

### **Appendix C**

**Transport Economic Efficiency Forecasts**-North of Otaki to Peka Peka Road

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### Introduction

The New Zealand Transport Agency (NZTA) has commissioned Opus to undertake a strategy study for the upgrading of State Highway 1 (SH1) in the Kapiti Coast District. SH1 in this area is currently an undivided single carriageway highway which is proposed to be upgraded to a four lane (two in each direction) expressway.

This appendix outlines our preliminary assessment of the economic benefits of the scheme between Peka Peka and north of Otaki. This incorporates two sections as shown in Figure 1, being:

- Stage A: North of Otaki to Addingon / Otaki Gorge Road This 4.3km section includes a lower speed zone through Otaki township; and
- Stage B: Addington Road to Peka Peka A rural section of 8.4km.

### **Input Data**

Input data collated for this evaluation includes:

- Classified, directional and hourly traffic count information from the NZTA's monitoring database;
- Base and forecast year traffic demands, modelled speeds and capacities from the Wellington Transport Strategy Model (WSTM) and Kapiti Coast SATURN Model;
- Feasibility cost estimates and construction timeline for the scheme from the Opus project team;
- Five years of crash history for the existing highway from the NZTA Crash Analysis System;
- Weekend peak period journey time surveys; and
- Journey time surveys along the study area in the AM, Inter and PM Peak periods.



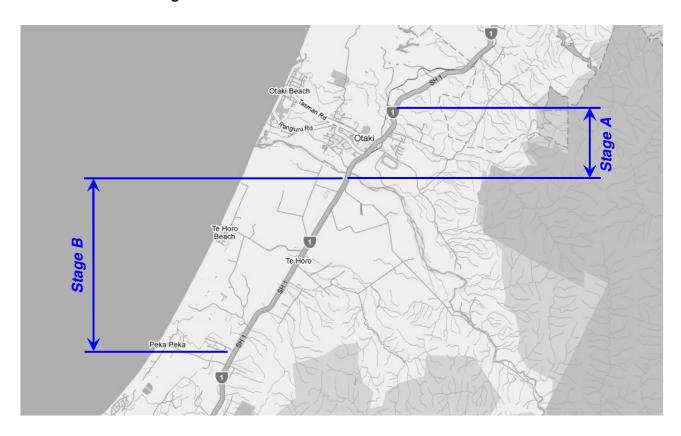


Figure 1 – Peka Peka to North of Otaki Location Plan

### **Development of Spreadsheet Model**

There is very little traffic model information for the study area that can be used to forecast any benefits from the scheme. The study area does lie on the edge of WSTM, however as advised by Greater Wellington Regional Council the model would not be suitable as a detailed forecasting tool.

As a result, Opus developed a spreadsheet model to assess relevant performance statistics as a result of the scheme based on journey time surveys and other available data. As viable alternative routes to SH1 are not feasible in this area, this approach was considered to be acceptable for this assessment. The spreadsheet model is detailed in the following sections.

### Modelled Periods

Stage A and B costs were calculated for the Do Minimum (existing) and Option 1 (four lane expressway) models based on the journey time surveys, measured distances and available count data. Specifically, costs were developed for travel time, congestion relief and vehicle operating costs for 2009, 2016 and 2026 for the following model periods:

- AM Peak (average hour 07:00 to 09:00);
- Inter Peak (average hour 12:00 to 14:00);
- PM Peak (average hour 16:00 to 18:00);
- Thursday/Friday Holiday PM Peak Northbound (average hour 14:00 to 18:00); and



Sunday/Monday Holiday PM Peak Southbound (average hour 13:00 to 17:00).

The following performance statistics were calculated:

- Traffic Flow (Veh/h);
- Journey Time (seconds);
- Speed (km/h);
- Travel Time (Veh-hrs/h);
- Congestion Relief (Veh-hrs/h); and
- Travel Distance (Veh-km/h).

Congestion relief costs were estimated based on observed variation from Inter Peak journey times, on the assumed basis that any additional travel time from 'normal' conditions would be a source of frustration. This is a crude assumption, but only a small proportion of benefits were produced using this methodology (approximately 2% of travel time benefits for the combined Stages A and B).

The performance results for 2009, 2016 and 2026 for Stages A and B are included in Addendum A for reference.

### Demand Growth Assumptions

Average forecast traffic demand growth was assessed from the WSTM and recently re-forecast Kapiti Coast SATURN Model for Sections A and B as shown in Table 1. The Kapiti Coast Model runs north to Peka Peka, being the southernmost portion of Stage B.

Table 1 - Annual Growth Forecasts on State Highway 1

Section Description	Annual Grow	rth Forecasts
Section Description	2006 to 2016 (%)	2016 to 2026 (%)
WTSM Stage A	1.3	0.7
WTSM Stage B	1.2	0.6
Kapiti SATURN Stage B	2.2	0.9

Following the advice of GWRC, the SATURN forecasts were considered to be the most appropriate and based on the most up to date information. These forecasts at Peka Peka were adopted for both Sections A and B for this assessment, based on the assumption that traffic growth north of Otaki will be proportional to south of Otaki.

To put this into context, Table A2.5 of the EEM recommends the use of 2% per annum for a rural strategic highway in the Wellington Region. The effect of this assumption on the economic efficiency of the project is examined in sensitivity test 3.

The full calculations are included in Addendum B for reference.



### Journey Time Estimation

2009 Do Minimum (existing) performance statistics were based on the observed average journey time surveys (October 2008 and June 2009) and NZTA counts from April 2009. The journey times include all current delays to traffic as a result of slow moving Heavy Commercial Vehicles (HCV), speed limits and traffic congestion etc. Average operating speeds were calculated from measured distances. The April 2009 NZTA counts were the most recent representative period of available data on both sections, which also included HCV counts. The counts are also the most reflective of the journey time survey operating conditions.

Vehicle speeds and corresponding journey times are commonly related to vehicle flow in strategic modelling software such as SATURN for highway link sections. Observed levels of flow and average speed were plotted for each of the two modelled sections. Rough empirical approximations of this speed-flow relationship were developed from the plots as included in Addendum C using SATURN based formulae.

It should be noted that the relationships developed represent average speed and flow over the whole highway section. These forecasts were then used to predict average operating speeds in the forecast years of 2016 and 2026 based on the predicted traffic flows. This works reasonably well for Section B where intersection delays are minimal, but is not very accurate for Section A due to the presence of lower speed limits, side friction due to development accesses, and intersection delays within Otaki. Therefore the assumed curve for Stage A is more conservative (predicts a higher speed) than would be expected in reality, as the capacity of the intersections / accesses / side friction and the delay due to turning interactions are more complex than can be accurately reflected using this method. This is particularly apparent for the holiday peak southbound journey times, which show a significantly slower travel time than is explained by the speed/flow relationship – in this instance a correction offset was applied to the predicted speed.

All forecast Option 1 performance statistics were based on assumed average operating speeds for the expressway of 105km/h. This makes the assumption that the new expressway will be well within capacity in all time periods and years, and that vehicles will travel at their desired speeds and overtake slower vehicles at will. The travel distance for Option 1 was assumed to be the same as for the existing highway, which is another source of conservatism in the analysis.

### **Crash History**

Five years (2004-2008) of crash history for the existing highway was obtained from the NZTA Crash Analysis System (CAS) for each of the two sections. Addington Road crashes have been assumed to reside in Stage A for the purposes of this assessment. A summary of the accident history is presented in Table 2.



Table 2 – Accident History 2004 to 2008

Crash Severity	CAS Accid	ent History
Grash Seventy	Stage A	Stage B
Fatal	2	2
Serious	15	28
Minor	14	12
Non-Injury	41	36
Total	72	78

Table 2 shows that there is a significant crash history for the study area with a number of serious and fatal accidents. Each section has had two fatal accidents in the last five years.

The CAS coded accident listings and collision diagrams are included in Addendum D for reference.

### **Economic Evaluation**

Economic benefits for Option 1 have been calculated in accordance with NZTA Economic Evaluation Manual procedures to generate a Benefit / Cost Ratio (BCR) and First Year Rate of Return (FYRR). This assessment has been based on the spreadsheet model estimates of travel time, congestion relief, vehicle operating costs, CO<sub>2</sub> emissions and accident benefits.

### **Evaluation Assumptions**

Evaluation assumptions for this assessment are as follows:

- Base Date: 1 July 2009;
- Time Zero: 1 July 2009;
- Construction: Commences 1 July 2012 for a duration of four years completing 1 July 2016;
- First Year of Benefits: 1 July 2016 to 1 July 2017 (Midpoint Year 7.5);
- Benefit Period: 26 Years (Year 7 to Year 33); and
- Discount Rate: 8%.

All update factors, base value of travel times, and values of travel cost are based on estimates for a Rural Strategic Highway from NZTA's EEM Vol 1 Amendment 2 (Updated on September 2008).

All cost and benefit estimations have been based on an extrapolation of the peak traffic models, using the following annualisation factors:



- AM Peak: 245 days at 2 hours per day (07:00-09:00);
- Inter Peak: 245 days at 8 hours per day (09:00-16:00 & 18:00-19:00);
- PM Peak: 240 days at 2 hours per day (16:00-18:00);
- Off Peak: 245 days at 10 hours per day (19:00-07:00) at 0.193 (Stage A) or 0.204 (Stage B) x Inter Peak;
- Weekend Inter Peak: 118 days at 10 hours per day (10:00-20:00) at 1.162 (Stage A) or 1.168 (Stage B) x Inter Peak;
- Thursday/Friday Holiday PM Peak Northbound: 5 days at 4 hours per day (14:00-18:00);
   and
- Sunday/Monday Holiday PM Peak Southbound: 5 days at 4 hours per day (13:00-17:00).

Weekend Off Peak costs have not been assessed – this is a slightly conservative assumption.

The above factors are based on profiles developed from the NZTA count database as shown in Addendum E for reference.

### Accident Analysis

A simplified accident analysis was undertaken for the two sections, based on the available accident history outlined above. As this is only a very high level assessment of the benefits of the scheme, it was considered inappropriate to perform a detailed crash analysis. The two sections have a high accident history, which qualifies for an accident by accident assessment of the Do Minimum in the EEM as opposed to an accident rate analysis.

For the Option crash costs, applying an accident rate for a four lane expressway is not conservative as this is mid-block only and ignores any intersection crashes. Therefore the proposed methodology was to apply a range of crash reduction percentages on an accident by accident basis to estimate crash benefits. Conservative accident reduction assumptions applied to both Stages A and B of the scheme are as follows, based on the assumption of a limited access rural expressway standard road for Option 1:

- 100% Head On;
- 100% U-Turn;
- 40% Fatal, 30% Serious, 10% Minor, 10% Non-Injury for Loss of Control, Changing Lanes, Overtaking;
- 100% Pedestrian (only 1 minor pedestrian crash observed);
- 100% Train Related;
- 100% Parking Related;
- 25% Reduction for miscellaneous (trailer loss of control/hitting misc. objects) due to improved geometrics; and
- 50% Manoeuvring, Turning, Rear-End.

The annual accident costs for the Do Minimum and Option 1 are shown below in Table 3.



Table 3 - Annual Accident Costs

Description	,	Annual Accident Cost	s
Description	Stage A	Stage B	Both
Do Minimum Costs	\$3.4m	\$10.2m	\$13.6m
Option 1 Costs	\$1.2m	\$4.4m	\$5.6m
Total Annual Benefits	\$2.2m	\$5.8m	\$8.0m

Table 3 shows that significant accident benefits can be attributed to the scheme using the conservative reductions assumed. If accident rates were used, the benefits would be considerably higher as shown in Table 4.

Table 4 - Accident Rate Annual Accident Costs

Description	I	Annual Accident Cost	s
Description	Stage A	Stage B	Both
Do Minimum Costs	\$3.4m	\$10.2m	\$13.6m
Option 1 Accident Rate Costs	\$0.46m	\$1.2m	\$1.7m
Total Annual Benefits	\$2.9m	\$9.0m	\$11.9m

Therefore Table 4 shows that using the accident by accident methodology for Option 1 is conservative by around \$3m per annum on the combined scheme.

### Costs

Construction has been assumed to commence on 1 July 2012 for a duration of four years completing on 1 July 2016, and costs have been assumed to be incurred evenly over this period. Table 5 shows the construction and discounted (NPV) costs for each stage.

Table 5 - Peka Peka to North of Otaki Construction Costs

Description	N	PV Construction Cos	ts
Description	Stage A	Stage B	Both
Construction Costs	\$105m	\$110m	\$215m
Net Present Value Costs	\$71.8m	\$75.2m	\$147m

Table 5 shows that the NPV cost for the entire Option 1 scheme is \$147m.

No maintenance costs have been assumed for this assessment.



### Benefits

Economic benefits for Option 1 have been calculated for travel time, congestion relief, vehicle operating costs, CO<sub>2</sub> emissions and accident benefits.

Net present value (NPV) benefits for the project are shown in Table 6.

Table 6 - Peka Peka to North of Otaki NPV Benefits

Description		NPV Benefits	
Description	Stage A	Stage B	Both
Travel Time	\$37.5m	\$23.0m	\$60.5m
Congestion Relief	\$0.5m	\$0.8m	\$1.3m
Vehicle Operating	-\$11.3m	-\$14.0m	-\$25.3m
Accidents	\$15.1m	\$40.9m	\$56.0m
Carbon Dioxide (4% of VOC)	-\$0.45m	-\$0.56m	-\$1.0m
Total NPV Benefits	\$41.4m	\$50.2m	\$91.5m

Table 6 shows that the NPV benefits for the Option 1 scheme are \$92m.

The majority of benefits for Stage A come from improving travel times through the corridor around Otaki to the desired operating speed. In Stage B this is not so pronounced as the average speed for the Do Minimum is higher. A significant benefit is forecast for accident benefits for both sections, but this makes up the bulk of benefits for Stage B.

Dis-benefits for vehicle operating costs are expected for both sections in this situation as a result of high speed travel costing more than low speed travel.

### **Evaluation Results**

Benefit / Cost Ratio (BCR) and First Year Rate of Return (FYRR) results are presented in Table 7.

Table 7 – Peka Peka to North of Otaki BCR and FYRR Results

Results		<b>Evaluation Results</b>	
nesuns	Stage A	Stage B	Both
Benefit / Cost Ratio (BCR)	0.6	0.9	0.7
First Year Rate of Return (FYRR)	5%	7%	6%



The overall BCR result of 0.7 forecast significant benefits for the scheme, but not enough to cover the high expected costs. Stage B is forecast to have a higher economic efficiency than Stage A.

Full EEM worksheets for all BCR results are documented within Addendum F.

### Sensitivity Tests

Three sensitivity tests were undertaken to examine how volatile the BCR is to changing assumptions in the assessment as follows:

- Test 1: This test assumes that only the stated accident reductions for Head On, U Turns, and Loss of Control/Lane Changing/Overtaking were applied. This gives a very conservative accident reduction for the scheme;
- Test 2: The assumed desire speed of the expressway has been reduced to 95km/h instead of 105km/h; and
- Test 3: Traffic growth has been assumed to be the EEM default of 2% per annum for Wellington Region highways. This is lower than the 2.2% assumed in the early years to 2016, but greater than the 0.9% assumed thereafter in the main assessment.

The BCR results for these tests are presented in Table 8.

Table 8 - Peka Peka to North of Otaki BCR Sensitivity Tests

Benefit / Cost Ratio (BCR)	S	ensitivity Test Resul	ts
Deficility Gost Hatio (BGH)	Stage A	Stage B	Both
Test 1: Low Crash Reductions	0.6	0.7	0.6
Test 2: 95km/h Desired Speed	0.6	0.8	0.7
Test 3: EEM 2% Growth	0.7	0.9	0.8

The sensitivity tests show that the modification of assumptions in the modelling has a limited effect on the economic viability of the scheme, although Stage B comes very close to having a 'low' economic efficiency of 1.

### Summary

The main conclusions from the assessment are as follows:

- Both sections have a significant crash record, including two fatal crashes each;
- Significant crash benefits can be attributed to the scheme using the conservative reductions assumed. In particular, most of the benefits for Stage B come from crash savings;
- The overall BCR result of 0.7 forecasts significant benefits for the scheme, but not enough to cover the high expected costs;

C-9



- The FYRR of 6% shows that the project will provide a significant benefit in the opening year; and
- The presented sensitivity tests show that the modification of assumptions in the modelling has a limited effect on the economic viability of the scheme.



- 1 Addendum A Performance Calculations
- 1.1 Stage A: North of Otaki to Addingon / Otaki Gorge Road



2472 2779 3510 4479 2334 2684 3627 4913 4913 7137 7137 0.0 0.2 0.2 8.0 0.4 1.0 5.3 169.1 0.4 2.1 5.5 40.0 48.9 60.6 85.0 38.6 43.9 63.3 78.7 78.7 92.8 332.6 62 57 57 53 53 53 59 59 58 © 253 274 296 296 252 252 272 272 278 2026 Flow (Vehs) 570 641 810 11033 552 619 837 1122 1122 1260 1260 1646 2268 2550 3220 2196 2196 2462 3328 4507 4464 5012 6548 0.0 0.5 0.0 0.1 0.1 0.5 3.5 1.0 3.5 1.33.5 36.4 44.3 54.3 75.0 75.0 39.9 39.9 39.9 71.6 71.6 71.6 71.6 62 55 62 55 62 62 62 63 63 88 (8) 251 271 271 285 285 250 253 266 697 Flow Vehs) 523 588 743 948 507 568 768 768 1030 1156 1510 1510 1510 1510 1965 2209 2790 3561 1903 2134 2883 3805 3868 3868 3868 7466 0.0 0.0 0.0 0.2 0.2 0.5 86.5 0.0 0.0 31.7 38.0 38.0 44.4 61.1 30.6 34.1 46.6 62.4 62.4 91.0 Speed (km/h) 62 62 63 63 62 62 62 64 64 64 Stage A North of Otaki to Addingon / Otaki Gorge Road (s) 252 252 269 248 268 251 251 252 252 595 Flow (ehs.th) (ehs.th AM Peak Inter Peak PM Peak Holiday PM AM Peak Inter Peak PM Peak Holiday PM AM Peak Inter Peak PM Peak Both SB 贸

Option 1		2009 Flow	Distance	105 T		II	CRV	Distance	2016 Flow	Distance	Ţ	Speed	II	CRV	Distance		2026 Flow		Distance	Distance JT Speed	Distance JT Speed TT	Distance JT Speed TT
		(Vehs/hr)	(m)	(s)	(km/h) (\	Veh-hrs/hr) (	Veh-hrs/hr)(	(Veh-km/hr)	(Vehs)	(m)	(s)	(km/h)	0	$\leq$	(Veh-hrs/hr)(Veh-hrs/hr)(V	r"(Veh-hrs/hr"(V	r](Veh-hrs/hr](Veh-km/hr	r](Veh-hrs/hr](Veh-km/hr	r)(Veh-hrs/hr)(Veh-km/hr (Vehs)	r](Veh-hrs/hr](Veh-km/hr (Vehs) (m) (s) (km/h) (V	r](Veh-hrs/hr](Veh-km/hr (Veh-hrs/hr]) (Veh-hrs/hr]	r](Veh-hrs/hr](Veh-km/hr (Vehs) (m) (s) (km/h) (V
	AM Peak	453	4335	149		18.7	0.0	1965	523	4335	149	105				0.0	0.0 2268	0.0 2268 570	0.0 2268 570 4335	0.0 2268 570 4335 149 105	0.0 2268 570 4335 149 105 23.5	0.0 2268 570 4335 149 105 23.5
9	Inter Peak	510	4335	149		21.0	0.0	2209	288	4335	149	105	24.3			0.0	0.0 2550	0.0 2550 641	0.0 2550 641 4335	0.0 2550 641 4335 149 105	0.0 2550 641 4335 149 105 26.5	0.0 2550 641 4335 149 105 26.5
9	PM Peak	644	4335	149		26.6	0.0	2790	743	4335	149	105	30.7		0.0		3220	3220 810	3220 810 4335	3220 810 4335 149 105	3220 810 4335 149 105 33.4	3220 810 4335 149 105 33.4
	Holiday PM		4335	149		33.9	0.0	3561	948	4335	149	105	39.1		0.0		4109	4109 1033	4109 1033 4335	4109 1033 4335 149 105	4109 1033 4335 149 105 42.7	4109 1033 4335 149 105 42.7
	AM Peak	439	4335	149		18.1	0.0	1903	202	4335	149	105	20.9		0.0		2196	2196 552	2196 552 4335	2196 552 4335 149 105	2196 552 4335 149 105 22.8	2196 552 4335 149 105 22.8
9	Inter Peak	492	4335	149		20.3	0.0	2134	268	4335	149	105	23.4		0.0		2462	2462 619	2462 619 4335	2462 619 4335 149 105	2462 619 4335 149 105 25.6	2462 619 4335 149 105 25.6
0	PM Peak	999	4335	149		27.5	0.0	2883	292	4335	149	105	31.7		0.0		3328	3328 837	3328 837 4335	3328 837 4335 149 105	3328 837 4335 149 105 34.5	3328 837 4335 149 105 34.5
	Holiday PM		4335	149		37.2	0.0	3905	1040	4335	149	105	42.9		0.0		4507	4507 1133	4507 1133 4335	4507 1133 4335 149 105	4507 1133 4335 149 105 46.8	4507 1133 4335 149 105 46.8
	AM Peak	892				36.8	0.0	3868	1030			105	42.5		0.0		4464	4464	4464	4464 1122 105	4464 1122 46.3	4464 1122 46.3
4	Inter Peak	1002		-	105	41.4 0.0	0.0	4343	1156			105	47.7		0.0	0.0 5012	5012	5012	5012	5012 1260 105	5012 1260 105 52.0	5012 1260 105 52.0
5	PM Peak	1309		-		54.0	0.0	5674	1510			105	62.4		0.0		6548	6548	6548	6548 1646 105	6548 1646 105 68.0	6548 1646 105 68.0
	Holiday PM	_				71 1	0	7466	1987			105	20		0		8616	8616	8616	2166	8616 2166 105 89.4	8616 2166 105 89.4

### 1.2 Stage B: Addington Road to Peka Peka

Stage B Addington Road to Peka Peka

### 2 Addendum B – Forecast Growth Analysis



Rate	16-26%	0.7%	%9.0	0.7%
Rate	% 91-90	1.0%	4.0%	1.3%
		Cars	HCVs	Total
0.4%	0.5%	%2.0	0.4%	%2.0

	Rate	Rate
	06-16 %	16-26%
Sars	1.5%	%8.0
-CVs	13.7%	1.7%
Fotal	2.5%	%6:0

		AM Peak			Rate	Rate	Inter Peak			Rate	Rate	PM Peak			Rate	Rate
		2006	2016	2026	06-16%	16-26%	2006	2016	2026	06-16 %	16-26%	2006	2016	2026	% 91-90	16-26%
	Cars	484	538	211	1.1%	%2'0	403	445	478	1.0%	%2'0	645	704	742	%6.0	0.5%
æ	HCVs	55	92	81	3.9%	0.7%	55	77	83	3.9%	0.8%	48	29	20	4.0%	0.4%
	Total	539	614	658	1.4%	%2'0	458	522	260	1.4%	%2'0	£69	177	812	1.1%	0.5%
	Cars	290	645	681	%6:0	%9:0	403	444	477	1.0%	%2'0	299	614	099	1.0%	%2'0
SB	HCVs	26	78	82	4.0%	0.6%	56	78	82	4.0%	0.6%	49	69	71	4.0%	0.4%
	Total	646	722	292	1.2%	<b>%9</b> '0	459	522	229	1.4%	%2'0	909	683	730	1.3%	%2'0
VTSM St	TSM Stage B: North of Peka Peka	th of Peka F	eka													
		AM Peak			Rate	Rate	Inter Peak			Rate	Rate	PM Peak			Rate	Rate
		2006	2016	2026	06-16%	16-26%	2006	2016	2026	06-16 %	16-26%	2006	2016	2026	06-16 %	16-26%
	Cars	405	397	431	-0.5%	%8.0	376	383	412	0.2%	%8.0	649	658	692	0.1%	0.5%
R	HCVs	169	243	260	4.4%	0.7%	179	258	278	4.4%	0.8%	143	207	215	4.4%	0.4%
	Total	573	640	691	1.2%	0.8%	222	640	069	1.5%	0.8%	792	865	406	%6:0	0.5%
	Cars	571	220	296	%0.0	0.4%	698	374	403	0.1%	%8'0	456	451	484	-0.1%	%2'0
SB	HCVs	165	238	252	4.4%	0.6%	163	234	248	4.4%	0.6%	128	184	190	4.4%	0.4%
	Total	735	808	848	1.0%	0.5%	531	809	651	1.4%	%2'0	584	635	674	%6:0	%9.0

(apiti SA	TURN Mod	apiti SATURN Model Stage B: Nortl	_	of Peka Peka												
		AM Peak			Rate	Rate	Inter Peak			Rate	Rate	PM Peak			Rate	Rate
		2006	2016	2026	%91-90	16-26%	2006		2026	06-16 %	16-26%	2006		2026	06-16 %	16-26%
	Cars	642	724	773	1.3%	%2'0	541	618	672	1.4%	%6.0	236	9/8	954	1.9%	%6:0
æ	HCVs	24	22	65	14.0%	1.5%	30		74	11.8%	1.2%	49		110	8.6	1.4%
	Total	999	781	838	1.7%	0.7%	571		746	2.0%	0.9%	785		1064	2.4%	%6:0
	Cars	604	705	29/	1.7%	%6.0	536		647	1.2%	0.8%	526		929	1.7%	%9.0
SB	HCVs	65	123	143	8.9%	1.6%	32		9/	11.6%	1.2%	25		117	26.1%	3.5%
	Total	699	828	806	2.4%	1.0%	268		723	1.8%	0.8%	551		773	2.8%	%6'0

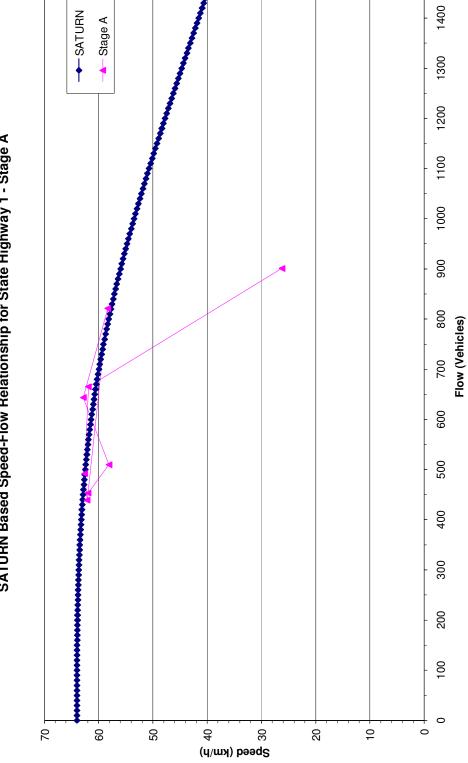
WTSM Stage A: North of Otaki



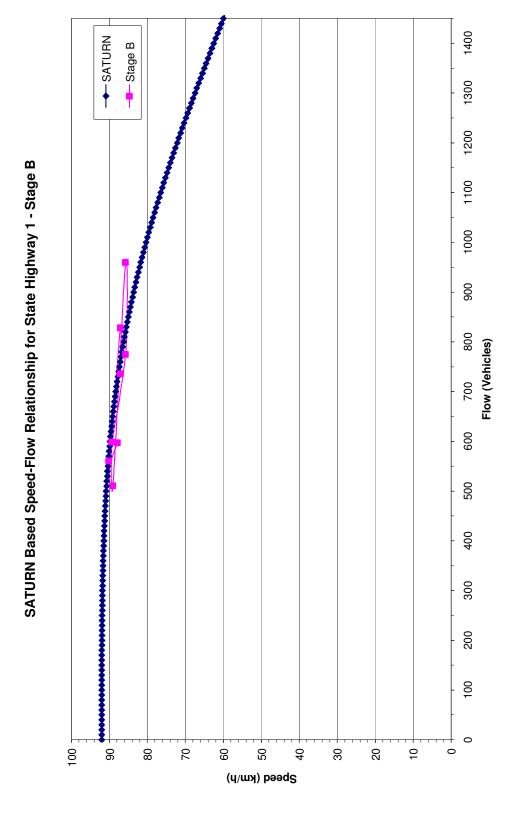
- 3 Addendum C Speed-Flow Relationships
- 3.1 Stage A: North of Otaki to Addingon / Otaki Gorge Road



SATURN Based Speed-Flow Relationship for State Highway 1 - Stage A



### 3.2 Stage B: Addington Road to Peka Peka



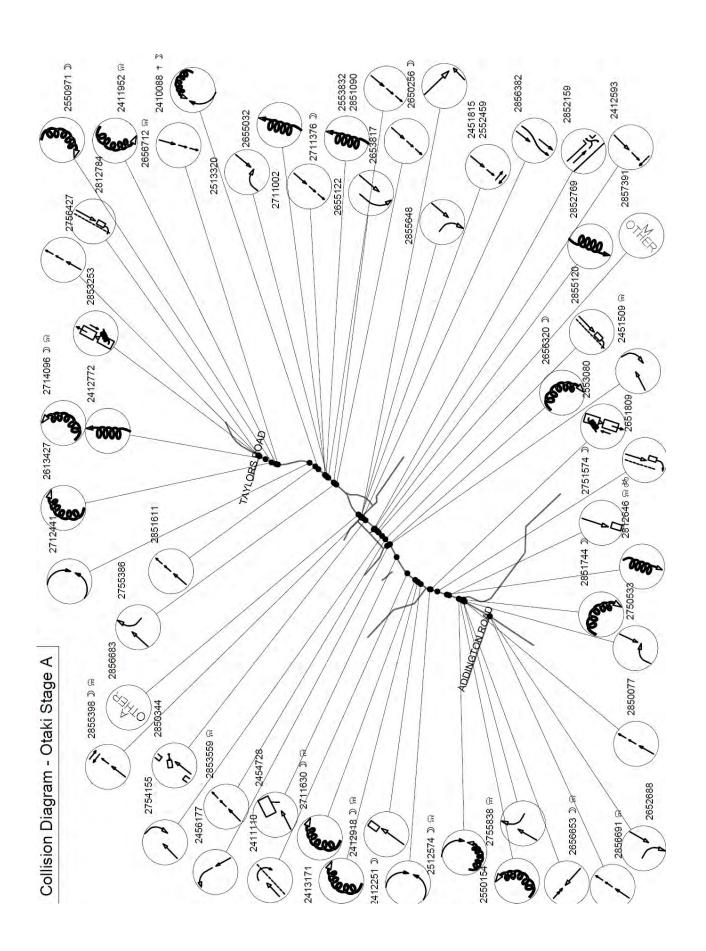
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### 4 Addendum D – CAS Outputs

### 4.1 Stage A: North of Otaki to Addingon / Otaki Gorge Road

WAKA KOTAHI	D   Second street	Crash Date Day Time Factors and Roles	O C W L W J C M S Total F
First Street	I for landmark	Grash   Date   Day Time   Factors and Roles   Number	B U E I E U O A P Inj E
	1 8.1	M. D So doe mobile to	J R T G T N N R D
	1 1	A IS IOI VENICLE I	E V N H H C T K L F S M &
	1 1	M VN VVV	C E E T E T R S M A E I q
	Distance	DD/MM/YYYY DDD HHMM T 1 234	T S R L T TRN
N/995/7.643	I ADDINGTON ROAD	2856691 30/12/2008 Tue 1143 FD CN1C 331A 351A	R W O L T N C 100
N/995/5.135	50N MILL ROAD	2856683 19/12/2008 Frf 1100 AO CNIT 150A	EDOF NC 050
N/995/5.538	80S ARTHUR ST	2857391 21/11/2008 Fri 1730 MO CSIC 387A	RDBFNC050
N/995/5.223	15s MILL ROAD	2856382 28/09/2008 Sun 1530 AATSIC 387A	EDB FRGC 050
N/995/5.185	I RAHUI ROAD	2855648 07/09/2008 Sun 1400 KB CSIM 302A 375A	E D B F R G C 050
N/995/5.676	100N WAERENGA ROAD	2855120 15/08/2008 Fri 0820 GDTS14 101A 386A 927	R D B F D N C 050
N/995/5.208	I MILL ROAD	2855398 11/08/2008 Mon 1815 FB CN1C 331A	R W TO L R G R 050
N/995/3.302	I TAYLORS ROAD	2812784 10/08/2008 Sun 1610 GD CS1C 333A 360A 902	R D B F T G C 100 1 1
N/995/6.939	20s otaki RIV BR S	2812646 30/07/2008 Wed 1623 CASS1 105A	R W O N N C 100 1
N/995/5.676	100N WAERENGA ROAD	2853559 12/06/2008 Thu 1035 FD CN1C 331A	R W O H N C 050
N/995/5.508	50s ARTHUR ST	2852769 29/05/2008 Thu 1200 CB CB1CCC 129A	MMM R D B F N R 050
N/995/3.302	I TAYLORS ROAD	2853253 02/05/2008 Fri 1040 QG CNIC 682A	D R D O F T G L 100
RTHUR ST	20W SH 1N	2852159 29/04/2008 Tue 1100 MD TEIC 371A 920	R D B F D N C 050
TAKI GORGE ROAD	20E SH IN	2851744 07/04/2008 Mon 2130 DA CS1 101A 101	C M D DN F N N 100
N/995/4.423	50S WAITOHU VALLEY ROAD	2851090 29/02/2008 Fri 1720 FD CS1CCC 181A	R D B E N C 050
N/995/5.276	500N WAERENGA ROAD	2850344 31/01/2008 Thu 1450 MA CN1C 181A	R D B F N C 050
N/995/7.22	30S OTAKI GORGE ROAD	2850077 22/01/2008 Tue 0856 FD CNIC 181A	R D B F N L 100
(/995/4.173	200N WAITOHU VALLEY ROAD	2851611 16/01/2008 Wed 1340 FD 4NICC 181A	R D B F N L 100
N/995/3.402	100s TAYLORS ROAD	2714096 01/10/2007 Mon 0320 DB CN1 134A 402A 800	GV M W DN L N C 100 1
0/995/7.19	I OTAKI GORGE ROAD	2755838 30/09/2007 Sun 1800 KB 4N1C 176B 301B	R W O H T S C 100
0/995/3.202	20N TAYLORS ROAD	2756427 30/09/2007 Sun 1500 FD VN1CC 181A	R D O F N L 100
/995/4.559	I TE MANUAO ROAD	2755386 22/09/2007 Sat 1400 KB VN14 176B 302B 375B	R D B F T G C 050
/995/5.608	150S ARTHUR ST	2754155 25/07/2007 Wed 1240 JACNIC 308B 423B 922	R D O P D N C 050
FCT MOBIL	50N SH 1N/ARTHUR	2712907 13/07/2007 Fri 1900 MO 4NIC 103A 517A 512B	IP R D DO F N R 050 1
N/995/4.073	300N WAITOHU VALLEY ROAD	2712441 18/06/2007 Mon 0810 BC VNIC 121A 410A	E D B F N L 100 2
N/995/6.973	350S RIVERBANK ROAD	2751574 24/03/2007 Sat 0415 EATSLV 386A	Q R D DF F N L 100
N/995/6,423	200N RIVERBANK ROAD	2711630 21/03/2007 Wed 2200 DA VN1 410A	P E W DO L N C 070 1 1
N/995/4.383	10S WAITOHU VALLEY ROAD	2711376 26/02/2007 Mon 0534 CB CN1 410A	P R D DO F T N C 050 1
N/995/7.19	I OTAKI GORGE ROAD	2750533 11/02/2007 Sun 1445 LB CSIC 303B 404B	R D B F T N C 100
N/995/4.363	10N WAITOHU VALLEY ROAD	2711002 03/01/2007 Wed 1614 FD CSICC 331A 351A	R D B F T N 050 1
N/995/3.602	300s TAYLORS ROAD	2656712 27/12/2006 Wed 1639 FD CS1C 112A 331A 337A	R W O L N L 100
AERENGA ROAD	50W SH IN	2656320 02/12/2006 Sat 0400 DACE1 103A 111A	P E D DO F N C 050.
N/995/3.502	200S TAYLORS ROAD	2613427 19/11/2006 Sun 1140 DA CNIC 372A 501A	E D O F N L 100 2
TAKI GORGE ROAD	I 1N/995/7.19	2656653 18/11/2006 Sat 1910 MG 4WLV 512B	B W TN T G C 100
N/995/4.373	I WAITOHU VALLEY ROAD	2655032 14/10/2006 Sat 1507 CBVN1 410A	PRDOFTNL 050
N/995/4.529	30N TE MANUAO ROAD	2655122 06/10/2006 Fri 1750 GB 4SIC 112A 158A 175B 929	F R D B F D N P 050
N/995/4.579	20s TE MANUAO ROAD	2653817 04/08/2006 Fri 1500 FD CS14 359A	R D B F M N P 050
NZ TRANSE WAKA KOTAHI	PORT AGENCY		Coded Crash report, run on 24-06-2009, Page
First Street	D   Second street	Crash Date Day Time Factors and Roles	O C W L W J C M S Total P
	I   Or landmark	Number	BUEIEUOAPINE JRTGINNRD
	R	M D A is for vehicle 1	J R T G T N N R D D
		V R B is for weh 2 etc	C E E T E T R S M A E I g
	Distance	DD/MM/YYYY DDD HHMM!I 1 234	T S R L T TRN e
IN/995/7.642	I ADDINGTON ROAD	2652688 17/05/2006 Wed 0840 KB CS14 125A 302B 382B	R D B F T G C 100
N/995/6.793	170S RIVERBANK ROAD	2651809 19/04/2006 Wed 1315 GC CS1C 145B 300B 372B 920	R D B F D N L 100
N/995/5,196	I MILL ROAD	2650256 23/01/2006 Mon 2235 HA CE2C 103A 205A 302A	R D DO FR G R 050
DWAY SH IN	130W WAERENGA ROAD	2513697 13/12/2005 Tue 0855 QC 481 370A	NT R D B F N N 070 1
N/995/4.413	40S WAITOHU VALLEY ROAD	2513320 27/11/2005 Sun 1745 LB MS1C 303A 377A 151B 929	R D B P D N P 050 1
	A SH IN	2512385 21/07/2005 Thu 1220 DACEIC 504A 923	MX R D B F D N C 050 1
FCT CALTEX OTAKI		2553832 10/07/2005 Sun 1549 PD VSICV 331A 353A	
PCT CALTEX OTAKI IN/995/4.423	50s WAITOHU VALLEY ROAD	The state of the s	R D B F N C 050
	50S WAITONU VALLEY ROAD 70S RIVERBANK ROAD	2553080 01/07/2005 Pri 0905 QG VS1 660A	R D B F N C 050 B E D B F N C 100
18/995/4.423 18/995/6.693			
N/995/4.423 N/995/6.693 N/995/5,184	70S RIVERBANK ROAD	2553080 01/07/2005 Pri 0905 QG V81 660A	B E D B F N C 100
N/995/4.423 N/995/6.693 N/995/5,104 N/995/3.502	70s RIVERBANK ROAD I RAHUI ROAD	2553080 01/07/2005 Pri 0905 QG VS1 660A 2552459 27/05/2005 Pri 1250 PB CS1C 181A	B E D B F N C 100 R D O F R G R 050
N/995/4.423 N/995/6.693 N/995/5.104 N/995/3.502 N/995/7.123	705 RIVERBANK ROAD I RANUI ROAD 2005 TAYLORS ROAD	2553080 01/07/2005 Fri 0905 Q0 V81 660A 2552459 27/05/2005 Fri 1250 FB CSIC 181A 2550971 02/03/2005 Wed 0625 DA CSI 410A 504A	B E D B F N C 100 R D O F R G R 050 CF E D TN F N L 100
N/995/4.423 N/995/6.693 N/995/5.184 N/995/3.502 N/995/7.123 N/995/7.14	70S RIVERBANK ROAD I PAHUI ROAD 200S TAYLORS ROAD 500S RIVERBANK ROAD	2553080 01/07/2005 Fri 0905 Q8 V81 660A 2552459 27/05/2005 Fri 1250 FB C81C 181A 2550971 02/03/2005 Wed 0625 DA C81 410A 504A 2512574 11/02/2005 Fri 1927 BF CN1C 137A 407A	B E D B F N C 100 R D O F R G R 050 CF E D TN F N L 100 G M W TF L N C 100 1
N/995/4.423 N/995/6.693 N/995/5.184 N/995/3.502 N/995/7.123 N/995/7.14 ABRENGA ROAD	70S RIVERBANK ROAD I RAMUI ROAD 200S TAYLORS ROAD 500S RIVERBANK ROAD 50N OTAKI GORGE ROAD	2553080 01/07/2005 Fri 0905 QG V81 660A 2552459 27/05/2005 Fri 1525 FB CSLC 181A 2550971 02/03/2005 Wed 0625 DA CSI 410A 504A 2512574 11/02/2005 Fri 1527 BF CNLC 137A 407A 2550154 16/01/2005 Wed 0830 DB VN1 130A 410A	B E D B F N 0 100  R D O F R G R 050  CF E D TH F N L 100  G M W TF L N C 100 1  FJ M D B F N C 100
N/995/4.423 N/995/6.693 N/995/5.184 N/995/3.502 N/995/7.123 N/995/7.124 HARRENGA ROAD N/995/6.465	70S RIVERBANK ROAD I RAWLI ROAD 200S TAYLORS ROAD 500S RIVERBANK ROAD 50N OTAKI GORGE ROAD 10W SH 1H	2553080 01/07/2005 Pri 0905 QG VSI 660A 2552459 27/05/2005 Pri 1250 FB CSIC 181A 2550971 02/03/2005 Ned 0625 DACSI 410A 504A 2512574 11/02/2005 Pri 1927 BF CNIC 137A 407A 25509154 26/01/2005 Ned 0800 DB VNI 130A 410A 2456177 12/12/2004 Sun 0920 GA VNIC 331A 350A 930 2413371 12/11/2004 Fri 2015 DACNI 129A 330A	B E D B F N C 100  R D O F R G R 050  CF E D TH F N L 100  G M TF L N C 100  FJ M D B F N C 100  R D B F D N C 050
N/995/4.423 N/995/6.693 N/995/5.104 N/995/3.502 N/995/7.123 N/995/7.124 NAPENDA ROAD N/995/6.465 N/995/4.233	70S RIVERBANK ROAD I RAHUI ROAD 200S TATLORS ROAD 500S RIVERBANK ROAD 500 OTAKI GORGE ROAD 10W SH IN 150N RIVERBANK ROAD	2553080 01/07/2005 Fri 0905 QUV81 660A 2552459 27/05/2005 Fri 1525 FBCSIC 181A 2550971 02/03/2005 Wed 0625 FACSI 410A 504A 251574 11/02/2005 Fri 1527 BFCNIC 137A 407A 2550154 26/01/2005 Wed 0800 DBVNI 130A 410A 2456177 12/12/2004 Sun 0820 QRVNIC 331A 350A 930 2413011 12/12/2004 Fri 2015 RACHI 128A 330A 2410088 13/10/2004 Mon 2150 BFCSIV 106A 120A 410A	B E D B F N C 100  R D O F R G R 050  CF E D TN F N L 100  G M W TF L N C 100  FJ M D B F N C 100  R D B F D N C 050  P E D B F N C 070 L
IN/995/4.423 IN/995/5.104 IN/995/5.104 IN/995/5.105 IN/995/7.123 IN/995/7.14 ARRERNOR ROAD IN/995/6.465 IN/995/6.233 IN/995/6.515	TOS RIVERDANK ROAD  I RAMUI ROAD  2005 TAYLORS ROAD  5005 RIVERBANK ROAD  500 OTAKI GORGE ROAD  10W SH IN  1500 RIVERBANK ROAD  1400 WAITORY VALLEY ROAD  1000 RIVERBANK ROAD	2553080 01/07/2005 Fri 0905 QG V81 660A 2552459 27/05/2005 Fri 1520 FB CSIC 181A 2550971 02/03/2005 Wed 0625 DA CSI 410A 504A 2512574 11/02/2005 Fri 1527 BF CNIC 137A 407A 2550154 16/01/2005 Wed 0830 DB VN1 130A 410A 2456177 12/12/2004 Sun 0520 0A VNIC 331A 350A 930 2413171 12/11/2004 Fri 2015 DA CNI 129A 330A 2410088 25/10/2004 Mon 2150 BF CSIV 106A 120A 410A 2412918 18/10/2004 Mon 0445 EA VNIV 129A 359A	B E D B F N C 100  R D O F R G R 050  CF E D TN F N L 100  G M W TF L N C 100  FJ M D B F N C 100  R D B F D C 050  P E D B F N C 070 1  HHF R W EO L N C 070 1
M/995/4.423 M/995/5.104 M/995/5.104 M/995/5.102 M/995/7.123 M/995/7.124 ARRENOA ROAD M/995/6.465 M/995/6.453 M/995/6.515	70S RIVERBANK ROAD I RAMUI ROAD 200S TAYLORS ROAD 500S RIVERBANK ROAD 50N OTAKI GORGE ROAD 10W SH IN 150N RIVERBANK ROAD 140N WAITORU VALLEY ROAD 100N RIVERBANK ROAD I MILL ROAD	2553080 01/07/2005 Pri 1930 FQ V81 660A 2552459 27/05/2005 Pri 1520 FB CSIC 181A 2550971 02/03/2005 Wed 0625 DA CSI 410A 504A 2512574 11/02/2005 Pri 1927 BF CNIC 137A 407A 2550154 26/03/2005 Wed 0830 DB VNI 130A 410A 2456177 12/12/2004 Sun 0920 GA VNIC 331A 350A 930 2413171 12/11/2004 Fri 2015 DA CNI 125A 330A 2410088 25/10/2004 Mon 2150 BF CSIV 106A 120A 410A 2412918 18/10/2004 Mon 2455 EA VNIV 125A 359A 2455003 06/10/2004 Med 2138 JA CNIC 103B 302B 375B	B E D B F N 0 100  R D O F R G R 050  CF E D 7H F N L 100  G M W TF L N C 100 1  FJ M D B F N C 100  R D B F D N C 050  P E D B F N C 070 1  ED D D F N L 100 11  HMF R W DO L N C 070 1  R D D F R G R 050
M/995/4.423 M/995/6.683 M/995/5.184 M/995/7.123 M/995/7.123 M/995/7.14 ARERMAR ROAD M/995/6.465 M/995/4.233 M/995/5.196 M/995/5.196 M/995/5.378	TOS RIVERBANE BOAD  I RAMUI BOAD  1005 TAYLORS BOAD  5005 RIVERBANE FOAD  500 OTARI GORGE BOAD  10W SH IN  1500 RIVERBANE FOAD  1400 WAITORU VALLEY BOAD  1000 RIVERBANE BOAD  I MILL BOAD  I MILL BOAD  1100 WAEFENGA BOAD	2553080 01/07/2005 Fri 10905 QUV81 660A 2552459 27/05/2005 Fri 15250 FB CSIC 181A 2550971 02/03/2005 Wed 0625 EA CSI 410A 504A 2512574 11/02/2005 Fri 15273 FF CSIC 137A 407A 2550154 26/01/2005 Wed 0830 DB VNI 330A 410A 2456177 12/12/2004 Sun 0920 DA VNIC 310A 410A 24513171 12/11/2004 Fri 2015 DA CSI 127A 330A 2410388 152/10/2004 Mon 0445 EA VNICV 128A 359A 2412988 152/10/2004 Mon 0445 EA VNICV 128A 359A 2455030 66/10/2004 Wed 21383 ACAIC 108B 302B 375B 2454728 03/10/2004 Sun 0715 EE CNIC 374B	B E D B F N C 100  R D O F R G R 050  CF E D TN F N L 100  G M W TF L N C 100  F D N D B F N C 100  P E D B F N C 070  E D DO F N L 100 11  HMF R W DO L N C 070  R D D OF R G R 050  M R D B F N F 070
M/995/4.423 M/995/6.693 M/995/5.104 M/995/7.123 M/995/7.123 M/995/7.14 ARENIOA ROAD M/995/6.405 M/995/6.515 M/995/5.196 M/995/3.198 M/995/3.378	TOS RIVERDANK BOAD I RAMUI BOAD 2005 TAYLORS BOAD 5005 RIVERBANK BOAD 500 TAKEN BOAD 100 WHIN 150N RIVERBANK BOAD 140N WAITOHU VALLEY BOAD 100N RIVERBANK BOAD I MILL BOAD I MILL BOAD 1105 WAREBNAR BOAD 1105 WAREBNAR BOAD	2553080 01/07/2005 Fri 0905 QUV81 660A 2552459 27/05/2005 Fri 1520 FBCSIC 181A 2550971 02/03/2005 Wed 0625 DA CB1 137A 407A 2550154 26/01/2005 Wed 0830 DB VN1 130A 410A 2456177 12/12/2004 Sun 0520 0A VNIC 331A 350A 930 2458177 12/12/2004 Mon 0210 DB VN1 10A 410A 241098 25/10/2004 Mon 0210 DB VN1 10A 410A 241098 25/10/2004 Mon 0210 DB VR1 10A 410A 2412918 18/10/2004 Mon 0455 EA VNIV 126A 359A 2455093 06/10/2004 Mon 0715 EE CNIC 17AB 2452728 03/10/2004 Sun 0715 EE CNIC 37AB 2412772 29/08/2004 Sun 1425 CB MN1 10A 330A	B E D B F N 0 100  R D O F R G R 050  CF E D TH F N L 100  G M W TF L N C 100 1  FJ M D B F N C 100  R D B F N C 050  P E D B F N C 070 1  E D D O F N L 100 11  HMF R W CO L N C 070 1  R D D O F N C 070  M R D B F N C 070 2  M R D B F N C 070 2  M R D B F N C 070 2
1M/995/4.423 1M/995/6.663 1M/995/5.184 1M/995/7.123 1M/995/7.123 1M/995/7.144 1ARERDAG BOAD 1M/995/6.465 1M/995/6.515 1M/995/5.196 1M/995/5.196 1M/995/5.458	TOS RIVERBANK ROAD  I RAMUI ROAD  2005 TAYLORS ROAD  5005 RIVERBANK ROAD  500 OTAKI GORGE ROAD  1006 SH IN  1500 RIVERBANK ROAD  1400 MAITORU VALLEY ROAD  1001 RIVERBANK ROAD  I MILL ROAD  1005 MARERING ROAD  1005 TAYLORS ROAD  1 ARTHUR ST	2553080 01/07/2005 Fri 0905 QG V81 660A 2552459 27/05/2005 Fri 1520 FB CSIC 181A 2550971 02/03/2005 Wed 0625 DA CSI 410A 504A 2512574 11/02/2005 Fri 1527 BF CNIC 137A 407A 2550154 26/01/2005 Wed 0830 DB VN1 130A 410A 2456177 12/12/2004 Sun 0520 0A VNIC 331A 350A 930 2413171 12/11/2004 Fri 2015 DA CNI 129A 330A 241098 25/10/2004 Mon 2150 BF CSIV 106A 120A 410A 2412918 18/10/2004 Mon 0445 EA VNIV 129A 359A 2455093 06/10/2004 Wed 2138 3A CNIC 103B 302B 375B 2454728 03/10/2004 Sun 1425 CB MSI 104A 330A 2412752 26/08/2004 Sun 1515 CB MSI 104A 330A 2412752 12/08/2004 Sun 1515 CB MSI 104A 330A	B E D B F N C 100  R D O F R G R 050  CF E D TN F N L 100  G M W TF L N C 100  R D B F N C 100  R D B F N C 050  P E D B F N C 070  L E D TO F N L 100 11  HMF R W EO L N C 070  I R D B F N C 070  F R D TO F R G R 050  M R D B F N F 070  F R D O F N C 100  2  R D O F N C 100  2
M/995/4.423 M/995/6.603 M/995/5.104 M/995/5.104 M/995/7.123 M/995/7.14 M/995/6.465 M/995/6.405 M/995/6.315 M/995/5.196 M/995/5.196 M/995/5.196 M/995/5.402 M/995/5.402 M/995/5.402 M/995/5.402 M/995/5.402 M/995/5.402 M/995/5.402 M/995/5.402	TOS RIVERBANK BOAD I RAMUI BOAD 2005 TAYLORS BOAD 5005 RIVERBANK BOAD 500 TAYLORS BOAD 100 SH IN 1500 RIVERBANK BOAD 1400 MAITORU VALLEY BOAD 1000 HIVERBANK BOAD I MILL BOAD 2105 WAERENGA BOAD 1005 TAYLORS BOAD I ARTHUR ST I RAMUI BOAD	2552489 21/05/2005 Fri 1926 FROSIC 181A 2552499 21/05/2005 Fri 1926 FROSIC 181A 2550971 02/03/2005 Med 0625 DACS1 410A 504A 2512574 11/02/2005 Fri 1927 BFCNIC 137A 407A 2550154 26/01/2005 Med 0830 DB VNI 130A 410A 2456177 12/12/2004 Sun 0920 GA VNIC 331A 350A 930 2413171 12/11/2004 Fri 2015 DACNI 127A 330A 2410088 25/10/2004 Mnd 2150 BFCSIV 106A 120A 410A 2412918 18/10/2004 Mnd 2138 JACNIC 103B 302B 375B 245503 06/10/2004 Sun 0715 EKCNIC 374B 2412772 29/08/2004 Thu 1400 FCCNICE 331A 2412593 12/08/2004 Thu 1400 FCCNICE 331A	B E D B F N 0 100  R D O F R G R 050  CF E D 7H F N L 100  G M W TF L N C 100 1  FJ M D B F N C 100  R D B F D N C 050  P E D B F N C 070 1  ED D D F N L 101 11  HMF R W DO L N C 070 1  R D B F N F 070  F R D B F N F 070  F R D B F N F 070  F R D O F X X 050 1 74  R D B F R G R 050
M/995/4.423 M/995/6.663 M/995/5.104 M/995/1.502 M/995/7.123 M/995/7.123 M/995/7.14 AGENINA ROAD M/995/6.515 M/995/6.515 M/995/5.516 M/995/5.302 M/995/5.450 M/995/5.450 M/995/5.450 M/995/5.450 M/995/5.450 M/995/5.104 M/995/5.766	TOS RIVERDANE BOAD I RAMUI BOAD 2003 TAYLORS BOAD 5003 RIVERBANE BOAD 500 TAYLORS BOAD 10W SH IN 150N RIVERBANE BOAD 140N WAITOHU VALLEY BOAD 100N RIVERBANE BOAD I MILL BOAD I MILL BOAD 1003 WAREBNAN BOAD 1003 TAYLORS BOAD I RATUR ST I BANUI BOAD I WARRENGA BOAD I WARRENGA BOAD I RATUR ST I BANUI BOAD I WARRENGA BOAD	2553080 01/07/2005 Fri 0905 QUV81 660A 2552459 27/06/2005 Fri 1520 FBCSIC 181A 2550971 02/03/2005 Wed 0625 FACSI 410A 504A 2515274 11/02/2005 Fri 1527 BFCNIC 137A 407A 2550154 26/01/2005 Wed 0830 DBVNI 330A 410A 2456177 12/12/2004 Sun 0520 0A VNIC 331A 350A 930 2413311 12/11/2004 Fri 2015 FACNI 128A 330A 241088 125/10/2004 Mon 0445 EA VNIV 128A 359A 2455003 06/10/2004 Mon 0445 EA VNIV 128A 359A 2455003 06/10/2004 Mon 0715 EECNIC 137A 2412772 29/08/2004 Sun 0715 EECNIC 374B 2412772 29/08/2004 Thu 1400 FCCNICE 331A 2451509 27/04/2004 Thu 1000 FCCNICE 331A 2451509 27/04/2004 Thu 1000 FCCNICE 331A 2451509 27/04/2004 Thu 1420 JA VNIC 302B 375B 901	B E D B F N C 100  R D O F R G R 050  CF E D TH F N L 100  G M W TF L N C 100 1  FJ M D B F N C 050  P E D B F N C 050  E D C F N L 100 11  HMF R W DO L N C 070 1  R D D F R G R 050  M R D B F N C 100  T R D C F R G R 050  F R D O F R G R 050  F R D O F R G R 050  F R D O F N C 100 2
M/995/4.423 M/995/6.603 M/995/5.104 M/995/7.105 M/995/7.123 M/995/7.14 AREBINGA ROAD M/995/6.405 M/995/6.515 M/995/6.515 M/995/5.106 M/995/5.450 M/995/5.450 M/995/5.104 M/995/5.104 M/995/5.106 M/995/5.106 M/995/5.106 M/995/5.106 M/995/5.106 M/995/5.106 M/995/5.106 M/995/5.106 M/995/5.106	TOS RIVERDANE ROAD  I RAMUI ROAD  2005 TAYLORS ROAD  5005 RIVERBANE ROAD  500 OTAKI GORGE ROAD  100 SI IN IN  1500 RIVERBANE ROAD  1400 WAITOHU VALLEY ROAD  1000 RIVERBANE ROAD  1001 ROAD  INIL ROAD  1005 TAYLORS ROAD  1005 TAYLORS ROAD  I RATERUR ST  I PANUI ROAD  8000 WAITOHU VALLEY ROAD	2553080 01/07/2005 Fri 0905 QU V81 660A 2552459 27/05/2005 Fri 1520 FB CSIC 181A 2550971 02/03/2005 Wed 0625 DA CSI 140A 504A 2512574 11/02/2005 Fri 1527 BF CNIC 137A 407A 2550154 26/01/2005 Wed 0830 DB VNI 130A 410A 2456177 12/12/2004 Sun 0520 0A VNIC 131A 350A 930 2413371 12/11/2004 Fri 2015 DA CNI 12PA 330A 241038 25/10/2004 Mon 2150 BF CSIV 106A 120A 410A 2412918 18/10/2004 Mon 0445 EA VNIV 12PA 359A 2455093 06/10/2004 Wed 2138 JA CNIC 101B 302B 375B 2454720 301/10/2004 Sun 0715 EECENIC 378B 2412722 29/08/2004 Thu 1400 FC CNICE 331A 2415103 06/05/2004 Thu 1400 FC CNICE 331A 2451050 60/05/2004 Thu 1400 FC CNICE 331A 2451050 60/05/2004 Thu 1400 FC CNICE 331A 2451050 20/04/2004 VE 1420 JA VNIC 101A 331A 2451050 20/04/2004 Thu 1400 FC CNICE 331A 2451050 20/04/2004 Thu 1400 FC CNICE 331A	B E D B F N 0 100  R D O FR G R 050  CF E D TH F N L 100  G M M TFL N C 100 1  FJ M D B F N C 100  R D B F N C 050  P E D B F N C 070 1  ED D TO F N L 100 11  HMF R W DO L N C 070 1  R D D B F N C 070 2  R D D F N C 070 1  E D D O F N L 100 11  HMF R W DO L N C 070 1  R D D F N C 070 1  R D D F N C 070 1  R D D F N C 070 1  F R D D F N C 070 1  F R D D F N C 070 1  R D B F R G R 050  R M D D F N C 100 2  R D D F N C 100 2  R D D F N C 100 174  R D B F R G R 050  CF E W O L N L 100 1
1M/995/4.423 1M/995/6.693 1M/995/5.104 1M/995/7.105 1M/995/7.123 1M/995/7.14 AGRENIOA ROAD 1M/995/4.233 1M/995/6.515 1M/995/6.515 1M/995/5.196 1M/995/5.970 1M/995/3.402	TOS RIVERDANE BOAD I RAMUI BOAD 2003 TAYLORS BOAD 5003 RIVERBANE BOAD 500 TAYLORS BOAD 10W SH IN 150N RIVERBANE BOAD 140N WAITOHU VALLEY BOAD 100N RIVERBANE BOAD I MILL BOAD I MILL BOAD 1003 WAREBNAN BOAD 1003 TAYLORS BOAD I RATUR ST I BANUI BOAD I WARRENGA BOAD I WARRENGA BOAD I RATUR ST I BANUI BOAD I WARRENGA BOAD	2553080 01/07/2005 Fri 0905 QUV81 660A 2552459 27/06/2005 Fri 1520 FBCSIC 181A 2550971 02/03/2005 Wed 0625 FACSI 410A 504A 2515274 11/02/2005 Fri 1527 BFCNIC 137A 407A 2550154 26/01/2005 Wed 0830 DBVNI 330A 410A 2456177 12/12/2004 Sun 0520 0A VNIC 331A 350A 930 2413311 12/11/2004 Fri 2015 FACNI 128A 330A 241088 125/10/2004 Mon 0445 EA VNIV 128A 359A 2455003 06/10/2004 Mon 0445 EA VNIV 128A 359A 2455003 06/10/2004 Mon 0715 EECNIC 137A 2412772 29/08/2004 Sun 0715 EECNIC 374B 2412772 29/08/2004 Thu 1400 FCCNICE 331A 2451509 27/04/2004 Thu 1000 FCCNICE 331A 2451509 27/04/2004 Thu 1000 FCCNICE 331A 2451509 27/04/2004 Thu 1420 JA VNIC 302B 375B 901	B E D B F N C 100  R D O F R G R 050  CF E D TH F N L 100  G M W TF L N C 100 1  FJ M D B F N C 050  P E D B F N C 050  E D C F N L 100 11  HMF R W DO L N C 070 1  R D D F R G R 050  M R D B F N C 100  T R D C F R G R 050  F R D O F R G R 050  F R D O F R G R 050  F R D O F N C 100 2

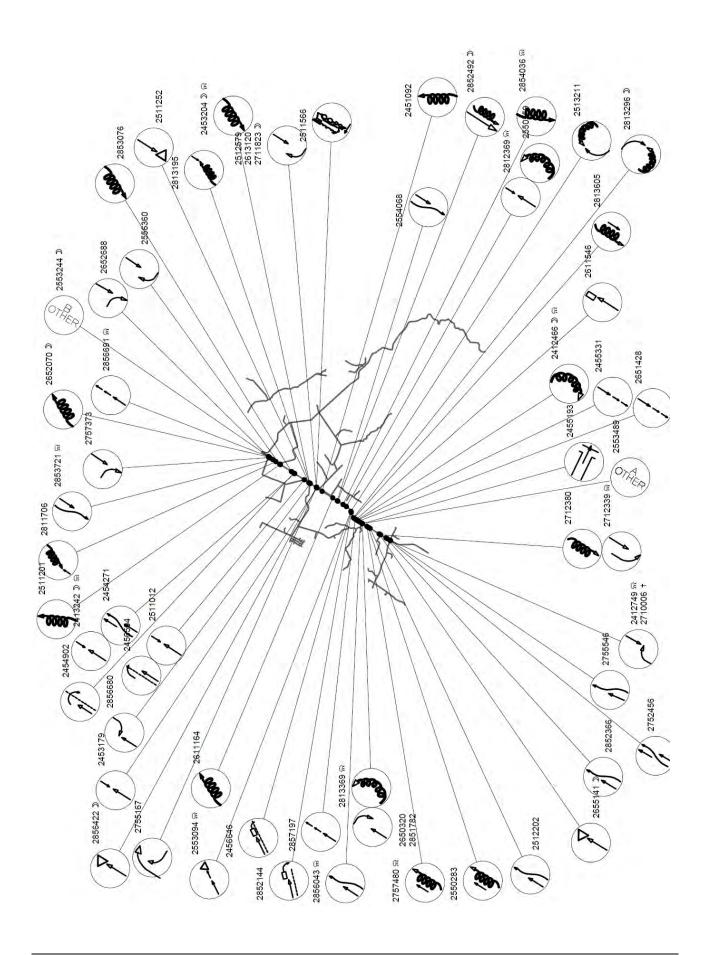




### 4.2 Stage B: Addington Road to Peka Peka

NZ TRAN	ISPORT AGENCY				Coc	led Cr	asn :	repor	t, ru	n on	24-0		09, P	
irst Street	D   Second street	Crash   Date	Day Time	Pactors and Roles	1	0	C	W L	W	J C	M :	\$ 7	otal	P
	I   or landmark	Number	1	1	1.	В		E I		0 0			Inj	E
	I R I	1	M D	A is for vehicle I		J		T G		N N		D L F	SM	D
		1 1	V R	B is for web I etc		c		ET		T R			EI	
	Distance	DD/MM/YYY	Y DDD HHMM T 1 234		1	T		s	R	L			RN	e
/995/7.643	I ADDINGTON ROAD	2055501 20/12/200	8 Tue 1143 FD CNIC	2218 2518							c 1	100		
/995/13.734	SOON TE HAPUA ROAD		8 Fri 1235 FD CNICC					D B			C 1			
995/10.446	I TE HORO BEACH ROAD		0 Fri 1114 LB MN1C								P 0			
995/13.674	560N TE HAPUA ROAD		8 Sat 1803 AD MS1C					D B	F		C 1		1	
995/10.853	I SCHOOL ROAD	2856422 18/11/200		911		w	R	D DO	F		C 0			
995/14.084	150N TE HAPUA ROAD	2856043 06/11/200	8 Thu 1821 AC TNIT	159A 381A 137B		3	R	w o	L	N	C 1	100		
995/14.234	I TE HAPUA ROAD		8 Sat 1340 DB CNIC	111A			R	w o	L	T S	c 1	100	1	
995/13.634	600N TE HAPUA ROAD	2813296 30/10/200	8 Thu 2153 BF CNIC	101A 111A 514A			м	D DN	F	N	C 1	100	2 1	
995/10.406	40N TE HORO BEACH ROAD		8 Fri 1150 BE CNIC	500A			R	D B	r	20	L 0	080	2	
95/12.634	1600N TE HAPUA ROAD	2854036 06/08/200	8 Wed 1210 CB TS1	137A 197A		V.	B.	w B	F	20	L 1	100		
95/12.853	2000S SCHOOL ROAD	2812369 27/06/200	8 Fri 0800 BACNIC	125A 150A			R	w o	В	207	c 1	100	1	
995/7.942	300s ADDINGTON ROAD	2853721 07/06/2000	8 Sat 1025 ACCS1C	145A 372A 387B 927			R	w o	L	D N	L 1	100		
95/15.777	300N PERA PERA ROAD	2852366 22/05/200	8 Thu 1555 AC CNIC	103A 381A			R	D O	P	N	L 1	100		
95/9.19	2000S OTAKI GORGE ROAD	2853076 18/05/200	8 Sun 1630 CC CS1	410A		F	R	D B	F	N	L 1	100		
95/12.293	1440S SCHOOL ROAD	2852492 08/05/200	8 Thu 2121 AFCS1C	197A 400A 632A 1568		v	R	D DN	F	22	L 1	100		
95/13.304	930N TE HAPUA ROAD	2852144 26/04/200	8 Sat 1035 GC CNIC	372B 929		G	E	D B	F	D N	C 1	100		
95/14.234	I TE HAPUA ROAD	2851782 25/04/2001	8 Fri 1200 JACNIC	301B 382B			R	D B	E	T S	C 1	100		
95/8.152	510S ADDINGTON ROAD		8 Thu 1615 BE CSIC	137A 331A 927			R	D B	F	D N	L 1	100	1 3	
95/14.534	300S TE HAPUA ROAD	2757480 25/12/200	7 Tue 1755 AD CN1	135A 402A		G	R	W O	L	N	L 1	100		
95/7.742	100s ADDINGTON ROAD	2757373 13/12/200	7 Thu 1148 KB CS1C	300B 375B 929			R	0 0	F	D N	L 1	100		
012/0	I PEKA PEKA ROAD	2755546 12/09/200	7 Wed 1643 ACCNIC	159A 173A			R	D O	F	K N	P 1	100		
95/10.852	I SCHOOL ROAD	2755167 28/08/200	7 Tue 1725 JC CW2C	302A 360A 375A			R	D B	F	T G	P 1	100		
995/15.429	I TE KOWHAI ROAD	2712380 07/07/200		136A 610A			R	D O	Ε	T G	C 1	100	1	
95/15.429	I TE KOWHAI ROAD	2712339 21/06/200	7 Thu 1104 GB TSIVC	145B 372B			R	w o	H	T G	L 1	100	4	
95/10.852	I SCHOOL ROAD	2711823 27/04/200	7 Fri 1708 JACS1C	302B 377B			R	D TO	F	T G	0 0	080	1	
95/15.877	200N PEKA PEKA ROAD		7 Thu 1600 AA CNIC	372A		r		D B			L 1			
95/16.041	I HADFIELD ROAD		7 Tue 1620 LB 481CO			м		D B				100 1		
95/10.852	I SCHOOL ROAD		6 Fri 0918 JACSIC	302B 377B							L 0:		2	
95/15.341	700N HADFIELD ROAD	2655141 25/09/200		912		W		D DN			L 1			
95/7.642	I ADDINGTON ROAD			125A 302B 302B							c 1			
95/7.684	50s ADDINGTON ROAD	2652070 06/05/200		101A 517A 524A				D DN			C 1			
995/13.014	420N TE HAPUA ROAD		6 Thu 1300 EA VN10	330A 443B 668B		М		D B			L 1		1	
995/13.974	260N TE HAPUA ROAD		6 Sun 0820 FD CS14	181A 376A 831				D B			C 1			
995/11.953	1100s school ROAD	2611164 22/02/200		125A 504A		8.		D B			L 1		1	
995/14.226	I TE HAPUA ROAD		6 Sat 1315 JA CNIC	301B 375B				D B			L 1			
995/8.403 995/13.234	I OLD HAUTERE ROAD 1000N TE HAPUA ROAD		5 Fri 1235 JACSIV 5 Tue 1400 BF VS14	303B 375B					F		L 1		1 1	
<b>N</b>	TOWN IN INCOME.	2010211 007117200	. 140 1400 00 7014	1208 1108 1408									port	(ne
NZ TRAN WAKA KOTAI	ISPORT AGENCY				Co	ded C			rt, r	un or	n 24-	-06-2	009,	
st Street	D   Second street	Crash Date	Day Time	Factors and Roles	1	В	G	W L			M A		Total Inj	
	1					J		T G			R		THO	
							R						FSM	
	R. I	1 1	M D	A is for vehicle 1	7	E	R			CT	K		AEI	
	R I		V R	B is for yeh 2 etc	1			N H E T		C T T R		М		1 .
	Distance	1 1		8 is for weh 2 etc	1		v	N H			s		TRN	
995/10:844			V R M VN VV YY DDD HHMM T 1 23	B is for weh 2 etc	1		V E	N H E T	E	T R	s	Ŧ		
	Distance   I SCHOOL ROAD	1	V R M VN VV YY DDD HHMM(T 1 23	B is for veh 2 etc 4 i 302B 360B 377B	1		V E	N H E T S D B	ER	T R L T G	\$	T 100	TRN	
95/13.234	Distance  I SCHOOL ROAD  1000M TE HAPUA ROAD		V R M VN VV YY DDD HHMM(T 1 23 05 Wed 0753 JAVS1C 05 Wed 1020 FFVN1C	8 is for veh 2 etc 41 302B 360B 377B	1		V E R	N H E T S D B	E R %	T R L T G N	. s	T 100 100		
95/13.234 95/12.253	Distance   I school Road   1000M TE HAPUA ROAD   1400S SCHOOL ROAD	DD/MM/YYY 2512579 03/08/200 2553094 22/06/200 2554068 22/06/200	V R M VN VV YY DDD HHMM T 1 23 05 Wed 0753 JAVS1C 05 Wed 1020 FFVN1C 05 Wed 1000 ACCS1T	N B is for veh 2 etc 4 I 302B 360B 377B 181A 381A 386A	1		V E R R	N H E T S D B W O D O	E R % % %	T R L T G N N	P C	T 100 100 100		
95/13.234 95/12.253 95/14.234	Distance  I SCHOOL ROAD  1000N TE HAPUA ROAD  1400S SCHOOL ROAD  I TE HAPUA ROAD	2512579 03/08/290 2553094 22/06/200 2554066 22/06/200 2554089 18/06/200	V R M VN VV 17 DDD HHMM T 1 23 15 Wed 0753 JA V31c 15 Wed 1020 FFVN1c 15 Wed 1000 Accsit 15 Sat 1125 Accsic	V B is for veh 2 etc 4 I 302B 360B 377B 181A 381A 386A 156A 157A	1	E C	V E R R	N H E T S D B W O D O D	ERF	T R L T G N N T S	. S	T 100 100 100 100		
995/13.234 995/12.253 995/14.234 995/8.453	Distance  I SCHOOL ROAD  1000M TE HAPUA ROAD  1400S SCHOOL ROAD  I TE HAPUA ROAD  503 OLD HAUTERE ROAD		V R M VN VV Y DDD HHMM(T 1 23 05 Wed 0753 JA V31c 55 Wed 1020 FFVNIc 05 Wed 1000 ACCSIT 05 Sat 1125 ACCSIC 05 Thu 2025 BCCSIC	8 is for veh 2 etc 4 i 3028 3608 3778 181A 381A 386A 156A 157A 120A 197B		E C T	V E R R R	N H E T S D B O D O D D D	E R F F F N F	T R L T G N N T S N	P :	T 100 100 100 100		
95/13.234 95/12.253 95/14.234 95/8.453 95/12.853	Distance  I SCHOOL ROAD  1000M TE HAPUA ROAD  1400S SCHOOL ROAD  I TE HAPUA ROAD  508 OLD HAUTERE ROAD  2000S SCHOOL ROAD	1	V R M VN VV Y DDD HHMM(T 1 23 05 Wed 0753 JA V51c 05 Wed 1020 FFVN1c 05 Sat 1125 AOCS1c 05 Thu 2025 BOCS1c 05 Thu 1722 DB CN1	N B is for veh 2 etc 4 I 302B 360B 377B 181A 381A 386A 156A 157A 120A 197B 136A 622A	1	E C	V E R R R R E	N H E T S W O D D O D D D D	ERFF	T R L T G N N T S N N	P : L : P :	T 100 100 100 100 100	1	
95/13.234 95/12.253 95/14.234 95/8.453 95/12.053 95/14.726	Distance  I SCHOOL ROAD  1000M TE HAPUA ROAD  1400S SCHOOL ROAD  I TE HAPUA ROAD  500 OLD HAUTERE ROAD  2000S SCHOOL ROAD  500 TE HAPUA ROAD	1	V R   W N V W   W N V W   W N V W W   W N V W   W N V W   W N V W N   W N V M N V N V N V N V N V N V N V N V N	B is for veh 2 etc 4   302B 360B 377B 181A 381A 384A 156A 157A 157A 157A 134A 622A 103A 159A 384A 532B		E C T	V E R R R R E R	N H E T S D B O D O D D O D O D O D	ERFF	T R L T G N N T S N N N	. S	T 100 100 100 100 100 100	1	
95/13.234 95/12.253 95/14.234 95/8.453 95/12.853 95/14.726 95/10.344	Distance  I SCHOOL ROAD  1000M TE HABUA ROAD  1400S SCHOOL ROAD  I TE HABUA ROAD  503 OLD HAUTER ROAD  2000S SCHOOL ROAD  500S TE HABUA ROAD  500M SCHOOL ROAD	2512579 03/09/200 25533094 22/08/200 25534089 12/08/200 2553440 09/08/200 2553234 09/08/200 2552550 03/03/200 25122202 27/02/200 2511252 26/02/200	V R. V DDD HHMMT 1 23 55 Wed 0753 JA V91C 55 Wed 1030 FF VNIC 55 Wed 1030 ACSIT 55 Sat 1125 AO CSIC 55 Thu 1025 BO CSIC 55 Thu 1722 DB CNI 55 Sun 0724 AC CNIT 55 Sat 1059 EC CSI	8 is for veh 2 etc v	1	E C T	V E R R R R R R R R	N H E T S D B D D D D D D D D D D D D D D D D D	E R F F F F F F F F F F F F F F F F F F	T R L T G N N N N N N N	. s	T 100 100 100 100 100 100 100	1 2	
95/13.234 95/12.253 95/14.234 95/8.453 95/12.853 95/14.726 95/10.344 OL ROAD	Distance  I SCHOOL ROAD  1000M TE HAPUA ROAD  1400S SCHOOL ROAD  I TE HAPUA ROAD  500 OLD HAUTERE ROAD  2000S SCHOOL ROAD  500 TE HAPUA ROAD	1	V R V N VV VV V DDD HHMMT 1 23  55 Wed 0753 JA V31C  55 Wed 1020 FF VN1C  56 Wed 1020 ACSIT  57 Sat 1125 AG CSIC  57 Thu 1722 DB CN1  58 Sun 0724 AC CN1T  55 Sat 1094 EG CSI  55 Sat 1094 EG CSI  56 Sat 1094 EG CSI  57 Sat 1095 EG CSI	B is for veh 2 etc 4   302B 360B 377B 181A 381A 384A 156A 157A 157A 157A 134A 622A 103A 159A 384A 532B	1	E C T	V E R R R R E R R R	N H E T S D B D D D D D D D D D D D D D D D D D	E R F F F F F F F F F F F F F F F F F F	T R L L T G N N N N N N N T	. S	T 100 100 100 100 100 100 080	1	1
95/13.234 95/12.253 95/14.234 95/8.453 95/12.853 95/12.726 95/10.344 OL ROAD 95/8.438	Distance  I SCHOOL ROAD  1000M TE HAPUA ROAD  1400S SCHOOL ROAD  I TE HAPUA ROAD  500 HAUTERE ROAD  2000S SCHOOL ROAD  500 TE HAPUA ROAD  500 M SCHOOL ROAD  200 M SCHOOL ROAD  200 M SCHOOL ROAD	1	V R. V DDD HHMMT 1 23 55 Wed 0753 JA V91C 55 Wed 1030 FF VNIC 55 Wed 1030 ACSIT 55 Sat 1125 AO CSIC 55 Thu 1025 BO CSIC 55 Thu 1722 DB CNI 55 Sun 0724 AC CNIT 55 Sat 1059 EC CSI	N B is for veh 2 etc  4    302B 360B 377B 181A 381A 386A 156A 157A 120A 197B 136A 622A 103A 159A 386A 532B 158A 178A 357A 300A 326A 130A 602A	1	E C T	V E R R R R R R R R R	N H E T S D B D D D D D D D D D D D D D D D D D	ERFF	T R L T G N N N N N N N N N N	P	T 100 100 100 100 100 100 080 080 100	1 2 2	1
95/13.234 95/12.253 95/14.234 95/8.453 95/12.953 95/12.953 95/10.344 OL ROAD 95/8.438 95/14.626	Distance  I SCHOOL ROAD  1000M TE HAPUA ROAD  14008 SCHOOL ROAD  I TE HAPUA ROAD  508 OLD HAUTERE ROAD  2000S SCHOOL ROAD  500 M TE HAPUA ROAD  500 M SCHOOL ROAD  500 M SCHOOL ROAD	1	V R V N VV V DDD HHMM T 1 23 05 Wed 0753 JA V91C 05 Wed 1020 FF VN1C 05 Wed 1020 A C CSIT 05 Sat 1125 A C CSIC 05 Thu 2025 BO CSIC 05 Thu 1722 DB CN1 05 Sat 1059 E CCSI 05 Sat 1054 Q C CW1 05 Thu 1730 CB MN1	8 is for veh 2 etc 4 i  3028 3608 3778 181A 386A 156A 157A 120A 1978 136A 622A 103A 159A 386A 5328 159A 170A 357A 300A 326A 130A 680A		E C T	V E R R R R R R R R R R	N H E T S D B B D O D D D D B B D D D D D D D D D	ERFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF	T R L L T G N N N N N N N N N N N N N N N N N N	P	T 100 100 100 100 100 100 080 080 100	1 2 2	1
995/13.234 995/12.253 995/14.234 1995/8.453 1995/12.053 1995/14.726 1995/10.344 100 ROAD 1995/8.438 1995/8.438 1995/8.438	Distance  I SCHOOL ROAD  1000M TE HAFUA ROAD  1400S SCHOOL ROAD  I TE HAFUA ROAD  500 OLD HAUTERE ROAD  2000S SCHOOL ROAD  500 TE HAFUA ROAD  500M TE HAFUA ROAD  100 SH IN  2000M TE HORO BEACH ROAD  400S TE HORO BEACH ROAD	2512579 03/09/200 2553094 22/08/200 2553094 22/08/200 2553048 18/08/200 2553244 09/08/200 2553259 03/03/200 2512202 27/02/200 2511252 26/02/200 2511252 16/02/200 2511201 17/02/200 2511201 19/02/200 2511201 19/01/200	V R   W N V W   W N V W W N V W W N V W W N W N W N W N	8 is for veh 2 etc   4     302B 360B 377B 181A 381A 386A 156A 157A 150A 187B 196A 622A 103A 159A 386A 532B 158A 178A 357A 300A 326A 130A 682A 150A 386A 150A 386A	1	E C T	V E R R R R R R R R R R R R	N H E T S D B W O O D O D D D O D D D D D D D D D D D		T R L L T G N N N N N N N N N N N N N N N N N N	P : C : C : C : C : C : C : C : C : C :	T 100 100 100 100 100 100 080 100 100 100	1 2 2	1
995/13.234 995/12.253 995/14.234 95/0.453 995/14.726 995/10.344 OL ROAD 995/14.426 995/10.043	Distance  I SCHOOL ROAD  1000M TE HAPUA ROAD  14008 SCHOOL ROAD  I TE HAPUA ROAD  508 OLD HAUTERE ROAD  2008 SCHOOL ROAD  508 TE HAPUA ROAD  508 TE HAPUA ROAD  20E SH IN  2000M TE HORO BEACH ROAD  408 TE HAPUA ROAD  I TE MANA ROAD  I TE MANA ROAD	1	V R N VN VV VV DDD HHMMT 1 23  55 Wed 0753 JA VS1C  55 Wed 1020 FF VN1C  55 Wed 1020 AC SIT  55 SAT 1125 AC CS1C  55 Thu 1722 DB CN1  55 SAT 1059 EC CS1  55 Thu 1730 CB MN1  55 Thu 1730 CB MN1  55 Thu 1730 CB MN1  55 Men 0900 AD CNIT  55 SAT 1045 BA CNIC	8 is for veh 2 etc   4     302B 360B 377B 181A 381A 386A 156A 157A 150A 187B 196A 622A 103A 159A 386A 532B 158A 178A 357A 300A 326A 130A 682A 150A 386A 150A 386A		E C T	V E R R R R R R R R R R R R R	N H E T S D B W O O D O D D D O D D D D D D D D D D D	E R F F F F F F F F F F F F F F F F F F	T R L L T G N N N N N N N N N N N N N N N N N N		T 100 100 100 100 100 100 080 100 100 100	1 2 2	1
995/13,234 995/12,253 995/12,253 995/12,253 995/12,053 995/12,053 995/12,053 995/10,344 905/10,344 905/10,043 995/10,043 995/10,043 995/10,043	Distance  I SCHOOL ROAD  1000M TE HABUA ROAD  1400S SCHOOL ROAD  I TE HABUA ROAD  500 ALD HAUTERE ROAD  2000S SCHOOL ROAD  500M TE HABUA ROAD  200 SH IN  2000M TE HORO BEACH ROAD  400S TE HABUA ROAD  I TE MAKA ROAD	10b/Met/YYY 2512579 03/08/200 2553044 22/06/200 25534068 22/06/200 2553489 16/06/200 2553244 09/06/200 2553252 109/06/200 2512202 27/06/200 2511252 26/02/200 2511252 109/01/200 2511201 17/02/200 2511201 17/02/200 2511201 29/01/200 2511202 29/01/200	V R N VN VV VV DDD HHBMNT 1 23 15 Wed 0753 JA V31C 15 Wed 1020 FF VN1C 15 Wed 1020 AC SIT 15 Wat 1020 BOCS1C 15 Thu 1022 BOCS1C 15 Thu 1022 BOCS1C 15 Thu 1022 BOCS1C 15 Sun 0724 AC CNIT 15 Sat 1059 EC CS1C 15 Thu 1730 CB NN1C 15 M00 0900 AD CNIT 15 Sun 1240 AC NICT 15 Sun 1240 AC NICT 15 Sun 1250 AB AC NICC 14 Fri 0915 OE CNIC	N 8 is for veh 2 etc  4    3028 3608 3778  181A  381A 386A  156A 157A  120A 197B  136A 622A  103A 159A 386A 532B  159A 176A 357A  200A 326A  130A 682A  130A 682A  130A 682A  135A 386A  125A 410A  155A 160A 929  412A		E C T	V E R R R R R R R R R R R R R	N H E T S D B W O D O D D D D D D D D D D D D D D D D		T R L L T G N N N N N N N N N N N N N N N N N N	P	T 100 100 100 100 100 080 100 100 100 100	1 2 2 1 1 1	1
995/13,234 995/12,253 995/14,234 995/14,234 995/14,726 995/14,726 995/14,726 995/14,626 995/14,043 995/14,626 995/10,043 995/10,043 995/13,253	Distance  I SCHOOL ROAD  1000M TE HAFUA ROAD  1400S SCHOOL ROAD  I TE HAFUA ROAD  500 OLD HAUTERE ROAD  500S TE HAFUA ROAD  500M TE HAFUA ROAD  500M TE HORO BEACH ROAD  400S TE HAFUA ROAD  I TE WAKA ROAD  I TE WAKA ROAD  1000S OLD HAUTERE ROAD  1000S SCHOOL ROAD	1	V R. V DDD HHMMT 1 23 DDD HHMMT 1 1 23 DD HT 2025 BOCSIC DD HMM 20	8 is for veh 2 etc   4     302B 360B 377B 181A 381A 386A 156A 157A 120A 197B 136A 622A 103A 159A 386A 532B 159A 178A 357A 300A 324A 130A 682A 150A 386A 1125A 410A 155A 160A 929 412A 333A 370A 929		E C T	V E R R R R B R R R R R R R E	N H E T S D B W O D D D D D D D D D D D D D D D D D D		T R L L T G N N N N N N N N N N N N N N N N N N	P	T 100 100 100 100 100 100 100 100 100 10	1 2 2 1 1 1	1
995/13.234 995/12.253 995/14.234 995/14.653 995/14.726 995/14.726 995/14.38 995/14.626 995/14.033 995/14.033 995/14.036 995/14.039 995/14.039 995/14.039	Distance  I SCHOOL ROAD  1000M TE HAPUA ROAD  14008 SCHOOL ROAD  I TE HAPUA ROAD  508 OLD HAUTERE ROAD  20008 SCHOOL ROAD  500M SCHOOL ROAD  500M SCHOOL ROAD  500M SCHOOL ROAD  1008 H N  2000M TE HORG BEAUM ROAD  400S TE HAPUA ROAD  I TE WANAR ROAD  I TE WANAR ROAD  1008 OLD HAUTERE ROAD  2400S SCHOOL ROAD  350M TE HAPUA ROAD		Y R N VN WY  TY DDD HHMMT 1 23  TH VN VN WY  TY DDD HHMMT 1 1 23  TH VN VN WY  TY DDD HHMMT 1 1 23  TH VN VN WY  TH VN VN VN VN VN  TH VN VN VN VN VN VN VN  TH VN  T	8 is for veh 2 etc   4     302B 360B 377B 181A 381A 386A 156A 157A 150A 187B 196A 622A 100A 159A 386A 532B 158A 178A 357A 300A 326A 130A 682A 150A 386A 125A 410A 155A 160A 929 412A 331A 370A 929		E C T	VE RRRRERRRRRR	N H E T S D B W O O D O D D D D D D D D D D D D D D D		T R L L T G N N N N N N N N N N N N N N N N N N	P	T 100 100 100 100 100 100 100 100 100 10	1 2 2 1 1 1	1
995/13,234 995/12,253 995/14,234 995/14,234 995/14,234 995/14,234 995/13,853 995/12,853 995/14,266 995/16,436 995/16,436 995/16,436 995/16,437 995/16,438	Distance  I SCHOOL ROAD  1000M TE HAPUA ROAD  14008 SCHOOL ROAD  I TE HAPUA ROAD  SOS OLD HAUTERE ROAD  2008 SCHOOL ROAD  500M ECHOOL ROAD  500M ECHOOL ROAD  20E SH IN  2000M TE HAPUA ROAD  I TE WARAR ROAD  I TE WARAR ROAD  1 TE WARAR ROAD  10008 OLD HAUTERE ROAD  14008 SCHOOL ROAD  350M TE HAPUA ROAD  I TE WARAR ROAD  10008 OLD HAUTERE ROAD  150M TE HAPUA ROAD  I TE HAPUA ROAD	1	V R N VN VV VV DDD HHBMNT 1 23  55 Wed 0753 JA V91c  55 Wed 1020 FF VN1c  55 Wed 1020 FF VN1c  55 Wed 1020 ACSIT  56 Wed 1020 ACSIT  57 Wed 1020 ACSIT  58 Wed 1020 ACSIT  59 Wed 1020 ACSIT  59 Wed 1020 ACSIT  50 Wed 1020 A	8 is for veh 2 etc 4 i 3028 3608 3778 181A 381A 386A 156A 157A 120A 197B 136A 622A 103A 156A 386A 532B 156A 187A 300A 326A 130A 602A 150A 386A 125A 410A 155A 160A 92P 412A 333A 370A 92P 331A 353A 335A 354A		E C T	V E R R R R R R R R R R R R R R R	N H E T S S D B W O O O O O O O O O O O O O O O O O O		T R L L L L L L L L L L L L L L L L L L		T 100 100 100 100 100 100 100 100 100 10	1 2 2 3 1 1 1 1 1	1 1 1 1
995/10.844 995/13.234 995/12.253 995/14.234 995/14.234 995/14.726 995/14.726 995/14.726 995/14.328 995/10.043 995/10.043 995/10.043 995/13.253 995/13.884 995/14.234	Distance  I SCHOOL ROAD  1000M TE HABUA ROAD  1400S SCHOOL ROAD  I TE HABUA ROAD  500 SCH HAUTERE ROAD  2000S SCHOOL ROAD  500 STE HABUA ROAD  500M TE HABUA ROAD  TOE SH IN  2000M TE HORO BEACH ROAD  400S TE HABUA ROAD  I TE WANA ROAD  I TE WANA ROAD  1000S OLD HAUTERE ROAD  2400S SCHOOL ROAD  350M TE HABUA ROAD  I TE HABUA ROAD  I TE HABUA ROAD  I TE HABUA ROAD  I TE HABUA ROAD	10b/88/YYY 2512579 03/08/200 2533044 22/06/200 2534068 22/06/200 2534089 16/06/200 2533244 09/06/200 2531252 26/02/200 2511252 26/02/200 2511250 17/02/200 2511250 17/02/200 2511251 26/02/200 2511251 26/02/200 2511251 17/02/200 2511251 17/02/200 2511251 17/02/200 2511251 17/02/200 2511251 17/02/200 2456464 16/11/200 2456464 16/11/200 2456491 19/10/200 2455199 19/10/200 245199 19/10/200	V R N VN V	8 is for veh 2 etc   4     102B 360B 377B 181A 181A 386A 156A 157A 120A 197B 136A 622A 100A 159A 386A 532B 159A 176A 357A 300A 326A 130A 682A 130A 682A 130A 386A 1125A 110A 155A 160A 92P 412A 333A 370A 925 331A 353A 335A 354A 692A 303B 387B		E C T	VE RRRRERRRRRRRERR	N H E T S S D B W O O O D D D D D D D D D D D D D D D D		T R L L L L L L L L L L L L L L L L L L		T 100 100 100 100 100 100 100 100 100 10	1 2 2 1 1 1	1 1 1 1
995/13,234 995/12,253 995/12,253 995/14,254 995/14,726 995/14,726 995/14,726 995/14,726 995/14,626 995/14,626 995/14,626 995/14,626 995/14,626 995/14,234 995/13,253 995/13,253 995/14,234 995/14,234 995/14,033	Distance  I SCHOOL ROAD  1000M TE HABUA ROAD  1400S SCHOOL ROAD  I TE HABUA ROAD  500 OLD HAUTERE ROAD  500S TE HABUA ROAD  500M TE HABUA ROAD  100S SCHOOL ROAD  10E SH IN  2000M TE HORO BEACH ROAD  1 TE WAKA ROAD  1 TE WAKA ROAD  1 TE WAKA ROAD  1000S OLD HAUTERE ROAD  2400S SCHOOL ROAD  350M TE HABUA ROAD  1 TE HABUA ROAD	2512579 03/08/200 2533094 22/06/200 2534060 22/06/200 2534080 18/06/200 2534080 18/06/200 2535244 09/06/200 2512202 27/02/200 2511252 26/02/200 2511251 17/02/200 2511261 17/02/200 2511261 17/02/200 251262 26/12/200 251262 26/12/200 2512749 16/06/200 2512749 16/06/200 2512749 16/06/200	V R N VN VV VV DDD HHMMT 1 23  55 Wed 0753 JA V31C  55 Wed 1020 FF VN1C  55 Wed 1020 BOCSIC  55 Thu 1025 BOCSIC  56 FP 1035 BOCNIC  57 Wed 1035 BOCNIC  58 Wed 1035 BOCNIC  58 Wed 1035 BOCNIC  59 Wed 1035 BOCSIC  59 Wed 1035 BOCSIC  50 Wed 1030 BOCSIC  50 Wed 103	8 is for veh 2 etc   4     302B 360B 377B 181A 381A 386A 156A 157A 120A 197B 136A 622A 103A 159A 386A 532B 158A 178A 357A 300A 324A 130A 682A 130A 682A 125A 410A 155A 160A 929 412A 333A 370A 929 331A 353A 335A 354A 692A 333B 387B 372B		E C T	VE 医鼠鼠鼠鼠鼠鼠鼠鼠鼠鼠鼠鼠鼠鼠鼠鼠	N H E T S S S S S S S S S S S S S S S S S S		T R L L L L L L L L L L L L L L L L L L	S	T 100 100 100 100 100 100 100 100 100 10	1 2 2 3 1 1 1 1 1	1 1 1 1
999/13,234 999/12,253 999/12,253 995/14,234 995/14,234 995/12,953 995/12,953 995/12,344 005, ROAD 995/10,043 995/10,043 995/10,043 995/10,043 995/13,284 995/14,234 995/14,234 995/14,234 995/14,234	Distance  I SCHOOL ROAD  1000M TE HAPUA ROAD  14008 SCHOOL ROAD  I TE HAPUA ROAD  SOS OLD HAUTERE ROAD  20008 SCHOOL ROAD  500M SCHOOL ROAD  500M SCHOOL ROAD  500M SCHOOL ROAD  100 SH IN  2000M TE HORO BEACH ROAD  400S TE HAPUA ROAD  I TE MAKA ROAD  I TE MAKA ROAD  10008 OLD HAUTERE ROAD  24008 SCHOOL ROAD  350M TE HAPUA ROAD  I TE HAPUA ROAD  I TE HAPUA ROAD  1 TE HAPUA ROAD  I HADIFIELD ROAD  10008 OLD HAUTERE ROAD	1512579 03/08/YYY 2512579 03/08/YYY 2512579 03/08/200 2553469 12/06/200 2553469 18/06/200 2553489 18/06/200 2553244 09/06/200 2511252 16/02/200 2511252 16/02/200 2511251 17/02/200 2511251 19/01/200 2511251 09/01/200 2413242 26/11/200 2413242 26/11/200 2413543 10/10/200 2455531 10/10/200 2455531 10/10/200 2455531 19/10/200 2455531 19/10/200 2455531 19/10/200 2455531 19/10/200 2455331 19/10/200 2455331 19/10/200 2455331 19/10/200 2455331 19/10/200 2455331 19/10/200	V R V N VV VV V V V V V V V V V V V V V	8 is for veh 2 etc   4     302B 360B 377B   181A   381A 386A   156A 157A   120A 187B   196A 622A   103A 155A 386A 532B   158A 178A 357A   300A 326A   130A 682A   125A 410A   155A 160A 929   412A   331A 370A 929   331A 353A   335A 3354A   692A 303B 387B   372B		E C T	VE 医鼠鼠鼠鼠鼠鼠鼠鼠鼠鼠鼠鼠鼠鼠鼠鼠鼠	N H E T S S S S S S S S S S S S S S S S S S		T R G N N N N N N N N T G N N N T G N N N N	S	T 100 100 100 100 100 100 100 100 100 10	1 2 2 3 1 1 1 1 1	1 1 1 1
999/13, 234 999/12, 253 999/12, 253 999/14, 234 999/12, 253 999/14, 253 999/14, 256 999/10, 344 909/10, 344 909/10, 344 909/10, 043 999/10, 043 999/10, 043 999/10, 043 999/10, 043 999/10, 043 999/10, 043 999/10, 043 999/10, 043 999/10, 043 999/10, 043 999/10, 043 999/10, 043 999/10, 043	Distance  I SCHOOL ROAD  1000M TE HAPUA ROAD  1400S SCHOOL ROAD  I TE HAPUA ROAD  500 SCHOOL ROAD  500 SCHOOL ROAD  500M SCHOOL ROAD  500M SCHOOL ROAD  500M SCHOOL ROAD  500M TE HAPUA ROAD  10E SH IN  2000M TE HORO BEACH ROAD  400S TE HAPUA ROAD  I TE MAKA ROAD  I TE MAKA ROAD  1000S SCHOOL ROAD  500M TE HAPUA ROAD  1000S SCHOOL ROAD  500M TE HAPUA ROAD  I TE HAPUA ROAD  I TE HAPUA ROAD  1 TE HAPUA ROAD  1 HADTIELD ROAD  1000S OLD HAUTERE ROAD  1000S OLD HAUTERE ROAD  1000S OLD HAUTERE ROAD	1	V R   V N W W W W W W W W W W W W W W W W W W	8 is for veh 2 etc vi 4 i 3028 3608 3778 181A 381A 386A 156A 157A 120A 197B 136A 622A 103A 156A 386A 532B 156A 187A 300A 326A 130A 602A 150A 386A 125A 480A 155A 160A 929 412A 333A 370A 929 331A 353A 335A 354A 692A 303B 387B 372B 372B		E C T	VE 农民民民民民民民民民民民民民民民民民民民民民民民	N H H E T T S D B W O O O O O D B B B B D O B B B B B D B B B B		T R R N N N N N N N N N N N N N N N N N	S	T 100 100 100 100 100 100 100 100 100 10	1 2 2 3 1 1 1 1 1	1 1 1 1
995/13,234 995/12,253 995/14,234 995/14,234 995/14,234 995/14,234 995/13,853 995/12,853 995/14,266 995/16,436 995/16,436 995/16,436 995/16,437 995/16,438	Distance  I SCHOOL ROAD  1000M TE HAPUA ROAD  14008 SCHOOL ROAD  I TE HAPUA ROAD  SOS OLD HAUTERE ROAD  20008 SCHOOL ROAD  500M SCHOOL ROAD  500M SCHOOL ROAD  500M SCHOOL ROAD  100 SH IN  2000M TE HORO BEACH ROAD  400S TE HAPUA ROAD  I TE MAKA ROAD  I TE MAKA ROAD  10008 OLD HAUTERE ROAD  24008 SCHOOL ROAD  350M TE HAPUA ROAD  I TE HAPUA ROAD  I TE HAPUA ROAD  1 TE HAPUA ROAD  I HADIFIELD ROAD  10008 OLD HAUTERE ROAD	1512579 03/08/279 2513094 22/06/200 2513094 22/06/200 2513094 22/06/200 2513094 22/06/200 2513095 03/03/200 2513220 27/02/200 2511252 26/02/200 2511252 16/02/200 2511251 26/02/200 2511261 17/02/200 2511261 17/02/200 2511261 17/02/200 2511270 17/02/200 2511270 17/02/200 2511270 17/02/200 2511270 17/02/200 2511270 17/02/200 2511270 17/02/200 2451271 17/02/200 2451271 17/09/200 2451271 17/09/200 2451271 17/09/200 2451271 17/09/200 2451271 17/09/200 2451271 17/09/200 2451271 17/09/200 2451271 17/09/200 2451271 17/09/200 2451271 17/09/200 2451271 17/09/200 2451271 17/09/200 2451271 17/09/200 2451271 17/09/200 2451271 17/09/200 2451271 17/09/200	V R V N VV VV V V V V V V V V V V V V V	8 is for veh 2 etc   4     302B 360B 377B   181A   381A 386A   156A 157A   120A 187B   196A 622A   103A 155A 386A 532B   158A 178A 357A   300A 326A   130A 682A   125A 410A   155A 160A 929   412A   331A 370A 929   331A 353A   335A 3354A   692A 303B 387B   372B		E C T	VE RRRRERRRRRRRERRRRRRR	N H H E T T S D B W O O O O O D B B B B D O B B B B B D B B B B		T R R N N N N N N N N N N N N N N N N N	S	T 100 100 100 100 100 100 100 100 100 10	1 2 2 3 1 1 1 1 1	1 1 1 1



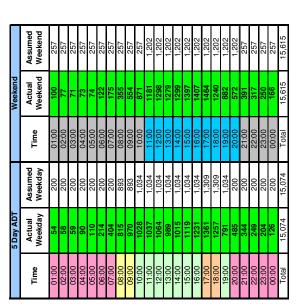


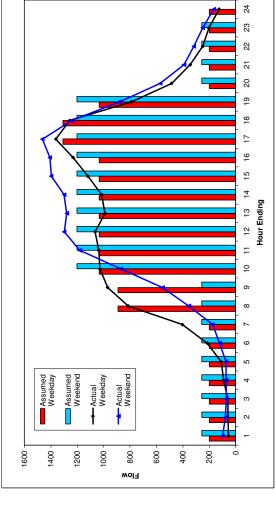


- 5 Addendum E Annualisation Factors
- 5.1 Stage A: North of Otaki to Addingon / Otaki Gorge Road



## Otaki Stage A 01N00998 - Economic Flow Profile April 2009





Economic Hour Summary	mary		
	Hours	Volume	veh/hr
AM Peak	2	1,785	893
Inter Peak	∞	8,274	1034
PM Peak	2	2,618	1309
Off Peak	12	2,397	200
Weekend 10 - 20	9	12,019	1202
Weekend 20 - 10	41	3,596	257
Off Peak Proportion of the Inter Peak	of the Inter Peak		
Interpeak	80	8,274	1034
Offpeak	12	2,397	200
% of interpeak	12		19.3%
Weekend Proportion of the Inter Peak	of the Inter Peak		
Inter Peak	80	8274	1034
Weekend 10 - 20	10	12019	1202
% of interpeak	10		116.2%
Weekend Off Peak Proportion of the Inter Peak	oportion of the Inte	r Peak	
Interpeak		8,274	1034
Weekend 20 - 10	41	3,596	257
% of internesk	14		%8 PC

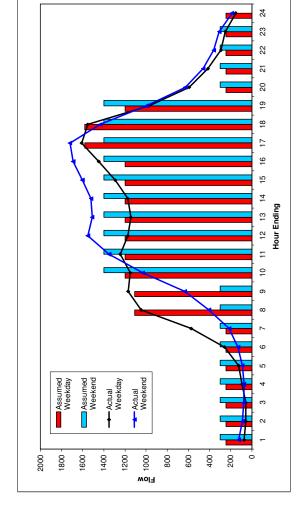
C:Work/Otaki Bypass/Kapiti SH1 Strategy - Otaki Economics\[2008 traffic data Ohau.xls]Summary Sunday



# Otaki Stage B 01N01011 - Economic Flow Profile April 2009

5.2

### Stage B: Addington Road to Peka Peka



Economic Hour Summary	nmary		
	Hours	Volume	veh/hr
AM Peak	2	2,217	1109
Inter Peak	∞	9,598	1200
PM Peak	2	3,163	1582
Off Peak	12	2,942	245
Weekend 10 - 20	10	14,010	1401
Weekend 20 - 10	41	4,187	536
Off Peak Proportion of the Inter Peak	or the inter Peak		
Interpeak	∞	9,598	1200
Offpeak	12	2,942	245
% of interpeak	12		20.4%
Weekend Proportion of the Inter Peak	n of the Inter Peak		
Inter Peak	∞	9598	1200
Weekend 10 - 20	10	14010	1401
% of interpeak	10		116.8%
Weekend Off Peak F	Weekend Off Peak Proportion of the Inter Peak	r Peak	
Interpeak		9,598	1200
Weekend 20 - 10	14	4,187	299
% of interpeak	14		24.9%

	5 Day ADT			Weekend	
Time	Actual Weekday	Assumed Weekday	Тіте	Actual Weekend	Assumed Weekend
01:00	- 22	245	01:00	125	299
02:00	99	245	05:00	88	299
03:00	69	245	00:60	92	299
04:00	92	245	04:00	74	299
02:00	125	245	00:50	06	588
00:90	529	245	00:90	131	599
00:20	229	245	00:20	214	599
08:00	1047	1,109	00:80	407	299
00:60	1170	1,109	00:60	633	588
10:00	1150	1,200	10:00	1034	588
11:00	1244	1,200	11:00	1351	1,401
12:00	1172	1,200	12:00	1551	1,401
13:00	1144	1,200	13:00	1511	1,401
14:00	1174	1,200	14:00	1521	1,401
15:00	1292	1,200	15:00	1604	1,401
16:00	1448	1,200	16:00	1690	1,401
17:00	1610	1,582	17:00	1721	1,401
18:00	1553	1,582	18:00	1434	1,401
19:00	974	1,200	19:00	266	1,401
20:00	594	245	20:00	089	1,401
21:00	416	245	21:00	460	299
22:00	292	245	22:00	360	299
23:00	250	245	23:00	308	299
00:00	152	245	00:00	187	299
Total	17,920	17,920	Total	18,197	18,197

C:Work/Otaki Bypass\Kapiti SH1 Strategy - Otaki Economics\(2008 traffic data Ohau.xls\)Summary Sunday



- 6 Addendum F BCR and FYRR Results
- 6.1 Stage A: North of Otaki to Addingon / Otaki Gorge Road



### **WORKSHEET 3**

### **COST-BENEFIT ANALYSIS**

1. Project Options			
	Do Minimum	Option 1 - Expressway	Option 1 - Expressway
DISCOUNTED COSTS:			Net Costs of the Project Options (\$)
2. Construction Costs	\$0.00	\$71,779,154.86	\$71,779,154.86
3. Maintenance Costs	\$0.00	\$0.00	\$0.00
4. Design Costs (7% of Construction)	\$0.00	\$0.00	\$0.00
5. Total Costs (2) to (4)	\$0.00	\$71,779,154.86	\$71,779,154.86
DISCOUNTED BENEFITS:			Net Benefits of the Project Options (\$)
6. Travel Time Costs	\$85,464,919.03	\$47,492,610.69	\$37,972,308.34
7. Vehicle Operating Costs	\$63,031,503.77	\$74,318,275.69	-\$11,286,771.92
8. Accident Costs	\$23,790,398.66	\$5,726,325.56	\$18,064,073.10
9. Seal Ext. / Passing Lane			\$0.00
10. Carbon Dioxide (4% of VOC)	\$2,521,260.15	\$2,972,731.03	-\$451,470.88
11. Total Benefits (6) to (10)	\$174,808,081.61	\$130,509,942.96	\$44,298,138.65
12. B/C Ratio (11) / (5)			9.0
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**WORKSHEET 5** FIRST YEAR RATE OF RETURN

<b>←</b> 0	Preferred Project Option
N C	Present Value of 1 oral Inet Costs

Mid Point of First Year of Benefits (Relative to Time Zero) Discount Factor (SPPWF) for First Year of Benefits

Option 1 - Expressway 71,779,155 7.50 0.5615

Travel Time Savings Vehicle Operating Costs Accident Costs Seal Extr Benefits Passing Lane Benefits Carbon Dioxide (@ 4% of VOC) Other Monetised Eachrs	(9)	(7) \$2,935,566.12 -\$900,045.35 \$1,486,826.31 \$0.00
Travel Time Savings Vehicle Operating Costs Accident Costs Seal Extr Benefits Passing Lane Benefits Carbon Dioxide (@ 4% of VOC)		\$2,935,566.12 -\$900,045.35 \$1,486,826.31 \$0.00
Vehicle Operating Costs Accident Costs Seal Extr Benefits Passing Lane Benefits Carbon Dioxide (@ 4% of VOC)		-\$900,045.35 \$1,486,826.31 \$0.00
Accident Costs Seal Extr Benefits Passing Lane Benefits Carbon Dioxide (@ 4% of VOC)		\$1,486,826.31 \$0.00
Seal Extr Benefits Passing Lane Benefits Carbon Dioxide (@ 4% of VOC) Other Monetised Factors		\$0.00
Passing Lane Benefits Carbon Dioxide (@ 4% of VOC) Other Monetised Factors		
Carbon Dioxide (@ 4% of VOC) Other Monetised Factors		\$0.00
Other Monetised Factors		-\$36,001.81
		\$0.00
9 Present Value of Tangible Benefits in First Year		\$3,486,345.26
10 First Year Rate of Return (9)/(2)		2%

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### 6.2 Stage B: Addington Road to Peka Peka

Page 1
WORKSHEET 3

**COST-BENEFIT ANALYSIS** 

÷.	Project Options			
		Do Minimum	Option 1 - Expressway	Option 1 - Expressway
DIS	DISCOUNTED COSTS:			Net Costs of the Project Options (\$)
٥i	Construction Costs	\$0.00	\$75,197,209.86	\$75,197,209.86
က်	Maintenance Costs	\$0.00	\$0.00	\$0.00
4	Design Costs (7% of Construction)	\$0.00	\$0.00	\$0.00
5.	Total Costs (2) to (4)	\$0.00	\$75,197,209.86	\$75,197,209.86
DIS	DISCOUNTED BENEFITS:			Net Benefits of the Project Options (\$)
9	Travel Time Costs	\$132,726,566.15	\$108,931,109.50	\$23,795,456.65
7.	Vehicle Operating Costs	\$156,304,591.15	\$170,291,376.66	-\$13,986,785.51
œ	Accident Costs	\$72,366,783.41	\$16,926,763.74	\$55,440,019.67
<u>о</u>	Seal Ext. / Passing Lane			\$0.00
10.	Carbon Dioxide (4% of VOC)	\$6,252,183.65	\$6,811,655.07	-\$559,471.42
Ξ.	Total Benefits (6) to (10)	\$367,650,124.36	\$302,960,904.97	\$64,689,219.39
12.	B/C Ratio (11) / (5)			0.9
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WORKSHEET 5	
FIRST YEAR RATE OF RETURN	

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### Stages A & B: North of Otaki to Peka Peka 6.3

WORKSHEET 3

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		Page 1	
		Page 1	

1 Project Options			
	Do Minimum	Option 1 - Expresswav	Option 1 - Expresswav
DISCOUNTED COSTS:			Net Costs of the Project Options (\$)
2. Construction Costs	\$0.00	\$146,976,364.72	\$146,976,364.72
3. Maintenance Costs	\$0.00	\$0.00	\$0.00
4. Design Costs (7% of Construction)	\$0.00	\$0.00	\$0.00
5. Total Costs (2) to (4)	\$0.00	\$146,976,364.72	\$146,976,364.72
DISCOUNTED BENEFITS:			Net Benefits of the Project Options (\$)
6. Travel Time Costs	\$218,191,485.18	\$156,423,720.19	\$61,767,764.99
7. Vehicle Operating Costs	\$219,336,094.92	\$244,609,652.35	-\$25,273,557.42
8. Accident Costs	\$96,157,182.07	\$22,653,089.30	\$73,504,092.77
9. Seal Ext. / Passing Lane			\$0.00
10. Carbon Dioxide (4% of VOC)	\$8,773,443.80	\$9,784,386.09	-\$1,010,942.30
11. Total Benefits (6) to (10)	\$542,458,205.97	\$433,470,847.93	\$108,987,358.04
12. B/C Ratio (11) / (5)			0.7
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**COST-BENEFIT ANALYSIS** 

<b>WORKSHEET 5</b>	
FIRST YEAR RATE OF RETURN	

Preferred Project Option     Present Value of Total Net Costs     Mid Point of First Year of Benefits (Relative to Time Zero)     Discount Factor (SPPWF) for First Year of Benefits			Option 1 - Expressway 146,976,365 7.50 0.5615
	Net Annual Benefit (at Time Zero)	Growth Rate (as a decimal)	PV of Benefits in First Year (1.0 + (3)*(6))*(4)*(5)
	(5)	(9)	(2)
Travel Time Savings Vehicle Operating Costs Accident Costs Seal Extr. Benefits Passing Lane Benefits Carbon Dioxide (@ 4% of VOC) Other Monetised Factors			\$4,678,379.68 \$1,958,084.95 \$6,050,009.77 \$0.00 \$0.00 \$78,323.40 \$0.00
9 Present Value of Tangible Benefits in First Year			\$8,691,981.10
10 First Year Rate of Return (9)/(2)			%9

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