (7-9 AM)

	Reference Case	Bus Priority	Bus Rapid Transit	Light Rail Transit
2021 (regional)	35,600	+ 200	+ 700	+ 200
2031 (regional)	34,000	+ 300	+ 800	+ 300
2041 (regional)	35,200	+ 300	+ 900	+ 400

Table 5 Changes in trips to the CBD from key locations 2031 morning peak (7-9 AM)

	Reference Case	Bus Priority	Bus Rapid Transit	Light Rail Transit
Miramar	1,320	+ 60	+ 170	- 70
Kilbirnie	680	+ 40	+ 80	+ 90
Mount Victoria / Hataitai	790	+ 10	- 50	- 40
Island Bay / Berhampore	1,140	+ 30	+ 100	- 60
Newtown	790	+ 30	+ 90	+ 40

Regional Patronage

	Ref	Bus priority	BRT
2021	35600	35800	36300
2031	34000	34300	34800
2041	35200	35500	36100

Growth rates:

	2021 to 2031	2031 to 2041
Reference	-4.5%	3.5%
Bus priority	-4.2%	3.5%
BRT	-4.1%	3.7%

2025	
2019	
0.8	
1.2	

Based on the Local Government Capex Price Index and long term CPI. Calculations are outlined in the separate cost analysis
0.20%

- 3 Year of Basin development
- 4 Year that option begins
- 5 Travel time savings improve relative to the do-minimum over time, in the short term (2021)
- 6 Travel time savings improve relative to the do-minimum over time, over the long run (by 2041).
- 7 Assume that travel time savings cap in the long run at 2041 value.
- 8 For BRT, existing PT users walk further to stations (rather than a closer stop)
- 9 For bus priority, only new PT users gain walking benefits
- 10 Vehicle km travelled is constant over the evaluation period.
- 11 Capex cost escalation factor (per annum)
- 12 Operating costs change per year
- 13 Assume that people travelling from Kilbirnie and Newtown stay on the system until after Mt Vic
- 14 Trip purpose same as IFT work
- 15 PT user benefits are only for BRT stations (no additional benefits for BP).
- 16 PT user benefits accrue to the trips south of Basin and Mt Vic
- 17 Emissions benefits only occur due to the reduction in VKT (no change in fleet mix to more efficient buses because the buses are new high capacity buses, the same as the do-minimum)
- 18 Trips by suburb to th CBD:
 - Miramar 23%
 - Kilbirnie 26%
 - Mt Vic/Hataitai 47%
 - Island Bay 35%
 - Newtown 64%

19 Peak vehicle occupancy is 1.4 persons **1.40** <-car_occupancy

Table A2.4 Vehicle occupancy and travel purpose

Road category	Car				LCV				MCV and HCV			
	Occupancy	Travel purpose %			Occupancy	Travel purpose %			Occupancy	Travel purpose %		
		Work	Commute	Other		Work	Commute	Other		Work	Commute	Other
Urban arterial												
AM Peak	1.4	10	50	40	1.4	65	20	15	1.2	90	5	5
Daytime inter-peak	1.3	30	10	60	1.4	65	5	30	1.2	90	0	10
PM peak	1.4	10	30	60	1.4	65	15	20	1.2	90	5	5
Evening/night-time	1.4	10	5	85	1.4	65	15	20	1.2	90	5	5
Weekday all periods	1.4	20	20	60	1.4	65	10	25	1.2	90	5	5
Weekend	1.7	5	5	90	1.7	10	10	80	1.6	75	5	20
All periods	1.5	15	15	70	1.5	50	10	40	1.3	85	5	10
Urban other												
Weekday	1.4	20	20	60	1.6	65	10	25	1.2	90	5	5
Weekend	1.7	5	5	90	2.0	10	10	80	1.6	75	5	20
All periods	1.5	15	15	70	1.7	45	10	45	1.3	85	5	10
Rural strategic and rural other roads												
Weekday	1.6	40	10	50	1.6	75	5	20	1.3	90	5	5
Weekend	2.2	5	5	90	2.0	10	10	80	1.8	75	5	20
All periods	1.7	30	10	60	1.7	55	5	40	1.4	85	5	10

- 20 Assumed bus speed factor in 2021 **1.1**
- 21 Assumed bus speed factor in 2041 **0.8**
- 22 Assumed that on BRT the dedication allows the bus to keep the same speed as in 2031.
- 23 Patronage increases are in line with travel time benefits

- 24 Used ratio of Newtown demand to Kilbirnie demand to factor up costs
- 25 Assumed simplified procedures for car vehicle operating costs.
- 26 Assumed gradient of **0%**
- 27 Sensitivity test on a higher value of time for PT users: (% increase) **1.25** (Change the value of the percentage (%) increase here. The switch for using the sensitivity test is on the "Summary" tab)
- 28 Sensitivity test on a higher cost extra 20%
- 29 Sensitivity test on lower costs no contingency

Key assumptions and inputs to analysis

Units and valuation assumptions

Conversion factor (minutes to hours)

Value of time All figures reported in July 2014 \$/hr (unless otherwise indicated)

PT value of time \$8.15

Annualisation factors All figures reflect the ratio between daily AM peak benefits (calculated by transport model) and annual benefits

AM-peak	
Highway	490 <- car annualisation
PT Adult	583 <- assume that travellers along the spine study routes are adult PT travellers
PT child	647
Bus	
Peak only annualisation factor - PT	500 <-based on 250 working days per year and 2 peak periods per day
Inter-peak	
Highway	857.5
PT Adult	1745
PT child	2114

Demand Segment	Period	Hours covered by model	Factor
Highway	AM Peak	7 AM -9 AM	490
	Inter-peak	Average 2 hours between 9 AM and 4 PM	857.5
PT Adult	AM Peak	7 AM -9 AM	583
	Inter-peak	Average 2 hours between 9 AM and 3 PM	1745
PT Child	AM Peak	7 AM -9 AM	647
	Inter-peak	Average 2 hours between 9 AM and 3 PM	2114

Table 5 Annualisation Factors

1 BACKGROUND SECTION TAB 1:SECTION TAB 3: VALUE OF TIME CALCULATIONS

Time period	Road type	Vehicle type and occupant	APT model output category	Travel purpose	Travel purpose	Base VoT (2002 \$/hr)	Resource cost correction factor	Average VoT (2002 \$/hr)	Average VoT (July 2014 \$/hr)
AM Peak	Urban arterial	Seated bus and train passenger	New / existing PT users	Work	4%	\$21.70	1.00	\$5.74	\$8.15
				Commute	73%	\$4.70	1.15		
				Other	23%	\$3.50	1.15		

Benefit update factor (for travel time cost savings) 2002 to 2014 value:

1.42

Weighted av value of time calc for PT users:

\$8.15

A12.3 Update factors for benefits

The factors for updating the benefit values in this manual are:

Variable	Base Date	Factor to adjust to July 2014
Travel time cost savings ^{TT}	July 2002	1.42
Vehicle operating cost savings ^{VO}	July 2008	1.07
Accident cost savings ^{ACC}	July 2006	1.24
Comfort benefits ^{CB}	July 2002	1.42
Driver frustration ^{DF}	July 2002	1.42
Passenger transport user benefits ^{PT}	July 2008	1.14
Walking and cycling benefits ^{WCB}	July 2008	1.14
Travel behaviour change benefits ^{TBC}	July 2008	1.14

EEM table:

Table A4.1(a) Behavioural values of time for vehicle occupants in \$/h (all road categories; all time periods – July 2002)

Vehicle occupant	Work travel purpose	Commuting to/from work	Other non-work travel purposes
Base values of time for uncongested traffic (\$/h)			
Car, motorcycle driver	23.85	7.80	6.90
Car, motorcycle passenger	21.70	5.85	5.20
Light commercial driver	23.45	7.80	6.90
Light commercial passenger	21.70	5.85	5.20
Medium/heavy commercial driver	20.10	7.80	6.90
Medium/heavy commercial passenger	20.10	5.85	5.20
Seated bus and train passenger	21.70	4.70	3.05
Standing bus and train passenger	21.70	6.60	4.25
Pedestrian and cyclist	21.70	6.60	4.25
Maximum increment for congestion (CRV, \$/h)			
Car, motorcycle driver	3.15		2.75
Car, motorcycle passenger	2.35		2.05
Commercial vehicle driver	3.15		2.75
Commercial vehicle passenger	2.35		2.05

Spine Study economic report:

model. They are consistent with values used in other studies around New Zealand, so that projects can be easily compared against each other.

Value of Time	Work		Education		Other		Children
	CA	NCA	CA	NCA	CA	NCA	
Behavioural VoT (\$/hr)	12.29	9.17	8.85	5.83	10.75	7.56	6.73
EEM VoT (\$/hr)	11.90	11.90	8.78	8.78	8.78	8.78	8.78

Where CA: Car available
NCA: no car available

Table 2 Values of time used in evaluation

In the EEM approach, values of time are kept constant in all future years, whereas the behavioural values include

Underlying information from EEM

EEM Table A2.3 Traffic composition

EEM Table A2.4 Vehicle occupancy and travel purposes

EEM Table A4.1(a) Behavioural values of time for vehicle occupants - July 2002

EEM Table A11.1 Guidelines for estimating user time and vehicle

Time period	Road type	Vehicle type and occupant	Traffic composition	Vehicle occupancy	Travel purpose			traffic (VoT, 2002 \$/hr)			congestion (CRV, 2002\$/h)			Resource cost correction factor		
					Work	Commute	Other	Work	Commute	Other	Work	Commute	Other	Work	Commute	Other
AM peak	Urban arterial	Car	85%	1.4	10%	50%	40%	\$23.85	\$7.80	\$6.90	\$3.15	\$3.15	\$2.75	1.00	1.15	1.15
		Car passenger	10%	1.4	10%	50%	40%	\$21.70	\$5.85	\$5.20	\$2.35	\$2.35	\$2.05	1.00	1.15	1.15
		LCV			65%	20%	15%	\$23.45	\$7.80	\$6.90	\$3.15	\$3.15	\$2.75	1.00	1.15	1.15
		LCV passenger			65%	20%	15%	\$21.70	\$5.85	\$5.20	\$2.35	\$2.35	\$2.05	1.00	1.15	1.15
		MCV	2%	1.2	90%	5%	5%	\$20.10	\$7.80	\$6.90	\$3.15	\$3.15	\$2.75	1.00	1.15	1.15
		HCVI	1%	1.2	90%	5%	5%	\$20.10	\$7.80	\$6.90	\$3.15	\$3.15	\$2.75	1.00	1.15	1.15
		HCVII	2%	1.2	90%	5%	5%	\$20.10	\$7.80	\$6.90	\$3.15	\$3.15	\$2.75	1.00	1.15	1.15

PwC calcs to estimate VoT for road outputs

Time period	Road type	Vehicle type and occupant	ART3 model output category	Traffic composition	... by vehicle class	VoT by vehicle class and travel purpose (2002 \$/hr)			VoT by vehicle class and travel purpose (July 2014 \$/hr)			CRV by vehicle class and travel purpose (2002 \$/hr)			CRV by vehicle class and travel purpose (July 2014 \$/hr)			Resource cost correction (2002 \$/hr)			Resource cost correction (2014 \$/hr)					
						Work	Commute	Other	Work	Commute	Other	Work	Commute	Other	Work	Commute	Other	Work	Commute	Other	Work	Commute	Other			
AM peak	Urban arterial	Car	Cars	24.5%	61.2%	64%	\$23.21	\$7.24	\$6.41	\$32.95	\$10.28	\$9.11	\$2.92	\$2.92	\$2.55	\$4.15	\$4.15	\$3.62	\$0.00	\$0.94	\$0.84	\$0.00	\$1.34	\$1.19		
		Car passenger																							24.5%	26%
		LCV																							8%	
		LCV passenger	2.9%	3%																						
		MCV	HCVs	1.7%	1.7%	40.0%	\$18.83	\$26.73	\$3.13	\$4.44	\$0.28	\$0.40														
		HCVI											0.9%	20.0%												
HCVII	1.7%	40.0%																								

Overall weighted average \$12.08 <- car_vot

1 BACKGROUND SECTION TAB 1: SECTION TAB 4: BUS ANNUALISATION CALCULATION

From Bus fleet configuration work:

Bus Kilometres for Wellington City bus services (Mana and Go Wellington excluding Airport Flyer)

Current annual in service bus kilometres	6,445,769
Current annual in service bus kilometres operated by trolley buses	1,444,982
Proposed in service bus kilometres for proposed network	6,530,000 <i>Not used</i>

Source: Rhonda Hewitt (email), 14 Jan 2014

Re-presented:

Current annual in service bus km	6,445,769
Current annual in service bus km operated by trolley buses	1,444,982
Proposed in service bus km for proposed network	6,530,000

From PwC IFT work (AM peak)

Wellington Public Transport Model Statistics for IFT Prog

	2011 Base	
	AM	IP
Total bus services	738	363
Total rail services	72	29
Total bus boardings	18,136	5,726
Total rail boardings	12,697	1,151
Total boardings	30,833	6,877
Bus passenger kilometres (pax-km)	107,220	38,619
Rail passenger kilometres (pax-km)	292,585	21,298
Bus vehicle kilometres (veh-km)	10,829	5,620
Rail vehicle kilometres (veh-km)	1,952	950

Represented:

	2011 base	
	AM	IP
Total bus services	738	363
Total rail services	72	29
Total bus boardings	18136	5726
Total rail boardings	12697	1151
Total boardings	30833	6877
Bus passengr km (pax-km)	107220	38619
Rail passenger km (pax-km)	292585	21298
Bus vehicle km (veh-km)	10829	5620
Rail vehicl km (veh-km)	1952	950

Implied annualisation factor:

595.2322

Vehicle Operating Costs

Bus VOC by speed and gradient (cents/km), p. 241

Table A5.0(a)

Speed km/h	Gradient in percent (both directions)												
	0	1	2	3	4	5	6	7	8	9	10	11	12
10	104.2	105.1	107.6	111.4	116.3	122.1	128.6	135.3	142.2	149	155.4	161.1	166
11	102.84	103.74	106.24	110.04	114.94	120.74	127.24	133.94	140.84	147.64	154.04	159.74	164.64
12	101.48	102.38	104.88	108.68	113.58	119.38	125.88	132.58	139.48	146.28	152.68	158.38	163.28
13	100.12	101.02	103.52	107.32	112.22	118.02	124.52	131.22	138.12	144.92	151.32	157.02	161.92
14	98.76	99.66	102.16	105.96	110.86	116.66	123.16	129.86	136.76	143.56	149.96	155.66	160.56
15	97	97.6	100	103.8	108.9	114.9	121.7	129	136.6	144.1	151.4	158.2	164.2
16	95.64	96.24	98.64	102.44	107.54	113.54	120.34	127.64	135.24	142.74	150.04	156.84	162.84
17	94.28	94.88	97.28	101.08	106.18	112.18	118.98	126.28	133.88	141.38	148.68	155.48	161.48
18	92.92	93.52	95.92	99.72	104.82	110.82	117.62	124.92	132.52	140.02	147.32	154.12	160.12
19	91.56	92.16	94.56	98.36	103.46	109.46	116.26	123.56	131.16	138.66	145.96	152.76	158.76
20	90.2	90.6	92.8	96.6	101.7	107.9	114.9	122.5	130.4	138.4	146.3	153.7	160.5
21	88.84	89.24	91.44	95.24	100.34	106.54	113.54	121.14	129.04	137.04	144.94	152.34	159.14
22	87.48	87.88	90.08	93.88	98.98	105.18	112.18	119.78	127.68	135.68	143.58	150.98	157.78
23	86.12	86.52	88.72	92.52	97.62	103.82	110.82	118.42	126.32	134.32	142.22	149.62	156.42
24	84.76	85.16	87.36	91.16	96.26	102.46	109.46	117.06	124.96	132.96	140.86	148.26	155.06
25	85.2	85.4	87.4	91.1	96.2	102.4	109.6	117.4	125.6	133.9	142.2	150.1	157.5
26	83.84	84.04	86.04	89.74	94.84	101.04	108.24	116.04	124.24	132.54	140.84	148.74	156.14
27	82.48	82.68	84.68	88.38	93.48	99.68	106.88	114.68	122.88	131.18	139.48	147.38	154.78
28	81.12	81.32	83.32	87.02	92.12	98.32	105.52	113.32	121.52	129.82	138.12	146.02	153.42
29	79.76	79.96	81.96	85.66	90.76	96.96	104.16	111.96	120.16	128.46	136.76	144.66	152.06
30	81.9	81.9	83.8	87.4	92.4	98.7	105.9	113.8	122.2	130.9	139.4	147.7	155.5
35	80	79.8	81.5	85	90	96.3	103.6	111.6	120.2	129	137.8	146.4	154.5
40	79.2	78.8	80.4	83.8	88.8	95.1	102.4	110.5	119.1	128.1	137.1	146	154.4
45	79.4	78.8	80.3	83.6	88.5	94.7	102	110.2	119	128.1	137.3	146.3	155
50	80.2	79.5	80.8	84	88.9	95.1	102.4	110.7	119.5	128.7	138	147.3	156.1
55	81.7	80.7	82	85.1	89.9	96.1	103.5	111.7	120.6	129.9	139.4	148.7	157.8
60	83.6	82.5	83.7	86.7	91.5	97.6	105	113.2	122.2	131.6	141.1	150.6	159.8
65	85.9	84.7	85.8	88.7	93.4	99.5	106.9	115.1	124.1	133.6	143.3	152.9	162.2
70	88.6	87.3	88.2	91.1	95.7	101.8	109.1	117.4	126.5	136	145.7	155.5	164.9
75	91.5	90.1	90.9	93.7	98.3	104.4	111.7	120	129	138.6	148.4	158.3	167.9
80	94.7	93.2	93.9	96.6	101.1	107.2	114.5	122.8	131.9	141.5	151.4	161.3	171
85	98.1	96.4	97.1	99.7	104.2	110.2	117.5	125.8	134.9	144.5	154.5	164.5	174.3
90	101.6	99.9	100.4	103	107.4	113.4	120.6	129	138.1	147.8	157.8	167.9	177.8
95	105.3	103.5	103.9	106.5	110.8	116.7	124	132.3	141.4	151.2	161.2	171.4	181.3
100	109.1	107.2	107.6	110	114.3	120.2	127.4	135.8	144.9	154.7	164.8	175	185
105	113.1	111	111.3	113.7	118	123.8	131	139.3	148.5	158.3	168.4	178.7	188.8
110	117.1	114.9	115.2	117.5	121.7	127.5	134.7	143	152.2	162	172.2	182.5	192.7
115	121.2	118.9	119.1	121.3	125.5	131.3	138.4	146.7	155.9	165.8	176	186.4	196.6
120	125.3	123	123.1	125.3	129.4	135.1	142.3	150.6	159.8	169.6	179.9	190.3	200.6

A5.7 Vehicle operating cost tables

Table A5.1: Passenger car VOC by speed and gradient (cents/km – July 2008)

Speed(km/h)	Gradient in percent (both directions)												
	0	1	2	3	4	5	6	7	8	9	10	11	12
10	43.9	44.0	44.1	44.2	44.2	44.3	44.4	44.5	44.7	45.0	45.2	45.6	46.1
15	38.2	38.3	38.5	38.6	38.7	38.9	39.1	39.3	39.6	39.9	40.4	40.9	41.5
20	34.0	34.2	34.3	34.5	34.6	34.9	35.1	35.4	35.7	36.1	36.6	37.2	37.9
25	31.0	31.1	31.3	31.5	31.7	31.9	32.2	32.5	32.9	33.3	33.9	34.5	35.3
30	28.8	28.9	29.1	29.2	29.5	29.7	30.0	30.3	30.8	31.3	31.9	32.6	33.4
35	27.1	27.3	27.4	27.6	27.8	28.1	28.4	28.8	29.2	29.7	30.4	31.1	31.9
40	26.0	26.1	26.3	26.4	26.7	26.9	27.2	27.6	28.1	28.6	29.3	30.1	30.9
45	25.1	25.3	25.4	25.6	25.8	26.1	26.4	26.8	27.3	27.9	28.5	29.3	30.2
50	24.6	24.7	24.9	25.1	25.3	25.5	25.9	26.3	26.8	27.4	28.0	28.8	29.8
55	24.3	24.4	24.5	24.7	24.9	25.2	25.5	26.0	26.5	27.0	27.7	28.6	29.5
60	24.1	24.3	24.4	24.6	24.8	25.1	25.4	25.8	26.3	26.9	27.6	28.4	29.4
65	24.2	24.3	24.4	24.6	24.8	25.0	25.4	25.8	26.3	26.9	27.6	28.5	29.4
70	24.3	24.4	24.5	24.7	24.9	25.2	25.5	25.9	26.4	27.0	27.8	28.6	29.6
75	24.5	24.6	24.7	24.9	25.1	25.4	25.7	26.1	26.6	27.3	28.0	28.9	29.8
80	24.9	24.9	25.1	25.2	25.4	25.7	26.0	26.4	26.9	27.6	28.3	29.2	30.2
85	25.3	25.3	25.4	25.6	25.8	26.0	26.4	26.8	27.3	28.0	28.7	29.6	30.6
90	25.7	25.8	25.9	26.0	26.2	26.5	26.8	27.2	27.8	28.4	29.1	30.0	31.0
95	26.3	26.3	26.4	26.5	26.7	27.0	27.3	27.7	28.3	28.9	29.6	30.5	31.6
100	26.8	26.9	27.0	27.1	27.3	27.5	27.9	28.3	28.8	29.4	30.2	31.1	32.1
105	27.5	27.5	27.6	27.7	27.9	28.1	28.4	28.9	29.4	30.0	30.8	31.7	32.7
110	28.1	28.1	28.2	28.3	28.5	28.7	29.1	29.5	30.0	30.6	31.4	32.3	33.3
115	28.8	28.8	28.9	29.0	29.1	29.4	29.7	30.1	30.7	31.3	32.1	33.0	34.0
120	29.5	29.5	29.6	29.7	29.8	30.1	30.4	30.8	31.3	32.0	32.7	33.6	34.7

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Table 5.7 Comparison and Ranking of PT and Highway Travel Times to Wellington CBD, AM peak, 2011

Journey	Distance	PT Speed	Speed – Rank	Car Speed	Diff car PT	Rank	Comb Rank
JVL - CBD	10	26	2	25	-1	1	3
Newlands - CBD	9	27	1	28	+1	2	3
Khandallah - CBD	6	14	8	24	+10	7	15
Wadestown - CBD	4	16	6	19	+3	3	9
Karori - CBD	6	17	4	26	+9	5	9
Newtown - CBD	3.5	12	9	21	+9	5	14
Island Bay - CBD	7	17	4	38	+21	11	15
Lytell Bay - CBD	7	12	9	20	+8	4	13
Airport - CBD	7	22	3	35	+13	9	12
Miramar - CBD	6	11	10	32	+21	11	21
Kilbirnie - CBD	4.5	15	7	32	+17	10	17
Brooklyn - CBD	3	11	10	23	+12	8	18

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2 GWRC MODELLING INPUTS - Tab 1, assumptions

	Option 0	Option 1	Option 2, 2a, 2b	Option 3, 3a,3b	Option 4c, 4ac	Option 4, 4a, 4b	Option 5c, 5ac	Option 5, 5a, 5b
		Targeted bus priority and other modes improvement		Targeted bus lanes & priority	Full bus lanes & priority, targeted Kilbirnie branch	Full bus lanes & priority	Physically separated lanes & full priority, targeted Kilbirnie branch	Physically separated lanes & priority
	Do minimum							
		To Newtown as soon as possible (given constraints), no Kilbirnie branch	Full route as soon as possible (given constraints)	Full route as soon as possible (given constraints)	Full route as soon as possible (given constraints)	Full route as soon as possible (given constraints)	Full route as soon as possible (given constraints)	Full route as soon as possible (given constraints)
Section								
Kilbirnie to SH1	Nothing	Nothing	Peak bus lanes	Turn priority into / out of KBC from SH1 but no pre-emption, no bus lanes on KBC, priority around Kilbirnie TC	Turn priority into / out of KBC from SH1 but no pre-emption, no bus lanes on KBC, priority around Kilbirnie TC	Turn priority into / out of KBC from SH1 with pre-emption, no bus lanes on KBC, priority around Kilbirnie TC	Turn priority into / out of KBC from SH1 with pre-emption, no bus lanes on KBC, priority around Kilbirnie TC	Segregation, full priority, pre-emption, no GT in bus lanes
SH1 to Basin	Nothing	Nothing	Bus lanes on Ruahine, no pre-emption	Bus lanes on Ruahine, no pre-emption	Bus lanes on Ruahine, no pre-emption	Bus lanes on Ruahine, plus pre-emption	Bus lanes on Ruahine, plus pre-emption	Segregation, full priority, pre-emption, no GT in bus lanes
Newtown to Basin	Nothing	Bus lanes to stop line, no B phase	Bus lanes to stop line plus B phase	Bus lanes to stop line plus B phase	Bus lanes to stop line plus pre-emption	Bus lanes to stop line plus pre-emption	Segregation, full priority, pre-emption, no GT in bus lanes	Segregation, full priority, pre-emption, no GT in bus lanes
Basin	Bus lanes	Bus lanes to stop line, no B phase	Bus lanes to stop line plus B phase	Bus lanes to stop line plus B phase	Bus lanes to stop line plus pre-emption	Bus lanes to stop line plus pre-emption	Segregation, full priority, pre-emption, no GT in bus lanes	Segregation, full priority, pre-emption, no GT in bus lanes
Kent Cambridge	As current	Bus lanes to stop line, no B phase	Bus lanes to stop line plus B phase	Bus lanes to stop line plus B phase	Bus lanes to stop line plus pre-emption	Bus lanes to stop line plus pre-emption	Segregation, full priority, pre-emption, no GT in bus lanes	Segregation, full priority, pre-emption, no GT in bus lanes
Courtenay Place to Taranki Street	As current	Improved bus lanes including some removal of parking, some B phase, GT allowed	Improved bus lanes including some removal of parking, some B phase, no GT at peak times	Improved bus lanes including some removal of parking, some B phase, no GT at peak times	Improved bus lanes, removal of most parking and access restrictions, pre-emption, no GT allowed	Improved bus lanes, removal of most parking and access restrictions, pre-emption, no GT allowed	Segregation, full priority, pre-emption, no GT	Segregation, full priority, pre-emption, no GT
Tarnaki Street to Willis Street	As current (effectively bus only) with no signal priority / pre-emption	As current (effectively bus only) with no signal priority / pre-emption	As current (effectively bus only) with no signal priority / pre-emption	As current (effectively bus only) with no signal priority / pre-emption	Improved bus lanes, pre-emption, no GT, effectively fully segregated	Improved bus lanes, pre-emption, no GT, effectively fully segregated	Improved bus lanes, pre-emption, no GT, effectively fully segregated	Improved bus lanes, pre-emption, no GT, effectively fully segregated
Willis Street	As current	As current	No GT at peak times, no pre-emption	No GT at peak times, no pre-emption	No GT 24/7, pre-emption, effectively fully segregated	No GT 24/7, pre-emption, effectively fully segregated	No GT 24/7, pre-emption, effectively fully segregated	No GT 24/7, pre-emption, effectively fully segregated
Lambton Quay to Wellington bus station	As current	General traffic restrictions at peak times, shared bus lanes, some b phase	No GT at peak times, no pre-emption	No GT at peak times, no pre-emption	No GT 24/7, pre-emption, effectively fully segregated	No GT 24/7, pre-emption, effectively fully segregated	No GT 24/7, pre-emption, effectively fully segregated	No GT 24/7, pre-emption, effectively fully segregated
Key Intersections								
Basin entry from Mt Vic	Nothing	Bus lane but not to stop line, buses mix with GT turning left, no B phase	Bus lane tostop line, B phase	Bus lane tostop line, B phase	Bus lane tostop line, B phase	Bus lane tostop line, pre-emption	Bus lane tostop line, pre-emption	Segregated bus lane tostop line, pre-emption
Basin entry from Newtown	Nothing	Bus lane but not to stop line, buses mix with GT turning left, no B phase	Bus lane to stop line, B phase	Bus lane tostop line, B phase	Bus lane tostop line, pre-emption	Bus lane tostop line, pre-emption	Segregated bus lane tostop line, pre-emption	Segregated bus lane tostop line, pre-emption
Vivian Street Description	Nothing	Bus lanes to stop line, no B phase, no pre-emption	Bus lane to stop line, no B phase, no pre-emption	Bus lane to stop line, B phase	Bus lane tostop line, pre-emption	Bus lane tostop line, pre-emption	Segregated bus lane tostop line, pre-emption	Segregated bus lane tostop line, pre-emption
Adelaide / John Street description	Nothing	Bus lane but not to stop line, buses mix with GT turning left, no B phase	Bus lane but not to stop line, buses mix with GT turning left, no B phase	Bus lane to stop line, B phase	Bus lane tostop line, pre-emption	Bus lane tostop line, pre-emption	Segregated bus lane tostop line, pre-emption	Segregated bus lane tostop line, pre-emption

Assumptions - percentage of benefits delivered (1 = Do Min congested speed, 0 = Fully segregated free flow speed, gradation inbetween)

Key Intersections	Option 1	Option 2, 2a, 2b	Option 3, 3a,3b	Option 4c, 4ac	Option 4, 4a, 4b	Option 5c, 5ac	Option 5, 5a, 5b
Bay Road / Onepu	1	1	0.8	0.8	0.8	0.2	0.2
Bay Road / Kilbirnie Crescent	1	1	0.8	0.8	0.8	0.2	0.2
Kilbirnie Crescent / Wellington Road	1	1	0.6	0.6	0.6	0.2	0.2
Wellington Road / Ruahine Street	1	1	0.6	0.6	0.6	0.2	0.2
Wellington Road / Ruahine Street	1	1	0.6	0.6	0.6	0.2	0.2
Basin Reserve approach	1	0.8	0.4	0.4	0.4	0.2	0.2
Hospital	1	0.6	0.4	0.4	0.2	0.2	0
Adelaide / John Street	1	0.8	0.8	0.6	0.2	0.2	0
Hospital Road	1	0.6	0.4	0.4	0.2	0.2	0
Ped Xing	1	0.6	0.4	0.4	0.2	0.2	0
Basin approach	1	0.6	0.4	0.4	0.2	0.2	0
Basin exit	1	0.6	0.4	0.4	0.2	0.2	0
Vivian Street	1	0.6	0.6	0.4	0.2	0.2	0
Elizabeth Street	1	0.6	0.4	0.4	0.2	0.2	0
GM Ped Xing	1	0.6	0.4	0.4	0.2	0.2	0
Tory Street	1	0.7	0.4	0.4	0.2	0.2	0
Taranaki Street	1	0.7	0.4	0.4	0.2	0.2	0
Cuba Street	1	1	1	1	0	0	0
Victoria Street	1	1	1	1	0	0	0
Willis Street / Boulcott	1	1	0.4	0.4	0	0	0
Willis / BNZ	1	1	0.4	0.4	0	0	0
Lambtown Quay Signals 1	1	0.7	0.4	0.4	0	0	0
Lambtown Quay Signals 2	1	0.7	0.4	0.4	0	0	0
Lambton / Bowen	1	0.7	0.4	0.4	0	0	0

2 GWRC MODELLING INPUTS - Tab 2, SATURN Calculations

Kilbirnie to Station - Mt Vic

A Node	B Node	C Node	Cruise (s)	Delay(split)	Link
440_8087	440	8087	3.81	0	55
440_8087_8035	440	8087	0	0	55
8087_8035	8087	8035	3.81	42.23	110
8087_8035_8092	8087	8035	45.17	45.17	110
8035_8092	8035	8092	2.95	0	155
8035_8092_8034	8035	8092	0	0	155
8092_8034	8092	8034	2.77	44.06	195
8092_8034_8088	8092	8034	44.06	44.06	195
8034_8088	8034	8088	2.77	0	235
8034_8088_1439	8034	8088	0	0	235
8088_1439	8088	1439	25.62	0	605
8088_1439_8019	8088	1439	0	0	605
1439_8019	1439	8019	13.09	0	805
1439_8019_439	1439	8019	0	0	805
8019_439	8019	439	2.77	27.79	845
8019_439_8017	8019	439	21.58	21.58	845
439_8017	439	8017	3.6	0	905
439_8017_1437	439	8017	0	0	905
8017_1437	8017	1437	9.16	0.46	1050
8017_1437_437	8017	1437	0	0	1050
1437_437	1437	437	3	21.97	1100
1437_437_8002	1437	437	24.86	24.86	1100
437_8002	437	8002	2.1	0	1135
437_8002_8004	437	8002	0	0	1135
8002_8004	8002	8004	19.31	1.91	1425
8002_8004_8003	8002	8004	0	0	1425
8004_8003	8004	8003	2.1	45.02	1460
8004_8003_8203	8004	8003	45.02	45.02	1460
8003_8203	8003	8203	1.8	0	1490
8003_8203_436	8003	8203	0	0	1490
8203_436	8203	436	27	0	1940
8203_436_394	8203	436	0	0	1940
436_394	436	394	6	0	2040
436_394_396	436	394	0	0	2040
394_396	394	396	36	3.02	2640
394_396_8500	394	396	3.02	3.02	2640
396_8500	396	8500	19.44	1.67	2910
396_8500_381	396	8500	1.67	1.67	2910
8500_381	8500	381	2.16	73.56	2940
8500_381_590	8500	381	73.56	73.56	2940
381_590	381	590	4.5	0	2990
381_590_591	381	590	0	0	2990
590_591	590	591	4.5	0	3040
590_591_382	590	591	0	0	3040
591_382	591	382	9.9	6.66	3150
591_382_383	591	382	4.88	4.88	3150
382_383	382	383	7.88	0.69	3270
382_383_384	382	383	0.66	0.66	3270
383_384	383	384	17.1	8.85	3460
383_384_493	383	384	11.99	11.99	3460
384_493	384	493	9.6	17.17	3580
384_493_397	384	493	4.19	4.19	3580
493_397	493	397	3.38	10.79	3630
493_397_815	493	397	10.68	10.68	3630
397_815	397	815	13.09	0	3830
397_815_378	397	815	0	0	3830
815_378	815	378	3.27	39.65	3880
815_378_813	815	378	31.8	31.8	3880
378_813	378	813	3.2	0	3920
378_813_852	378	813	0	0	3920
813_852	813	852	6.4	0	4000
813_852_377	813	852	0	0	4000
852_377	852	377	4	21.32	4050
852_377_2376	852	377	21.32	21.32	4050
377_2376	377	2376	1.64	0	4070
377_2376_1376	377	2376	0	0	4070
2376_1376	2376	1376	9.82	0	4190
2376_1376_376	2376	1376	0	0	4190
1376_376	1376	376	4.09	24.85	4240

2.0	3.0	5.0	7.0	8.0	10.0	11.0	13.0
Option 0	Option 1	Option 2	Option 3	Option 4	Option 5	Option 6	Option 7
4	4	4	4	4	4	4	4
4	4	4	4	4	4	4	4
8	8	8	8	8	8	8	8
53	53	44	44	44	17	17	8
56	56	47	47	47	20	20	11
56	56	47	47	47	20	20	11
59	59	49	49	49	22	22	13
103	103	85	85	85	31	31	13
105	105	87	87	87	34	34	16
105	105	87	87	87	34	34	16
131	131	113	113	113	60	60	42
131	131	113	113	113	60	60	42
144	144	126	126	126	73	73	55
144	144	126	126	126	73	73	55
147	147	129	129	129	75	75	58
168	168	142	142	142	80	80	58
172	172	146	146	146	83	83	61
172	172	146	146	146	83	83	61
181	181	155	155	155	93	93	70
181	181	155	155	155	93	93	70
184	184	158	158	158	96	96	73
209	209	173	173	173	100	100	73
211	211	175	175	175	103	103	75
211	211	175	175	175	103	103	75
230	230	194	194	194	122	122	95
230	230	194	194	194	122	122	95
233	233	196	196	196	124	124	97
278	278	223	223	223	133	133	97
279	279	225	225	225	135	135	99
279	279	225	225	225	135	135	99
306	306	252	252	252	162	162	126
306	306	252	252	252	162	162	126
312	312	258	258	258	168	168	132
312	312	258	258	258	168	168	132
348	348	294	294	294	204	204	168
351	351	297	297	297	207	207	171
371	371	316	316	316	226	226	190
372	372	318	318	318	228	228	192
375	375	320	320	320	230	230	194
448	433	350	350	350	245	245	194
453	438	354	354	354	249	249	198
453	438	354	354	354	249	249	198
457	442	359	359	359	254	254	203
457	442	359	359	359	254	254	203
467	452	369	369	369	264	264	203
472	457	373	373	373	269	269	213
480	465	381	381	381	276	276	218
481	466	382	382	382	277	277	226
498	483	399	399	399	294	294	243
510	495	411	411	411	306	306	255
519	504	421	421	421	316	316	265
523	509	425	425	425	320	320	269
527	512	428	428	428	323	323	273
537	523	439	439	439	334	334	283
551	536	452	452	452	347	347	296
554	539	455	455	455	350	350	296
586	558	474	474	468	357	350	300
589	561	478	478	471	360	354	303
589	561	478	478	471	360	354	303
595	568	484	484	478	366	360	309
595	568	484	484	478	366	360	309
599	572	488	488	482	370	364	313
621	585	496	496	490	375	364	313
622	586	498	498	492	376	366	315
622	586	498	498	492	376	366	315
632	596	508	508	491	386	375	325
632	596	508	508	491	386	375	325
636	600	512	506	495	390	380	329

Newtown to Station - BRT

A Node	B Node	C Node	Cruise (s)
1433_8069	1433	8069	2.8
1433_8069	1433	8069	0
8069_8269	8069	8269	16
8069_8269	8069	8269	10.15
8269_8078	8269	8078	8
8269_8078	8269	8078	7.1
8269_8078	8269	8078	434
8078_434	8078	434	6
8078_434	8078	434	55.84
434_1434	434	1434	4.5
434_1434	434	1434	0
1434_1435	1434	1435	4.91
1434_1435	1434	1435	23.92
1435_2435	1435	2435	10.64
1435_2435	1435	2435	3.09
2435_435	2435	435	4.91
2435_435	2435	435	1848
435_1848	435	1848	9.82
435_1848	435	1848	3.09
1848_848	1848	848	13.09
1848_848	1848	848	0.02
848_382	848	382	9
848_382_3	848	382	5.41
382_383	382	383	7.88
382_383_3	382	383	0.66
383_384	383	384	17.1
383_384_4	383	384	11.99
384_493	384	493	9.6
384_493_3	384	493	4.19
493_397	493	397	3.38
493_397_8	493	397	10.68
397_815	397	815	13.09
397_815_3	397	815	0
815_378	815	378	3.27
815_378_8	815	378	31.8
378_813	378	813	3.2
378_813_8	378	813	0
813_852	813	852	6.4
813_852_3	813	852	0
852_377	852	377	4
852_377_2	852	377	21.32
377_2376	377	2376	1.64
377_2376	377	2376	1376
2376_1376	2376	1376	9.82
2376_1376	2376	1376	0
1376_376	1376	376	4.09

2 GWRC MODELLING INPUTS - Tab 2, SATURN Calculations

Delay(split) Link	2.0	3.0	5.0	7.0	8.0	10.0	11.0	13.0
	Option 0	Option 1	Option 2	Option 3	Option 4	Option 5	Option 6	Option 7
0 0	3	3	3	3	3	3	3	3
0 0	3	3	3	3	3	3	3	3
0 200 Hospital	19	19	19	19	19	19	19	19
10 200 Hospital	29	25	23	23	21	21	19	19
0 300	37	33	31	31	29	29	27	27
7 300	44	40	38	38	36	36	34	34
0 375	50	46	44	44	42	42	40	40
56 375 Adelaide / John Street	105	90	88	88	82	82	77	77
0 425	110	95	93	93	87	87	82	82
0 425	110	95	93	93	87	87	82	82
0 485	115	100	98	98	92	92	87	87
24 485 Hospital Road	139	114	107	107	101	101	96	96
0 615	149	125	118	118	112	112	107	107
3 615	153	128	121	121	115	115	110	110
0 675	157	133	126	126	120	120	115	115
17 675 Ped Xing	174	143	133	133	127	127	122	122
0 795	184	153	142	142	136	136	131	131
3 795	187	156	146	146	140	140	135	135
0 955	200	169	159	159	153	153	148	148
0 955	200	169	159	159	153	153	148	148
0 1065	209	178	168	168	162	162	157	157
30 1065 Basin approach	239	196	180	180	174	174	169	169
0 1185	247	204	188	188	182	182	177	177
1 1185	248	204	188	188	182	182	177	177
0 1375	265	221	205	205	199	199	194	194
12 1375 Basin exit	277	229	210	210	204	204	199	199
0 1495	287	238	220	220	214	214	209	209
4 1495	291	242	224	224	218	218	213	213
0 1545	294	246	227	227	221	221	216	216
11 1545 Ped Xing	305	252	232	232	226	226	221	221
0 1745	318	265	245	245	239	239	234	234
0 1745	318	265	245	245	239	239	234	234
0 1795	321	269	248	248	242	242	237	237
32 1795 Vivian Street	353	288	267	267	261	261	256	256
0 1835	356	291	270	270	264	264	259	259
0 1835	356	291	270	270	264	264	259	259
0 1915	363	297	277	277	271	271	266	266
0 1915	363	297	277	277	271	271	266	266
0 1965	367	301	281	281	275	275	270	270
21 1965 Elizabeth Street	388	314	289	289	283	283	278	278
0 1985	390	316	291	291	285	285	280	280
0 1985	390	316	291	291	285	285	280	280
0 2105	399	326	301	301	295	295	290	290
0 2105	399	326	301	301	295	295	290	290
0 2155	404	330	305	305	299	299	294	294

Golden Mile

A Node	B Node	C Node	Cruise (s)	Delay(s)	Link
376_762	376	762	6	5.67	6
376_762_822	376	762	822	5.67	6
762_822	762	822	365	9.6	4
762_822_365	762	822	365	4.13	16
822_365	822	365	824	18.56	22
822_365_824	822	365	824	18.41	18
365_824	365	824	826	6.43	25
365_824_826	365	824	826	6.43	25
824_826	824	826	364	20.4	46
824_826_364	824	826	364	5.02	46
826_364	826	364	1364	27.44	49
826_364_1364	826	364	1364	34.72	49
364_1364	364	1364	1763	0	55
364_1364_1763	364	1364	1763	0	55
1364_1763	1364	1763	763	13.2	68
1364_1763_763	1364	1763	763	0	68
1763_763	1763	763	323	13.82	74
1763_763_323	1763	763	323	13.8	74
763_323	763	323	1323	16.8	91
763_323_1323	763	323	1323	37.25	91
323_1323	323	1323	322	6	97
323_1323_322	323	1323	322	0	97
1323_322	1323	322	766	12	109
1323_322_766	1323	322	766	72.92	109
322_766	322	766	802	3.6	113
322_766_802	322	766	802	0	113
766_802	766	802	285	7.2	120
766_802_285	766	802	285	0	120
802_285	802	285	800	3.6	124
802_285_800	802	285	800	1.64	124
285_800	285	800	739	3.6	127
285_800_739	285	800	739	0	127
800_739	800	739	259	18	145
800_739_259	800	739	259	0	145
739_259	739	259	268	3.6	149
739_259_268	739	259	268	21.8	149
259_268	259	268	291	15.6	164
259_268_291	259	268	291	5.95	164
268_291	268	291	276	13.2	178
268_291_276	268	291	276	7.12	178
291_276	291	276	275	8.4	186
291_276_275	291	276	275	0	186
276_275	276	275	274	9.6	196
276_275_274	276	275	274	14.17	196
275_274	275	274	515	8.4	204
275_274_515	275	274	515	1.35	204
274_515	274	515	273	6	210
274_515_273	274	515	273	3.82	210
515_273	515	273	289	2.4	212
515_273_289	515	273	289	14.08	212
273_289	273	289	270	7.2	220
273_289_270	273	289	270	9.01	220
289_270	289	270	863	20.4	240
289_270_863	289	270	863	1.43	240
270_863	270	863	269	4.8	245
270_863_269	270	863	269	0	245
863_269	863	269	861	4.8	250
863_269_861	863	269	861	49.8	250
269_861	269	861	241	1.71	251
269_861_241	269	861	241	0	251
861_241	861	241	216	10.29	262
861_241_216	861	241	216	1.97	262
241_216	241	216		16	278

2.0	3.0	5.0	7.0	8.0
Option 0	Option 1	Option 2	Option 3	
3	3	3	3	
8	6	5	5	0.2
18	16	15	15	
22	18	16	16	0.2
28	24	22	22	
47	37	30	30	0.2
50	41	33	33	
57	45	36	36	0.2
77	65	56	56	
82	68	58	58	0.2
86	72	62	62	
120	96	76	76	0.2
126	102	82	82	
126	102	82	82	
140	115	95	95	
140	115	95	95	
146	121	101	101	
159	135	115	115	-
176	152	132	132	
213	189	169	169	-
219	195	175	175	
219	195	175	175	
231	207	187	187	
304	280	216	216	-
308	284	220	220	
308	284	220	220	
315	291	227	227	
315	291	227	227	
319	294	230	230	
320	296	232	232	
324	300	236	236	
324	300	236	236	
342	318	254	254	
342	318	254	254	
346	321	257	257	
367	343	266	266	-
383	359	282	282	
389	362	284	284	0.2
402	375	297	297	
409	380	300	300	0.2
418	388	308	308	
418	388	308	308	
427	398	318	318	
441	408	324	324	-
450	416	332	332	
451	417	333	333	
457	423	339	339	
461	427	343	343	
463	429	346	346	
477	439	351	351	-
485	447	358	358	
494	452	362	362	0.2
514	472	382	382	
516	474	384	384	
520	479	389	389	
520	479	389	389	
525	483	393	393	
575	518	413	413	-
577	520	415	415	
577	520	415	415	
587	530	425	425	
589	532	427	427	
605	548	443	443	

2 GWRC MODELLING INPUTS - Tab 2, SATURN Calculations

304	304	285	285
1	10.0	11.0	13.0
Option 4	Option 5	Option 6	Option 7
3	3	3	3
4	0.2	4	3
14	14	12	12
14	0.2	14	12
20	20	18	18
24	0.2	24	18
28	28	22	22
29	0.2	29	22
49	49	42	42
50	0.2	50	42
54	54	46	46
61	0.2	61	46
67	67	52	52
67	67	52	52
80	80	65	65
80	80	65	65
86	86	71	71
86	-	86	-
103	103	88	88
103	-	103	-
109	109	94	94
109	109	94	94
121	121	106	106
121	-	121	-
124	124	110	110
124	124	110	110
132	132	117	117
132	132	117	117
135	135	120	120
137	137	122	122
141	141	126	126
141	141	126	126
159	159	144	144
159	159	144	144
162	162	147	147
162	-	162	-
178	178	163	163
179	0.2	179	163
192	192	176	176
194	0.2	194	176
202	202	184	184
202	202	184	184
212	212	194	194
212	-	212	-
220	220	202	202
221	221	204	204
227	227	210	210
231	231	214	214
234	234	216	216
234	-	234	-
241	241	223	223
243	0.2	243	223
263	263	244	244
264	264	245	245
269	269	250	250
269	269	250	250
274	274	255	255
274	-	274	-
276	276	256	256
276	276	256	256
286	286	267	267
288	288	269	269
304	304	285	285

AM peak 2031 travel time

	PTSS BP Option						PTSS BRT Option	
	Option 0	Option 1	Option 2, 2a, 2b	Option 3, 3a,3b	Option 4c, 4ac	Option 4, 4a, 4b	Option 5c, 5ac	Option 5, 5a, 5b
Newtown	404	330	305	287	233	233	191	191
Kilbirnie	636	600	512	506	495	390	380	329
Golden Mile	605	548	443	443	304	304	285	285
Kilbirnie to Wellington CBD	1,038.95	965.23	807.28	800.92	697.43	592.59	569	518
Newtown to CBD	806	695	600	582	436	436	380	380

Percentage of travel time savings (Option 7 minus Option 0) preserved

Weightings of trips		Option 0	Option 1	Option 2, 2a, 2b	Option 3, 3a,3b	Option 4c, 4ac	Option 4, 4a, 4b	Option 5c, 5ac	Option 5, 5a, 5b
N	41%	0%	35%	47%	55%	80%	80%	100%	100%
K	59%	0%	12%	40%	42%	46%	80%	83%	100%
Source: Ref Travel time savings		0%	18%	50%	50%	94%	94%	100%	100%
Kilbirnie to Wellington CBD		0%	14%	44%	46%	66%	86%	90%	100%
Newtown to CBD		0%	26%	48%	53%	87%	87%	100%	100%

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3 MODEL OUTPUT SECTION TAB 1: PATRONAGE

Raw numbers - along spine (not regional figures) Additional patronage (vs do min) 1a

Table 7 Local growth in patronage to the CBD (2 hour 2031 morning peak)

Year	Area	Reference Case		Bus Priority		Bus Rapid Transit		Light Rail Transit	
		Trips	Mode Share	Trips	Mode Share	Trips	Mode Share	Trips	Mode Share
2031	Miramar	1,320	43%	+ 60	45%	+ 170	47%	-70	42%
	Kilbirnie Lyall	680	36%	+ 40	38%	+ 80	39%	+ 90	40%
	Mt Vic / Hataitai	790	33%	+ 20	34%	-50	32%	-40	32%
	Island Bay	1,140	43%	+ 20	44%	+ 100	46%	-60	42%
	Newtown	790	31%	+ 30	32%	+ 90	34%	+ 40	32%
	Total	4,710	38%	+ 170	39%	+ 400	40%	-30	38%

Scale factors (relative to option 7)

Staging/operational by:
Analysis year Financial year (ie July to June)

Analysis year	Financial year (ie July to June)	0	0	0	BP	BP	BRT	BRT	BP	BP	BRT	BRT	1a		
Year 0	2015	5075	3000	2075	3114	2119	3196	2266	114	43	196	191	2015	2119	3000
Year 1	2016	5053	2987	2066	3101	2110	3183	2257	114	44	196	191	2016	2110	2987
Year 2	2017	5031	2974	2057	3088	2101	3170	2248	114	44	197	191	2017	2101	2974
Year 3	2018	5009	2961	2048	3075	2093	3158	2239	115	44	197	191	2018	2093	2961
Year 4	2019	4987	2948	2039	3063	2084	3145	2230	115	45	197	191	2019	2084	2948
Year 5	2020	4964	2934	2030	3050	2075	3132	2221	116	45	197	191	2020	2075	2934
Year 6	2021	4942	2921	2021	3037	2067	3119	2211	116	46	198	191	2021	2067	2921
Year 7	2022	4920	2908	2012	3025	2058	3106	2202	116	46	198	191	2022	2058	2908
Year 8	2023	4898	2895	2003	3012	2049	3093	2193	117	47	198	190	2023	2049	2895
Year 9	2024	4875	2882	1994	2999	2041	3080	2184	117	47	198	190	2024	2041	2882
Year 10	2025	4853	2869	1984	2986	2032	3067	2175	118	47	199	190	2025	2032	2869
Year 11	2026	4831	2856	1975	2974	2023	3054	2166	118	48	199	190	2026	2023	2856
Year 12	2027	4809	2843	1966	2961	2015	3042	2157	118	48	199	190	2027	2015	2843
Year 13	2028	4787	2829	1957	2948	2006	3029	2147	119	49	199	190	2028	2006	2829
Year 14	2029	4764	2816	1948	2935	1997	3016	2138	119	49	200	190	2029	1997	2816
Year 15	2030	4742	2803	1939	2923	1989	3003	2129	120	50	200	190	2030	1989	2803
Year 16	2031	4720	2790	1930	2910	1980	2990	2120	120	50	200	190	2031	1980	2790
Year 17	2032	4737	2800	1937	2920	1987	3001	2128	120	50	201	191	2032	1987	2800
Year 18	2033	4753	2810	1944	2930	1994	3012	2136	121	50	203	192	2033	1994	2810
Year 19	2034	4770	2820	1950	2941	2001	3024	2144	121	50	204	193	2034	2001	2820
Year 20	2035	4787	2829	1957	2951	2008	3035	2152	121	50	205	194	2035	2008	2829
Year 21	2036	4803	2839	1964	2961	2015	3046	2160	122	51	207	196	2036	2015	2839
Year 22	2037	4820	2849	1971	2971	2022	3057	2168	122	51	208	197	2037	2022	2849
Year 23	2038	4837	2859	1978	2981	2028	3068	2175	122	51	209	198	2038	2028	2859
Year 24	2039	4853	2869	1984	2991	2035	3079	2183	123	51	211	199	2039	2035	2869
Year 25	2040	4870	2879	1991	3002	2042	3091	2191	123	51	212	200	2040	2042	2879
Year 26	2041	4887	2888	1998	3012	2049	3102	2199	123	51	213	201	2041	2049	2888
Year 27	2042	4903	2898	2005	3022	2056	3113	2207	124	51	215	202	2042	2056	2898
Year 28	2043	4920	2908	2012	3032	2063	3124	2215	124	51	216	203	2043	2063	2908
Year 29	2044	4937	2918	2019	3042	2070	3135	2223	124	51	217	204	2044	2070	2918
Year 30	2045	4953	2928	2025	3053	2077	3146	2231	125	52	219	206	2045	2077	2928
Year 31	2046	4970	2938	2032	3063	2084	3158	2239	125	52	220	207	2046	2084	2938
Year 32	2047	4987	2948	2039	3073	2091	3169	2247	125	52	221	208	2047	2091	2948
Year 33	2048	5003	2957	2046	3083	2098	3180	2255	126	52	222	209	2048	2098	2957
Year 34	2049	5020	2967	2053	3093	2105	3191	2263	126	52	224	210	2049	2105	2967
Year 35	2050	5037	2977	2059	3103	2112	3202	2270	126	52	225	211	2050	2112	2977
Year 36	2051	5053	2987	2066	3114	2119	3213	2278	127	52	226	212	2051	2119	2987
Year 37	2052	5070	2997	2073	3124	2125	3225	2286	127	52	228	213	2052	2125	2997
Year 38	2053	5086	3007	2080	3134	2132	3236	2294	127	53	229	214	2053	2132	3007
Year 39	2054	5103	3016	2087	3144	2139	3247	2302	128	53	230	215	2054	2139	3016
Year 40	2055	5120	3026	2093	3154	2146	3258	2310	128	53	232	217	2055	2146	3026
Year 41	2056	5136	3036	2100	3165	2153	3269	2318	128	53	233	218	2056	2153	3036
Year 42	2057	5153	3046	2107	3175	2160	3280	2326	129	53	234	219	2057	2160	3046
Year 43	2058	5170	3056	2114	3185	2167	3292	2334	129	53	236	220	2058	2167	3056
Year 44	2059	5186	3066	2121	3195	2174	3303	2342	129	53	237	221	2059	2174	3066
Year 45	2060	5203	3076	2128	3205	2181	3314	2350	130	53	238	222	2060	2181	3076
Year 46	2061	5220	3085	2134	3215	2188	3325	2358	130	53	240	223	2061	2188	3085
Year 47	2062	5236	3095	2141	3226	2195	3336	2366	130	54	241	224	2062	2195	3095
Year 48	2063	5253	3105	2148	3236	2202	3347	2373	131	54	242	225	2063	2202	3105
Year 49	2064	5270	3115	2155	3246	2209	3359	2381	131	54	244	227	2064	2209	3115
Year 50	2065	5286	3125	2162	3256	2216	3370	2389	131	54	245	228	2065	2216	3125
Year 51	2066	5303	3135	2168	3266	2222	3381	2397	132	54	246	229	2066	2222	3135
Year 52	2067	5320	3144	2175	3277	2229	3392	2405	132	54	248	230	2067	2229	3144
Year 53	2068	5336	3154	2182	3287	2236	3403	2413	132	54	249	231	2068	2236	3154
Year 54	2069	5353	3164	2189	3297	2243	3414	2421	133	54	250	232	2069	2243	3164
Year 55	2070	5370	3174	2196	3307	2250	3426	2429	133	54	252	233	2070	2250	3174
Year 56	2071	5386	3184	2202	3317	2257	3437	2437	133	55	253	234	2071	2257	3184
Year 57	2072	5403	3194	2209	3327	2264	3448	2445	134	55	254	235	2072	2264	3194
Year 58	2073	5420	3204	2216	3338	2271	3459	2453	134	55	256	237	2073	2271	3204
Year 59	2074	5436	3213	2223	3348	2278	3470	2461	134	55	257	238	2074	2278	3213
Year 60	2075	5453	3223	2230	3358	2285	3481	2468	135	55	258	239	2075	2285	3223

<http://www.gw.govt.nz/assets/Transport/Regional-transport/PT-Spine-Study/PTSS-Final-Reports-2013/FINAL-PTSS-Option-Evaluation-Report-for-web.pdf>

2031 Newtown segments:	Ref Trips	Bus Priority Trips	BRT Trips
Island Bay	1140	1160	1240
Newtown	790	820	880
Total Newtown	1930	1980	2120

2031 Kilbirnie segments:	Ref Trips	Bus Priority Trips	BRT Trips
Miramar	1320	1380	1490
Kilbirnie Lyall	680	720	760
Mt Vic / Hataitai	790	810	740
Total Kilbirnie	2790	2910	2990

2031 Full (Newtown + Kilbirnie)	Ref	BP	BRT
	4720	4890	5110

To Newtown as soon as possible (given constraints), no Kilbirnie branch

Kilbirnie - Do min

3 MODEL OUTPUT SECTION TAB 1: PATRONAGE

Raw numbers - along spine (not regional figures)																									0				
2a	2b	2c	3a	3b	3c	4a	4b	4a	4b	5a	5b	5c	6a	6b	6a	6b	7a	7b	7c	0									
To Newtown as soon as possible (given constraints), no Kilbirnie branch	Kilbirnie - do min	Full route as soon as possible (given constraints)	Full route, all delivered to conincide with Basin and Mt Vic tunnel improvements	To Newtown as soon as possible (given constraints), no Kilbirnie branch	Kilbirnie - do min	Full route as soon as possible (given constraints)	Full route, all delivered to conincide with Basin and Mt Vic tunnel improvements	Newtown	Kilbirnie	Newtown	Kilbirnie	Full route	Full route	To Newtown as soon as possible (given constraints), no Kilbirnie branch	Kilbirnie - do min	Full route as soon as possible (given constraints)	Full route, all delivered to conincide with Basin and Mt Vic tunnel improvements	Newtown	Kilbirnie	Newtown	Kilbirnie	Full route	Full route	To Newtown as soon as possible (given constraints), no Kilbirnie branch	Kilbirnie - do min	Full route as soon as possible (given constraints)	Full route, all delivered to conincide with Basin and Mt Vic tunnel improvements	Do min	
47%	43%	43%	55%	48%	48%	80%	42%	80%	42%	80%	80.0%	80.0%	100%	42%	100%	42%	1	1	1										
																				YEAR									
2144	3000	5223	5223	2156	3000	5239	5239	2193	3035	2193	3035	5229	5229	2193	3000	5350	5350	2223	3035	2223	3035	5258	5258	2266	3000	5462	5462	0	2015
2135	2987	5201	5201	2147	2987	5217	5217	2184	3022	2184	3022	5206	5206	2184	2987	5328	5328	2213	3022	2213	3022	5235	5235	2257	2987	5440	5440	0	2016
2125	2974	5178	5178	2137	2974	5194	5194	2175	3009	2175	3009	5183	5183	2175	2974	5306	5306	2204	3009	2204	3009	5213	5213	2248	2974	5418	5418	0	2017
2116	2961	5156	5156	2128	2961	5172	5172	2165	2996	2165	2996	5161	5161	2165	2961	5283	5283	2194	2996	2194	2996	5190	5190	2239	2961	5396	5396	0	2018
2107	2948	5134	5134	2119	2948	5150	5150	2156	2982	2156	2982	5138	5138	2156	2948	5261	5261	2185	2982	2185	2982	5167	5167	2230	2948	5374	5374	0	2019
2097	2934	5111	5111	2109	2934	5127	5127	2146	2969	2146	2969	5115	5115	2146	2934	5238	5238	2175	2969	2175	2969	5144	5144	2221	2934	5352	5352	0	2020
2088	2921	5089	5089	2100	2921	5105	5105	2137	2956	2137	2956	5093	5093	2137	2921	5216	5216	2166	2956	2166	2956	5122	5122	2211	2921	5330	5330	0	2021
2079	2908	5067	5067	2091	2908	5083	5083	2127	2943	2127	2943	5070	5070	2127	2908	5194	5194	2156	2943	2156	2943	5099	5099	2202	2908	5308	5308	0	2022
2070	2895	5044	5044	2081	2895	5060	5060	2118	2930	2118	2930	5047	5047	2118	2895	5171	5171	2146	2930	2146	2930	5076	5076	2193	2895	5286	5286	0	2023
2060	2882	5022	5022	2072	2882	5038	5038	2108	2916	2108	2916	5025	5025	2108	2882	5149	5149	2137	2916	2137	2916	5053	5053	2184	2882	5264	5264	0	2024
2051	2869	5000	5000	2063	2869	5016	5016	2099	2903	2099	2903	5002	5002	2099	2869	5126	5126	2127	2903	2127	2903	5031	5031	2175	2869	5242	5242	5242	2025
2042	2856	4977	4977	2053	2856	4993	4993	2089	2890	2089	2890	4979	4979	2089	2856	5104	5104	2118	2890	2118	2890	5008	5008	2166	2856	5220	5220	5220	2026
2032	2843	4955	4955	2044	2843	4971	4971	2080	2877	2080	2877	4957	4957	2080	2843	5082	5082	2108	2877	2108	2877	4985	4985	2157	2843	5198	5198	5198	2027
2023	2829	4933	4933	2035	2829	4949	4949	2070	2864	2070	2864	4934	4934	2070	2829	5059	5059	2099	2864	2099	2864	4962	4962	2147	2829	5176	5176	5176	2028
2014	2816	4911	4911	2025	2816	4926	4926	2061	2850	2061	2850	4911	4911	2061	2816	5037	5037	2089	2850	2089	2850	4939	4939	2138	2816	5154	5154	5154	2029
2004	2803	4888	4888	2016	2803	4904	4904	2051	2837	2051	2837	4889	4889	2051	2803	5014	5014	2080	2837	2080	2837	4917	4917	2129	2803	5132	5132	5132	2030
1995	2790	4866	4866	2007	2790	4882	4882	2042	2824	2042	2824	4866	4866	2042	2790	4992	4992	2070	2824	2070	2824	4894	4894	2120	2790	5110	5110	5110	2031
2002	2800	4884	4884	2014	2800	4899	4899	2050	2834	2050	2834	4884	4884	2050	2800	5011	5011	2078	2834	2078	2834	4912	4912	2128	2800	5129	5129	5129	2032
2010	2810	4901	4901	2021	2810	4917	4917	2057	2844	2057	2844	4902	4902	2057	2810	5029	5029	2086	2844	2086	2844	4930	4930	2136	2810	5148	5148	5148	2033
2017	2820	4919	4919	2029	2820	4935	4935	2065	2855	2065	2855	4920	4920	2065	2820	5048	5048	2093	2855	2093	2855	4948	4948	2144	2820	5167	5167	5167	2034
2024	2829	4937	4937	2036	2829	4953	4953	2072	2865	2072	2865	4937	4937	2072	2829	5066	5066	2101	2865	2101	2865	4966	4966	2152	2829	5186	5186	5186	2035
2031	2839	4954	4954	2043	2839	4970	4970	2080	2875	2080	2875	4955	4955	2080	2839	5085	5085	2109	2875	2109	2875	4984	4984	2160	2839	5205	5205	5205	2036
2039	2849	4972	4972	2051	2849	4988	4988	2088	2886	2088	2886	4973	4973	2088	2849	5103	5103	2117	2886	2117	2886	5002	5002	2168	2849	5225	5225	5225	2037
2046	2859	4989	4989	2058	2859	5006	5006	2095	2896	2095	2896	4991	4991	2095	2859	5122	5122	2125	2896	2125	2896	5020	5020	2175	2859	5244	5244	5244	2038
2053	2869	5007	5007	2065	2869	5024	5024	2103	2906	2103	2906	5009	5009	2103	2869	5140	5140	2132	2906	2132	2906	5039	5039	2183	2869	5263	5263	5263	2039
2061	2879	5025	5025	2073	2879	5041	5041	2110	2916	2110	2916	5027	5027	2110	2879	5159	5159	2140	2916	2140	2916	5057	5057	2191	2879	5282	5282	5282	2040
2068	2888	5042	5042	2080	2888	5059	5059	2118	2927	2118	2927	5045	5045	2118	2888	5177	5177	2148	2927	2148	2927	5075	5075	2199	2888	5301	5301	5301	2041
2075	2898	5060	5060	2088	2898	5077	5077	2126	2937	2126	2937	5063	5063	2126	2898	5196	5196	2156	2937	2156	2937	5093	5093	2207	2898	5320	5320	5320	2042
2082	2908	5078	5078	2095	2908	5095	5095	2133	2947	2133	2947	5080	5080	2133	2908	5214	5214	2164	2947	2164	2947	5111	5111	2215	2908	5339	5339	5339	2043
2090	2918	5095	5095	2102	2918	5113	5113	2141	2957	2141	2957	5098	5098	2141	2918	5233	5233	2171	2957	2171	2957	5129	5129	2223	2918	5358	5358	5358	2044
2097	2928	5113	5113	2110	2928	5130	5130	2148	2968	2148	2968	5116	5116	2148	2928	5251	5251	2179	2968	2179	2968	5147	5147	2231	2928	5377	5377	5377	2045
2104	2938	5131	5131	2117	2938	5148	5148	2156	2978	2156	2978	5134	5134	2156	2938	5270	5270	2187	2978	2187	2978	5165	5165	2239	2938	5396	5396	5396	2046
2111	2948	5148	5148	2124	2948	5166	5166	2164	2988	2164	2988	5152	5152	2164	2948	5288	5288	2195	2988	2195	2988	5183	5183	2247	2948	5415	5415	5415	2047
2119	2957	5166	5166	2132	2957	5184	5184	2171	2998	2171	2998	5170	5170	2171	2957	5307	5307	2203	2998	2203	2998	5201	5201	2255	2957	5435	5435	5435	2048
2126	2967	5184	5184	2139	2967	5201	5201	2179	3009	2179	3009	5188	5188	2179	2967	5325	5325	2210	3009	2210	3009	5219	5219	2263	2967	5454	5454	5454	2049
2133	2977	5201	5201	2146	2977	5219	5219	2187	3019	2187	3019	5206	5206	2187	2977	5344	5344	2218	3019	2218	3019	5237	5237	2270	2977	5473	5473	5473	2050
2141	2987	5219	5219	2154	2987	5237	5237	2194	3029	2194	3029	5223	5223	2194	2987	5362	5362	2226	3029	2226	3029	5255	5255	2278	2987	5492	5492	5492	2051
2148	2997	5237	5237	2161	2997	5255	5255	2202	3040	2202	3040	5241	5241	2202	2997	5381	5381	2234	3040	2234	3040	5273	5273	2286	2997	5511	5511	5511	2052
2155	3007	5254	5254	2168	3007	5272	5272	2209	3050	2209	3050	5259	5259	2209	3007	5399	5399	2242	3050	2242	3050	5292	5292	2294	3007	5530	5530	5530	2053
2162	3016	5272	5272	2176	3016	5290	5290	2217	3060	2217	3060	5277	5277	2217	3016	5418	5418	2249	3060	2249	3060	5310	5310	2302	3016	5549	5549	5549	2054
2170	3026	5290	5290	2183	3026	5308	5308	2225	3070	2225	3070	5295	5295	2225	3026	5436	5436	2257	3070	2257	3070	5328	5328	2310	3026	5568	5568	5568	2055
2177	3036	5307	5307	2191	3036	5326	5326	2232	3081	2232	3081	5313	5313	2232	3036	5455	5455	2265	3081	2265	3081	5346	5346	2318	3036	5587			

3 MODEL OUTPUT SECTION TAB 1: PATRONAGE

Additional patronage - above the do-minimum																													
1a	1a	2a	2a	2b	2c	3a	3a	3b	3c	4a	4a	4b	4b	4a	4b	5a	5a	5b	5c	6a	6a	6b	6b	6a	6b	7a	7a	7b	7c
To Newtown as soon as possible (given constraint s), no Kilbirnie branch	To Newtown as soon as possible (given constraint s), no Kilbirnie branch	To Newtown as soon as possible (given constraint s), no Kilbirnie branch	To Newtown as soon as possible (given constraint s), no Kilbirnie branch	Full route, all delivered as soon as possible (given constraint s)	Full route, all delivered as soon as possible (given constraint s)	To Newtown as soon as possible (given constraint s), no Kilbirnie branch	To Newtown as soon as possible (given constraint s), no Kilbirnie branch	Full route, all delivered as soon as possible (given constraint s)	Full route, all delivered as soon as possible (given constraint s)	Newtown	Kilbirnie	Newtown	Kilbirnie	Full route	Full route	To Newtown as soon as possible (given constraint s), no Kilbirnie branch	To Newtown as soon as possible (given constraint s), no Kilbirnie branch	Full route, all delivered as soon as possible (given constraint s)	Full route, all delivered as soon as possible (given constraint s)	Newtown	Kilbirnie	Newtown	Kilbirnie	Full route	Full route	To Newtown as soon as possible (given constraint s), no Kilbirnie branch	To Newtown as soon as possible (given constraint s), no Kilbirnie branch	Full route, all delivered as soon as possible (given constraint s)	Full route, all delivered as soon as possible (given constraint s)
1	0	47%		43%	43%	55%		48%	48%	80%	42%	80%	42%			80%		80.0%	80.0%	100%	42%	100%	42%			1	1	1	1
43	0	69	0	148	148	81	0	163	163	118	35	118	35	153	153	118	0	275	275	148	35	148	35	183	183	191	0	387	0
44	0	68	0	147	147	81	0	163	163	118	35	118	35	153	153	118	0	275	275	147	35	147	35	182	182	191	0	387	0
44	0	68	0	147	147	80	0	163	163	117	35	117	35	152	152	117	0	275	275	147	35	147	35	182	182	191	0	387	0
44	0	68	0	147	147	80	0	163	163	117	35	117	35	152	152	117	0	274	274	146	35	146	35	181	181	191	0	388	0
45	0	68	0	147	147	80	0	163	163	117	35	117	35	151	151	117	0	274	274	146	35	146	35	181	181	191	0	388	0
45	0	68	0	147	147	80	0	163	163	116	35	116	35	151	151	116	0	274	274	145	35	145	35	180	180	191	0	388	0
46	0	67	0	147	147	79	0	163	163	116	35	116	35	150	150	116	0	274	274	145	35	145	35	179	179	191	0	388	0
46	0	67	0	147	147	79	0	163	163	115	35	115	35	150	150	115	0	274	274	144	35	144	35	179	179	191	0	388	0
47	0	67	0	147	147	79	0	163	163	115	34	115	34	150	150	115	0	274	274	144	34	144	34	178	178	190	0	389	0
47	0	67	0	147	147	78	0	162	162	115	34	115	34	149	149	115	0	273	273	143	34	143	34	178	178	190	0	389	0
47	0	66	0	147	147	78	0	162	162	114	34	114	34	149	149	114	0	273	273	143	34	143	34	177	177	190	0	389	389
48	0	66	0	146	146	78	0	162	162	114	34	114	34	148	148	114	0	273	273	142	34	142	34	177	177	190	0	389	389
48	0	66	0	146	146	78	0	162	162	114	34	114	34	148	148	114	0	273	273	142	34	142	34	176	176	190	0	389	389
49	0	66	0	146	146	77	0	162	162	113	34	113	34	147	147	113	0	273	273	141	34	141	34	176	176	190	0	389	389
49	0	66	0	146	146	77	0	162	162	113	34	113	34	147	147	113	0	272	272	141	34	141	34	175	175	190	0	390	390
50	0	65	0	146	146	77	0	162	162	112	34	112	34	146	146	112	0	272	272	140	34	140	34	174	174	190	0	390	390
50	0	65	0	146	146	77	0	162	162	112	34	112	34	146	146	112	0	272	272	140	34	140	34	174	174	190	0	390	390
50	0	66	0	147	147	77	0	163	163	113	34	113	34	147	147	113	0	274	274	141	34	141	34	175	175	191	0	392	392
50	0	66	0	148	148	78	0	164	164	114	35	114	35	148	148	114	0	276	276	142	35	142	35	177	177	192	0	395	395
50	0	66	0	149	149	78	0	165	165	114	35	114	35	150	150	114	0	278	278	143	35	143	35	178	178	193	0	397	397
50	0	67	0	150	150	79	0	166	166	115	36	115	36	151	151	115	0	279	279	144	36	144	36	180	180	194	0	400	400
51	0	67	0	151	151	79	0	167	167	116	36	116	36	152	152	116	0	281	281	145	36	145	36	181	181	196	0	402	402
51	0	68	0	152	152	80	0	168	168	117	36	117	36	153	153	117	0	283	283	146	36	146	36	182	182	197	0	405	405
51	0	68	0	153	153	80	0	169	169	118	37	118	37	154	154	118	0	285	285	147	37	147	37	184	184	198	0	407	407
51	0	69	0	154	154	81	0	170	170	118	37	118	37	156	156	118	0	287	287	148	37	148	37	185	185	199	0	409	409
51	0	69	0	155	155	82	0	172	172	119	38	119	38	157	157	119	0	289	289	149	38	149	38	187	187	200	0	412	412
51	0	70	0	156	156	82	0	173	173	120	38	120	38	158	158	120	0	291	291	150	38	150	38	188	188	201	0	414	414
51	0	70	0	157	157	83	0	174	174	121	39	121	39	159	159	121	0	292	292	151	39	151	39	189	189	202	0	417	417
51	0	71	0	158	158	83	0	175	175	122	39	122	39	161	161	122	0	294	294	152	39	152	39	191	191	203	0	419	419
51	0	71	0	159	159	84	0	176	176	122	39	122	39	162	162	122	0	296	296	153	39	153	39	192	192	204	0	422	422
52	0	72	0	160	160	84	0	177	177	123	40	123	40	163	163	123	0	298	298	154	40	154	40	194	194	206	0	424	424
52	0	72	0	161	161	85	0	178	178	124	40	124	40	164	164	124	0	300	300	155	40	155	40	195	195	207	0	426	426
52	0	72	0	162	162	85	0	179	179	125	41	125	41	165	165	125	0	302	302	156	41	156	41	197	197	208	0	429	429
52	0	73	0	163	163	86	0	180	180	125	41	125	41	167	167	125	0	303	303	157	41	157	41	198	198	209	0	431	431
52	0	73	0	164	164	86	0	181	181	126	42	126	42	168	168	126	0	305	305	158	42	158	42	199	199	210	0	434	434
52	0	74	0	165	165	87	0	183	183	127	42	127	42	169	169	127	0	307	307	159	42	159	42	201	201	211	0	436	436
52	0	74	0	166	166	88	0	184	184	128	42	128	42	170	170	128	0	309	309	160	42	160	42	202	202	212	0	439	439
52	0	75	0	167	167	88	0	185	185	129	43	129	43	171	171	129	0	311	311	161	43	161	43	204	204	213	0	441	441
53	0	75	0	168	168	89	0	186	186	129	43	129	43	173	173	129	0	313	313	162	43	162	43	205	205	214	0	443	443
53	0	76	0	169	169	89	0	187	187	130	44	130	44	174	174	130	0	315	315	163	44	163	44	206	206	215	0	446	446
53	0	76	0	170	170	90	0	188	188	131	44	131	44	175	175	131	0	316	316	164	44	164	44	208	208	217	0	448	448
53	0	77	0	171	171	90	0	189	189	132	44	132	44	176	176	132	0	318	318	165	44	165	44	209	209	218	0	451	451
53	0	77	0	172	172	91	0	190	190	133	45	133	45	178	178	133	0	320	320	166	45	166	45	211	211	219	0	453	453
53	0	78	0	173	173	91	0	191	191	133	45	133	45	179	179	133	0	322	322	167	45	167	45	212	212	220	0	456	456
53	0	78	0	174	174	92	0	192	192	134	46	134	46	180	180	134	0	324	324	168	46	168	46	213	213	221	0	458	458
53	0	78	0	175	175	92	0	194	194	135	46	135	46	181	181	135	0	326	326	169	46	169	46	215	215	222	0	460	460
53	0	79	0	176	176	93	0	195	195	136	47	136	47	182	182	136	0	328	328	170	47	170	47	216	216	223	0	463	463
54	0	79	0	177	177	93	0	196	196	137	47	137	47	184	184	137	0	329	329	171	47	171	47	218	218	224	0	465	465
54	0	80	0	178	178	94	0	197	197	137	47	137	47	185	185	137	0	331	331	172	47	172	47	219	219	225	0	468	468
54	0	80	0	179	179	95	0	198	198	138	48	138	48	186	186	138	0	333	333	173	48	173	48						

3 MODEL OUTPUT SECTION TAB 2: TRAVEL TIME SAVINGS

Kilbirnie

Table 8 Comparison of travel time savings against Reference Case: Kilbirnie to Rail Station (2031 morning peak)

From Kilbirnie To	Reference Case	Bus Priority	Bus Rapid Transit	Light Rail Transit
Elizabeth Street	13.9	-1.1	-7.6	-7.9
Courtenay Place	14.7	-1.1	-8.1	-8.4
Willis Street	19.3	-1.5	-9.5	-9.8
Rail Station	24.5	-2.7	-11.2	-11.5

Relative patronage along the lines (used to weight the patronage)

	Ref	BP	BRT
Newtown	936	992	1154
Kilbirnie	1161	1193	1658
Newtown	0.446352	0.454004577	0.410384068
Kilbirnie	0.553648	0.545995423	0.589615932

Newtown

Table 9 Comparison of travel time savings against Reference Case: Newtown to Wellington Rail Station (2031 morning peak)

From Newtown To	Reference Case	Bus Priority	Bus Rapid Transit	Light Rail Transit
Basin	5.1	-1.4	-1.7	-2.1
Courtenay Place	8.5	-1.4	-3.3	-3.9
Willis Street	13.1	-1.8	-4.7	-5.4
Rail Station	18.3	-3.0	-6.4	-7.0

Estimated travel time savings (relative to do-min) in minutes			
Bus priority		BRT	
Kilbirnie - North of Golden Mile	Kilbirnie - North of Golden Mile	Newtown - North of Golden Mile	Newtown - North of Golden Mile

Analysis year	Financial year (ie July to June)	BP	BRT	BP	BRT	BP	BRT	BP	BRT
Year 0	2015	0.544	1.292	0.544	1.496	1.258	6.426	2.203	3.359
Year 1	2016	0.560	1.330	0.560	1.540	1.295	6.615	2.268	3.458
Year 2	2017	0.576	1.368	0.576	1.584	1.332	6.804	2.333	3.557
Year 3	2018	0.592	1.406	0.592	1.628	1.369	6.993	2.398	3.656
Year 4	2019	0.608	1.444	0.608	1.672	1.406	7.182	2.462	3.754
Year 5	2020	0.624	1.482	0.624	1.716	1.443	7.371	2.527	3.853
Year 6	2021	0.640	1.520	0.640	1.760	1.480	7.560	2.592	3.952
Year 7	2022	0.656	1.558	0.656	1.804	1.517	7.749	2.657	4.051
Year 8	2023	0.672	1.596	0.672	1.848	1.554	7.938	2.722	4.150
Year 9	2024	0.688	1.634	0.688	1.892	1.591	8.127	2.786	4.248
Year 10	2025	0.704	1.672	0.704	1.936	1.628	8.316	2.851	4.347
Year 11	2026	0.720	1.710	0.720	1.980	1.665	8.505	2.916	4.446
Year 12	2027	0.736	1.748	0.736	2.024	1.702	8.694	2.981	4.545
Year 13	2028	0.752	1.786	0.752	2.068	1.739	8.883	3.046	4.644
Year 14	2029	0.768	1.824	0.768	2.112	1.776	9.072	3.110	4.742
Year 15	2030	0.784	1.862	0.784	2.156	1.813	9.261	3.175	4.841
Year 16	2031	0.800	1.900	0.800	2.200	1.850	9.450	3.240	4.940
Year 17	2032	0.816	1.938	0.816	2.244	1.887	9.639	3.305	5.039
Year 18	2033	0.832	1.976	0.832	2.288	1.924	9.828	3.370	5.138
Year 19	2034	0.848	2.014	0.848	2.332	1.961	10.017	3.434	5.236
Year 20	2035	0.864	2.052	0.864	2.376	1.998	10.206	3.499	5.335
Year 21	2036	0.880	2.090	0.880	2.420	2.035	10.395	3.564	5.434
Year 22	2037	0.896	2.128	0.896	2.464	2.072	10.584	3.629	5.533
Year 23	2038	0.912	2.166	0.912	2.508	2.109	10.773	3.694	5.632
Year 24	2039	0.928	2.204	0.928	2.552	2.146	10.962	3.758	5.730
Year 25	2040	0.944	2.242	0.944	2.596	2.183	11.151	3.823	5.829
Year 26	2041	0.960	2.280	0.960	2.640	2.220	11.340	3.888	5.928
Year 27	2042	0.960	2.280	0.960	2.640	2.220	11.340	3.888	5.928
Year 28	2043	0.960	2.280	0.960	2.640	2.220	11.340	3.888	5.928
Year 29	2044	0.960	2.280	0.960	2.640	2.220	11.340	3.888	5.928
Year 30	2045	0.960	2.280	0.960	2.640	2.220	11.340	3.888	5.928
Year 31	2046	0.960	2.280	0.960	2.640	2.220	11.340	3.888	5.928
Year 32	2047	0.960	2.280	0.960	2.640	2.220	11.340	3.888	5.928
Year 33	2048	0.960	2.280	0.960	2.640	2.220	11.340	3.888	5.928
Year 34	2049	0.960	2.280	0.960	2.640	2.220	11.340	3.888	5.928
Year 35	2050	0.960	2.280	0.960	2.640	2.220	11.340	3.888	5.928
Year 36	2051	0.960	2.280	0.960	2.640	2.220	11.340	3.888	5.928
Year 37	2052	0.960	2.280	0.960	2.640	2.220	11.340	3.888	5.928
Year 38	2053	0.960	2.280	0.960	2.640	2.220	11.340	3.888	5.928
Year 39	2054	0.960	2.280	0.960	2.640	2.220	11.340	3.888	5.928
Year 40	2055	0.960	2.280	0.960	2.640	2.220	11.340	3.888	5.928
Year 41	2056	0.960	2.280	0.960	2.640	2.220	11.340	3.888	5.928
Year 42	2057	0.960	2.280	0.960	2.640	2.220	11.340	3.888	5.928
Year 43	2058	0.960	2.280	0.960	2.640	2.220	11.340	3.888	5.928
Year 44	2059	0.960	2.280	0.960	2.640	2.220	11.340	3.888	5.928
Year 45	2060	0.960	2.280	0.960	2.640	2.220	11.340	3.888	5.928
Year 46	2061	0.960	2.280	0.960	2.640	2.220	11.340	3.888	5.928
Year 47	2062	0.960	2.280	0.960	2.640	2.220	11.340	3.888	5.928
Year 48	2063	0.960	2.280	0.960	2.640	2.220	11.340	3.888	5.928
Year 49	2064	0.960	2.280	0.960	2.640	2.220	11.340	3.888	5.928
Year 50	2065	0.960	2.280	0.960	2.640	2.220	11.340	3.888	5.928
Year 51	2066	0.960	2.280	0.960	2.640	2.220	11.340	3.888	5.928
Year 52	2067	0.960	2.280	0.960	2.640	2.220	11.340	3.888	5.928
Year 53	2068	0.960	2.280	0.960	2.640	2.220	11.340	3.888	5.928
Year 54	2069	0.960	2.280	0.960	2.640	2.220	11.340	3.888	5.928
Year 55	2070	0.960	2.280	0.960	2.640	2.220	11.340	3.888	5.928
Year 56	2071	0.960	2.280	0.960	2.640	2.220	11.340	3.888	5.928
Year 57	2072	0.960	2.280	0.960	2.640	2.220	11.340	3.888	5.928
Year 58	2073	0.960	2.280	0.960	2.640	2.220	11.340	3.888	5.928
Year 59	2074	0.960	2.280	0.960	2.640	2.220	11.340	3.888	5.928
Year 60	2075	0.960	2.280	0.960	2.640	2.220	11.340	3.888	5.928

Kilbirnie Segment					
Trips from Newtown to:	PTSS data		Re-presented		Weighting assumptions
	Travel time savings, 2031 AM peak		Travel time savings, 2031 AM peak		
	BP	BRT	BP	BRT	
			Only to Elizabeth	To Kilbirnie	
Basin	1.10	7.60	0.0	1.1	10%
Courtenay Pl	1.10	8.10	0.0	1.1	10%
Willis St	1.50	8.50	0.4	1.5	40%
Rail Station	2.70	11.20	1.6	2.7	40%

Newtown segment					
Trips from Newtown to:	PTSS data		Re-presented		Weighting assumptions
	Travel time savings, 2031 AM peak		Travel time savings, 2031 AM peak		
	BP	BRT	BP	BRT	
			Only to Basin	To Newtown too	
Basin	1.40	1.70	0.0	1.4	10%
Courtenay Pl	1.40	3.30	0.0	1.4	10%
Willis St	1.80	4.70	0.4	1.8	40%
Rail Station	3.00	6.40	1.6	3.0	40%

Weighted average travel time savings

All trips (weighted average) - Kilbirnie section	BP		BRT	
	Only to Basin	To Kilbirnie too	Only to Basin	To Kilbirnie too
	0.8	1.9	1.9	9.5

All trips (weighted average) - Newto	BP		BRT	
	Only to Basin	To Newtown too	Only to Basin	To Newtown too
	0.80	2.20	3.24	4.94

Note: These must be multiplied by the full patronage figures (incl those who don't get any benefit).

Table:

	Ref	BP	BRT
Miramar	1320	1380	1490
Kilbirnie Lyall	680	720	760
Mt Vic/Hataitai	790	810	740
Island Bay	1140	1160	1240
Newtown	790	820	880
Total	4710	4880	5110
NB: individual segments do not add to total due to rounding			
Kilbirnie branch	59%	60%	59%
Newtown branc	41%	41%	41%

Table 7 Local growth in patronage to the CBD (2 hour 2031 morning peak)

Year	Area	Reference Case		Bus Priority		Bus Rapid Transit		Light Rail Transit	
		Trips	Mode Share	Trips	Mode Share	Trips	Mode Share	Trips	Mode Share
2031	Miramar	1,320	43%	+ 60	45%	+ 170	47%	-70	42%
	Kilbirnie Lyall	680	36%	+ 40	38%	+ 80	39%	+ 90	40%
	Mt Vic / Hataitai	790	33%	+ 20	34%	-50	32%	-40	32%
	Island Bay	1,140	43%	+ 20	44%	+ 100	46%	-60	42%
	Newtown	790	31%	+ 30	32%	+ 90	34%	+ 40	32%
	Total	4,710	38%	+ 170	39%	+ 400	40%	-30	38%

3 MODEL OUTPUT SECTION TAB 2: TRAVEL TIME SAVINGS

Kilbirnie (% of travel time savings relative to option 7)								Newtown (% of travel time savings relative to option 7)							Golden mile segment (% of travel time savings relative to option 7) - Kilbirnie travellers							Golden mile segment (% of travel time savings relative to option 7) - Newtown travellers																																												
Option 0	option 1	Option 2	Option 3	Option 4	Option 5	Option 6	Option 7	Option 0	option 1	Option 2	Option 3	Option 4	Option 5	Option 6	Option 7	Option 0	option 1	Option 2	Option 3	Option 4	Option 5	Option 6	Option 7	Option 0	option 1	Option 2	Option 3	Option 4	Option 5	Option 6	Option 7																																			
Percent of travel time savings (relative to option 7)																																	0%	100%	40%	42%	46%	80%	83%	100%	0%	100%	47%	55%	80%	80%	100%	100%	0%	100%	50%	50%	94%	94%	100%	100%	0%	100%	50%	50%	94%	94%	100%	100%		Weight
0.000	1.292	3.364	3.471	3.648	5.399	5.577	6.426	0.000	1.496	2.362	2.516	2.987	2.987	3.359	3.359	0.000	0.544	0.904	0.904	1.215	1.215	1.258	1.258	0.000	0.544	1.381	1.381	2.103	2.103	2.203	2.203	Year 0	2015																																	
0.000	1.330	3.463	3.573	3.755	5.558	5.741	6.615	0.000	1.540	2.432	2.590	3.074	3.074	3.458	3.458	0.000	0.560	0.931	0.931	1.251	1.251	1.295	1.295	0.000	0.560	1.421	1.421	2.165	2.165	2.268	2.268	Year 1	2016																																	
0.000	1.368	3.562	3.675	3.863	5.717	5.905	6.804	0.000	1.584	2.501	2.664	3.162	3.162	3.557	3.557	0.000	0.576	0.957	0.957	1.286	1.286	1.332	1.332	0.000	0.576	1.462	1.462	2.227	2.227	2.333	2.333	Year 2	2017																																	
0.000	1.406	3.661	3.777	3.970	5.876	6.069	6.993	0.000	1.628	2.571	2.738	3.250	3.250	3.656	3.656	0.000	0.592	0.984	0.984	1.322	1.322	1.369	1.369	0.000	0.592	1.503	1.503	2.289	2.289	2.398	2.398	Year 3	2018																																	
0.000	1.444	3.760	3.879	4.077	6.034	6.233	7.182	0.000	1.672	2.640	2.812	3.338	3.338	3.754	3.754	0.000	0.608	1.010	1.010	1.358	1.358	1.406	1.406	0.000	0.608	1.543	1.543	2.351	2.351	2.462	2.462	Year 4	2019																																	
0.000	1.482	3.859	3.981	4.185	6.193	6.397	7.371	0.000	1.716	2.710	2.886	3.426	3.426	3.853	3.853	0.000	0.624	1.037	1.037	1.394	1.394	1.443	1.443	0.000	0.624	1.584	1.584	2.413	2.413	2.527	2.527	Year 5	2020																																	
0.000	1.520	3.958	4.083	4.292	6.352	6.561	7.560	0.000	1.760	2.779	2.960	3.514	3.514	3.952	3.952	0.000	0.640	1.064	1.064	1.429	1.429	1.480	1.480	0.000	0.640	1.625	1.625	2.474	2.474	2.592	2.592	Year 6	2021																																	
0.000	1.558	4.057	4.185	4.399	6.511	6.725	7.749	0.000	1.804	2.849	3.034	3.601	3.601	4.051	4.051	0.000	0.656	1.090	1.090	1.465	1.465	1.517	1.517	0.000	0.656	1.665	1.665	2.536	2.536	2.657	2.657	Year 7	2022																																	
0.000	1.596	4.156	4.287	4.507	6.670	6.889	7.938	0.000	1.848	2.918	3.108	3.689	3.689	4.150	4.150	0.000	0.672	1.117	1.117	1.501	1.501	1.554	1.554	0.000	0.672	1.706	1.706	2.598	2.598	2.722	2.722	Year 8	2023																																	
0.000	1.634	4.255	4.389	4.614	6.828	7.053	8.127	0.000	1.892	2.988	3.182	3.777	3.777	4.248	4.248	0.000	0.688	1.143	1.143	1.537	1.537	1.591	1.591	0.000	0.688	1.746	1.746	2.660	2.660	2.786	2.786	Year 9	2024																																	
0.000	1.672	4.354	4.492	4.721	6.987	7.217	8.316	0.000	1.936	3.057	3.256	3.865	3.865	4.347	4.347	0.000	0.704	1.170	1.170	1.572	1.572	1.628	1.628	0.000	0.704	1.787	1.787	2.722	2.722	2.851	2.851	Year 10	2025																																	
0.000	1.710	4.453	4.594	4.828	7.146	7.381	8.505	0.000	1.980	3.127	3.330	3.953	3.953	4.446	4.446	0.000	0.720	1.197	1.197	1.608	1.608	1.665	1.665	0.000	0.720	1.828	1.828	2.784	2.784	2.916	2.916	Year 11	2026																																	
0.000	1.748	4.552	4.696	4.936	7.305	7.545	8.694	0.000	2.024	3.196	3.404	4.041	4.041	4.545	4.545	0.000	0.736	1.223	1.223	1.644	1.644	1.702	1.702	0.000	0.736	1.868	1.868	2.846	2.846	2.981	2.981	Year 12	2027																																	
0.000	1.786	4.651	4.798	5.043	7.464	7.709	8.883	0.000	2.068	3.266	3.478	4.128	4.128	4.644	4.644	0.000	0.752	1.250	1.250	1.680	1.680	1.739	1.739	0.000	0.752	1.909	1.909	2.907	2.907	3.046	3.046	Year 13	2028																																	
0.000	1.824	4.750	4.900	5.150	7.622	7.873	9.072	0.000	2.112	3.335	3.552	4.216	4.216	4.742	4.742	0.000	0.768	1.276	1.276	1.715	1.715	1.776	1.776	0.000	0.768	1.949	1.949	2.969	2.969	3.110	3.110	Year 14	2029																																	
0.000	1.862	4.849	5.002	5.258	7.781	8.037	9.261	0.000	2.156	3.405	3.626	4.304	4.304	4.841	4.841	0.000	0.784	1.303	1.303	1.751	1.751	1.813	1.813	0.000	0.784	1.990	1.990	3.031	3.031	3.175	3.175	Year 15	2030																																	
0.000	1.900	4.948	5.104	5.365	7.940	8.201	9.450	0.000	2.200	3.474	3.700	4.392	4.392	4.940	4.940	0.000	0.800	1.330	1.330	1.787	1.787	1.850	1.850	0.000	0.800	2.031	2.031	3.093	3.093	3.240	3.240	Year 16	2031																																	
0.000	1.938	5.047	5.206	5.472	8.099	8.365	9.639	0.000	2.244	3.544	3.774	4.480	4.480	5.039	5.039	0.000	0.816	1.356	1.356	1.822	1.822	1.887	1.887	0.000	0.816	2.071	2.071	3.155	3.155	3.305	3.305	Year 17	2032																																	
0.000	1.976	5.146	5.308	5.580	8.258	8.529	9.828	0.000	2.288	3.613	3.848	4.568	4.568	5.138	5.138	0.000	0.832	1.383	1.383	1.858	1.858	1.924	1.924	0.000	0.832	2.112	2.112	3.217	3.217	3.370	3.370	Year 18	2033																																	
0.000	2.014	5.245	5.410	5.687	8.416	8.693	10.017	0.000	2.332	3.683	3.922	4.656	4.656	5.236	5.236	0.000	0.848	1.409	1.409	1.894	1.894	1.961	1.961	0.000	0.848	2.152	2.152	3.279	3.279	3.434	3.434	Year 19	2034																																	
0.000	2.052	5.344	5.512	5.794	8.575	8.857	10.206	0.000	2.376	3.752	3.996	4.743	4.743	5.335	5.335	0.000	0.864	1.436	1.436	1.930	1.930	1.998	1.998	0.000	0.864	2.193	2.193	3.340	3.340	3.499	3.499	Year 20	2035																																	
0.000	2.090	5.443	5.614	5.901	8.734	9.021	10.395	0.000	2.420	3.822	4.070	4.831	4.831	5.434	5.434	0.000	0.880	1.463	1.463	1.965	1.965	2.035	2.035	0.000	0.880	2.234	2.234	3.402	3.402	3.564	3.564	Year 21	2036																																	
0.000	2.128	5.541	5.716	6.009	8.893	9.185	10.584	0.000	2.464	3.891	4.144	4.919	4.919	5.533	5.533	0.000	0.896	1.489	1.489	2.001	2.001	2.072	2.072	0.000	0.896	2.274	2.274	3.464	3.464	3.629	3.629	Year 22	2037																																	
0.000	2.166	5.640	5.819	6.116	9.052	9.349	10.773	0.000	2.508	3.961	4.218	5.007	5.007	5.632	5.632	0.000	0.912	1.516	1.516	2.037	2.037	2.109	2.109	0.000	0.912	2.315	2.315	3.526	3.526	3.694	3.694	Year 23	2038																																	
0.000	2.204	5.739	5.921	6.223	9.210	9.513	10.962	0.000	2.552	4.030	4.292	5.095	5.095	5.730	5.730	0.000	0.928	1.542	1.542	2.073	2.073	2.146	2.146	0.000	0.928	2.356	2.356	3.588	3.588	3.758	3.758	Year 24	2039																																	
0.000	2.242	5.838	6.023	6.331	9.369	9.677	11.151	0.000	2.596	4.100	4.366	5.183	5.183	5.829	5.829	0.000	0.944	1.569	1.569	2.108	2.108	2.183	2.183	0.000	0.944	2.396	2.396	3.650	3.650	3.823	3.823	Year 25	2040																																	
0.000	2.280	5.937	6.125	6.438	9.528	9.841	11.340	0.000	2.640	4.169	4.440	5.270	5.270	5.928	5.928	0.000	0.960	1.595	1.595	2.144	2.144	2.220	2.220	0.000	0.960	2.437	2.437	3.712	3.712	3.888	3.888	Year 26	2041																																	
0.000	2.280	5.937	6.125	6.438	9.528	9.841	11.340	0.000	2.640	4.169	4.440	5.270	5.270	5.928	5.928	0.000	0.960	1.595	1.595	2.144	2.144	2.220	2.220	0.000	0.960	2.437	2.437	3.712	3.712	3.888	3.888	Year 27	2042																																	
0.000	2.280	5.937	6.125	6.438	9.528	9.841	11.340	0.000	2.640	4.169	4.440	5.270	5.270	5.928	5.928	0.000	0.960	1.595	1.595	2.144	2.144	2.220	2.220	0.000	0.960	2.437	2.437	3.712	3.712	3.888	3.888	Year 28	2043																																	
0.000	2.280	5.937	6.125	6.438	9.528	9.841	11.340	0.000	2.640	4.169	4.440	5.270	5.270	5.928	5.928	0.000	0.960	1.595	1.595	2.144	2.144	2.220	2.220	0.000	0.960	2.437	2.437	3.712	3.712	3.888	3.888	Year 29	2044																																	
0.000	2.280	5.937	6.125	6.438	9.528	9.841	11.340	0.000	2.640	4.169	4.440	5.270	5.270	5.928	5.928	0.000	0.960	1.595	1.595	2.144	2.144	2.220	2.220	0.000	0.960	2.437	2.437	3.712	3.712	3.888	3.888	Year 30	2045																																	
0.000	2.280	5.937	6.125	6.438	9.528	9.841	11.340	0.000	2.640	4.169	4.440	5.270	5.270	5.928	5.928	0.000	0.960	1.595	1.595	2.144	2.144	2.220	2.220	0.000	0.960	2.437	2.437	3.712	3.712	3.888	3.888	Year 31	2046																																	
0.000	2.280	5.937	6.125	6.438	9.528	9.841	11.340	0.000	2.640	4.169	4.440	5.270	5.270	5.928	5.928	0.000	0.960	1.595	1.595	2.144	2.144	2.220	2.220	0.000	0.960	2.437	2.437	3.712	3.712	3.888	3.888	Year 32	2047																																	
0.000	2.280	5.937	6.125	6.438	9.528	9.841	11.340	0.000	2.640	4.169	4.440	5.270	5.270	5.928	5.928	0.000																																																		

3 MODEL OUTPUT SECTION TAB 2: TRAVEL TIME SAVINGS

Estimated travel time savings (relative to do-min) in minutes - weighted averages

	1a	1a	2a	2a	2b	2c	3a	3a	3b	3c	4a	4a	4b	4b	4a	4b	5a	5a	5b	5c	6a	6a	6b	6b	6a	6b	7a	7a	7b	7c	
	To	Kilbirnie	To	Kilbirnie	Full route	Full route,	To	Kilbirnie	Full route	Full route,	Newtown	Kilbirnie	Newtown	Kilbirnie	Whole	Whole	To	Kilbirnie	Full route	Full route,	Newtown	Kilbirnie	Newtown	Kilbirnie	Full route	Full route	To	Kilbirnie	Full route	Full route,	
	Newtown	travellers	Newtown	travellers	as soon as all	as soon as all	Newtown	travellers	as soon as all	as soon as all	Newtown	Kilbirnie	Newtown	Kilbirnie	route	route	Newtown	Kilbirnie	as soon as all	as soon as all	Newtown	Kilbirnie	Newtown	Kilbirnie	Full route	Full route	Newtown	Kilbirnie	Full route	Full route,	
Weighted av full route:	1.4		2.2				2.3										2.9										3.1				
(to June)																															
	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	0.608	0.608	1.543	1.010	1.232	0.000	1.543	1.010	1.232	0.000	2.351	1.010	0.000	0.000	1.770	0.000	2.351	1.358	1.770	0.000	2.462	1.010	0.000	0.000	1.844	0.000	2.462	1.406	1.844	0.000	0.000
	0.624	0.624	1.584	1.037	1.264	0.000	1.584	1.037	1.264	0.000	2.413	1.037	0.000	0.000	1.816	0.000	2.413	1.394	1.816	0.000	2.527	1.037	0.000	0.000	1.893	0.000	2.527	1.443	1.893	0.000	0.000
	0.640	0.640	1.625	1.064	1.296	0.000	1.625	1.064	1.296	0.000	2.474	1.064	0.000	0.000	1.863	0.000	2.474	1.429	1.863	0.000	2.592	1.064	0.000	0.000	1.941	0.000	2.592	1.480	1.941	0.000	0.000
	0.656	0.656	1.665	1.090	1.329	0.000	1.665	1.090	1.329	0.000	2.536	1.090	0.000	0.000	1.910	0.000	2.536	1.465	1.910	0.000	2.657	1.090	0.000	0.000	1.990	0.000	2.657	1.517	1.990	0.000	0.000
	0.672	0.672	1.706	1.117	1.361	0.000	1.706	1.117	1.361	0.000	2.598	1.117	0.000	0.000	1.956	0.000	2.598	1.501	1.956	0.000	2.722	1.117	0.000	0.000	2.038	0.000	2.722	1.554	2.038	0.000	0.000
	0.688	0.688	1.746	1.143	1.394	0.000	1.746	1.143	1.394	0.000	2.660	1.143	0.000	0.000	2.003	0.000	2.660	1.537	2.003	0.000	2.786	1.143	0.000	0.000	2.087	0.000	2.786	1.591	2.087	0.000	0.000
	1.936	0.704	3.057	1.170	3.816	3.816	3.256	1.170	3.979	3.979	3.865	3.256	3.865	3.256	4.366	4.366	3.865	1.572	5.692	5.692	4.347	3.256	4.347	3.256	6.026	6.026	4.347	1.628	6.669	6.669	6.669
	1.980	0.720	3.127	1.197	3.903	3.903	3.330	1.197	4.069	4.069	3.953	3.330	3.953	3.330	4.465	4.465	3.953	1.608	5.821	5.821	4.446	3.330	4.446	3.330	6.163	6.163	4.446	1.665	6.821	6.821	6.821
	2.024	0.736	3.196	1.223	3.990	3.990	3.404	1.223	4.160	4.160	4.041	3.404	4.041	3.404	4.564	4.564	4.041	1.644	5.951	5.951	4.545	3.404	4.545	3.404	6.300	6.300	4.545	1.702	6.973	6.973	6.973
	2.068	0.752	3.266	1.250	4.076	4.076	3.478	1.250	4.250	4.250	4.128	3.478	4.128	3.478	4.664	4.664	4.128	1.680	6.080	6.080	4.644	3.478	4.644	3.478	6.437	6.437	4.644	1.739	7.124	7.124	7.124
	2.112	0.768	3.335	1.276	4.163	4.163	3.552	1.276	4.341	4.341	4.216	3.552	4.216	3.552	4.763	4.763	4.216	1.715	6.209	6.209	4.742	3.552	4.742	3.552	6.574	6.574	4.742	1.776	7.276	7.276	7.276
	2.156	0.784	3.405	1.303	4.250	4.250	3.626	1.303	4.431	4.431	4.304	3.626	4.304	3.626	4.862	4.862	4.304	1.751	6.339	6.339	4.841	3.626	4.841	3.626	6.711	6.711	4.841	1.813	7.427	7.427	7.427
	2.200	0.800	3.474	1.330	4.336	4.336	3.700	1.330	4.522	4.522	4.392	3.700	4.392	3.700	4.961	4.961	4.392	1.787	6.468	6.468	4.940	3.700	4.940	3.700	6.848	6.848	4.940	1.850	7.579	7.579	7.579
	2.244	0.816	3.544	1.356	4.423	4.423	3.774	1.356	4.612	4.612	4.480	3.774	4.480	3.774	5.061	5.061	4.480	1.822	6.597	6.597	5.039	3.774	5.039	3.774	6.985	6.985	5.039	1.887	7.731	7.731	7.731
	2.288	0.832	3.613	1.383	4.510	4.510	3.848	1.383	4.702	4.702	4.568	3.848	4.568	3.848	5.160	5.160	4.568	1.858	6.727	6.727	5.138	3.848	5.138	3.848	7.122	7.122	5.138	1.924	7.882	7.882	7.882
	2.332	0.848	3.683	1.409	4.597	4.597	3.922	1.409	4.793	4.793	4.656	3.922	4.656	3.922	5.259	5.259	4.656	1.894	6.856	6.856	5.236	3.922	5.236	3.922	7.259	7.259	5.236	1.961	8.034	8.034	8.034
	2.376	0.864	3.752	1.436	4.683	4.683	3.996	1.436	4.883	4.883	4.743	3.996	4.743	3.996	5.358	5.358	4.743	1.930	6.985	6.985	5.335	3.996	5.335	3.996	7.396	7.396	5.335	1.998	8.185	8.185	8.185
	2.420	0.880	3.822	1.463	4.770	4.770	4.070	1.463	4.974	4.974	4.831	4.070	4.831	4.070	5.457	5.457	4.831	1.965	7.115	7.115	5.434	4.070	5.434	4.070	7.533	7.533	5.434	2.035	8.337	8.337	8.337
	2.464	0.896	3.891	1.489	4.857	4.857	4.144	1.489	5.064	5.064	4.919	4.144	4.919	4.144	5.557	5.557	4.919	2.001	7.244	7.244	5.533	4.144	5.533	4.144	7.670	7.670	5.533	2.072	8.488	8.488	8.488
	2.508	0.912	3.961	1.516	4.944	4.944	4.218	1.516	5.155	5.155	5.007	4.218	5.007	4.218	5.656	5.656	5.007	2.037	7.374	7.374	5.632	4.218	5.632	4.218	7.807	7.807	5.632	2.109	8.640	8.640	8.640
	2.552	0.928	4.030	1.542	5.030	5.030	4.292	1.542	5.245	5.245	5.095	4.292	5.095	4.292	5.755	5.755	5.095	2.073	7.503	7.503	5.730	4.292	5.730	4.292	7.944	7.944	5.730	2.146	8.792	8.792	8.792
	2.596	0.944	4.100	1.569	5.117	5.117	4.366	1.569	5.335	5.335	5.183	4.366	5.183	4.366	5.854	5.854	5.183	2.108	7.632	7.632	5.829	4.366	5.829	4.366	8.081	8.081	5.829	2.183	8.943	8.943	8.943
	2.640	0.960	4.169	1.595	5.204	5.204	4.440	1.595	5.426	5.426	5.270	4.440	5.270	4.440	5.954	5.954	5.270	2.144	7.762	7.762	5.928	4.440	5.928	4.440	8.218	8.218	5.928	2.220	9.095	9.095	9.095
	2.640	0.960	4.169	1.595	5.204	5.204	4.440	1.595	5.426	5.426	5.270	4.440	5.270	4.440	5.954	5.954	5.270	2.144	7.762	7.762	5.928	4.440	5.928	4.440	8.218	8.218	5.928	2.220	9.095	9.095	9.095
	2.640	0.960	4.169	1.595	5.204	5.204	4.440	1.595	5.426	5.426	5.270	4.440	5.270	4.440	5.954	5.954	5.270	2.144	7.762	7.762	5.928	4.440	5.928	4.440	8.218	8.218	5.928	2.220	9.095	9.095	9.095
	2.640	0.960	4.169	1.595	5.204	5.204	4.440	1.595	5.426	5.426	5.270	4.440	5.270	4.440	5.954	5.954	5.270	2.144	7.762	7.762	5.928	4.440	5.928	4.440	8.218	8.218	5.928	2.220	9.095	9.095	9.095
	2.640	0.960	4.169	1.595	5.204	5.204	4.440	1.595	5.426	5.426	5.270	4.440	5.270	4.440	5.954	5.954	5.270	2.144	7.762	7.762	5.928	4.440	5.928	4.440	8.218	8.218	5.928	2.220	9.095	9.095	9.095
	2.640	0.960	4.169	1.595	5.204	5.204	4.440	1.595	5.426	5.426	5.270	4.440	5.270	4.440	5.954	5.															

3 MODEL OUTPUT SECTION TAB 3: TRAVEL TIME SAVINGS 2

Source: From Andy GWRC

AM peak 2031 travel time

	PTSS BP Option				PTSS BRT Option			
	Option 0	option 1	Option 2	Option 3	Option 4	Option 5	Option 6	Option 7
Newtown	404	330	305	287	233	233	191	191
Kilbirnie	636	600	512	506	495	390	380	329
Golden Mile	605	548	443	443	304	304	285	285
Kilbirnie to Wellington CBD	1,038.95	965.23	807.28	800.92	697.43	592.59	569	518
Newtown to CBD	806	695	600	582	436	436	380	380

Percentage of travel time savings (Option 7 minus Option 0) preserved

Weightings of trips		Option 0	option 1	Option 2	Option 3	Option 4	Option 5	Option 6	Option 7
N	41%	0%	35%	47%	55%	80%	80%	100%	100%
K	59%	0%	12%	40%	42%	46%	80%	83%	100%
Source: Ref Travel time savings		0%	18%	50%	50%	94%	94%	100%	100%
		0%	14%	44%	46%	66%	86%	90%	100%
		0%	26%	48%	53%	87%	87%	100%	100%

3 MODEL OUTPUT SECTION TAB 4: BUS VKT

Ref: From Andy at GRWC

Vehicle kilometres travelled

Table 8 Comparison of travel time savings against Reference Case: Kilbirnie to Rail Station (2031 morning peak)

From Kilbirnie To	Reference Case	Bus Priority	Bus Rapid Transit	Light Rail Transit
Elizabeth Street	13.9	-1.1	-7.6	-7.9
Courtenay Place	14.7	-1.1	-8.1	-8.4
Willis Street	19.3	-1.5	-9.5	-9.8
Rail Station	24.5	-2.7	-11.2	-11.5

Kilbirnie to Station = 6km

One bus every 4 minutes for BRT
 One bus every 3 minutes for BP
 One bus every 2 minutes for Ref

Kilbirnie to Stations

Travel time improvement (cf base)

Ref	24.5	
BP	21.8	-11%
BRT	13.3	-46%

VKT improvement (cf base)

Ref	360	
BP	240	-33%
BRT	180	-50%

Buses requ improvement (cf base)

Ref	30	
BP	18	-39%
BRT	9	-69%

Table 9 Comparison of travel time savings against Reference Case: Newtown to Wellington Rail Station (2031 morning peak)

From Newtown To	Reference Case	Bus Priority	Bus Rapid Transit	Light Rail Transit
Basin	5.1	-1.4	-1.7	-2.1
Courtenay Place	8.5	-1.4	-3.3	-3.9
Willis Street	13.1	-1.8	-4.7	-5.4
Rail Station	18.3	-3.0	-6.4	-7.0

Newtown to Station = 5k

One bus every 4 minutes for BRT
 One bus every 3 minutes for BP
 One bus every 2 minutes for Ref

Newtown to Stations

Travel time improvement (cf base)

Ref	18.3	
BP	15.3	-16%
BRT	11.9	-35%

VKT improvement (cf base)

Ref	360	
BP	240	-33%
BRT	180	-50%

Buses requ improvement (cf base)

Ref	23	
BP	14	-42%
BRT	8	-64%

0	1a	2a	2b	2c	3a
Do min	To Newtown as soon as possible (given	To Newtown as soon as possible (given	Full route as soon as all delivered to		To Newtown as soon as possible
Kilbirnie + Newtown	Do min Kilbirnie + BP Newtown				

Analysis year Financial year (ie July to June)

Year 0	2015	428,567	357,139	357,139	285,711	285,711	357,139
Year 1	2016	428,567	357,139	357,139	285,711	285,711	357,139
Year 2	2017	428,567	357,139	357,139	285,711	285,711	357,139
Year 3	2018	428,567	357,139	357,139	285,711	285,711	357,139
Year 4	2019	428,567	357,139	357,139	285,711	285,711	357,139
Year 5	2020	428,567	357,139	357,139	285,711	285,711	357,139
Year 6	2021	428,567	357,139	357,139	285,711	285,711	357,139
Year 7	2022	428,567	357,139	357,139	285,711	285,711	357,139
Year 8	2023	428,567	357,139	357,139	285,711	285,711	357,139
Year 9	2024	428,567	357,139	357,139	285,711	285,711	357,139
Year 10	2025	428,567	357,139	357,139	285,711	285,711	357,139
Year 11	2026	428,567	357,139	357,139	285,711	285,711	357,139
Year 12	2027	428,567	357,139	357,139	285,711	285,711	357,139
Year 13	2028	428,567	357,139	357,139	285,711	285,711	357,139
Year 14	2029	428,567	357,139	357,139	285,711	285,711	357,139
Year 15	2030	428,567	357,139	357,139	285,711	285,711	357,139
Year 16	2031	428,567	357,139	357,139	285,711	285,711	357,139
Year 17	2032	428,567	357,139	357,139	285,711	285,711	357,139
Year 18	2033	428,567	357,139	357,139	285,711	285,711	357,139
Year 19	2034	428,567	357,139	357,139	285,711	285,711	357,139
Year 20	2035	428,567	357,139	357,139	285,711	285,711	357,139
Year 21	2036	428,567	357,139	357,139	285,711	285,711	357,139
Year 22	2037	428,567	357,139	357,139	285,711	285,711	357,139
Year 23	2038	428,567	357,139	357,139	285,711	285,711	357,139
Year 24	2039	428,567	357,139	357,139	285,711	285,711	357,139
Year 25	2040	428,567	357,139	357,139	285,711	285,711	357,139
Year 26	2041	428,567	357,139	357,139	285,711	285,711	357,139
Year 27	2042	428,567	357,139	357,139	285,711	285,711	357,139
Year 28	2043	428,567	357,139	357,139	285,711	285,711	357,139
Year 29	2044	428,567	357,139	357,139	285,711	285,711	357,139
Year 30	2045	428,567	357,139	357,139	285,711	285,711	357,139
Year 31	2046	428,567	357,139	357,139	285,711	285,711	357,139
Year 32	2047	428,567	357,139	357,139	285,711	285,711	357,139
Year 33	2048	428,567	357,139	357,139	285,711	285,711	357,139
Year 34	2049	428,567	357,139	357,139	285,711	285,711	357,139
Year 35	2050	428,567	357,139	357,139	285,711	285,711	357,139
Year 36	2051	428,567	357,139	357,139	285,711	285,711	357,139
Year 37	2052	428,567	357,139	357,139	285,711	285,711	357,139
Year 38	2053	428,567	357,139	357,139	285,711	285,711	357,139
Year 39	2054	428,567	357,139	357,139	285,711	285,711	357,139
Year 40	2055	428,567	357,139	357,139	285,711	285,711	357,139
Year 41	2056	428,567	357,139	357,139	285,711	285,711	357,139
Year 42	2057	428,567	357,139	357,139	285,711	285,711	357,139
Year 43	2058	428,567	357,139	357,139	285,711	285,711	357,139
Year 44	2059	428,567	357,139	357,139	285,711	285,711	357,139
Year 45	2060	428,567	357,139	357,139	285,711	285,711	357,139
Year 46	2061	428,567	357,139	357,139	285,711	285,711	357,139
Year 47	2062	428,567	357,139	357,139	285,711	285,711	357,139
Year 48	2063	428,567	357,139	357,139	285,711	285,711	357,139
Year 49	2064	428,567	357,139	357,139	285,711	285,711	357,139
Year 50	2065	428,567	357,139	357,139	285,711	285,711	357,139
Year 51	2066	428,567	357,139	357,139	285,711	285,711	357,139
Year 52	2067	428,567	357,139	357,139	285,711	285,711	357,139
Year 53	2068	428,567	357,139	357,139	285,711	285,711	357,139
Year 54	2069	428,567	357,139	357,139	285,711	285,711	357,139
Year 55	2070	428,567	357,139	357,139	285,711	285,711	357,139
Year 56	2071	428,567	357,139	357,139	285,711	285,711	357,139
Year 57	2072	428,567	357,139	357,139	285,711	285,711	357,139
Year 58	2073	428,567	357,139	357,139	285,711	285,711	357,139
Year 59	2074	428,567	357,139	357,139	285,711	285,711	357,139
Year 60	2075	428,567	357,139	357,139	285,711	285,711	357,139

	0	1a	2a	2b	2c	3a	3b	
Do min		Full BP	To Newtown as soon as possible (given constraints), no Kilbirnie branch	To Newtown as soon as possible (given constraints), no Kilbirnie branch	Full route as soon as possible (given constraints)	Full route, all delivered to coincide with Basin and Mt Vic tunnel improvements	To Newtown as soon as possible (given constraints), no Kilbirnie branch	Full route as soon as possible (given constraints)
	Kilbirnie + Newtown	Do min Kilbirnie + BP Newtown						
				0.47	0.43	0.43	0.55	0.48

AM Peak 2031 Model Stats

Car Kms (VKT)	Reference	Bus priority	BRT	BP - Ref Change	BRT - ref change
Local Collector	149,532	148,248	148,354	1,284	1,178
Arterial	516,361	514,939	513,520	1,422	2,841
Motorway	521,952	522,261	520,948	308	1,005
Rural	305,821	304,148	301,488	1,672	4,333
Total	1,493,666	1,489,596	1,484,309	4,070	9,357

Source: From GWRC

Difference over do-min			
Total	-	4,070	9,357

Effect is due to better PT options. If only half the route, then not the same PT mode share response

Assume only **50%** improvement because only one route open for the Newtown only options

Long run growth in VKT (pa) **1%**

Assume that VKT stops growing after 2046

Staging/operational by:

Analysis year Financial year (ie July to June)

Year 0	2015	624,176,760	622,476,021	623,326,391	622,959,464	621,798,835	621,798,835	622,894,426	621,725,764
Year 1	2016	630,418,528	628,700,781	629,559,655	629,189,059	628,016,823	628,016,823	629,123,370	627,943,022
Year 2	2017	636,722,713	634,987,789	635,855,251	635,480,949	634,296,992	634,296,992	635,414,604	634,222,452
Year 3	2018	643,089,941	641,337,667	642,213,804	641,835,759	640,639,961	640,639,961	641,768,750	640,564,677
Year 4	2019	649,520,840	647,751,043	648,635,942	648,254,116	647,046,361	647,046,361	648,186,437	646,970,324
Year 5	2020	656,016,048	654,228,554	655,122,301	654,736,657	653,516,825	653,516,825	654,668,302	653,440,027
Year 6	2021	662,576,209	660,770,839	661,673,524	661,284,024	660,051,993	660,051,993	661,214,985	659,974,427
Year 7	2022	669,201,971	667,378,548	668,290,259	667,896,864	666,652,513	666,652,513	667,827,134	666,574,171
Year 8	2023	675,893,991	674,052,333	674,973,162	674,575,833	673,319,038	673,319,038	674,505,406	673,239,913
Year 9	2024	682,652,930	680,792,857	681,722,894	681,321,591	680,052,228	680,052,228	681,250,460	679,972,312
Year 10	2025	689,479,460	687,600,785	688,540,122	688,134,807	686,852,751	686,852,751	688,062,965	686,772,035
Year 11	2026	696,374,254	694,476,793	695,425,524	695,016,155	693,721,278	693,721,278	694,943,594	693,639,756
Year 12	2027	703,337,997	701,421,561	702,379,779	701,966,317	700,658,491	700,658,491	701,893,030	700,576,153
Year 13	2028	710,371,377	708,435,777	709,403,577	708,985,980	707,665,076	707,665,076	708,911,960	707,581,915
Year 14	2029	717,475,091	715,520,134	716,497,612	716,075,840	714,741,727	714,741,727	716,001,080	714,657,734
Year 15	2030	724,649,842	722,675,336	723,662,589	723,236,598	721,889,144	721,889,144	723,161,091	721,804,311
Year 16	2031	731,896,340	729,902,089	730,899,214.50	730,468,964	729,108,035	729,108,035	730,392,702	729,022,354
Year 17	2032	739,215,303	737,201,110	738,208,207	737,773,654	736,399,116	736,399,116	737,696,629	736,312,578
Year 18	2033	746,607,456	744,573,121	745,590,289	745,151,390	743,763,107	743,763,107	745,073,595	743,675,704
Year 19	2034	754,073,531	752,018,852	753,046,192	752,602,904	751,200,738	751,200,738	752,524,331	751,112,461
Year 20	2035	761,614,266	759,539,041	760,576,654	760,128,933	758,712,745	758,712,745	760,049,574	758,623,585
Year 21	2036	769,230,409	767,134,431	768,182,420	767,730,222	766,299,873	766,299,873	767,650,070	766,209,821
Year 22	2037	776,922,713	774,805,775	775,864,244	775,407,525	773,962,871	773,962,871	775,326,571	773,871,919
Year 23	2038	784,691,940	782,553,833	783,622,887	783,161,600	781,702,500	781,702,500	783,079,836	781,610,639
Year 24	2039	792,538,860	790,379,372	791,459,116	790,993,216	789,519,525	789,519,525	790,910,635	789,426,745
Year 25	2040	800,464,248	798,283,165	799,373,707	798,903,148	797,414,720	797,414,720	798,819,741	797,321,012
Year 26	2041	808,468,891	806,265,997	807,367,444	806,892,180	805,388,868	805,388,868	806,807,939	805,294,223
Year 27	2042	808,468,891	806,265,997	807,367,444	806,892,180	805,388,868	805,388,868	806,807,939	805,294,223
Year 28	2043	808,468,891	806,265,997	807,367,444	806,892,180	805,388,868	805,388,868	806,807,939	805,294,223
Year 29	2044	808,468,891	806,265,997	807,367,444	806,892,180	805,388,868	805,388,868	806,807,939	805,294,223
Year 30	2045	808,468,891	806,265,997	807,367,444	806,892,180	805,388,868	805,388,868	806,807,939	805,294,223
Year 31	2046	808,468,891	806,265,997	807,367,444	806,892,180	805,388,868	805,388,868	806,807,939	805,294,223
Year 32	2047	808,468,891	806,265,997	807,367,444	806,892,180	805,388,868	805,388,868	806,807,939	805,294,223
Year 33	2048	808,468,891	806,265,997	807,367,444	806,892,180	805,388,868	805,388,868	806,807,939	805,294,223
Year 34	2049	808,468,891	806,265,997	807,367,444	806,892,180	805,388,868	805,388,868	806,807,939	805,294,223
Year 35	2050	808,468,891	806,265,997	807,367,444	806,892,180	805,388,868	805,388,868	806,807,939	805,294,223
Year 36	2051	808,468,891	806,265,997	807,367,444	806,892,180	805,388,868	805,388,868	806,807,939	805,294,223
Year 37	2052	808,468,891	806,265,997	807,367,444	806,892,180	805,388,868	805,388,868	806,807,939	805,294,223
Year 38	2053	808,468,891	806,265,997	807,367,444	806,892,180	805,388,868	805,388,868	806,807,939	805,294,223
Year 39	2054	808,468,891	806,265,997	807,367,444	806,892,180	805,388,868	805,388,868	806,807,939	805,294,223
Year 40	2055	808,468,891	806,265,997	807,367,444	806,892,180	805,388,868	805,388,868	806,807,939	805,294,223
Year 41	2056	808,468,891	806,265,997	807,367,444	806,892,180	805,388,868	805,388,868	806,807,939	805,294,223
Year 42	2057	808,468,891	806,265,997	807,367,444	806,892,180	805,388,868	805,388,868	806,807,939	805,294,223
Year 43	2058	808,468,891	806,265,997	807,367,444	806,892,180	805,388,868	805,388,868	806,807,939	805,294,223
Year 44	2059	808,468,891	806,265,997	807,367,444	806,892,180	805,388,868	805,388,868	806,807,939	805,294,223
Year 45	2060	808,468,891	806,265,997	807,367,444	806,892,180	805,388,868	805,388,868	806,807,939	805,294,223
Year 46	2061	808,468,891	806,265,997	807,367,444	806,892,180	805,388,868	805,388,868	806,807,939	805,294,223
Year 47	2062	808,468,891	806,265,997	807,367,444	806,892,180	805,388,868	805,388,868	806,807,939	805,294,223
Year 48	2063	808,468,891	806,265,997	807,367,444	806,892,180	805,388,868	805,388,868	806,807,939	805,294,223
Year 49	2064	808,468,891	806,265,997	807,367,444	806,892,180	805,388,868	805,388,868	806,807,939	805,294,223
Year 50	2065	808,468,891	806,265,997	807,367,444	806,892,180	805,388,868	805,388,868	806,807,939	805,294,223
Year 51	2066	808,468,891	806,265,997	807,367,444	806,892,180	805,388,868	805,388,868	806,807,939	805,294,223
Year 52	2067	808,468,891	806,265,997	807,367,444	806,892,180	805,388,868	805,388,868	806,807,939	805,294,223
Year 53	2068	808,468,891	806,265,997	807,367,444	806,892,180	805,388,868	805,388,868	806,807,939	805,294,223
Year 54	2069	808,468,891	806,265,997	807,367,444	806,892,180	805,388,868	805,388,868	806,807,939	805,294,223
Year 55	2070	808,468,891	806,265,997	807,367,444	806,892,180	805,388,868	805,388,868	806,807,939	805,294,223
Year 56	2071	808,468,891	806,265,997	807,367,444	806,892,180	805,388,868	805,388,868	806,807,939	805,294,223
Year 57	2072	808,468,891	806,265,997	807,367,444	806,892,180	805,388,868	805,388,868	806,807,939	805,294,223
Year 58	2073	808,468,891	806,265,997	807,367,444	806,892,180	805,388,868	805,388,868	806,807,939	805,294,223
Year 59	2074	808,468,891	806,265,997	807,367,444	806,892,180	805,388,868	805,388,868	806,807,939	805,294,223
Year 60	2075	808,468,891	806,265,997	807,367,444	806,892,180	805,388,868	805,388,868	806,807,939	805,294,223

3 MODEL OUTPUT SECTION TAB 5: CAR VKT

Car Vehicle km travelled, annually																	
3c	4a	4b	5a	5b	5c	6a	6b	7a	7b	7c	0	1a	2a	2b	2c		
Full route, all delivered to coincide with Basin and Mt Vic tunnel improvements	Full route as soon as possible (given constraints)	Full route, all delivered to coincide with Basin and Mt Vic tunnel improvements	To Newtown as soon as possible (given constraints), no Kilbirnie branch	Full route as soon as possible (given constraints)	Full route, all delivered to coincide with Basin and Mt Vic tunnel improvements	Full route as soon as possible (given constraints)	Full route, all delivered to coincide with Basin and Mt Vic tunnel improvements	To Newtown as soon as possible (given constraints), no Kilbirnie branch	Full route as soon as possible (given constraints)	Full route, all delivered to coincide with Basin and Mt Vic tunnel improvements	Do min	To Newtown as soon as possible (given constraints), no Kilbirnie branch	To Newtown as soon as possible (given constraints), no Kilbirnie branch	Full route as soon as possible (given constraints)	Full route, all delivered to coincide with Basin and Mt Vic tunnel improvements		
	Used weighted average based on GWRC calcs (no splits for car demand)					verage based on GWRC calcs (no split:		BRT Newtown	BRT Newtown + BRT Kilbirnie		Kilbirnie + Newtown	Do min Kilbirnie + BP Newtown					
0.48	60.04%	60.04%	0.8	0.8	0.8	90%	90%										
621,725,764	621,528,531	621,528,531	622,695,185.23	621,213,610	621,213,610	621,050,761	621,050,761	622,221,781	620,266,802	620,266,802	2015	-	-	-	-		
627,943,022	627,743,816	627,743,816	628,922,137	627,425,746	627,425,746	627,261,268	627,261,268	628,443,999	626,469,470	626,469,470	2016	-	-	-	-		
634,222,452	634,021,255	634,021,255	635,211,358	633,700,004	633,700,004	633,533,881	633,533,881	634,728,439	632,734,165	632,734,165	2017	-	-	-	-		
640,564,677	640,361,467	640,361,467	641,563,472	640,037,004	640,037,004	639,869,220	639,869,220	641,075,723	639,061,506	639,061,506	2018	-	-	-	-		
646,970,324	646,765,082	646,765,082	647,979,107	646,437,374	646,437,374	646,267,912	646,267,912	647,486,481	645,452,121	645,452,121	2019	-	-	-	-		
653,440,027	653,232,733	653,232,733	654,458,898	652,901,747	652,901,747	652,730,591	652,730,591	653,961,345	651,906,642	651,906,642	2020	-	-	-	-		
659,974,427	659,765,060	659,765,060	661,003,487	659,430,765	659,430,765	659,257,897	659,257,897	660,500,959	658,425,709	658,425,709	2021	-	-	-	-		
666,574,171	666,362,710	666,362,710	667,613,522	666,025,072	666,025,072	666,850,476	666,850,476	667,105,968	665,009,966	665,009,966	2022	-	-	-	-		
673,239,913	673,026,338	673,026,338	674,289,657	672,685,323	672,685,323	672,508,981	672,508,981	673,777,028	671,660,066	671,660,066	2023	-	-	-	-		
679,972,312	679,756,601	679,756,601	681,032,553	679,412,176	679,412,176	679,234,070	679,234,070	680,514,798	678,376,666	678,376,666	2024	-	-	-	-		
686,772,035	686,554,167	686,554,167	687,842,879	686,206,298	686,206,298	686,026,411	686,026,411	687,319,946	685,160,433	685,160,433	2025	-	939,337	-	2,626,709		
693,639,756	693,419,709	693,419,709	694,721,308	693,068,361	693,068,361	692,886,675	692,886,675	694,193,146	692,012,037	692,012,037	2026	-	948,731	-	2,652,976		
700,576,153	700,353,906	700,353,906	701,668,521	699,999,045	699,999,045	699,815,542	699,815,542	701,135,077	698,932,158	698,932,158	2027	-	958,218	-	2,679,506		
707,581,915	707,357,445	707,357,445	708,685,206	706,999,035	706,999,035	706,813,697	706,813,697	708,146,428	705,921,479	705,921,479	2028	-	967,800	-	2,706,301		
714,657,734	714,431,019	714,431,019	715,772,058	714,069,026	714,069,026	713,881,834	713,881,834	715,227,892	712,980,694	712,980,694	2029	-	977,478	-	2,733,364		
721,804,311	721,575,329	721,575,329	722,929,779	721,209,716	721,209,716	721,020,653	721,020,653	722,380,171	720,110,501	720,110,501	2030	-	987,253	-	2,760,698		
729,022,354	728,791,083	728,791,083	730,159,077	728,421,813	728,421,813	728,230,859	728,230,859	729,603,973	727,311,606	727,311,606	2031	-	997,126	-	2,788,305		
736,312,578	736,078,994	736,078,994	737,460,667	735,706,031	735,706,031	735,513,168	735,513,168	736,900,013	734,584,722	734,584,722	2032	-	1,007,097	-	2,816,188		
743,675,704	743,439,783	743,439,783	744,835,274	743,063,091	743,063,091	742,868,299	742,868,299	744,269,013	741,930,569	741,930,569	2033	-	1,017,168	-	2,844,350		
751,112,461	750,874,181	750,874,181	752,283,627	750,493,722	750,493,722	750,296,982	750,296,982	751,711,703	749,349,875	749,349,875	2034	-	1,027,339	-	2,872,793		
758,623,585	758,382,923	758,382,923	759,806,667	757,998,660	757,998,660	757,799,952	757,799,952	759,228,820	756,843,374	756,843,374	2035	-	1,037,613	-	2,901,521		
766,209,821	765,966,752	765,966,752	767,404,528	765,578,646	765,578,646	765,377,952	765,377,952	766,821,108	764,411,807	764,411,807	2036	-	1,047,989	-	2,930,536		
773,871,919	773,626,420	773,626,420	775,078,573	773,234,433	773,234,433	773,031,731	773,031,731	774,489,319	772,055,926	772,055,926	2037	-	1,058,469	-	2,959,842		
781,610,639	781,362,684	781,362,684	782,829,359	780,966,777	780,966,777	780,762,049	780,762,049	782,234,212	779,776,485	779,776,485	2038	-	1,069,053	-	2,989,440		
789,426,745	789,176,311	789,176,311	790,657,652	788,776,445	788,776,445	788,569,669	788,569,669	790,056,555	787,574,250	787,574,250	2039	-	1,079,744	-	3,019,334		
797,321,012	797,068,074	797,068,074	798,564,229	796,664,209	796,664,209	796,455,366	796,455,366	797,957,120	795,449,992	795,449,992	2040	-	1,090,541	-	3,049,528		
805,294,223	805,038,755	805,038,755	806,549,871	804,630,851	804,630,851	804,419,919	804,419,919	805,936,691	803,404,492	803,404,492	2041	-	1,101,447	-	3,080,023		
805,294,223	805,038,755	805,038,755	806,549,871	804,630,851	804,630,851	804,419,919	804,419,919	805,936,691	803,404,492	803,404,492	2042	-	1,101,447	-	3,080,023		
805,294,223	805,038,755	805,038,755	806,549,871	804,630,851	804,630,851	804,419,919	804,419,919	805,936,691	803,404,492	803,404,492	2043	-	1,101,447	-	3,080,023		
805,294,223	805,038,755	805,038,755	806,549,871	804,630,851	804,630,851	804,419,919	804,419,919	805,936,691	803,404,492	803,404,492	2044	-	1,101,447	-	3,080,023		
805,294,223	805,038,755	805,038,755	806,549,871	804,630,851	804,630,851	804,419,919	804,419,919	805,936,691	803,404,492	803,404,492	2045	-	1,101,447	-	3,080,023		
805,294,223	805,038,755	805,038,755	806,549,871	804,630,851	804,630,851	804,419,919	804,419,919	805,936,691	803,404,492	803,404,492	2046	-	1,101,447	-	3,080,023		
805,294,223	805,038,755	805,038,755	806,549,871	804,630,851	804,630,851	804,419,919	804,419,919	805,936,691	803,404,492	803,404,492	2047	-	1,101,447	-	3,080,023		
805,294,223	805,038,755	805,038,755	806,549,871	804,630,851	804,630,851	804,419,919	804,419,919	805,936,691	803,404,492	803,404,492	2048	-	1,101,447	-	3,080,023		
805,294,223	805,038,755	805,038,755	806,549,871	804,630,851	804,630,851	804,419,919	804,419,919	805,936,691	803,404,492	803,404,492	2049	-	1,101,447	-	3,080,023		
805,294,223	805,038,755	805,038,755	806,549,871	804,630,851	804,630,851	804,419,919	804,419,919	805,936,691	803,404,492	803,404,492	2050	-	1,101,447	-	3,080,023		
805,294,223	805,038,755	805,038,755	806,549,871	804,630,851	804,630,851	804,419,919	804,419,919	805,936,691	803,404,492	803,404,492	2051	-	1,101,447	-	3,080,023		
805,294,223	805,038,755	805,038,755	806,549,871	804,630,851	804,630,851	804,419,919	804,419,919	805,936,691	803,404,492	803,404,492	2052	-	1,101,447	-	3,080,023		
805,294,223	805,038,755	805,038,755	806,549,871	804,630,851	804,630,851	804,419,919	804,419,919	805,936,691	803,404,492	803,404,492	2053	-	1,101,447	-	3,080,023		
805,294,223	805,038,755	805,038,755	806,549,871	804,630,851	804,630,851	804,419,919	804,419,919	805,936,691	803,404,492	803,404,492	2054	-	1,101,447	-	3,080,023		
805,294,223	805,038,755	805,038,755	806,549,871	804,630,851	804,630,851	804,419,919	804,419,919	805,936,691	803,404,492	803,404,492	2055	-	1,101,447	-	3,080,023		
805,294,223	805,038,755	805,038,755	806,549,871	804,630,851	804,630,851	804,419,919	804,419,919	805,936,691	803,404,492	803,404,492	2056	-	1,101,447	-	3,080,023		
805,294,223	805,038,755	805,038,755	806,549,871	804,630,851	804,630,851	804,419,919	804,419,919	805,936,691	803,404,492	803,404,492	2057	-	1,101,447	-	3,080,023		
805,294,223	805,038,755	805,038,755	806,549,871	804,630,851	804,630,851	804,419,919	804,419,919	805,936,691	803,404,492	803,404,492	2058	-	1,101,447	-	3,080,023		
805,294,223	805,038,755	805,038,755	806,549,871	804,630,851	804,630,851	804,419,919	804,419,919	805,936,691	803,404,492	803,404,492	2059	-	1,101,447	-	3,080,023		
805,294,223	805,038,755	805,038,755	806,549,871	804,630,851	804,630,851	804,419,919	804,419,919	805,936,691	803,404,492	803,404,492	2060	-	1,101,447	-	3,080,023		
805,294,223	805,038,755	805,038,755	806,549,871	804,630,851	804,630,851	804,419,919	804,419,919	805,936,691	803,404,492	803,404,492	2061	-	1,101,447	-	3,080,023		
805,294,223	805,038,755	805,038,755	806,549,871	804,630,851	804,630,851	804,419,919	804,419,919	805,936,691	803,404,492	803,404,492	2062	-	1,101,447	-	3,080,023		
805,294,223	805,038,755	805,038,755	806,549,871	804,630,851	804,630,851	804,419,919	804,419,919	805,936,691	803,404,492	803,404,492	2063	-	1,101,447	-	3,080,023		
805,294,223	805,038,755	805,038,755	806,549,871	804,630,851	804,630,851	804,419,919	804,419,919	805,936,691	803,404,492	803,404,492	2064	-	1,101,447	-	3,080,023		
805,294,223	805,038,755	805,038,755	806,549,871	804,630,851	804,630,851	804,419,919	804,419,919	805,936,691	803,404,492	803,404,492	2065	-	1,101,447	-	3,080,023		
805,294,223	805,038,755	805,038,755	806,549,871	804,630,851	804,630,851	804,419,919	804,419,919	805,9									

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4 BENEFITS SECTION TAB 1: TRAVEL TIME SAVINGS

Annual travel time			Existing users																
0	1a	1a	2a	2a	2b	2c	3a	3a	3b	3c	4a	4b	5a	5a	5b	5c	6a	6b	
Do min	To Newtown as soon as possible (given constraints), no Kilbirnie	Kilbirnie - North of Mt Vic	To Newtown as soon as possible (given constraints)	Kilbirnie travellers North of Basin	Full route as soon as possible (given constraints)	Full route, all delivered to coincide with Basin and Mt Vic	To Newtown as soon as possible (given constraints)	Kilbirnie travellers North of Basin	Full route as soon as possible (given constraints)	Full route, all delivered to coincide with Basin and Mt Vic	Full route	Full route	To Newtown as soon as possible (given constraints)	Kilbirnie travellers North of Basin	Full route as soon as possible (given constraints)	Full route, all delivered to coincide with Basin and Mt Vic	Full route	Full route	
NPV (all years)	3,610,861	2,243,289	5,296,748	3,197,512	15,069,140	14,016,828	6,680,467	3,806,524	18,671,331	17,456,341	21,182,805	19,099,361	8,463,697	5,115,378	27,334,604	25,547,625	28,325,539	26,518,480	
NPV to remove (i.e. staging)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Net NPV	3,610,861	2,243,289	5,296,748	3,197,512	15,069,140	14,016,828	6,680,467	3,806,524	18,671,331	17,456,341	21,182,805	19,099,361	8,463,697	5,115,378	27,334,604	25,547,625	28,325,539	26,518,480	
Staging/operational by:																			
Analysis by Financial year (ie July to June)																			
Year 0	2015	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Year 1	2016	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Year 2	2017	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Year 3	2018	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Year 4	2019	0	100,335	141,918	220,820	202,285	429,386	-	264,378	240,813	512,749	-	735,195	-	409,688	323,616	752,782	-	770,475
Year 5	2020	0	102,548	145,004	225,630	206,684	438,770	-	270,138	246,050	523,961	-	751,213	-	418,623	330,653	769,302	-	787,268
Year 6	2021	0	104,738	148,056	230,389	211,035	448,056	-	275,838	251,230	535,056	-	767,062	-	427,463	337,614	785,653	-	803,882
Year 7	2022	0	106,907	151,076	235,097	215,339	457,243	-	281,476	256,353	546,034	-	782,739	-	436,208	344,499	801,836	-	820,317
Year 8	2023	0	109,054	154,062	239,753	219,595	466,333	-	287,052	261,420	556,895	-	798,246	-	444,859	351,308	817,850	-	836,574
Year 9	2024	0	111,179	157,015	244,357	223,804	475,324	-	292,567	266,430	567,639	-	813,582	-	453,415	358,041	833,695	-	852,652
Year 10	2025	0	311,524	159,934	425,861	227,965	1,295,808	1,295,808	543,031	271,384	1,613,549	1,613,549	1,765,653	1,765,653	655,850	364,699	2,359,164	2,359,164	2,451,054
Year 11	2026	0	317,246	162,821	433,564	232,079	1,319,343	1,319,343	552,856	276,282	1,642,876	1,642,876	1,797,599	1,797,599	667,731	371,280	2,402,238	2,402,238	2,495,419
Year 12	2027	0	322,908	165,674	441,178	236,146	1,342,616	1,342,616	562,570	281,123	1,671,876	1,671,876	1,829,182	1,829,182	679,477	377,786	2,444,843	2,444,843	2,539,279
Year 13	2028	0	328,510	168,493	448,705	240,165	1,365,626	1,365,626	572,172	285,908	1,700,549	1,700,549	1,860,401	1,860,401	691,089	384,216	2,486,980	2,486,980	2,582,636
Year 14	2029	0	334,051	171,280	456,144	244,137	1,388,373	1,388,373	581,662	290,636	1,728,896	1,728,896	1,891,257	1,891,257	702,566	390,570	2,528,648	2,528,648	2,625,488
Year 15	2030	0	339,532	174,033	463,496	248,061	1,410,857	1,410,857	591,041	295,308	1,756,917	1,756,917	1,921,749	1,921,749	713,909	396,848	2,569,847	2,569,847	2,667,836
Year 16	2031	0	344,953	176,753	470,759	251,938	1,433,078	1,433,078	600,307	299,923	1,784,611	1,784,611	1,951,877	1,951,877	725,117	403,050	2,610,578	2,610,578	2,709,680
Year 17	2032	0	353,083	180,924	481,925	257,884	1,467,043	1,467,043	614,558	307,001	1,826,925	1,826,925	1,998,227	1,998,227	742,374	412,562	2,672,663	2,672,663	2,774,079
Year 18	2033	0	361,261	185,120	493,159	263,865	1,501,215	1,501,215	628,896	314,122	1,869,499	1,869,499	2,044,864	2,044,864	759,739	422,131	2,735,136	2,735,136	2,838,879
Year 19	2034	0	369,488	189,342	504,462	269,882	1,535,595	1,535,595	643,323	321,285	1,912,333	1,912,333	2,091,787	2,091,787	777,212	431,757	2,797,996	2,797,996	2,904,078
Year 20	2035	0	377,763	193,588	515,834	275,934	1,570,184	1,570,184	657,837	328,490	1,955,427	1,955,427	2,138,998	2,138,998	794,794	441,439	2,861,243	2,861,243	2,969,678
Year 21	2036	0	386,086	197,859	527,274	282,022	1,604,980	1,604,980	672,440	335,737	1,998,780	1,998,780	2,186,495	2,186,495	812,483	451,179	2,924,877	2,924,877	3,035,678
Year 22	2037	0	394,457	202,155	538,783	288,146	1,639,984	1,639,984	687,131	343,027	2,042,393	2,042,393	2,234,279	2,234,279	830,280	460,975	2,988,898	2,988,898	3,102,079
Year 23	2038	0	402,877	206,476	550,361	294,305	1,675,196	1,675,196	701,909	350,359	2,086,266	2,086,266	2,282,349	2,282,349	848,186	470,829	3,053,307	3,053,307	3,168,879
Year 24	2039	0	411,345	210,822	562,007	300,500	1,710,616	1,710,616	716,776	357,734	2,130,398	2,130,398	2,330,707	2,330,707	866,199	480,739	3,118,103	3,118,103	3,236,080
Year 25	2040	0	419,861	215,193	573,722	306,730	1,746,244	1,746,244	731,730	365,151	2,174,790	2,174,790	2,379,351	2,379,351	884,320	490,706	3,183,286	3,183,286	3,303,681
Year 26	2041	0	428,426	219,589	585,505	312,996	1,782,080	1,782,080	746,773	372,610	2,219,442	2,219,442	2,428,282	2,428,282	902,550	500,730	3,248,856	3,248,856	3,371,682
Year 27	2042	0	429,874	220,338	587,565	314,063	1,788,319	1,788,319	749,413	373,880	2,227,233	2,227,233	2,436,885	2,436,885	905,791	502,437	3,260,473	3,260,473	3,383,688
Year 28	2043	0	431,322	221,087	589,624	315,130	1,794,557	1,794,557	752,054	375,151	2,235,024	2,235,024	2,445,488	2,445,488	909,032	504,144	3,272,089	3,272,089	3,395,695
Year 29	2044	0	432,770	221,835	591,684	316,197	1,800,796	1,800,796	754,694	376,421	2,242,815	2,242,815	2,454,091	2,454,091	912,273	505,851	3,283,705	3,283,705	3,407,702
Year 30	2045	0	434,218	222,584	593,743	317,264	1,807,034	1,807,034	757,335	377,691	2,250,605	2,250,605	2,462,694	2,462,694	915,514	507,558	3,295,322	3,295,322	3,419,708
Year 31	2046	0	435,667	223,332	595,802	318,331	1,813,273	1,813,273	759,975	378,961	2,258,396	2,258,396	2,471,297	2,471,297	918,755	509,265	3,306,938	3,306,938	3,431,715
Year 32	2047	0	437,115	224,081	597,862	319,398	1,819,512	1,819,512	762,615	380,232	2,266,187	2,266,187	2,479,900	2,479,900	921,996	510,972	3,318,554	3,318,554	3,443,721
Year 33	2048	0	438,563	224,830	599,921	320,465	1,825,750	1,825,750	765,256	381,502	2,273,978	2,273,978	2,488,503	2,488,503	925,237	512,679	3,330,170	3,330,170	3,455,728
Year 34	2049	0	440,011	225,578	601,981	321,532	1,831,989	1,831,989	767,896	382,772	2,281,769	2,281,769	2,497,106	2,497,106	928,478	514,386	3,341,787	3,341,787	3,467,734
Year 35	2050	0	441,459	226,327	604,040	322,599	1,838,227	1,838,227	770,537	384,043	2,289,560	2,289,560	2,505,709	2,505,709	931,718	516,094	3,353,403	3,353,403	3,479,741
Year 36	2051	0	442,908	227,075	606,099	323,666	1,844,466	1,844,466	773,177	385,313	2,297,351	2,297,351	2,514,312	2,514,312	934,959	517,801	3,365,019	3,365,019	3,491,747
Year 37	2052	0	444,356	227,824	608,159	324,733	1,850,705	1,850,705	775,818	386,583	2,305,142	2,305,142	2,522,915	2,522,915	938,200	519,508	3,376,636	3,376,636	3,503,754
Year 38	2053	0	445,804	228,573	610,218	325,800	1,856,943	1,856,943	778,458	387,853	2,312,933	2,312,933	2,531,517	2,531,517	941,441	521,215	3,388,252	3,388,252	3,515,761
Year 39	2054	0	447,252	229,321	612,278	326,867	1,863,182	1,863,182	781,098	389,124	2,320,723	2,320,723	2,540,120	2,540,120	944,682	522,922	3,399,868	3,399,868	3,527,767
Year 40	2055	0	448,700	230,070	614,337	327,934	1,869,420	1,869,420	783,739	390,394	2,328,514	2,328,514	2,548,723	2,548,723	947,923	524,629	3,411,484	3,411,484	3,539,774
Year 41	2056	0	450,149	230,818	616,397	329,001	1,875,659	1,875,659	786,379	391,664	2,336,305	2,336,305	2,557,326	2,557,326	951,164	526,336	3,423,101	3,423,101	3,551,780
Year 42	2057	0	451,597	231,567	618,456	330,068	1,881,898	1,881,898	789,020	392,934	2,344,096	2,344,096	2,565,929	2,565,929	954,405	528,043	3,434,717	3,434,717	3,563,787
Year 43	2058	0	453,045	232,316	620,515	331,135	1,888,136	1,888,136</											

4 BENEFITS SECTION TAB 1: TRAVEL TIME SAVINGS

				New users (rule of half)																			
7a	7a	7b	7c	0	1a	1a	2a	2a	2b	2c	3a	3a	3b	3c	4a	4b	5a	5a	5b	5c	6a	6b	7a
To Newtown as soon as possible (given constraints)	Kilbirnie-North of Mt Vic	Full route as soon as possible (given constraints)	Full route, all delivered to coincide with Basin and Mt Vic	Do min	To Newtown as soon as possible (given constraints)	Kilbirnie - North of Mt Vic	To Newtown as soon as possible (given constraints)	Kilbirnie - North of Mt Vic	Full route as soon as possible (given constraint)	Full route, all delivered to coincide	To Newtown as soon as possible (given constraints)	Kilbirnie - North of Mt Vic	Full route as soon as possible (given constraint)	Full route, all delivered to coincide	Full route	Full route	To Newtown as soon as possible (given constraints)	Kilbirnie - North of Mt Vic	Full route as soon as possible (given constraint)	Full route, all delivered to coincide with Basin and Mt Vic	Full route	Full route	To Newtown as soon as possible (given constraints)
9,533,017	5,187,606	31,682,655	30,014,611		44,073	-	87,808	-	228,393	214,637	126,990	-	306,151	289,107	318,367	290,428	230,675	-	737,292	695,881	504,616	477,088	427,473
9,533,017	5,187,606	31,682,655	30,014,611		44,073	-	87,808	-	228,393	214,637	126,990	-	306,151	289,107	318,367	290,428	230,675	-	737,292	695,881	504,616	477,088	427,473
-	-	-	-	2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	2016	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	2017	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
434,779	328,185	784,910	-	2019	1,081	-	3,552	-	6,153	-	4,876	-	7,949	-	10,608	-	10,853	-	19,220	-	13,183	-	18,590
444,392	335,321	802,264	-	2020	1,120	-	3,634	-	6,311	-	4,988	-	8,152	-	10,854	-	11,102	-	19,713	-	13,488	-	19,074
453,911	342,381	819,449	-	2021	1,160	-	3,715	-	6,468	-	5,099	-	8,355	-	11,099	-	11,349	-	20,204	-	13,792	-	19,557
463,336	349,363	836,464	-	2022	1,200	-	3,795	-	6,625	-	5,209	-	8,558	-	11,343	-	11,594	-	20,695	-	14,094	-	20,040
472,667	356,268	853,310	-	2023	1,240	-	3,874	-	6,782	-	5,318	-	8,761	-	11,584	-	11,837	-	21,185	-	14,393	-	20,523
481,905	363,097	869,987	-	2024	1,281	-	3,954	-	6,939	-	5,427	-	8,963	-	11,824	-	12,079	-	21,674	-	14,691	-	21,005
748,698	369,848	2,768,677	2,768,677	2025	3,638	-	6,898	-	18,987	18,987	10,085	-	25,574	25,574	25,699	25,699	17,492	-	61,558	61,558	42,291	42,291	32,762
762,496	376,522	2,819,704	2,819,704	2026	3,754	-	7,031	-	19,405	19,405	10,279	-	26,137	26,137	26,203	26,203	17,829	-	62,913	62,913	43,118	43,118	33,497
776,152	383,120	2,870,202	2,870,202	2027	3,871	-	7,163	-	19,822	19,822	10,472	-	26,700	26,700	26,704	26,704	18,164	-	64,266	64,266	43,940	43,940	34,231
789,665	389,641	2,920,171	2,920,171	2028	3,990	-	7,294	-	20,239	20,239	10,664	-	27,261	27,261	27,201	27,201	18,496	-	65,618	65,618	44,755	44,755	34,965
803,034	396,084	2,969,612	2,969,612	2029	4,110	-	7,424	-	20,655	20,655	10,854	-	27,822	27,822	27,694	27,694	18,826	-	66,967	66,967	45,565	45,565	35,698
816,261	402,451	3,018,524	3,018,524	2030	4,232	-	7,553	-	21,071	21,071	11,042	-	28,382	28,382	28,184	28,184	19,153	-	68,314	68,314	46,369	46,369	36,431
829,344	408,741	3,066,907	3,066,907	2031	4,355	-	7,681	-	21,486	21,486	11,229	-	28,941	28,941	28,671	28,671	19,477	-	69,660	69,660	47,167	47,167	37,164
849,091	418,387	3,139,931	3,139,931	2032	4,453	-	7,890	-	22,065	22,065	11,535	-	29,720	29,720	29,487	29,487	20,007	-	71,537	71,537	48,500	48,500	38,128
868,962	428,091	3,213,413	3,213,413	2033	4,551	-	8,102	-	22,650	22,650	11,844	-	30,508	30,508	30,313	30,313	20,543	-	73,433	73,433	49,850	49,850	39,101
888,957	437,853	3,287,354	3,287,354	2034	4,649	-	8,315	-	23,240	23,240	12,156	-	31,304	31,304	31,149	31,149	21,085	-	75,348	75,348	51,214	51,214	40,083
909,076	447,672	3,361,753	3,361,753	2035	4,747	-	8,531	-	23,837	23,837	12,471	-	32,107	32,107	31,994	31,994	21,632	-	77,282	77,282	52,594	52,594	41,073
929,319	457,549	3,436,610	3,436,610	2036	4,846	-	8,749	-	24,439	24,439	12,790	-	32,918	32,918	32,849	32,849	22,184	-	79,235	79,235	53,989	53,989	42,072
949,685	467,484	3,511,926	3,511,926	2037	4,946	-	8,969	-	25,047	25,047	13,112	-	33,738	33,738	33,713	33,713	22,742	-	81,206	81,206	55,399	55,399	43,080
970,176	477,477	3,587,699	3,587,699	2038	5,045	-	9,191	-	25,661	25,661	13,437	-	34,565	34,565	34,587	34,587	23,306	-	83,197	83,197	56,825	56,825	44,096
990,790	487,527	3,663,931	3,663,931	2039	5,146	-	9,415	-	26,281	26,281	13,765	-	35,400	35,400	35,470	35,470	23,875	-	85,207	85,207	58,266	58,266	45,121
1,011,529	497,635	3,740,622	3,740,622	2040	5,246	-	9,642	-	26,907	26,907	14,096	-	36,242	36,242	36,363	36,363	24,449	-	87,236	87,236	59,723	59,723	46,155
1,032,391	507,800	3,817,770	3,817,770	2041	5,347	-	9,871	-	27,538	27,538	14,430	-	37,093	37,093	37,266	37,266	25,029	-	89,283	89,283	61,194	61,194	47,197
1,036,109	509,532	3,831,518	3,831,518	2042	5,359	-	9,936	-	27,714	27,714	14,526	-	37,330	37,330	37,552	37,552	25,195	-	89,852	89,852	61,654	61,654	47,457
1,039,826	511,263	3,845,267	3,845,267	2043	5,371	-	10,002	-	27,890	27,890	14,621	-	37,566	37,566	37,838	37,838	25,361	-	90,422	90,422	62,113	62,113	47,717
1,043,544	512,994	3,859,015	3,859,015	2044	5,383	-	10,067	-	28,065	28,065	14,717	-	37,803	37,803	38,124	38,124	25,526	-	90,991	90,991	62,573	62,573	47,977
1,047,262	514,725	3,872,763	3,872,763	2045	5,395	-	10,132	-	28,241	28,241	14,812	-	38,039	38,039	38,410	38,410	25,692	-	91,560	91,560	63,032	63,032	48,237
1,050,980	516,456	3,886,511	3,886,511	2046	5,407	-	10,198	-	28,416	28,416	14,908	-	38,275	38,275	38,696	38,696	25,858	-	92,129	92,129	63,492	63,492	48,497
1,054,697	518,187	3,900,259	3,900,259	2047	5,419	-	10,263	-	28,592	28,592	15,003	-	38,512	38,512	38,982	38,982	26,023	-	92,698	92,698	63,951	63,951	48,757
1,058,415	519,918	3,914,008	3,914,008	2048	5,432	-	10,328	-	28,767	28,767	15,099	-	38,748	38,748	39,268	39,268	26,189	-	93,267	93,267	64,410	64,410	49,017
1,062,133	521,650	3,927,756	3,927,756	2049	5,444	-	10,394	-	28,943	28,943	15,194	-	38,985	38,985	39,554	39,554	26,355	-	93,836	93,836	64,870	64,870	49,277
1,065,851	523,381	3,941,504	3,941,504	2050	5,456	-	10,459	-	29,118	29,118	15,290	-	39,221	39,221	39,840	39,840	26,520	-	94,406	94,406	65,329	65,329	49,537
1,069,568	525,112	3,955,252	3,955,252	2051	5,468	-	10,524	-	29,294	29,294	15,386	-	39,458	39,458	40,126	40,126	26,686	-	94,975	94,975	65,789	65,789	49,797
1,073,286	526,843	3,969,000	3,969,000	2052	5,480	-	10,590	-	29,469	29,469	15,481	-	39,694	39,694	40,412	40,412	26,852	-	95,544	95,544	66,248	66,248	50,057
1,077,004	528,574	3,982,749	3,982,749	2053	5,492	-	10,655	-	29,645	29,645	15,577	-	39,931	39,931	40,699	40,699	27,017	-	96,113	96,113	66,708	66,708	50,317
1,080,722	530,305	3,996,497	3,996,497	2054	5,504	-	10,720	-	29,821	29,821	15,672	-	40,167	40,167	40,985	40,985	27,183	-	96,682	96,682	67,167	67,167	50,577
1,084,439	532,036	4,010,245	4,010,245	2055	5,516	-	10,786	-	29,996	29,996	15,768	-	40,404	40,404	41,271	41,271	27,349	-	97,251	97,251	67,627	67,627	50,837
1,088,157	533,767	4,023,993	4,023,993	2056	5,528	-	10,851	-	30,172	30,172	15,863	-	40,640	40,640	41,557	41,557	27,514	-	97,820	97,820	68,086	68,086	51,097
1,091,875	535,499	4,037,741	4,037,741	2057	5,540	-	10,916	-	30,347	30,347	15,959	-	40,876	40,876	41,843	41,843	27,680	-	98,390	98,390	68,545	68,545	51,357
1,095,593	53																						

4 BENEFITS SECTION TAB 1: TRAVEL TIME SAVINGS

7a	7b	7c
Kilbirnie- North of Mt Vic	Full route as soon as possible (given constraints)	Full route, all delivered to conincide with Basin and Mt Vic tunnel improvements
-	1,216,110	1,162,564
-	-	-
-	1,216,110	1,162,564
-	-	-
-	-	-
-	-	-
-	28,317	-
-	29,076	-
-	29,835	-
-	30,596	-
-	31,357	-
-	32,119	-
-	102,696	102,696
-	105,080	105,080
-	107,467	107,467
-	109,855	109,855
-	112,246	112,246
-	114,639	114,639
-	117,035	117,035
-	120,119	120,119
-	123,233	123,233
-	126,376	126,376
-	129,548	129,548
-	132,749	132,749
-	135,980	135,980
-	139,239	139,239
-	142,528	142,528
-	145,846	145,846
-	149,193	149,193
-	150,068	150,068
-	150,943	150,943
-	151,818	151,818
-	152,694	152,694
-	153,569	153,569
-	154,444	154,444
-	155,319	155,319
-	156,194	156,194
-	157,069	157,069
-	157,945	157,945
-	158,820	158,820
-	159,695	159,695
-	160,570	160,570
-	161,445	161,445
-	162,320	162,320
-	163,195	163,195
-	164,071	164,071
-	164,946	164,946
-	165,821	165,821
-	166,696	166,696
-	167,571	167,571
-	168,446	168,446
-	169,322	169,322
-	170,197	170,197
-	171,072	171,072
-	171,947	171,947
-	172,822	172,822
-	173,697	173,697
-	174,572	174,572
-	175,448	175,448
-	176,323	176,323
-	177,198	177,198
-	178,073	178,073
-	178,948	178,948

4 BENEFITS SECTION TAB 3: RELIABILITY

Annual reliability = Patronage * EL * VTT (per hour) * 1/60 * AML (min) * Annualisation factor

0 1a 2a 2b 2c 3a 3b

Do min
 To Newtown as soon as possible (given constraints), no Kilbirnie branch
 To Newtown as soon as possible (given constraints), no Kilbirnie branch
 Full route as soon as possible (given constraints)
 Full route, all delivered to coincide with Basin and Mt Vic tunnel improvements
 To Newtown as soon as possible (given constraints), no Kilbirnie branch
 Full route as soon as possible (given constraints)

VTT	\$ 17.10
Update factor	1.42
VTT2014	\$ 24.28 <-named VTT_2014

NPV (all years)	15,523,258	43,725,848	98,368,055	69,140,098	51,776,325	109,333,103
NPV to remove (i.e. staging)	3,385,692	9,558,213	21,487,950	54,055,712	11,316,367	23,879,384
Net NPV	12,137,566	34,167,635	76,880,105	15,084,385	40,459,958	85,453,718

Table A18.1: Equivalent time to a minute late ratios

Segment	Departure	In vehicle travel	Combined
All	5.0	2.8	3.9
Train	3.9	2.4	3.1
Bus	6.4	3.2	4.8
Work	5.5	2.8	4.1
Education	3.0	3.8	3.4
Other	5.4	2.0	3.7

Note: The combined value assumes a 50:50 split between departure and in vehicle time delay en route

Calculate the user reliability benefits using the formula below:

Reliability benefit = EL * (VTT(\$/h)/60) * AML * NPT

Where:

- EL = equivalent time to a minute late ratio from table A18.1
- VTT = vehicle travel time (\$/h) from table A4.2 in Appendix A4
- AML = reduction in average minutes late (minutes)
- NPT = number of passengers affected

EL 4.8

Reduction in average minutes late (AML):
 Option 0 0

1a	0.5
2a	1.395147
2b	1.287414
2c	1.287414
3a	1.642
3b	1.426331
3c	1.426331

Table A4.1(b) Base values for vehicle and freight time in \$/h (July 2002) by purpose for calculating travel time benefits

Trip Purpose	Base value of time (\$/h)	Maximum increments for congestion (CRV \$/h)
Work Travel Purpose	23.85	3.15
Commuting to/from work	7.80	3.15
Other non-work travel purpose	6.90	2.75

Table A4.2 Base values for vehicle and freight time in \$/h (July 2002) for vehicles used for work purposes

Vehicle type	Vehicle and freight time (\$/h)
Passenger car	0.50
Light commercial vehicle	1.70
Medium commercial vehicle	6.10
Heavy commercial vehicle I	17.10
Heavy commercial vehicle II	28.10
Bus	17.10

4a	1.801
4b	1.801
5a	2.4
5b	2.4
5c	2.4
6a	2.709597
6b	2.709597
7a	3.5
7b	3.5
7c	3.5

Ref: Average lateness data from Andy (See below)

Table A18.1: Equivalent time to a minute late ratios

Segment	Departure	In vehicle travel	Combined
All	5.0	2.8	3.9
Train	3.9	2.4	3.1
Bus	6.4	3.2	4.8
Work	5.5	2.8	4.1
Education	3.0	3.8	3.4
Other	5.4	2.0	3.7

Note: The combined value assumes a 50:50 split between departure and in vehicle time delay en route

Calculate the user reliability benefits using the formula below:

Reliability benefit = EL * (VTT(\$/h)/60) * AML * NPT

Where:

- EL = equivalent time to a minute late ratio from table A18.1
- VTT = vehicle travel time (\$/h) from table A4.2 in Appendix A4
- AML = reduction in average minutes late (minutes)
- NPT = number of passengers affected

Table 4 Core bus travel time variability and reliability – AM peak

Route start and end points	Route numbers	Average lateness at bus stops along route (minutes)	Standard deviation of lateness at bus stops along route (minutes)
Island Bay – Wellington Station	1	3.8 (2)	3.7
Karori – Courtenay Place	3	3.4 (1.6)	3.8
Seatoun – Wellington Station	11	3.6 (3.1)	5.0
Upper Hutt – Queensgate	110	5.1 (3.1)	4.2
Stokes Valley – Petone Station	120	3.1 (1.3)	2.4
Naenae – Petone Station	130	2.2 (1.6)	3.0
Average across all routes		3.5	3.7

Analysis of Financial year (ie July to June)

Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
Year 0	1,199,638	1,194,735	1,189,831	1,184,928	1,180,025	1,175,122	1,170,219	1,165,316	1,160,413	1,155,509	1,150,606	1,145,703	1,140,800	1,135,897	1,130,994	1,126,091	1,121,187	1,116,284	1,111,381	1,106,478	1,101,575	1,096,672	1,091,769	1,086,866	1,081,963	1,077,060	1,072,157	1,067,254	1,062,351	1,057,448	1,052,545	1,047,642	1,042,739	1,037,836	1,032,933	1,028,030	1,023,127	1,018,224	1,013,321	1,008,418	1,003,515	998,612	993,709	988,806	983,903	979,000	974,097	969,194	964,291	959,388	954,485	949,582	944,679	939,776	934,873	929,970	925,067	920,164	915,261	910,358	905,455	900,552	895,649	890,746	885,843	880,940	876,037	871,134	866,231	861,328	856,425	851,522	846,619	841,716	836,813	831,910	827,007	822,104	817,201	812,298	807,395	802,492	797,589	792,686	787,783	782,880	777,977	773,074	768,171	763,268	758,365	753,462	748,559	743,656	738,753	733,850	728,947	724,044	719,141	714,238	709,335	704,432	699,529	694,626	689,723	684,820	679,917	675,014	670,111	665,208	660,305	655,402	650,499	645,596	640,693	635,790	630,887	625,984	621,081	616,178	611,275	606,372	601,469	596,566	591,663	586,760	581,857	576,954	572,051	567,148	562,245	557,342	552,439	547,536	542,633	537,730	532,827	527,924	523,021	518,118	513,215	508,312	503,409	498,506	493,603	488,700	483,797	478,894	473,991	469,088	464,185	459,282	454,379	449,476	444,573	439,670	434,767	429,864	424,961	420,058	415,155	410,252	405,349	400,446	395,543	390,640	385,737	380,834	375,931	371,028	366,125	361,222	356,319	351,416	346,513	341,610	336,707	331,804	326,901	322,000	317,097	312,194	307,291	302,388	297,485	292,582	287,679	282,776	277,873	272,970	268,067	263,164	258,261	253,358	248,455	243,552	238,649	233,746	228,843	223,940	219,037	214,134	209,231	204,328	199,425	194,522	189,619	184,716	179,813	174,910	170,007	165,104	160,201	155,298	150,395	145,492	140,589	135,686	130,783	125,880	120,977	116,074	111,171	106,268	101,365	96,462	91,559	86,656	81,753	76,850	71,947	67,044	62,141	57,238	52,335	47,432	42,529	37,626	32,723	27,820	22,917	18,014	13,111	8,208	3,305	-1,600	-6,700	-11,800	-16,900	-22,000	-27,100	-32,200	-37,300	-42,400	-47,500	-52,600	-57,700	-62,800	-67,900	-73,000	-78,100	-83,200	-88,300	-93,400	-98,500	-103,600	-108,700	-113,800	-118,900	-124,000	-129,100	-134,200	-139,300	-144,400	-149,500	-154,600	-159,700	-164,800	-169,900	-175,000	-180,100	-185,200	-190,300	-195,400	-200,500	-205,600	-210,700	-215,800	-220,900	-226,000	-231,100	-236,200	-241,300	-246,400	-251,500	-256,600	-261,700	-266,800	-271,900	-277,000	-282,100	-287,200	-292,300	-297,400	-302,500	-307,600	-312,700	-317,800	-322,900	-328,000	-333,100	-338,200	-343,300	-348,400	-353,500	-358,600	-363,700	-368,800	-373,900	-379,000	-384,100	-389,200	-394,300	-399,400	-404,500	-409,600	-414,700	-419,800	-424,900	-430,000	-435,100	-440,200	-445,300	-450,400	-455,500	-460,600	-465,700	-470,800	-475,900	-481,000	-486,100	-491,200	-496,300	-501,400	-506,500	-511,600	-516,700	-521,800	-526,900	-532,000	-537,100	-542,200	-547,300	-552,400	-557,500	-562,600	-567,700	-572,800	-577,900	-583,000	-588,100	-593,200	-598,300	-603,400	-608,500	-613,600	-618,700	-623,800	-628,900	-634,000	-639,100	-644,200	-649,300	-654,400	-659,500	-664,600	-669,700	-674,800	-679,900	-685,000	-690,100	-695,200	-700,300	-705,400	-710,500	-715,600	-720,700	-725,800	-730,900	-736,000	-741,100	-746,200	-751,300	-756,400	-761,500	-766,600	-771,700	-776,800	-781,900	-787,000	-792,100	-797,200	-802,300	-807,400	-812,500	-817,600	-822,700	-827,800	-832,900	-838,000	-843,100	-848,200	-853,300	-858,400	-863,500	-868,600	-873,700	-878,800	-883,900	-889,000	-894,100	-899,200	-904,300	-909,400	-914,500	-919,600	-924,700	-929,800	-934,900	-940,000	-945,100	-950,200	-955,300	-960,400	-965,500	-970,600	-975,700	-980,800	-985,900	-991,000	-996,100	-1001,200	-1006,300	-1011,400	-1016,500	-1021,600	-1026,700	-1031,800	-1036,900	-1042,000	-1047,100	-1052,200	-1057,300	-1062,400	-1067,500	-1072,600	-1077,700	-1082,800	-1087,900	-1093,000	-1098,100	-1103,200	-1108,300	-1113,400	-1118,500	-1123,600	-1128,700	-1133,800	-1138,900	-1144,000	-1149,100	-1154,200	-1159,300	-1164,400	-1169,500	-1174,600	-1179,700	-1184,800	-1189,900	-1195,000	-1200,100	-1205,200	-1210,300	-1215,400	-1220,500	-1225,600	-1230,700	-1235,800	-1240,900	-1246,000	-1251,100	-1256,200	-1261,300	-1266,400	-1271,500	-1276,600	-1281,700	-1286,800	-1291,900	-1297,000	-1302,100	-1307,200	-1312,300	-1317,400	-1322,500	-1327,600	-1332,700	-1337,800	-1342,900	-1348,000	-1353,100	-1358,200	-1363,300	-1368,400	-1373,500	-1378,600	-1383,700	-1388,800	-1393,900	-1399,000	-1404,100	-1409,200	-1414,300	-1419,400	-1424,500	-1429,600	-1434,700	-1439,800	-1444,900	-1450,000	-1455,100	-1460,200	-1465,300	-1470,400	-1475,500	-1480,600	-1485,700	-1490,800	-1495,900	-1501,000	-1506,100	-1511,200	-1516,300	-1521,400	-1526,500	-1531,600	-1536,700	-1541,800	-1546,900	-1552,000	-1557,100	-1562,200	-1567,300	-1572,400	-1577,500	-1582,600	-1587,700	-1592,800	-1597,900	-1603,000	-1608,100	-1613,200	-1618,300	-1623,400	-1628,500	-1633,600	-1638,700	-1643,800	-1648,900	-1654,000	-1659,100	-1664,200	-1669,300	-1674,400	-1679,500	-16

4 BENEFITS SECTION TAB 3: RELIABILITY

Existing users												New users (ROH)									
3c	4a	4b	5a	5b	5c	6a	6b	7a	7b	7c	0	1a	2a	2b	2c	3a	3b	3c	4a	4b	
Full route, all delivered to coincide with Basin and Mt Vic tunnel improvements	Full route as soon as possible (given constraints)	Full route, all delivered to coincide with Basin and Mt Vic tunnel improvements	To Newtown as soon as possible (given constraints), no Kilbirnie branch	Full route as soon as possible (given constraints)	Full route, all delivered to coincide with Basin and Mt Vic tunnel improvements	Full route as soon as possible (given constraints)	Full route, all delivered to coincide with Basin and Mt Vic tunnel improvements	To Newtown as soon as possible (given constraints), no Kilbirnie branch	Full route as soon as possible (given constraints)	Full route, all delivered to coincide with Basin and Mt Vic tunnel improvements	Do min	To Newtown as soon as possible (given constraints), no Kilbirnie branch	To Newtown as soon as possible (given constraint s), no Kilbirnie branch	Full route, all delivered to coincide with Basin and Mt Vic tunnel improvements	To Newtown as soon as possible (given constraints), no Kilbirnie branch	Full route, all delivered to coincide with Basin and Mt Vic tunnel improvements	Full route, all delivered to coincide with Basin and Mt Vic tunnel improvements	Full route, all delivered to coincide with Basin and Mt Vic tunnel improvements	Full route as soon as possible (given constraints)	Full route, all delivered to coincide with Basin and Mt Vic tunnel improvements	
76,790,971	137,701,284	96,701,945	77,000,806	188,105,605	132,168,874	208,337,904	146,316,523	116,419,015	280,613,758	185,621,307		183,924	718,902	1,467,286	989,106	996,341	1,801,019	1,214,078	2,515,956	1,688,183	
60,073,442	30,095,704	75,696,861	16,822,227	41,039,147	103,263,100	45,527,403	114,512,643	25,353,090	61,110,513	-		35,002	153,235	304,547	-	212,372	373,816	-	533,519	-	
16,717,530	107,605,580	21,005,084	60,178,579	147,066,459	28,905,774	162,810,501	31,803,880	91,065,925	219,503,244	185,621,307		148,922	565,667	1,162,739	989,106	783,970	1,427,203	1,214,078	1,982,437	1,688,183	
8,462,503	10,666,229	10,666,229	5,961,861	14,542,626	14,542,626	16,135,288	16,135,288	8,982,777	21,651,881	-	2015	12,238	54,251	107,556	-	75,188	132,020	-	188,851	-	
8,426,441	10,619,996	10,619,996	5,936,133	14,481,737	14,481,737	16,065,447	16,065,447	8,946,556	21,564,575	-	2016	12,358	54,075	107,482	-	74,944	131,929	-	188,275	-	
8,390,380	10,573,762	10,573,762	5,910,406	14,420,849	14,420,849	15,995,606	15,995,606	8,910,335	21,477,269	-	2017	12,478	53,899	107,408	-	74,700	131,837	-	187,698	-	
8,354,318	10,527,528	10,527,528	5,884,678	14,359,960	14,359,960	15,925,765	15,925,765	8,874,114	21,389,963	-	2018	12,598	53,723	107,333	-	74,456	131,746	-	187,122	-	
8,318,256	10,481,294	10,481,294	5,858,950	14,299,071	14,299,071	15,855,924	15,855,924	8,837,893	21,302,657	-	2019	12,718	53,547	107,259	-	74,212	131,655	-	186,546	-	
8,282,194	10,435,060	10,435,060	5,833,222	14,238,182	14,238,182	15,786,083	15,786,083	8,801,672	21,215,351	-	2020	12,838	53,371	107,185	-	73,968	131,564	-	185,969	-	
8,246,132	10,388,827	10,388,827	5,807,495	14,177,293	14,177,293	15,716,241	15,716,241	8,765,451	21,128,045	-	2021	12,957	53,195	107,110	-	73,724	131,473	-	185,393	-	
8,210,070	10,342,593	10,342,593	5,781,767	14,116,405	14,116,405	15,646,400	15,646,400	8,729,230	21,040,739	-	2022	13,077	53,019	107,036	-	73,480	131,381	-	184,817	-	
8,174,008	10,296,359	10,296,359	5,756,039	14,055,516	14,055,516	15,576,559	15,576,559	8,693,010	20,953,433	-	2023	13,197	52,843	106,962	-	73,236	131,290	-	184,240	-	
8,137,946	10,250,125	10,250,125	5,730,311	13,994,627	13,994,627	15,506,718	15,506,718	8,656,789	20,866,128	-	2024	13,317	52,667	106,887	-	72,992	131,199	-	183,664	-	
8,101,884	10,203,891	10,203,891	5,704,584	13,933,738	13,933,738	15,436,877	15,436,877	8,620,568	20,778,822	20,778,822	2025	13,437	52,491	106,813	106,813	72,748	131,108	131,108	183,088	183,088	
8,065,822	10,157,658	10,157,658	5,678,856	13,872,849	13,872,849	15,367,036	15,367,036	8,584,347	20,691,516	20,691,516	2026	13,557	52,315	106,739	106,739	72,505	131,016	131,016	182,511	182,511	
8,029,760	10,111,424	10,111,424	5,653,128	13,811,961	13,811,961	15,297,195	15,297,195	8,548,126	20,604,210	20,604,210	2027	13,677	52,139	106,664	106,664	72,261	130,925	130,925	181,935	181,935	
7,993,698	10,065,190	10,065,190	5,627,400	13,751,072	13,751,072	15,227,353	15,227,353	8,511,905	20,516,904	20,516,904	2028	13,797	51,963	106,590	106,590	72,017	130,834	130,834	181,359	181,359	
7,957,636	10,018,956	10,018,956	5,601,673	13,690,183	13,690,183	15,157,512	15,157,512	8,475,684	20,429,598	20,429,598	2029	13,917	51,787	106,516	106,516	71,773	130,743	130,743	180,782	180,782	
7,921,574	9,972,722	9,972,722	5,575,945	13,629,294	13,629,294	15,087,671	15,087,671	8,439,463	20,342,292	20,342,292	2030	14,037	51,611	106,441	106,441	71,529	130,652	130,652	180,206	180,206	
7,885,512	9,926,489	9,926,489	5,550,217	13,568,406	13,568,406	15,017,830	15,017,830	8,403,243	20,254,986	20,254,986	2031	14,156	51,435	106,367	106,367	71,285	130,560	130,560	179,630	179,630	
7,914,200	9,962,948	9,962,948	5,570,890	13,618,718	13,618,718	15,073,283	15,073,283	8,434,634	20,330,651	20,330,651	2032	14,189	51,800	107,091	107,091	71,790	131,449	131,449	181,047	181,047	
7,942,887	9,999,408	9,999,408	5,591,562	13,669,031	13,669,031	15,128,736	15,128,736	8,466,025	20,406,316	20,406,316	2033	14,222	52,164	107,816	107,816	72,296	132,338	132,338	182,465	182,465	
7,971,575	10,035,867	10,035,867	5,612,235	13,719,344	13,719,344	15,184,190	15,184,190	8,497,417	20,481,981	20,481,981	2034	14,254	52,529	108,540	108,540	72,801	133,227	133,227	183,883	183,883	
8,000,262	10,072,327	10,072,327	5,632,907	13,769,657	13,769,657	15,239,643	15,239,643	8,528,808	20,557,646	20,557,646	2035	14,287	52,894	109,264	109,264	73,306	134,116	134,116	185,301	185,301	
8,028,950	10,108,786	10,108,786	5,653,580	13,819,969	13,819,969	15,295,096	15,295,096	8,560,200	20,633,312	20,633,312	2036	14,320	53,258	109,988	109,988	73,812	135,005	135,005	186,719	186,719	
8,057,637	10,145,245	10,145,245	5,674,252	13,870,282	13,870,282	15,350,549	15,350,549	8,591,591	20,708,977	20,708,977	2037	14,352	53,623	110,712	110,712	74,317	135,894	135,894	188,137	188,137	
8,086,325	10,181,705	10,181,705	5,694,925	13,920,595	13,920,595	15,406,002	15,406,002	8,622,983	20,784,642	20,784,642	2038	14,385	53,987	111,437	111,437	74,822	136,783	136,783	189,555	189,555	
8,115,012	10,218,164	10,218,164	5,715,597	13,970,908	13,970,908	15,461,456	15,461,456	8,654,374	20,860,307	20,860,307	2039	14,418	54,352	112,161	112,161	75,328	137,672	137,672	190,973	190,973	
8,143,700	10,254,624	10,254,624	5,736,270	14,021,220	14,021,220	15,516,909	15,516,909	8,685,765	20,935,972	20,935,972	2040	14,450	54,717	112,885	112,885	75,833	138,561	138,561	192,391	192,391	
8,172,387	10,291,083	10,291,083	5,756,943	14,071,533	14,071,533	15,572,362	15,572,362	8,717,157	21,011,637	21,011,637	2041	14,483	55,081	113,609	113,609	76,338	139,450	139,450	193,808	193,808	
8,201,075	10,327,543	10,327,543	5,777,615	14,121,846	14,121,846	15,627,815	15,627,815	8,748,548	21,087,303	21,087,303	2042	14,516	55,446	114,333	114,333	76,843	140,338	140,338	195,226	195,226	
8,229,762	10,364,002	10,364,002	5,798,288	14,172,159	14,172,159	15,683,268	15,683,268	8,779,940	21,162,968	21,162,968	2043	14,548	55,810	115,058	115,058	77,349	141,227	141,227	196,644	196,644	
8,258,450	10,400,462	10,400,462	5,818,960	14,222,472	14,222,472	15,738,721	15,738,721	8,811,331	21,238,633	21,238,633	2044	14,581	56,175	115,782	115,782	77,854	142,116	142,116	198,062	198,062	
8,287,137	10,436,921	10,436,921	5,839,633	14,272,784	14,272,784	15,794,175	15,794,175	8,842,723	21,314,298	21,314,298	2045	14,614	56,540	116,506	116,506	78,359	143,005	143,005	199,480	199,480	
8,315,824	10,473,381	10,473,381	5,860,305	14,323,097	14,323,097	15,849,628	15,849,628	8,874,114	21,389,963	21,389,963	2046	14,646	56,904	117,230	117,230	78,865	143,894	143,894	200,898	200,898	
8,344,512	10,509,840	10,509,840	5,880,978	14,373,410	14,373,410	15,905,081	15,905,081	8,905,505	21,465,629	21,465,629	2047	14,679	57,269	117,954	117,954	79,370	144,783	144,783	202,316	202,316	
8,373,199	10,546,300	10,546,300	5,901,650	14,423,723	14,423,723	15,960,534	15,960,534	8,936,897	21,541,294	21,541,294	2048	14,712	57,633	118,679	118,679	79,875	145,672	145,672	203,734	203,734	
8,401,887	10,582,759	10,582,759	5,922,323	14,474,035	14,474,035	16,015,987	16,015,987	8,968,288	21,616,959	21,616,959	2049	14,744	57,998	119,403	119,403	80,381	146,561	146,561	205,151	205,151	
8,430,574	10,619,218	10,619,218	5,942,995	14,524,348	14,524,348	16,071,441	16,071,441	8,999,680	21,692,624	21,692,624	2050	14,777	58,363	120,127	120,127	80,886	147,450	147,450	206,569	206,569	
8,459,262	10,655,678	10,655,678	5,963,668	14,574,661	14,574,661	16,126,894	16,126,894	9,031,071	21												

4 BENEFITS SECTION TAB 3: RELIABILITY

5a	5b	5c	6a	6b	7a	7b	7c
To Newtown as soon as possible (given constraints), no Kilbirnie branch	Full route as soon as possible (given constraints)	Full route, all delivered to coincide with Basin and Mt Vic tunnel improvements	Full route as soon as possible (given constraints)	Full route, all delivered to coincide with Basin and Mt Vic tunnel improvements	To Newtown as soon as possible (given constraints), no Kilbirnie branch	Full route as soon as possible (given constraints)	Full route, all delivered to coincide with Basin and Mt Vic tunnel improvements
2,127,417	5,099,180	3,437,389	3,740,421	2,511,682	5,165,570	10,582,846	7,148,468
453,462	1,058,375	-	792,032	-	1,071,637	2,174,342	-
1,673,955	4,040,805	3,437,389	2,948,389	2,511,682	4,093,933	8,408,504	7,148,468
160,543	373,784	-	280,343	-	378,323	767,045	-
160,022	373,526	-	279,502	-	378,213	767,413	-
159,501	373,268	-	278,662	-	378,103	767,782	-
158,980	373,010	-	277,821	-	377,992	768,150	-
158,459	372,751	-	276,981	-	377,882	768,518	-
157,939	372,493	-	276,140	-	377,772	768,887	-
157,418	372,235	-	275,300	-	377,662	769,255	-
156,897	371,977	-	274,459	-	377,552	769,624	-
156,376	371,718	-	273,619	-	377,442	769,992	-
155,855	371,460	-	272,779	-	377,331	770,361	-
155,335	371,202	371,202	271,938	271,938	377,221	770,729	770,729
154,814	370,943	370,943	271,098	271,098	377,111	771,098	771,098
154,293	370,685	370,685	270,257	270,257	377,001	771,466	771,466
153,772	370,427	370,427	269,417	269,417	376,891	771,834	771,834
153,251	370,169	370,169	268,576	268,576	376,781	772,203	772,203
152,730	369,910	369,910	267,736	267,736	376,671	772,571	772,571
152,210	369,652	369,652	266,895	266,895	376,560	772,940	772,940
153,289	372,169	372,169	269,062	269,062	378,756	777,756	777,756
154,368	374,686	374,686	271,228	271,228	380,951	782,573	782,573
155,447	377,202	377,202	273,395	273,395	383,147	787,389	787,389
156,526	379,719	379,719	275,561	275,561	385,342	792,206	792,206
157,605	382,236	382,236	277,728	277,728	387,538	797,022	797,022
158,684	384,753	384,753	279,894	279,894	389,733	801,839	801,839
159,763	387,270	387,270	282,061	282,061	391,929	806,655	806,655
160,842	389,786	389,786	284,227	284,227	394,124	811,472	811,472
161,920	392,303	392,303	286,394	286,394	396,320	816,288	816,288
162,999	394,820	394,820	288,560	288,560	398,515	821,105	821,105
164,078	397,337	397,337	290,727	290,727	400,711	825,921	825,921
165,157	399,854	399,854	292,893	292,893	402,906	830,738	830,738
166,236	402,370	402,370	295,060	295,060	405,102	835,555	835,555
167,315	404,887	404,887	297,226	297,226	407,297	840,371	840,371
168,394	407,404	407,404	299,393	299,393	409,493	845,188	845,188
169,473	409,921	409,921	301,560	301,560	411,688	850,004	850,004
170,552	412,438	412,438	303,726	303,726	413,884	854,821	854,821
171,631	414,954	414,954	305,893	305,893	416,079	859,637	859,637
172,710	417,471	417,471	308,059	308,059	418,275	864,454	864,454
173,789	419,988	419,988	310,226	310,226	420,470	869,270	869,270
174,868	422,505	422,505	312,392	312,392	422,666	874,087	874,087
175,947	425,022	425,022	314,559	314,559	424,861	878,903	878,903
177,026	427,538	427,538	316,725	316,725	427,057	883,720	883,720
178,105	430,055	430,055	318,892	318,892	429,252	888,536	888,536
179,184	432,572	432,572	321,058	321,058	431,448	893,353	893,353
180,263	435,089	435,089	323,225	323,225	433,643	898,169	898,169
181,342	437,606	437,606	325,391	325,391	435,839	902,986	902,986
182,421	440,122	440,122	327,558	327,558	438,034	907,802	907,802
183,500	442,639	442,639	329,724	329,724	440,230	912,619	912,619
184,579	445,156	445,156	331,891	331,891	442,425	917,435	917,435
185,658	447,673	447,673	334,057	334,057	444,621	922,252	922,252
186,737	450,190	450,190	336,224	336,224	446,816	927,068	927,068
187,816	452,706	452,706	338,390	338,390	449,012	931,885	931,885
188,895	455,223	455,223	340,557	340,557	451,207	936,701	936,701
189,974	457,740	457,740	342,723	342,723	453,403	941,518	941,518
191,053	460,257	460,257	344,890	344,890	455,598	946,334	946,334
192,132	462,774	462,774	347,056	347,056	457,794	951,151	951,151
193,211	465,290	465,290	349,223	349,223	459,989	955,967	955,967
194,290	467,807	467,807	351,390	351,390	462,185	960,784	960,784
195,369	470,324	470,324	353,556	353,556	464,380	965,601	965,601
196,448	472,841	472,841	355,723	355,723	466,576	970,417	970,417
197,527	475,357	475,357	357,889	357,889	468,771	975,234	975,234
198,606	477,874	477,874	360,056	360,056	470,967	980,050	980,050
199,685	480,391	480,391	362,222	362,222	473,162	984,867	984,867

4 BENEFITS SECTION TAB 4: WALKING

	5a	5b	5c	6a	6b	7a	7b	7c
Kilbirnie	To Newtown as soon as possible (given constraints), no Kilbirnie branch	Full route as soon as possible (given constraints)	Full route, all delivered to coincide with Basin and Mt Vic tunnel improvements	Newtown	Kilbirnie Newtown Kilbirnie	To Newtown as soon as possible (given constraints), no Kilbirnie branch	Full route as soon as possible (given constraints)	Full route, all delivered to coincide with Basin and Mt Vic tunnel improvements
	58,963	6,708,692	16,386,083	17,281,117	6,797,471	86,325	7,169,181	58,963
	-	-	-	-	-	17,787	-	-
	58,963	6,708,692	16,386,083	17,281,117	6,797,471	68,538	7,169,181	58,963
-	-	-	-	-	-	6,290	-	-
-	-	-	-	-	-	6,277	-	-
-	-	-	-	-	-	6,265	-	-
-	-	-	-	-	-	6,252	-	-
-	-	-	-	-	-	6,240	-	-
-	-	-	-	-	-	6,228	-	-
-	-	-	-	-	-	6,215	-	-
-	-	-	-	-	-	6,203	-	-
-	-	-	-	-	-	6,191	-	-
-	-	-	-	-	-	6,178	-	-
6,166	794,268	1,937,871	1,937,871	804,523	6,166	804,523	6,166	848,844
6,154	790,733	1,929,763	1,929,763	800,954	6,154	800,954	6,154	845,545
6,141	787,198	1,921,655	1,921,655	797,385	6,141	797,385	6,141	842,245
6,129	783,663	1,913,547	1,913,547	793,816	6,129	793,816	6,129	838,945
6,117	780,129	1,905,438	1,905,438	790,247	6,117	790,247	6,117	835,646
6,104	776,594	1,897,330	1,897,330	786,678	6,104	786,678	6,104	832,346
6,092	773,059	1,889,222	1,889,222	783,108	6,092	783,108	6,092	829,047
6,167	776,074	1,896,530	1,896,530	786,194	6,167	786,194	6,167	832,287
6,243	779,089	1,903,838	1,903,838	789,280	6,243	789,280	6,243	835,527
6,318	782,103	1,911,146	1,911,146	792,366	6,318	792,366	6,318	838,767
6,393	785,118	1,918,454	1,918,454	795,452	6,393	795,452	6,393	842,006
6,469	788,132	1,925,763	1,925,763	798,538	6,469	798,538	6,469	845,246
6,544	791,147	1,933,071	1,933,071	801,623	6,544	801,623	6,544	848,486
6,619	794,162	1,940,379	1,940,379	804,709	6,619	804,709	6,619	851,726
6,695	797,176	1,947,687	1,947,687	807,795	6,695	807,795	6,695	854,966
6,770	800,191	1,954,995	1,954,995	810,881	6,770	810,881	6,770	858,206
6,845	803,205	1,962,303	1,962,303	813,967	6,845	813,967	6,845	861,446
6,920	806,220	1,969,611	1,969,611	817,053	6,920	817,053	6,920	864,685
6,996	809,234	1,976,919	1,976,919	820,138	6,996	820,138	6,996	867,925
7,071	812,249	1,984,227	1,984,227	823,224	7,071	823,224	7,071	871,165
7,146	815,264	1,991,535	1,991,535	826,310	7,146	826,310	7,146	874,405
7,222	818,278	1,998,843	1,998,843	829,396	7,222	829,396	7,222	877,645
7,297	821,293	2,006,151	2,006,151	832,482	7,297	832,482	7,297	880,885
7,372	824,307	2,013,459	2,013,459	835,567	7,372	835,567	7,372	884,125
7,447	827,322	2,020,767	2,020,767	838,653	7,447	838,653	7,447	887,364
7,523	830,337	2,028,075	2,028,075	841,739	7,523	841,739	7,523	890,604
7,598	833,351	2,035,383	2,035,383	844,825	7,598	844,825	7,598	893,844
7,673	836,366	2,042,691	2,042,691	847,911	7,673	847,911	7,673	897,084
7,749	839,380	2,050,000	2,050,000	850,997	7,749	850,997	7,749	900,324
7,824	842,395	2,057,308	2,057,308	854,082	7,824	854,082	7,824	903,564
7,899	845,410	2,064,616	2,064,616	857,168	7,899	857,168	7,899	906,804
7,975	848,424	2,071,924	2,071,924	860,254	7,975	860,254	7,975	910,043
8,050	851,439	2,079,232	2,079,232	863,340	8,050	863,340	8,050	913,283
8,125	854,453	2,086,540	2,086,540	866,426	8,125	866,426	8,125	916,523
8,200	857,468	2,093,848	2,093,848	869,512	8,200	869,512	8,200	919,763
8,276	860,483	2,101,156	2,101,156	872,597	8,276	872,597	8,276	923,003
8,351	863,497	2,108,464	2,108,464	875,683	8,351	875,683	8,351	926,243
8,426	866,512	2,115,772	2,115,772	878,769	8,426	878,769	8,426	929,483
8,502	869,526	2,123,080	2,123,080	881,855	8,502	881,855	8,502	932,722
8,577	872,541	2,130,388	2,130,388	884,941	8,577	884,941	8,577	935,962
8,652	875,555	2,137,696	2,137,696	888,027	8,652	888,027	8,652	939,202
8,728	878,570	2,145,004	2,145,004	891,112	8,728	891,112	8,728	942,442
8,803	881,585	2,152,312	2,152,312	894,198	8,803	894,198	8,803	945,682
8,878	884,599	2,159,620	2,159,620	897,284	8,878	897,284	8,878	948,922
8,953	887,614	2,166,928	2,166,928	900,370	8,953	900,370	8,953	952,162
9,029	890,628	2,174,237	2,174,237	903,456	9,029	903,456	9,029	955,401
9,104	893,643	2,181,545	2,181,545	906,541	9,104	906,541	9,104	958,641
9,179	896,658	2,188,853	2,188,853	909,627	9,179	909,627	9,179	961,881
9,255	899,672	2,196,161	2,196,161	912,713	9,255	912,713	9,255	965,121
9,330	902,687	2,203,469	2,203,469	915,799	9,330	915,799	9,330	968,361
9,405	905,701	2,210,777	2,210,777	918,885	9,405	918,885	9,405	971,601

4 BENEFITS SECTION TAB 5: EMISSIONS

Emissions = change in VKT * mJ per 100km * kg CO2 produced per mJ * (1/100) conversion to per km * Cost of CO2 per tonne * (1/1000) conversion to kg price

Electricity emissions is approx 0.15kg Co2 / kWh (decreasing to 0.1), so will use 0.12. There are 3.6 MJ per kWh
 Electricity emissions is therefore (0.12/3.6) kg Co2 / MJ.

	Diesel	Electric
kg CO2 / MJ	0.07325	0.033333333
1200 MJ/100km	12 MJ/km	24.3 MJ/km
	6.75kWh/km	3.6MJ/kWh
CO2	named cells ->	Value \$40 /tonne
PM10	named cells ->	\$ 399,000 /tonne
NOx	named cells ->	10% of PM10
NOx	named cells ->	\$ 10,400 /tonne
CO		5 g/km
HC		1.53 g/km
Nox		6.67 g/km
PM10		0.07 g/km
Population growth rate for Wlg, increasing PM10 cost		1.00% pa
		Stats NZ, med projection

Bus type	MJ/100km	kg CO2 / MJ
<i>Current fleet</i>		
Current trolley	715 (Varies with electricity generation mix)	
Euro I	1440	0.07325
Euro II	1380	0.07325
Euro III	1320	0.07325
Euro IV	1260	0.07325
Euro V	1200	0.07325
<i>New purchases</i>		
Euro V	1200	0.07325
Euro VI	1140	0.07325
Dual mode (trolley/diesel)	842.5 (Varies with electricity generation mix)	
Hydrogen fuel cell	1200 (Varies with electricity generation mix)	
New trolley	650 (Varies with electricity generation mix)	
Hybrid	840	0.07325
Opportunity electric	540 (Varies with electricity generation mix)	

Type of bus	MJ/100km	kg CO2 / MJ
Euro V	1200	0.07325

<- assumed type of bus

CO2 emissions (g) per km	221.7
convert to kg	0.2217
convert to tonnes	0.0002217

Value	Source
\$40 /tonne	EEM
\$ 399,000 /tonne	See source to the right
10% of PM10	PN note: unable to find appropriate source
\$ 10,400 /tonne	PwC (2014)
5 g/km	
1.53 g/km	
6.67 g/km	
0.07 g/km	
1.00% pa	Stats NZ, med projection

Value	Source
\$1,101,000,000	Health/social cost of PM10
\$399,000	Annual social cost
2,758 tonnes	Total annual anthr

Source: Nunns (2015), "Statement of evidence of Peter Nunns in the m...
 Based on: Data from the Auckland emissions inventory (Xie et al, 2014)

Analysis ye	Financial year (ie July to June)
Year 0	2015
Year 1	2016
Year 2	2017
Year 3	2018
Year 4	2019
Year 5	2020
Year 6	2021
Year 7	2022
Year 8	2023
Year 9	2024
Year 10	2025
Year 11	2026
Year 12	2027
Year 13	2028
Year 14	2029
Year 15	2030
Year 16	2031
Year 17	2032
Year 18	2033
Year 19	2034
Year 20	2035
Year 21	2036
Year 22	2037
Year 23	2038
Year 24	2039
Year 25	2040
Year 26	2041
Year 27	2042
Year 28	2043
Year 29	2044
Year 30	2045
Year 31	2046
Year 32	2047
Year 33	2048
Year 34	2049
Year 35	2050
Year 36	2051
Year 37	2052
Year 38	2053
Year 39	2054
Year 40	2055
Year 41	2056
Year 42	2057
Year 43	2058
Year 44	2059
Year 45	2060
Year 46	2061
Year 47	2062
Year 48	2063
Year 49	2064
Year 50	2065
Year 51	2066
Year 52	2067
Year 53	2068
Year 54	2069
Year 55	2070
Year 56	2071
Year 57	2072
Year 58	2073
Year 59	2074
Year 60	2075

	0	1a	2a	2b	2c	3a	3b	3c
Do min		To Newtown as soon as possible (given constraints), no Kilbirnie branch	To Newtown as soon as possible (given constraints), no Kilbirnie branch	Full route as soon as possible (given constraint s)	Full route, all delivered to coincide with Basin and Mt Vic tunnel improvements	To Newtown as soon as possible (given constraint s), no Kilbirnie branch	Full route as soon as possible (given constraint s)	Full route, all delivered to coincide with Basin and Mt Vic tunnel improvements
NPV (all years)		33,631	33,631	67,261	47,416	33,631	67,261	47,416
NPV to remove (i.e. staging)		7,116	7,116	14,232	36,213	7,116	14,232	36,213
Net NPV		26,515	26,515	53,030	11,203	26,515	53,030	11,203
Staging/operational by:								
Year 0	2015	2,511	2,511	5,023	5,023	2,511	5,023	5,023
Year 1	2016	2,511	2,511	5,023	5,023	2,511	5,023	5,023
Year 2	2017	2,511	2,511	5,023	5,023	2,511	5,023	5,023
Year 3	2018	2,511	2,511	5,023	5,023	2,511	5,023	5,023
Year 4	2019	2,511	2,511	5,023	5,023	2,511	5,023	5,023
Year 5	2020	2,511	2,511	5,023	5,023	2,511	5,023	5,023
Year 6	2021	2,511	2,511	5,023	5,023	2,511	5,023	5,023
Year 7	2022	2,511	2,511	5,023	5,023	2,511	5,023	5,023
Year 8	2023	2,511	2,511	5,023	5,023	2,511	5,023	5,023
Year 9	2024	2,511	2,511	5,023	5,023	2,511	5,023	5,023
Year 10	2025	2,511	2,511	5,023	5,023	2,511	5,023	5,023
Year 11	2026	2,511	2,511	5,023	5,023	2,511	5,023	5,023
Year 12	2027	2,511	2,511	5,023	5,023	2,511	5,023	5,023
Year 13	2028	2,511	2,511	5,023	5,023	2,511	5,023	5,023
Year 14	2029	2,511	2,511	5,023	5,023	2,511	5,023	5,023
Year 15	2030	2,511	2,511	5,023	5,023	2,511	5,023	5,023
Year 16	2031	2,511	2,511	5,023	5,023	2,511	5,023	5,023
Year 17	2032	2,511	2,511	5,023	5,023	2,511	5,023	5,023
Year 18	2033	2,511	2,511	5,023	5,023	2,511	5,023	5,023
Year 19	2034	2,511	2,511	5,023	5,023	2,511	5,023	5,023
Year 20	2035	2,511	2,511	5,023	5,023	2,511	5,023	5,023
Year 21	2036	2,511	2,511	5,023	5,023	2,511	5,023	5,023
Year 22	2037	2,511	2,511	5,023	5,023	2,511	5,023	5,023
Year 23	2038	2,511	2,511	5,023	5,023	2,511	5,023	5,023
Year 24	2039	2,511	2,511	5,023	5,023	2,511	5,023	5,023
Year 25	2040	2,511	2,511	5,023	5,023	2,511	5,023	5,023
Year 26	2041	2,511	2,511	5,023	5,023	2,511	5,023	5,023
Year 27	2042	2,511	2,511	5,023	5,023	2,511	5,023	5,023
Year 28	2043	2,511	2,511	5,023	5,023	2,511	5,023	5,023
Year 29	2044	2,511	2,511	5,023	5,023	2,511	5,023	5,023
Year 30	2045	2,511	2,511	5,023	5,023	2,511	5,023	5,023
Year 31	2046	2,511	2,511	5,023	5,023	2,511	5,023	5,023
Year 32	2047	2,511	2,511	5,023	5,023	2,511	5,023	5,023
Year 33	2048	2,511	2,511	5,023	5,023	2,511	5,023	5,023
Year 34	2049	2,511	2,511	5,023	5,023	2,511	5,023	5,023
Year 35	2050	2,511	2,511	5,023	5,023	2,511	5,023	5,023
Year 36	2051	2,511	2,511	5,023	5,023	2,511	5,023	5,023
Year 37	2052	2,511	2,511	5,023	5,023	2,511	5,023	5,023
Year 38	2053	2,511	2,511	5,023	5,023	2,511	5,023	5,023
Year 39	2054	2,511	2,511	5,023	5,023	2,511	5,023	5,023
Year 40	2055	2,511	2,511	5,023	5,023	2,511	5,023	5,023
Year 41	2056	2,511	2,511	5,023	5,023	2,511	5,023	5,023
Year 42	2057	2,511	2,511	5,023	5,023	2,511	5,023	5,023
Year 43	2058	2,511	2,511	5,023	5,023	2,511	5,023	5,023
Year 44	2059	2,511	2,511	5,023	5,023	2,511	5,023	5,023
Year 45	2060	2,511	2,511	5,023	5,023	2,511	5,023	5,023
Year 46	2061	2,511	2,511	5,023	5,023	2,511	5,023	5,023
Year 47	2062	2,511	2,511	5,023	5,023	2,511	5,023	5,023
Year 48	2063	2,511	2,511	5,023	5,023	2,511	5,023	5,023
Year 49	2064	2,511	2,511	5,023	5,023	2,511	5,023	5,023
Year 50	2065	2,511	2,511	5,023	5,023	2,511	5,023	5,023
Year 51	2066	2,511	2,511	5,023	5,023	2,511	5,023	5,023
Year 52	2067	2,511	2,511	5,023	5,023	2,511	5,023	5,023
Year 53	2068	2,511	2,511	5,023	5,023	2,511	5,023	5,023
Year 54	2069	2,511	2,511	5,023	5,023	2,511	5,023	5,023
Year 55	2070	2,511	2,511	5,023	5,023	2,511	5,023	5,023
Year 56	2071	2,511	2,511	5,023	5,023	2,511	5,023	5,023
Year 57	2072	2,511	2,511	5,023	5,023	2,511	5,023	5,023
Year 58	2073	2,511	2,511	5,023	5,023	2,511	5,023	5,023
Year 59	2074	2,511	2,511	5,023	5,023	2,511	5,023	5,023
Year 60	2075	2,511	2,511	5,023	5,023	2,511	5,023	5,023

4 BENEFITS SECTION TAB 6: AGGLOMERATION

Agglomeration benefits as % of travel time savings

15%

AECOM report used 25% of all other benefits. Can do this as a sensitivity test.

25%

4 BENEFITS SECTION TAB 7: CAR TRAVEL TIMES AND DECONGESTION

Reduced traffic congestion (Appendix A4) Road users value improvements in traffic congestion over and above the benefits gained from travel time saving. The benefits from reduced traffic congestion apply to both work and non-work travel time, and are calculated using the procedures in Appendix A4.

The change in congestion calculated using the procedures in Appendix A4, may also help demonstrate how a particular activity contributes to the wider objectives considered under the NZ Transport Agency funding allocation process.

Table 9.2 Highway and PT Travel Times to Wellington CBD, AM peak, 2031

Origin Suburb	Highway Travel Time (in minutes)		PT Travel Time (in minutes)		Difference between Highway and PT travel Time (in minutes)	
	2011	Change: 2011 to 2031	2011	Change: 2011 to 2031	2011	Change: 2011 to 2031
Miramar	27.2	-0.6	32.6	0.9	5.4	1.5
Seatoun	28.1	-0.6	32.2	0.9	4.1	1.5
Airport	26.4	-0.8	38.3	2.6	11.9	3.4
Island Bay	24.1	-0.2	35.9	-0.5	11.7	-0.2
Newtown	20.8	0.8	27.6	-2.3	6.9	-3.1
Hataitai	19.6	0.3	30.2	-1.0	10.5	-1.3
Kilbirnie	24.3	-1.7	30.4	-0.0	6.2	1.7
Karori	22.8	1.4	31.4	-1.2	8.6	-2.6
Brooklyn	18.7	2.0	22.3	1.2	3.6	-0.8

9.3.1 Car travel times
Table 9.3 shows the changes in car travel times between options in the AM peak:

Table 9.3 Change in Car Travel Time (in minutes) to Wellington CBD for Selected Journeys, AM peak, 2031

Origin Suburb	Reference	BP: Change from Ref	BRT: Change from Ref	LRT: Change from Ref
Miramar	26.6	-0.3	-0.9	0.2
Seatoun	27.4	-0.3	-0.9	0.2
Airport	25.7	-0.3	-0.9	0.2
Island Bay	23.9	0.0	0.5	0.6
Newtown	21.6	1.0	0.8	1.1
Hataitai	20.0	-0.3	0.5	0.6
Kilbirnie	22.6	0.2	-0.1	0.1
Karori	24.2	1.3	1.0	1.2
Brooklyn	20.8	0.0	0.8	1.1

9.5.2 Car Demand
[Read with Appendix 9.1, Section 9.1.3, for inter-peak results](#)
[Read with Appendix 9.2, Figure 9.2.3 and Figure 9.2.4, for GIS plots showing absolute change in car demand](#)

Table 9.11 below shows the change in car trips for each of the options for the AM peak, relative to the reference case.

Table 9.11 Change in Car Demand, AM peak, 2031

Origin Suburb	Car Demand		Change in Car Demand of Reference, AM peak				
	Ref	BP	% Diff	BRT	% Diff	LRT	% Diff
Miramar	7,502	-55	-1%	-121	-2%	39	1%
Kilbirnie	4,647	-43	-1%	-77	-2%	-88	-2%
Mt Vic/Hataitai	3,355	-20	-1%	37	1%	33	1%
Island Bay	4,333	-22	-1%	-92	-2%	52	1%
Newtown	4,548	-30	-1%	-76	-2%	-30	-1%
CBD	26,859	-90	0%	-25	0%	-8	0%
Rest of Wellington	34,171	-75	0%	-59	0%	-14	0%
Rest of Region	116,266	-31	0%	-51	0%	-14	0%
Total	201,681	-365	0%	-465	0%	-30	0%

The reduction in car trips roughly mirrors the corresponding increase in PT trips reported in section 9.6.1, with the greatest absolute decreases in car trips occurring in the sectors where the increase in PT trips is greatest:

<http://www.gw.govt.nz/assets/Transport/Regional-transport/PT-Spine-Study/PTSS-Final-Reports-2013/FINAL-GWRC-Modelling>

Table A2.4 Vehicle occupancy and travel purpose

Road category	Occupancy	Car			Occupancy	LCV			Occupancy	MCV and HCV		
		Travel purpose %				Travel purpose %				Travel purpose %		
		Work	Commute	Other		Work	Commute	Other		Work	Commute	Other
Urban arterial												
AM Peak	1.4	10	50	40	1.4	65	20	15	1.2	90	5	5
Daytime inter-peak	1.3	30	10	60	1.4	65	5	30	1.2	90	0	10
PM peak	1.4	10	30	60	1.4	65	15	20	1.2	90	5	5
Evening/night-time	1.4	10	5	85	1.4	65	15	20	1.2	90	5	5
Weekday all periods	1.4	20	20	60	1.4	65	10	25	1.2	90	5	5
Weekend	1.7	5	5	90	1.7	10	10	80	1.6	75	5	20
All periods	1.5	15	15	70	1.5	50	10	40	1.3	85	5	10
Urban other												
Weekday	1.4	20	20	60	1.8	65	10	25	1.2	90	5	5
Weekend	1.7	5	5	90	2.0	10	10	80	1.6	75	5	20
All periods	1.5	15	15	70	1.7	45	10	45	1.3	85	5	10
Rural strategic and rural other roads												
Weekday	1.6	40	10	50	1.6	75	5	20	1.3	90	5	5
Weekend	2.2	5	5	90	2.0	10	10	80	1.6	75	5	20
All periods	1.7	30	10	60	1.7	55	5	40	1.4	85	5	10

Analysis year	Financial year (ie July to June)	BP				BRT				BP						
		car travel time savings (AM peak, min)				car travel time savings (AM peak, min)				Car trips to CBD by origin suburb (AM peak)						
		Miramar	Kilbirnie	Mt Vic/Hat Island Bay	Newtown	Miramar	Kilbirnie	Mt Vic/Hat Island Bay	Newtown	Miramar	Kilbirnie	Mt Vic/Hat Island Bay	Newtown			
Year 0	2015	0.204	-0.136	0.204	0	-0.68	0.612	0.068	-0.34	-0.34	-0.544	1598	1138	1462	1408	2698
Year 1	2016	0.21	-0.14	0.21	0	-0.7	0.63	0.07	-0.35	-0.35	-0.56	1605	1143	1469	1414	2710
Year 2	2017	0.216	-0.144	0.216	0	-0.72	0.648	0.072	-0.36	-0.36	-0.576	1612	1148	1476	1420	2722
Year 3	2018	0.222	-0.148	0.222	0	-0.74	0.666	0.074	-0.37	-0.37	-0.592	1620	1153	1482	1427	2734
Year 4	2019	0.228	-0.152	0.228	0	-0.76	0.684	0.076	-0.38	-0.38	-0.608	1627	1158	1489	1433	2746
Year 5	2020	0.234	-0.156	0.234	0	-0.78	0.702	0.078	-0.39	-0.39	-0.624	1634	1163	1495	1439	2758
Year 6	2021	0.24	-0.16	0.24	0	-0.8	0.72	0.08	-0.4	-0.4	-0.64	1641	1168	1502	1446	2770
Year 7	2022	0.246	-0.164	0.246	0	-0.82	0.738	0.082	-0.41	-0.41	-0.656	1648	1173	1508	1452	2782
Year 8	2023	0.252	-0.168	0.252	0	-0.84	0.756	0.084	-0.42	-0.42	-0.672	1655	1179	1515	1458	2795
Year 9	2024	0.258	-0.172	0.258	0	-0.86	0.774	0.086	-0.43	-0.43	-0.688	1663	1184	1521	1465	2807
Year 10	2025	0.264	-0.176	0.264	0	-0.88	0.792	0.088	-0.44	-0.44	-0.704	1670	1189	1528	1471	2819
Year 11	2026	0.27	-0.18	0.27	0	-0.9	0.81	0.09	-0.45	-0.45	-0.72	1677	1194	1535	1477	2831
Year 12	2027	0.276	-0.184	0.276	0	-0.92	0.828	0.092	-0.46	-0.46	-0.736	1684	1199	1541	1484	2843
Year 13	2028	0.282	-0.188	0.282	0	-0.94	0.846	0.094	-0.47	-0.47	-0.752	1691	1204	1548	1490	2855
Year 14	2029	0.288	-0.192	0.288	0	-0.96	0.864	0.096	-0.48	-0.48	-0.768	1698	1209	1554	1496	2867
Year 15	2030	0.294	-0.196	0.294	0	-0.98	0.882	0.098	-0.49	-0.49	-0.784	1706	1214	1561	1503	2879
Year 16	2031	0.3	-0.2	0.3	0	-1	0.9	0.1	-0.5	-0.5	-0.8	1713	1219	1567	1509	2892
Year 17	2032	0.306	-0.204	0.306	0	-1.02	0.918	0.102	-0.51	-0.51	-0.816	1719	1224	1573	1514	2904
Year 18	2033	0.312	-0.208	0.312	0	-1.04	0.936	0.104	-0.52	-0.52	-0.832	1725	1228	1578	1519	2916
Year 19	2034	0.318	-0.212	0.318	0	-1.06	0.954	0.106	-0.53	-0.53	-0.848	1731	1232	1584	1525	2928
Year 20	2035	0.324	-0.216	0.324	0	-1.08	0.972	0.108	-0.54	-0.54	-0.864	1737	1236	1589	1530	2940
Year 21	2036	0.33	-0.22	0.33	0	-1.1	0.99	0.11	-0.55	-0.55	-0.88	1743	1241	1595	1535	2952
Year 22	2037	0.336	-0.224	0.336	0	-1.12	1.008	0.112	-0.56	-0.56	-0.896	1749	1245	1600	1541	2964
Year 23	2038	0.342	-0.228	0.342	0	-1.14	1.026	0.114	-0.57	-0.57	-0.912	1755	1249	1606	1546	2976
Year 24	2039	0.348	-0.232	0.348	0	-1.16	1.044	0.116	-0.58	-0.58	-0.928	1761	1254	1611	1551	2988
Year 25	2040	0.354	-0.236	0.354	0	-1.18	1.062	0.118	-0.59	-0.59	-0.944	1767	1258	1617	1556	2999
Year 26	2041	0.36	-0.24	0.36	0	-1.2	1.08	0.12	-0.6	-0.6	-0.96	1773	1262	1622	1562	3011
Year 27	2042	0.366	-0.244	0.366	0	-1.22	1.098	0.122	-0.61	-0.61	-0.972	1779	1266	1628	1567	3023
Year 28	2043	0.372	-0.248	0.372	0	-1.24	1.116	0.124	-0.62	-0.62	-0.984	1785	1271	1633	1572	3035
Year 29	2044	0.378	-0.252	0.378	0	-1.26	1.134	0.126	-0.63	-0.63	-0.996	1791	1275	1639	1577	3047
Year 30	2045	0.384	-0.256	0.384	0	-1.28	1.152	0.128	-0.64	-0.64	-1.008	1797	1279	1644	1583	3059
Year 31	2046	0.39	-0.26	0.39	0	-1.3	1.17	0.13	-0.65	-0.65	-1.02	1803	1283	1650	1588	3071
Year 32	2047	0.396	-0.264	0.396	0	-1.32	1.188	0.132	-0.66	-0.66	-1.032	1809	1287	1656	1593	3083
Year 33	2048	0.402	-0.268	0.402	0	-1.34	1.206	0.134	-0.67	-0.67	-1.044	1815	1291	1661	1599	3095
Year 34	2049	0.408	-0.272	0.408	0	-1.36	1.224	0.136	-0.68	-0.68	-1.056	1821	1295	1666	1604	3107
Year 35	2050	0.414	-0.276	0.414	0	-1.38	1.242	0.138	-0.69	-0.69	-1.068	1827	1299	1672	1609	3119
Year 36	2051	0.42	-0.28	0.42	0	-1.4	1.26	0.14	-0.7	-0.7	-1.08	1833	1303	1677	1614	3131
Year 37	2052	0.426	-0.284	0.426	0	-1.42	1.278	0.142	-0.71	-0.71	-1.092	1839	1307	1683	1620	3143
Year 38	2053	0.432	-0.288	0.432	0	-1.44	1.296	0.144	-0.72	-0.72	-1.104	1845	1311	1688	1625	3155
Year 39	2054	0.438	-0.292	0.438	0	-1.46	1.314	0.146	-0.73	-0.73	-1.116	1851				

**4 BENEFITS SECTION TAB 7:
CAR TRAVEL TIMES AND
DECONGESTION**

Annualised car travel time savings

BRT					BP					BRT					Annualised car travel time savings																																									
Car trips to CBD by origin suburb (AM peak)					Aggregate time travel time change to CBD by origin suburb (AM peak,min)					Aggregate time travel time change to CBD by origin suburb (AM peak,min)					0			1a			2a			2b			2c			3a			3b			3c			4a			4b			5a			5b			5c					
Miramar	Kilbirnie	Mt Vic/Hat	Island Bay	Newtown	Miramar	Kilbirnie	Mt Vic/Hat	Island Bay	Newtown	Miramar	Kilbirnie	Mt Vic/Hat	Island Bay	Newtown	Miramar	Kilbirnie	Mt Vic/Hat	Island Bay	Newtown	Do min	To Newtown as soon as possible	To Newtown as soon as possible	Full route as soon as possible	Full route, all delivered to coincide	To Newtown as soon as possible	Full route as soon as possible	Full route, all delivered to coincide	To Newtown as soon as possible	Full route as soon as possible	Full route, all delivered to coincide	Full route as soon as possible	Full route, all delivered to coincide	To Newtown as soon as possible	Full route as soon as possible	Full route, all delivered to coincide	To Newtown as soon as possible	Full route as soon as possible	Full route, all delivered to coincide	To Newtown as soon as possible	Full route as soon as possible	Full route, all delivered to coincide															
																				Scale factor (relative to option 7)	1			47%			43%			43%			55%			48%			48%			60.04%			60.04%			80%			0.8			0.8		
																				NPV	4,920,065			5,034,456			4,404,401			3,640,191			5,054,732			4,348,759			3,594,280			4,198,570			3,470,356			5,116,846			3,958,764			3,272,489		
																				Staging	-			-			-			-			-			-			-			-			-			-			-			-		
																				Net NPV	- 4,920,065			- 5,034,456			- 4,404,401			- 2,674,341			- 5,054,732			- 4,348,759			- 2,640,666			- 4,198,570			- 2,549,768			- 5,116,846			- 3,958,764			- 2,404,631		
																				Analysis year	Financial year (ie July to June)																																			
																				Year 0	2015																																			
																				Year 1	2016																																			
																				Year 2	2017																																			
																				Year 3	2018																																			
																				Year 4	2019																																			
																				Year 5	2020																																			
																				Year 6	2021																																			
																				Year 7	2022																																			
																				Year 8	2023																																			
																				Year 9	2024																																			
																				Year 10	2025																																			
																				Year 11	2026																																			
																				Year 12	2027																																			
																				Year 13	2028																																			
																				Year 14	2029																																			
																				Year 15	2030																																			
																				Year 16	2031																																			
																				Year 17	2032																																			
																				Year 18	2033																																			
																				Year 19	2034																																			
																				Year 20	2035																																			
																				Year 21	2036																																			
																				Year 22	2037																																			
																				Year 23	2038																																			
																				Year 24	2039																																			
																				Year 25	2040																																			
																				Year 26	2041																																			
																				Year 27	2042																																			
																				Year 28	2043																																			
																				Year 29	2044																																			
																				Year 30	2045																																			
																				Year 31	2046																																			
																				Year 32	2047																																			
																				Year 33	2048																																			
																				Year 34	2049																																			
																				Year 35	2050																																			
																				Year 36	2051																																			
																				Year 37	2052																																			
																				Year 38	2053																																			
																				Year 39	2054																																			
																				Year 40	2055																																			
																				Year 41	2056																																			
																				Year 42	2057																																			
																				Year 43	2058																																			
																				Year 44	2059																																			
																				Year 45	2060																																			
																				Year 46	2061																																			
																				Year 47	2062																																			
																				Year 48	2063																																			
																				Year 49	2064																																			
																				Year 50	2065																																			
																				Year 51	2066																																			
																				Year 52	2067																																			
																				Year 53	2068																																			
																				Year 54	2069																																			
																				Year 55	2070																																			
																				Year 56	2071																																			
																				Year 57	2072																																			
																				Year 58	2073																																			
																				Year 59	2074																																			
																				Year 60	2075																																			



6a	6b	7a	7b	7c
Full route as soon as possible	Full route, all delivered to coincide	to Newtown as soon as	Full route as soon as possible (given constraints)	Full route, all delivered to coincide with

90%	90%	1	1	1
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3,834,757	3,170,169	5,166,042	3,718,439	2,925,195
- 3,834,757	- 2,329,589	- 5,166,042	- 3,718,439	- 2,925,195

-	-	-	-	0
-	-	-	-	0
-	-	-	-	0
-	-	-	-	0
-	-	-	-	0
- 224,555	- 224,555	- 302,486	- 217,725	0
- 231,468	- 231,468	- 311,796	- 224,426	0
- 238,432	- 238,432	- 321,176	- 231,177	0
- 245,449	- 245,449	- 330,624	- 237,978	0
- 252,516	- 252,516	- 340,142	- 244,829	0
- 259,635	- 259,635	- 349,728	- 251,729	0
- 266,806	- 266,806	- 359,384	- 258,679	-258679.44
- 274,028	- 274,028	- 369,110	- 265,680	-265679.5288
- 281,302	- 281,302	- 378,904	- 272,729	-272729.4404
- 288,627	- 288,627	- 388,768	- 279,829	-279829.1746
- 296,003	- 296,003	- 398,701	- 286,979	-286978.7315
- 303,431	- 303,431	- 408,703	- 294,178	-294178.1112
- 310,910	- 310,910	- 418,774	- 301,427	-301427.3135
- 318,304	- 318,304	- 428,745	- 308,604	-308604.4018
- 325,744	- 325,744	- 438,779	- 315,827	-315826.5309
- 333,229	- 333,229	- 448,875	- 323,094	-323093.7009
- 340,761	- 340,761	- 459,034	- 330,406	-330405.9118
- 348,339	- 348,339	- 469,256	- 337,763	-337763.1635
- 355,963	- 355,963	- 479,540	- 345,165	-345165.4561
- 363,633	- 363,633	- 489,886	- 352,613	-352612.7896
- 371,349	- 371,349	- 500,296	- 360,105	-360105.1639
- 379,112	- 379,112	- 510,767	- 367,643	-367642.579
- 386,920	- 386,920	- 521,302	- 375,225	-375225.0351
- 388,303	- 388,303	- 523,179	- 376,576	-376576.261
- 389,685	- 389,685	- 525,056	- 377,927	-377927.4869
- 391,068	- 391,068	- 526,933	- 379,279	-379278.7128
- 392,451	- 392,451	- 528,811	- 380,630	-380629.9386
- 393,834	- 393,834	- 530,688	- 381,981	-381981.1645
- 395,216	- 395,216	- 532,565	- 383,332	-383332.3904
- 396,599	- 396,599	- 534,442	- 384,684	-384683.6163
- 397,982	- 397,982	- 536,320	- 386,035	-386034.8422
- 399,365	- 399,365	- 538,197	- 387,386	-387386.0681
- 400,747	- 400,747	- 540,074	- 388,737	-388737.294
- 402,130	- 402,130	- 541,952	- 390,089	-390088.5199
- 403,513	- 403,513	- 543,829	- 391,440	-391439.7457
- 404,895	- 404,895	- 545,706	- 392,791	-392790.9716
- 406,278	- 406,278	- 547,583	- 394,142	-394142.1975
- 407,661	- 407,661	- 549,461	- 395,493	-395493.4234
- 409,044	- 409,044	- 551,338	- 396,845	-396844.6493
- 410,426	- 410,426	- 553,215	- 398,196	-398195.8752
- 411,809	- 411,809	- 555,092	- 399,547	-399547.1011
- 413,192	- 413,192	- 556,970	- 400,898	-400898.327
- 414,575	- 414,575	- 558,847	- 402,250	-402249.5529
- 415,957	- 415,957	- 560,724	- 403,601	-403600.7787
- 417,340	- 417,340	- 562,601	- 404,952	-404952.0046
- 418,723	- 418,723	- 564,479	- 406,303	-406303.2305
- 420,106	- 420,106	- 566,356	- 407,654	-407654.4564
- 421,488	- 421,488	- 568,233	- 409,006	-409005.6823
- 422,871	- 422,871	- 570,110	- 410,357	-410356.9082
- 424,254	- 424,254	- 571,988	- 411,708	-411708.1341
- 425,637	- 425,637	- 573,865	- 413,059	-413059.36
- 427,019	- 427,019	- 575,742	- 414,411	-414410.5858
- 428,402	- 428,402	- 577,620	- 415,762	-415761.8117
- 429,785	- 429,785	- 579,497	- 417,113	-417113.0376
- 431,167	- 431,167	- 581,374	- 418,464	-418464.2635
- 432,550	- 432,550	- 583,251	- 419,815	-419815.4894
- 433,933	- 433,933	- 585,129	- 421,167	-421166.7153

4 BENEFITS SECTION TAB 8: VEHICLE OPERATING COSTS

Table 8 Comparison of travel time savings against Reference Case: Kibbirie to Rail Station (2011 morning peak)

From Kibbirie To	Reference Case	Bus Priority	Bus Rapid Transit	Light Rail Transit
Elizabeth Street	13.9	-1.1	-7.6	-7.9
Courtenay Place	14.7	-1.1	-8.1	-8.4
Wills Street	19.3	-1.5	-9.5	-9.8
Rail Station	24.5	-2.7	-11.2	-11.5
Courtenay Pl	14.7	13.6	6.6	
Wills St	19.3	17.8	9.8	
Rail Station	24.5	21.8	13.3	
		1.42		

Whole line

BP (min)	BP (hours)	BRT (min)	BRT (hours)	
21.8	0.363333	13.3	0.221667	
Newtown to Rail Station	15.3	0.255	11.9	0.198333

Distance along routes

	BP (min)	BRT (min)
Kibbirie to Rail Station	5.2	5.3 <- updated using data from GWR
Newtown to Rail Station	4.9	4.9

Implied speed (kph)

	BP	BRT
Kibbirie	14	23
Newtown	19	25

Sense check speed

	BP	BRT
Implied speed (kph) - sense check		
Kibbirie	14	23
Newtown	19	25

Assumed gradient

	BP	BRT
Assumed gradient	0%	0%

Table 8.2.3 Update factors for benefits

Benefit update factors	Value	Factor to update
Vehicle operating cost savings benefit update factor (2008 to 2014)	1.07	

Page 5-236 A5.7 Vehicle operating cost tables

Table A5.1: Passenger car VOC by speed and gradient (cents/km - July 2008)

Speed(km/h)	Gradient in percent (both directions)												
	0	1	2	3	4	5	6	7	8	9	10	11	12
10	43.9	44.0	44.1	44.2	44.3	44.4	44.5	44.7	45.0	45.2	45.6	46.1	
15	38.2	38.3	38.5	38.6	38.7	38.9	39.1	39.3	39.6	39.9	40.4	40.9	41.5
20	34.0	34.2	34.3	34.5	34.6	34.9	35.1	35.4	35.7	36.1	36.6	37.2	37.9
25	31.0	31.1	31.3	31.5	31.7	31.9	32.2	32.5	32.9	33.3	33.9	34.5	35.3
30	28.8	28.9	29.1	29.2	29.5	29.7	30.0	30.3	30.8	31.3	31.9	32.6	33.4
35	27.1	27.3	27.4	27.6	27.8	28.1	28.4	28.8	29.2	29.7	30.4	31.1	31.9
40	26.0	26.1	26.3	26.4	26.7	26.9	27.2	27.6	28.1	28.6	29.3	30.1	30.9
45	25.1	25.3	25.4	25.6	25.8	26.1	26.4	26.8	27.3	27.9	28.5	29.3	30.2
50	24.6	24.7	24.9	25.1	25.3	25.5	25.9	26.3	26.8	27.4	28.0	28.8	29.8
55	24.3	24.4	24.5	24.7	24.9	25.2	25.5	26.0	26.5	27.0	27.7	28.6	29.5
60	24.1	24.3	24.4	24.6	24.8	25.1	25.4	25.8	26.3	26.9	27.6	28.4	29.4
65	24.2	24.3	24.4	24.6	24.8	25.0	25.4	25.8	26.3	26.9	27.6	28.5	29.4
70	24.3	24.4	24.5	24.7	24.9	25.2	25.5	25.9	26.4	27.0	27.8	28.6	29.6
75	24.5	24.6	24.7	24.9	25.1	25.4	25.7	26.1	26.6	27.3	28.0	28.9	29.8
80	24.9	24.9	25.1	25.2	25.4	25.7	26.0	26.4	26.9	27.6	28.3	29.2	30.2
85	25.3	25.3	25.4	25.6	25.8	26.0	26.4	26.8	27.3	28.0	28.7	29.6	30.6
90	25.7	25.8	25.9	26.0	26.2	26.5	26.8	27.2	27.8	28.4	29.1	30.0	31.0
95	26.3	26.3	26.4	26.5	26.7	27.0	27.3	27.7	28.3	28.9	29.6	30.5	31.6
100	26.8	26.9	27.0	27.1	27.3	27.5	27.9	28.3	28.8	29.4	30.2	31.1	32.1
105	27.5	27.5	27.6	27.7	27.8	28.1	28.4	28.9	29.4	30.0	30.8	31.7	32.7
110	28.1	28.1	28.2	28.3	28.5	28.7	29.1	29.5	30.0	30.6	31.4	32.3	33.3
115	28.8	28.8	28.9	29.0	29.1	29.4	29.7	30.1	30.7	31.3	32.1	33.0	34.0
120	29.5	29.5	29.6	29.7	29.8	30.1	30.4	30.8	31.3	32.0	32.7	33.6	34.7

ANALYSIS SECTION TAB 8. VEHICLE OPERATING COSTS

Table 5.7 Comparison and Ranking of PT and Highway Travel Times to Wellington CBD, AM peak, 2011

Journey	Distance	PT Speed	Speed - Rank	Car Speed	Diff car PT	Rank	Comb Rank
PVL - CBD	10	26	2	23	-1	1	3
Newlands - CBD	9	27	1	28	+1	2	3
Khandallah - CBD	6	14	8	24	+10	7	15
Wadsworth - CBD	4	16	6	19	+3	3	9
Karori - CBD	6	17	4	26	+9	5	9
Newtown - CBD	3.5	12	9	21	+9	5	14
Island Bay - CBD	7	17	4	38	+21	11	15
Lyall Bay - CBD	7	12	9	20	+8	4	13
Airport - CBD	7	22	3	35	+13	9	12
Miramar - CBD	6	11	10	32	+21	11	21
Kilbirnie - CBD	4.5	15	7	32	+17	10	17
Brooklyn - CBD	3	11	10	23	+12	8	18

9.3.1 Car travel times

Table 9.3 shows the changes in car travel times between options in the AM peak

Table 9.3 Change in Car Travel Time (in minutes) to Wellington CBD for Selected Journeys, AM peak, 2011

Origin suburb	Reference	BP Change from Ref	BRT Change from Ref	LRT Change from Ref
Miramar	26.6	-0.1	-0.9	0.2
Newtown	27.4	-0.3	-0.9	0.2
Airport	25.7	-0.3	-0.9	0.2
Island Bay	23.9	0.0	0.5	0.6
Newtown	21.6	1.0	0.8	1.1
Hataiwi	20.0	-0.3	0.5	0.6
Kilbirnie	22.6	0.2	-0.1	0.1
Karori	24.2	1.3	1.0	1.2
Brooklyn	20.8	0.0	0.8	1.1

Implied travel speeds (kph) - Bus

	BP	BRT
Kilbirnie - North	19	21
Kilbirnie - all	17	21
Newtown - North	14	22
Newtown - All	22	21
Kilbirnie - North	21	23
Kilbirnie - all	23	23
Newtown - North	17	25
Newtown - All	25	25

Staging/operational by Financial year (ie July to June)

Year	Kilbirnie - North	Kilbirnie - all	Newtown - North	Newtown - All	Kilbirnie - North	Kilbirnie - all	Newtown - North	Newtown - All
2015	19	17	14	22	21	23	17	25
2016	18	16	14	22	21	23	17	25
2017	18	16	14	22	21	23	17	25
2018	18	16	14	22	21	23	17	25
2019	18	16	14	22	21	23	17	25
2020	18	16	14	21	21	23	17	25
2021	17	15	13	21	21	23	17	25
2022	17	15	13	21	21	23	17	25
2023	17	15	13	21	21	23	17	25
2024	17	15	13	21	21	23	17	25
2025	17	15	13	20	21	23	17	25
2026	17	15	13	20	21	23	17	25
2027	17	15	13	20	21	23	17	25
2028	16	15	13	20	21	23	17	25
2029	16	15	13	20	21	23	17	25
2030	16	14	13	19	21	23	17	25
2031	16	14	12	19	21	23	17	25
2032	16	14	12	19	21	23	17	25
2033	15	14	12	18	21	23	17	25
2034	15	13	12	18	21	23	17	25
2035	15	13	11	18	21	23	17	25
2036	14	13	11	17	21	23	17	25
2037	14	13	11	17	21	23	17	25
2038	14	12	11	17	21	23	17	25
2039	13	12	10	16	21	23	17	25
2040	13	12	10	16	21	23	17	25
2041	13	11	10	15	21	23	17	25
2042	13	11	10	15	21	23	17	25
2043	13	11	10	15	21	23	17	25
2044	13	11	10	15	21	23	17	25
2045	13	11	10	15	21	23	17	25
2046	13	11	10	15	21	23	17	25
2047	13	11	10	15	21	23	17	25
2048	13	11	10	15	21	23	17	25

Vehicle operating cost cents/km - Bus

	BP	BRT
Kilbirnie - North	92	94
Kilbirnie - all	94	96
Newtown - North	99	87
Newtown - All	87	89
Kilbirnie - North	89	86
Kilbirnie - all	86	84
Newtown - North	85	86
Newtown - All	85	85

Staging/operational by Financial year (ie July to June)

Year	Kilbirnie - North	Kilbirnie - all	Newtown - North	Newtown - All	Kilbirnie - North	Kilbirnie - all	Newtown - North	Newtown - All
2015	92	94	99	87	89	86	84	85
2016	93	96	99	87	89	86	84	85
2017	93	96	99	87	89	86	84	85
2018	93	96	99	87	89	86	84	85
2019	93	96	99	87	89	86	84	85
2020	93	96	99	89	89	86	84	85
2021	94	96	99	89	89	86	84	85
2022	94	96	99	89	89	86	84	85
2023	94	97	100	89	89	86	84	85
2024	94	97	100	89	89	86	84	85
2025	94	97	100	90	89	86	84	85
2026	94	97	100	90	89	86	84	85
2027	94	97	100	90	89	86	84	85
2028	96	97	100	90	89	86	84	85
2029	96	97	100	90	89	86	84	85
2030	96	99	100	92	89	86	84	85
2031	96	99	101	92	89	86	84	85
2032	96	99	101	92	89	86	84	85
2033	97	99	101	93	89	86	84	85
2034	97	100	101	93	89	86	84	85
2035	97	100	103	93	89	86	84	85
2036	99	100	103	94</				

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5 COSTS SECTION TAB 1: COSTS

	Option 1	Option 2	Option 3	Option 4	Option 5	Option 6	Option 7
Infrastructure scale factor	(per BP)	Half way between 1 and 7	25% more than 1	N = 5, K = 3	Half way between 1 and 7	N = 7, K = 3	(per BRT)
Infrastructure scale factor	1	0.5	0.25	N/A	0.5	N/A	1
Signalling scale factor	(per BP)	Same as 1	Same as 1	N = 7, K = 1	Same as 7	N = 7, K = 1	(per BRT)
Signalling scale factor	1	1	1	1	1	1	1

	Weights to allocate general costs	
Central spine (km)	5.7	0.6
Newtown segment	1.3	0.136842105
Kilbirnie segment	2.5	0.263157895
	9.5	

Cost Item	Option 3 Targeted bus lanes & priority											Option 4 Full bus lanes & priority, targeted Kibimie branch								Option 5 Full bus lanes & priority																	
	3a			3b		3c		3c		3c		3c		4a		4a		4b		4b		4b		5a			5b		5b		5c		5c		5c		
	General Allowances	Central segment	Newtown segment	Central segment	Newtown segment	Central segment	Newtown segment	Kibimie segment	General Allowances	Central segment	Newtown segment	Kibimie segment	General Allowances	Central segment	Newtown segment	Kibimie segment	General Allowances	Central segment	Newtown segment	Kibimie segment	General Allowances	Central segment	Newtown segment	Kibimie segment	General Allowances	Central segment	Newtown segment	Kibimie segment	General Allowances	Central segment	Newtown segment	Kibimie segment	General Allowances				
Wellington (Central) PT Spine																																					
Site Preparation Works (Within Existing Carriageway)																																					
No allowance for new concrete slabs below existing road finishes, alteration to junctions and medians measured elsewhere																																					
Traffic Management, Road Alterations																																					
Allowance for re-configuring existing traffic junctions and changes to traffic and pedestrian control, to Major Road Junction (strengthening of pavements for advanced options)																																					
Allowance for re-configuring existing traffic junctions and changes to traffic and pedestrian control, to Minor Road Junction (strengthening of pavements for advanced options)																																					
Allowance for re-configuring existing traffic junctions and changes to traffic and pedestrian control, to Minor Road Junction No Traffic Management (strengthening of pavements for advanced options)																																					
Realignment of existing reserve between Molesworth St and Bowen St																																					
Alteration of Featherston pavement and road layout																																					
Allowance for alterations to street signage																																					
Allowance for alterations to road markings																																					
Allowance for alterations to street lighting, assumed as existing																																					
Allowance for 10% of road/pavement fencing, no allowance included																																					
Utility Diversions/new services																																					
Alter Existing Services including electricity, gas, water, sewer, surface water, fibre optics for realignment of existing reserve between Molesworth St and Bowen St																																					
Alter Existing Services including electricity, gas, water, sewer, surface water, fibre optics for realignment of existing reserve between Featherston St junction																																					
Allowance for alteration to Kent/Cambridge Terrace pumping stations																																					
Signalling/Controls																																					
Telecoms, detector loop and signalling, allowances to existing junctions only																																					
Installation of conduits and pits along proposed road for controls wiring																																					
Stations/Ticketing and Fare Collection Systems																																					
Allowance for Bus Stop Alterations																																					
Allowance for new Bus Stops																																					
Road/Pavements/Landscaping																																					
Allowance for general landscaping to median/reserves																																					
General Items																																					
Allowance for Temporary Traffic Management during construction works, including pedestrian and road protection at signals and minor allowances for road markings																																					
Allowance for General Preliminaries, contractors facilities, on site overheads, off site overheads																																					
Newtown (Southern) PT Spine																																					
Site Preparation Works (Within Existing Carriageway)																																					
No allowance for new concrete slabs below existing road finishes, alterations to junctions and medians measured elsewhere																																					
No allowance for Adelaide Road																																					
Traffic Management, Road Alterations																																					
Allowance for re-configuring existing traffic junctions and changes to traffic and pedestrian control, to Major Road Junction (strengthening of pavements for advanced options)																																					
Allowance for re-configuring existing traffic junctions and changes to traffic and pedestrian control, to Minor Road Junction (strengthening of pavements for advanced options)																																					
Allowance for re-configuring existing traffic junctions and changes to traffic and pedestrian control, to Minor Road Junction No Traffic Management (strengthening of pavements for advanced options)																																					
Allowance for alterations to street signage																																					
Allowance for alterations to road markings																																					
Allowance for alterations to street lighting																																					
Allowance for 10% of road/pavement fencing																																					
Utility Diversions/new services, Allowances included at junction alterations or road modifications, existing services to be retained unless specifically altered by road alterations																																					
Alter Existing Services for road widening to some areas, including electricity, gas, water, sewer, surface water, fibre optics																																					
Signalling/Controls																																					
Telecoms and signalling																																					
Installation of conduits and pits along proposed road for controls wiring																																					
Stations/Ticketing and Fare Collection Systems																																					
Allowance for Bus Stop Alterations																																					
Allowance for new Bus Stops																																					
Road/Pavements/Landscaping																																					
Allowance for general landscaping to median/reserves																																					
General Items																																					
Allowance for Temporary Traffic Management during construction works, including pedestrian and road protection																																					
Allowance for General Preliminaries, contractors facilities, on site overheads, off site overheads																																					
Constable Street (Southern) PT																																					
Site Preparation Works (Within Existing Carriageway)																																					
No allowance for new concrete slabs below existing road finishes, alterations to junctions and medians measured elsewhere																																					
Traffic Management, Road Alterations																																					
Allowance for widening re-configuring existing traffic junctions and changes to traffic and pedestrian control to Constable Street, to Minor Road Junction																																					
Widening existing road of Riddiford St - Constable to Rintoul St																																					
Widening existing Carriageway to Constable St																																					

5 COSTS SECTION TAB 2: COSTS 2

Cost Item	Option 6 Physically separated lanes & full priority, targeted Kibirnie branch								Option 7 Physically separated lanes & priority											
	6a		6a		6b		6b		7a		7a		7b		7c					
	Central segment	Newtown segment	Kibirnie segment	General Allowances	Central segment	Newtown segment	Kibirnie segment	General Allowances	Central segment	Newtown segment	Kibirnie segment	General Allowances	Central segment	Newtown segment	Kibirnie segment	General Allowances				
Allowance for alterations to street signage, road markings	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y				
Allowance for alterations to road markings																				
Allowance for alterations to street lighting																				
Allowance for 10% of road/pavement fencing																				
Utility Diversions/new services, Allowances included at junction alterations or road modifications, existing services to be retained unless specifically altered by road alterations																				
Alter Existing Services for road widening to Constable Street, including electricity, gas, water, sewer, surface water, fibre optics																				
Signalling/Controls																				
Telecoms, detector loop and signalling, allowances to existing junctions only																				
Stations/Ticketing and Fare Collection Systems																				
Allowance for Bus Stop Alterations																				
Road/Pavements/Landscaping																				
Allowance for general landscaping to median/reserves																				
General Items																				
Allowance for Temporary Traffic Management during construction works, including pedestrian and road protection																				
Allowance for General Preliminaries, contractors facilities, on site overheads, off site overheads																				
Kibirnie (Eastern) PT Spine																				
No allowance for new concrete slabs below existing road finishes, alterations to junctions and medians measured elsewhere																				
Site Preparation Works (Within Existing Carriageway)																				
No allowance for new concrete slabs below existing road finishes, alterations to junctions and medians measured elsewhere																				
Traffic Management, Road Alterations																				
Allowance for re-configuring existing traffic junctions and changes to traffic and pedestrian control, to Major Road Junction (including strengthening of pavements for advanced options)			375,000				375,000						750,000			750,000				
Allowance for re-configuring existing traffic junctions and changes to traffic and pedestrian control, to Minor Road Junction No Traffic Management (including strengthening of pavements for advanced options)			500,000				500,000						600,000			600,000				
Allowance for alterations to street signage, road markings to Kibirnie Crescent			56,375				56,375						514,754			514,754				
Widen existing road of Kibirnie Crescent			294,215				294,215						45,100			45,100				
Allowance for alterations to street signage to Kibirnie Crescent			-				-						56,375			56,375				
Allowance for alterations to road markings			265,313				265,313						509,400			509,400				
Allowance for alterations to street lighting			636,750				636,750						170,000			170,000				
Allowance for 10% of road/pavement fencing			212,500				212,500						-			-				
Utility Diversions/new services, Allowances included at junction alterations or road modifications, existing services to be retained unless specifically altered by road alterations			1,127,500				1,127,500						902,000			902,000				
Alter Existing Services for road widening to Kibirnie Crescent, including electricity, gas, water, sewer, surface water, fibre optics			-				-						2,494,000			2,494,000				
Alter Existing Services from soft landscape areas			-				-						392,805			392,805				
Allowance for new drainage to new road finish			-				-						-			-				
Signalling/Controls			4,036,500				4,036,500						4,036,500			4,036,500				
Telecoms and signalling			2,691,000				2,691,000						2,691,000			2,691,000				
Installation of conduits and pits along proposed road for controls wiring			-				-						-			-				
Stations/Ticketing and Fare Collection Systems			75,000				75,000						60,000			60,000				
Allowance for Bus Stop Alterations			125,000				125,000						100,000			100,000				
Allowance for new Bus Stops			-				-						-			-				
Road/Pavements/Landscaping			39,688				39,688						31,750			31,750				
Allowance for general landscaping to median/reserves			-				-						-			-				
General Items			1,615,750				1,615,750						1,292,600			1,292,600				
Allowance for Temporary Traffic Management during construction works, including pedestrian and road protection			3,845,090				3,845,090						5,592,632			5,592,632				
Allowance for General Preliminaries, contractors facilities, on site overheads, off site overheads			-				-						-			-				
General Allowances			-				-						-			-				
Power Upgrade			-				-						-			-				
Power Upgrade to existing substations, assume battery operated bus, no upgrade included			-				-						-			-				
Real Time Alteration/Extension			-				-						-			-				
Alteration to existing Real Time installations, not required as included within existing services			3,684,211				3,684,211						5,000,000			5,000,000				
Building Structures			-				-						-			-				
Bus Depots not required use of existing			-				-						-			-				
Control Centre not required use of existing			-				-						-			-				
Rolling Stock			-				-						-			-				
Higher Capacity Bus Stock, re-use of existing bus stock			-				-						-			-				
Design Fees			-				-						-			-				
Detail Design and Supervision			5,181,578.95				5,181,579						4,800,000			4,800,000				
Total	79,843,520	29,383,910	15,895,680	8,865,789	79,843,520	29,383,910	15,895,680	8,865,789	79,843,520	29,383,910	-	7,221,053	79,843,520	29,383,910	25,566,316	9,800,000	79,843,520	29,383,910	25,566,316	9,800,000
Contingency	15,968,704	5,876,782	3,179,136	1,773,158	15,968,704	5,876,782	3,179,136	1,773,158	15,968,704	5,876,782	-	1,444,211	15,968,704	5,876,782	5,113,263	1,960,000	15,968,704	5,876,782	5,113,263	1,960,000
Total	95,812,224	35,260,692	19,074,816	10,638,947	95,812,224	35,260,692	19,074,816	10,638,947	95,812,224	35,260,692	-	8,665,263	95,812,224	35,260,692	30,679,579	11,760,000	95,812,224	35,260,692	30,679,579	11,760,000

5 COSTS SECTION TAB 3: COST SUMMARY

	CAPEX	% change p.a.	% change p.a. - LT CPI@2%	Cumulative	
2013	996			1.0000	1.0000
2014	1000	0.4%	-1.60%	0.984	0.9840
2015	1021	2.1%	0.10%	1.001	0.9850
2016	1045	2.4%	0.35%	1.004	0.9885
2017	1072	2.6%	0.58%	1.006	0.9942
2018	1100	2.6%	0.61%	1.006	1.0003
2019	1130	2.7%	0.73%	1.007	1.0076
2020	1161	2.7%	0.74%	1.007	1.0151
2021	1196	3.0%	1.01%	1.010	1.0254
2022	1233	3.1%	1.09%	1.011	1.0366
2023	1273	3.2%	1.24%	1.012	1.0495
2024	1317	3.5%	1.46%	1.015	1.0648
2025	1366	3.7%	1.72%	1.017	1.0831

Source: BERL

Contingency cost factor (per Davis Langdon)

1.2

No price escalation

	1a	2a	2b	2c	3a	3b	3c	4a	4b	5a	5b	5c	6a	6b	7a	7b	7c
Central Segment	19,378,138	47,899,181	47,899,181	47,899,181	23,547,672	23,547,672	23,547,672	67,291,181	67,291,181	67,291,181	67,291,181	67,291,181	95,812,224	95,812,224	95,812,224	95,812,224	95,812,224
Newtown Segment	7,134,720	18,146,706	18,146,706	18,146,706	8,693,400	8,693,400	8,693,400	24,248,706	24,248,706	24,248,706	24,248,706	24,248,706	35,260,692	35,260,692	35,260,692	35,260,692	35,260,692
Kilbirnie segment	-	-	23,777,016	23,777,016	-	19,074,816	19,074,816	19,074,816	19,074,816	-	23,777,016	23,777,016	19,074,816	19,074,816	-	30,679,579	30,679,579
General allowances	4,421,053	4,332,632	5,880,000	5,880,000	5,526,316	7,500,000	7,500,000	10,727,368	10,727,368	10,332,632	11,880,000	11,880,000	10,638,947	10,638,947	8,665,263	11,760,000	11,760,000
(Apportion using the propoirtion of route costs)																	
General allowances - Central	3,231,329.02	3,142,201.77	3,135,583.18	3,135,583.18	4,036,214.17	3,441,576.21	3,441,576.21	6,525,871.03	6,525,871.03	7,595,541.16	6,932,368.18	6,932,368.18	6,788,921.75	6,788,921.75	6,334,169.99	6,965,900.30	6,965,900.30
General allowances - Newtown	1,189,723.61	1,190,429.81	1,187,922.34	1,187,922.34	1,490,101.62	1,270,571.40	1,270,571.40	2,351,629.56	2,351,629.56	2,737,090.42	2,498,112.79	2,498,112.79	2,498,450.32	2,498,450.32	2,331,093.16	2,563,581.74	2,563,581.74
General allowances - Kilbirnie	-	-	1,556,494.49	1,556,494.49	-	2,787,852.39	2,787,852.39	1,849,867.83	1,849,867.83	-	2,449,519.03	2,449,519.03	1,351,575.29	1,351,575.29	-	2,230,517.96	2,230,517.96
Total	30,933,910	70,378,519	95,702,903	95,702,903	37,767,388	58,815,888	58,815,888	121,342,072	121,342,072	101,872,519	127,196,903	127,196,903	160,786,680	160,786,680	139,738,180	173,512,495	173,512,495

Price escalation from FY13 to FY14 (to match benefits)

Central Segment	19,668,810	48,617,669	48,617,669	48,617,669	23,900,887	23,900,887	23,900,887	68,300,549	68,300,549	68,300,549	68,300,549	68,300,549	97,249,407	97,249,407	97,249,407	97,249,407	97,249,407
Newtown Segment	7,241,741	18,418,907	18,418,907	18,418,907	8,823,801	8,823,801	8,823,801	24,612,437	24,612,437	24,612,437	24,612,437	24,612,437	35,789,603	35,789,603	35,789,603	35,789,603	35,789,603
Kilbirnie segment	-	-	24,133,671	24,133,671	-	19,360,938	19,360,938	19,360,938	19,360,938	-	24,133,671	24,133,671	19,360,938	19,360,938	-	31,139,772	31,139,772
General allowances - Central	3,279,799	-	3,189,335	3,182,617	-	4,096,757	3,493,200	3,493,200	-	6,623,759	6,623,759	-	7,709,474	7,036,354	6,890,756	6,890,756	-
General allowances - Newtown	1,207,569	-	1,208,286	1,205,741	-	1,512,453	1,289,630	1,289,630	-	2,386,904	2,386,904	-	2,778,147	2,535,584	2,535,584	2,535,584	-
General allowances - Kilbirnie	-	-	-	1,579,842	-	-	2,829,670	2,829,670	-	1,877,616	1,877,616	-	-	2,486,262	2,486,262	-	1,371,849

Price escalation (to year of spend = year before benefits)

Central Segment	19,674,864.30	48,632,634.46	48,632,634.46	51,766,496.29	23,908,244.47	23,908,244.47	25,448,879.39	68,321,573.43	72,724,180.31	68,321,573.43	68,321,573.43	72,724,180.31	97,279,343.58	103,547,974.21	97,279,343.58	97,279,343.58	103,547,974.21
Newtown Segment	7,243,970.02	19,611,846.92	19,611,846.92	19,611,846.92	9,395,293.43	9,395,293.43	9,395,293.43	26,206,514.20	26,206,514.20	26,206,514.20	26,206,514.20	26,206,514.20	38,107,593.41	38,107,593.41	38,107,593.41	38,107,593.41	38,107,593.41
Kilbirnie segment	-	-	25,696,740.11	25,696,740.11	-	20,614,891.27	20,614,891.27	20,614,891.27	20,614,891.27	-	25,696,740.11	25,696,740.11	20,614,891.27	20,614,891.27	-	33,156,606.57	33,156,606.57
General allowances - Central	3,280,808.58	3,190,316.57	3,183,596.63	3,388,745.95	4,098,018.48	3,494,275.16	3,719,444.44	6,625,798.09	7,052,761.09	7,711,847.48	7,038,519.70	7,492,078.27	6,892,876.75	7,337,050.17	6,431,161.64	7,072,565.28	7,528,317.73
General allowances - Newtown	1,207,941.19	1,286,543.51	1,283,833.59	1,283,833.59	1,610,410.42	1,373,155.63	1,373,155.63	2,541,496.97	2,541,496.97	2,958,079.42	2,699,807.06	2,699,807.06	2,700,171.85	2,700,171.85	2,519,302.49	2,770,561.89	2,770,561.89
General allowances - Kilbirnie	-	-	1,682,163.76	1,682,163.76	-	3,012,939.85	3,012,939.85	1,999,223.68	1,999,223.68	-	2,647,289.90	2,647,289.90	1,460,699.67	1,460,699.67	-	2,410,606.98	2,410,606.98

Discount to today's value

Central Segment	\$16,519,395.46	\$40,832,897.67	\$40,832,897.67	\$30,640,509.62	\$20,073,823.08	\$20,073,823.08	\$15,063,152.61	\$57,364,110.49	\$43,045,330.59	\$57,364,110.49	\$57,364,110.49	\$43,045,330.59	\$81,677,612.71	\$61,289,886.84	\$81,677,612.71	\$81,677,612.71	\$61,289,886.84
Newtown Segment	\$4,287,694.72	\$11,608,222.06	\$11,608,222.06	\$11,608,222.06	\$5,561,059.75	\$5,561,059.75	\$5,561,059.75	\$15,511,595.49	\$15,511,595.49	\$15,511,595.49	\$15,511,595.49	\$15,511,595.49	\$22,555,825.99	\$22,555,825.99	\$22,555,825.99	\$22,555,825.99	\$22,555,825.99
Kilbirnie segment	\$0.00	\$0.00	\$15,209,860.99	\$15,209,860.99	\$0.00	\$12,201,922.47	\$12,201,922.47	\$12,201,922.47	\$12,201,922.47	\$0.00	\$15,209,860.99	\$15,209,860.99	\$12,201,922.47	\$12,201,922.47	\$0.00	\$19,625,344.49	\$19,625,344.49
General allowances - Central	\$2,754,630.14	\$2,678,651.31	\$2,673,009.12	\$2,005,793.52	\$3,440,775.34	\$2,933,860.80	\$2,201,533.45	\$5,563,147.84	\$4,174,518.45	\$6,475,015.85	\$5,909,676.86	\$4,434,549.62	\$5,787,392.24	\$4,342,788.72	\$5,399,727.32	\$5,938,262.19	\$4,455,999.70
General allowances - Newtown	\$714,978.53	\$761,503.13	\$759,899.13	\$759,899.13	\$953,199.46	\$812,768.71	\$812,768.71	\$1,504,308.15	\$1,504,308.15	\$1,750,882.66	\$1,598,011.65	\$1,598,011.65	\$1,598,227.57	\$1,598,227.57	\$1,491,171.27	\$1,639,891.33	\$1,639,891.33
General allowances - Kilbirnie	\$0.00	\$0.00	\$995,670.14	\$995,670.14	\$0.00	\$1,783,354.47	\$1,783,354.47	\$1,183,337.42	\$1,183,337.42	\$0.00	\$1,566,926.83	\$1,566,926.83	\$864,585.89	\$864,585.89	\$0.00	\$1,426,834.57	\$1,426,834.57

Total PV of capex

	\$24,276,698.86	\$55,881,274.17	\$72,079,559.11	\$61,219,955.46	\$30,028,857.63	\$43,366,789.28	\$37,623,791.45	\$93,328,421.86	\$77,621,012.57	\$81,101,604.50	\$97,160,182.31	\$81,366,275.16	\$124,685,566.86	\$102,853,237.47	\$111,124,337.29	\$132,863,771.26	\$110,993,782.90
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		Indicative operating costs																											
		0	1a	2a	2b	2c	3a	3b	3c	4a	4b	5a	5b	5c	6a	6b	7a	7b	7c										
Do min		To Newtown as soon as possible (given constraints), no Kilbirnie branch	To Newtown as soon as possible (given constraints), no Kilbirnie branch	Full route as soon as possible (given constraints)	Full route, all delivered to coincide with Basin and Mt Vic tunnel improvements	To Newtown as soon as possible (given constraints), no Kilbirnie branch	Full route as soon as possible (given constraints)	Full route, all delivered to coincide with Basin and Mt Vic tunnel improvements	Full route as soon as possible (given constraints)	Full route, all delivered to coincide with Basin and Mt Vic tunnel improvements	Full route as soon as possible (given constraints)	Full route, all delivered to coincide with Basin and Mt Vic tunnel improvements	To Newtown as soon as possible (given constraints), no Kilbirnie branch	Full route as soon as possible (given constraints)	Full route, all delivered to coincide with Basin and Mt Vic tunnel improvements	Full route as soon as possible (given constraints)	Full route, all delivered to coincide with Basin and Mt Vic tunnel improvements	To Newtown as soon as possible (given constraints), no Kilbirnie branch	Full route as soon as possible (given constraints)	Full route, all delivered to coincide with Basin and Mt Vic tunnel improvements									
				47%	43%	43%	55%	48%	48%	60.04%	60.04%	0.8	0.8	0.8	90%	90%													
Staging/operational by:																													
Analysis ye Financial year (ie July to June)																													
Year 0 2015	\$	85,521,864	\$ 85,231,303	\$ 84,301,292.54	\$ 82,986,866.33	\$ 82,986,866.33	\$ 84,136,447.24	\$ 82,744,684.38	\$ 82,744,684.38	\$ 82,090,982.09	\$ 82,090,982.09	\$ 83,631,453.32	\$ 81,047,220.81	\$ 81,047,220.81	\$ 80,507,479.35	\$ 80,507,479.35	\$ 83,231,490.91	\$ 80,001,200	\$ 80,001,200										
Year 1 2016	\$	85,692,908	\$ 85,401,766	\$ 84,469,895.13	\$ 83,152,840.06	\$ 83,152,840.06	\$ 84,304,720.13	\$ 82,910,173.75	\$ 82,910,173.75	\$ 82,255,164.05	\$ 82,255,164.05	\$ 83,798,716.23	\$ 81,209,315.25	\$ 81,209,315.25	\$ 80,668,494.31	\$ 80,668,494.31	\$ 83,397,953.89	\$ 80,161,203	\$ 80,161,203										
Year 2 2017	\$	85,864,294	\$ 85,572,569	\$ 84,638,834.92	\$ 83,319,145.74	\$ 83,319,145.74	\$ 84,473,329.57	\$ 83,075,994.09	\$ 83,075,994.09	\$ 82,419,674.38	\$ 82,419,674.38	\$ 83,966,313.66	\$ 81,371,733.88	\$ 81,371,733.88	\$ 80,829,831.30	\$ 80,829,831.30	\$ 83,564,749.80	\$ 80,321,525	\$ 80,321,525										
Year 3 2018	\$	86,036,022	\$ 85,743,714	\$ 84,808,112.59	\$ 83,485,784.03	\$ 83,485,784.03	\$ 84,642,276.23	\$ 83,242,146.08	\$ 83,242,146.08	\$ 82,584,513.73	\$ 82,584,513.73	\$ 84,134,246.29	\$ 81,534,477.35	\$ 81,534,477.35	\$ 80,991,490.96	\$ 80,991,490.96	\$ 83,731,879.30	\$ 80,482,168	\$ 80,482,168										
Year 4 2019	\$	86,208,094	\$ 85,915,202	\$ 84,977,728.81	\$ 83,652,755.60	\$ 83,652,755.60	\$ 84,811,560.79	\$ 83,408,630.37	\$ 83,408,630.37	\$ 82,749,682.76	\$ 82,749,682.76	\$ 84,302,514.78	\$ 81,697,546.30	\$ 81,697,546.30	\$ 81,153,473.94	\$ 81,153,473.94	\$ 83,899,343.06	\$ 80,643,132	\$ 80,643,132										
Year 5 2020	\$	86,380,511	\$ 86,087,032	\$ 85,147,684.27	\$ 83,820,061.11	\$ 83,820,061.11	\$ 84,981,183.91	\$ 83,575,447.63	\$ 83,575,447.63	\$ 82,915,182.12	\$ 82,915,182.12	\$ 84,471,119.81	\$ 81,860,941.39	\$ 81,860,941.39	\$ 81,315,780.89	\$ 81,315,780.89	\$ 84,067,141.75	\$ 80,804,419	\$ 80,804,419										
Year 6 2021	\$	86,553,272	\$ 86,259,206	\$ 85,317,979.64	\$ 83,987,701.24	\$ 83,987,701.24	\$ 85,151,146.28	\$ 83,742,598.53	\$ 83,742,598.53	\$ 83,081,012.49	\$ 83,081,012.49	\$ 84,640,062.05	\$ 82,024,663.28	\$ 82,024,663.28	\$ 81,478,412.45	\$ 81,478,412.45	\$ 84,235,276.03	\$ 80,966,028	\$ 80,966,028	2021									
Year 7 2022	\$	86,726,378	\$ 86,431,725	\$ 85,488,615.60	\$ 84,155,676.64	\$ 84,155,676.64	\$ 85,321,448.57	\$ 83,910,083.73	\$ 83,910,083.73	\$ 83,247,174.51	\$ 83,247,174.51	\$ 84,809,342.17	\$ 82,188,712.60	\$ 82,188,712.60	\$ 81,641,369.28	\$ 81,641,369.28	\$ 84,403,746.58	\$ 81,127,960	\$ 81,127,960	2022									
Year 8 2023	\$	86,899,831	\$ 86,604,588	\$ 85,659,592.83	\$ 84,323,987.99	\$ 84,323,987.99	\$ 85,492,091.47	\$ 84,077,903.89	\$ 84,077,903.89	\$ 84,413,668.86	\$ 84,413,668.86	\$ 84,978,960.86	\$ 82,353,090.03	\$ 82,353,090.03	\$ 81,804,652.02	\$ 81,804,652.02	\$ 84,572,554.07	\$ 81,290,216	\$ 81,290,216	2023									
Year 9 2024	\$	87,073,631	\$ 86,777,797	\$ 85,830,912.02	\$ 84,492,635.97	\$ 84,492,635.97	\$ 85,663,075.65	\$ 84,246,059.70	\$ 84,246,059.70	\$ 83,580,496.20	\$ 83,580,496.20	\$ 85,148,918.78	\$ 82,517,796.21	\$ 82,517,796.21	\$ 81,968,261.32	\$ 81,968,261.32	\$ 84,741,699.18	\$ 81,452,796	\$ 81,452,796	2024									
Year 10 2025	\$	87,247,778	\$ 86,951,353	\$ 86,002,573.84	\$ 84,661,621.24	\$ 84,661,621.24	\$ 85,834,401.80	\$ 84,414,551.82	\$ 84,414,551.82	\$ 83,747,657.19	\$ 83,747,657.19	\$ 85,319,216.62	\$ 82,682,831.80	\$ 82,682,831.80	\$ 82,132,197.84	\$ 82,132,197.84	\$ 84,911,182.58	\$ 81,615,702	\$ 81,615,702	2025									
Year 11 2026	\$	87,422,273	\$ 87,125,255	\$ 86,174,578.99	\$ 84,830,944.48	\$ 84,830,944.48	\$ 86,006,070.60	\$ 84,583,380.92	\$ 84,583,380.92	\$ 83,915,152.51	\$ 83,915,152.51	\$ 85,489,855.05	\$ 82,848,197.46	\$ 82,848,197.46	\$ 82,296,462.24	\$ 82,296,462.24	\$ 85,081,004.95	\$ 81,778,933	\$ 81,778,933	2026									
Year 12 2027	\$	87,597,118	\$ 87,299,506	\$ 86,346,928.15	\$ 85,000,606.37	\$ 85,000,606.37	\$ 86,178,082.74	\$ 84,752,547.69	\$ 84,752,547.69	\$ 84,082,982.81	\$ 84,082,982.81	\$ 85,660,834.76	\$ 83,013,893.86	\$ 83,013,893.86	\$ 82,461,055.16	\$ 82,461,055.16	\$ 85,251,166.96	\$ 81,942,491	\$ 81,942,491	2027									
Year 13 2028	\$	87,772,312	\$ 87,474,105	\$ 86,519,622.00	\$ 85,170,607.58	\$ 85,170,607.58	\$ 86,350,438.91	\$ 84,922,052.78	\$ 84,922,052.78	\$ 84,251,148.78	\$ 84,251,148.78	\$ 85,832,156.43	\$ 83,179,921.65	\$ 83,179,921.65	\$ 82,625,977.27	\$ 82,625,977.27	\$ 85,421,669.29	\$ 82,106,376	\$ 82,106,376	2028									
Year 14 2029	\$	87,947,857	\$ 87,649,053	\$ 86,692,661.25	\$ 85,340,948.80	\$ 85,340,948.80	\$ 86,523,139.79	\$ 85,091,896.89	\$ 85,091,896.89	\$ 84,419,651.07	\$ 84,419,651.07	\$ 86,003,820.74	\$ 83,346,281.49	\$ 83,346,281.49	\$ 82,791,229.23	\$ 82,791,229.23	\$ 85,592,512.63	\$ 82,270,589	\$ 82,270,589	2029									
Year 15 2030	\$	88,123,752	\$ 87,824,351	\$ 86,866,046.57	\$ 85,511,630.70	\$ 85,511,630.70	\$ 86,696,186.07	\$ 85,262,080.88	\$ 85,262,080.88	\$ 84,588,490.38	\$ 84,588,490.38	\$ 86,175,828.38	\$ 83,512,974.05	\$ 83,512,974.05	\$ 82,956,811.69	\$ 82,956,811.69	\$ 85,763,697.65	\$ 82,435,130	\$ 82,435,130	2030									
Year 16 2031	\$	88,300,000	\$ 88,000,000	\$ 87,039,778.66	\$ 85,682,653.96	\$ 85,682,653.96	\$ 86,869,578.44	\$ 85,432,604.84	\$ 85,432,604.84	\$ 84,757,667.36	\$ 84,757,667.36	\$ 86,348,180.04	\$ 83,680,000.00	\$ 83,680,000.00	\$ 83,122,725.31	\$ 83,122,725.31	\$ 85,935,225.05	\$ 82,600,000	\$ 82,600,000	2031									
Year 17 2032	\$	88,476,600	\$ 88,176,000	\$ 87,213,858.22	\$ 85,854,019.27	\$ 85,854,019.27	\$ 87,043,317.60	\$ 85,603,470.05	\$ 85,603,470.05	\$ 84,927,182.69	\$ 84,927,182.69	\$ 86,520,876.40	\$ 83,847,360.00	\$ 83,847,360.00	\$ 83,288,970.76	\$ 83,288,970.76	\$ 86,107,095.50	\$ 82,765,200	\$ 82,765,200	2032									
Year 18 2033	\$	88,653,553	\$ 88,352,352	\$ 87,388,285.94	\$ 86,025,727.30	\$ 86,025,727.30	\$ 87,217,404.23	\$ 85,774,676.99	\$ 85,774,676.99	\$ 85,097,037.06	\$ 85,097,037.06	\$ 86,693,918.15	\$ 84,015,054.72	\$ 84,015,054.72	\$ 83,455,548.70	\$ 83,455,548.70	\$ 86,279,309.69	\$ 82,930,730	\$ 82,930,730	2033									
Year 19 2034	\$	88,830,860	\$ 88,529,057	\$ 87,563,062.51	\$ 86,197,778.76	\$ 86,197,778.76	\$ 87,391,839.04	\$ 85,946,226.35	\$ 85,946,226.35	\$ 85,267,231.13	\$ 85,267,231.13	\$ 86,867,305.99	\$ 84,183,084.83	\$ 84,183,084.83	\$ 83,622,459.80	\$ 83,622,459.80	\$ 86,451,868.31	\$ 83,096,592	\$ 83,096,592	2034									
Year 20 2035	\$	89,008,522	\$ 88,706,115	\$ 87,738,188.63	\$ 86,370,174.32	\$ 86,370,174.32	\$ 87,566,622.72	\$ 86,118,118.80	\$ 86,118,118.80	\$ 85,437,765.59	\$ 85,437,765.59	\$ 87,041,040.60	\$ 84,351,451.00	\$ 84,351,451.00	\$ 83,789,704.72	\$ 83,789,704.72	\$ 86,624,772.05	\$ 83,262,785	\$ 83,262,785	2035									
Year 21 2036	\$	89,186,539	\$ 88,883,527	\$ 87,913,665.01	\$ 86,542,914.67	\$ 86,542,914.67	\$ 87,741,755.96	\$ 86,290,355.04	\$ 86,290,355.04	\$ 85,608,641.12	\$ 85,608,641.12	\$ 87,215,122.68	\$ 84,520,153.90	\$ 84,520,153.90	\$ 83,957,284.13	\$ 83,957,284.13	\$ 86,798,021.59	\$ 83,429,311	\$ 83,429,311	2036									
Year 22 2037	\$	89,364,912	\$ 89,061,294	\$ 88,089,492.34	\$ 86,716,000.49	\$ 86,716,000.49	\$ 87,917,239.48	\$ 86,462,935.75	\$ 86,462,935.75	\$ 85,779,858.41	\$ 85,779,858.41	\$ 86,239,552.93	\$ 84,689,194.21	\$ 84,689,194.21	\$ 84,125,198.70	\$ 84,125,198.70	\$ 86,971,617.63	\$ 83,596,169	\$ 83,596,169	2037									
Year 23 2038	\$	89,543,642	\$ 89,239,417	\$ 88,265,617.32	\$ 86,889,432.50	\$ 86,889,432.50	\$ 88,093,073.95	\$ 86,633,661.62	\$ 86,633,661.62	\$ 85,951,418.12	\$ 85,951,418.12	\$ 87,564,332.03	\$ 84,858,572.60	\$ 84,858,572.60	\$ 84,293,449.09	\$ 84,293,449.09	\$ 87,145,560.87	\$ 83,763,362	\$ 83,763,362	2038									
Year 24 2039	\$	89,722,729	\$ 89,417,896	\$ 88,442,202.67	\$ 87,063,211.36	\$ 87,063,211.36	\$ 88,269,260.10	\$ 86,809,133.34	\$ 86,809,133.34	\$ 86,123,320.96	\$ 86,123,320.96	\$ 87,739,460.70	\$ 85,028,289.74	\$ 85,028,289.74	\$ 84,462,035.99	\$ 84,462,035.99	\$ 87,319,851.99	\$ 83,930,888	\$ 83,930,888	2039									
Year 25 2040	\$	89,902,175	\$ 89,596,731	\$ 88,619,087.07	\$ 87,237,337.78	\$ 87,237,337.78	\$ 88,445,798.62	\$ 86,982,751.61	\$ 86,982,751.61	\$ 86,295,567.60	\$ 86,295,567.60	\$ 87,914,939.62	\$ 85,198,346.32	\$ 85,198,346.32	\$ 84,630,960.06	\$ 84,630,960.06	\$ 87,494,491.69	\$ 84,098,750	\$ 84,098,750	2040									
Year 26 2041	\$	90,081,979	\$ 89,775,925	\$ 88,796,325.25	\$ 87,411,812.46	\$ 87,411,812.46	\$ 88,622,690.22	\$ 87,156,717.11	\$ 87,156,717.11	\$ 86,468,158.74	\$ 86,468,158.74	\$ 86,920,994.78	\$ 84,689,743.01	\$ 84,689,743.01	\$ 84,800,221.98	\$ 84,800,221.98	\$ 87,669,480.68	\$ 84,266,948	\$ 84,266,948	2041									
Year 27 2042	\$	90,262,143	\$ 89,955,477	\$ 88,973,917.90	\$ 87,586,636.08	\$ 87,586,636.08	\$ 88,799,935.60	\$ 87,331,030.55	\$ 87,331,030.55	\$ 86,641,095.05	\$ 86,641,095.05	\$ 87,162,377.24	\$ 84,443,484.94	\$ 84,443,484.94	\$ 84,969,822.43	\$ 84,969,822.43	\$ 87,844,819.64	\$ 84,435,481	\$ 84,435,481	2042									
Year 28 2043	\$	90,442,667	\$ 90,135,388	\$ 89,151,865.73	\$ 87,761,809.36	\$ 87,761,809.36	\$ 88,977,535.47	\$ 87,505,692.61	\$ 87,505,692.61	\$ 86,814,377.24	\$ 86,814,377.24	\$ 87,510,559.46	\$ 84,710,559.46	\$ 84,710,559.46	\$ 85,139,762.07	\$ 85,139,762.07	\$ 88,020,509.28	\$ 84,604,352	\$ 84,604,352	2043									
Year 29 2044	\$	90,623,553	\$ 90,315,658	\$ 89,330,169.46	\$ 87,937,332.98	\$ 87,937,332.98	\$ 89,155,490.54	\$ 87,680,703.99	\$ 87,680,703.99	\$ 86,988,006.00	\$ 86,988,006.00	\$ 87,510,978.59	\$ 84,536,305.97	\$ 84,536,305.97	\$ 84,969,822.43	\$ 84,969,822.43	\$ 88,196,550.30	\$ 84,773,561	\$ 84,773,561	2044									
Year 30 2045	\$	90,804,800	\$ 90,496,290	\$ 89,508,820.80	\$ 88,113,207.64	\$ 88,113,207.64	\$ 89,333,801.52	\$ 87,856,065.40	\$ 87,856,065.40	\$ 87,161,982.01	\$ 87,161,982.01	\$ 87,920,948.01	\$ 84,858,574.54	\$ 84,858,574.54	\$ 84,603,661.68	\$ 84,603,661.68	\$ 88,272,943.40	\$ 84,943,108	\$ 84,943,108	2045									
Year 31 2046	\$	90,986,409	\$ 90,677,282	\$ 89,687,847.46	\$ 88,289,434.06	\$ 88,289,434.06																							

5 COSTS SECTION TAB 4: OPEX

Change in operating costs (relative to the do-minimum) with staging

Table with 18 columns (2a-7c) and 2 rows of data. Column headers describe route types (e.g., 'To Newtown as soon as possible', 'Full route as soon as possible', 'Full route, all delivered to coincide with Basin and Mt Vic tunnel improvements').

Main data table with 18 columns (2a-7c) and multiple rows of numerical values. Many rows are highlighted in yellow, representing specific cost scenarios or milestones.

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6 SUMMARY SECTION TAB 1: SUMMARY

Key model parameters

Discount rate	6%
Evaluation period (years)	40
Year benefits begin	2019
Year of Mt Victoria and Basin improvements <i>[Must be later than the Year benefits begin]</i>	2025
Sensitivity test - Higher value of time	Off
Sensitivity test - Cost	Standard
Sensitivity test - Agglomeration	Standard
Sensitivity test - Reliability benefits	Off
Sensitivity test factor	0.31
Sensitivity test - Walking	Off

Cost-benefit analysis results

This table uses the original numbering of the options

All values are relative to the do-minimum

	Targeted bus priority and other modes improvement			Peak bus lanes & priority			Targeted bus lanes & priority			Full bus lanes & priority, targeted Kilbirnie branch			Full bus lanes & priority			Physically separated lanes & full priority, targeted Kilbirnie branch		Physically separated lanes & full priority		
	1a	2a	2b	2c	3a	3b	3c	4a	4b	5a	5b	5c	6a	6b	7a	7b	7c			
	To Newtown as soon as possible, no Kilbirnie branch	To Newtown as soon as possible (given constraints), no Kilbirnie branch	Full route as soon as possible (given constraints)	Full route, all delivered to coincide with Basin and Mt Vic tunnel improvements	To Newtown as soon as possible (given constraints), no Kilbirnie branch	Full route as soon as possible (given constraints)	Full route, all delivered to coincide with Basin and Mt Vic tunnel improvements	Full route as soon as possible (given constraints)	Full route, all delivered to coincide with Basin and Mt Vic tunnel improvements	To Newtown as soon as possible (given constraints), no Kilbirnie branch	Full route as soon as possible (given constraints)	Full route, all delivered to coincide with Basin and Mt Vic tunnel improvements	Full route as soon as possible (given constraints)	Full route, all delivered to coincide with Basin and Mt Vic tunnel improvements	To Newtown as soon as possible (given constraints), no Kilbirnie branch	Full route as soon as possible (given constraints)	Full route, all delivered to coincide with Basin and Mt Vic tunnel improvements			
	PV	PV	PV	PV	PV	PV	PV	PV	PV	PV	PV	PV	PV	PV	PV	PV	PV			
Benefits																				
Travel time benefits	\$5.9m	\$8.6m	\$15.3m	\$14.2m	\$10.6m	\$19.0m	\$17.7m	\$21.5m	\$19.4m	\$13.8m	\$28.1m	\$26.2m	\$28.8m	\$27.0m	\$15.1m	\$32.9m	\$31.2m			
Additional PT user benefits	\$0.0m	\$0.0m	\$0.0m	\$0.0m	\$0.0m	\$0.0m	\$0.0m	\$2.4m	\$2.5m	\$2.4m	\$5.8m	\$6.1m	\$2.4m	\$2.5m	\$2.5m	\$6.0m	\$6.3m			
Reliability benefits [Note: capped at time travel benefits]	\$5.9m	\$8.6m	\$15.3m	\$14.2m	\$10.6m	\$19.0m	\$17.7m	\$21.5m	\$19.4m	\$13.8m	\$28.1m	\$26.2m	\$28.8m	\$27.0m	\$15.1m	\$32.9m	\$31.2m			
Walking benefits	\$0.1m	\$0.1m	\$0.3m	\$0.1m	\$0.2m	\$0.3m	\$0.1m	\$6.8m	\$7.1m	\$6.7m	\$16.4m	\$17.3m	\$6.9m	\$7.2m	\$7.2m	\$17.1m	\$18.1m			
Emissions reductions benefits	\$0.1m	\$0.1m	\$0.3m	\$0.2m	\$0.1m	\$0.3m	\$0.2m	\$0.3m	\$0.3m	\$0.2m	\$0.3m	\$0.3m	\$0.4m	\$0.3m	\$0.2m	\$0.4m	\$0.4m			
Agglomeration benefits	\$0.9m	\$1.3m	\$2.3m	\$2.1m	\$1.6m	\$2.8m	\$2.7m	\$3.2m	\$2.9m	\$2.1m	\$4.2m	\$3.9m	\$4.3m	\$4.0m	\$2.3m	\$4.9m	\$4.7m			
Decongestion (dis)benefits	-\$4.9m	-\$5.0m	-\$4.4m	-\$2.7m	-\$5.1m	-\$4.3m	-\$2.6m	-\$4.2m	-\$2.5m	-\$5.1m	-\$4.0m	-\$2.4m	-\$3.8m	-\$2.3m	-\$5.2m	-\$3.7m	-\$2.9m			
Reduction in vehicle operating cost benefits (cars)	\$3.8m	\$5.5m	\$10.7m	\$11.2m	\$5.7m	\$11.0m	\$11.6m	\$11.9m	\$12.5m	\$6.6m	\$13.3m	\$14.0m	\$14.0m	\$14.8m	\$8.8m	\$17.5m	\$18.5m			
Total benefits	\$11.8m	\$19.1m	\$39.7m	\$39.5m	\$23.8m	\$48.0m	\$47.4m	\$63.4m	\$61.6m	\$40.5m	\$92.2m	\$91.7m	\$81.8m	\$80.5m	\$46.1m	\$108.1m	\$107.4m			
Costs																				
Capex	\$24.3m	\$55.9m	\$72.1m	\$61.2m	\$30.0m	\$43.4m	\$37.6m	\$93.3m	\$77.6m	\$81.1m	\$97.2m	\$81.4m	\$124.7m	\$102.9m	\$111.1m	\$132.9m	\$111.0m			
Opex (savings)	-\$2.4m	-\$10.0m	-\$20.8m	-\$22.0m	-\$11.4m	-\$22.8m	-\$24.1m	-\$28.2m	-\$29.8m	-\$15.5m	-\$36.8m	-\$38.8m	-\$41.2m	-\$43.5m	-\$18.8m	-\$45.4m	-\$47.9m			
Total costs	\$21.9m	\$45.9m	\$51.3m	\$39.2m	\$18.6m	\$20.6m	\$13.5m	\$65.1m	\$47.8m	\$65.6m	\$60.4m	\$42.5m	\$83.5m	\$59.3m	\$92.3m	\$87.5m	\$63.1m			
BCR	0.5	0.4	0.8	1.0	1.3	2.3	3.5	1.0	1.3	0.6	1.5	2.2	1.0	1.4	0.5	1.2	1.7			

6 SUMMARY SECTION TAB 2: SUMMARY (OPTIONS RENUMBERED)

Key model parameters

Discount rate	6%
Evaluation period (years)	40
Year benefits begin	2019
Year of Mt Victoria and Basin improvements <i>[Must be later than the Year benefits begin]</i>	2025
Sensitivity test - Higher value of time	On
Sensitivity test - Cost	Standard
Sensitivity test - Agglomeration	Standard
Sensitivity test - Reliability benefits	Off
Sensitivity test factor	0.31
Sensitivity test - Walking	Off

Use the switches on the previous tab to change the parameters

Cost-benefit analysis results

This table uses the final numbering of the options

All values are relative to the do-minimum

	Targeted bus priority and other modes improvement			Peak bus lanes & priority			Targeted bus lanes & priority			Full bus lanes & priority, targeted Kilbirnie branch			Full bus lanes & priority			Physically separated lanes & full priority, targeted Kilbirnie branch		Physically separated lanes & full priority		
	1	2b	2	2a	3b	3	3a	4c	4ac	4b	4	4a	5c	5ac	5b	5	5a			
	To Newtown as soon as possible, no Kilbirnie branch	To Newtown as soon as possible (given constraints), no Kilbirnie branch	Full route as soon as possible (given constraints)	Full route, all delivered to coincide with Basin and Mt Vic tunnel improvements	To Newtown as soon as possible (given constraints), no Kilbirnie branch	Full route as soon as possible (given constraints)	Full route, all delivered to coincide with Basin and Mt Vic tunnel improvements	Full route as soon as possible (given constraints)	Full route, all delivered to coincide with Basin and Mt Vic tunnel improvements	To Newtown as soon as possible (given constraints), no Kilbirnie branch	Full route as soon as possible (given constraints)	Full route, all delivered to coincide with Basin and Mt Vic tunnel improvements	Full route as soon as possible (given constraints)	Full route, all delivered to coincide with Basin and Mt Vic tunnel improvements	To Newtown as soon as possible (given constraints), no Kilbirnie branch	Full route as soon as possible (given constraints)	Full route, all delivered to coincide with Basin and Mt Vic tunnel improvements			
	PV	PV	PV	PV	PV	PV	PV	PV	PV	PV	PV	PV	PV	PV	PV	PV	PV			
Benefits																				
Travel time benefits	\$5.9m	\$8.6m	\$15.3m	\$14.2m	\$10.6m	\$19.0m	\$17.7m	\$21.5m	\$19.4m	\$13.8m	\$28.1m	\$26.2m	\$28.8m	\$27.0m	\$15.1m	\$32.9m	\$31.2m			
Additional PT user benefits	\$0.0m	\$0.0m	\$0.0m	\$0.0m	\$0.0m	\$0.0m	\$0.0m	\$2.4m	\$2.5m	\$2.4m	\$5.8m	\$6.1m	\$2.4m	\$2.5m	\$2.5m	\$6.0m	\$6.3m			
Reliability benefits [Note: capped at time travel benefits]	\$5.9m	\$8.6m	\$15.3m	\$14.2m	\$10.6m	\$19.0m	\$17.7m	\$21.5m	\$19.4m	\$13.8m	\$28.1m	\$26.2m	\$28.8m	\$27.0m	\$15.1m	\$32.9m	\$31.2m			
Walking benefits	\$0.1m	\$0.1m	\$0.3m	\$0.1m	\$0.2m	\$0.3m	\$0.1m	\$6.8m	\$7.1m	\$6.7m	\$16.4m	\$17.3m	\$6.9m	\$7.2m	\$7.2m	\$17.1m	\$18.1m			
Emissions reductions benefits	\$0.1m	\$0.1m	\$0.3m	\$0.2m	\$0.1m	\$0.3m	\$0.2m	\$0.3m	\$0.3m	\$0.2m	\$0.3m	\$0.3m	\$0.4m	\$0.3m	\$0.2m	\$0.4m	\$0.4m			
Agglomeration benefits	\$0.9m	\$1.3m	\$2.3m	\$2.1m	\$1.6m	\$2.8m	\$2.7m	\$3.2m	\$2.9m	\$2.1m	\$4.2m	\$3.9m	\$4.3m	\$4.0m	\$2.3m	\$4.9m	\$4.7m			
Decongestion (dis)benefits	-\$4.9m	-\$5.0m	-\$4.4m	-\$2.7m	-\$5.1m	-\$4.3m	-\$2.6m	-\$4.2m	-\$2.5m	-\$5.1m	-\$4.0m	-\$2.4m	-\$3.8m	-\$2.3m	-\$5.2m	-\$3.7m	-\$2.9m			
Reduction in vehicle operating cost benefits (cars)	\$3.8m	\$5.5m	\$10.7m	\$11.2m	\$5.7m	\$11.0m	\$11.6m	\$11.9m	\$12.5m	\$6.6m	\$13.3m	\$14.0m	\$14.0m	\$14.8m	\$8.8m	\$17.5m	\$18.5m			
Total benefits	\$11.8m	\$19.1m	\$39.7m	\$39.5m	\$23.8m	\$48.0m	\$47.4m	\$63.4m	\$61.6m	\$40.5m	\$92.2m	\$91.7m	\$81.8m	\$80.5m	\$46.1m	\$108.1m	\$107.4m			
Costs																				
Capex	\$24.3m	\$55.9m	\$72.1m	\$61.2m	\$30.0m	\$43.4m	\$37.6m	\$93.3m	\$77.6m	\$81.1m	\$97.2m	\$81.4m	\$124.7m	\$102.9m	\$111.1m	\$132.9m	\$111.0m			
Opex (savings)	-\$2.4m	-\$10.0m	-\$20.8m	-\$22.0m	-\$11.4m	-\$22.8m	-\$24.1m	-\$28.2m	-\$29.8m	-\$15.5m	-\$36.8m	-\$38.8m	-\$41.2m	-\$43.5m	-\$18.8m	-\$45.4m	-\$47.9m			
Total costs	\$21.9m	\$45.9m	\$51.3m	\$39.2m	\$18.6m	\$20.6m	\$13.5m	\$65.1m	\$47.8m	\$65.6m	\$60.4m	\$42.5m	\$83.5m	\$59.3m	\$92.3m	\$87.5m	\$63.1m			
BCR	0.5	0.4	0.8	1.0	1.3	2.3	3.5	1.0	1.3	0.6	1.5	2.2	1.0	1.4	0.5	1.2	1.7			