

Appendix 9.1 – Additional Model Results

Section 9.1.1 – Change in Demand between 2011 and 2031, Inter-peak

Table 9.1.1 Inter-peak – PT, Car and Combined (Car plus PT) Growth Rates, 2011 to 2031

Origin	2011 PT	2031 PT	% Inc	2011 Car	2031 Car	% Inc	2011 Comb	2031 Comb	% Inc
CBD	2,837	3,020	6%	26,693	32,426	21%	29,529	35,446	20%
Northern Suburbs	705	829	18%	12,969	15,520	20%	13,674	16,349	20%
Western Suburbs	356	357	1%	5,726	6,438	12%	6,082	6,796	12%
Southern Suburbs	468	510	9%	7,706	9,291	21%	8,174	9,800	20%
Eastern Suburbs	682	705	3%	11,279	13,388	19%	11,961	14,093	18%
Rest of Region	3,836	3,686	-4%	92,198	106,079	15%	96,034	109,765	14%
Total	8,883	9,107	3%	156,571	183,142	17%	165,454	192,249	16%

The Inter-peak growth rates between 2011 and 2031 show that the forecast PT growth of 3% is considerably lower than the growth in car trips of 17%. At a sector level, the growth in car trips is broadly even across all sectors. For PT, the northern and southern suburbs of Wellington City, together with Wellington CBD, see the greatest forecast increases in PT trips. PT trips from the rest of the region actually decrease between 2011 and 2031, likely due to the RoNS schemes considerably improving highway travel times from these areas.

Section 9.1.2 – Change in PT Demand between Options, Inter-peak

Table A 9.1.2 Change in PT Demand (WTSM) between Options, Inter-peak, 2031

Origin Sector	PT	Change in PT Demand of Reference, AM Peak					
	Ref	BP	% Diff	BRT	% Diff	LRT	% Diff
Miramar	276	5	2%	27	10%	-5	-2%
Kilbirnie	264	3	1%	9	3%	15	6%
Mt Vic /Hataitai	132	1	1%	-2	-2%	-3	-2%
Island Bay	182	1	1%	14	8%	-8	-4%
Newtown	234	3	1%	23	10%	8	3%
CBD	3,020	27	1%	102	3%	39	1%
Rest of Wellington	1,336	7	0%	29	2%	8	1%
Rest of Region	3,663	2	0%	14	0%	14	0%
Total	9,107	48	1%	215	2%	66	1%

In broad terms, the pattern of new trips in the Inter-peak is similar to that in the AM peak, the only difference is that the magnitude is lower due to a lower underlying level of base demand. Also the bus priority option has few new trips, as the priority measures in the AM peak are not functional in the Inter-peak, effectively meaning that travel speeds are identical for the Inter-peak reference and bus priority options.

Section 9.1.3 – Change in Car Demand between Options, Inter-peak

Table A 9.1.3 Change in Car Demand (WTSM) between Options, Inter-peak, 2031

Origin Sector	Car	Change in Car Demand of Reference, AM Peak					
	Ref	BP	% Diff	BRT	% Diff	LRT	% Diff
Miramar	5,791	-5	0%	-19	0%	7	0%
Kilbirnie	4,596	-5	0%	-14	0%	-18	0%
Mt Vic /Hataitai	2,394	-1	0%	3	0%	3	0%
Island Bay	3,036	-2	0%	-14	0%	7	0%
Newtown	4,487	-3	0%	-24	-1%	-13	0%
CBD	32,426	-14	0%	34	0%	87	0%
Rest of Wellington	25,402	-1	0%	-15	0%	0	0%
Rest of Region	105,010	1	0%	-16	0%	-17	0%
Total	183,142	-31	0%	-64	0%	56	0%

In the Inter-peak the change in car demand between the reference case and each option is insignificant, suggesting that the increase in inter-peak PT trips is due to current PT users making more trips and new users switching from active mode to PT rather than from car to PT.

Section 9.1.4 – Change in PT Mode Share between Options, Inter-peak

Table A 9.1.4 Change in PT Mode Share between Options (WTSM), Inter-peak, Trips to CBD, 2031

Origin Sector	Mode Share to Wellington CBD, Inter-peak						
	Ref	BP	% Point Change	LRT	% Point Change	BRT	% Point Change
Miramar	13.4%	13.9%	0.5	15.3%	1.8	12.5%	-0.9
Kilbirnie	10.8%	11.2%	0.4	12.0%	1.2	12.0%	1.2
Mt Vic /Hataitai	7.3%	7.4%	0.1	7.0%	-0.3	7.0%	-0.3
Island Bay	13.1%	13.2%	0.2	14.4%	1.3	12.1%	-1.0
Newtown	7.1%	7.2%	0.2	8.0%	1.0	7.5%	0.4
CBD	4.1%	4.1%	0.0	4.2%	0.1	4.2%	0.1
Rest of Wellington	10.2%	10.3%	0.1	10.4%	0.2	10.3%	0.1
Rest of Region	21.9%	21.9%	-0.0	22.1%	0.2	22.2%	0.3
Total	7.6%	7.7%	0.1	7.9%	0.3	7.7%	0.1

The change in PT mode share to the CBD in the Inter-peak shows a similar pattern to that seen in the AM peak, though the magnitude of the shift to PT is less pronounced.

This is partly because of the low base starting point – the reference case Inter-peak PT mode share to the CDB is around 8% compared with 35% in the AM peak – and the fact that differences between highway and PT travel times are actually greater in the Inter-peak compared within the AM peak, providing less scope for enhancing the PT mode share.

Section 9.1.5 – Change in PT Patronage between Options, Inter-peak

Table A 9.1.5 Change in PT Patronage (WPTM), Inter-peak, 2031

Segment	PT Pax	Change in PT Patronage between Options					
	Ref	BP	Diff	BRT	Diff	LRT	Diff
Miramar to Kilbirnie	82	3	3%	30	36%	14	17%
Kilbirnie to SH1	123	5	4%	84	68%	60	49%
SH1 to Courtenay Place (Hat / Mt Vic)	187	7	4%	90	48%	69	36%
Basin to Elizabeth Street	173	4	2%	285	165%	229	133%
Kilbirnie to Newtown	68	2	3%	-47	-70%	-44	-66%
Island Bay to Newtown	54	1	1%	8	15%	-10	-18%
Newtown to Hospital	264	8	3%	-30	-11%	-55	-21%
Hospital to Basin	168	3	2%	75	45%	26	15%
Cambridge to Taranaki	420	12	3%	169	40%	119	28%
Taranaki to Willis	471	11	2%	158	34%	110	23%
Manners to Lambton	562	12	2%	122	22%	86	15%
Willis to Bowen	469	14	3%	67	14%	35	7%

The pattern of change in Inter-peak PT patronage along the PT spine is similar to changes seen in the AM peak, although the magnitude of the change is lower (both in absolute and percentage terms)

Along the Golden Mile, both BRT & LRT options result in an increase in PT trips of between 100 – 170 passengers per hour.

Section 9.1.6 – Change in PT Capacity between Options, Inter-peak

Table A 9.1.6 Change in PT Capacity (WPTM) between Options, Inter-peak, 2031

Segment	PT Capc	Change in PT Capacity between Options					
		Ref	BP	Diff	BRT	Diff	LRT
Miramar to Kilbirnie	514	0	0%	81	16%	153	30%
Kilbirnie to SH1	561	0	0%	238	42%	718	128%
SH1 to Courtenay Place (Hat / Mt Vic)	564	0	0%	216	38%	696	123%
Basin to Elizabeth Street	512	0	0%	544	106%	1,389	271%
Kilbirnie to Newtown	256	0	0%	0	0%	0	0%
Island Bay to Newtown	403	0	0%	227	56%	19	5%
Newtown to Hospital	896	0	0%	-40	-4%	440	49%
Hospital to Basin	527	0	0%	73	14%	553	105%
Cambridge to Taranaki	1,483	0	0%	-75	-5%	885	60%
Taranaki to Willis	1,681	0	0%	-225	-13%	735	44%
Manners to Lambton	2,129	0	0%	-225	-11%	735	35%
Willis to Bowen	2,155	0	0%	-190	-9%	770	36%

The Inter-peak BRT option provides a small increase in capacity whilst the LRT option provides a large increase in capacity along the PTSS corridors.

Unlike in the AM peak where some segments have high volume / capacity ratios when looking at an average, peak loading and ‘peak of the peak’ level, the Inter-peak presents no capacity issues as all segments have V/C ratios comfortably under 50%.

Section 9.1.7 – Boardings by Sector, Inter-peak

Table A 9.1.7 Change in Total Boardings by Sector (WPTM), Inter-peak, 2031

Sector	Boardings	Change in Total PT Boardings of Reference					
	Ref	BP	% Change	BRT	% Change	LRT	% Change
Miramar	123	3	2%	18	15%	-15	-12%
Kilbirnie	146	2	1%	9	6%	148	101%
Mt Vic /Hataitai	55.5	2	4%	26	47%	22	41%
Island Bay	94	1	2%	14	15%	-15	-16%
Newtown	202	6.5	3%	4	2%	82	41%
CBD	1486	-4	0%	180	12%	259	17%
Rest of Wellington	569	9	2%	15	3%	-1	0%
Rest of Region	1327	-4	0%	3	0%	8	1%
Total	4004	15	0%	270	7%	488	12%

Boardings by sector in the Inter-peak show a similar pattern to the AM peak, with Kilbirnie and Newtown both seeing a sizeable increase in PT boardings in the LRT as people heading to Wellington CBD have to change between bus and LRT at these locations.

Section 9.1.8 – PT Boardings and Alightings by Stop, AM peak

Looking at boardings and alightings by stop gives an indication of how stop utilisation changes as a result of each of the options.

The stops shown in **Table A9.1.8** below have been clustered as follows:

- Miramar Shops;
- Kilbirnie Interchange;
- Constable Street (all stops combined)
- Moxham Ave (all stops combined)
- Hataitai

Table A 9.1.8 Change in Number of PT Boardings by Stop (both direction) and % of Boardings by Stop categorised as Transfer Boardings, AM Peak

Stop / Stop Cluster	PT Boardings		Change in Boardings cf; Reference Case & % of Transfer Boardings					
	Ref	% Trans	BP	% Trans	BRT	% Trans	LRT	% Trans
Kilbirnie Interchange	198	38%	10	37%	84	37%	704	74%
Kilbirnie Crescent	3	0%	-0	0%	123	0%	128	2%
SH1 / Wellington Street	0	0	0	0	188	0%	178	0%
Hataitai (BRT and LRT)	0	0	0	0	315	0%	318	0%
Moxham Avenue (Ref & BP)	138	0%	1	0%	-138	0%	-138	0%
Hataitai (Ref & BP)	196	0%	5	0%	-195	0%	-195	0%
Constable Street	121	0%	6	0%	-102	0%	-100	0%
Newtown Interchange	258	9%	13	10%	108	20%	605	59%
Wellington Regional Hospital	9.5	21%	0	21%	-2	0%	9	0%
Adelaide Road	64	0%	14	0%	32	0%	3	0%
Basin Reserve	3	0%	0	0%	45	3%	41	0%
Cambridge Terrace	52	0%	-4	0%	36	0%	39	0%
Elizabeth Street	55	0%	3	0%	-55	0	-55	0
Courtenay Place	290	24%	18	24%	83	34%	58	29%
Manners Mall	210	6%	7	7%	6	6%	-0	9%
Willis Street	95	2%	4	2%	4	2%	-1	3%
Lambton Quay 1	62	4%	2	4%	2	5%	-2	4%
Lambton Quay 2	87	39%	8	42%	-53	0%	-54	2%

Table A9.1.8 shows quite clearly the change in boardings that occur at the major interchange locations (highlighted yellow) between the options. It also displays clearly the reduction in boardings at standard stops through Hataitai / Moxham Avenue as passengers now use the BRT / LRT stops along Wellington rd and on the entry to Mt Vic tunnel.

Table A9.1.9 overleaf shows the same analysis for the inter-peak.

Section 9.1.9 – PT Boardings and Alightings by Stop, Inter-peak

Table A9.1.9 Change in Number of PT Boardings by Stop (both direction) and % of Boardings by Stop categorised as Transfer Boardings, Inter-peak, 2031

Stop / Stop Cluster	PT Boardings		Change in Boardings cf; Reference Case & % of Transfer Boardings					
	Ref	% Trans	BP	% Trans	BRT	% Trans	LRT	% Trans
Kilbirnie Interchange	68	26%	2	26%	11	22%	11	22%
Kilbirnie Crescent	2	0%	-0	0%	26	0%	26	0%
SH1 / Wellington Street	0	0	0	0	33	0%	33	0%
Hataitai (BRT and LRT)	0	0	0	0	43	0%	43	0%
Moxham Avenue (Ref & BP)	18	0%	1	0%	-18		-18	
Hataitai (Ref & BP)	31	0%	0	0%	-31	0%	-31	0%
Constable Street	27	0%	2	0%	-20	0%	-20	0%
Newtown Interchange	111	1%	4	1%	14	1%	14	1%
Wellington Regional Hospital	8	13%	0	13%	-0	0%	-0	0%
Adelaide Road	28	0%	0	0%	14	0%	14	0%
Basin Reserve	4	0%	0	0%	14	0%	14	0%
Cambridge Terrace	18	0%	0	0%	8	0%	8	0%
Elizabeth Street	6	0%	0	0%	-6		-6	
Courtenay Place	139	8%	3	9%	35	11%	35	11%
Manners Mall	129	2%	1	2%	21	1%	21	1%
Willis Street	133	0%	3	0%	19	1%	19	1%
Lambton Quay 1	77	2%	7	2%	4	1%	4	1%
Lambton Quay 2	62	8%	4	7%	-24	0%	-24	0%