# APPENDIX F **Environmental Social Responsibility Screens** (ESRs) RELEASED UNIDIER UNIT

NZ TRANSPORT AGENCY



#### Use to assess options in the Indicative Business Case

Use this screen to identify opportunities and risks and assess options for state highway projects. Complete the screen for each option to distinguish them from one another or bundle options where appropriate. Screen results will signal where technical assessments are required and provide a written record to support the alternatives assessment required for statutory applications. For further assistance contact the <u>EUD Team</u>.



		OR Are there HAIL or SLUR (contaminated) sites within 200m of the area of interest?	Y	Ν	
SOCIAL	S1	Does the option affect access to community facilities i.e. libraries, open space etc (either temporarily or permanently)?	Y N Which?		NZTA MapHub Project Team District Plan Maps
	S2	Does the option affect community cohesion and accessibility including vehicular connectivity on the local road network?	Y	Ν	Council and Community Strategy Documents
	ULD 1	Are there opportunities to enhance infrastructure for, and/or improve access to, public transport and/or active modes of travel such as as walking and cycling?	Y	N	NZTA MapHub Environmental and Social Risk Map- Natural Environment (Scenic Routes)
URBAN AND LANDSCAPE DESIGN	ULD2	Does the option enhance the development potential of adjacent land where appropriate?	Y	Ν	Regional Land Transport Plan Project Team
	ULD3	Is the option located on a themed highway? Is the option part of or near a national cycle or walking route?	Y	N	Strategies and District Plan
	ULD4	Are there opportunities to enhance the urban character, landscape character and visual amenity?	Y	Ν	



Answers and Comments Refer	to screen questions explanation to help complete this part.
1. Summarize the potential environ Consider short and long term ris	nmental and social risks/impacts associated with this option. sks and impacts.
NATURAL ENVIRONMENT:	
CULTURAL AND HISTORIC HERITAGE:	THE CT
HUMAN HEALTH:	NOFER DA AND
SOCIAL:	ED UNIT ABUT
The responses above will be used in the URBAN AND LANDSCAPE DESIGN:	EAS MEON
	above into the economy, social and geography sections of the IBC assessment of options summary table. cial integration, landscape design or urban design benefits or opportunities presented by this option? s that could be use if not considered early in the design process.
3. Are there any impacts, risks or a Is further information required t	opportunities which require preliminary technical assessments to help understand risks or opportunities? to support the development of the detailed business case or can it be left until the detailed business case/pre-implementation?

Completed by		
Reviewed by NZTA Project Manager		
Incorporated results into IBC assessment of options summary table?	Yes	Νο



#### Use to assess options in the Indicative Business Case

Use this screen to identify opportunities and risks and assess options for state highway projects. Complete the screen for each option to distinguish them from one another or bundle options where appropriate. Screen results will signal where technical assessments are required and provide a written record to support the alternatives assessment required for statutory applications. For further assistance contact the <u>EUD Team</u>.



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	S2	Does the option affect community cohesion and accessibility including vehicular connectivity on the local road network?	Y	Ν	Council and Community Strategy Documents
	ULD 1	Are there opportunities to enhance infrastructure for, and/or improve access to, public transport and/or active modes of travel such as as walking and cycling?	Y	N	NZTA MapHub Environmental and Social Risk Map- Natural Environment (Scenic Routes)
URBAN AND LANDSCAPE DESIGN	ULD2	Does the option enhance the development potential of adjacent land where appropriate?	Y	Ν	Regional Land Transport Plan Project Team
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	ULD4	Are there opportunities to enhance the urban character, landscape character and visual amenity?	Y	Ν	



Answers and Comments Refer	to screen questions explanation to help complete this part.
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Completed by		
Reviewed by NZTA Project Manager		
Incorporated results into IBC assessment of options summary table?	Yes	Νο



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Use this screen to identify opportunities and risks and assess options for state highway projects. Complete the screen for each option to distinguish them from one another or bundle options where appropriate. Screen results will signal where technical assessments are required and provide a written record to support the alternatives assessment required for statutory applications. For further assistance contact the <u>EUD Team</u>.



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	S2	Does the option affect community cohesion and accessibility including vehicular connectivity on the local road network?	Y	Ν	Council and Community Strategy Documents
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Answers and Comments Refer	to screen questions explanation to help complete this part.
1. Summarize the potential environ Consider short and long term ris	nmental and social risks/impacts associated with this option. sks and impacts.
NATURAL ENVIRONMENT:	
CULTURAL AND HISTORIC HERITAGE:	THE CT
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Completed by		
Reviewed by NZTA Project Manager		
Incorporated results into IBC assessment of options summary table?	Yes	Νο



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SOCIAL	S1	Does the option affect access to community facilities i.e. libraries, open space etc (either temporarily or permanently)?	Y N Which?		NZTA MapHub Project Team District Plan Maps
	S2	Does the option affect community cohesion and accessibility including vehicular connectivity on the local road network?	Y	Ν	Council and Community Strategy Documents
	ULD 1	Are there opportunities to enhance infrastructure for, and/or improve access to, public transport and/or active modes of travel such as as walking and cycling?	Y	N	NZTA MapHub Environmental and Social Risk Map- Natural Environment (Scenic Routes)
URBAN AND LANDSCAPE DESIGN	ULD2	Does the option enhance the development potential of adjacent land where appropriate?	Y	Ν	Regional Land Transport Plan Project Team
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Answers and Comments Refer	to screen questions explanation to help complete this part.
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Completed by		
Reviewed by NZTA Project Manager		
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	ULD 1	Are there opportunities to enhance infrastructure for, and/or improve access to, public transport and/or active modes of travel such as as walking and cycling?	Y	N	NZTA MapHub Environmental and Social Risk Map- Natural Environment (Scenic Routes)
URBAN AND LANDSCAPE	ULD2	Does the option enhance the development potential of adjacent land where appropriate?	Y	Ν	Regional Land Transport Plan Project Team
DESIGN	ULD3	Is the option located on a themed highway? Is the option part of or near a national cycle or walking route?	Y	N	Strategies and District Plan
	ULD4	Are there opportunities to enhance the urban character, landscape character and visual amenity?	Y	Ν	



Answers and Comments Refer	to screen questions explanation to help complete this part.
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3. Are there any impacts, risks or a Is further information required t	opportunities which require preliminary technical assessments to help understand risks or opportunities? to support the development of the detailed business case or can it be left until the detailed business case/pre-implementation?

Completed by		
Reviewed by NZTA Project Manager		
Incorporated results into IBC assessment of options summary table?	Yes	Νο

# APPENDIX G Final Multi Criteria Analysis

RELEASED UNDER THE ACT

LANE E	EXTENSION					
Business case name	SH10 Waipapa Road Int Improvements	tersection	Name of Project Region	: Manager &	Sebastian Reed Northland	l, Auckland /
Business case purpose	To upgrade the SH10 V safety, and to promote					n, efficiency,
Option description	<b>Description:</b> The Klina SH10, Waipapa Road ar outcome that tries to p intersection.	nd Waipapa I	Loop Road. This e	xtension is p	ractically essent	ial for any
			MO	AAS	A A A A A A A A A A A A A A A A A A A	
R	Dependencies: Nove	M				BRAWING IN PROGRESS
Estimated	Dependencies: None	IN	Lowe			DRAWING IN PROGRESS
Estimated total public	- Chin	M	Lowe \$361.0		-	pper 0.194
total public sector funding	Capital cost (\$m):		Lowe \$361,0		-	pper 0,194
total public sector	Capital cost (\$m): Net property cost (\$m				-	-
total public sector funding	Capital cost (\$m): Net property cost (\$m Opex (\$m/30yr):				-	-
total public sector funding	Capital cost (\$m): Net property cost (\$m	r):			-	-
total public sector funding	Capital cost (\$m): Net property cost (\$m Opex (\$m/30yr): Maintenance (\$m/30y Present value of cost (\$m):	r):			-	-
total public sector funding requirement	Capital cost (\$m): Net property cost (\$m Opex (\$m/30yr): Maintenance (\$m/30y Present value of cost (\$m):	r):			-	-

#### NZ TRANSPORT AGENCY

# ASSESSMENT SUMMARY TABLE – DO MINIMUM: KLINAC LANE EXTENSION

C the day	<b>C</b>	
Criterion	Score	Discussion
Objective 1: Economic Growth through integrated land-use	0	This option scored neutral for the first objective of <i>Economic Growth</i> as it is likely to make no effect to the economics of the area in terms of either aiding or restricting it.
Objective 2: Improve network efficiency		This option increases traffic at the intersection of SH10, Waipapa Road and Waipapa Loop Road. This traffic increase will saturate the intersection and adversely affect the SH10 traffic.
Objective 3: Improve safety by reducing crossing/turning crashes	-	This option increases the traffic at the intersection of SH10, Waipapa Road and Waipapa Loop Road, thereby increasing the risk of crossing/turning crashes.
Objective 4: Facilitate growth of multi-modal travel	0	This option has scored neutral for facilitating multi-modal travel as it is likely to make no effect to facilitate multi-modal travel in the area in terms of either aiding or restricting it.
Feasibility	0	As this option has already been decided to go ahead by EMBC, it is considered feasible and scored neutral in comparison to the other options.
Affordability	0	This option scored neutral for affordability as this project is most likely to go ahead regardless of the Waipapa Road intersection Improvements and will be funded in part by ENDC.
Public/Stake-holders		As the public stakeholders consider the intersection at SH10, Waipapa Road and Waipapa Loop Road to be a bad and unsafe intersection. ' <i>Do</i> Nothing' will not be an acceptable option at this site.
Environmental and social		Although this option will not fix the issues with the intersection at SH10, Waipapa Road and Waipapa Loop Road; it will however, aid in dealing with the traffic in its proximity and offering better solutions to the businesses in and around it.
Safety	50	This oppion increases the traffic at the intersection of SH10, Waipapa Road and Waipapa Loop Road, thereby increasing the risk of crossing/turning crashes. This option does not address the needs of pedestrians and cyclists.
Economy	all a	This option scored neutral for economy as this option as it is likely to make no effect to the economics of the area in terms of either aiding or restricting it.
Environmental opportunities	There is will imp	some opportunity to improve the stormwater capacity on Klinac Lane, which rove the overflow during flood events.
Social opportunities	There m	ay be some social opportunities based on the needs of the local businesses.
Rationale for selection or rejection of alternative	approac been ex benefici	ion ranked 6 <sup>th</sup> of those assessed. It was believed that a Do-Minimum h will not be met favourably by the public and stakeholders as they have pecting improvements to the intersection. This option would also not be al in terms of improvements to safety and efficiency, which will degrade with increase in traffic over time.

ASSESS	AENT SUMMARY TA		
Business case name	SH10 Waipapa Road Intersection Improvements	Name of Project Manager & Region	Sebastian Reed, Auckland / Northland
Business case purpose	To upgrade the SH10 Waipapa Ro safety, and to promote of multi-m		
Option description	<b>Description:</b> This option will invo room due to the existing width or unimpeded, and provide right tur	f the road. This will allow the t	hrough traffic to continue
	The dis-benefit of this option will add to the difficulty of exiting the		traffic will likely increase and
R			
$\checkmark$			
R	Dependencies: None		
Estimated total public	FU	Lower	Upper
total public sector	Capital cost (\$m):	\$5,030,208	\$5,722,276
total public sector funding	Capital cost (\$m): Net property cost (\$m):		
total public sector funding	Capital cost (\$m): Net property cost (\$m): Opex (\$m/30yr):	\$5,030,208	\$5,722,276
Estimated total public sector funding requirement	Capital cost (\$m): Net property cost (\$m):	\$5,030,208	\$5,722,276
total public sector funding	Capital cost (\$m): Net property cost (\$m): Opex (\$m/30yr):	\$5,030,208	\$5,722,276
total public sector funding	Capital cost (\$m): Net property cost (\$m): Opex (\$m/30yr): Maintenance (\$m/30yr): Present value of cost to govt. (\$m):	\$5,030,208	\$5,722,276
total public sector funding requirement	Capital cost (\$m): Net property cost (\$m): Opex (\$m/30yr): Maintenance (\$m/30yr): Present value of cost to govt. (\$m):	\$5,030,208	\$5,722,276

ASSESSME	NT S	UMMARY TABLE – RIGHT TURN BAY
Criterion	Score	Discussion
Objective 1: Economic Growth through integrated land- use	+	This option provides a slightly better situation than <i>Do Minimum</i> in terms of improved local business access. However, this option still poses some level of impediment to local traffic from Waipapa Road crossing the SH10.
Objective 2: Improve network efficiency	0	The benefit to SH10 through-traffic from separating the <i>right</i> turning traffic is offset by the longer and less straight-forward route for the cross-traffic. Therefore, the net effect remains neutral.
Objective 3: Improve safety by reducing crossing/turning crashes	-	Whilst some safety benefit is delivered to right turners exiting Waipapa Road, the northbound through-traffic may travel at faster speeds, no longer impeded by traffic turning right from SH10. Additionally, the increased traffic movements at Waipapa Loop Road North will create more conflict with SH10 traffic and the shops opposite.
Objective 4: Facilitate growth of multimodal travel	++	This option will mean that pedestrian movements are well provided for, with uncontrolled crossing points as this option offers some of the shortest walking routes across the intersection. Cycling (stal) o reasonably well catered for in this option.
Feasibility		N.E. and S.W. corners will remain unaffected and with least impact on the S.E. corner. On the N.W. corner major land take is required. Some property access in industrial area will be slightly affected by change to one way in Skipperstane. In terms of consenting, this option is neutral relative to the other options, as at this early stage, it is considered that the each of the options is equally consentable. For this option the whole of Nite/maintenance costs will be minimal.
Affordability	<b>1</b> 0	Whilst costs vary somewhat between options, the affordability of whatever become the preferred option will be considered to be "affordable" if economically viable overall.
Public/Stake- holders		Whilst the public may recognise some benefit, any non-roundabout option is likely to be seen as nett dis-benefit as such. This is due to the fact that the other options really do not address the full extent of the problems in the area of the intersection at SH10, Waipapa Road and Waipapa Loop Road.
Environmental and social	C	Good pedestrian connectivity to all amenities. Slight dis-benefit for motorists as straight through movement from Waipapa Loop Road is no longer possible. Full access to existing walking and cycling facilities. Least land take.
Safet	-	Whilst some safety benefit is delivered to right turners exiting Waipapa Road, the northbound through-traffic may travel at faster speeds, no longer impeded by traffic turning right from SH10. Additionally, the increased traffic movements at Waipapa Loop Road North will create more conflict.
Economy	+	Refer to the Traffic Modelling Report, Opus June 2017 which details that this option will make slight benefits when compared to the other options including <i>Do Nothing.</i>
Environmental opportunities	There a	are no identified environmental opportunities connected with this option.
Social opportunities	There a	are no identified social opportunities connected with this option.
Rationale for selection or rejection of alternative		$2^{nd}$ of those assessed as it does not meet the safety, environmental and/or social s as some of the other options.

AF profile	<u>Strategic fit</u>	М	Effectivene	<u>.ss</u>	Н	Efficiency M
iming of need:	Optimal programme:		Likely:			
Estimated BCR	k range					
$\smile$	Present value of cost (\$m):	t to govt.				
$(\bigcirc)^{\vee}$	Maintenance (\$m/30	-				
	Opex (\$m/30yr):					
unding equirement	Net property cost (\$)	m):	\$	998,750	)	\$1,198,500
ector	Capital cost (\$m):		\$6	,186,23	6	\$7,069,265
stimated otal public	allest			Lower		Upper
(	Dependencies: None	1 All				DRAWING IN PROGRI
		E P	OG	200		
			JIE	A		
	mm	W.	112	)	2	P
	1+11				jes -	ap
	MARIN V			~	5	
		1		- The	R	Alts C
	1-12-17	MAS	SH1			
Option description		op Road. It is reduction (A	understood ustroads Roa	that urb d Safety	oan rounda / Engineeri	
Business case ourpose	To upgrade the SH10 safety, and to promot					conomic growth, efficiency, ion.
	Improvements	Manager &	Region	Sebast	ian Reed, A	Auckland / Northland

Criterion	Score	Discussion
Objective 1: Economic Growth through integrated land- use	+++	This option provides a significantly better situation than <i>Do Minimum</i> in terms of ease of movement in all directions and provides a gateway treatment to the Waipapa area. It also provides the optimum economic growth and integrated land-use solutions in terms of tourism, i.e. for Twin Coast Discovery Highway movements.
Objective 2: Improve network efficiency	++	This option provides the best overall efficiency benefits but the pedestrian crossing points are necessarily some distance from the desire lines for crossing. It also provides the optimum solutions for network efficiency in terms of tourism, i.e. for Twin Coast Discovery Highway movements.
Objective 3: Improve safety by reducing crossing/turning crashes	++	This option will significantly reduce the number of conflict points and, for most users, will represent a safe and easy option. Even though roundabouts can have a higher number of crashes, compared to other intersection treatments, but these tend to be of a lesser severity due to lower speeds. It is assumed cycling provision can be carefully designed for.
Objective 4: Facilitate growth of multimodal travel	+	This option can provide well thought out pedestrian movements, with uncontrolled crossing points. But some of the walking comes across the intersection are at some distance from the desire lines. Cycling provision can be carefully designed for but less confident cyclists may find roundabouts less desirable
Feasibility		This option will require land in take from all four corners, and will have the largest overall footprint of all the considered options. Access within industrial area will largely remain unaffected to terms of consenting, this option is neutral relative to the other options, as at this early stage, it is considered that the each of the options is equally consentable. In terms of whole of the option/maintenance this option will pose greater stress on seal, so will require higher maintenance and/or earlier reseal. Landscaping maintenance also a factor for this option.
Affordability	0	Whilst toosts van somewhat between options, the affordability of whatever become the preferred option will be considered to be "affordable" if economically viable overall.
Public/Stake- holders	FE	The community are all very much expecting the solution to be a roundabout, based on various prior forms of awareness of a potential project at this intersection. The community is also expecting this option to be selected due to the success of the nearby SH10 / Kerikeri Rd Roundabout. In the eyes of the community, this option will be the best solution.
Environmental and social		The pedestrian connectivity to all amenities will have to be considered carefully but is achievable as it will be potentially affected by free-flowing traffic. This option will provide easier access for motorists for all movements. Full access to existing walking and cycling facilities can also be accommodated. This option will require the largest amount of land in-take, with a significant effect on the dairy.
Safety	++	This option will significantly reduce the number of conflict points and, for most users, will represent a safe and easy option. Even though roundabouts can have a higher number of crashes, compared to other intersection treatments, but these tend to be of a lesser severity due to lower speeds. It is assumed cycling provision can be carefully designed for.
Economy	++	A Traffic Modelling Study was conducted and found that that this option is preferred between all the options considered.
Environmental opportunities		s some opportunity to clean up any potential contamination from the land in-take he orchard. Also, for some landscaping on the actual roundabout.
Social opportunities	There a	are no social opportunities associated with this option.
Rationale for selection or rejection of alternative	with go	ntion ranked 1 <sup>st</sup> of the options considered as it provides the best safety benefits and efficiency and economic benefits. The dis-benefit being that this option is the expensive of the options considered.

Business case name	SH10 Waipapa Road Intersection Improvements	Name of Project Manager & Region	Sebastian Re	ed, Auckland / Nor	thland
Business case purpose	To upgrade the SH10 W safety, and to promote o				vth, efficiency,
Option description	Description: This option Waipapa Loop Road. It is turning vehicles, making cyclists. Traffic Signals t Safety Engineering Tool controlled.	s understood that ir g it easier for all rig ypically have a 30-3	nstalling traffic s ht turning move 35% effectivenes	ignals will remove t ments, pedestrians s in crash reductior	he conflict for and off-road (Austroads Road
	Disbenefits of this optic inter-peak periods, and north of Whangarei, whi	potential issues rela	ated to this then	being the only set	of traffic signals
			DEP	TIOR	A Pro .
			2 PA		
_	ELEAS	Mage Co			
$\bigcirc$	St nest				
S.	Dependencies: None				DRAWING IN PROGRES
R.	Dependencies: None				DRAWING IN PROGRES
Est mater			Lower		DRAWING IN PROGRES
otal public sector	Capital cost (\$m):		\$5,809,6		56,597,650
tota public sector funding	Capital cost (\$m): Net property cost (\$m)				
tota public sector funding	Capital cost (\$m): Net property cost (\$m) Opex (\$m/30yr):		\$5,809,6		56,597,650
tota public sector funding	Capital cost (\$m): Net property cost (\$m) Opex (\$m/30yr): Maintenance (\$m/30yr	):	\$5,809,6		56,597,650
tota public sector funding requirement	Capital cost (\$m): Net property cost (\$m) Opex (\$m/30yr): Maintenance (\$m/30yr Present value of cost to	):	\$5,809,6		56,597,650
Estimated BC Timing of need:	Capital cost (\$m): Net property cost (\$m) Opex (\$m/30yr): Maintenance (\$m/30yr Present value of cost to	): o govt. (\$m):	\$5,809,6		56,597,650

ASSESSME	NT SU	MMARY TABLE – TRAFFIC SIGNALS
Criterion	Score	Discussion
Objective 1: Economic Growth through integrated land- use	+++	This option will provide a significantly better situation than <i>Do Minimum</i> in terms of ease of movement in all directions and provides a gateway treatment to the Waipapa area. It will also provide the optimum economic growth and integrated land-use solutions in terms of tourism, i.e. for Twin Coast Discovery Highway movements.
Objective 2: Improve network efficiency	-	This option will provide a detrimental effect on journey times for all movements particularly during off-peak periods. It is noted that this option is optimum for pedestrians. It also provides the optimum economic growth and integrated land-use solutions in terms of tourism, i.e. for Twin Coast Discovery Highway movements.
Objective 3: Improve safety by reducing crossing/turning crashes		SH traffic will not expect traffic signals this far north and so the instances of red light running are likely to be high. This could result in high-speed high-severity crashes (for example "T-boning")
Objective 4: Facilitate growth of multimodal travel	++	Pedestrians will have controlled crossing points close to the desire lines. These can also be used by less confident cyclists.
Feasibility		N.E. and S.W. corners will be unaffected. This option's greatest impact will be on the S.E. On N.W. corner, the land in-take will be minimal but building modification may be required. Access within industrial area will be largely unaffected. At this stage of project all options are considered generally neutral relative to each other in terms of planning. Traffic signals represent the greatest oppoing care obligation and operational cost scenario i.e. signals infrastructure, heightened seal maintenance, etc.
Affordability	0A	Whilst costs vary somewhat between options, the affordability of whatever become the preferred option will be considered to be "affordable" if sconomically wable overall.
Public/Stake holders		The Far Northwight be regarded as 'proud' of the fact that there are no traffic signals in the region, so signals would be strongly disliked. Neither would they be considered the best solution because of the inevitable waiting times.
Environmental and social	CI	Perestrian connectivity to all amenities will be available and controlled by signals. There will be easier access for motorists for all movements, but with some inherent delays. Full access to existing walking and cycling facilities can be provided in this option. This option will require a Medium level of land take overall.
Safety		SH traffic will not expect traffic signals this far north and so the instances of red light running are likely to be high. This could result in high-speed, high-severity crashes (for example "T-boning").
Economy	+	Refer to the Traffic Modelling Report, Opus June 2017 which details that this option will make slight benefits when compared to the other options including <i>Do Nothing</i> .
Environmental opportunities	There are	no direct environmental opportunities associated with this option.
Social opportunities	There are	no social opportunities associated with this option.
Rationale for selection or rejection of alternative	economic	on ranked <b>4</b> <sup>th</sup> of the options considered as it provides significant benefits in growth with additional benefits in multi-modal travel but is also vastly in terms of safety, feasibility and public expectations.

# ASSESSMENT SUMMARY TABLE – HEAD TO HEAD RIGHT TURN BAYS

Business case name	SH10 Waipapa Road Intersection Improvements	Name of Project N Region	1anager &	Sebastian Re Northland	ed, Auckla	nd /
Business case purpose	To upgrade the SH10 Waip safety, and to promote of				c growth, e	fficiency,
Option description	<b>Description:</b> This option w Waipapa Loop Road further to create a staggered pair some of the uncertainty as	er south on the Stat of T-intersections.	e Highway, aw Separating the	/ay from Waipa ese two local r	apa Loop Ro oads is like	oad, in order ly to remove
						ACT
R	Dependencies:None	RE O			DRA	WING IN PROGRESS
Estimated	Dependencies:None		Lowe	er	Up	wing it Progress
total public sector	Dependencies:None Capital cost (\$m):		Lowe \$5,395	-		while the Progress oper 41,090
total public sector funding	- Albert			,801	\$6,14	-
total public sector	Carpital cost (\$m):		\$5,395	,801	\$6,14	1,090
total public sector funding	Capital cost (\$m): Net property cost (\$m):		\$5,395	,801	\$6,14	1,090
total public sector funding	Capital cost (\$m): Net property cost (\$m): Opex (\$m/30yr):	govt. (\$m):	\$5,395	,801	\$6,14	1,090
total public sector funding	Capital cost (\$m): Net property cost (\$m): Opex (\$m/30yr): Maintenance (\$m/30yr): Present value of cost to g	govt. (\$m):	\$5,395	,801	\$6,14	1,090
total public sector funding requirement	Capital cost (\$m): Net property cost (\$m): Opex (\$m/30yr): Maintenance (\$m/30yr): Present value of cost to g		\$5,395	,801	\$6,14	1,090

# ASSESSMENT SUMMARY TABLE – HEAD TO HEAD RIGHT TURN BAYS

Criterion	Score	Discussion
Objective 1: Economic Growth through integrated land- use	+	This option will provide a slightly better situation than Do Minimum in terms of improved local business access. However, it will still pose some level of impediment to local traffic from Waipapa Road crossing the State Highway.
Objective 2: Improve network efficiency	+	This option will provide a small benefit to SH through-traffic from separating the Right turning traffic. There will also be a slight benefit from vehicles turning right out of Waipapa Road due to the increased separation from Waipapa Loop Road.
Objective 3: Improve safety by reducing crossing/turning crashes	-	Whilst some safety benefit is delivered to right turning traffic exiting Waipapa Road, the northbound through-traffic may travel faster (speed as they are no longer impeded by traffic turning right from the SH. Traffic turning right out of Waipapa Loop Road South will still have conflicts to manage.
Objective 4: Facilitate growth of multimodal travel	+	Pedestrian movements will be well provided for by this option, with uncontrolled crossing points, burssome of the walking poutes across the intersection will be at some distance from the desire lines. Cycling will also be reasonably well-calered for.
Feasibility		N.E. and S.W. corners will be unaffected. This option will have some impact the S.E. corner. On the N.W. corner, the land in-take will be minimal but modification may be required. Access within Skippers Lane will be slightly restricted. At this stage of the project, all options considered are generally neutral relative to each other in terms of planning. This option will have minimal effect on whole of him maintenance.
Affordability		Whilst costs vary somewhat between options, the affordability of whatever become the preferred option will be considered to be "affordable" if economically viable overall.
Public/Stake- holders		Whilst the public may recognise some benefit, any non-roundabout option is likely to be seen as nett dis-benefit.
Environmental and social	CLA	Redestrian connectivity overall will be improved, but there will be some separation of crossing points from desire lines in places. No improvement for motorists via this option. Full access to existing walking and cycling facilities will also be provided, but not optimal.
Safety	_	Whilst some safety benefit is delivered to right turning traffic exiting Waipapa Road, the northbound through-traffic may travel faster (speed) as they are no longer impeded by traffic turning right from the SH. Traffic turning right out of Waipapa Loop Road South will still have conflicts to manage.
Economy	+	Refer to the Traffic Modelling Report, Opus June 2017 which details that this option will make slight benefits when compared to the other options including <i>Do Nothing</i> .
Environmental opportunities	There are n	o direct environmental opportunities associated with this option.
Social opportunities	There are n	o social opportunities associated with this option.
Rationale for selection or rejection of alternative		ranked <b>3</b> <sup>rd</sup> in all the options considered as it only provides minimal economic growth, efficiency and multi-modal travel but will be worse off safety.

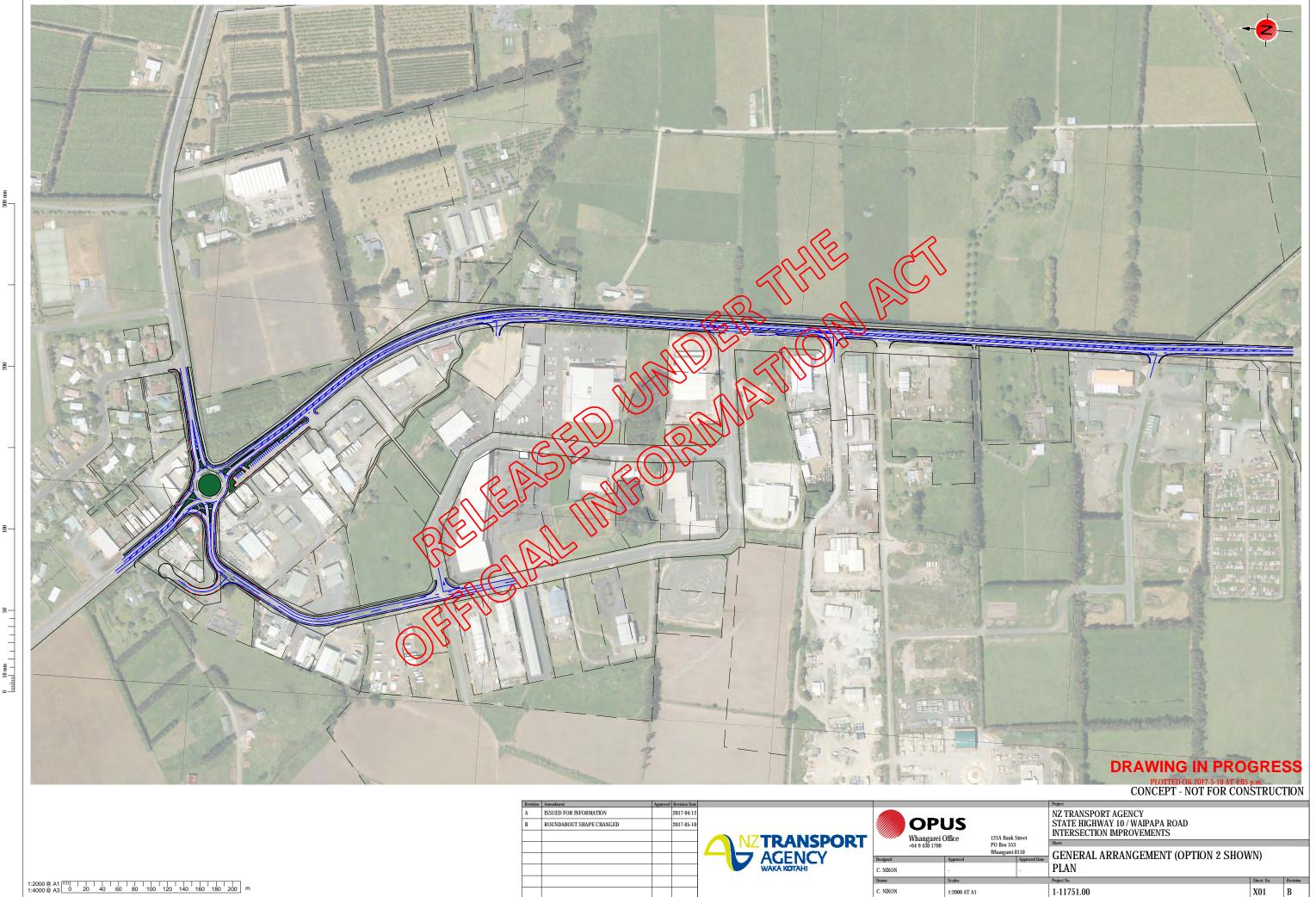
# ASSESSMENT SUMMARY TABLE – CLOSE WAIPAPA LOOP ROAD SOUTH

Estimated BC Timing of need:	Maintenance (\$m/30yr): Present value of cost to g	ovt. (\$m):	Likely:					
$\bigcirc$	Maintenance (\$m/30yr): Present value of cost to g	ovt. (\$m):						
	Maintenance (\$m/30yr):	ovt. (\$m):						
$\bigcirc$								
()	) Opex (\$117 50\$17.	I						
	Opex (\$m/30yr):							
funding requirement			\$93,75	0	\$11	\$112,500		
total public sector	Capital cost (\$m):		\$4,982,3	56	\$5,04	12,174		
Estimated	CILLES		Lower		Up	per		
(5)	Dependencies: None	$\checkmark$						
	E ASE							
	a strange with	Mr.		-				
				5	Als Als	AC		
	improvements incorporated	d into the design	A ST		Ro			
Option description	<b>Description:</b> This option w and divert all traffic to Wai	papa Loop Road I	North. This inte					
Business case ourpose	To upgrade the SH10 Waip safety, and to promote of r	apa Road Interse nulti-modal trave	ction to improv l in the Northla	e the ecor nd region	iomic growth,	efficiency,		
Business case name	SH10 Waipapa Road Intersection Improvements	Name of Project Manager & Regi		າ Reed, Aເ	ickland / Nort	hland		

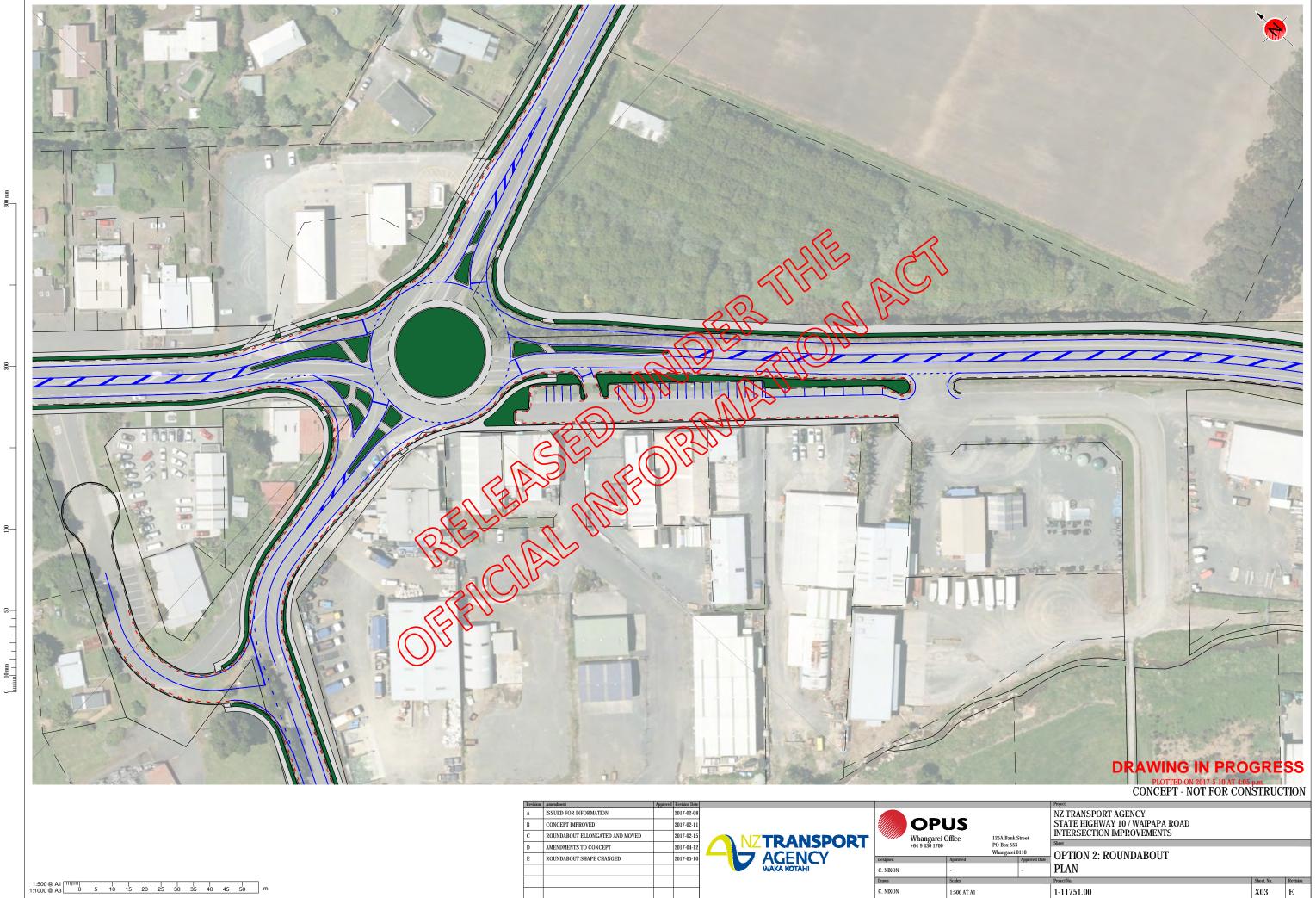
# ASSESSMENT SUMMARY TABLE – CLOSE WAIPAPA LOOP ROAD – SOUTH

$\mathbf{KUAD} = \mathbf{3U}$		
Criterion	Score	Discussion
Objective 1: Economic Growth through integrated land- use	-	This option is considered a net dis-benefit overall due to access to the business park being less straight-forward.
Objective 2: Improve network efficiency	-	This option is less beneficial as local road users will have to travel slightly further due to the closing of the Waipapa Loop Road South. Those movements are less intuitive and are likely to result in motorists using alternative access further to the South.
Objective 3: Improve safety by reducing crossing/turning crashes		Whilst some safety benefit will be delivered to right torning traffic exiting Waipapa Road, the northbound through-traffic may travel faster (speed) as they are no longer impeded by traffic turning right from the SH. Traffic turning right out of Waipapa Loop Road North will still have conflicts to manage.
Objective 4: Facilitate growth of multimodal travel	+	Pedestrian movements will be well provided for, with uncontrolled crossing points, but some of the walking routes across the intersection will be at some distance from the desire lines. Cycling will also be reasonably well-catered for.
Feasibility	-	Land in-take will be essentially focussed on the S.E. corner. No direct access will be provided from Schopers Lane into the main intersection. At this stage of the project, all options considered are generally neutral relative to each other in terms of planning. This option will have minimal costs for Whole of Life Operation / Maintenance.
Affordability	0	Whilst costs vary somewhat between options, the affordability of whatever become the preferred option will be considered to be "affordable" if economically viable overall.
Public/Stake- holders	F	Whilst the public may recognise some benefit, any non-roundabout option is likely to be seen as wett dis-benefit, and as such options felt to be not really addressing the tuil extent of problems in the area of the intersection.
Environnental and social		Pedestrian connectivity overall will be improved, but there will be some separation of crossing points from desire lines in places. There will be no improvement for motorists. Full access will be provided to the existing walking and cycling facilities, but not optimal. Some land take will be required.
Safety		Whilst some safety benefit is delivered to right turners exiting Waipapa Road, the northbound through-traffic may travel faster (speed) as they are no longer impeded by traffic turning right from the SH. Traffic turning right out of Waipapa Loop Road North still has conflicts to manage.
Economy	-	Refer to the Traffic Modelling Report, Opus June 2017 which details that this option will make slight benefits when compared to the other options including <i>Do Nothing</i> .
Environmental opportunities	There a	are no direct environmental opportunities associated with this option.
Social opportunities	There a	are no social opportunities associated with this option.
Rationale for selection or rejection of alternative	apart f	ption ranked <b>5<sup>th</sup> out of the options considered as it provides no real benefits</b> rom slightly better connectivity for pedestrians and cyclists. In all other aspects ered, it will only provide dis-benefits.

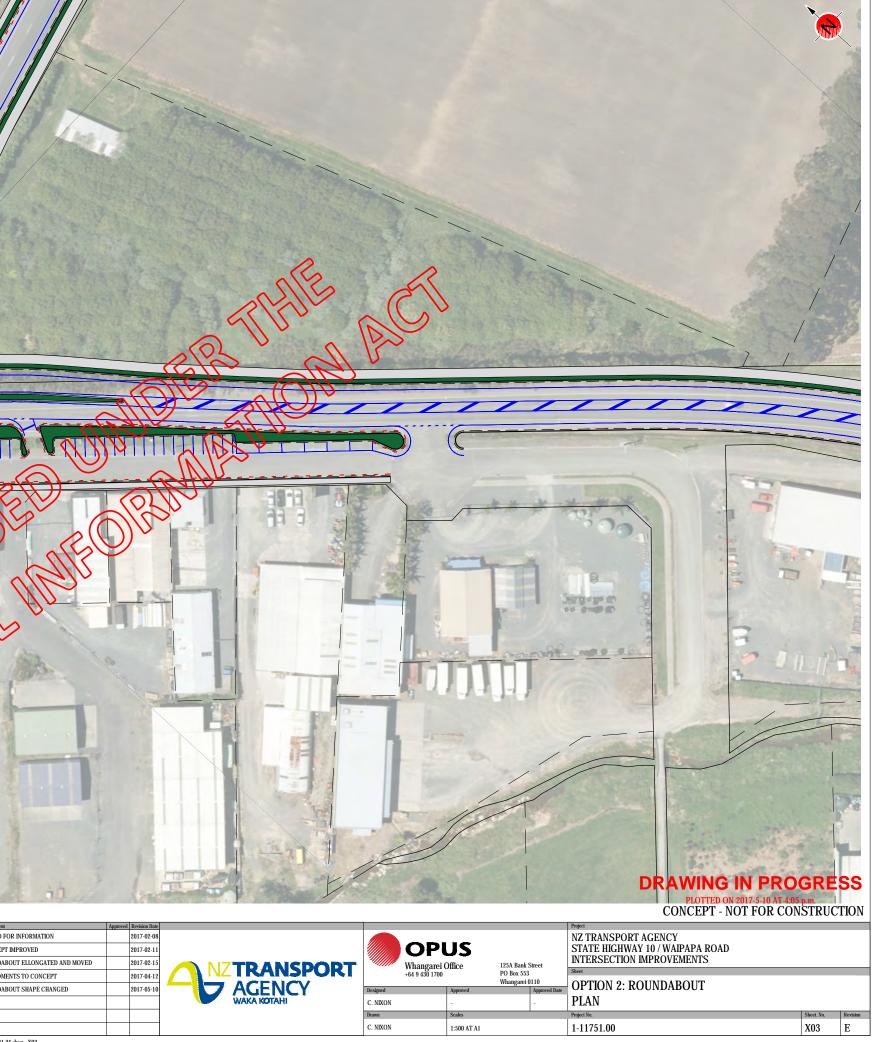
# APPENDIX H **Recommended Option Area Drawings** BELEASED UNDER THUE

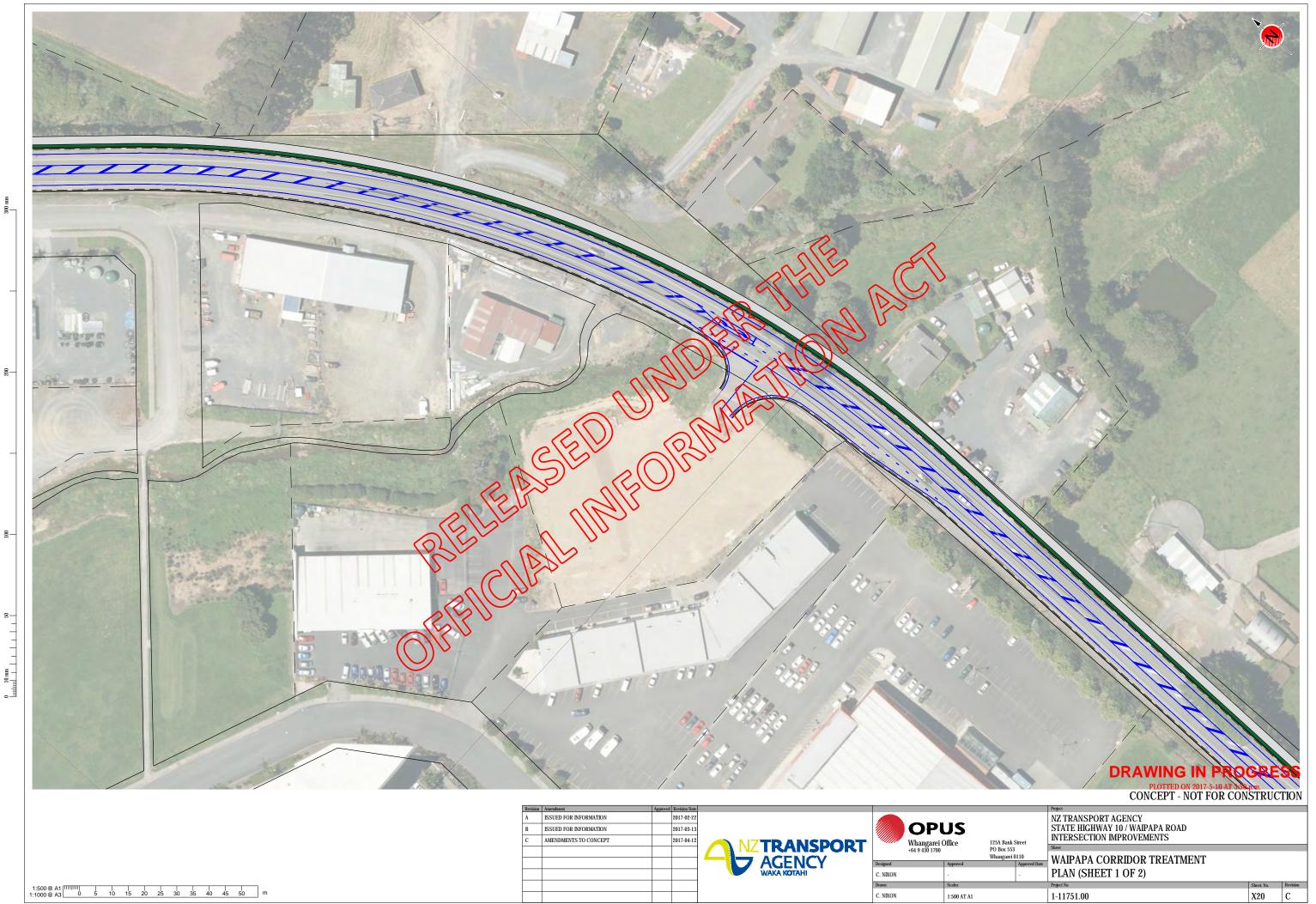


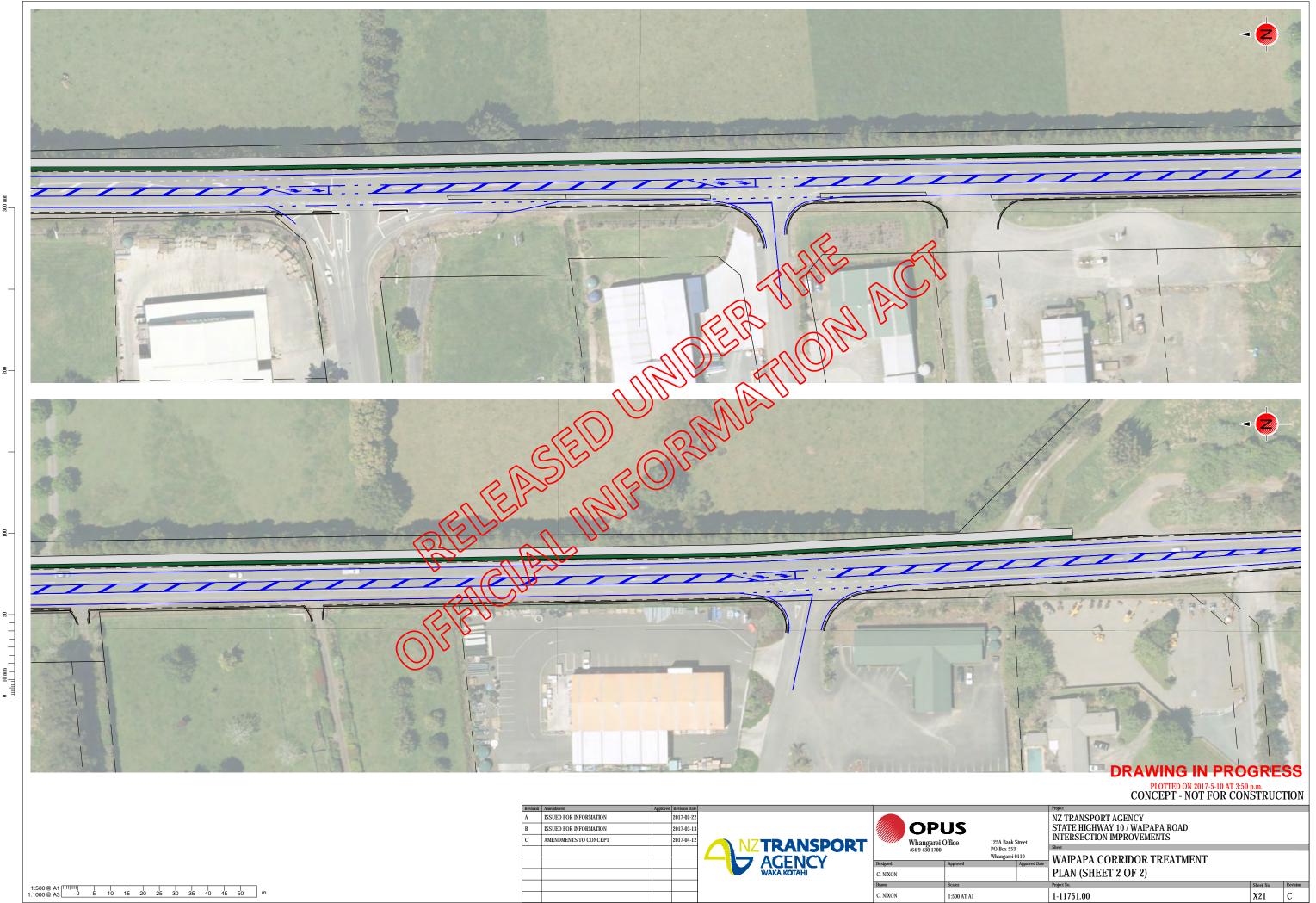
Revision	Amendment	Approved	Revision Date					
A	ISSUED FOR INFORMATION		2017-04-12					
В	ROUNDABOUT SHAPE CHANGED		2017-05-10			OP	JS	
						Whangarei ( +64 9 430 1700		125A Ban PO Box 5 Whangare
					Designed		Approved	Ū
				WAKA KOTAHI	C. NIXON		-	
					Drawn		Scales	
					C. NIXON		1:2000 AT A1	

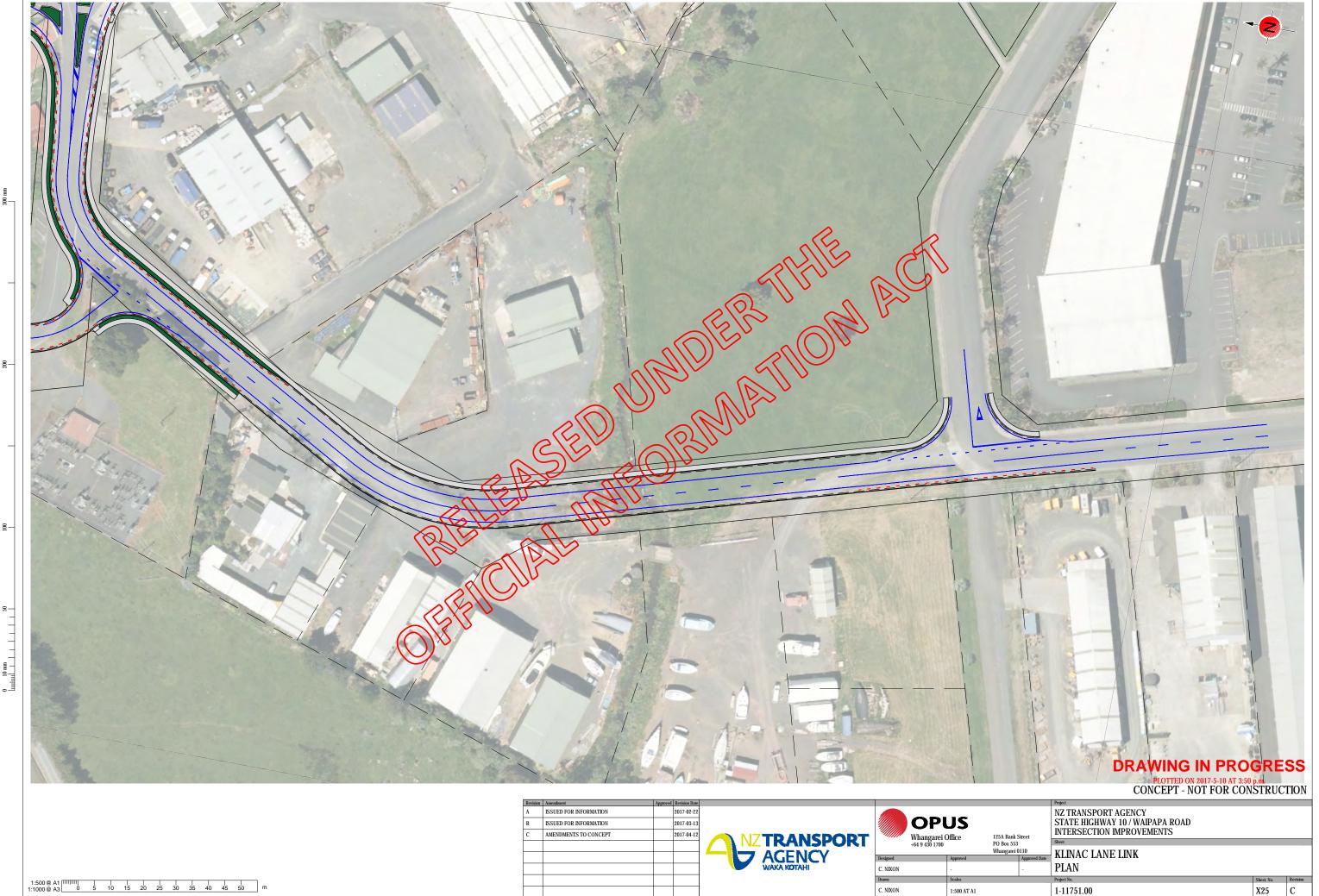


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	1:1000 @ A3 0	5	10	15	20	25	30	35	40	45	50		m		
Ċ	riginal Sheet Size A1 [841x594]		Plot Da	ite 20	17-05-1	0 at 4:0	5:41 p.m	. Path	G:\01 C	lients\N2	TA\1-11	751.0	00 PN4234 SH10 Waipapa Road Intersection Improvements\200 Technical\210 Drawings\(X) Other Category\+AutoCAD\1-11	/51.00_X0	1-06,20-21,25.dwg - X03









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nal Sheet Size A1 [841x594] Plot Date 2017-05-10 at 3:50:12 p.m. Path G:01 Clients/NZTA/1-11751.00 PN4234 SH10 Waipapa Road Intersection Improvements/200 Technical/210 Drawings/(X) Other Category/+AutoCAD/1-11751.00\_X01-06,20-21,25.dwg - X25

# APPENDIX I Traffic Modelling



	Economi	Waipapa Road/SH10 Intersection ic Analysis Inputs - using SIDRA model outputs
Assumptions and input data		Worksheets A2.1 to A2.8
Evaluation carried out i	n accordance with	
Manual:	NZTA's EEM (volume 1)	
Revision: Date:	First Edition, Amendment 0 Effective from 1 July 2013	
Jaie.	Effective from 1 July 2015	
Project Timing:		
	Date of Evaluation:	31-Mar-17
	Base date is 1 July	2016
	Time Zero is 1 July	2017
	Discount Factor	6.00%
	Earliest Start of Construction is	1-Oct-18
	Construction Period is	6.0 Booths
	Construction Period ends	1-Apr 2 ) ie at Time = 1.75 2016
		Analysis period extends to 40 years after the start of construction, to Time= 41.25 2041
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#### Author of Spreadsheet: Kristoffer Hansson Reviewed: Joanna Jarvie, Nerissa Harrison

#### **Construction Cost of Options (+MSQA)**

Expected Construction Costs - 1 July	1st period
Time Period	1st periou
Discount period - midpoint	1.50
2.5count periou - intepoint	1100
Do Min	
Option 1 (Right Turn Bay))	\$4,926,802
Option 2 (4 Leg Roundabout)	\$5,362,676
Option 3 (Signals)	\$5,575,956
Option 4 (Head to Head Right turn Bays)	\$5,142,295
Option 5 (Close Waipapa Loop)	\$5,058,386
Expected Land Cost of Options	1st period
Time Period	Oct-18
Discount period	1.25
Do Min	\$0.0
Option 1 (Right Turn Bay))	\$329,700.0
Option 2 (4 Leg Roundabout)	\$1,198,500.0
Option 3 (Signals)	\$492,900.0
Option 4 (Head to Head Right turn Bays)	\$512,100.0
Option 5 (Close Waipapa Loop)	\$112,500.0
	+,- • • • • •
Expected Fees -	1st period
Time Period	I/R
Discount period - midpoint	0.25
Do Min	
Option 1 (Right Turn Bay))	\$232,887.0
Option 2 (4 Leg Roundabout)	\$254,0445
Option 3 (Signals)	\$264,397.0
Option 4 (Head to Head Right turn Bays)	\$43,847.5
Option 5 (Close Waipapa Loop)	\$289,408.0
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Accident Savings are based of			Action			
Step 1	More than 1500vpd	Yes	Five year accident data	AADT	3,857 source:	NZTA Count Site Data - Station 17 at Kerikeri Based on 5 year count site data - annualis
Step 2	Crash history adequate	Yes	Go to step 3	Traffic growth rate	2.20% source:	compound growth of SH10 between 201 2015
Step 3	Significant change in last three years	No	Go to step 4	Growth rate ajustment for use in crash cost =	-2.00%	2015
Step 4	Minimum of crashes $\geq 5$ injury or $\geq 2$ serious and fatal	No	Go to step 5	Accident growth rate $= 0$ .	20%	
Step 5	Are Crash Prediction Models or crash rates available for the do minimum and project option(s)?	Yes	Go to Step 7		R	
Step 7	Fundamental Change	Yes	Method C for do min and Method B for Project Option	T	able A.1(a)	
Step /	Fundamental Change	No	Method C for do minimum and project Option	Acoident Trend Adjustment	0000	
Conclusion	Do Min	Method C		RIPS All	V	
	Option 1 (Right Turn Bay))	Method B				
	Option 2 (4 Leg Roundabout)	Method B	~	$() \land () \land$		
	Option 3 (Signals)	Method B				
	Option 4 (Head to Head Right turn Bays)	Method B		Se Clo		
	Option 5 (Close Waipapa Loop)	Method B				
Traffic Volume Inputs & Mo	del Assumptions			- WILL		
	SIDRA 7.0.5.6563 software used to determine the and	nual operating cos	SEL	RIL		
Project Operating Costs						
	Operating costs are based on SIDRA outputs		allo			
	Vehicle Operating costs are determined from fuel as	ga outputs				
	Travel time costs are based on average sidea deals	× .	$\int \nabla^2$			
	CO2 is calculated from Sidra CO2 outputs	IN IN				
	Benefits begin after construction (all benefits prior to	construction are a	seammed to be equal)			
		20				
		2				
	$(\bigcirc)$					
	_					

#### **Annualisation Factors**

PERIOD	DESCRIPTION	hr/day	days/year	hrs/year	
1	AM Peak (1hr)	1	245	245	
2	PM Peak (1hr)	2	245	490	
3	IP Peak (1hr)	8	245	1960	
4	Saturday (1hr)	6	52	312	
5 Sunday	Sunday (1hr)	6	68	408	
5 off peak	Off peak			5345	8760.00
and VOC Cost Values u	sed in economics			- SPI	
T & CRV COST/HR	Tab A4.3	RS		202	$\sim$
Period	Π	CRV			$\langle n \rangle$
1	15.13	3.88		$\sum_{i=1}^{n}$	$\bigcap N $
2	14.96	3.79			$\subseteq$
3	17.95	3.60	10	$\sum (1)^{n}$	>
4	14.09	4.26	$\langle U   D$		
5	14.09	4.26	$\sim \vee$		
C based on total fuel used and er VOC components considered C costs (BASED ON \$1.49/LIT (factor to get total VOC)) Period all periods	d to be the same	ELEAS	OPERATING OUS IS	Т	2016 1.45 0.98
		An A	CONSTRUCTION COSTS	ACC Estimate at year	1.03 2017

#### YEARLY OPERATING COST WORKSHEET

1 hour modelled period

					Travel Time Cost	:	VC	с	C	02				Yearly Cost
Year	Time Period	Total Travel Time	Number of Vehicles (veh/hr)	Travel Time Cost	v/c	CRV Additional Congestion Cost	Fuel use litres/period	Cost/litre	CO2 Tonnes	Cost/Tonne	Periods/Yr	π	voc	CO2
2016	AM Peak (1hr)	3.23	1435.00	\$49	0.54	\$0	187.4	1.49	0.448	40	245	\$11,968	\$68,410	\$4,391
	PM Peak (1hr)	3.09	1339.00	\$46	0.41	\$0	175	1.49	0.418	40	490	\$22,630	\$127,768	\$8,201
	IP Peak (1hr)	2.25	1054.00	\$40	0.31	\$0	134.2	1.49	0.321	40	1960	\$79,314	\$391,918	\$25,159
	Saturday (1hr)	2.25	1054.00	\$32	0.31	\$0	134.2	1.49	0.321	40	312	\$9,910	\$62,387	\$4,005
	Sunday	1.77	860.00	\$25	0.25	\$0	108.9	1.49	0.2804	40	408	\$10,162	\$66,202	\$4,250
	Night							2				\$6,223	\$11,690	
									$\langle \langle \rangle$			\$140,208	\$728,375	\$46,005
2026	AM Peak (1hr)	5.07	1,845	\$77	0.73	\$2	245.7	1.49	0.587		245	\$19,354	\$89,693	\$5,756
	PM Peak (1hr)	4.99	1,780	\$75	0.58	\$0	236.9	1.49 🗸	0.566		490	\$36,607	\$172,961	\$11,099
	IP Peak (1hr)	3.34	1,415	\$60	0.43	\$0	182.7	1,49	0.437	40	1960	\$117,542	\$533,557	\$34,253
	Saturday (1hr)	3.34	1415.00	\$47	0.43	\$0	182.	1.49	0.43	40	312	\$14,687	\$84,934	\$5,453
	Sunday	2.57	1155.00	\$36	0.34	\$0	147.9	1.49	0.3536	40	408	\$14,755	\$89,911	\$5,771
	Night						())					\$7,592	\$14,262	
											TOTAL	\$210,538	\$985,317	\$62,331
2036	AM Peak (1hr)	18.81	2,335	\$285	1.00	\$72	342	1.49	V 0.817	40	245	\$87,307	\$124,847	\$8,007
	PM Peak (1hr)	12.02	2,289	\$180	0.87	\$26	320.2	13,49	0.765	40	490	\$101,035	\$233,778	\$14,998
	IP Peak (1hr)	5.23	1,829	\$94	0.59		240.8	2.49	0.576	40	1960	\$184,106	\$703,232	\$45,143
	Saturday (1hr)	5.23	1829.00	\$74	0.59	\$0	240,8	<b>1</b> .49	0.576	40	312	\$23,005	\$111,943	\$7,186
	Sunday	3.61	1492.00	\$51	0.46	\$0	193.6	1.49	0.463	40	408	\$20,728	\$117,693	\$7,556
	Night						1050					\$8,961	\$16,833	
							1/2				TOTAL	\$425,142	\$1,308,327	\$82,889
2056	AM Peak (1hr)	41.84	2,517	\$633	1.00	\$162	414.7	1.49	0.990	40	245	\$194,858	\$151,386	\$9,701
	PM Peak (1hr)	26.87	2,474	\$402	1200	\$102	372.9	1.49	0.890	40	490	\$246,872	\$272,254	\$17,452
	IP Peak (1hr)	6.33	1,964	\$114	0.65	(ps)	261.4	1.49	0.625	40	1960	\$222,647	\$763,393	\$49,000
	Saturday (1hr)	6.33	1964.00	589	0.65	So I	261.4	1.49	0.625	40	312	\$27,820	\$121,520	\$7,800
	Sunday	4.01	1602.00	56	0.50	\$0	209	1.49	0.4997	40	408	\$23,024	\$127,055	\$8,155
	Night					V						\$8,961	\$16,833	
			N N	2							TOTAL	\$724,182	\$1,452,441	\$92,108

# YEARLY OPERATING COST WORKSHEET

1 hour modelled period

frame sign	als (Option 3)								-					
					Travel Time Cost		VC		C	02				Yearly Cost
Year	Time Period	Total Travel Time	Number of Vehicles (veh/hr)	Travel Time Cost	V/C	CRV Additional Congestion Cost	Fuel use litres/period	Cost/litre CO2 Tonnes	Cost/Tonne	Periods/Yr	TT	voc	CO2	
2016	AM Peak (1hr)	12.28	1435.00	\$186	0.79	\$14	193.4	1.49	0.462	40	245	\$48,972	\$70,601	\$4,531
	PM Peak (1hr)	11.34	1339.00	\$170	0.86	\$23	186.7	1.49	0.446	40	490	\$94,254	\$136,310	\$8,744
	IP Peak (1hr)	7.79	1054.00	\$140	0.68	\$0	141.7	1.49	0.339	40	1960	\$273,994	\$413,821	\$26,554
	Saturday (1hr)	7.79	1054.00	\$110	0.68	\$0	141.7	1.49	0.339	40	312	\$34,236	\$65,873	\$4,227
	Sunday	6.12	860.00	\$86	0.75	\$4	115.80	1.49	0,28	40	408	\$36,964	\$70,397	\$4,519
											TOTAL	\$488,419	\$757,002	\$48,574
2026	AM Peak (1hr)	22.31	1846.00	\$337	0.88	\$52	257.3	1.49	0.615	40	245	\$95,477	\$93,927	\$6,026
	PM Peak (1hr)	20.17	1,780	\$302	0.92	\$55	255.4	1.49	0.619	40	90	\$174,853	\$186,468	\$11,958
	IP Peak (1hr)	11.79	1,415	\$212	0.79	\$13	193.5	109	0.463	C40	1960	\$439,815	\$565,097	\$36,268
	Saturday (1hr)	11.79	1415.00	\$166	0.79	\$15	193.5	1.49	0.463		312	\$56,539	\$89,954	\$5,773
	Sunday	8.66	1155.00	\$122	0.72	\$3	156.1	<u>4</u> .49	0.373	40	408	\$51,003	\$94,896	\$6,091
								$\sim$			TOTAL	\$817,687	\$1,030,343	\$66,116
2036	AM Peak (1hr)	75.11	2,335	\$1,136	1.00	\$291	403.5	1.49	2963	40	245	\$349,817	\$147,298	\$9,437
	PM Peak (1hr)	53.86	2,289	\$806	1.00	\$204	\$71.6	1.49	( 0.8 <sup>8</sup> )	40	490	\$494,794	\$271,305	\$17,387
	IP Peak (1hr)	23.27	1,829	\$418	0.94	\$68	263	1.49	0.628	40	1960	\$951,091	\$768,065	\$49,259
	Saturday (1hr)	23.27	1829.00	\$328	0.94	\$80	263	1,49	0.628	40	312	\$127,240	\$122,263	\$7,841
	Sunday	12.60	1492.00	\$178	0.89	\$33	206.1	1.49	0.493	40	408	\$86,079	\$125,292	\$8,038
							r G				TOTAL	\$2,009,021	\$1,434,224	\$91,962
2056	AM Peak (1hr)	116.34	2,517	\$1,760	1.00	\$451	487.9	1.49	1.164	40	245	\$541,854	\$178,108	\$11,403
	PM Peak (1hr)	95.46	2,474	\$1,428	1.00	\$362	454.8	1.49	1.085	40	490	\$876,994	\$332,049	\$21,266
	IP Peak (1hr)	52.32	1,964	\$939	100	\$188	()329.4	1.49	0.763	40	1960	\$2,209,841	\$932,776	\$59,788
	Saturday (1hr)	52.32	1964.00	\$737	1.00	\$223	<b>R19</b>	1.49	0.763	40	312	\$299,535	\$148,483	\$9,517
	Sunday	15.66	1602.00	\$221	0.87	\$38	223	1.49	0.533	40	408	\$105,476	\$135,566	\$8,697
				>	ID						TOTAL	\$4,033,700	\$1,726,982	\$110,671

S221 S221 S221 S28 REFERENCE

# YEARLY OPERATING COST WORKSHEET

					<b>Travel Time Cost</b>		V	DC DC	C	02				Yearly Cost
Year	Time Period	Total Travel Time	Number of Vehicles (veh/hr)	Travel Time Cost	v/c	CRV Additional Congestion Cost	Fuel use litres/period	Cost/litre	CO2 Tonnes	Cost/Tonne	Periods/Yr	π	voc	CO2
2016	AM Peak (1hr)	2.43	1,521	\$37	0.43	\$0	159.2	1.49	0.382	40	245	\$8,991	\$58,116	\$3,741
	PM Peak (1hr)	2.85	1,449	\$43	0.60	\$0	161.1	1.49	0.386	40	490	\$20,885	\$117,619	\$7,556
	IP Peak (1hr)	1.96	1,203	\$35	0.27	\$0	133.3	1.49	0.319	40	1960	\$69,096	\$389,289	\$25,025
	Saturday (1hr)	1.96	1203.00	\$28	0.27	\$0	133.3	1.49	0.349	40	312	\$8,634	\$61,969	\$3,984
	Sunday	1.51	981	\$21	0.19	\$0	108.6	1.49	0.860	40	408	\$8,700	\$66,020	\$4,243
											TOTAL	\$116,306	\$693,013	\$44,549
2026	AM Peak (1hr)	5.03	1,965	\$76	0.87	\$11	208.8	1.49	0.500	40	245	\$21,322	\$76,222	\$4,902
	PM Peak (1hr)	9.65	1,942	\$144	1.00	\$37	260.3	149	0.623	C40	490	\$88,675	\$190,045	\$12,215
	IP Peak (1hr)	2.99	1,620	\$54	0.44	\$0	179.9	1.49	0.430	A A	1960	\$105,318	\$525,380	\$33,743
	Saturday (1hr)	2.99	1620.00	\$42	0.44	\$0	179.9	<b>1</b> .49	0.430	40	312	\$13,160	\$83,632	\$5,371
	Sunday	2.21	1,322	\$31	0.30	\$0	146.	1.49	0.350	40	408	\$12,683	\$88,939	\$5,715
								<sup>N</sup> N		$\mathcal{P}$	TOTAL	\$241,158	\$964,218	\$61,947
2036	AM Peak (1hr)	24.27	2,488	\$367	1.00	\$94	849.9	1.49	( 0.836	40	245	\$113,018	\$127,731	\$8,196
	PM Peak (1hr)	48.06	2,504	\$719	1.00	\$182	\$79.9	1.49	1.382	40	490	\$441,573	\$423,385	\$27,083
Sunday+102:105	IP Peak (1hr)	5.14	2,088	\$92	0.77	\$4	233.4	1.49	0.559	40	1960	\$189,524	\$681,621	\$43,794
	Saturday (1hr)	5.14	2088.00	\$72	0.77	<b>A</b> 5	233.4	1.49	0.559	40	312	\$24,233	\$108,503	\$6,971
	Sunday	3.26	1,703	\$46	0.49	ξά )	188.8 🕥	( LEAD	0.520	40	408	\$18,713	\$114,775	\$8,490
					/						TOTAL	\$787,062	\$1,456,016	\$94,534
2056	AM Peak (1hr)	28.07	2,700	\$425	1.00	\$109	476.9	1.49	1.137	40	245	\$130,749	\$173,946	\$11,145
	PM Peak (1hr)	66.92	2,700	\$1,001	1.00	\$254	BLO.X	1.49	2.025	40	490	\$614,872	\$621,096	\$39,686
Sunday+102:105	IP Peak (1hr)	8.69	2,238	\$156	0.98	\$29	254.9	1.49	0.610	40	1960	\$363,226	\$744,410	\$47,840
	Saturday (1hr)	8.69	2238.00	\$122	0.98)	\$35	254.9	1.49	0.610	40	312	\$49,040	\$118,498	\$7,615
	Sunday	3.76	1,826	\$53 🔿	0.50		202.6	1.49	0.560	40	408	\$21,591	\$123,165	\$9,141
					NY T						TOTAL	\$1,179,478	\$1,781,115	\$115,426

1 hour modelled period

# YEARLY OPERATING COST WORKSHEET

1 hou	modelled	period
2.110.01	mouched	penou

DO MINIM	JM													
					<b>Travel Time Cost</b>		V	C	C	02				Yearly Cost
Year	Time Period	Total Travel Time	Number of Vehicles (veh/hr)	Travel Time Cost	v/c	CRV Additional Congestion Cost	Fuel use litres/period	Cost/litre	CO2 Tonnes	Cost/Tonne	Periods/Yr	тт	voc	CO2
2016	AM Peak (1hr)	3.55	1435	\$54	0.72	\$1	160.10	1.49	0.38	40	245	\$13,364	\$58,445	\$3,757
	PM Peak (1hr)	5.73	1339	\$86	0.94	\$17	157.80	1.49	0.38	40	490	\$50,463	\$115,210	\$7,401
	IP Peak (1hr)	2.23	1054	\$40	0.41	\$0	120.30	1.49	0.29	40	1960	\$78,284	\$351,324	\$22,571
	Saturday (1hr)	2.23	1054	\$31	0.41	\$0	120.3	1.49	0.288	40	312	\$9,782	\$55,925	\$3,593
	Sunday	1.62	860	\$23	0.27	\$0	97.6	1.49	0,2336	40	408	\$9,338	\$59,333	\$3,812
											TOTAL	\$161,231	\$640,236	\$41,135
2026	AM Peak (1hr)	19.17	1846	\$290	1.00	\$74	258.9	1.49	Q.619	40	245	\$89,285	\$94,511	\$6,065
	PM Peak (1hr)	32.88	1780	\$492	1.00	\$125	334.6	149	0.798	(40)	<b>4</b> 90	\$302,065	\$244,291	\$15,641
	IP Peak (1hr)	4.36	1415	\$78	0.79	\$5	164.3	1.49	0.393		1960	\$162,937	\$479,822	\$30,827
	Saturday (1hr)	4.36	1415	\$61	0.79	\$6	164.3	<b>↓</b> .49	0.393	40	312	\$20,958	\$76,380	\$4,907
	Sunday	2.60	1155	\$37	0.48	\$0	132	1.49	0.3161	40	408	\$14,939	\$80,245	\$5,159
										$\mathbf{\rho}$	TOTAL	\$590,184	\$975,250	\$62,599
2036	AM Peak (1hr)	29.05	2335	\$440	1.00	\$113	621.6	1.49	1.48	40	245	\$135,298	\$226,915	\$14,509
	PM Peak (1hr)	43.94	2289	\$657	1.00	\$167	889	1.49	2.115	40	490	\$403,680	\$649,059	\$41,450
	IP Peak (1hr)	25.34	1829	\$455	1.00	\$91	278.5	1,49	0.665	40	1960	\$1,070,283	\$813,331	\$52,144
	Saturday (1hr)	25.34	1829	\$357	1.00	\$108	278.5	1.49	0.665	40	312	\$145,073	\$129,469	\$8,300
	Sunday	5.80	1492	\$82	0.91	\$4X ))	175	(12AD)	0.4188	40	408	\$40,314	\$106,386	\$6,835
					/	$\langle 0 \rangle$		$\chi/D$			TOTAL	\$1,794,648	\$1,925,160	\$123,238
2036	AM Peak (1hr)	34.06	2517	\$515	1.00	\$132	959.4	1.49	2.282	40	245	\$158,617	\$350,229	\$22,368
	PM Peak (1hr)	52.17	2474	\$781	1.00	\$198	341.2	1.49	3.188	40	490	\$479,355	\$979,210	\$62,485
	IP Peak (1hr)	28.64	1964	\$514	1.00	\$103	8558	1.49	0.845	40	1960	\$1,209,627	\$1,033,238	\$66,217
	Saturday (1hr)	28.64	1964	\$404	(1.00)	\$122	953.8	1.49	0.845	40	312	\$163,960	\$164,475	\$10,541
	Sunday	14.82	1602	\$209 🦯	1.00	63	200.5	1.49	0.4796	40	408	\$110,943	\$121,888	\$7,827
							]				TOTAL	\$2,122,503	\$2,649,039	\$169,437

REPUSICION CONTRACTOR

# ACCIDENT BY ACCIDENT ANALYSIS - DO MINIMUM

# WORKSHEET A6.2

Project Name:	Waipapa Road/SH10 Intersection		Posted Speed Limi	it:	70	km/h
Vehicle Involvement:	All		Mean Speed:		100	km/h
· cancie in correlatint.			Road Category:		70	
			Traffic growth rate	e	2.20%	%
Crash Type	Crash Cost (per Year)	1	and Brown law	-	2.2070	
Lost Control off Road	2,303					
Head On	5,613					
Crossing, Direct	0					
Crossing Turning	9,211					
Rear End, Crossing	8,635					
	25,762					
		-				
Lost Control off Road			Injury Severity			
		Fatal	Serious	Minor	Non-Injury	Total Cost
1. No. of Years of typical acc	cident rate records	5	5		5	
2. No. of Reported Accidents		0	0			
3. Proportion of Fatal to Seri		0.2	0.8			
4. No. of Reported Accidents	s Adjusted by severity (2) x (3)	0	0			
5. Accidents per year (4)/(1)		0	0			
6. Adjustment Factor (table A		1.028	1.028		1.028	
7. Adjusted Accidents per Y		0.000	0.000		0.206	
8. Under-Reporting Factors		1.0	1.5		7	
9. Total Estimated Accidents		0.000	0.000		1.439	
	Speed Limit (Table A6.21(a)-(d))	5,000,000	505,000		1,800	
	Speed Limit (Table A6.21(e)-(h))	4,600,000	505,000	28,000	1,600	$1 \vee 1$
1 0	= (Do Min Mean Speed - 50) / 50	1			<u> </u>	
13. Cost per Accident = (11)		4,600,000	305,000		1,600	
14. Total Accident Cost per	Year (9) x (13)	0		0	2,103	2,303
		<u> </u>	$\overline{\sqrt{1}}$			
Head On			Injury Severity			
1 XX CXX C. 1 1		Fatal	Serious	Minor	Non-Injury	Total Cost
1. No. of Years of typical acc		-(1)	5		5	_
2. No. of Reported Accidents			0			1
3. Proportion of Fatal to Seri		0.12	288		1	4
	s Adjusted by severity (2) x (3)				0.2	-
5.Accidents per year (4)/(1) 6. Adjustment Factor (table A		1.028		1.028	1.028	
7. Adjusted Accidents per Ye		0.000	0.900	0.000	0.206	
8. Under-Reporting Factors (		0.000	1.5	0.000	7.0	
9. Total Estimated Accidents		0.090	0.000		1.439	
	Speed Limit (Table 16.21(a) (d)	4,850,000	585,000		3,200	
11. Accident Cost, 30 km/h	Speed Limit (Table A6.21(k)-(h))	5,400,000	610,000		3,200	
	= (Do Min Mean Speed - 59) / 50		1	1	3,700	1
13. Cost per Accident = $(11)$		5,400,000	610,000	36,000	3,900	
14. Total Accident Cost per	Year Wix 13	0	010,000	,	5,613	
			0		5,015	0,010
Crossing, Direct		$\mathbf{O}$	Injury Severity			
		Fatal	Serious	Minor	Non-Injury	Total Cost
1. No. of Years of wpical acc	rident rate records	5	5		5	
1. No. of Years of typical act 2. No. of Reported Accident	over Period	0	0		0	i l
3. Proportion of Fatal to Seri	ous (Table A6. 9(a) o ( c)	0.21	0.79			1
	Adjuster by sevenity (2) x (3)	0	0		0	1
5.Accidents per year (4)/(1)		0	0	0	0	,† I
6. Adjustment Factor (table )		1.028	1.028	1.028	1.028	
7. Adjusted Accidents per		0.000	0.000	0.000	0.000	
8. Under-Reporting Factor		1.0	1.5	4.5	7.0	1
9. Total Estimated Accidents		0.000	0.000		0.000	
	Spee Limit (Table A6.21(a)-(d))	4,600,000	490,000		2,800	
10. Accident Cost, 50 km/n S	Speed Limit (Table A6.21(e)-(h))	4,650,000	525,000	35,000	3,200	/ I
		1	1	1	1	
11. Accident Cost 100 km/h	= (Do Min Mean Speed - 50) / 50	1	1			
11. Accident Cost 100 km/h		4,650,000	525,000	35,000	3,200	1
11. Accident Cost 100 km/h 12. Mean Speed Adjustment	+ (12) x [(10) - (11)]	4,650,000	525,000	,	3,200 0	

# ACCIDENT BY ACCIDENT ANALYSIS - DO MINIMUM

# WORKSHEET A6.2

Project Name:	Waipapa Road/SH10 Intersection		Posted Speed Limi	it:	70	km/h
ehicle Involvement:	All		Mean Speed:		100	
charter fill of chickens			Road Category:		70	
			Traffic growth rate	P	2.20%	%
Crossing Turning			Injury Severity	<u>ر</u>	2.2070	1     0       1     0       1     0       1     9,211       1     9,211       1     9,211       1     9,211       1     0       2     1       1     0       1     1       1     0       1     1       1     0    <
Crossing running		Fatal	Serious	Minor	Non-Injury	Total Cost
1. No. of Years of typical	accident rate records	ratai 5	5	5	5	Total Cost
2. No. of Reported Accide		0		0	2	
	Serious (Table A6.19 (a) to ( c))	0.09		0	2	
	ents Adjusted by severity (2) x (3)	0.09		0	2	+
5.Accidents per year (4)/		0	-	0	0.4	+
		1.028	1.028	1.028	1.028	
<ol> <li>Adjustment Factor (tab 7. Adjusted Accidents per</li> </ol>		0.000	0.000	0.000	0.411	
8. Under-Reporting Facto		1.0 0.000		4.5	7.0 2.878	
9. Total Estimated Accide		4,500,000		31.000	2.878	
	/h Speed Limit (Table A6.21(a)-(d))	, ,		- ,	2,000	
	n/h Speed Limit (Table A6.21(e)-(h))	4,650,000	525,000	35,000	3,200	
	ent = (Do Min Mean Speed - 50) / 50	1	1	1		h
13. Cost per Accident = (		4,650,000		35,000	1,200	
14. Total Accident Cost p	er Year (9) x (13)		0		9,211	9,211
				<i>(</i> //	\\ ~	$\sim$
					$\langle \checkmark$	11
Rear End, Crossing			Injury Severity			
Real End, Crossing		Fatal	Serious	Mimor	Non Injur	Total Corr
1 No. of Voors of training	accident rate records	ratai	Seriou	VINOr -	Non-Injury	Infiai Cost
1. No. of Years of typical		5				$\sim$
2. No. of Reported Accid		0		0		$\sim$
	berious (Table A6.19 (a) to ( c))	0.16				<b>v</b>
	ents Adjusted by severity (2) x (3)	<b>(</b>			$\lambda \lambda J^2$	+
5.Accidents per year (4)/				20	0.4	
6. Adjustment Factor (tab		1.028	1.028	1.028	1.028	
7. Adjusted Accidents per		0,000	0.000	0.000	0.411	
8. Under-Reporting Facto		1.0	1.5	45	7.0	
9. Total Estimated Accide		0.000	0.000	8,000	2.878	
	/h Speed Limit (Table A6.21(a)-(d))	4,690,000		30,000	2,900	
	n/h Speed Limit (Table A6.21(e)-(h))	4,250,000	525,000	34,000	3,000	
	ent = (Do Min Mean Speed - 50) / 50	1		$\mathbf{V}$ 1	1	
13. Cost per Accident = (		4,250,000		34,000	3,000	
14. Total Accident Cost p	er Year (9) x (13)			0	8,635	8,635
	$(\Box )$		$\sim$			
		$\sim (( \ X )$				
			) *			
01 Clients\NZTA\1-1175	.00 PN4234 SHIN Waipapa Boad Intersection Int	provements\390 De	iverables\310 Report	rts\Business Case\l	29-Sep-17	13:49:58
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# Worksheets A6: Accident cost savings Weighted accident procedure – do minimum

Worksheet A6.5

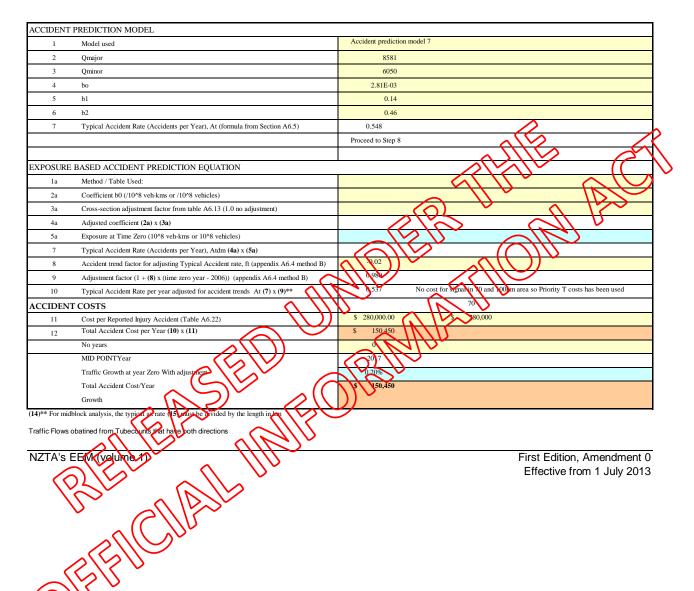
	Project option Do minimum	
	Posted speed limit 70 Traffic growth rate	2.20%
	Road category RS Time zero	2017
#	Site specific accident rate	
1	Number of years of accident records	5
2	Number of reported injury accidents over period	0
3	Number of accidents per year (2)/(1)	0
4	Trend adjustment factor (table A6.1(a))	1.028
5	Site-specific accident rate (accidents per year), $A_s$ (3) x (4)	0
#	Accident prediction model	
6	Table used	6.1
7	Parameter b <sub>0</sub>	0.00108
8	Parameter b <sub>1</sub>	0.51
9	Parameter b <sub>2</sub>	0.21
10	Lowest or sideroad AADT, Q <sub>minor</sub>	6050
11	Highest or primary AADT, Q <sub>major</sub>	9581
12	Typical accident rate (accidents per year), A <sub>T,dm</sub> (formula from appendix A6.5)	0.681862355
#	Exposure based accident prediction equation	Go to step 13
6a	Table used	
7a	Coefficient $b_0$ (/10 <sup>8</sup> veh-km or /10 <sup>8</sup> vehicles)	
8a	Cross-section adjustment factor from table A6.13 (1.0 for no adjustment)	
9a	Adjusted coefficient (7a) x (8a)	
10a	Exposure at time zero (10 <sup>8</sup> veh-km or 10 <sup>8</sup> vehicles)	
12	Typical accident rate (accidents per year), A, dm (9a) x (10a)	0.681862355
13	Accident trend factor for adjusting typical accident rate, f, (appendix) A6.4 method B).	-0.02
14	Adjustment factor for accident trend (1 + (8) x (time zero year - 2006)	0.98
	(appendix A6 Amethod B)	
15	Typical acchernt rate per year adjusted for accident trends, A <sub>T,dm</sub> (12) x (14)*	0.668225108
#	Weighting factor	
16	k value (appendix A6.5)	2.3
17	Reliability of accident history (period is 1.0)	1
18	Reliability of accedent prediction model or equation, $_{\rm M}$ (default is 1.0)	1
19	Weighting vector w, (17) <sup>2</sup> x (16) / ((17) <sup>2</sup> x (16) + (18) <sup>2</sup> x (15)))	0.771330037
20	Do minimum weighted accident rate, A <sub>W,dm</sub> [(19) × (15)] + [(1) – (19)] × (5)	0.515422097
~	Cost per reported injury accident (table A6.22)	295000
21		

\* For all mid-block analyses, the typical accident rate **(15)** must be divided by the mid-block length (in km).

## ACCIDENT RATE ANALYSIS - Option

WORKSHEET A6.5

Project:	Waipapa Road/SH10 Interse	aipapa Road/SH10 Intersection										
Project Option :												
Option Posted Speed Limit :	70	Traffic Growth :	2.20%									
Road Category:	RS	Time Zero :	2017									



### ACCIDENT RATE ANALYSIS - Option

WORKSHEET A6.5

Project:	Waipapa Road/SH10 Interse	ipapa Road/SH10 Intersection										
Project Option :												
Option Posted Speed Limit :	70	Traffic Growth :	2.20%									
Road Category:	RS	Time Zero :	2017									



		0.5
pund		110
10 Southbo	541.44 20 70 391.654	105
SH10 NoriSH10 Southbound	Ň.	100 
5	0700-1900 0000-0000 Difference 599.04 Unive Spe 20 Initial Spec 70 Additional 4.1 Total VOC 8841.83 Total VOC 8841.83	95 95 95 95 7 3 7 3 95
puno		00 4 8 7. 6. 4 - 1. 6. 1. 6. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.
SH10 NorlSH10 Southbound	541.44 5.5 2977.92 4254.166	88 5 4 3 2 1 - 1 - 4 5 2 3 2 5 - 1 - 4 5 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -
410 NoriSH	599.04 5.5 3294.72 4706.736 42 <b>8960.902</b>	
2036 SH	0700-1900 00000-0000 Difference Geomeric Total TT Additional 41 Total TT <b>8</b>	
ound		78 8 9 1 2 1 8 8 9 1 2 1 8 9 4 9 1 2 1 9 0 0 1 2 1 9 0 0 1 2 1 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1
110 Southb	458.72 20 70 4.1 770.707	8 3 3 2 7 5 8 8 7 7 5 8 8 9 7 7 9 8 9 9 9 9 9 9 9 9 9 9 9 9 9
SH10 NortSH10 Southbound	507.52 20 70 4.1 14261.7	00 0, 0, 4 0, 0, 0, 4 0, 0, 0, 4 0,
ц.	0700-1900 0000-0000 Diffeence 507.52 458.72 Curve Spe 20 20 Initial Spet 70 70 Additional 4.1 4.1 Total VOC 7490.995 6770.707 Total VOC 7430.955	
SH10 NortSH10 Southbound	607.52 458.72 5.5 5.5 2791.36 252.96 3987.652 3604.224 661.875	1     1     1     0
2026 ST	0700-1900 0000-0000 Growth Geowth Total I T Total I T Total I T Total I T	
pun oqu		
SH10 Sout	3679 4055 376 20 70 70 70 70	
SH10 North SH10 Southbound	3821 4237 416 6 4.1 6 4.1 7 6 4.1 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	2000 100 1000 1
S	0700 900 0000 0000 Diff trace Curve Speed Initial Speed Additional V Total VOC Total VOC	
		$\begin{array}{cccccccccccccccccccccccccccccccccccc$
H10 Southbound	3821         3679         0700/990           4237         4055         0000/900           416         376         0111/400           5.5         5.5         Curve Species           2288         2268.9         22954.281611         Additional Vector           3282.2.8485         22954.2816111         Additional Vector           220%         220%         Total VOC	- - - - - - - - - - - - - - - - - - -
SH10 Northbound SH10 Southbound	3821 4237 416 5.5 2.5 22889 6222.8485 6222.8485	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
2016 S	0700-1900 0000-0000 Difference Geomeric delay (s) Total TT Total TT Total TT Cost	Initial speed((m/h))           5

### Hourly Count Export

Site Ref: 01000015 ( 1km south of Waimate Nth Rd ) Start Date ( dd-mon-yyyy ): 01-Jan-2015 End Date ( dd-mon-yyyy ): 31-Dec-2015 Direction: Both Data Type: ALL Vehicles

Day		00:00 - 01 01:	00 - 02 02:0	0 - 03 03:00 - 0	4 04:00 - 05	05:00 - 06 0	06:00 - 07 0	7:00 - 08	08:00 - 09	09:00 - 10 1	0:00 - 11	1:00 - 12 12	2:00 - 13 1	3:00 - 14	14:00 - 15 15	5:00 - 16 16	:00 - 17 1	7:00 - 18	18:00 - 19	19:00 - 20 20	:00 - 21 21:	00 - 22 22:	00 - 23 23:	00 - 00 T <sup>,</sup>	otal
27-Feb	FRI	13	11	7 1			158	381	529	490	493	446	516	488		636	676	526	378	204	149	94	57	37	6960
6-Mar	FRI	16	13	10 1	6 28	85	132	379	545	458	495	550	508	507	577	624	645	539	339	240	162	106	78	37	7089
29-May	FRI	12	15	12	9 26	73	133	395	508	460	416	500	507	538	577	688	632	575	279	208	168	97	118	46	6992
7-Aug	FRI	11	7	11 1	2 23	61	155	365	484	445	431	436	470	440	481	561	605	471	259	149	98	75	60	35	6145
30-Oct	FRI	10	6	11 1	6 15	65	157	440	548	457	483	502	528	452	558	652	589	562	293	172	126	83	61	33	6819
6-Nov	FRI	19	14	16 1	1 19	67	150	395	549	474	480	518	529	507	554	667	607	584	337	208	140	116	90	27	7078
2-Mar	MON	15	16	9 2	4 27	70	176	456	536	435	423	509	455	398	419	570	566	503	251	164	77	60	35	31	6225
9-Mar	MON	15	8	12 1	8 37	67	149	406	509	419	421	432	414	387	479	477	530	546	249	122	88	53	18	20	5876
25-May	MON	7	9	7 1	6 31	77	162	388	519	421	396	423	430	426	438	520	∧ 528	498	112	116	54	40	40	11	5731
10-Aug	MON	12	7	14 1	6 25	62	142	397	468	373	338	394	422	384	468	455	535	420		117	67	45	27	12	5396
2-Nov	MON	15	13	10 1	3 26	90	165	448	537	452	458	427	475	463	480	947	591	532	294	149	78	48	41	16	6368
9-Nov	MON	14	9	14 1	9 25	71	185	426	577	441	453	495	484	438	493	649	591	550	289	156	114	59	36	15	6494
28-Feb	SAT	21	12	11 1:	2 28	43	94	194	287	456	503	581	507	465	(440)	343	358	308	228	160	116	92	67	50	5376
7-Mar	SAT	26	13	12 1	0 13	40	88	171	271	416	533	560	527	496	464	379	316	804	212	139	94	99	66	31	5280
23-May	SAT	17	9	7 1	1 14	35	54	118	186	284	430	449	422	367	316	273	(281	238	173	81	61	60	45	23	3954
8-Aug	SAT	17	10	9	8 26	30	54	144	250	410	512	521	499	297	377	343 🥖	27	242	180	106	87	61	44	24	4622
31-Oct	SAT	18	12	12 1	3 20	23	91	196	311	453	523	570	550	(400	438	408	431	306	231	195	136	92	59	27	5575
7-Nov	SAT	17	12	11	7 16	40	86	193	332	475	571	549	504	424	399	354	363	314	354	315	232	290	195	30	6083
1-Mar	SUN	29	12	16	4 10	25	46	105	145	322	426	489	40	874	416	431	341	301	223	165	115	53	34	17	4509
8-Mar	SUN	17	14	9	5 10	18	48	81	148	286	425	468	420	405		374	354	335	228	158	120	60	30	18	4440
24-May	SUN	28	24	20	4 12		35	86	129	272	340	39	349	370	288	336	286	232	166	104	50	34	12	8	3602
9-Aug	SUN	22	11	6	4 9	14	34	71	126	226	311	(389) (354)	391	320		289	284	248	156	104	69	44	20	13	3421
1-Nov	SUN	17	12	8 1	2 43	16	42	117	177	313	389	354	402	368		392	370	279	183	151	126	72	26	18	4264
8-Nov	SUN	19	14		6 11		55	129		305	422	433	414	<b>6</b> 52	348	448	321	313	230	151	117	55	25	22	4418
5-Mar	THU	12	8	9 1			141	393	592	469	484		481	510	530	594	590	579	325	193	126	87	46	35	6789
12-Mar	THU	7	3	13 2			149	397	551	439	460	502	469	181	478	540	596	590	313	187	136	91	55	30	6609
28-May	THU	9	9	15 1			172	394	553	484		474	472	44		582	604	552	248	146	101	62	59	21	6439
6-Aug	THU	19	8		8 20		139	384	499	442		404	(425	439		515	530	487	217	120	88	61	46	22	5889
29-Oct	THU	7	8	15 1			158	402		(469	493	482	512	<b>457</b>		572	562	563	255	167	84	68	37	24	6475
5-Nov	THU	8	7		9 24		160	421	536	544	478	561	549	503		566	604	614	294	196	118	87	57	22	6973
3-Mar	TUE	12	15	12 1			143	395		431	428	454	475	461	521	545	581	541	248	150	112	78	36	17	6302
10-Mar	TUE	4	7	11 1			143	384			456	(489)	486	445		546	581	524	260	175	107	74	36	20	6236
26-May	TUE	16	6		0 18		161	412		450	410		466	447		566	529	520 471	228	108	66	63	33	33	6049
11-Aug	TUE	12	6		3 18		152	<b>6</b> 9	550	429		482	455	384	412	487	563 588	471 506	205	104	60	49	22	18	5611
3-Nov 10-Nov	TUE	7	10	14 1	8 14 5 25		174	446		474	475	536 437	503 491	466		546		506	283 303	147 179	114 110	67 73	43 50	21 16	6608 6638
4-Mar	WED	9	9							481	464	437 528		459		589	574 572	518 601	293			82		16	6497
4-iviar 11-Mar	WED	8	17	14 1- 9 1				438	536 554		489	526	480 478	405 484	471	563 545	580	568	293	176 169	103 118	78	42 40	20	6497
27-May	WED		11	11 1					515	401		440	478	404		545	539	506	200	109	80	87	28	17	6044
		10	9	7 1			<u></u>	<u>402</u> 364				440	467		474	529	528	422	233		74	73	35		5653
5-Aug 4-Nov	WED WED	10	11				142	364		398	407 489	423	43Z 547	454	534		526	422 562	302	108		87	44	17 20	6668
4-1NOV	WED	10	5	11 1 10 1			173	307 441		500 517	469	494	537	467 494	505	536 549	600	562 603	302	173 200	103 124	108	53	30	6900
TT-INOV	WED		00 02 02:0	0 - 03 03:00 - 0																					
Weekdav		11	9	12 1						457	451	471	482	3:00 - 14	498	5:00 - 16 16	590	7:00 - 18 534	271	19:00 - 20:20	105	75	47	24	Jiai
Sat		19	11		4 <u>23</u> 0 20			69		457	512	538	502	435		350	337	285	271	166	105	116	79	31	
Sun		22	15		6 16		- <b>S</b>			287	386	408	398	365		378	326	285		139	121	53	25	16	
oun	1	- 22	10		10	19			100	201	500	400	000	- 305		510	520	200	130	155	100		20	10	
						(	( ))	S		F	PERIOD	0	Davs/Yr	hrs/dav	Hrs/Year flo	ow/hr									
						· · · · ·	$\langle \cup \rangle$				-	_													
							$\smile$		weekday r	iaht			240	13	3120	75									

	PERIOD	Days/Yr	hrs/day	Hrs/Year	flow/hr			
weekday night		240	13	3120	75			
week day AM		240	1	240	534			
week day PM		240	2	480	571			
week day IP		240	8	1920	469 Sa	me as Saturday pe	Counte	
Saturday		52	6	312	468 Co	unt was 11-12	Sidra Volmes reduced by	0.87
Sunday		68	6	408	383 829	% of IP	Sidra Volmes reduced by	0.71
Weekend offpeak/nig	ght	120	18	2160	115			

# APPENDIX J ECONOMICS

# RELEASED UNDER THE A

Opus International Consultants

	ENEFIT ANALYSIS OF THE OPTIONS											WORKSHEET 4	
		<u> </u>			Const Starts	1-Oct-18							
					Const Ends	1-Apr-19							
Project		Waipapa Road/SH10	Intersection								Time Zero:	1-Jul	201
Project Calculated		Kristoffer Hansson	Intersection								Base Date:	1-Jul	201
Reviewed I		Risoner Hansson									Dase Date.	1-501	20
teneneu	<u>.</u>												
			Option 4 (Head to	Option 5 (Close					Option 4 (Head to	Option 5 (Close			
OPTION		Option 2 (Roundabout)	Head Right Turn	Waipapa Loop South)	Option 3 (Traffic Signals)	Option 1 (Right Turn Bay)	Do Min	Option 2 (Roundabout)	Head Right Turn	Waipapa Loop South)	Option 3 (Traffic Signals)	Option 1 (Right Turn Bay)	
			Bays)	Southy					Bays)	Southy			
TANGIBLE	BENEFITS CALCULATION:							^		NET BENERITS OF T	THE OPTIONS		
								<u>,                                    </u>		CAL			
I. Travel T	me	\$6,465,175	\$9,838,281	\$10,203,623	\$29,877,354	\$9,838,281	\$21,037,803	\$14,578,628	\$11,199,523	\$10,834,181	(\$8,839,551)	\$11,199,523	
2. Vehicle	Oper.	\$14,838,274	\$15,743,905	\$16,027,995	\$16,098,854	\$15,743,905	\$18,924,446	\$4,086,173	\$3,180,541	\$2,896,451	\$2,825,592	\$3,180,541	
<ol> <li>Accident</li> </ol>	s	\$1,794,968	\$1,927,424	\$1,927,424	\$2,223,937	\$1,927,424	\$2,247,576		\$320,15	\$320,152	\$23,639	\$320,152	
4.Carbon c	ixiode (\$40/tonne)	\$939,343	\$1,017,102	\$1,031,307	\$1,032,524	\$1,017,102	\$1,212,531	\$273,188	\$195,429	\$181,224	\$180,007	\$195,429	
6. TOTAL	1+2+3+4)	\$24,037,760	\$28,526,712	\$29,190,348	\$49,232,670	\$28,526,712	\$43,422,396	\$19,384,597	\$44,895,645	\$14,232,008	(\$5,810,313)	\$14,895,645	
				ı I			- CUIR	- ((	110		ı I		
COSTS C	LCULATION:					_		2011		NET COSTS OF THE	PROJECT OPTIONS		
	-						AIV.	11.72					
1. Fees		\$473,810	\$453,859	\$449,037	\$493,118	\$434,850	\$0		\$453,859	\$449,037	\$493,118	\$434,350	
2. Property		\$1,069,609	\$457,027	\$100,401	\$439,892	\$294,248			\$457,027	\$100,401	\$439,892	\$294,243	
. Construc		\$4,716,741	\$4,522,905	\$4,449,102	\$4,904,331	\$4,339,388	60	\$4,716,741	\$4,522,905	\$4,449,102	\$4,904,331	\$4,333,368	
<ol> <li>Maintena</li> </ol>	ance				^		(1)	Sr .					
		-						1 .			65 007 044	<b>#F 004 000</b>	
5. TOTAL	1+2+3+4)	\$6,260,159	\$5,433,791	\$4,998,541	\$5,637,341	\$5,061,960	$\langle \circ \rangle \rangle \rangle \otimes$	\$6,260,159	\$5,433,791	\$4,998,541	\$5,837,341	\$5,061,960	
		\$6,260,159	\$5,433,791	\$4,998,541	\$5,637,341	\$5,061,960	$\left( \begin{array}{c} \\ \\ \\ \\ \\ \end{array} \right)^{\infty}$						
	E BENEFIT TO COST RATIO	\$6,260,159	\$5,433,791	\$4,998,541	\$5,637,344	\$5,061,960		\$6,260,159 <b>3.1</b>	\$5,433,791 <b>2.7</b>	\$4,998,541 <b>2.8</b>	\$5,837,341 <b>N/A</b>	\$5,061,960 <b>2.9</b>	
TANGIBL Ranking	E BENEFIT TO COST RATIO B/C Ratio	\$6,260,159	\$5,433,791	\$4,998,541	\$5,634,34	\$5,061,960	Jegger **						
TANGIBL Ranking	E BENEFIT TO COST RATIO	\$6,260,159	\$5,433,791	\$4,998,541	SS 636 34	\$5,061,960	COT 1 20						
TANGIBL Ranking Intangibl	E BENEFIT TO COST RATIO B/C Ratio 9 Benefits			\$4,998,541		\$5,061,960				2.8	N/A		
TANGIBL Ranking Intangibl	E BENEFIT TO COST RATIO B/C Ratio			\$4,998,541	SS FOR GAL	\$5.061,960				2.8			
TANGIBL Ranking Intangibl	E BENEFIT TO COST RATIO B/C Ratio 9 Benefits		ONS	ELE		\$5,061,960				2.8	N/A		
TANGIBL Ranking Intangibl	E BENEFIT TO COST RATIO B/C Ratio 9 Benefits			ELE		MEC	ental BCR			2.8	N/A		
TANGIBL Ranking Intangibl	E BENEFIT TO COST RATIO B/C Ratio Denefits ENTAL COST-BENEFIT ANALYSIS O Incremental BCR in order of increasing cost: Target BCR		ONS	ELE	A	MEC		3.1		2.8	N/A		
TANGIBL Ranking Intangibl	E BENEFIT TO COST RATIO B/C Ratio B Benefits ENTAL COST-BENEFIT ANALYSIS O Incremental BCR in order of increasing cost: Target BCR Ranked by increasing cost	F PROJECT OPTI	ions	ELE	A	MEC	ental BCR			2.8	N/A		
TANGIBL Ranking Intangibl	E BENEFIT TO COST RATIO B/C Ratio a Benefits ENTAL COST-BENEFIT ANALYSIS O Incremental BCR in order of increasing cost: Target BCR Ranked by increasing cost Option	F PROJECT OPTI	ONS Net Benefits	ELE	A	MEC		3.1		2.8	N/A		
TANGIBL Ranking ntangibl	E BENEFIT TO COST RATIO B/C Ratio e Benefits ENTAL COST-BENEFIT ANALYSIS O Incremental BCR in order of increasing cost: Target BCR Ranked by increasing cost Option Do Min	F PROJECT OPTI 3.0 Net Costs \$0	ONS Net Benefits	ELE	A	MEC	ental BCR	3.1		2.8	N/A		
TANGIBL Ranking ntangibl	E BENEFIT TO COST RATIO B/C Ratio a Benefits ENTAL COST-BENEFIT ANALYSIS O Incremental BCR in order of increasing cost: Target BCR Ranked by increasing cost Option Do Min Minor Improvements	F PROJECT OPTI 3.0 Net Costs \$0 \$5,061,960	ONS Net Benefits \$0 \$14,895,645	ELE	A	MEC	ental BCR	3.1		2.8	N/A		
TANGIBL Ranking Intangibl	E BENEFIT TO COST RATIO B/C Ratio a Benefits ENTAL COST-BENEFIT ANALYSIS O Incremental BCR in order of increasing cost: Target BCR Ranked by increasing cost Option Do Min Minor Improvements Small Staggered	5 PROJECT OPTI 3.0 Net Costs \$,061,960 \$5,433,791	ONS  Net Benefits \$ \$14,895,645 \$14,895,645 \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	ELE	A	MEC	ental BCR	3.1		2.8	N/A		
TANGIBL Ranking Intangibl	E BENEFIT TO COST RATIO B/C Ratio De Benefits ENTAL COST-BENEFIT ANALYSIS O Incremental BCR in order of increasing cost: Target BCR Ranked by increasing cost Option Do Minor Improvements Small Staggered Signals	F PROJECT OPTI 3.0 Net Costs \$0 \$5,061,960	ONS Net Benefits \$14,895,645 \$14,895,6			MEC	ental BCR	3.1		2.8	N/A		
TANGIBL Ranking Intangibl	E BENEFIT TO COST RATIO B/C Ratio De Benefits ENTAL COST-BENEFIT ANALYSIS O Incremental BCR in order of increasing cost:: Target BCR Ranked by increasing cost Option Do Min Minor Improvements Small Staggered Signals Large Staggered Roundabout	5,061,3791 5,061,360 5,061,360 5,433,791 5,5337,341 5,6337,341 5,620,159	ONS Net Benefits \$0 \$14.895.647 (\$5.810.313 \$14.295.647 (\$5.810.313 \$14.295.647 (\$5.810.313 \$14.395.947 (\$5.810.313 \$14.395.947 (\$5.810.313 \$14.395.947 (\$5.810.313 \$14.395.947 (\$5.810.313 \$14.395.947 (\$5.810.313 \$14.395.947 (\$5.810.313 \$14.395.947 (\$5.810.313 \$15.810 (\$5.810.313 \$15.810 (\$5.810.313 \$15.810 (\$5.810.313 \$15.810 (\$5.810.313 \$15.810 (\$5.810.313 \$15.810 (\$5.810.313 \$15.810 (\$5.810.313 \$15.810 (\$5.810.313 \$15.810 (\$5.810.313 (\$5.810.313 (\$5.810.313 (\$5.810.313) (\$5.810.313 (\$5.810.313) (\$		ASE		ental BCR	8.1	2.7	2.8	N/A		
TANGIBL Ranking Intangibl	E BENEFIT TO COST RATIO B/C Ratio b Benefits ENTAL COST-BENEFIT ANALYSIS O Incremental BCR in order of increasing cost: Target BCR Ranked by increasing cost Option Do Min Minor Improvements Small Staggered Signals Large Staggered Roundabout PW Roundabout	5 PROJECT OPTI 3.0 80 \$5,061,960 \$5,337,91 \$5,837,341 \$6,260,159 #REFI	ONS Net Benefits \$14,895,645 \$14,895,6				ental BCR	8.1	2.7	2.8	N/A		
TANGIBL Ranking Intangibl	E BENEFIT TO COST RATIO B/C Ratio Benefits ENTAL COST-BENEFIT ANALYSIS O Incremental BCR in order of increasing cost: Target BCR Ranked by increasing cost Option Do Min Minor Improvements Small Staggered Signals Large Staggered Roundabout PW Roundabout Option	3.0 Net Costs \$0 \$5,661,960 \$5,837,941 \$4,998,641 \$6,260,159 #REFI 14	ONS Net Benefits \$0 \$14,895,645 \$14,895,645 \$14,895,645 \$14,92,003 \$14,93,003 \$14,93,0003 \$14		Option B		ental BCR	Roundabout rement registragered signals	2.7	2.8	N/A		
TANGIBL Ranking ntangibl	E BENEFIT TO COST RATIO B/C Ratio b Benefits ENTAL COST-BENEFIT ANALYSIS O Incremental BCR in order of increasing cost: Target BCR Ranked by increasing cost Option Do Min Minor Improvements Small Staggered Signals Large Staggered Roundabout PW Roundabout	5 PROJECT OPTI 3.0 80 \$5,061,960 \$5,337,91 \$5,837,341 \$6,260,159 #REFI	ONS Net Benefits \$0 \$14.895.647 (\$5.810.313 \$14.295.647 (\$5.810.313 \$14.295.647 (\$5.810.313 \$14.395.947 (\$5.810.313 \$14.395.947 (\$5.810.313 \$14.395.947 (\$5.810.313 \$14.395.947 (\$5.810.313 \$14.395.947 (\$5.810.313 \$14.395.947 (\$5.810.313 \$14.395.947 (\$5.810.313 \$15.810 (\$5.810.313 \$15.810 (\$5.810.313 \$15.810 (\$5.810.313 \$15.810 (\$5.810.313 \$15.810 (\$5.810.313 \$15.810 (\$5.810.313 \$15.810 (\$5.810.313 \$15.810 (\$5.810.313 \$15.810 (\$5.810.313 (\$5.810.313 (\$5.810.313 (\$5.810.313) (\$5.810.313 (\$5.810.313) (\$	51.0000 51.0000 51.0000 50.00000 50.00000000 50.00000 50.0000 50.0000 50.0000 50.000			ental BCR	8.1	2.7	2.8	N/A		
FANGIBL Ranking ntangibl	E BENEFIT TO COST RATIO B/C Ratio Benefits ENTAL COST-BENEFIT ANALYSIS O Incremental BCR in order of increasing cost: Target BCR Ranked by increasing cost Option Do Min Minor Improvements Small Staggered Signals Large Staggered Roundabout PW Roundabout Option	3.0 Net Costs \$0 \$5,661,960 \$5,837,941 \$4,998,641 \$6,260,159 #REFI 14	ONS Net Benefits \$0 \$14,895,645 \$14,895,645 \$14,895,645 \$14,92,003 \$14,93,003 \$14,93,0003 \$14	Coption Option 4 (Head to Head Right Turn Bays)	Option B		ental BCR	Boundabout Program Served 1000,000 Signals Incremental Benefits	2.7	2.8	N/A		
TANGIBL Ranking Intangibl INCREN	E BENEFIT TO COST RATIO B/C Ratio De Benefits ENTAL COST-BENEFIT ANALYSIS O Incremental BCR in order of increasing cost:: Target BCR Ranked by increasing cost Option Do Min Minor Improvements Small Staggered Signals Large Staggered Roundabout PW Roundabout PW Roundabout Option	5,001,500,500,500,500,500,500,500,500,50	ONS Net Benefits \$0 \$14,995,647 (\$5,810,313) \$14/92,645 \$114/92,645 \$114/92,645 \$114/92,645 \$114/92,645 \$114/92,645 \$114/92,645 \$114/92,645 \$114/95,647 Benefits	Option Option (Traffic	Option B Costs	SLOOLOO SLOOLOO	ental BCR Miner Impre 54,000,000 50	Boundabout Program Served 1000,000 Signals Incremental Benefits	2.7 57,000,000 Incremental BCR N/A	2.8	N/A		
TANGIBL Ranking Intangibl NCREM	E BENEFIT TO COST RATIO B/C Ratio a Benefits ENTAL COST-BENEFIT ANALYSIS O Incremental BCR in order of increasing cost: Target BCR Ranked by increasing cost Option Do Min Minor Improvements Small Staggered Signals Large Staggered Roundabout PW Roundabout Option Option Option Option 1 (Right Turn Bay)	State         State           State         State	Net Benefits         \$0           \$14,895,645         \$14,895,645           \$14,895,645         \$14,92,003           \$14,92,003         \$14,92,003           \$14,92,003         \$14,92,003           \$14,92,003         \$14,92,003           \$14,92,003         \$14,92,003           \$14,92,003         \$14,92,003           \$14,92,003         \$14,92,003           \$14,92,003         \$14,92,003           #REF         Benefits           \$14,895,645         \$14,895,645	Content of the second s	000000 000000 000000 000000 000000 00000	52.000.000 53.000.000 Benefits \$14,895,645	ental BCR s4.000.000 s2 incremental Costs \$371,830	3.1 Roundabout Performance Separation Separa	2.7	2.8	N/A		
TANGIBI Ranking Intangibi INCREM Step 1 2	E BENEFIT TO COST RATIO B/C Ratio  B Benefits ENTAL COST-BENEFIT ANALYSIS O Incremental BCR in order of increasing cost: Target BCR Ranked by increasing cost Option Do Min Minor Improvements Small Staggered Signals Large Staggered Roundabout PW Roundabout Option Option Option Option Option 1 (Right Turn Bay) Option 1 (Right Turn Bay)	3.0           Net Costs           \$0           \$5,061,960           \$5,837,941           \$4,998,541           \$6,260,159           #REFI <b>A</b> Costs           \$5,061,960           \$5,061,960	Net Benefits         \$0           \$14,895,645         \$14,895,645           \$14,895,645         \$14,22,00           \$14,895,645         \$14,895,645           \$14,895,645         \$14,895,645           \$14,895,645         \$14,895,645           \$14,895,645         \$14,895,645	Coption 4 (Head to Head Right Turn Bays) Option 5 (Close	Option B Costs \$5,837,341	Increm 3.00000 \$3.00000 Benefits \$14,895,645 (\$5,810,313)	ental BCR state of the state o	3.1 Boundabout Vermits Boundabout Vermits Boundabout Vermits Boundabout Incremental Benefits \$0 (\$20,705,958)	2.7	2.8	N/A		

INPUT TABLE - read from "inputdata" worksheet	
year of EEM amendment	2016
Year of MAINTENANCE Costs	2017
YEAR OF CONSTRUCTION COSTS	2017
YEAR OF LAND COSTS	2017
Base Date:	2016
Time Zero:	2017
Discount factor	6.00%
UPDATE FACTORS USED	
TT & Reliability	1.45
VOC	0.98
ACC	1.03
MAINTENANCE COSTS	0.96
CONSTRUCTION COSTS & FEES	0.96
LAND COSTS	0.96

		CRITERIA RANGE						
TYPE	TYPE	TYPE	TYPE	TYPE	TYPE	TYPE	TYPE	TYPE
с	м	т	v	A	F	L	CO2	R

TIME STREAMS AND DISCOUNT	ING			OPTION	Do Min				•		WORKSHEET	A1.1 and A	1.2	
									alle	Å	BASE DATE		2016 2017	
DESCRIPTION	PAYMENT	START	END	DURATION		YEAR		YEAR	NEAR OF ESTIMATE	UPDATE	PRESENT VALUE	1	DISCOUNTING	
	TYPE T	YEAR.	YEAR	YEARS	COST/YR. \$	GROWTH.	COST/YR \$	GROWTH	ESTIMATE	FACTOR		SPPWF	UNSPWF	AGPWF
COSTS & MAINTENANCE Construction Cost Fees Fees	C F F	1.5 0.3 0.8	1.5 0.3 0.8	0.0 0.0 0.0			1	R V	2017 2017 2017	0.96 0.96 0.96		0.916 0.986 0.957	0.000 0.000 0.000	0.000 0.000 0.000
Property Maintenance (ignored)	L M	1.3	1.3	0.0					()	0.96		0.930	0.000	0.000
OPERATING COSTS Travel Time 2016-2026 Travel Time 2026-2036 Travel Time 2036-2056	T T T	1.8 10.0 20.0	10.0 20.0 41.3	8.2 10.0 21.3	161,231	26.60%	236,586 530,184 ,794,648	18.18% 20.44% 0.91%	2002 2002 2002	1.45 1.45 1.45	\$3,422,510 \$6,960,151 \$10,655,142	0.903 0.558 0.312	6.549 7.579 12.187	24.852 34.234 103.433
VOC 2016-2026 VOC 2026-2036 VOC 2036-2056	v v v	1.8 10.0 20.0	10.0 20.0 41.3	8.2 10.0 21.3	640,236		698,933 975,250 1,925,160	979% 9774% 1.88%	2008 2008 2008	0.98 0.98 0.98	\$4,786,972 \$5,824,205 \$8,313,270	0.903 0.558 0.312	6.549 7.579 12.187	24.852 34.234 103.433
CO2 2016-2026 CO2 2026-2036 CO2 2036-2056	CO2 CO2 CO2	1.8 10.0 20.0	10.0 20.0 41.3	8.2 10.0 21.3	2 P	5.22%		4.78% 9.69% 1.87%	2008 2008 2008	0.98 0.98 0.98	\$307,366 \$373,217 \$531,948	0.903 0.558 0.312	6.549 7.579 12.187	24.852 34.234 103.433
Crash Costs Period 1 TRANSFERED IN FROM OTHER WORKSHEETS	A TT/yr	1.8 growth/yr	41.3 VOC/yr	39.5 growty		0.20%	052,582 crashes	0.20% growth/yr	2006	1.03	\$2,247,576	0.903	15.444	197.192
2016 2026 2036 2036	\$161,231 \$590,184 \$1,794,648	\$42,895 \$120,446	\$640,236 \$975,250 \$1,925	\$1350	\$41,135 1 \$62,599 1 \$128,338	\$2,146 \$6,064	152050 i	304	- - -					
		(	RE NFF	CU			ROWTH adjustment =	0.20%	1					

INPUT TABLE - read from "inputdata" worksheet	
year of EEM amendment	2016
Year of MAINTENANCE Costs	2017
YEAR OF CONSTRUCTION COSTS	2017
YEAR OF LAND COSTS	2017
Base Date:	2016
Time Zero:	2017
Discount factor	6.00%
UPDATE FACTORS USED	
TT & Reliability	1.45
VOC	0.98
ACC	1.03
MAINTENANCE COSTS	0.96
CONSTRUCTION COSTS & FEES	0.96
LAND COSTS	0.96

		CRITERIA RANGE						
TYPE	TYPE	TYPE	TYPE	TYPE	TYPE	TYPE	TYPE	TYPE
с	м	т	v	A	F	L	CO2	R

TIME STREAMS AND DISCOUN	NTING			OPTION	Option 3 (Tra	affic Signals)			$\wedge$		WORKSHEET	A1.1 and A	.2	
								2	II.	کی	RASE DATE TIME ZERO		2016 2017	
DESCRIPTION	PAYMENT	START	END	DURATION	BASE	YEAR	START	YEAR	YEAR OF	UPDATE	PRESENT VALUE	[	ISCOUNTING	
	TYPE T	YEAR.	YEAR	YEARS	COST/YR. \$	GROWTH.	COST/YR	GROWTH	ESTIMATE	INCTOR	TIMEZERO \$	SPPWF	UNSPWF	AGPWF
COSTS & MAINTENANCE					ş	76		$\sim$			ð	SEEWE	UNSEVE	AGEWI
Construction Cost	С	1.5	1.5	0.0	5,575,956		5,575,956	NL NL	2017	0.96	\$4,904,331	0.916	0.000	0.000
Fees	F	0.3	0.3	0.0	264,397		264,387	$\sim$	2017	0.96	\$250,150	0.986	0.000	0.000
Fees	F	0.8	0.8	0.0	264,397		264,397	N N	<u>-9017</u>	0.96	\$242,968	0.957	0.000	0.000
Property	L	1.3	1.3	0.0	492,900		492,990	0		0.96	\$439,892	0.930	0.000	0.000
Maintenance (ignored)	M						$\langle \langle \langle \rangle \rangle \rangle$	í .0	$(( )) \sim$					
OPERATING COSTS						$\sim$								
Travel Time 2016-2026	Т	1.8	10.0	8.2	488,419	6.74%	546,109	603%	2002	1.45	\$5,753,744	0.903	6.549	24.852
Travel Time 2026-2036	т	10.0	20.0	10.0			817,687	14.57%	2002	1.45	\$8,319,783	0.558	7.579	34.234
Travel Time 2036-2056	т	20.0	41.3	21.3		$\langle \langle \rangle \rangle$	2,009,021	3.04% V	2002	1.45	\$15,803,827	0.312	12.187	103.433
VOC 2016-2026	V	1.8	10.0	8.2	757,002	3 8194	804,893	240%	2008	0.98	\$5,265,374	0.903	6.549	24.852
VOC 2026-2036	v	10.0	20.0	10.0	101,002		1 030 343	8.92%	2008	0.98	\$5,029,763	0.558	7.579	34.234
VOC 2036-2056	v	20.0	41.3	21.3		n -	1.34224	1.02%	2008	0.98	\$5,803,718	0.312	12.187	103.433
						))		Ň						
CO2 2016-2026	CO2	1.8	10.0	8.2		3.61%	51,648	3.40%	2008	0.98	\$337,868	0.903	6.549	24.852
CO2 2026-2036 CO2 2036-2056	CO2 CO2	10.0 20.0	20.0 41.3	10.0 21.3	$\mathcal{O} \setminus \mathcal{O}$		91.96	3.91% 1.02%	2008 2008	0.98	\$322,622 \$372,034	0.558 0.312	7.579 12.187	34.234 103.433
002 2030-2030	002	20.0	41.5	21.3		$(\cap$	91,002	1.0276	2008	0.98	<i>\$312,034</i>	0.312	12.107	103.433
Crash Costs Period 1	А	1.8	41.3	39.6	150,450	20%	150,978	0.20%	2006	1.03	\$2,223,937	0.903	15.444	197.192
TRANSFERED IN FROM OTHER WORKSHEETS	TT/yr	growth/yr	VOC/y	r glowth	C02	growth/yr	crashes	growth/y	r		1		1	
2	016 \$488,419		\$757,002		\$48.574		150450	301	1					
	026 \$817,687													
	036 \$2,009,021 056 4.033,700	\$119,133 \$101,234		4 \$40,38 \$14,63		\$2,585			_					
2	4,033,700	\$101,234	(1, 20, 902	\$14,03			OWTH adjustment =	0.20%						
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INPUT TABLE - read from "inputdata" worksheet	
year of EEM amendment	2016
Year of MAINTENANCE Costs	2017
YEAR OF CONSTRUCTION COSTS	2017
YEAR OF LAND COSTS	2017
Base Date:	2016
Time Zero:	2017
Discount factor	6.00%
UPDATE FACTORS USED	
TT & Reliability	1.45
VOC	0.98
ACC	1.03
MAINTENANCE COSTS	0.96
CONSTRUCTION COSTS & FEES	0.96
LAND COSTS	0.96

		CRITERIA RANGE						
TYPE	TYPE	TYPE	TYPE	TYPE	TYPE	TYPE	TYPE	TYPE
с	м	т	v	A	F	L	CO2	R

TIME STREAMS AND DISCOUNT	TING			OPTION	Option 1 (Ri	ght Turn Bay	)		~		WORKSHEET	A1.1 and A1	.2	
									ne	4	BASE DATE		2016 2017	
DESCRIPTION	PAYMENT TYPE	START YEAR.	END YEAR	DURATION YEARS	BASI COST/YR.	E YEAR GROWTH.	START COST/YR	YEAR	NEAR OF ESTIMATE		PRESENT VALUE	C	DISCOUNTING	
	т			n	\$	%	\$	%		10/	\$	SPPWF	UNSPWF	AGPWF
COSTS & MAINTENANCE Construction Cost	С	1.5	1.5	0.0	4.926.802		4,926,802		2017	0,96	\$4.333.368	0.916	0.000	0.000
Fees	Ĕ	0.3	0.3	0.0	4,926,802		232,887	KOL -	2017	0.96	\$220,338	0.986	0.000	0.000
Fees	E E	0.8	0.8	0.0	232,887		232,867	N'A	2017	0.96	\$214,011	0.957	0.000	0.000
		1.3	1.3	0.0	329,700		329,700	\\~	2017	0.96	\$294,243	0.930	0.000	0.000
Property Maintenance (ignored)	M	1.5	1.0	0.0	323,700		323,10	$\sim$		0.30	\$254,245	0.350	0.000	0.000
							()		(())					
OPERATING COSTS Travel Time 2016-2026	т	1.8	10.0	8.2	116,306	10.73%		9.04%	2902	1.45	\$1,591,017	0.903	6.549	24.852
Travel Time 2026-2036	÷	10.0	20.0	10.0	110,300	10.73/0	211 158	20.64%	2002	1.45	\$2,992,990	0.558	7.579	34.234
Travel Time 2036-2056	Ť	20.0	41.3	21.3		1/0	787.062	2.49%	2002	1.45	\$5,254,274	0.312	12.187	103.433
								(A)			,			
VOC 2016-2026	V	1.8	10.0	8.2	693,013	391%	740,530	3,000	2008	0.98	\$4,887,700	0.903	6.549	24.852
VOC 2026-2036	v	10.0	20.0	10.0	033,013		964,218	5.10%	2008	0.98	\$4,920,226	0.558	7.579	34.234
VOC 2036-2056	v	20.0	41.3	21.3	6	$\sim$	1,456,046	1.12%	2008	0.98	\$5,935,979	0.312	12.187	103.433
						))		V.						
CO2 2016-2026 CO2 2026-2036	CO2 CO2	1.8	10.0	8.2 10.0	44,549	3.91%		3.66%	2008	0.98	\$314,079	0.903	6.549	24.852
CO2 2026-2036 CO2 2036-2056	CO2 CO2	10.0 20.0	20.0 41.3	21.3	るくどう			5.26% 1.11%	2008 2008	0.98 0.98	\$317,960 \$385,063	0.558 0.312	7.579 12.187	34.234 103.433
002 2030 2030	002	20.0	41.5	21.5	$( \square ) \vee$			1.1170	2000	0.30	\$303,003	0.012	12.107	103.433
Crash Costs Period 1	Α	1.8	41.3	39.8	130,391	20%	430,848	0.20%	2006	1.03	\$1,927,424	0.903	15.444	197.192
TRANSFERED IN FROM OTHER WORKSHEETS	TT/yr	growth/yr	VOC/yr	n / globar	C02	2 arouth/y	r crashes	growth/y						
201		giowary	\$693.013		\$44,549		130391	26						
202	\$241,158	\$12,485	\$964,218	\$ \$271	21 \$61,941	\$1,74								
203		\$54,590	\$1,456,010	\$49,18	21 \$61,941 80 \$94,53	\$3,25								
205	6 1,179,478	\$19,621	1,181,115	\$16,2	55 13,426	\$1,04		0.000/						
			$\sim$	$\sim$		Crash G	ROWTH adjustment =	0.20%						
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INPUT TABLE - read from "inputdata" worksheet	
year of EEM amendment	2016
Year of MAINTENANCE Costs	2017
YEAR OF CONSTRUCTION COSTS	2017
YEAR OF LAND COSTS	2017
Base Date:	2016
Time Zero:	2017
Discount factor	6.00%
UPDATE FACTORS USED	
TT & Reliability	1.45
VOC	0.98
ACC	1.03
MAINTENANCE COSTS	0.96
CONSTRUCTION COSTS & FEES	0.96
LAND COSTS	0.96

ſ			CRITERIA RANGE						
F	TYPE	TYPE	TYPE	TYPE	TYPE	TYPE	TYPE	TYPE	TYPE
0	с	м	т	v	A	F	L	CO2	R

TIME STREAMS AND DISCOUN	ITING			OPTION	Option 2 (Ro	oundabout)					WORKSHEET	A1.1 and A1	.2	
									AR S	Å	BASE DATE		2016 2017	
DESCRIPTION	PAYMENT	START	END	DURATION	BASE	E YEAR	START	YEAR	NEAR OF	UPDATE	PRESENT VALUE	DI	SCOUNTING	
	TYPE T	YEAR.	YEAR	YEARS	COST/YR. \$	GROWTH. %	COST/YR \$	GROWTH	NEAR OF ESTIMATE	PACTOR	TIMEZERO \$	SPPWF	UNSPWF	AGPWF
COSTS & MAINTENANCE										9.96 0.96				
Construction Cost	ç	1.5 0.3	1.5 0.3	0.0	5,362,676 254,045		5,362,676	NL I	2017 2017	0.96	\$4,716,741 \$240,356	0.916	0.000 0.000	0.000
Fees Fees		0.3	0.3	0.0	254,045		254,045	N'N	20	0.96	\$233,454	0.966	0.000	0.000
		1.3	1.3	0.0	1,198,500		1,198,500	\\ <b>~</b>	2017	0.96	\$1,069,609	0.930	0.000	0.000
Property Maintenance (ignored)	M	1.5	1.5	0.0	1,130,300		1.1.00.00	$\sim$		0.30	\$1,003,003	0.350	0.000	0.000
							()		( )					
OPERATING COSTS						(	$\overline{\mathcal{M}}$							
Travel Time 2016-2026	т	1.8	10.0	8.2	140,208	5.02%	152,530	4.61%	2902	1.45	\$1,536,643	0.903	6.549	24.852
Travel Time 2026-2036	т	10.0	20.0	10.0		1/0	210,538	10,19%	2002	1.45	\$1,886,777	0.558	7.579	34.234
Travel Time 2036-2056	т	20.0	41.3	21.3			425,142	3.52%	2002	1.45	\$3,041,755	0.312	12.187	103.433
NOC 2010 2020	v	1.8	10.0	8.2	728,375		773,393	IN V	2008	0.98	\$5,046,772	0.903	6.549	24.852
VOC 2016-2026 VOC 2026-2036	v	10.0	20.0	10.0	120,313		985,317	228	2008	0.98	\$4,691,525	0.558	7.579	34.234
VOC 2036-2056	v	20.0	41.3	21.3			1,308,327	0.55%	2008	0.98	\$5,099,976	0.312	12.187	103.433
100 2000 2000		20.0	11.0	21.0		· -		V V	2000	0.00	40,000,010	0.012	12.107	100.100
CO2 2016-2026	CO2	1.8	10.0	8.2	16,005	3.55%	48,666	3.34%	2008	0.98	\$319,074	0.903	6.549	24.852
CO2 2026-2036	CO2	10.0	20.0	10.0	$\langle \langle \rangle \rangle$			3.30%	2008	0.98	\$297,019	0.558	7.579	34.234
CO2 2036-2056	CO2	20.0	41.3	21.3	P V C ~ V		82,889	0.56%	2008	0.98	\$323,250	0.312	12.187	103.433
		10		00.5	$( \ ) \ )$		121,856	0.000/	0000	4.00	AL 704 000	0.000		107 100
Crash Costs Period 1	A	1.8	41.3	39.5	121,000	0.20%	121,856	0.20%	2006	1.03	\$1,794,968	0.903	15.444	197.192
TRANSFERED IN FROM OTHER WORKSHEETS	TT/yr		VOC/yr		VI C02	arowthy	<del>// .</del>				1			
					C02									
20	016 \$140,208 026 \$210,538	\$7,033	\$728,375 \$985,347		\$46,005	\$1,63	\$ 121,430.41	243	3					
	036 \$425,142				94 \$62,331 01 \$82,88	\$2.05			-					
	056 724,182	\$14,952		\$7,20	06 92,108	\$46			-					
	721,102	\$11,00L	<u> </u>				ROWTH adjustment =	0.20%						
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INPUT TABLE - read from "inputdata" worksheet	
year of EEM amendment	2016
Year of MAINTENANCE Costs	2017
YEAR OF CONSTRUCTION COSTS	2017
YEAR OF LAND COSTS	2017
Base Date:	2016
Time Zero:	2017
Discount factor	6.00%
UPDATE FACTORS USED	
TT & Reliability	1.45
VOC	0.98
ACC	1.03
MAINTENANCE COSTS	0.96
CONSTRUCTION COSTS & FEES	0.96
LAND COSTS	0.96

		CRITERIA RANGE						
TYPE	TYPE	TYPE	TYPE	TYPE	TYPE	TYPE	TYPE	TYPE
с	м	т	v	A	F	L	CO2	R

TIME STREAMS AND DISCOUNT	TIME STREAMS AND DISCOUNTING				Option 4 (Head to Head Right Turn Bays)				WORKSHEET A1.1 and A1.2					
									NE	Å	SASE DATE		2016 2017	
DESCRIPTION	PAYMENT	START	END	DURATION		E YEAR		r year	NEAR OF ESTIMATE	UPDATE	PRESENT VALUE	1	DISCOUNTING	
	TYPE T	YEAR.	YEAR	YEARS	COST/YR. \$	GROWTH. %	COST/YR \$	GROWTH	ESTIMATE	MACTOR		SPPWF	UNSPWF	AGPWF
COSTS & MAINTENANCE										9.96 () 96				
Construction Cost	ç	1.5	1.5	0.0	5,142,295 243,348		5,142,295 243,348		2017 2017	0.96	\$4,522,905 \$230,235	0.916 0.986	0.000	0.000 0.000
Fees	1 1	0.3 0.8	0.3 0.8	0.0	243,348		243,348	N'N	20	0.96	\$230,235 \$223,624	0.986	0.000 0.000	0.000
Fees Property		1.3	1.3	0.0	512,100		512,100	$\langle \rangle \rangle$	2017	0.96	\$223,624 \$457,027	0.930	0.000	0.000
Property Maintenance (ignored)	M	1.5	1.5	0.0	512,100		312,100	2 N		0.90	\$407,027	0.930	0.000	0.000
							()		$(( )) \vee$					
OPERATING COSTS						•	((,,))							
Travel Time 2016-2026	т	1.8	10.0	8.2	116,306	10.73%	138,181	9.04% 28.64%	2902	1.45	\$1,591,017	0.903	6.549	24.852
Travel Time 2026-2036	т	10.0	20.0	10.0		1/0	241,158	22,64%	2002	1.45	\$2,992,990	0.558	7.579	34.234
Travel Time 2036-2056	т	20.0	41.3	21.3			787,062	2.49%	2002	1.45	\$5,254,274	0.312	12.187	103.433
VOC 2016 2026	V	1.8	10.0	8.2	693,013	010	740,530	1 Decen V	2008	0.98	\$4,887,700	0.903	6.549	24.852
VOC 2016-2026 VOC 2026-2036	v	10.0	20.0	10.0	083,013		964,218	5.10%	2008	0.98	\$4,920,226	0.558	7.579	34.234
VOC 2036-2056	v	20.0	41.3	21.3			1,456,016	1.12%	2008	0.98	\$5,935,979	0.312	12.187	103.433
								NV			**,***,***			
CO2 2016-2026	CO2	1.8	10.0	8.2	4 849	3.91%	47,69	3.66%	2008	0.98	\$314,079	0.903	6.549	24.852
CO2 2026-2036	CO2 CO2	10.0	20.0	10.0 21.3	$\langle \langle \rangle \rangle$		(Og1,947)~	5.26%	2008	0.98	\$317,960	0.558	7.579	34.234
CO2 2036-2056	CO2	20.0	41.3	21.3	P V C AV		94,534	1.11%	2008	0.98	\$385,063	0.312	12.187	103.433
Crash Costs Period 1	А	1.8	41.3	39.5	130,807	0.20%	180,848	0.20%	2006	1.03	\$1,927,424	0.903	15.444	197.192
TRANSFERED IN FROM OTHER WORKSHEETS	TT/yr	growth/vr	VOC/y	a drahan	VT C02	growth-y	crashes	s growth/y	,					
201			\$693,01		\$44,549		130391							
202	6 \$241,158	\$12,485	\$964,21	8 \$27,12	21 \$61.947	\$1,740	0							
203	6 \$787,062	\$54,590	\$1,456,01	6 .18	30 \$94,534	\$3,259								
205	6 1,179,478	\$19,621	1,761,115	\$16,25	55 115,426	\$1,045								
			$\sim$		. \\\	Crash G	ROWTH adjustment =	0.20%						
			$\Delta \mathcal{X}$	$\sim$	$\wedge$ $\vee$	·								
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INPUT TABLE - read from "inputdata" worksheet	
year of EEM amendment	2016
Year of MAINTENANCE Costs	2017
YEAR OF CONSTRUCTION COSTS	2017
YEAR OF LAND COSTS	2017
Base Date:	2016
Time Zero:	2017
Discount factor	6.00%
UPDATE FACTORS USED	
TT & Reliability	1.45
VOC	0.98
ACC	1.03
MAINTENANCE COSTS	0.96
CONSTRUCTION COSTS & FEES	0.96
LAND COSTS	0.96

		CRITERIA RANGE						
TYPE	TYPE	TYPE	TYPE	TYPE	TYPE	TYPE	TYPE	TYPE
с	м	т	v	A	F	L	CO2	R

TIME STREAMS AND DISCOUNT		OPTION	Option 5 (Close Waipapa Loop South)				WORKSHEET A1.1 and A1.2							
								-	A E	Æ	BASE DATE TIME ZERO		2016 2017	
DESCRIPTION	PAYMENT	START	END	DURATION	BASE	YEAR	START	YEAR	YEAR OF	UPDATE	PRESENT VALUE	0	SCOUNTING	
	TYPE T	YEAR.	YEAR	YEARS	COST/YR.	GROWTH.	COST/YR	GROWTH	ESTIMATE	FASTOR		SPPWF	UNSPWF	AGPWF
COSTS & MAINTENANCE Construction Cost Fees Fees Property Maintenance (ignored)	C F F L M	1.5 0.3 0.8 1.3	1.5 0.3 0.8 1.3	0.0 0.0 0.0 0.0	5,058,386 239,408 242,156 112,500		5,058,386 239,408 242,156 112,500		2017 2017 2017 2017	0.96 0.96 0.96 0.96	\$4,449,102 \$226,508 \$222,529 \$100,401	0.916 0.986 0.957 0.930	0.000 0.000 0.000 0.000	0.000 0.000 0.000 0.000
OPERATING COSTS Travel Time 2016-2026 Travel Time 2026-2036 Travel Time 2036-2056 Additional Travel Time 2016-2026 Additional Travel Time 2026-2036 Additional Travel Time 2026-2056	T T T T T	1.8 10.0 20.0 1.8 10.0 20.0	10.0 20.0 41.3 10.0 20.0 41.3	8.2 10.0 21.3 8.2 10.0 21.3	116,306	10.739	188.461 241,158 787,062 13,113 17,062 21,725	9104% 22.64% 9.49% 9.6% 0.00%	2002 2002 2002 2002 2002 2002 2002	1.45 1.45 1.45 1.45 1.45 1.45 1.45	\$1,591,017 \$2,992,990 \$5,254,274 \$128,012 \$117,623 \$119,707	0.903 0.558 0.312 0.903 0.558 0.312	6.549 7.579 12.187 6.549 7.579 12.187	24.852 34.234 103.433 24.852 34.234 103.433
VOC 2016-2026 VOC 2026-2036 VOC 2036-2026 Additional VOC 2016-2026 Additional VOC 2026-2026 Additional VOC 2026-2036 Additional VOC 2036-2056	V V V V V V	1.8 10.0 20.0 1.8 10.0 20.0	10.0 20.0 41.3 10.0 20.0 41.3	8.2 10.0 21.3 8.2 10.0 21.5	SE	3.91%	749,399 954,318 ,466,016 10 9,659 24,926	3.66% 5.10% 1.12% 3.59% 2.68% 0.00%	2008 2008 2008 2002 2002 2002	0.98 0.98 0.98 0.98 0.98 0.98	\$4,887,700 \$4,920,226 \$5,935,979 \$99,866 \$91,398 \$92,825	0.903 0.558 0.312 0.903 0.558 0.312	6.549 7.579 12.187 6.549 7.579 12.187	24.852 34.234 103.433 24.852 34.234 103.433
CO2 2016-2026 CO2 2026-2036 CO2 2036-2026 CO2 2036-2026 Additional CO2 2016-2026 Additional CO2 2026-2036 Additional CO2 2036-2036	CO2 CO2 CO2 CO2 CO2 CO2 CO2	1.8 10.0 20.0 1.8 10.0 20.0	10.0 20.0 41.3 10.0 20.0 4 3	8.2 73.0 21.3 20 21.3 20 21.3	44,549		47,597 61,947 94,534 758 983 1,246	3.66% 5.26% 1.11% 3.59% 2.68% 0.00%	2008 2008 2008 2002 2002 2002	0.98 0.98 0.98 0.98 0.98 0.98 0.98	\$314,079 \$317,960 \$385,063 \$4,993 \$4,570 \$4,641	0.903 0.558 0.312 0.903 0.558 0.312	6.549 7.579 12.187 6.549 7.579 12.187	24.852 34.234 103.433 24.852 34.234 103.433
Crash Costs Period 1	Α	1.8	RV	39.5	130,391	0.20%	130,848	0.20%	2006	1.03	\$1,927,424	0.903	15.444	197.192
TRANSFERED IN FROM OTHER WORKSHEETS 201 202 203 203 205 206	26 \$241,158 86 \$787,062	growthýr \$12,485 \$54,590 \$19,621	\$693.013 \$964.218 \$1,456.016 1.781.45	\$49,18	\$44,549 \$61,947 \$94,534	growth/yn \$1,740 \$3,255 \$1,045 crash Gf	130391	growth/y 261						

# APPENDIX K Cost Estimates and Risk Register

RELEASED UNDER THUE

Project Estimate - Form C			DBE
234 SH10 Waipapa Road Intersection Improvements	Deta	iled Business	
m Description	Base Estimate	Contingency	Funding Risk Contingency
Nett Project Property Cost	274,750	54,950	27,475
Project Development Phase		- ,	
- Consultancy Fees	Nil	Nil	Nil
- NZTA Managed Costs	Nil	Nil	Nil
Total Project Development	Nil	Nil	Nil
Pre-implementation Phase - Consultancy Fees - NZTA Managed Costs			
Total Pre-implementation	423,431	42,343	42,343
Implementation Phase		,515	
Implementation Fees			11 m
- Consultancy Fees		(	
- NZTA Managed Costs		0	
- Construction Monitoring Fees			
Sub Total Base Implementation Fees	325,716	65,143	
Physical Works		~ // '	
1 Environmental Compliance	50,000	2 200	6
2 Earthworks	23918	2,292	
3 Ground Improvements 4 Drainage	634584	63,438	$(\mathcal{A})$
5 Pavement and Surfacing	462,499	46,250	$\sim 111 \sim$
6 Bridges	100,43	40,2.0	
7 Retaining Walls	62,550	6,255	
8 Traffic Services	216,500	81,630	
9 Service Relocations	1,290,000	258,000	1.
10 Landscaping	143,312	14,331	a.
11 Traffic Management and Temporary Works	375,900	37,500	
12 Preliminary and General	260,978	26,057	
13 Extraordinary Construction Costs	488,514	48,857	
Sub Total Base Physical works	4,006,311	529,631	
Total for Implementation Phase	4332,027	594,774	950,000
Project Base Estimate (A+C+D)	5,030,208		
Contingency (Assessed (An) lysed)	(A+C+D)	692,067	
Project Expected Estimate	(E+F)	5,722,276	
Project Property Cost expected Estimate			
ct Development Phase Expected Estimate		Nil	
nplementation Phase Expected Estimate	[		
nentation Phase Expected Estimate			
Funding Risk Contingency (Assessed/Analysed)		(A+C+D)	1,019,818
95th perceptile troject Estiplate		(G+H)	6,742,094
roject Property Cost 95th percentile Estimate			
t Development Phase 95th percentile Estimate			Nil
plementation Phase 95th percentile Estimate			
entation Phase 95th percentile Estimate			
Estimate 29/09/17	Cost Index (Qtr/Ye		
ate prepared by	Signed NJCC	dans	>.0
nate internal peer review by	Signed CC	and-	all
te external peer review by	Signed		
ate accepted by NZTA	Signed		

Pro	ject Estimate - Form C			DBE
PN423	4 SH10 Waipapa Road Intersection Improvements	Deta	iled Business (	Case Estimate Roundabout
ltem	Description	Base Estimate	Contingency	Funding Risk Contingency
A	Nett Project Property Cost	998,750	199,750	99,875
	Project Development Phase			
	- Consultancy Fees	Nil	Nil	Nil
	- NZTA Managed Costs	Nil	Nil	Nil
В	Total Project Development	Nil	Nil	Nil
	Pre-implementation Phase			
	- Consultancy Fees	-		
с	- NZTA Managed Costs Total Pre-implementation	461,899	46,190	46,190
<u> </u>	Implementation Phase	401,099	40,190	40,190
	Implementation Fees			
	- Consultancy Fees		^	NY.
	- NZTA Managed Costs		$\sim$	
	- Construction Monitoring Fees			
	Sub Total Base Implementation Fees	355,307	71,061	~ (
1.02	Physical Works			
	Environmental Compliance	50,000	2,826	0
	Earthworks Ground Improvements	8,250	2,820	
	Drainage	667,241	66,72	12
	Pavement and Surfacing	A A A A A	57,93	$\sim H \sim$
	Bridges	0		
	Retaining Walls	62,550	6,453	
8	Traffic Services	226,550	22,55	
9	Service Relocations	1,290,000	238,000	
	Landscaping	274 170		
	Traffic Management and Temporary Works	371,000	37,500	
	Preliminary and General	284248		
13	Extraordinary Construction Costs Sub Total Base Physical works	4,378,279	53,296 566,028	
				1 512 500
D	Total for Implementation Phase	4,725,587	637,089	1,512,500
E	Project Base Estimate (A+C+D)	6,186,236		
F		(4)(C)(D)	882.020	
	Contingency (Assessed Analysed)	(A+C+D)	883,029	
	Project Expected Estimate	(E+F)	7,069,265	
ett Proj	ect Property Cost Experied Estimate	-	ALL A	
	evelopment Phase Expected Estimate		Nil	
	ntation Phase Expected Estimate			
pieme				
н	Funding Risk Conjugency (Assessed/Analysed)		(A+C+D)	1,658,565
1	95th percentil Project Estimate		(G+H)	8,727,830
	ect Property Cost 95th percentile Estimate		(u+n)	0,727,030
	everopmen. Phase 95th percentile Estimate			Nil
	mentation Phase 95th percentile Estimate			
	ntation Phase 95th percentile Estimate			
11				
	Estimate 29/09/17	Cost Index (Qtr/Ye	21)	
	04/04/11			
imate	prepared by	Signed Noto	ad Jours,	$\frown$

Date of Estimate 29/09/17	Cost Index (Qtr/Year)
Estimate prepared by	Signed NTodd January
Estimate internal peer review by	Signed Could al
Estimate external peer review by	Signed
Estimate accepted by NZTA	Signed

ro	ject Estimate - Form C			DBE	
423	4 SH10 Waipapa Road Intersection Improvements	Deta	iled Business (		
em	Description	Base Estimate	Contingency	Funding Risk Contingency	
A	Nett Project Property Cost	410,750	82,150	41,075	
	Project Development Phase				
	- Consultancy Fees	Nil	Nil	Nil	
	- NZTA Managed Costs	Nil	Nil	Nil	
В	Total Project Development	Nil	Nil	Nil	
	Pre-implementation Phase				
1	- Consultancy Fees				
	- NZTA Managed Costs		-		
с	Total Pre-implementation	480,722	48,072	48,072	
	Implementation Phase				
	Implementation Fees			11.	
	- Consultancy Fees		0		
	- NZTA Managed Costs				
	- Construction Monitoring Fees	-			((
	Sub Total Base Implementation Fees	369,786	73,958		$\langle ( ($
	Physical Works				$\sim \sim$
1	Environmental Compliance	50,000			N/
2	Earthworks	12,878	1,287		15
3	Ground Improvements			())	~
	Drainage	659,124	65,912	$\sim 11 \sim$	
5	Pavement and Surfacing	683,962	60,306	110	
	Bridges	0	0		
	Retaining Walls	56,250	5.623		
	Traffic Services	515,500	51,350		
	Service Relocations	1,290,000	238,000		
	Landscaping	136,057	3,606		
	Traffic Management and Temporary Works	3 5 000	37,500		
	Preliminary and General	295,829	29,583		
13	Extraordinary Construction Costs	554,680	55,468		
	Sub Total Base Physical works	4,548,374	583,837		
D	Total for Implementation Phase	4,918,160	657,795	1,265,000	
E	Project Base Estimate (A+C+D)	5,809,633			
F	Contingency (Assested (Analyter)	(A+C+D)	788,017		
G	Project Expected Estimate	(E+F)	6,597,650		
	ect Property Cost Expected Estimate				
	evelopment these Expected Estimate	ł	Nil		
imple	mentajign Phase Expected Estimate	ŀ			
	ntation Phase Expected Estimate				
.c.ne					
н	Funding Risk Contingency (Assessed/Analysed)		(A+C+D)	1,354,147	
1	95th percentile Project Estimate		(G+H)	7,951,797	
t Proj	ect Property Cost 95th percentile Estimate				
ect D	evelopment Physe 95th percentile Estimate			Nil	
imple	mentation Phase 95th percentile Estimate				
	ntation Rhase 95th percentile Estimate				

Date of Estimate	29/	91	17	Cost Index (Qtr/Year)	
Estimate prepared by	Signed NJOdd Ame				
Estimate internal peer review by	Signed Contain				
Estimate external peer review by				Signed	
Estimate accepted by NZTA				Signed	

Pro	ject Estimate - Form C			DBE
423	4 SH10 Waipapa Road Intersection Improvements	Deta	ailed Business (	
em	Description	Base Estimate	Contingency	Funding Risk Contingency
A	Nett Project Property Cost	426,750	85,350	42,675
	Project Development Phase		,	
	- Consultancy Fees	Nil	Nil	Ni
	- NZTA Managed Costs	Nil	Nil	Ni
В	Total Project Development	Nil	Nil	Nil
	Pre-implementation Phase			
	- Consultancy Fees			
	- NZTA Managed Costs	442.454		
2	Total Pre-implementation Implementation Phase	442,450	44,245	44,245
	Implementation Phase			$\wedge$
	- Consultancy Fees			$\langle \langle \rangle$
	- NZTA Managed Costs	1		116
	- Construction Monitoring Fees			
	Sub Total Base Implementation Fees	340,346	68,069	V
	Physical Works			
1	Environmental Compliance	50,000	5,000	^
2	Earthworks	13.07	1,287	
3	Ground Improvements		0	(N)
4	Drainage	651,124	65,112	$\sim$
	Pavement and Surfacing	589,472	58,9 7	NU
	Bridges	0		
7	Retaining Walls	62,550	6255	
	Traffic Services	223,000	22,300	
	Service Relocations	1,290,000	258,000	
	Landscaping	149,742	14,974	
	Traffic Management and Temporary Works Preliminary and General	375000	37,500	
	Extraordinary Construction Costs	e la bra	27,228	
15	Sub Total Base Physical works	4, 86,255	547,625	
	Total for Implementation Phase	526,601	615,695	1,277,500
	Project Base Estimate (A+C+D)	5,395,801		
:	Contingency (Assesseet (A))alveet)	(A+C+D)	745,290	
	Project Expected Estimate	(E+F)	6,141,090	
Proj	ect Property Cost Expected Estimate			
ct D	evelopment Phase Expected Estimate		Nil	
	nentation Phase Expected Estimate			
	ntation Phase Expected Estimate			
	V allast			
	Funding Risk Contingency (Assessed/Analysed)		(A+C+D)	1,364,420
	95th percentile Project Securiate		(G+H)	7,505,510
Proj	ect Property Cost 9 th percentile Estimate			
ct D	evelopment Phase 95th percentile Estimate	2.		Nil
nple	mentation Phase 95th percentile Estimate			
	nation Rhase 95th percentile Estimate			
7				
-	a la lu			
	stimate 29/09/17	Cost Index (Qtr/Ye	ar)	

Date of Estimate 29	109/	17	Cost Inde	x (Qtr/Year)			
Estimate prepared by			Signed	NJoeld	Imes	$\bigcirc$	0
Estimate internal peer review by			Signed	CO	n	Jac	L.
Estimate external peer review by			Signed				
Estimate accepted by NZTA			Signed				

Project Estimate - Form C		DBE							
PN4234 SH10 Waipapa Road Intersection Improvement	s	Detailed Business Case Estimate Close Waipapa Loop Road							
Item Description	Base Estima	e Contingeno	Funding Risk Contingency						
A Nett Project Property Cost	93,	750 18	,750 9,3						
Project Development Phase									
- Consultancy Fees		Nil	Nil						
- NZTA Managed Costs		Nil	Nil						
B Total Project Development		Nil	Nil						
Pre-implementation Phase									
- Consultancy Fees - NZTA Managed Costs									
C Total Pre-implementation	435,	87 43	,529 43,52						
Implementation Phase	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,								
Implementation Fees									
- Consultancy Fees			AV2.						
- NZTA Managed Costs		-							
- Construction Monitoring Fees			V.						
Sub Total Base Implementation Fees Physical Works	334,	336 66,	.90						
Physical Works 1 Environmental Compliance	50.0		000						
2 Earthworks	50,0		287						
3 Ground Improvements	1		0						
4 Drainage	43		327						
5 Pavement and Surfacing	34.		448						
6 Bridges		0							
7 Retaining Walls	62,		235						
8 Traffic Services	220,		050						
9 Service Relocations	1,290,0								
10 Landscaping 11 Traffic Management and Temporary Works	159		969 500						
12 Preliminary and General			787						
13 Extraordinary Construction Costs	502		225						
Sub Total Base Physical works	4118								
Total for Implementation Phase	4453,3		816 922,50						
Project Base Estimate (A+C+D)	4,982,3	56							
Contingency (Assessed/Am)iyaed		D) 670							
G Project Expected Estimate	(A+C-								
Project Property Cost expected Estimate	(E	+F) 5,652,	450						
ect Development Phase Expected Estimate			Nil						
implementation Phase Expected Estimate		-							
ementation Phase Expected Estimate									
Funding Risk Contingency (Assassed/Analysed)		(A+C	(+D) 975,40						
95th percentile Rroject Estimate		(G	(+H) 6,627,85						
Project Property Cost 95th percentile Estimate									
ect Development Phase 95th percentile Estimate			N						
mplementation phase 95th percentile Estimate									
ementation Phase 95th percentile Estimate									
		/Year)							
of Estimate 29/	09/17 Cost Index (Qt								
of Estimate 29/	Signed NSC	dd gnis	$\frown$						
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te prepared by	Signed NSC	dd frus	Parl						

roject Estimate - Form C		1	DBE
4234 SH10 Waipapa Road Intersection Improvements		iled Business ( IMUM: Klinac L	Case Estimate
em Description	Base Estimate	Contingency	Funding Risk Contingency
A Nett Project Property Cost	0	0	0
Project Development Phase			
- Consultancy Fees	Nil	Nil	Nil
- NZTA Managed Costs	Nil	Nil	Nil
3 Total Project Development	Nil	Nil	Nil
Pre-implementation Phase			
- Consultancy Fees			
- NZTA Managed Costs			
Total Pre-implementation	39,775	3,977	3,977
Implementation Phase			$\wedge$
Implementation Fees			11
- Consultancy Fees		$\mathbf{O}$	
- NZTA Managed Costs		$\sim$	
- Construction Monitoring Fees			
Sub Total Base Implementation Fees	30,596	6, 19	~
Physical Works			
1 Environmental Compliance	0		<u> </u>
2 Earthworks		0	
3 Ground Improvements		0	111
4 Drainage			$\gamma \mu \gamma$
5 Pavement and Surfacing			110
6 Bridges	0		
7 Retaining Walls	0		
8 Traffic Services	0	$\sqrt{10}$	
9 Service Relocations	<u> </u>	0	
10 Landscaping	0		
11 Traffic Management and Temporary Works	0	0	
12 Preliminary and General	-	0	
13 Extraordinary Construction Costs		0	
Sub Total Base Physical works	376,329	37,633	
D Total for Implementation Phase	406,925	43,752	387,500
E Project Base Estimate (A+C+D)	446,700		1
		49 990	
Contingency (Assessed Analysed)	(A+C+D)	47,730	
F Project Expected Estimate	(E+F)	494,429	
Project Property Cost Expensed Estimate			
ect Development Phase Expected Estimate		Nil	
mplementation Rhase Expected Estimate			
ementation Phase Expected Estimate			
		(1. 6. 5)	201.477
I Funding Risk Contingency (Assessed/Analysed)		(A+C+D)	391,477
95th percentile Project Estimate		(G+H)	885,907
Project Property Cost 95th percentile Estimate			
ect Development Phase 95th percentile Estimate			Nil
mplementation Phase 95th percentile Estimate			
ementation Phase 95th percentile Estimate			

Date of Estimate	29	109	/H	Cost Ind	ex (Qtr/Year)
Estimate prepared by				Signed	NJeodd Juse
Estimate internal peer review by				Signed	Colulally
Estimate external peer review by				Signed	
Estimate accepted by NZTA		-		Signed	

Elemental Breakdown

Elemental Breakdown for Physical Works         Unit         Sub-Element Totals         Element Total           300         Ground Improvements         -         5         -           400         Drainage         -         5         -           401         Stormwater drainage, temporary stream diversion and culverts including         5         -         -           402         Storound and pavement diversion and culverts including         -         5         -           403         Storound and pavement diversion and culverts including         -         5         -           404         Storound and pavement diversion and culverts including         -         5         -           405         Storound and pavement diversion and culverts including         -         5         -           406         Kerb without Channel (Inclusbastil) (Option)         m         5         -         -           408         Erosion control         -         5         -         -         -           408         Fainage         -         5         -         -         -           409         funnes         -         5         -         -         -           410         Relamant devices         -         5<	
4.00         Drainage         5         634,384           4.01         Stormwater drainage, temporary stream diversion and culverts including headwalls, chambers and riprago         \$         .           4.02         Subsoil and pavement drains         \$         .           4.02         Subsoil and pavement drains         \$         .           4.03         Kerb bioks (incl. subsoil) (Waipaga Corridor)         m         \$         264,866.51           4.04         Kerb without Channel (Incl.subsoil) (Option)         m         \$         13,894.29           4.05         Kerb without Channel (Incl.subsoil) (Option)         m         \$         13,280.00           4.05         Kerb without Channel (Incl.subsoil) (Option)         m         \$         1.           4.06         Fulmes         \$         .         .           4.07         Surface water channel         \$         .         .           4.08         Fulmes         \$         .         .         .           4.10         Remainert ponds         \$         \$         .         .           4.11         Merainert ponds         \$         \$         .         .           4.11         Merainert ponds         \$         \$         . <th>Totals</th>	Totals
Stormwater drainage, temporary stream diversion and culverts including         \$         \$           4.02         Subsoil and pavement drains         \$         \$           4.03         Kerb blocks (incl. subsoil) (Wajapa Corridor)         m         \$         1,280,00           4.04         Kerb without Channel (Incl. subsoil) (Option)         m         \$         1,280,00           4.05         Kerb without Channel (Incl. subsoil) (Option)         m         \$         2,248,865,51           4.06         Kerb without Channel (Incl. subsoil) (Option)         m         \$         2,1600,00           4.08         Kerb without Channel (Incl. subsoil) (Option)         m         \$         2,1600,00           4.07         Surface water channel         \$         \$         -           4.08         Irumes         \$         \$         -           4.10         Ramgardens         \$         \$         -           4.11         Permeent devices         \$         \$         -           4.11         Fernament devices         \$         \$         -           4.11         Fernament devices         \$         \$         -           4.11         Textment devices         \$         \$         \$	-
Stormwater drainage, temporary stream diversion and culverts including         5           4.02         Subsoil and pavement drains         5           4.03         Kerb biocks (ind: subsoil) (Waipapa Corridor)         m         5           4.04         Kerb without Channel (Incl.subsoil) (Waipapa Corridor)         m         5         264,866.51           4.04         Kerb without Channel (Incl.subsoil) (Option)         m         5         27,800.0           4.05         Kerb without Channel (Incl.subsoil) (Option)         m         5         21,600.00           4.06         Kerb without Channel (Incl.subsoil) (Option)         m         5         -           4.07         Surface water channel         5         -         -           4.08         Flumes         5         -         -           4.10         Rain gardens         5         -         -           4.11         remment ponds         5         -         -           4.11         remment ponds         5         -         -           4.12         reased sales         5         -         -           4.14         Treatment devices         5         -         -           4.11         Formanent ponds         6	4 384 05
4.00       headwalls, chambers and rip-rap       5         4.02       Subsoill and pavement drains       5         4.03       Kerb blocks (incl. subsoill) (Wajapaa Corridor)       m       5       2.64,866.51         4.04       Kerb blocks (incl. subsoill) (Option)       m       5       1.280.00         4.05       Kerb blocks (incl. subsoill) (Option)       m       5       1.280.00         4.06       Kerb blocks (incl. subsoill) (Option)       m       5       1.1         4.06       Kerb blocks (incl. subsoill) (Option)       m       5       1.1         4.07       Surface water chamel       m       5       1.1         4.08       trois control       5       1.1       1.1         4.08       trois control       5       1.1       1.1         4.10       Rain gardens       5       1.1       1.1         4.11       reatment devices       5       1.1       1.1         4.11       Teatment devices       5       1.1       1.2       1.2       1.2       1.2       1.2       1.2       1.2       1.2       1.2       1.2       1.2       1.2       1.2       1.2       1.2       1.2       1.2       1.2       1.2 <td>7,507.05</td>	7,507.05
4.02         Subsoil and pavement drains         s         s           4.03         Kerb without Channel (Inclusboil) (Waipapa Corridor)         m         S         2.86.865.1           4.04         Kerb without Channel (Inclusboil) (Option)         m         S         1.280.00           4.05         Kerb without Channel (Inclusboil) (Option)         m         S         1.280.00           4.06         Kerb without Channel (Inclusboil) (Option)         m         S         2.1600.00           4.08         Kerb without Channel (Inclusboil) (Option)         m         S         1.280.00           4.08         Kerb without Channel (Inclusboil) (Option)         m         S         1.10           4.09         Flumes         S         .         .           4.10         Ramaent pands         S         .         .           4.11         Remainent pands         S         .         .           4.11         Treatment devices         S         .         .           4.11         Kernament davices         S         .         .           4.11         Kernament davices         S         .         .           4.11         Kernament davices         S         .         . <tr< td=""><td></td></tr<>	
4.03       Kerb blocks (incl. subsoil) (Wajapa Corridor)       m       \$       2.64,866.51         4.04       Kerb blocks (incl. subsoil) (Option)       m       \$       1.39,894.29         4.05       Kerb blocks (incl. subsoil) (Option)       m       \$       1.39,894.29         4.06       Kerb blocks (incl. subsoil) (Option)       m       \$       2.7,600.00         4.07       Surface water chamel       m       \$       2.7,600.00         4.08       trois control       s       -       -         4.09       Flumes       s       -       -         4.10       Rain gardens       s       -       -         4.11       Perament ponds       s       -       -         4.12       Wetlands       s       -       -         4.13       Grassed swales       s       -       -         4.14       Treatment devices       s       -       -         4.15       KERB IPpe - 300mm dia, Class 4       m       s       4.00,80,40         4.16       RCRB IPpe - 400mm dia, Class 4       m       s       -       -         4.17       RCRB IPpe - 300mm dia, Class 4       m       s       5       - <t< td=""><td></td></t<>	
4.05       kerb blocks (incl. subsol) (Option)       m       \$ 139,894.29         4.06       kerb without Channel (incl.subsol) (Option)       m       \$ 21,600.00         4.07       Surface water channel       \$ \$	
4.06         Kerb without Channel (Inclusboil) (Option)         m         \$ 21,600.00           4.07         Surface water channel         \$         \$         .           4.08         Erosion control         \$         \$         .           4.09         Flumes         \$         \$         .           4.10         Rain gardens         \$         \$         .           4.11         Permaent ponds         \$         \$         .           4.11         Wetlands         \$         \$         .           4.12         Wetlands         \$         \$         .           4.13         Grassed svales         \$         \$         .           4.14         Manhole 1200mm         ea         \$         6.474.55           4.15         Machole 1200mm         a         \$         .           4.17         RCRR Pipe - 300mm dia, Class 4         m         \$         4.08.08           4.18         RCRR Pipe - 300m dia, Class 4         m         \$         4.08.06           4.20         RCRR Pipe - 500m dia, Class 4         m         \$         1.04.166.17           4.21         RCRR Pipe - 500m dia, Class 4         m         \$         .	
4.08       Erson control       \$       \$       .         4.08       Erson control       \$       \$       .         4.09       Flumes       \$       .       .         4.10       Rain gardens       \$       \$       .         4.11       Permanent ponds       \$       \$       .         4.12       Wetlands       \$       \$       .         4.13       Crassed swales       \$       \$       .         4.14       Treatment devices       \$       \$       .         4.15       Manhole 1200mm       ea       \$       6,474.55         4.16       RCRR Pipe - 300mm dia, Class 4       m       \$       40,064         4.18       RCRR Pipe - 300mm dia, Class 4       m       \$       40,064         4.18       RCRR Pipe - 300mm dia, Class 4       m       \$       40,064         4.20       RCRR Pipe - 300mm dia, Class 4       m       \$       \$       .         4.21       RCRR Pipe - 300mm dia, Class 4       m       \$       \$       .         4.22       RCRR Pipe - 300mm dia, Class 4       \$       \$       .       .         4.22       RCRR Pipe - 300mm dia, Class 4	
4.09       Flowes       \$       .         4.10       Rain gardens       \$       .         4.11       Permaent bonds       \$       .         4.11       Permaent bonds       \$       .         4.11       Permaent bonds       \$       .         4.12       Wetlands       \$       .         4.13       Crassed swales       \$       .         4.14       Treatment devices       \$       .         4.14       Treatment devices       \$       .         4.15       Mahole 1200mm       as \$       6,474.55         4.16       RCRR Pipe - 375mm dia, Class 4       m       \$       40.0 kB         4.18       RCRR Pipe - 500mm dia, Class 4       m       \$       \$       .         4.20       RCRR Pipe - 500m dia, Class 4       m       \$       \$       .         4.21       RCRR Pipe - 500m dia, Class 4       m       \$       \$       .         4.22       RCRR Pipe - 500m dia, Class 4       m       \$       \$       .         4.22       RCRR Pipe - 500m dia, Class 4       .       \$       .       .         4.23       RCRR Pipe - 500m dia, Class 4       \$       .	
4.09       Flumes       \$       .         4.10       Rain gardens       \$       .         4.11       Permanent ponds       \$       .         4.12       Wetlands       \$       .         4.11       Versaed swales       \$       .         4.13       Grassed swales       \$       .         4.14       Treatment devices       \$       .         4.15       Manhole 1200mm       ea       \$       6.474.55         4.16       RCRRJ Pipe - 300mm dia, Class 4       m       \$       4.09.68         4.17       RCRRJ Pipe - 300mm dia, Class 4       m       \$       4.09.68         4.18       RCRRJ Pipe - 300mm dia, Class 4       m       \$       4.09.68         4.18       RCRRJ Pipe - 300mm dia, Class 4       m       \$       5.0         4.20       RCRRJ Pipe - 500mm dia, Class 4       m       \$       5.0         4.21       RCRRJ Pipe - 300mm dia, Class 4       m       \$       5       .         4.21       RCRRJ Pipe - 500m dia, Class 4       m       \$       .       .         4.22       RCRRJ Pipe - 500m dia, Class 4       \$       .       .       .         4.22	
4.10       Rein gardens       \$       -         4.11       Wetlands       \$       -         4.12       Wetlands       \$       -         4.13       Grassed swales       \$       -         4.14       Treatment devices       \$       -         4.14       Treatment devices       \$       -         4.15       Manhole 1200mm       ea       \$       6,474.55         4.16       RCRR Pipe - 375mm dia, Class 4       m       \$       4,60.65         4.18       RCRR Pipe - 600mm dia, Class 4       m       \$       40.80.65         4.18       RCRR Pipe - 600mm dia, Class 4       m       \$       40.80.65         4.20       RCRR Pipe - 500m dia, Class 4       m       \$       5.806.75         4.21       RCRR Pipe - 375mm dia, Class 4       m       \$       -         4.22       RCRR Pipe - 450mm dia, Class 4       f       \$       -         4.22       RCRR Pipe - 450mm dia, Class 4       f       \$       -         4.23       RCRR Pipe - 450mm dia, Class 4       f       \$       -         4.24       RCRR Pipe - 50mm dia, Class 4       f       \$       -         4.25       RCRR Pip	
4.11       Permanent ponds       \$       .         4.12       Wetlands       \$       .         4.13       Grassed swales       \$       .         4.14       Treatment devices       \$       .         4.15       Manhole 1200mm       ea       \$       .         4.16       Manhole 1200mm       ea       \$       6,474.55         4.16       RCRRJ Pipe - 370mm dia, Class 4       m       \$       4,60,66         4.18       RCRRJ Pipe - 370m dia, Class 4       m       \$       4,60,66         4.19       RCRRJ Pipe - 370m dia, Class 4       m       \$       N.0.47673         4.20       RCRRJ Pipe - 300mm dia, Class 4       m       \$       V.0.40675         4.21       RCRRJ Pipe - 300mm dia, Class 4       m       \$       V.0.40675         4.21       RCRRJ Pipe - 300mm dia, Class 4       m       \$       V.0.40675         4.22       RCRRJ Pipe - 300mm dia, Class 4       m       \$       V.0.40675         4.22       RCRRJ Pipe - 300mm dia, Class 4       m       \$       V.1.407667         4.23       RCRRJ Pipe - 500m dia, Class 4       \$       \$       V.1.407667         4.24       RCRRJ Pipe - 500m dia, Class 4	
4.12       Wetlands       \$         4.13       Grassed swales       \$         4.14       Treatment devices       \$         4.15       Manhole 1200mm       \$         4.16       RCRRJ Pipe - 300mm dia, Class 4 (Waipapa Corridor)       m       \$         4.17       RCRRJ Pipe - 375mm dia, Class 4       m       \$       \$         4.18       RCRRJ Pipe - 500mm dia, Class 4       m       \$       \$       \$         4.19       RCRRJ Pipe - 500mm dia, Class 4       m       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$ <td></td>	
4.13       Grased swales       \$       .         4.14       Treatment devices       \$       .         4.15       Manhole 1200mm       ea       \$       6,474.55         4.16       RCRRJ Pipe - 300mm dia, Class 4       m       \$       4,60,60         4.17       RCRRJ Pipe - 300mm dia, Class 4       m       \$       4,60,60         4.18       RCRRJ Pipe - 450mm dia, Class 4       m       \$       60,800,30         4.19       RCRRJ Pipe - 450mm dia, Class 4       m       \$       60,800,30         4.20       RCRRJ Pipe - 500mm dia, Class 4       m       \$       5       -         4.21       RCRRJ Pipe - 900mm dia, Class 4       m       \$       1,5806.75       1         4.21       RCRRJ Pipe - 375mm dia, Class 4       m       \$       5       -         4.22       RCRRJ Pipe - 600mm dia, Class 4       \$       \$       -       -         4.22       RCRRJ Pipe - 600mm dia, Class 4       \$       \$       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       - <td></td>	
4.15       Manhole 1200mm       ea       \$ 6,474.55         4.16       RCRRJ Pipe - 300mm dia, Class 4 (Waipapa Corridor)       m       \$         4.17       RCRRJ Pipe - 300mm dia, Class 4       m       \$       4,20,60         4.18       RCRRJ Pipe - 375mm dia, Class 4       m       \$       4,20,60         4.18       RCRRJ Pipe - 500mm dia, Class 4       m       \$       6,080,30         4.20       RCRRJ Pipe - 300mm dia, Class 4       m       \$       6,080,30         4.21       RCRRJ Pipe - 300mm dia, Class 4       m       \$       5       -         4.22       RCRRJ Pipe - 375mm dia, Class 4       m       \$       \$       -         4.22       RCRRJ Pipe - 375mm dia, Class 4       m       \$       5       -         4.23       RCRRJ Pipe - 375mm dia, Class 4       \$       \$       -       -         4.24       RCRRJ Pipe - 375mm dia, Class 4       \$       \$       -       -       -       -         4.24       RCRRJ Pipe - 375mm dia, Class 4       \$       \$       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -	
4.16       RCRRJ Pipe - 300mm dia, Class 4       m       \$       4.10         4.17       RCRRJ Pipe - 375mm dia, Class 4       m       \$       4.10       http://www.nmdia, Class 4         4.18       RCRRJ Pipe - 450mm dia, Class 4       m       \$       4.00,800       0         4.19       RCRRJ Pipe - 500mm dia, Class 4       m       \$       4.00,100       1         4.20       RCRRJ Pipe - 500mm dia, Class 4       m       \$       15,806.75       1         4.21       RCRRJ Pipe - 300mm dia, Class 4       m       \$       15,806.75       1         4.22       RCRRJ Pipe - 300mm dia, Class 4       m       \$       5       1         4.22       RCRRJ Pipe - 300mm dia, Class 4       m       \$       5       1         4.23       RCRRJ Pipe - 450mm dia, Class 4       f       \$       1       1         4.24       RCRJ Pipe - 450mm dia, Class 4       f       \$       5       1         4.25       RCRJ Pipe - 750mm dia, Class 4       f       \$       5       1         4.26       RCRJ Pipe - 900mm dia, Class 4       f       \$       5       1         4.28       Single Sump Catchpit       f       \$       1       5       1 </td <td></td>	
4.17       RCRR Pipe - 375mm dia, Class 4       m       \$ 4,00,00         4.18       RCRR Pipe - 450mm dia, Class 4       m       \$ 60,800,30         4.19       RCRR Pipe - 600mm dia, Class 4       m       \$ 60,800,30         4.20       RCRR Pipe - 750mm dia, Class 4       m       \$ 60,800,30         4.21       RCRR Pipe - 750mm dia, Class 4       m       \$ 5,806.75         4.22       RCRR Pipe - 300mm dia, Class 4       m       \$ 5,806.75         4.22       RCRR Pipe - 450mm dia, Class 4       m       \$ 5,806.75         4.22       RCRR Pipe - 450mm dia, Class 4       m       \$ 5,806.75         4.24       RCRR Pipe - 450mm dia, Class 4       S       -         4.25       RCRR Pipe - 450mm dia, Class 4       S       -         4.24       RCRR Pipe - 450mm dia, Class 4       S       -         4.25       RCRR Pipe - 500mm dia, Class 4       S       -         4.26       RCRR Pipe - 900mm dia, Class 4       S       S         4.27       RCRR Pipe - 900mm dia, Class 4       S       S         4.28       Single Sump Catchpit       S       S         5       Subgrade tabilisation/improvement (aggregate, lime(or center)       S       S         5.02 <td< td=""><td></td></td<>	
4.18       RCRR Pipe - 450mm dia, Class 4       m       \$ 0.080.30         4.19       RCRR Pipe - 600mm dia, Class 4       m       \$ NOV First         4.20       RCRR Pipe - 750mm dia, Class 4       m       \$ 15,806.75         4.21       RCRR Pipe - 300mm dia, Class 4 (Option)       m       \$ 15,806.75         4.22       RCRR Pipe - 300mm dia, Class 4       m       \$ 15,806.75         4.23       RCRR Pipe - 375mm dia, Class 4       m       \$ 15,806.75         4.24       RCRR Pipe - 300mm dia, Class 4       f 1       \$ 1         4.24       RCRR Pipe - 450mm dia, Class 4       f 1       \$ 1         4.25       RCRR Pipe - 500mm dia, Class 4       f 1       \$ 1         4.26       RCRR Pipe - 750mm dia, Class 4       f 1       \$ 1         4.27       RCRR Pipe - 750mm dia, Class 4       f 1       \$ 1         4.28       Single Sump Catchpit       g 1       g 1       \$ 1         4.29       Manhole 1200mm       g 1       g 1       \$ 462,498         5.01       Subgrade stabilisation/improvement (aggregate, limeon centent)       g 1       \$ 1         5.02       Subgrade stabilisation/improvement (aggregate, limeon centent)       g 1       \$ 1         5.03       Subgrade stabilisation/i	
4.19       RCRR Pipe - 600mm dia, Class 4       m       State 1         4.20       RCRR Pipe - 750mm dia, Class 4       m       State 1         4.21       RCRR Pipe - 300mm dia, Class 4       m       State 1         4.22       RCRR Pipe - 300mm dia, Class 4       m       State 1         4.22       RCRR Pipe - 350mm dia, Class 4       m       State 1         4.23       RCRR Pipe - 350mm dia, Class 4       m       State 1         4.24       RCRR Pipe - 500mm dia, Class 4       State 1       State 1         4.25       RCRR Pipe - 500mm dia, Class 4       State 1       State 1         4.26       RCRR Pipe - 500mm dia, Class 4       State 1       State 1         4.27       RCRR Pipe - 500mm dia, Class 4       State 1       State 1         4.28       Manhole 1200mm       State 1       State 1         5.00       Pavement and Surfacing       State 1       State 1         5.01       Subgrade stabilisation/improvement (aggregate, lime or center)       State 1       State 1         5.02       Subgrade reparation and testing       State 1       State 1       State 1         5.02       Subgrade reparation and testing       State 2       State 2       State 2       State 2       State 2       Sta	
4.20       RCRI Pipe - 750mm dia, Class 4       m       S       -         4.21       RCRRI Pipe - 300mm dia, Class 4       m       S       -         4.22       RCRRI Pipe - 300mm dia, Class 4       m       S       -         4.23       RCRRI Pipe - 300mm dia, Class 4       m       S       -         4.24       RCRI Pipe - 600mm dia, Class 4       S       -       -         4.25       RCRRI Pipe - 600mm dia, Class 4       S       -       -         4.26       RCRI Pipe - 750mm dia, Class 4       S       -       -       -         4.27       RCRI Pipe - 750mm dia, Class 4       S       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -	(
4.21       RCRIP pipe - 900mm dia, Class 4       m       S       1         4.22       RCRIP pipe - 300mm dia, Class 4 (Option)       m       S       1         4.23       RCRIP pipe - 375mm dia, Class 4       m       S       -         4.24       RCRIP pipe - 375mm dia, Class 4       S       -       -         4.25       RCRIP pipe - 750mm dia, Class 4       S       -       -         4.26       RCRIP pipe - 750mm dia, Class 4       S       -       -         4.27       RCRIP pipe - 750mm dia, Class 4       S       -       -         4.28       Single Sump Catchpit       ea.       S       8093.19       -         4.29       Manhole 1200mm       S       -       -       -       -         5.00       Pavement and Surfacing       S       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       - <td>((</td>	((
4.22       RCRI Pipe - 375mm dia, Class 4 (Option)       m       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$<	$\sim$
4.23       RCRI Pipe - 375mm dia, Class 4       \$       \$          4.24       RCRI Pipe - 450mm dia, Class 4       \$       \$          4.25       RCRI Pipe - 600mm dia, Class 4       \$       \$          4.26       RCRI Pipe - 900mm dia, Class 4       \$       \$          4.27       RCRI Pipe - 900mm dia, Class 4       \$       \$       \$         4.28       Single Sump Catchpit       ea.       \$       \$       \$         4.29       Manhole 1200mm       \$       \$       \$       \$       \$         5.00       Pavement and Surfacing       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$	141
4.25       RCRRJ Pipe - 600mm dia, Class 4       \$       \$         4.26       RCRRJ Pipe - 750mm dia, Class 4       \$       \$         4.27       RCRRJ Pipe - 900mm dia, Class 4       \$       \$         4.28       Single Sump Catchpit       ea.       \$       \$         4.29       Manhole 1200mm       \$       \$       \$         5.00       Pavement and Surfacing       \$       \$       \$         5.01       Subgrade stabilisation/improvement (aggregate, limeOrcenent)       \$       \$       \$         5.02       Subgrade preparation and testing       \$       \$       \$       \$         5.03       Sub-basecourse (Waipapa Corridor)       Inf3       \$       48,934.87         5.04       Pavement Stabilisation (150mm, 4kg/m2, 1.5% Hydrated kinde)       Inf2       \$       \$       \$         5.05       Base course       Inf3       \$       \$3,635.03       \$       \$       \$         5.06       Surfacing (scone doat)       \$       \$       \$       \$       \$       \$         5.07       Surfacing (scone doat)       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$ </td <td></td>	
4.26       RCRI Pipe - 750mm dia, Class 4       \$       \$         4.27       RCRI Pipe - 900mm dia, Class 4       \$       \$         4.28       Single Sump Catchpit       ea.       \$       \$         4.29       Manhole 1200mm       ea.       \$       \$       \$         5.00       Pavement and Surfacing       \$       \$       \$       \$         5.01       Subgrade stabilisation/improvement (aggregate, limeor.cenent)       \$       \$       \$       \$         5.02       Subprade stabilisation (150mm, 4kg/m2, 1.5% Hydrated lime)       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$ <td< td=""><td></td></td<>	
4.27       RCRRJ Pipe - 900mm dia, Class 4       \$       \$         4.28       Single Sump Catchpit       ea.       \$       8 (093.19)         4.29       Manhole 1200mm       \$       \$       -         5.00       Pavement and Surfacing       \$       \$       \$         5.01       Subgrade stabilisation/improvement (aggregate, lime or centent)       \$       \$       \$         5.02       Subgrade preparation and testing       \$       \$       \$       \$         5.02       Subgrade preparation and testing       \$       \$       \$       \$         5.03       Sub-basecourse (Waipapa Corridor)       mB       \$       48,934.87       \$         5.04       Pavement Stabilisation (150mm, 4kg/m2, 1.5% Hydraded pre)       m2       \$       \$       \$         5.05       Base course       m2       \$       \$       \$       \$       \$         5.06       Surfacing (chip seal)       m2       \$       \$       \$       \$       \$         5.07       Surfacing (second coat)       m2       \$       7       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$ <td></td>	
4.28       Single Sump Catchpit       ea.       \$       \$ 8093.19         4.29       Manhole 1200mm       \$       \$       \$         5.00       Pavement and Surfacing       \$       \$       \$         5.00       Subgrade stabilisation/improvement (aggregate, limeor/cement)       \$       \$       \$         5.02       Subgrade preparation and testing       \$       \$       \$       \$         5.03       Sub-basecourse (Waipapa Corridor)       nB3       \$       48,934.87       \$         5.04       Pavement Stabilisation (150mm, 4kg/m2, 1.5% Hydrated Line)       \$       \$       \$       \$         5.05       Base course       1       \$       \$       \$       \$       \$         5.06       Surfacing (chip seal)       1       \$       \$       \$       \$       \$         5.07       Surfacing (second coat)       m2       \$       \$       \$       \$         5.08       Surfacing (second coat)       m2       \$       \$       \$       \$       \$         5.09       Sub-basecourse (Option)       m3       \$       \$       \$       \$       \$       \$       \$         5.10       Pavement Stabilisation (160mm, 4kg/m	
4.29       Manhole 1200mm       \$       .         5.00       Pavement and Surfacing       \$       .         5.01       Subgrade stabilisation/improvement (aggregate, lime@rcene(t)       \$       .         5.02       Subgrade preparation and testing       \$       .         5.03       Sub-basecourse (Waipapa Corridor)       nB       \$       48,934.87         5.04       Pavement Stabilisation (150mm, 4kg/m2, 1.5% Hydrad kine)       nB       \$       48,934.87         5.05       Base course       nB       \$       \$       .         5.06       Surfacing (chip seal)       .       .       .       .         5.06       Surfacing (second coat)       m2       \$       75,900.00       .         5.08       Surfacing (second coat)       m2       \$       .       .         5.09       Sub-basecourse (Option)       m3       \$       38,193.07         5.10       Pavement Stabilisation (150mm, 4kg/m2, 1.5% Hydrated/tipes)       m2       \$       6,368.00         5.11       Base course       m3       \$       41,861.49       .         5.12       Surfacing (stopned tots) c Asolent)       m2       \$       9,544.00         5.13       Surfacin	
S.00         Pavement and Surfacing         \$ 462,498           5.01         Subgrade stabilisation/improvement (aggregate, lime on cenerol)         \$ -         \$ -           5.02         Subgrade preparation and testing         \$ -         \$ -           5.03         Sub-basecourse (Waipapa Corridor)         n13         \$ 48,934.87           5.04         Pavement Stabilisation (150mm, 4kg/m2, 1.5% Hydraed dire)         n12         \$ 8,159.00           5.05         Base course         n13         \$ 53,635.03           5.06         Surfacing (chip seal)         112         \$ 12,228.25           5.07         Surfacing (second coat)         \$ 2         -           5.08         Surfacing (second coat)         m2         \$ 75,900.00           5.09         Sub-basecourse (Option)         m3         \$ 38,193.07           5.10         Pavement Stabilisation (160mm, 4kg/m2, 1.5% Hydrated cines)         m2         \$ 6,368.00           5.11         Base course         m3         \$ 41,861.49         \$           5.12         Surfacing (chip seat)         m2         \$ 6,368.00         \$           5.13         Surfacing (chip seat)         m2         \$ 121,200.00         \$           5.13         Surfacing (chip seat)         m2	
5.01       Subgrade stabilisation/improvement (aggregate, lime on center)       3         5.02       Subgrade preparation and testing       5         5.03       Sub-basecourse (Waipapa Corridor)       m3       \$         5.04       Pavement Stabilisation (150mm, 4kg/m2, 1.5% Hyorated Juple)       m2       \$       8,159.00         5.05       Base course       m3       \$       53,635.03         5.06       Surfacing (chip seal)       m2       \$       12,228.25         5.07       Surfacing (second coat)       m2       \$       75,900.00         5.08       Surfacing (second coat)       m3       \$       38,193.07         5.10       Pavement Stabilisation (160mm, 4kg/m2, 1.5% Hydrated Lines)       m2       \$       6,368.00         5.19       Surfacing (second coat)       m2       \$       6,368.00         5.11       Base course       m3       \$       41,861.49         5.12       Surfacing (second coat)       m2       \$       9,544.00         5.13       Surfacing (second coat)       m2       \$       9,544.00         5.13       Surfacing (second coat)       m2       \$       121,200.00         5.14       Surfacing (second coat)       m2       \$	
5.01       Subgrade stabilisation/improvement (aggregate, lime on centent)       3         5.02       Subgrade preparation and testing       5         5.03       Sub-basecourse (Waipapa Corridor)       m3       \$         5.04       Pavement Stabilisation (150mm, 4kg/m2, 1.5% Hydrated Liple)       m2       \$       8,159.00         5.05       Base course       m3       \$       53,635.03         5.06       Surfacing (chip seal)       m2       \$       12,228.25         5.07       Surfacing (second coat)       m2       \$       75,900.00         5.08       Surfacing (second coat)       m3       \$       38,193.07         5.10       Pavement Stabilisation (160mm, 4kg/m2, 1.5% Hydrated Liples)       m2       \$       6,368.00         5.11       Base course       m3       \$       41,861.49         5.12       Surfacing (chip seat)       m2       \$       9,544.00         5.13       Surfacing (chip seat)       m2       \$       121,200.00         5.14       Surfacing (second coat)       m2       \$       -         5.15       Jograde ensping dariageway(s).       \$       -       -         5.16       Swrutting       \$       -       -       -	2,498.70
5.03       Sub-basecourse (Waipapa Corridor)       m3       \$ 48,934.87         5.04       Pavement Stabilisation (150mm, 4kg/m2, 1.5% Hydrated Lorle)       m2       \$ 8,159.00         5.05       Base course       m3       \$ 53,635.03         5.06       Surfacing (chip seal)       m2       \$ 12,228.25         5.07       Surfacing (scond coat)       m2       \$ 75,900.00         5.08       Surfacing (second coat)       m2       \$ 75,900.00         5.09       Sub-basecourse (Option)       m3       \$ 38,193.07         5.10       Pavement Stabilisation (150mm, 4kg/m2, 1.5% Hydrated Lore)       m2       \$ 6,368.00         5.11       Base course       m3       \$ 41,861.49         5.12       Surfacing (chip seal)       m2       \$ 12,200.00         5.13       Surfacing (chip seal)       m2       \$ 12,200.00         5.14       Surfacing (chip seal)       m2       \$ 12,200.00         5.14       Surfacing cond coat)       m2       \$ 46,475.00         5.15       Upgrade existing earliageway(s).       \$ 5       -         5.16       Swcutting       \$ -       \$       -         5.14       Swcutting       \$ -       \$       -         5.15	- <u>·</u>
5.04     Pavement Stabilisation (150mm, 4kg/m2, 1.5% Hydraded unde)     In2     S     8,159.00       5.05     Base course     In3     \$     53,635.03       5.06     Surfacing (chip seal)     In2     \$     \$       5.07     Surfacing (scond coat)     In2     \$     \$       5.09     Surfacing (second coat)     In2     \$     \$       5.09     Surfacing (second coat)     In3     \$     38,193.07       5.10     Pavement Stabilisation (160mm, 4kg/m2, 1.5% Hydrated clove)     In3     \$     38,193.07       5.11     Base course     In3     \$     41,861.49       5.12     Surfacing (chip seal)     In2     \$     9,544.00       5.13     Surfacing (second coad)     In2     \$     9,544.00       5.14     Surfacing (second coad)     In2     \$     46,475.00       5.15     Upgrade excliption (second coad)     In2     \$     -       5.16     Swithing datriageway(s).     S     -     -       5.17     Joht	
5.05       Base course       n3       \$ 53,635.03         5.06       Surfacing (chip seal)       yr       \$ 12,228.25         5.07       Surfacing (second coat)       xr       \$ 2,5,900.00         5.08       Surfacing (second coat)       xr       \$ 5,75,900.00         5.09       Sub-basecourse (Option)       xr3       \$ 38,193.07         5.10       Pavement Stabilisation (160mm, 4k9/m2, 1.5% Hydrated/time)       m2       \$ 6,368.00         5.11       Base course       m3       \$ 41,861.49         5.12       Surfacing (stop Mastic Asphalt)       m2       \$ 9,544.00         5.13       Surfacing (stop Mastic Asphalt)       m2       \$ 121,200.00         5.14       Surfacing (stop of the set)       m2       \$ 121,200.00         5.15       Upgrade exceed coat)       xr       \$ 46,475.00         5.15       Upgrade exceed coat)       S       -         5.16       Swrutting       \$ -       -         5.17       Johnts       \$ -       -         5.18       Swrutting       \$ -       -         5.19       Ancillar foadworks       \$ -       -	
5.06       Surfacing (chip seal)       972       \$ 12,228.25         5.07       Surfacing (Stone Mastic Asphala)       \$       \$         5.08       Surfacing (second coat)       m2       \$ 75,900.00         5.09       Sub-basecourse (Option)       m3       \$ 38,193.07         5.10       Pavement Stabilisation (150mm, kkym2, 1.5% Hydrated lines)       m2       \$ 6,368.00         5.11       Base course       m3       \$ 41,861.49         5.12       Surfacing (chip seal)       m2       \$ 9,544.00         5.13       Surfacing (chip seal)       m2       \$ 121,200.00         5.13       Surfacing (coat)       m2       \$ 46,475.00         5.15       Upgrade existing damiageway(s).       \$ 5       -         5.16       Swrbutting       \$ 5       -         5.17       Johts       \$ 5       -         5.18       Swrbutting       \$ 5       -         5.19       Ancillax roadworks       \$ 5       -	
5.07       Surfacing (Stone Mastic Asphalt)       \$       \$         5.08       Surfacing (second coat)       m2       \$       75,900.00         5.09       Sub-basecourse (Option)       m3       \$       38,193.07         5.00       Sub-basecourse (Option)       m3       \$       38,193.07         5.01       Pavement Stabilisation (160mm, 48, m2, 1.5% Hydrated Lines)       m2       \$       6,368.00         5.11       Base course       m3       \$       41,861.49         5.12       Surfacing (chip seat)       m2       \$       9,544.00         5.13       Surfacing (second coad)       m2       \$       12,200.00         5.14       Surfacing (second coad)       m2       \$       46,475.00         5.15       Upgrade exciring dat riageway(s).       \$       -       -         5.16       Swutting       \$       -       -         5.17       Johnts       \$       -       -       -         5.18       Swutting       \$       -       -       -         5.19       Johnts       \$       -       -       -         5.14       Swutting       \$       -       -       -         <	
5.08       Surfacing (second coat)       m2       \$ 75,900.00         5.09       Sub-basecourse (Option)       m3       \$ 38,193.07         5.10       Pavement Stabilisation (160man, 48,7m2, 1.5% Hydrated Line)       m2       \$ 6,368.00         5.11       Base course       m3       \$ 41,481.49         5.12       Surfacing (spone Mtspic Aschent)       m2       \$ 9,544.00         5.13       Surfacing (spone Mtspic Aschent)       m2       \$ 121,200.00         5.14       Surfacing (second coat)       m2       \$ 46,475.00         5.15       Upgrade existing dariageway(s).       \$ -       -         5.16       Swcutting       \$ -       -         5.17       Johnts       \$ -       -         5.18       Swartyned       \$ -       -         5.19       Ancillax roadworks       \$ -       -	
5.09       Sub-basecourse (Option)       m3       \$ 38,193.07         5.10       Pavement Stabilisation (160mm, Vk9/m2, 1.5% Hydrated (1me)       m2       \$ 6,368.00         5.11       Base course       m3       \$ 41,861.49         5.12       Surfacing (chip seal)       m2       \$ 9,544.00         5.13       Surfacing (chip seal)       m2       \$ 121,200.00         5.14       Surfacing (scond coat)       m2       \$ 46,475.00         5.15       Upgrade existing dariageway(s).       \$ 5       -         5.16       Swrutting       \$ -       -         5.17       Johrts       \$ -       -         5.18       Sigarity/her       \$ -       -         5.19       Annihar       \$ -       -	
5.11     Base course     m3     \$ 41,861.49       5.12     Surfacing (chip seq)     m2     \$ 9,544.00       5.13     Surfacing (Store Wisc Aschert)     m2     \$ 121,200.00       5.14     Surfacing (second coat)     m2     \$ 46,475.00       5.15     Upgrade existing damageway(s).     \$ -       5.16     Sawcutting     \$ -       5.17     Johns     \$ -       5.18     Swrathyned     \$ -       5.19     Johns     \$ -       5.10     Sawcutting     \$ -       5.110     Sawcutting     \$ -       5.12     Johns     \$ -       5.14     Surfacing (coating coating coatin	
5.11     Base course     m3     \$ 41,861.49       5.12     Surfacing (chip seq)     m2     \$ 9,544.00       5.13     Surfacing (Store Wisc Aschert)     m2     \$ 121,200.00       5.14     Surfacing (second coat)     m2     \$ 46,475.00       5.15     Upgrade existing damageway(s).     \$ -       5.16     Sawcutting     \$ -       5.17     Johns     \$ -       5.18     Swrathyned     \$ -       5.19     Johns     \$ -       5.10     Sawcutting     \$ -       5.110     Sawcutting     \$ -       5.12     Johns     \$ -       5.14     Surfacing (coating coating coatin	
5.13         Surfacing (stopne Muspic Aschemit)         m2         \$         121,200.00           5.14         Surfacing (stopne Muspic Aschemit)         m2         \$         121,200.00           5.14         Surfacing (stopne Muspic Aschemit)         m2         \$         121,200.00           5.15         Upgrade (stopne Muspic Aschemit)         S         -         -           5.15         Upgrade (stopne Muspic Aschemit)         S         -         -           5.15         Upgrade (stopne Muspic Aschemit)         S         -         -           5.16         Stopration         S         -         -         -           5.17         Johntis         S         -         -         -         -           5.17         Johntis         S         -         -         -         -         -           5.18         Strantyled         S         -         -         -         -         -           5.18         Strantyled         S         -         -         -         -         -         -         -           5.19         Ancillacy foadworks         S         -         -         -         -         -         -	
5.14         Surfacing (second cont)         m2         \$ 46,475.00           5.15         Upgrade existing darriageway(s).         \$         -           5.16         Seventing         \$         -           5.16         Seventing         \$         -           5.17         Joints         \$         -           5.18         Seventing         \$         -           5.19         Ancillar foadworks         \$         -	
5.15         Upgrade existing earlingeway(s).         \$         -           5.16         Sewcurring         \$         -           5.17         Johns         \$         -           5.18         Sewcurring         \$         -           5.17         Johns         \$         -           5.18         SearNymer         \$         -           5.19         Ancillax roadworks         \$         -	
5.16         Swcutting         \$         -           5.17         Johnts         \$         -           5.88         scantrybut         \$         -           5.18         scantrybut         \$         -           5.18         scantrybut         \$         -           5.19         Ancillar foadworks         \$         -	
5.17         Johns         \$         -           508         Seantyme         \$         -           519         Ancillacy roadworks         \$         -	
5.08     Santying     Santying       S.19     Ancillage roadworks     Santying	
S -	
6.0% Peridges S	
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	SH10 Waipapa Road Intersection Improvements	1	Right Turn Bay				
Item	Description	Unit	Su	ıb-Element Totals	Eler	ment Totals	
7.00	Retaining Walls and Access Works				\$	62,550.00	
7.01	Timber-piled walling		\$	-			
7.02	Concrete-piled walling including ground anchors		\$ \$				
7.03	Gabion walling Crib walling	1	\$	-			
7.04	Mechanically stabilised earth (MSE) walling		s S	-			
1.05	Backfill behind retaining walls where the estimator is to consider the provisions		~				
7.06	included in the earthworks element and allow extra for special materials and/or		\$	-			
	placement requirements behind retaining walls).						
7.07	Stone strong walling		\$	-			
7.08	Diaphragm walling		\$	-			
7.09	Precast concrete facing panels		\$	-			
7.10	Drainage in association with retaining walls		\$	-			
7.11	Temporary works associated with retaining walls.	F-	\$	-			
7.12	Residential Vehicle crossing (Waipapa Corridor) Commercial Vehicle Crossing (Waipapa Corridor)	Ea Ea	\$ \$	6,000.00			
7.13	Residential Vehicle crossing (Walpapa Corridor)	Ea	\$	3,000.00			
7.14	Commercial Vehicle Crossing (Option)	Ea	\$	34,650.00			
			÷	51,050.00	_		
8.00	Traffic Services			/		216,500.00	
8.01	Barrier (wire/concrete median barrier and verge barrier)		\$		5		
8.02	Pavement markings, pavement markers (Waipapa Corridor)	LS	\$	5,000.00	~		
8.03	Pavement markings, pavement markers (Option)	LS	\$	8,000.00	$\wedge \checkmark$		
8.04 8.05	Road signs, gantries (Waipapa Corridor) Road signs, gantries (Option)	LS	S	300.00	$\sim$		
8.05	Traffic signals		$\mathbf{k}$	1.000.00		$\sim$	
8.07	Marker posts		S				
8.08	Lighting (Waipapa Corridor)	02		150,000.00	$\sim$		
8.09	Lighting (Option)		\$	50,000.00		$\mathcal{A}$	
8.10	Emergency cross-overs and phones		\$	30,00			
8.11	Variable Message Signs	0	\$	$-((\cdot)$	$\mathcal{T}\mathcal{T}$		
8.12	Intelligent Traffic Signals/ATMS.		\$	$\overline{\nabla U}$	) ] _		
8.13	Bus/cycleway green paint marking		~				
8.14	Guardrails		s				
8.15	Leading and trailing end terminals			<u> </u>			
8.16	Crash cushions	$+ \mathbf{N}$	s	<u> </u>			
9.00	Service Relocations	Estimated	$\diamond$		\$	1,290,000.00	
9.01	NZTA cost of local authority and uti <mark>lity companies (after cost share) and</mark> contractors on costs - <b>TOP ENERCY</b>	Nr	\$	550,000.00			
9.02	NZTA cost of local authority ind utility coloradies (after cost sharer and contractors on costs - CHORUS		\$	500,000.00			
9.03	NZTA cost of local authority and drivery companies (after cost shale) and contractors on costs FNDC		\$	115,000.00			
9.04	NZTA cost of local purpoints and utility companies (afre) cost share) and contractors on costs - KERIKERI IRRIGATION		\$	10,000.00			
9.05	IZTA cost of local authority and utility companies (after cost share) and contractors on costs - EDWARD LOCK Quil works associated with utility services such as trenching.		\$ \$	50,000.00			
9.0X	ennonary works associated with utility services		\$	15,000.00			
	Landscaping & Urhan design		-		\$	143,312.00	
	Landscaping (resthetit and equiponmental)		\$	-			
	Grassing (Wajhapa Corridor)	m2	\$	3,712.00			
10.03 10.04	Grassing option	m2	\$ \$	3,200.00			
	Architectlure		5	-			
10.05	streatstading	1	\$	-			
	Land accommodation costs (also refer to project property cost funding)	1	\$	-			
	Footpaths (1.5m) and cycleway	m2	\$	63,000.00			
	Footpaths (2.5m) and cycleway	m2	\$	43,500.00			
	Building relocations		\$			_	
101	Traffic islands - splitter	m2	\$	24,000.00			
0.12	Traffic islands - pedestrian	m2	\$	3,400.00			
		Ea	\$	2,500.00	1		
	Pram crossings with kerb and tactile pavers Urban design features to bridges, structures, barriers, retaining walls etc.	La	\$ \$	2,300.00			

	I Breakdown for Physical Works		K	ght Turn	bay
Item	Description	Unit		lement tals	Element Totals
11.00	Traffic Management and Temporary Works				\$ 375,000.00
	Temporary traffic diversions		\$	-	
	Traffic management physical works costs		5	-	
11.03	Temporary roads		\$	•	1.7.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1
12.00	Preliminary and General				\$ 260,573.05
12.01	Establishment, temporary accommodation, clean up, disestablishment and other		\$ 9	7,714.89	
	site operating costs Contractor's supervision, on site staffing, prescribed specialists and other time				
12.02	related costs.		s	•	
12.03	Insurances, bonds, warrantees/guarantees, as-built requirement plans and other non time-related costs.		s	-	
12.04	Temporary works design and traffic management planning		\$	•	
12.05	Project plans, quality assurance, traffic management plans, environmental management plans, programming and reporting, consent fees, stakeholder management, health and safety, security management, contractor's escrow tender documents		s	de la	
	Network maintenance		S		0
	QA systems Testing		S S	5	
		· · · · · · · ·	1	11	
13	Extraordinary Construction Costs			$\checkmark$	488,574.46
			<del>~\</del>	++	~
lase Esti	mate		-/'	$\checkmark$	\$ 4,755,458.12
ate of E	istimate	$\binom{1}{2}$	29/	69	(Rest)
Estimate	prepared by	2	NJe	det	D aff
Estimate	internal peer review by			AV0	Mach
			14	111	
Estimate	external peer review by	~	$\int$	P	
Estimate	external peer review by accepted by NZTA project manager se estimates are exclusive of Contingency, Funding Risk Contingency, Escenation and			) //	
Estimate	accepted by NZTA project manager			, T	

Liementa	l Breakdown for Physical Works		Roundat	bout
ltem	Description	Unit	Sub-Element Totals	Element Tota
с	Pre-implementation Phase Fees	+	Totals	\$ 461,899
D1	Implementation Phase fees			\$ 355,307
	•			
D2	Physical Works			\$ 4,370,279
1.00	Environmental Compliance			\$ 50,000
2.00	Earthworks			\$ 28,25
2.01	Site clearance - greenfield such as small trees, shrubs, hedging etc. Demolition - building demolition, structures, fences, retaining walls, utility services, stormwater pipe, manholes, cesspits, surfacing, kerbs, lights, signs, temporary works etc.		s - s -	
2.03	Temporary fencing		s -	
2.04	Topsoil stripping,		\$ -	
2.05	Cut to fill, Cut to waste (Option)	m3	\$- \$15,383.55	
2.00	Cut to waste (Waipapa Corridor)	m3	\$ 12,871.95	0
2.08	Borrow to fill		s -	$\mathbf{N}$
2.09	Imported fill Undergutting soft spots		S -	$\sim$
2.10	Undercutting soft spots Excavation in rock (state types)	+	S S S S S S S S S S S S S S S S S S S	
2.11	Conditioning of cut and/or fill materials	/	$\langle \langle \rangle \rangle$	Ψ ,
2.13	Preloading, additional preload materials, settlement monitoring and removal of		s v	
	preload materials			
2.14 2.15	Respreading topsoil Imported topsoil	10L	<u>s</u> - s -	
2.16	Reclamation works	NC	S -	$\sim$
2.16	Foreshore works		s	
2.17 2.18	Temporary earthworks Temporary haul roads	$\rho^{-}$	s (C	
2.18	Construct, maintain & remove temporary sediment control measures, temporary			)) <b>`</b>
2.19	sediment control ponds, including temporary hydroseeding, took check dans, silt			
	fencing	<b>C</b>	$\sqrt{\sqrt{1}}$	
2.20 2.21	Dust control Archaeological treatment/mitigation works		s -	
	FASEDRA	110		

	I SH10 Waipapa Road Intersection Improvements	-	Roundab	out	1
ltem	Description	Unit	Sub-Element Totals	Element Totals	
3.00	Ground Improvements			\$-	
4.00	Drainage			\$ 667,241.31	ł
4.01	Stormwater drainage, temporary stream diversion and culverts including		s -	• ••••	ł
	headwalls, chambers and rip-rap				
4.02	Subsoil and pavement drains		\$-		1
4.03	Kerb blocks (incl. subsoil) (Waipapa Corridor)	m	\$ 264,866.51		ł
4.04 4.05	Kerb without Channel (Incl.subsoil) (Waipapa Corridor) Kerb blocks (incl. subsoil) (Option)	m	\$ 1,280.00 \$ 135,231.14		ł
4.05	Kerb without Channel (Incl.subsoil) (Option)	m m	\$ 40,000.00		l
4.07	Surface water channel		\$ -		ł
4.08	Erosion control		\$ -		ł
4.09	Flumes		\$ -		l
4.10	Rain gardens		\$ -		ł
4.11 4.12	Permanent ponds		<u>s</u> - s -		ł
4.12	Wetlands Grassed swales		<u> </u>		ł
4.14	Treatment devices		s -		i
4.15	Manhole 1200mm	ea	\$ 6,474.55		i i
4.16	RCRRJ Pipe - 300mm dia, Class 4 (Waipapa Corridor)	m	s .	$\sim$	i
4.17	RCRRJ Pipe - 375mm dia, Class 4 RCRRJ Pipe - 450mm dia, Class 4	m	\$ 4,701.60 \$ 00,860.50		/
4.18 4.19	RCRRJ Pipe - 450mm dia, Class 4 RCRRJ Pipe - 600mm dia, Class 4	m m	\$ 00,860.50		11
4.19	RCRRJ Pipe - 750mm dia, Class 4	m	5		111
4.21	RCRRJ Pipe - 900mm dia, Class 4	m			1
4.22	RCRRJ Pipe - 300mm dia, Class 4 (Option)	m	\$ 28,452.60		
4.23	RCRRJ Pipe - 375mm dia, Class 4	(-	sv.	$\neg$	$\sim$
4.24 4.25	RCRRJ Pipe - 450mm dia, Class 4 RCRRJ Pipe - 600mm dia, Class 4	$\frac{1}{2}$	<u>s</u> -	$\sim 11$ V	ł
4.25	RCRRJ Pipe - 750mm dia, Class 4		s –	1011	ł
4.27	RCRRJ Pipe - 900mm dia, Class 4		s		ł
4.28	Single Sump Catchpit		\$ 14,67.73		l
4.29	Manhole 1200mm		5111		ł
5.00	Pavement and Surfacing	/	$\langle \langle \rangle \rangle$	\$ 579,305.93	ł
5.01	Subgrade stabilisation/improvement (aggregate, lime or cement)			* 575,505155	ł
5.02	Subgrade preparation and testing		s -		
5.03	Sub-basecourse (Waipapa Corridor)	n3	48,934.87		ł
5.04	Pavement Stabilisation (150mm, 4kg/m2, 1.5% Hydrated Line)	mz	\$ 53,635.03		ł
5.05 5.06	Base course Surfacing (chip seal)	n13	\$ 53,635.03 \$ 12,228.25		ł
5.07	Surfacing (Stone Mastic Asphale)		\$ -		ł
5.08	Surfacing (second coat)	m2	\$ 75,900.00		
5.09	Sub-basecourse (Optiop)	m3	\$ 58,483.13		ł
5.10	Pavement Stabilisation (50mm, 4kg/pr2, 1.5% Hydrated Lime)	m2	\$ 9,751.00		l
5.11 5.12	Base course	m3 m2	\$ 64,100.40 \$ 14,614.25		ł
5.12	Surfacing (Stone Massic Asphalt)	m2	\$ 195,000.00		i
5.14	Surfacing (second coat)	m2	\$ 38,500.00		i
5.15	Upgrade existing carriageway(s).		\$ -		i i
5.16	savcutting		s -		ł
	Joint	+	<u>s</u> -		ł
5,19	Ancillar roadworks		<u>s</u> -		ł
$\mathcal{T}$			•		ł
6.00	Bridges			\$ -	1
$\sim$			<u></u>		ł
	FICHER				
$\mathcal{N}$					

	SH10 Waipapa Road Intersection Improvements I Breakdown for Physical Works		Roundabout				
ltem	Description	Unit	S	ub-Element Totals	Eler	nent Totals	
7.00	Retaining Walls and Access Works				\$	62,550.00	
7.01	Timber-piled walling		\$	-			
7.02	Concrete-piled walling including ground anchors		\$	-			
7.03	Gabion walling		\$	-			
7.04	Crib walling		\$	-			
7.05	Mechanically stabilised earth (MSE) walling		\$	-			
7.06	Backfill behind retaining walls where the estimator is to consider the provisions included in the earthworks element and allow extra for special materials and/or		\$				
7.07	placement requirements behind retaining walls). Stone strong walling		\$	-			
7.08	Diaphragm walling		\$	-			
7.09	Precast concrete facing panels		\$	-			
	Drainage in association with retaining walls		\$	-			
7.11	Temporary works associated with retaining walls.		\$	-			
7.12	Residential Vehicle crossing (Waipapa Corridor)	Ea	ŝ	6,000.00			
7.12	Commercial Vehicle Crossing (Waipapa Corridor)	Ea	s	18,900.00	t i		
7.14	Residential Vehicle crossing (Option)	Ea	\$	3,000.00	1		
7.15	Commercial Vehicle Crossing (Option)	Ea	ŝ	34,650.00			
8.00	Traffic Services	I	*		2	226,550.00	
8.01	Barrier (wire/concrete median barrier and verge barrier)	10	\$ ¢	5,000,00	$\sim$		
8.02	Pavement markings, pavement markers (Waipapa Corridor)	LS	\$	5,000,00	$\langle \cdot \rangle$	>	
8.03	Pavement markings, pavement markers (Option) Poad signs, gantries (Wajaana Corridor)	LS	\$	500.00	$\wedge$	· · · · · · · · · · · · · · · · · · ·	
8.04	Road signs, gantries (Waipapa Corridor)	LS	s	5 5 0.00	<u>ک</u>		
8.05	Road signs, gantries (Option) Traffic signals			5 500.00	٢	$\sim$	
8.06 8.07	Marker posts	+	\$ \$	$\cdot \cdot \cdot$		<u> </u>	
0.07	ויומוגכו איטוא		\$	$\mathbf{N}$			
8.08	Lighting (Waipapa Corridor)	P2	s	150,000.00	$\sim$	לו //	
8.09	Lighting (Option)	Ea	s	50,000.00		41-	
8.10	Emergency cross-overs and phones	72	\$			$\sim$	
8.11	Variable Message Signs	2	\$		111	3	
8.12	Intelligent Traffic Signals/ATMS.	1	\$	110	())		
8.13	Bus/cycleway green paint marking	1		$\sim 1/1/2$			
8.14	Guardrails	/	s		r		
8.15	Leading and trailing end terminals		S		I		
8.16	Crash cushions	(~)	\$				
				~			
9.00	Service Relocations	メンジ	$\sim$		\$	1,290,000.00	
9.01	NZTA cost of local authority and utility coordanies (arter cost share) and contractors on costs - TOP ENEBGY	NU	\$	550,000.00			
9.02	NZTA cost of local authority and units coordanies (after cost share) and contractors on costs - critorus		s	500,000.00			
9.03	NZTA cost of local authority and tillity companies (after cost share) and contractors on cost _ FNDC		\$	115,000.00			
9.04	NZTA corr of local anthony and utility companies (after cost share) and contractors on coster - KERIKERI IRRIGATION		\$	10,000.00			
9.05	27A cost of local authority and utilith companies (after cost share) and contractor op costs - EDWARD LOCK		s	50,000.00			
906 9.07	Winworks associated with utility services with as trenching. Tepporary works associated with utility services		\$ \$	50,000.00 15,000.00			
$\mathcal{L}$			I		L		
	Landscaping & Urban design	l	I,		\$	274,169.90	
10.01	Landscaping (aesthetic and environmental)	m2	\$	34,000.00			
	Grassing Walpaga Corrigon	m2	\$	3,712.00			
10.02		m2	\$	4,320.00			
10.02 10.03	Grassing (Option)			-	1		
10.02 10.03 10.04	Architecture		\$				
10.02 10.03 10.04 10.05	Architecture Rencing		\$	2,187.90			
10.02 10.03 10.04 10.05 10.06	Architecture Fencing Streetscaping		\$ \$	2,187.90			
10.02 10.03 10.04 10.05 10.06 10.06	Architecture Fencing Street caping Bud accommodation costs (also refer to project property cost funding)		\$ \$ \$	2,187.90			
10.02 10.03 10.04 10.05 10.06 10.07 10.07	Architecture Fercing Streetscaping And accommodation costs (also refer to project property cost funding) Footpaths (1.5m) and cycleway	m2	\$ \$ \$ \$	2,187.90 - - 81,000.00			
10.02 10.03 10.04 10.05 10.06 10.06 10.07 10.08	Architecture Fencing Streets caving Add accommodation costs (also refer to project property cost funding) Kootpaths (1.5m) and cycleway Footpaths (2.5m) and cycleway	m2 m2	\$ \$ \$ \$	2,187.90			
0.02 10.03 10.04 10.05 10.06 10.07 10.08 10.08	Architecture Fencing Street Caping Land accommodation costs (also refer to project property cost funding) Footpaths (1.5m) and cycleway Footpaths (2.5m) and cycleway Building relocations	m2	\$ \$ \$ \$ \$	2,187.90 - - 81,000.00 39,000.00 -			
0.02 10.03 10.04 10.05 10.05 10.07 10.07 10.08 10.08 1010 10.10	Architecture Fencing Streetscaping Apple Commodation costs (also refer to project property cost funding) Footpaths (1.5m) and cycleway Footpaths (2.5m) and cycleway Building relocations Traffic islands - splitter	m2 m2	\$ \$ \$ \$ \$ \$	2,187.90 - - 81,000.00 39,000.00 - 48,000.00			
0.02 10.03 10.04 10.05 10.06 10.07 10.08 10.08 10.10 10.10 10.12	Architecture Fercing StreetLeaning Ford Accommodation costs (also refer to project property cost funding) Footpaths (1.5m) and cycleway Footpaths (2.5m) and cycleway Building relocations Traffic islands - splitter Traffic islands - pedestrian	m2 m2 m2	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	2,187.90 - - 81,000.00 39,000.00 - - 48,000.00 3,400.00			
0.02 10.03 10.04 10.05 10.06 10.06 10.08 10.08 10.08 10.08 10.08 10.10 10.12 10.13	Architecture Fencing Streetscaping Apple Commodation costs (also refer to project property cost funding) Footpaths (1.5m) and cycleway Footpaths (2.5m) and cycleway Building relocations Traffic islands - splitter	m2 m2	\$ \$ \$ \$ \$ \$	2,187.90 - - 81,000.00 39,000.00 - 48,000.00			

<b>Elemental Breakdown for Physical Worl</b>
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11.01       Temporary t         11.02       Traffic mana         11.03       Temporary r         12.00       Preliminary         12.01       Site operatin         12.02       Contractor's related costs         12.03       Insurances, I         12.04       Temporary w         12.05       management documents         12.06       Network mai         12.07       QA systems         12.08       Testing         13       Extraordina         Base Estimate       Sase Estimate         Stimate internal peer       Stimate external peer	agement and Temporary Works affic diversions gement physical works costs bads and General it, temporary accommodation, clean up, disestablishment and g costs supervision, on site staffing, prescribed specialists and other to bonds, warrantees/guarantees, as-built requirement plans and ted costs. forks design and traffic management planning , quality assurance, traffic management plans, environmental plans, programming and reporting, consent fees, stakeholder , health and safety, security management, contractor's escrow intenance	other time .		Tot 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	ement als - - - - - - - - - - - - -	\$	284,245.81 532,960.90
11.01       Temporary t         11.02       Traffic mana         11.03       Temporary r         12.00       Preliminary         12.01       Establishmer         12.02       Contractor's         12.03       Insurances, t         12.04       Temporary management         12.05       management         12.06       Network mai         12.07       QA systems         12.08       Testing         3       Extraordinate         Sase Estimate       Stimate prepared by         Stimate internal peer       Stimate accepted by	affic diversions gement physical works costs and General it, temporary accommodation, clean up, disestablishment and g costs supervision, on site staffing, prescribed specialists and other the ionds, warrantees/guarantees, as-built requirement plans and ited costs. forks design and traffic management planning , quality assurance, traffic management plans, environmental plans, programming and reporting, consent fees, stakeholder , health and safety, security management, contractor's escrow intenance y Construction Costs	time other	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	5 5 5 5 5 5	- - ,960.90 - -	\$	284,245.81
11.02       Traffic mana         11.03       Temporary r         12.00       Preliminary         12.01       Establishmer         site operatin       Stablishmer         12.02       Contractor's         related costs       Insurances, t         12.03       Insurances, t         12.04       Temporary w         Project plans       management         documents       Iscore sting         12.05       Management         documents       Iscore sting         13       Extraordina         asse Estimate       Stimate         stimate internal peer       Stimate external peer         stimate accepted by       Stimate accepted by	gement physical works costs aads and General It, temporary accommodation, clean up, disestablishment and g costs supervision, on site staffing, prescribed specialists and other i conds, warrantees/guarantees, as-built requirement plans and ted costs. forks design and traffic management planning , quality assurance, traffic management plans, environmental plans, programming and reporting, consent fees, stakeholder , health and safety, security management, contractor's escrow intenance by Construction Costs	time other	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	5 5 5 5 5 5	- - ,960.90 - -		532,960.90
11.03       Temporary r         12.00       Preliminary         12.01       Establishmer         12.02       Contractor's         12.03       Insurances, I         12.04       Temporary w         12.05       management         management       documents         12.06       Network mail         12.07       QA systems         12.08       Testing         13       Extraordina         Base Estimate       Stimate         Stimate internal peer       Stimate external peer	and General and General it, temporary accommodation, clean up, disestablishment and g costs supervision, on site staffing, prescribed specialists and other 1 ionds, warrantees/guarantees, as-built requirement plans and ited costs. orks design and traffic management planning , quality assurance, traffic management plans, environmental plans, programming and reporting, consent fees, stakeholder , health and safety, security management, contractor's escrow intenance y Construction Costs	time other	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	5 5 5 5 5 5	- ,960.90 - -		532,960.90
12.00       Preliminary         12.01       Establishmer         12.02       Folder         12.03       Insurances, tano time-reliated costs         12.04       Temporary with anagement management management documents         12.05       Management management documents         12.06       Network mai 12.06         12.07       QA systems         12.08       Testing         13       Extraordinate         Base Estimate       State of Estimate         Stimate internal peer       Statimate external peer         Stimate accepted by       State accepted by	and General It, temporary accommodation, clean up, disestablishment and g costs supervision, on site staffing, prescribed specialists and other i bonds, warrantees/guarantees, as-built requirement plans and ted costs. Torks design and traffic management planning , quality assurance, traffic management plans, environmental plans, programming and reporting, consent fees, stakeholder , health and safety, security management, contractor's escrow Intenance y Construction Costs	time other	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	532	,960.90 - -		532,960.90
12.01       Establishmer site operating site operating site operating severating	it, temporary accommodation, clean up, disestablishment and g costs supervision, on site staffing, prescribed specialists and other i onds, warrantees/guarantees, as-built requirement plans and ited costs. oroks design and traffic management planning , quality assurance, traffic management plans, environmental plans, programming and reporting, consent fees, stakeholder , health and safety, security management, contractor's escrow intenance y Construction Costs	time other		5 5 5	•		532,960.90
12.01       Establishmer site operating site operating site operating severating	it, temporary accommodation, clean up, disestablishment and g costs supervision, on site staffing, prescribed specialists and other i onds, warrantees/guarantees, as-built requirement plans and ited costs. oroks design and traffic management planning , quality assurance, traffic management plans, environmental plans, programming and reporting, consent fees, stakeholder , health and safety, security management, contractor's escrow intenance y Construction Costs	time other		5 5 5	•		532,960.90
Site operating         12.02       Contractor's contrentor's contrentor's contractor's contrentor's contract	supervision, on site staffing, prescribed specialists and other is sonds, warrantees/guarantees, as-built requirement plans and ted costs. orks design and traffic management planning , quality assurance, traffic management plans, environmental plans, programming and reporting, consent fees, stakeholder , health and safety, security management, contractor's escrow ntenance <b>y Construction Costs</b>	other		5 5 5	•	\$ 5	- (
12.02       related costs         12.03       Insurances, I         12.04       Temporary w         Project plans       management         12.05       management         12.06       Network mail         12.07       QA systems         12.08       Testing         13       Extraordina         case Estimate       Stimate         case internal peer       Stimate external peer         castimate external peer       Stimate accepted by	onds, warrantees/guarantees, as-built requirement plans and ited costs. forks design and traffic management planning , quality assurance, traffic management plans, environmental plans, programming and reporting, consent fees, stakeholder , health and safety, security management, contractor's escrow intenance by Construction Costs	other		5 5 5	÷	\$ 5	- (
12.03       Insurances, L         12.04       Temporary w         Project plans       Project plans         12.05       managemeni documents         12.06       Network mai         12.07       QA systems         12.08       Testing         13       Extraordina         date of Estimate       Stimate internal peer         stimate external peer       Stimate accepted by	onds, warrantees/guarantees, as-built requirement plans and ited costs. orks design and traffic management planning , quality assurance, traffic management plans, environmental plans, programming and reporting, consent fees, stakeholder , health and safety, security management, contractor's escrow ntenance y Construction Costs			5 5 5		\$ 5	- (
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12.04       Temporary w         Project plans       Project plans         management       documents         12.05       Metwork mail         12.06       Network mail         12.07       QA systems         12.08       Testing         13       Extraordina         case Estimate       Stimate         Sate of Estimate       Stimate         stimate internal peer       Stimate external peer         Stimate accepted by       Stimate accepted by	orks design and traffic management planning , quality assurance, traffic management plans, environmental plans, programming and reporting, consent fees, stakeholder , health and safety, security management, contractor's escrow ntenance			; ;	L.	\$ 5	- (
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12:03       management documents         12:06       Network main 12:07         QA systems       12:08         13       Extraordination Extraordination         13       Extraordination         case Estimate       20         case finate of Estimate       20         castimate prepared by       20         castimate internal peel       20         castimate external peel       20         castimate accepted by       20	, health and safety, security management, contractor's escrow ntenance y Construction Costs				<del>S</del>	\$ 5	- (
12.06       Network mail         12.07       QA systems         12.08       Testing         13       Extraordina         case Estimate       Date of Estimate         Satimate prepared by       Stimate internal peer         stimate external peer       Stimate external peer	y Construction Costs		1	5	<i>S</i>	\$ 5	- (
12.07       QA systems         12.08       Testing         13       Extraordina         iase Estimate       Date of Estimate         Satimate prepared by       Satimate internal peel         Satimate external peel       Satimate external peel	y Construction Costs		1	5	K K	\$ 5	- (
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lote: These estimates	NZTA project manager	<u> </u>	V	<u>&gt;`</u>			
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Elemental Breakdown

Liement	SH10 Waipapa Road Intersection Improvements Traffic Signal I Breakdown for Physical Works			Inals
Item	Description	Unit	Sub-Element Totals	Element Totals
с	Pre-implementation Phase Fees		Totals	\$ 480,722.44
D1	Implementation Phase fees			\$ 369,786.50
D2	Physical Works			\$ 4,548,373.92
1.00	Environmental Compliance			\$ 50,000.00
2.00	Earthworks			\$ 12,871.95
2.01	Site clearance - greenfield such as small trees, shrubs, hedging etc. Demolition - building demolition, structures, fences, retaining walls, utility		\$-	
2.02	services, stormwater pipe, manholes, cesspits, surfacing, kerbs, lights, signs,		\$-	
2.03	temporary works etc. Temporary fencing		\$-	
2.04	Topsoil stripping,		\$ -	
2.05	Cut to fill,		\$ -	
2.06	Cut to waste (Option) Cut to waste (Waipapa Corridor)	m3 m3	\$ - \$ 12,871.9 <b>5</b>	<i>b</i>
2.07	Borrow to fill	1115	\$ 12,871.95	$\checkmark$
2.09	Imported fill		\$	
2.10	Undercutting soft spots		5	
2.11 2.12	Excavation in rock (state types) Conditioning of cut and/or fill materials	<u> </u>	2	<b>}</b>
	Preloading, additional preload materials, settlement monitoring and removal of	<b>⊢</b>		
2.13	preload materials		\$	
2.14	Respreading topsoil	$(\mathbf{O})$	s 🗸 -	
2.15 2.16	Imported topsoil Reclamation works	$\sim$	<u>s</u> -	$\sim 1 \vee$
2.16	Foreshore works		s _	
2.17	Temporary earthworks	D <sup>×</sup>	s (	$M \sim$
2.18	Temporary haul roads		\$	$\gamma \sim$
2.19	Construct, maintain & remove temporary sediment control mesore, temporary sediment control ponds, including temporary hydroseedipg, cock check dams, silt			$\mathcal{V}$
2.20	fencing Dust control			
2.20	Archaeological treatment/mitigation works		s ·	
	EED ON	100		
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Elemental Breakdown

lomonto	SH10 Waipapa Road Intersection Improvements	Traffic Signals				
Item	Description	Unit	Sub-Element Totals	Element Totals		
3.00	Ground Improvements		\$-	\$-		
4.00	Desinago	-		\$ 659,124.01		
	Drainage Stormwater drainage, temporary stream diversion and culverts including			\$ 659,124.01		
4.01	headwalls, chambers and rip-rap		\$ -			
4.02	Subsoil and pavement drains		\$-			
4.03	Kerb blocks (incl. subsoil) (Waipapa Corridor)	m	\$ 264,866.51			
4.04	Kerb without Channel (Incl.subsoil) (Waipapa Corridor)	m	\$ 1,280.00			
4.05	Kerb blocks (incl. subsoil) (Option) Kerb without Channel (Incl.subsoil) (Option)	m	\$ 139,894.29 \$ 32,000.00			
4.00	Surface water channel		\$ 52,000.00			
4.08	Erosion control		\$-			
4.09	Flumes		\$-			
4.10	Rain gardens		\$ -			
4.11	Permanent ponds	-	\$ -			
4.12	Wetlands Grassed swales	+	\$- \$-			
4.13	Treatment devices	1	\$ -			
4.15	Manhole 1200mm	ea	\$ 6,474.55			
	RCRRJ Pipe - 300mm dia, Class 4 (Waipapa Corridor)	m	\$ -	$\sim$		
	RCRRJ Pipe - 375mm dia, Class 4	m	\$ 4,791,60			
	RCRRJ Pipe - 450mm dia, Class 4 RCRRJ Pipe - 600mm dia, Class 4	m	\$ 00,860.50 \$ N 0,716.67			
	RCRRJ Pipe - 500mm dia, Class 4 RCRRJ Pipe - 750mm dia, Class 4	m m	\$ 100, 10, 07			
4.21	RCRRI Pipe - 900mm dia. Class 4	m 🕻	$\lambda \setminus \setminus$			
4.22	RCRRJ Pipe - 300mm dia, Class 4 (Option)	m	\$ \$5,290.80			
4.23	RCRRJ Pipe - 375mm dia, Class 4		s 💙 -			
4.24	RCRRJ Pipe - 450mm dia, Class 4	$\sqrt{\sqrt{2}}$	<u>\$</u> -			
4.25 4.26	RCRRJ Pipe - 600mm dia, Class 4 RCRRJ Pipe - 750mm dia, Class 4		s - s -			
4.20	RCRRJ Pipe - 900mm dia, Class 4		s C			
4.28	Single Sump Catchpit	ea.	\$ 12,949.10			
4.29	Manhole 1200mm		\$			
		· · · ·	<b>///\</b>			
5.00 5.01	Pavement and Surfacing Subgrade stabilisation/improvement (aggregate, lime of cement)	- C		\$ 603,062.11		
5.02	Subgrade preparation and testing	+	\$ \$ -			
5.02	Sub-basecourse (Waipapa Corridor)	nB	48,934.87			
5.04	Pavement Stabilisation (150mm, 4kg/m2, 1.5% Hydrated Lime)	mz	8,159.00			
5.05	Base course	n 3	\$ 53,635.03			
5.06	Surfacing (chip seal)		\$ 12,228.25 \$ -			
5.07 5.08	Surfacing (Stone Mastic Asphalt) Surfacing (second coat)	m2	\$ 75,900.00			
5.09	Sub-basecourse (Option)	m3	\$ 79,966.73			
5.10	Pavement Stabilisation (150mm, 4kg/m2, 1.5% Hydrated Lime)	m3	\$ 13,333.00			
5.11	Base course	m2	\$ 87,647.49			
5.12	Surfacing (chip ten)	m2	\$ 19,982.75			
5.13 5.14	Surfacing (Sone Massic Asshalt) Surfacing (Second Coat)	m2 m2	\$ 159,000.00 \$ 44,275.00			
5.14	Upgradi existing tarriageway(s).	mz	\$ 44,275.00			
5.16	Savicutting	1	\$ -			
5.17	Johnts		\$-			
518	a can fy hog		\$ -			
5.10	Ancillary roadworks	-	\$-			
ᢣᠴ	Pridges	+	+	\$ -		
6.00	en ruges	1				
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<b>7.00</b>	Description				
7.01		Unit	Sub-Element Totals	Eleme	ent Totals
	Retaining Walls and Access Works			\$	56,250.00
7 0 2	Timber-piled walling		\$-		
7.02	Concrete-piled walling including ground anchors		s -		
7.03	Gabion walling		\$-		
7.04	Crib walling		\$-		
	Mechanically stabilised earth (MSE) walling		\$ -	-	
	Backfill behind retaining walls where the estimator is to consider the provisions				
	included in the earthworks element and allow extra for special materials and/or		\$ -		
	placement requirements behind retaining walls).		Ψ.		
	Stone strong walling		\$-	-	
	Diaphragm walling		\$ -	-	
	Precast concrete facing panels		\$ -	-	
	Drainage in association with retaining walls		\$ -	+	
	Temporary works associated with retaining walls.	E-	\$ - \$ 6000.00	+	
	Residential Vehicle crossing (Waipapa Corridor)	Ea	\$ 6,000.00		
	Commercial Vehicle Crossing (Waipapa Corridor)	Ea	\$ 18,900.00		
	Residential Vehicle crossing (Option)	Ea	\$ 3,000.00		
7.15	Commercial Vehicle Crossing (Option)	Ea	\$ 28,350.00	4	
				<u>h</u>	
	Traffic Services		/		515,500.00
	Barrier (wire/concrete median barrier and verge barrier)		\$ -(	$\sim$	
	Pavement markings, pavement markers (Waipapa Corridor)	LS	\$ 5,000,00		
	Pavement markings, pavement markers (Option)	LS	\$ \$2,000.00		
	Road signs, gantries (Waipapa Corridor)	LS	\$ 500.00	$\checkmark$	
	Road signs, gantries (Option)	LS	\$ 3,000.00	¥	
	Traffic signals	LS 🗸	\$ 295,000,00	4	- [n]
8.07 I	Marker posts	$\sim$	\$ -	-	-1D
8.08	Lighting (Waipapa Corridor)	02	\$ 150,000.00	$\sim$	\ Ľ
8.09	Lighting (Option)	Ea	\$ 50,000.00		
	Emergency cross-overs and phones		\$ 50,000	+++	$\overline{}$
	Variable Message Signs	$\sim$	\$ (-	++++	
	Intelligent Traffic Signals/ATMS.		s.		
	Bus/cycleway green paint marking			<u>//</u>	
	Guardrails			/	
	Leading and trailing end terminals			+	
	Crash cushions	$\sim$	<u>s</u>		
0.10		10	· · · ·		
9.00	Service Relocations		$\sim$	\$ 1,2	290,000.00
0.01	NZTA cost of local authority and utility companies (after cost share) and contractors on costs - TOP ENERGY	Nr.	\$ 550,000.00		290,000.00
9.02	NZTA cost of local authority and utility companies (after cost share) and contractors on costs - CHORUS		\$ 500,000.00		
9.03	NZTA cost of local authority and utility companies (after rost share) and contractors on rosts FNDC		\$ 115,000.00		
9.04	NZTA cort of local authority and utility companies and ost share) and contractors on cost of KERIKERI IRRIGATION		\$ 10,000.00		
9.05	IZTA cost of local authority and utility companies (after cost share) and contractors on costs - EDWARD LOCK		\$ 50,000.00		
	Ovil works associated with utility services such as trenching.		\$ 50,000.00		
30%	Temporary works associated with utility services		\$ 15,000.00	+	
	andscaning & Urban design			\$ 1	136,056.90
3 S S S S S S S S S S S S S S S S S S S	Landscaping & Urban design Landscaping (aesthatic and equivonmental)		¢	+ 3	1 20,020.90
			\$ -	+	
	Grassing Wanapa Corrigion	m2	\$ 3,712.00		
	Grassing (Option)	m2	\$ 1,440.00	+	
10.04	Architecture	-	\$ -	<u> </u>	
10.05	Felicity	m2	\$ 504.90	+	
10.00	StreetStaping		\$ -	4	
Max V	and accommodation costs (also refer to project property cost funding)		\$ -	4	
10.08	Footpaths (1.5m) and cycleway	m2	\$ 63,000.00		
	Footpaths (2.5m) and cycleway	m2	\$ 43,500.00		
010	Building relocations		\$ -		
	Traffic islands - splitter	m2	\$ 18,000.00		
1012	Traffic islands - pedestrian	m2	\$ 3,400.00		
10.12	Pram crossings with kerb and tactile pavers	Ea	\$ 2,500.00		
	rian crossings with kerb and tactile pavers				

Item Descrip 11.00 Traffic 11.01 Trampo 11.02 Traffic 11.03 Tempo 12.00 Prelimi 12.01 Establis site op 12.02 Contra related 12.03 Insuran non tin 12.04 Tempo Project 12.05 maagg docum	Management and Temporary Works rary traffic diversions management physical works costs rary roads inary and General ihment, temporary accommodation, clean up, dise erating costs tor's supervision, on site staffing, prescribed spe	cialists and other time	Unit		lement tals - - -	Ele \$	ment Totals 375,000.00
11.01     Tempo       11.02     Traffic       12.00     Prelimi       12.01     Site op       12.02     Contra       12.03     related       12.04     Insuran       12.05     Project       12.06     Project	rary traffic diversions management physical works costs rary roads inary and General ihment, temporary accommodation, clean up, dise erating costs ctor's supervision, on site staffing, prescribed spe costs. ces, bonds, warrantees/guarantees, as-built requi ne-related costs. rary works design and traffic management plannin	cialists and other time		\$	-	\$	375,000.00
11.02     Traffic       11.03     Tempo       12.00     Prelimi       12.01     Establis site op       12.02     Contra related       12.03     Insuran non tin Tempo       12.04     Project       12.05     manage docume	management physical works costs rary roads inary and General ihment, temporary accommodation, clean up, dise erating costs ctor's supervision, on site staffing, prescribed spe costs. ces, bonds, warrantees/guarantees, as-built requi ie-related costs. rary works design and traffic management plannin	cialists and other time		\$	-		
11.03     Tempo       12.00     Prelimi       12.01     Establis site op       12.02     Contra related       12.03     Insuran non tin       12.04     Tempo       Project     managg document	rary roads inary and General ihment, temporary accommodation, clean up, dise erating costs ctor's supervision, on site staffing, prescribed spe costs. ces, bonds, warrantees/guarantees, as-built requi ie-related costs. rary works design and traffic management plannin	cialists and other time					
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12.01         Establis site op related           12.02         Contra related           12.03         Insuran non tim           12.04         Tempo Project           12.05         manage document	hment, temporary accommodation, clean up, dise erating costs ctor's supervision, on site staffing, prescribed spe costs. ces, bonds, warrantees/guarantees, as-built requi ie-related costs. rary works design and traffic management plannin	cialists and other time					
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12.02 related 12.03 Insuran non tin 12.04 Tempo Project manage manage document	costs. ces, bonds, warrantees/guarantees, as-built requi re-related costs. ary works design and traffic management plannin			\$ 11	0,935.95	_	
12.03 Insuran non tim 12.04 Tempor Project 12.05 manage docume	ces, bonds, warrantees/guarantees, as-built requi ne-related costs. rary works design and traffic management plannin			\$			
12.03 non tim 12.04 Tempo Project 12.05 manage docume	ne-related costs. rary works design and traffic management plannin				-		
12.05 https://www.anage Project manage docume		rement plans and other		5	-		
12.05 manage manage docume	plans, quality assurance, traffic management plan			\$	-		
docume	ement plans, programming and reporting, consent			1.20			
	ement, health and safety, security management, co			\$	-		
12.06 [Networ						5	
12.07 QA syst	k maintenance			S		$\boldsymbol{\mathcal{C}}$	1
12.07 QA Sys 12.08 Testing				S	2	$\mathbf{N}$	~
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13 Extraol	rdinary Construction Costs				$\checkmark$	VV,	554,679.75
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Base Estimate					$\overline{1}$	3	5,398,882.86
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Date of Estimate			$^{\prime}$	291	09/	20	NAN N
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Estimate prepare	ed by			NJa	DO 1	MA	the
Estimate interna	I neer review hy				10	1	
				$\mathcal{K}$	44	2	aun
Estimate externa	Il peer review by	$\frac{112}{12}$	-	$\langle \cdot \rangle$	$\mathbf{\mathbf{y}}$		
Estimate accepte	ed by NZTA project manager		210	>			
EL	hates are exclusive of Contingency, Finaling Risk C	OBU	·''				

Elemental Breakdown

	I SH10 Waipapa Road Intersection Improvements al Breakdown for Physical Works	-	Head to Hea	ad RTB
Item	Description	Unit	Sub-Element Totals	Element Totals
3.00	Ground Improvements			\$ -
4.00	Drainage			\$ 651,124.01
	Stormwater drainage, temporary stream diversion and culverts including			* 051,121101
4.01	headwalls, chambers and rip-rap		s -	
4.02	Subsoil and pavement drains		\$-	
4.03	Kerb blocks (incl. subsoil) (Waipapa Corridor)	m	\$ 264,866.51	
4.04	Kerb without Channel (Incl.subsoil) (Waipapa Corridor)	m	\$ 1,280.00	
4.05	Kerb blocks (incl. subsoil) (Option)	m	\$ 139,894.29 \$ 24,000.00	
4.06	Kerb without Channel (Incl.subsoil) (Option) Surface water channel	m	\$ 24,000.00	
4.07	Erosion control		s -	
4.09	Flumes		s -	
4.10	Rain gardens		s -	
4.11	Permanent ponds		s -	
4.12	Wetlands		s -	
4.13	Grassed swales		s -	
4.14 4.15	Treatment devices Manhole 1200mm	0.2	\$ - \$ 6,474.55	
4.15	RCRRJ Pipe - 300mm dia, Class 4 (Waipapa Corridor)	ea m	\$ 0,474.55	
4.10	RCRRJ Pipe - 375mm dia, Class 4	m	\$ 4,791,60	
4.18	RCRRJ Pipe - 450mm dia, Class 4	m	\$ 60,860.50	
4.19	RCRRJ Pipe - 600mm dia, Class 4	m	\$ 10,716.07	
4.20	RCRRJ Pipe - 750mm dia, Class 4	m	S	
4.21	RCRRJ Pipe - 900mm dia, Class 4	m		
4.22 4.23	RCRRJ Pipe - 300mm dia, Class 4 (Option) RCRRJ Pipe - 375mm dia, Class 4	m	\$ <b>1</b> 5,290.80 \$ -	
4.23	RCRRJ Pipe - 37 Smith dia, Class 4	$(\mathcal{O})$	s -	
4.25	RCRRJ Pipe - 600mm dia, Class 4	$\sim$	s -	$\sim 1 \vee$
4.26	RCRRJ Pipe - 750mm dia, Class 4		s –	
4.27	RCRRJ Pipe - 900mm dia, Class 4		s (	
4.28	Single Sump Catchpit	ea.	\$ 12,949.10	
4.29	Manhole 1200mm		5112	
5.00	Pavement and Surfacing		$\langle \langle \rangle \rangle$	\$ 589,171.52
5.01	Subgrade stabilisation/improvement (aggregate, lime of cement)			\$ 505,171.52
5.02	Subgrade preparation and testing		<u>s</u> -	
5.03	Sub-basecourse (Waipapa Corridor)	n 3	48,934.87	
5.04	Pavement Stabilisation (150mm, 4kg/m2, 1.5% Hydrated Line)	mz	8,159.00	
5.05	Base course	nh3	\$ 53,635.03	
5.06 5.07	Surfacing (chip seal) Surfacing (Stone Mastic Aspha	Unz.	\$ 12,228.25 \$ -	
5.08	Surfacing (second coat)	m2	\$ 75,900.00	
5.09	Sub-basecourse (Option)	m3	\$ 69,224.93	
5.10	Pavement Stabilisation (50mm, 4kg/pr2, 1.5% Hydrated Lime)	m3	\$ 11,542.00	
5.11	Base course	m2	\$ 75,873.94	
5.12	Surfacing (chip see)	m2	\$ 17,298.50	
5.13	Surfacing (Stone Mastic Acomalt)	m2	\$ 177,600.00	
5.14 5.15	Surfacing (second coat) Upgrade existing carriageway(s).	m2	\$ 38,775.00 \$ -	
5.15	avcutting	-	s - s -	
	Joints	-	s -	
	6califying		\$ -	
5.19	Ancillan roadworks		s -	
11				
6.00	Bridges			\$-
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	I Breakdown for Physical Works		Head to He	ead RTB
Item	Description	Unit	Sub-Element Totals	Element Totals
7.00	Retaining Walls and Access Works			\$ 62,550.00
7.01	Timber-piled walling		\$-	
7.02	Concrete-piled walling including ground anchors		\$ -	
7.03	Gabion walling		s -	
7.04	Crib walling		s -	
7.05	Mechanically stabilised earth (MSE) walling		s -	
	Backfill behind retaining walls where the estimator is to consider the provisions			
7.06	included in the earthworks element and allow extra for special materials and/or		s -	
	placement requirements behind retaining walls).			
7.07	Stone strong walling		s -	
7.08	Diaphragm walling		s -	
7.09	Precast concrete facing panels		s -	
7.10	Drainage in association with retaining walls		s -	
7.11	Temporary works associated with retaining walls.		s -	
7.12	Residential Vehicle crossing (Waipapa Corridor)	Ea	\$ 6,000.00	
7.13	Commercial Vehicle Crossing (Waipapa Corridor)	Ea	\$ 18,900.00	
7.14	Residential Vehicle crossing (Option)	Ea	\$ 3,000.00	
7.15	Commercial Vehicle Crossing (Option)	Ea	\$ 34,650.00	)
8.00	Traffic Services			223,000.00
8.01	Barrier (wire/concrete median barrier and verge barrier)		s -	$\sim$
8.02	Pavement markings, pavement markers (Waipapa Corridor)	LS	\$ 5,000,00	
8.03	Pavement markings, pavement markers (Option)	LS	\$ 72,000.0	
8.04	Road signs, gantries (Waipapa Corridor)	LS	\$ 500.00	
8.05	Road signs, gantries (Option)	LS	\$ 3,500.00	
8.06	Traffic signals			
8.07	Marker posts		s -	
8.08	Lighting (Waipapa Corridor)	02	\$ 150,000.00	
8.09	Lighting (Option)	E	\$ 50,000.00	
8.10	Emergency cross-overs and phones		s	
8.11	Variable Message Signs	$\sim$	s (·	****
8.12	Intelligent Traffic Signals/ATMS.		s.	
8.13	Bus/cycleway green paint marking		>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>	1
8.14	Guardrails	/	<u>- / }</u>	
8.15	Leading and trailing end terminals		λ V-	
8.16	Crash cushions	$\sim$	<u>s</u> -	
0.10		11		
9.00	Service Relocations		$\diamond$	\$ 1.290.000.00
<b>9.00</b> 9.01	Service Relocations NZTA cost of local authority and utility companies (after cost share) and contractors on costs - TOP ENEBGY		\$ 550,000.00	\$ 1,290,000.00
	NZTA cost of local authority and utility companies (after cost share) and contractors on costs - <b>TOP ENEBGY</b> NZTA cost of local authority and unity companies (after cost share) and contractors on costs - <b>CHORUS</b>	JU	\$ 550,000.00 \$ 500,000.00	
9.01	NZTA cost of local authority and utility compunies (after cost share) and contractors on costs - <b>TOP ENEBGY</b> NZTA cost of local authority and unity companies (after cost share) and contractors on costs - <b>CHORUS</b> NZTA cost of local authority and utility companies (after cost share) and contractors on costs - <b>FNDC</b>			
9.01 9.02	NZTA cost of local authority and utility companies (after cost share) and contractors on costs - <b>TOP ENEBGY</b> NZTA cost of local authority and utility companies (after cost share) and contractors on costs - <b>CHORUS</b> NZTA cost of local authority and utility companies (after cost share) and contractors on costs - <b>FNDC</b> NZTA cost of local authority and utility companies (after cost share) and contractors on costs - <b>FNDC</b>		\$ 500,000.00	
9.01 9.02 9.03 9.04 9.05	NZTA cost of local authority and utility companies (after cost share) and contractors on costs - <b>TOP ENEBGY</b> NZTA cost of local authority and utility companies (after cost share) and contractors on costs - <b>GRORUS</b> NZTA cost of local authority and utility companies (after cost share) and contractors on costs - <b>FNDC</b> NZTA cost of local authority and utility companies (after cost share) and contractors on costs - <b>KERIKERI IRRIGATION</b>		\$ 500,000.00 \$ 115,000.00 \$ 10,000.00 \$ 50,000.00	
9.01 9.02 9.03 9.04 9.05 9.06	NZTA cost of local authority and utility companies (after cost share) and contractors on costs - TOP ENERGY NZTA cost of local authority and utility companies (after cost share) and contractors on costs - CHORUS NZTA cost of local authority and utility companies (after cost share) and contractors on costs - FNDC NZTA cost of local authority and utility companies (after cost share) and contractors on costs - FNDC NZTA cost of local authority and utility companies (after cost share) and contractors on costs - KERIKERI IRRIGATION VZTA cost of local authority and utility companies (after cost share) and contractors on costs - KERIKERI IRRIGATION VZTA cost of local authority and utility companies (after cost share) and contractors op costs - EDWARD LOCK Ovin worke associated with utility services such as trenching.		\$ 500,000.00 \$ 115,000.00 \$ 10,000.00 \$ 50,000.00 \$ 50,000.00	
9.01 9.02 9.03 9.04 9.05 9.06	NZTA cost of local authority and utility companies (after cost share) and contractors on costs - <b>TOP ENEBGY</b> NZTA cost of local authority and utility companies (after cost share) and contractors on costs - <b>GRORUS</b> NZTA cost of local authority and utility companies (after cost share) and contractors on costs - <b>FNDC</b> NZTA cost of local authority and utility companies (after cost share) and contractors on costs - <b>KERIKERI IRRIGATION</b>		\$ 500,000.00 \$ 115,000.00 \$ 10,000.00 \$ 50,000.00	
9.01 9.02 9.03 9.04 9.05 9.06 3.05	NZTA cost of local authority and utility companies (after cost share) and contractors on costs - <b>TOP ENEBGY</b> NZTA cost of local authority and utility companies (after cost share) and contractors on costs - <b>CHORUS</b> NZTA cost of local authority and utility companies (after cost share) and contractors on costs - <b>FNDC</b> NZTA cost of local authority and utility companies (after cost share) and contractors on costs - <b>FNDC</b> NZTA cost of local authority and utility companies (after cost share) and contractors on costs - <b>KERIKERI IRRIGATION</b> NZTA cost of local authority and utility companies (after cost share) and contractors on costs - <b>EDWARD LOCK</b> Ovil works associated with utility services such as trenching. Tepporary works associated with utility services		\$ 500,000.00 \$ 115,000.00 \$ 10,000.00 \$ 50,000.00 \$ 50,000.00	
9.01 9.02 9.03 9.04 9.05 9.05 9.06	NZTA cost of local authority and utility companies (after cost share) and contractors on costs - <b>TOP ENEBGY</b> NZTA cost of local authority and utility companies (after cost share) and contractors on costs - <b>CHORUS</b> NZTA cost of local authority and utility companies (after cost share) and contractors on costs - <b>FNDC</b> NZTA cost of local authority and utility companies (after cost share) and contractors on costs - <b>KERIKERI IRRIGATION</b> NZTA cost of local authority and utility companies (after cost share) and contractors on costs - <b>KERIKERI IRRIGATION</b> NZTA cost of local authority and utility companies (after cost share) and contractors on costs - <b>EDWARD LOCK</b> Givinworke associated with utility services such as trenching. Tencorary works associated with utility services <b>Candscaping &amp; Urban design</b>		\$ 500,000.00 \$ 115,000.00 \$ 10,000.00 \$ 50,000.00 \$ 50,000.00 \$ 15,000.00	\$ 149,741.8(
9.01 9.02 9.03 9.04 9.05 9.06 9.05	NZTA cost of local authority and utility companies (after cost share) and contractors on costs - TOP ENERGY NZTA cost of local authority and utility companies (after cost share) and contractors on costs - CFORUS NZTA cost of local authority and utility companies (after cost share) and contractors on costs - FNDC NZTA cost of local authority and utility companies (after cost share) and contractors on costs - FNDC NZTA cost of local authority and utility companies (after cost share) and contractors on costs - KERIKERI IRRIGATION NZTA cost of local authority and utility companies (after cost share) and contractors on costs - KERIKERI IRRIGATION NZTA cost of local authority and utility companies (after cost share) and contractors optical authority and utility companies (after cost share) and contractors optical authority and utility companies (after cost share) and contractors optical authority and utility companies (after cost share) and contractors optical authority and utility companies (after cost share) and contractors optical authority and utility companies (after cost share) and contractors optical authority and utility companies (after cost share) and contractors optical authority and utility companies (after cost share) and contractors optical authority and utility companies (after cost share) and contractors optical authority and utility companies (after cost share) and contractors optical authority and utility companies (after cost share) and contractors optical authority and utility companies (after cost share) temportation optical authority and utility companies (after cost share) contactors optical authority and utility companies (after cost share) temportation optical authority and utility companies (after cost share)	m2 m2	\$ 500,000.00 \$ 115,000.00 \$ 10,000.00 \$ 50,000.00 \$ 50,000.00 \$ 50,000.00 \$ 12,800.00 \$ 12,800.00	\$ 149,741.80
9.01 9.02 9.03 9.04 9.05 9.05 9.05 9.05 9.05 9.05 9.05 9.05	NZTA cost of local authority and utility companies (after cost share) and contractors on costs - <b>TOP ENEBGY</b> NZTA cost of local authority and utility companies (after cost share) and contractors on costs - <b>CHORUS</b> NZTA cost of local authority and utility companies (after cost share) and contractors on costs - <b>FNDC</b> NZTA cost of local authority and utility companies (after cost share) and contractors on costs - <b>FNDC</b> NZTA cost of local authority and utility companies (after cost share) and contractors on costs - <b>KERIKERI IRRIGATION</b> NZTA cost of local authority and utility companies (after cost share) and contractors on costs - <b>EDWARD LOC</b> Oviveority associated with utility services turn as trenching. Tepporary works associated with utility services <b>Landscaping &amp; Urban design</b> Landscaping (aestheric and componental) Grassing (we have a dorued)	m2	\$ 500,000.00 \$ 115,000.00 \$ 10,000.00 \$ 50,000.00 \$ 50,000.00 \$ 50,000.00 \$ 12,800.00 \$ 12,800.00 \$ 3,712.00	\$ 149,741.8(
9.01 9.02 9.03 9.04 9.05 9.06 9.05 9.06 9.05 9.06 9.05 9.05 9.05 9.05 9.05 9.05 9.05 9.05	NZTA cost of local authority and utility companies (after cost share) and contractors on costs - <b>TOP ENEBGY</b> NZTA cost of local authority and utility companies (after cost share) and contractors on costs - <b>CHORUS</b> NZTA cost of local authority and utility companies (after cost share) and contractors on costs - <b>FNDC</b> NZTA cost of local authority and utility companies (after cost share) and contractors on costs - <b>FNDC</b> NZTA cost of local authority and utility companies (after cost share) and contractors on costs - <b>FNDC</b> NZTA cost of local authority and utility companies (after cost share) and contractors on costs - <b>ENWARD LOCK</b> Ovinworke associated with utility services such as trenching. Tepporary works associated with utility services <b>Landscaping &amp; Urban design</b> Landscaping (esther Cost and antironmental) Grassing (wangana corizon) Grassing (wangana corizon)		\$ 500,000.00 \$ 115,000.00 \$ 10,000.00 \$ 50,000.00 \$ 50,000.00 \$ 50,000.00 \$ 15,000.00 \$ 12,800.00 \$ 3,712.00 \$ 1,920.00	\$ 149,741.8(
9.01 9.02 9.03 9.04 9.05 9.06 9.05 9.08 9.08 9.08 9.08 9.08 9.08 9.08 9.08	NZTA cost of local authority and utility companies (after cost share) and contractors on costs - <b>TOP ENEBCY</b> NZTA cost of local authority and utility companies (after cost share) and contractors on costs - <b>CHORUS</b> NZTA cost of local authority and utility companies (after cost share) and contractors on costs - <b>FNDC</b> NZTA cost of local authority and utility companies (after cost share) and contractors on costs - <b>FNDC</b> NZTA cost of local authority and utility companies (after cost share) and contractors on costs - <b>KERIKERI IRRIGATION</b> NZTA cost of local authority and utility companies (after cost share) and contractors on costs - <b>KERIKERI IRRIGATION</b> NZTA cost of local authority and utility services (after cost share) and contractors on costs - <b>EDWARD LOCK</b> Willwork associated with utility services <b>Landscaping &amp; Urban design</b> Landscaping (estified and vioronmental) Grassing (winheal of cost) Grassing (winheal of cost)	m2 m2	\$ 500,000.00 \$ 115,000.00 \$ 10,000.00 \$ 50,000.00 \$ 50,000.00 \$ 50,000.00 \$ 12,800.00 \$ 3,712.00 \$ 1,920.00 \$ -	\$ 149,741.80
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9.01 9.02 9.03 9.04 9.05 9.04 9.05 9.06 9.05 9.06 10.02 10.03 10.04 10.05 10.05 10.05 10.05 10.05 10.05 10.05 10.05 10.05	NZTA cost of local authority and utility companies (after cost share) and contractors on costs - <b>TOP ENEBCY</b> NZTA cost of local authority and utility companies (after cost share) and contractors on costs - <b>CHORUS</b> NZTA cost of local authority and utility companies (after cost share) and contractors on costs - <b>FNDC</b> NZTA cost of local authority and utility companies (after cost share) and contractors on costs - <b>FNDC</b> NZTA cost of local authority and utility companies (after cost share) and contractors on costs - <b>FNDC</b> NZTA cost of local authority and utility companies (after cost share) and contractors on costs - <b>EDWARD LOCK</b> <b>Contractors on costs - EDWARD LOCK</b> <b>Cassing &amp; Unbart design</b> Landscaping (esthelic and souronmental) Grassing (Managa dorfueor) Grassing (Optioq) Arghitecture Feacing Streets caping Land accommodation costs (also refer to project property cost funding) Footpaths (1.5m) and cycleway Footpaths (2.5m) and cycleway Building relocations Traffic islands - splitter Traffic islands - splitter	m2 m2 m m2 m2 m2 m2 m2 m2 m2	\$ 500,000.00 \$ 115,000.00 \$ 10,000.00 \$ 50,000.00 \$ 50,000.00 \$ 50,000.00 \$ 12,800.00 \$ 12,800.00 \$ 12,800.00 \$ 1,920.00 \$ 1,920.00 \$ 1,920.00 \$ 5 \$ 1,009.80 \$ - \$ 5 \$ 68,400.00 \$ - \$ 5 \$ 7,200.00 \$ 10,200.00	\$ 149,741.8( ) ) ) ) ) ) ) ) ) ) ) ) ) ) ) ) ) ) )
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Elementa	al Breakdown for Physical Works		п	ead to Hea	ad RIB	
ltem	Description	Unit		Element otals	Elen	nent Totals
11.00	Traffic Management and Temporary Works			_	\$	375,000.00
11.01	Temporary traffic diversions Traffic management physical works costs		S			
11.02	Temporary roads	1	\$	-		
			1			
12.00	Preliminary and General Establishment, temporary accommodation, clean up, disestablishment and other				\$	272,276.74
12.01	site operating costs		\$ 10	02,103.78	· · · · · ·	
12.02	Contractor's supervision, on site staffing, prescribed specialists and other time		\$			
12.03	related costs. Insurances, bonds, warrantees/guarantees, as-built requirement plans and other		s			
	non time-related costs.					
12.04	Temporary works design and traffic management planning Project plans, quality assurance, traffic management plans, environmental		\$	•		
12.05	management plans, programming and reporting, consent fees, stakeholder management, health and safety, security management, contractor's escrow tender documents		\$	÷		
12.06	Network maintenance		\$		$\mathcal{D}$	
12.07	QA systems		S	~	$\searrow$	
12.08	Testing		5	$\sim$	$\mathcal{H}$	$\wedge$
13	Extraordinary Construction Costs				11	510,518.89
			4	11	V	
Base Est	imate		~\'		\$ .	4,969,050.55
		5		U U		0 1
Date of I	Estimate	$\sqrt{2}$	39/	09/	201	3
Estimate	prepared by		NJ	de	Far	
Estimate	internal peer review by		A	FAC.	I	all
Ectimato	external peer review by	~	$\sim 1$			
Lotinate		<u> </u>	$ \rightarrow $			
Estimate	accepted by NZTA project manager ese estimates are exclusive of Contingency, Numbing Risk Contingency, Established and		2	3		
Estimate	accepted by NZTA project manager			2		

D1       Implementation Phase fees       \$ 334,836.02         D2       Physical Works       \$ 4,118,483.02         1.00       Environmental Compliance       \$ 50,000.00		4 SH10 Waipapa Road Intersection Improvements al Breakdown for Physical Works	_	Close Waipapa I	Loop	Road
D1       Implementation Phase fees       \$ 334,836.02         D2       Physical Works       \$ 4,118,483.02         1.00       Environmental Compliance       \$ 50,000.00         2.00       Earthworks       \$ 12,871.91         2.01       Site clearance - greenfield such as small trees, shrubs, hedging etc.       \$ -         D2       Demolition - building demolition, structures, fences, retaining walls, utility       \$ -         2.02       services, stormwater pipe, manholes, cesspits, surfacing, kerbs, lights, signs, temporary works etc.       \$ -         2.03       Temporary encing       \$ -       -         2.04       Topsoil stripping,       \$ -       -         2.05       Cut to Maste (Option)       \$ -       -         2.06       Cut to waste (Walpapa Corridor)       \$ 3       -         2.08       Borrow to fill       \$ 5       -         2.09       Imported fill       \$ 5       -         2.11       Excavation in rock (state types)       \$ 5       -         2.13       Preload materials       \$ -       -         2.14       Respreading topsoil       \$ -       -         2.13       Preload materials       \$ -       -         2.14       Respreading topsoil	Item	Description	Unit		E	lement Totals
D2       Physical Works       \$ 4,118,483.00         1.00       Environmental Compliance       \$ 50,000.0         2.00       Earthworks       \$ 12,871.9         2.01       Site clearance - greenfield such as small trees, shrubs, hedging etc.       \$ -         Demolition - building demolition, structures, fences, retaining walls, utility       \$ -         2.02       services, stormwater pipe, manholes, cesspits, surfacing, kerbs, lights, signs, temporary works etc.       \$ -         2.03       Temporary fencing       \$ -       -         2.04       Topsoil stripping,       \$ -       -         2.05       Cut to fill,       \$ -       -         2.06       Gut to sate (Option)       m3       \$ 12,871.95         2.08       Borrow to fill       \$ -       -         2.09       Imported fill       \$ -       -         2.10       Undercutting soft spots       \$ \$ -       -         2.11       Excavation in rock (state types)       \$ \$ -       -         2.13       Preloading, additional preload materials, settlement monitoring and removal of preload materials, settlement monitoring and removal of preload materials       \$ -         2.14       Respreading topsoil       \$ -       -         2.15       Imported topsoil	С	Pre-implementation Phase Fees			\$	435,286.82
1.00       Environmental Compliance       \$ 50,000.0         2.00       Earthworks       \$ 12,871.9         2.01       Site clearance - greenfield such as small trees, shrubs, hedging etc.       \$ -         Demolition - building demolition, structures, fences, retaining walls, utility       \$ -         2.02       services, stormwater pipe, manholes, cesspits, surfacing, kerbs, lights, signs, temporary works etc.       \$ -         2.03       Temporary fencing       \$ -         2.04       Topsoil stripping,       \$ -         2.05       Cut to full,       \$ -         2.06       Cut to waste (Option)       m3 \$ -         2.07       Cut to waste (Waipapa Corridor)       m3 \$ 12,871.95         2.08       Borrow to fill       \$ -         2.09       Imported fill       \$ -         2.00       Cut to waste (Waipapa Corridor)       m3 \$ 12,871.95         2.08       Borrow to fill       \$ -         2.10       Undercutting soft spots       \$ -         2.11       Excavation in rock (state types)       \$ -         2.12       Conditioning of cut and/or fill materials       \$ -         2.11       Excavation und/or fill materials, settlement monitoring and removal of preload materials       \$ -         2.13       Imported	D1	Implementation Phase fees			\$	334,836.0
2.00       Earthworks       \$       12,871.91         2.01       Site clearance - greenfield such as small trees, shrubs, hedging etc.       \$       \$       \$         2.02       services, stormwater pipe, manholes, cesspits, surfacing, kerbs, lights, signs, temporary works etc.       \$       \$       \$         2.03       Temporary fencing       \$       \$       \$       \$       \$         2.04       Topsoil stripping,       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$       \$	D2	Physical Works			\$	4,118,483.02
2.01       Site clearance - greenfield such as small trees, shrubs, hedging etc.       \$         Demolition - building demolition, structures, fences, retaining walls, utility       \$         2.02       services, stormwater pipe, manholes, cesspits, surfacing, kerbs, lights, signs, temporary works etc.       \$         2.03       Temporary fencing       \$       -         2.04       Topsoil stripping,       \$       -         2.05       Cut to vaste (Option)       m3       \$       -         2.06       Cut to waste (Option)       m3       \$       -         2.08       Borrow to fill       \$       -       -         2.09       Imported fill       \$       \$       -         2.09       Imported fill       \$       \$       -         2.10       Undercutting soft spots       \$       \$       -         2.11       Excavation in rock (state types)       \$       -       -         2.13       Preloading, additional preload materials, settlement monitoring and removal of preload materials, settlement monitoring and removal of set -       \$       -         2.14       Respreading topsoil       \$       \$       -       -         2.13       preload materials       \$       -       -       - </td <td>1.00</td> <td>Environmental Compliance</td> <td></td> <td></td> <td>\$</td> <td>50,000.00</td>	1.00	Environmental Compliance			\$	50,000.00
2.01       Site clearance - greenfield such as small trees, shrubs, hedging etc.       \$         Demolition - building demolition, structures, fences, retaining walls, utility       \$         2.02       services, stormwater pipe, manholes, cesspits, surfacing, kerbs, lights, signs, temporary works etc.       \$         2.03       Temporary fencing       \$       -         2.04       Topsoil stripping,       \$       -         2.05       Cut to swate (Option)       m3       \$         2.06       Cut to waste (Option)       m3       \$         2.08       Borrow to fill       \$       -         2.09       Imported fill       \$       \$         2.09       Imported fill       \$       \$         2.10       Undercutting soft spots       \$       \$         2.11       Excavation in rock (state types)       \$       \$         2.12       Conditioning of cut and/or fill materials       \$       -         2.13       preload materials, settlement monitoring and removal of preload materials, settlement monitoring and removal of preload materials       \$       -         2.14       Respreading topsoil       \$       \$       -       -         2.13       preload materials       \$       -       -       - </td <td>2.00</td> <td>Farthworks</td> <td></td> <td></td> <td>¢</td> <td>12 871 9</td>	2.00	Farthworks			¢	12 871 9
Demolition - building demolition, structures, fences, retaining walls, utility2.02services, stormwater pipe, manholes, cesspits, surfacing, kerbs, lights, signs, temporary works etc.\$2.03Temporary fencing\$2.04Topsoil stripping,\$2.05Cut to fill,\$2.06Cut to waste (Option)m32.07Cut to waste (Waipapa Corridor)m32.08Borrow to fill\$2.09Imported fill\$2.09Imported fill\$2.10Undercutting soft spots\$2.11Excavation in rock (state types)\$2.12Conditioning of cut and/or fill materials\$2.13preloading, additional preload materials, settlement monitoring and removal of preload materials\$2.18If emporary earthworks\$2.19S\$2.11Excavation works\$2.12Conditioning of cut and/or fill materials2.13preload materials2.14Respreading topsoil2.15Imported topsoil2.16Foreshore works2.17Temporary earthworks2.18Importery earthworks2.19sediment control ponds, including temporary hydroseedme, ork (hackbaans, silt fencing2.20Dust control				¢ .	-	12,071.5
2.03Temporary fencing\$2.04Topsoil stripping,\$2.05Cut to fill,\$2.06Cut to waste (Option)m32.07Cut to waste (Waipapa Corridor)m32.08Borrow to fill\$2.09Imported fill\$2.10Undercutting soft spots\$2.11Excavation in rock (state types)\$2.12Conditioning of cut and/or fill materials\$2.13Preloading, additional preload materials, settlement monitoring and removal of preload materials\$2.15Imported topsoil\$\$2.16Reclamation works\$\$2.17Temporary earthworks\$\$2.18Temporary haul roads\$\$2.19construct, maintain & remove temporary sediment control measures, temporary sediment control ponds, including temporary hydroseedims, rotk chackbaans, silt fencing\$2.20Dust control\$\$		Demolition - building demolition, structures, fences, retaining walls, utility services, stormwater pipe, manholes, cesspits, surfacing, kerbs, lights, signs,				
2.04       Topsoil stripping,       \$       .         2.05       Cut to fill,       \$       .         2.06       Cut to waste (Option)       m3       \$       .         2.06       Cut to waste (Waipapa Corridor)       m3       \$       12,871.45         2.07       Cut to waste (Waipapa Corridor)       m3       \$       12,871.45         2.08       Borrow to fill       \$       \$       \$         2.09       Imported fill       \$       \$       \$         2.10       Undercutting soft spots       \$       \$       \$         2.11       Excavation in rock (state types)       \$       \$       \$         2.12       Conditioning of cut and/or fill materials       \$       \$       \$         Preloading, additional preload materials, settlement monitoring and removal of preload materials       \$       \$       \$         2.13       Preloading, additional preload materials, settlement monitoring and removal of preload materials       \$       \$       \$         2.14       Respreading topsoil       \$       \$       \$       \$       \$         2.16       Foreshore works       \$       \$       \$       \$       \$       \$       \$       \$       \$ <td>2.03</td> <td></td> <td></td> <td>s -</td> <td></td> <td></td>	2.03			s -		
2.05       Cut to fill,       \$       -         2.06       Cut to waste (Option)       m3       \$       -         2.07       Cut to waste (Waipapa Corridor)       m3       \$       -         2.08       Borrow to fill       \$       \$       -         2.09       Imported fill       \$       \$       -         2.00       Undercutting soft spots       \$       \$       -         2.10       Undercutting soft spots       \$       \$       -         2.10       Undercutting of cut and/or fill materials       \$       \$       -         2.11       Excavation in rock (state types)       \$       \$       -       -         2.12       Conditioning of cut and/or fill materials       \$       \$       -       -         2.13       Preload materials       \$       -       -       -       -       -         2.14       Respreading topsoil       \$       \$       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       <					1	
2.06       Cut to waste (Option)       m3       \$       -         2.07       Cut to waste (Wajpapa Corridor)       m3       \$       12,871,95         2.08       Borrow to fill       \$       \$       12,871,95         2.09       Imported fill       \$       \$       -         2.09       Imported fill       \$       \$       -         2.10       Undercutting soft spots       \$       \$       -         2.11       Excavation in rock (state types)       \$       \$       -         2.12       Conditioning of cut and/or fill materials       \$       -       -         2.13       Preloading, additional preload materials, settlement monitoring and removal of preload materials       \$       -       -         2.14       Respreading topsoil       \$       \$       -       -       -         2.16       Reclamation works       \$       \$       -       -       -       -         2.16       Foreshore works       \$       \$       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -						
2.07       Cut to waste (Waipapa Corridor)       m3       \$ 12,871.45         2.08       Borrow to fill       \$       \$         2.09       Imported fill       \$       \$         2.10       Undercutting soft spots       \$       \$         2.11       Excavation in rock (state types)       \$       \$         2.12       Conditioning of cut and/or fill materials       \$       \$         2.13       Preloading, additional preload materials, settlement monitoring and removal of preload materials       \$       \$         2.14       Respreading topsoil       \$       \$       \$         2.15       Imported topsoil       \$       \$       \$         2.16       Foreshore works       \$       \$       \$         2.17       Temporary earthworks       \$       \$       \$         2.18       Iremporary haul roads       \$       \$       \$         2.17       Temporary haul roads       \$       \$       \$         2.18       Iremporary haul roads       \$       \$       \$         2.19       sediment control ponds, including temporary hydroseedims, rotk chackbaans, silt       \$       \$         2.20       Dust control       \$       \$       \$			m3		<b>k</b>	
2.08       Borrow to fill       \$         2.09       Imported fill       \$         2.10       Undercutting soft spots       \$         2.11       Excavation in rock (state types)       \$         2.11       Excavation in rock (state types)       \$         2.12       Conditioning of cut and/or fill materials       \$         Preloading, additional preload materials, settlement monitoring and removal of preload materials       \$         2.13       Preloading topsoil       \$         2.14       Respreading topsoil       \$         2.15       Imported topsoil       \$         2.16       Foreshore works       \$         2.17       Temporary earthworks       \$         2.18       Temporary haul roads       \$         Construct, maintain & remove temporary sediment control measures, tempolary       \$         2.19       sediment control ponds, including temporary hydroseedings roky the chains, silt       \$         2.20       Dust control       \$       \$				\$ 12,871,95	2	
2.10       Undercutting soft spots       \$         2.11       Excavation in rock (state types)       \$         2.12       Conditioning of cut and/or fill materials       \$         2.13       Preloading, additional preload materials, settlement monitoring and removal of preload materials       \$         2.14       Respreading topsoil       \$       -         2.15       Imported topsoil       \$       -         2.16       Reclamation works       \$       -         2.17       Temporary earthworks       \$       -         2.18       Temporary haul roads       \$       -         2.19       Sediment control ponds, including temporary hydroseeding, rotk charles, silt fencing       \$       -         2.20       Dust control       \$       -       -				s	0	
2.11       Excavation in rock (state types)       S         2.12       Conditioning of cut and/or fill materials       S         2.13       Preloading, additional preload materials, settlement monitoring and removal of preload materials       S         2.14       Respreading topsoil       S         2.15       Imported topsoil       S         2.16       Foreshore works       S         2.17       Temporary earthworks       S         2.18       Temporary haul roads       S         Construct, maintain & remove temporary sediment control measures, tempolary seliment control ponds, including temporary hydroseeding, rotic chackedans, silt fencing       S         2.20       Dust control       S       -					S	<u> </u>
2.12       Conditioning of cut and/or fill materials       S       -         2.13       Preloading, additional preload materials, settlement monitoring and removal of preload materials       S       -         2.13       Respreading topsoil       S       -       -         2.14       Respreading topsoil       S       -       -         2.15       Imported topsoil       S       -       -         2.16       Reclamation works       S       -       -         2.16       Foreshore works       S       -       -         2.16       Foreshore works       S       -       -         2.17       Temporary earthworks       S       -       -         2.18       Temporary haul roads       S       -       -         Construct, maintain & remove temporary sediment control measures temporary       S       -       -         2.18       Temporary haul roads       S       -       -       -       -         2.18       Temporary haul roads       S       -       -       -       -       -         2.19       Sediment control ponds, including temporary hydroseedims, roit chackedams, silt       S       -       -       -         1	2.10			\$ -	$\sim$	
2.13       Preloading, additional preload materials, settlement monitoring and removal of preload materials         2.14       Respreading topsoil       \$         2.14       Respreading topsoil       \$         2.15       Imported topsoil       \$         2.16       Reclamation works       \$         2.17       Temporary earthworks       \$         2.18       Temporary haul roads       \$         2.19       Sediment control ponds, including temporary hydroseeding, roth chack dams, silt fencing       \$         2.20       Dust control       \$						
2.13       preload materials       \$       \$         2.14       Respreading topsoil       \$       \$         2.15       Imported topsoil       \$       \$         2.15       Imported topsoil       \$       \$         2.15       Imported topsoil       \$       \$         2.16       Reclamation works       \$       \$         2.16       Foreshore works       \$       \$         2.17       Temporary earthworks       \$       \$         2.18       Temporary haul roads       \$       \$         Construct, maintain & remove temporary sediment control measures, temporary sediment control ponds, including temporary hydroseedims, roth chark dams, silt fencing       \$       \$         2.20       Dust control       \$       \$       \$	2.12					$\sim$
2.14       Respreading topsoil       \$       -         2.14       Respreading topsoil       \$       -         2.15       Imported topsoil       \$       -         2.16       Reclamation works       \$       -         2.16       Foreshore works       \$       -         2.17       Temporary earthworks       \$       -         2.18       Temporary haul roads       \$       -         Construct, maintain & remove temporary sediment control measures, temporary sediment control ponds, including temporary hydroseedims, silt fencing       \$       -         2.20       Dust control       \$       -       -	213		· ·	$\mathbf{V}$		1
2.15       Imported topsoil       \$       -         2.16       Reclamation works       \$       -         2.16       Foreshore works       \$       -         2.16       Foreshore works       \$       -         2.17       Temporary earthworks       \$       -         2.18       Temporary haul roads       \$       -         Construct, maintain & remove temporary sediment control measures, temporary sediment control ponds, including temporary hydroseedims, roth check dams, silt fencing       \$       -         2.20       Dust control       \$       -       -						
2.16       Reclamation works       \$       -         2.16       Foreshore works       \$       \$         2.17       Temporary earthworks       \$       \$         2.18       Temporary haul roads       \$       -         Construct, maintain & remove temporary sediment control measures, temporary       \$       -         9       sediment control ponds, including temporary hydroseedims, roth chack dams, silt       \$       -         19       sediment control       \$       -       -         2.20       Dust control       \$       -       -			$\sim$	-		$\wedge$ $\vee$
2.16     Foreshore works     \$       2.17     Temporary earthworks     \$       2.18     Temporary haul roads     \$       Construct, maintain & remove temporary sediment control measures, temporary sediment control ponds, including temporary hydroseeding, roth chackdams, silt fencing     \$       2.20     Dust control     \$			M >			$\gamma $ $\gamma$
2.17     Temporary earthworks     \$       2.18     Temporary haul roads     \$       Construct, maintain & remove temporary sediment control measures, temporary sediment control ponds, including temporary hydroseeding, rock check dams, silt fencing     \$       2.20     Dust control     \$			$\overline{}$			
2.18     Temporary haul roads     \$ -       Construct, maintain & remove temporary sediment control measures temporary     \$       2.19     sediment control ponds, including temporary hydroseeding, rock chack cards, silt fencing       2.20     Dust control					44	$\sim$
Construct, maintain & remove temporary sediment control measures, temporary 2.19 sediment control ponds, including temporary hydroseedime, rock chack dams, silt fencing 2.20 Dust control					$\Lambda \Lambda$	<u>}</u>
2.19     sediment control ponds, including temporary hydroseeding, rock check rains, silt fencing       2.20     Dust control	2.18					<b>v</b>
2.20 Dust control	2.19	sediment control ponds, including temporary hydroseeding, rock chack dams, silt	6	$\langle     \rangle$		
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Elemental Breakdown

	SH10 Waipapa Road Intersection Improvements	-	Close Waipapa L	oop Road
ltem	Description	Unit	Sub-Element Totals	Element Totals
3.00	Ground Improvements			\$-
4.00	Drainage			\$ 643,272.43
4.01	Stormwater drainage, temporary stream diversion and culverts including		ş -	
	headwalls, chambers and rip-rap			
4.02	Subsoil and pavement drains Kerb blocks (incl. subsoil) (Waipapa Corridor)	m	\$ - \$ 264,866.51	
4.03	Kerb without Channel (Incl.subsoil) (Waipapa Corridor)	m	\$ 1,280.00	
4.05	Kerb blocks (incl. subsoil) (Option)	m	\$ 146,422.69	
4.06	Kerb without Channel (Incl.subsoil) (Option)	m	\$ 14,400.00	
4.07	Surface water channel		\$ -	
4.08	Erosion control		\$ - \$ -	
4.09 4.10	Flumes Rain gardens		\$ -	
4.11	Permanent ponds		\$ -	
4.12	Wetlands		\$ -	
4.13	Grassed swales		\$-	
4.14	Treatment devices		\$ -	<b></b>
4.15	Manhole 1200mm RCRRJ Pipe - 300mm dia, Class 4 (Waipapa Corridor)	ea	\$ 6,474.55 \$	
4.16	RCRRJ Pipe - 300mm dia, Class 4 (walpapa Corridor) RCRRJ Pipe - 375mm dia, Class 4	m m	\$ 4791.60	2.
4.18	RCRRJ Pipe - 450mm dia, Class 4	m	\$ 60,860.50	$\checkmark$
4.19	RCRRJ Pipe - 600mm dia, Class 4	m	\$ 1 10,726 6T	
4.20	RCRRJ Pipe - 750mm dia, Class 4	m		~
4.21	RCRRJ Pipe - 900mm dia, Class 4	mV		
4.22 4.23	RCRRJ Pipe - 300mm dia, Class 4 (Option) RCRRJ Pipe - 375mm dia, Class 4	m	\$ 22,129.45 \$ -	
4.23	RCRRJ Pipe - 450mm dia, Class 4	$\mathcal{O}\mathcal{L}$	\$ -	
4.25	RCRRJ Pipe - 600mm dia, Class 4	1 A	\$ - (	
4.26	RCRRJ Pipe - 750mm dia, Class 4	$\sim$	\$	
4.27	RCRRJ Pipe - 900mm dia, Class 4	$b^{\vee}$	\$	$\sim 11$
4.28	Single Sump Catchpit	ea.	\$ 1, <u>3</u> 0.46	
4.29	Manhole 1200mm			
5.00	Pavement and Surfacing		$\langle \langle \rangle$	\$ 534,475.70
5.01	Subgrade stabilisation/improvement (aggregate, line or dement)	$\sim$		
5.02	Subgrade preparation and testing		s .	
5.03 5.04	Sub-basecourse (Waipapa Corridor) Pavement Stabilisation (150mm, 4kg/m2, 1.5% Hydrated ume)		\$ 48,934.87 \$ 8,159.00	
5.04	Base course	m2 m3	\$ 53,635.03	
5.06	Surfacing (chip seal)	m2	\$ 12,228.25	
5.07	Surfacing (Stone Mastic Asphart)	$\sim$	\$ -	
5.08	Surfacing (second coat)	m2	\$ 75,900.00	
5.09	Sub-basecourse (Option)	m3	\$ 64,450.80	
5.10 5.11	Pavement Stabilisation (150m), 4kg/m2, 1.5% Hydrated Lime) Base course	m3 m2	\$ 10,746.00 \$ 70,641.26	
5.12	Surfacing (ching seal	m2	\$ 16,105.50	
5.13	Surfacing Stone Mastic Apphalt)	m2	\$ 130,500.00	
5.14	Surfacing (second coat)	m2	\$ 43,175.00	
5.15	Upgrate existing carriageway(s).		\$ -	
5.16	Sawcutting		\$ - \$ -	
	scaritying		\$ -	
5,19	AnciNary roadworks		\$ -	
)//(				
6.00	Bridges			\$
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lementa	al Breakdown for Physical Works		CIC	ose Waipapa L	оор коай
Item	Description	Unit	S	ub-Element Totals	Element Totals
7.00	Retaining Walls and Access Works				\$ 62,550.00
7.01	Timber-piled walling		\$	-	
7.02	Concrete-piled walling including ground anchors		\$	-	
7.03	Gabion walling		\$	-	
7.04	Crib walling		\$	-	
7.05	Mechanically stabilised earth (MSE) walling		\$	-	
	Backfill behind retaining walls where the estimator is to consider the provisions				
7.06	included in the earthworks element and allow extra for special materials and/or		\$		
	placement requirements behind retaining walls).		-		
7.07	Stone strong walling		\$	-	
7.08	Diaphragm walling		\$		
7.09	Precast concrete facing panels		\$		
7.10	Drainage in association with retaining walls		\$	-	
7.11	Temporary works associated with retaining walls.		\$	-	
7.11		Ea	s	6,000.00	
	Residential Vehicle crossing (Waipapa Corridor)				
7.13	Commercial Vehicle Crossing (Waipapa Corridor)	Ea	\$	18,900.00	
7.14	Residential Vehicle crossing (Option)	Ea	\$	3,000.00	
7.15	Commercial Vehicle Crossing (Option)	Ea	\$	34,650.00	
8.00	Traffic Services			/	\$ 220,500.00
8.01	Barrier (wire/concrete median barrier and verge barrier)		\$	<u> </u>	
8.02	Pavement markings, pavement markers (Waipapa Corridor)	LS	\$	5,000.00	
8.03	Pavement markings, pavement markers (Option)	LS	\$	12,000.00	
8.04	Road signs, gantries (Waipapa Corridor)	LS	S	500.00	$\sim$
8.05	Road signs, gantries (Option)	LS	1	3,000.00	
8.06	Traffic signals		\$	<u> </u>	
8.07	Marker posts		\$		
8.08	Lighting (Waipapa Corridor)	P2	\$	150,000.00	11
8.09	Lighting (Option)		\$	50,000.00	
8.10	Emergency cross-overs and phones	a a	\$	30,000.00	
			\$	$-(\frown)$	
8.11	Variable Message Signs		\$	$\sim ((\cdot))$	
8.12	Intelligent Traffic Signals/ATMS.		À		
8.13	Bus/cycleway green paint marking	/	12		
8.14	Guardrails				
8.15	Leading and trailing end terminals	$\sim$	\$		
8.16	Crash cushions	101	\$	<u> </u>	
9.00	Service Relocations		≯		\$ 1,290,000.00
9.01	NZTA cost of local authority and uptile commanies (after cost share) and contractors on costs - TOP ENERCY	No	\$	550,000.00	
9.02	NZTA cost of local authority and mility companies (after cost chare) and contractors on costs <b>EDORUS</b>		\$	500,000.00	
9.03	NZTA cost of local authority and with companies (afee cost shart) and contractors of costs - FND		\$	115,000.00	
9.04	NZTA cost of local duthorty and utility companies (affect cost of are) and contractors on doors - KERIKERI IRRIGATION		\$	10,000.00	
9.05	NTTA cost of food authority and willy comparies (after cost share) and contractors on costs - EDWARD LOCK Civil works associated with utility services such as trenching.		s s	50,000.00	
7.01	Temporary works associated with utility services		\$	15,000.00	
1000	Landscaping & Urban design		-		¢ 150.000.00
10.00	Landscaping & Urban vesion				\$ 159,690.10
	Landscaping (aesthetic and environmental)		\$	-	
	Grassing Waipapa Corridor	m2	\$	3,712.00	
10.03	Grassing (Option)	m2	\$	1,600.00	
10.04	Architetture		\$		
	Nencing	m	\$	1,178.10	
	Streetscaping		\$	-	
	Cand accommodation costs (also refer to project property cost funding)		\$	-	
	Footpaths (1.5m) and cycleway	m2	\$	63,000.00	
1009	Pootpaths (2.5m) and cycleway	m2	\$	43,500.00	
	Building relocations		\$	-	
10,11	Traffic islands - splitter	m2	\$	40,800.00	
10.12	Traffic islands - pedestrian	m2	ŝ	3,400.00	
10.12	Pram crossings with kerb and tactile pavers	Ea	ŝ	2,500.00	
		Lu		2,300.00	
0.14	Urban design features to bridges, structures, barriers, retaining walls etc.		\$	-	

	al Breakdown for Physical Works		Close	Waipapa I	соор к	loau
Item	Description	Unit		Element otals	Ele	ement Totals
11.00	Traffic Management and Temporary Works		-		\$	375,000.00
11.01	Temporary traffic diversions		S			
11.02	Traffic management physical works costs		5	•		
11.03	Temporary roads		5	•		
12.00	Preliminary and General		1.		\$	267,868.81
12.01	Establishment, temporary accommodation, clean up, disestablishment and other		\$ 1	00,450.81	1	
12101	site operating costs Contractor's supervision, on site staffing, prescribed specialists and other time			50,450.01	-	
12.02	related costs.		\$	•		
12.03	Insurances, bonds, warrantees/guarantees, as-built requirement plans and other		s	2.0	1	
1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.	non time-related costs. Temporary works design and traffic management planning		-		-	
12.04	Project plans, quality assurance, traffic management plans, environmental		S			
12.05	management plans, programming and reporting, consent fees, stakeholder		s			
12.05	management, health and safety, security management, contractor's escrow tender		3			
12.06	documents Network maintenance		5		5	
12.00	QA systems		5		K	>
12.08	Testing		\$	()	N7	0
13	Extraordinary Construction Costs			$\sim$		502,254.03
	Extraordinary construction costs		$\mathcal{H}$	$\mathbf{\dot{\mathbf{x}}}$	$\Theta$	502,254.03
Base Est	imate		5	77	\$	4,888,605,8
buse Est			$\rightarrow$		*	4,000,005.00
		OL	1.4	ř .	,	$\Lambda$
Date of	Estimate	$\sim$	29/	09/	20	HAL V
			117	0.000	1	$\sim$
Estimate	e prepared by	$\gamma$	NUQ	20/0	YY	
Estimate	internal peer review by		5	917	· T	20
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Estimate	external peer review by		$\square$	$\mathbf{y}$		
Estimate	e external peer review by e accepted by NZTA project manager ese estimates are exclusive of Contingency, Sunding Risk Contingency, Escalation and	JD	2			
Estimate	accepted by NZTA project manager		2			

### Nett Property Costs

Property Acquisition Reference	Property Requirements	P u r c h a s	Property Purchase Costs (A)	Purchase Costs	Purchase Costs	Purchase Costs	Purchase Costs	(Less) Disposal Value (B)		Nett Property Purchase Costs (A-B=C)					Property owner Accommodation Works (E)	Nett Project Property Cost (C+D+E=F)
		e d			Right Turn Bay	Round- about	Signals	Head to Head RTB	Cloase Waipapa Loop Road							
	Lot 2 DP 22952		0			12,000	12,000	12,000	2,000							
	Lot 2 DP 72659		1,000,000				200,000			0	0	÷				
	Lot 1 DP 153739		0	-			40,000				•					
	Lot 1 DP 95010		0	÷	-				·	÷	0	-				
	Lot 2 DP 153648		0	-				135,000	0	÷	*	-				
	Lot 1 DP 164804		0	0	0		3,000	3,000	0	0	0	0				
	Waipapa Corridor Treatment: Lot 1 DP 153739, Lot 4 DP 98489, Lot 3 DP 98489, Lot 4 DP 102236, Lot 5 DP 102236, Lot 3 DP 99619		0	0	46,750	46,750	21400	46,750	46,750	0	0	0				
			0	0			10			0						
			0	Ó	110		0			0	0	0				
			0				>			0	0	0				
			0		) V	and				0	0	0				
Fees	Property Acquisition Agents Fees	-	1	$\langle \cdot \rangle$	6	n > n				-	-	0				
Base Estimate			G	0	274,750	998,750	410,750	426,750	93,750	0	0	0				
Contingency		~	Eleve		<u>z</u>							0				
Expected Estir	nate			<u> </u>	)							0				
Funding Risk Contingency										0						
95th Percentile Estimate										0						
Date of Estima	ate	$\mathcal{S}$	3-	Cost Index												
Estimate prep		-		Signed												
	nal peer review by			Signed												
	rnal peer review by			Signed												
Estimate acce	pted by NZTA project manager			Signed												

Note: These estimates are exclusive of escalation and GST.

<b>Risk Register</b>	
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Project/Contract:	SH10 Waipapa Road Intersection
Project/Contract ID:	PN4234
NZTA Office:	Northland
NZTA Lead:	Sebastian Reed

Document Date:	21 Jun	e 2017
Supplier Lead:	Chris Parker	Opus
RM Specialist:	Naushaba Todd-Jones	Opus
Risk Tolerance Threshold:	Moderate	

				1		Threshold.			]	Cu	Irrent Expos	ure		Residu	al (Target) E	xposure	
										Se	mi-Quantitat	ive	Treatment Strategy	Semi-Quantitative			
?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
Rank	RID	Risk Title	Description/ Cause/ Consequence	Risk Owner	Risk Owning Org	Date Raised (xx/xx/xxxx)	Risk Status	Phase	Established Controls		Likelihood	Risk	Individual actions to be recorded in the Actions Register (Tab 4)	Consq.	Likelihood	Risk Score	Commentary & Closure Statement
5	1	Property acquisition required to widen the carriageway lanes and add the intersections	<ul> <li>Description: There is a threat that compulsory acquisition will be required.</li> <li>Cause: The cause of the threat is that due to the design (carriageway widths and shared pathways) land in-take will be required and uncooperative owners may require statutory timeframes (18 months).</li> <li>Consequence: The consequence of the threat is that this will lead to delays in the project programme until compulsory acquisition has been completed.</li> </ul>	Sebastian Reed / Stu Graham	NZTA	21/03/2017	Draft	Pre Implementation	Bean property acquisition liaisop as a law as possible in the project	very-ligh	Low	20		High	Very Low	8	
1	2	Property disposal	<ul> <li>Description: There is an opportunity to sell a portion of the Loop Road (north end) by moving the turnaround (closed end) treatment further into Loop Road.</li> <li>Cause: The cause of the opportunity is that Loop Road is to be closed off with a turnaround treatment in the current design</li> <li>Consequence: The consequence of the opportunity is that the north end of Loop Road can be separated as a section and sold possibly to the neighbouring property as a store frontage.</li> </ul>	Sebastian Reed /	NZTA	21/08/2011	Draft	umplementation	This opportunity to be explored and implemented at the Detailed Design Stage.	High	High	21		Very High	Very High	25	
5	3	Treatment of Loop Road	<ul> <li>Description: There is a threat that there may be public objections to the closing of the Loop Road, currently proposed in the Roundabout Option.</li> <li>Cause: The cause of the threat is that closing a road requires public notification, which may lead to objections and hearings.</li> <li>Consequence: The consequence of the threat is that Loop Road may have to be left open to the SH, which is not desirable for safety reasons.</li> </ul>	Sebastian Reed / Keith Kent / Chris Parker	NZTAS FNOCI Opus	21/03/2017	Draft	Pre Implementation	Manage expectation early - prepare the arguments for closing Loop Road and demonstrate the benefits to the Public and Key Stakeholders on Open Days, meetings, etc. Include FNDC in presenting these arguments.	Very High	Low	20		Very High	Very Low	13	
1	4	Treatment of Loop Road	<ul> <li>Description: There is a threat that for the Roundabout Option, the power poles on the top end (N) of Loop Road and the western end of Skippers lane will require relocating.</li> <li>Cause: The cause of the threat is the design requirement (closure of Loop Road, becoming a cul-de-sac and additional area requirement for the roundabout treatment at the intersection).</li> <li>Consequence: The consequence of the threat is that this involves major works and will affect both the cost and the programme of the project.</li> </ul>	Sebastian Reed /	NZTA / Opus	21/03/2017	Draft	Pre Implementation	Establish from the design whether this relocation will be required and plan ahead, taking in account the cost and time requirements early in the project.	Very High	Medium	23		High	Low	16	

<b>Risk Register</b>	
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Project/Contract:	SH10 Waipapa Road Intersection
Project/Contract ID:	PN4234
NZTA Office:	Northland
NZTA Lead:	Sebastian Reed

Document Date:	21 Jun	e 2017
Supplier Lead:	Chris Parker	Opus
RM Specialist:	Naushaba Todd-Jones	Opus
Risk Tolerance Threshold:	Moderate	

						i nresnoia:				Cur	rent Exposu	re		Residu	al (Target) E	xposure	
										Semi-Quantitative				Semi-Quantitative			
?	?	?	?	?	?	?	?	? ?		?	?	?	?	?	?	?	?
Rank	RID	Risk Title	Description/ Cause/ Consequence	Risk Owner	Risk Owning Org	Date Raised (xx/xx/xxxx)	Risk Status	Phase Established Cor	trols		Likelihood	Risk	Individual actions to be recorded in the Actions Register (Tab 4)	Consq.	Likelihood	Risk Score	Commentary & Closure Statement
1	5	Treatment of Klinac Lane	<ul> <li>Description: There is a threat that there is lack of clarity as to the funding of the Klinac Lane Treatment.</li> <li>Cause: The cause of the threat is that the funding for the project from FNDC is as yet uncommitted.</li> <li>Consequence: The consequence of the threat is that the without the Klinac Lane treatment, the Waipapa Intersection treatment will have reduced economic benefits, and affect the viability of the project.</li> </ul>	Sebastian Reed / Keith Kent	NZTA / FNDC	21/03/2017	Draft		ess Case account for ment for	arythan	Medium	23		High	Low	16	
10	6	Services Relocation	<ul> <li>Description: There is a threat that the project programme may be extended.</li> <li>Cause: The cause of the threat is the requirement for the services relocations to accommodate the new intersection &amp; associated geometrics design, and the difficulty in the accurate planning and estimating of the services relocations based on conceptual design.</li> <li>Consequence: The consequence of the threat is adverse impact on the project programme.</li> </ul>	<sup>e</sup> Sebastian Reed	NZTA	21/03/2017	Drafe	Implementation Implementation Instructing programming revised at Detailed Desi with the asset owners.	plan ) to be M gn stage M	1edium	High	17		Low	Medium	10	
11	7	Services Relocation	<ul> <li>Description: There is a threat that project costs may escalate from services relocation.</li> <li>Cause: The cause of the threat is the requirement for the services relocations to accommodate the new intersection &amp; associated geometrics design, and the difficulty in the accurate planning and estimating of the services relocations based on conceptual design.</li> <li>Consequence: The consequence of the threat is that the cost of services relocation is much higher than anticipated and will have a major impact on the project costs.</li> </ul>	e Sebastian Reed	NZTAN	C L	Draft	Implementation Implementation Implementation Implementation Implementation Implementation Implementation Implementation Implementation Implementation Implementation Implementation Implementation Implementation	/ised at	4edium	Medium	15		Low	Low	6	
1	8	Consents (NZTA)	<ul> <li>Description: There is a threat that NRC may require treatment of the road to a 100year ARI through the consenting process.</li> <li>Cause: The cause of the threat is that the project site is on a floodplain / flood overland flowpath.</li> <li>Consequence: The consequence of the threat is that the design will have to incorporate 100year ARI (which is not economically feasible for the site) but may otherwise not be consented.</li> </ul>	Sebastian Reed	NZTA	21/03/2017	Draft	Pre Pre Implementation Project Manager to enga early on in the project to the design requirements criteria including the ecc feasibility.	discuss and Ve	ery High	Medium	23		High	Very Low	8	

<b>Risk Register</b>	
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Project/Contract:	SH10 Waipapa Road Intersection
Project/Contract ID:	PN4234
NZTA Office:	Northland
NZTA Lead:	Sebastian Reed

Document Date:	21 Jun	e 2017
Supplier Lead:	Chris Parker	Opus
RM Specialist:	Naushaba Todd-Jones	Opus
Risk Tolerance Threshold:	Moderate	

						Threshold.				Cu	rrent Exposure		Residu	al (Target) E	xposure	
										Se	mi-Quantitative	Treatment Strategy	Se	emi-Quantita	tive	
?	?	?	?	?	?	?	?	?	?	?	? ?	?	?	?	?	?
Rank	RID	Risk Title	Description/ Cause/ Consequence	Risk Owner	Risk Owning Org	Date Raised (xx/xx/xxxx)	Risk Status	Phase	Established Controls		Likelihood	Individual actions to be recorded in the Actions Register (Tab 4)	Consq.	Likelihood	Risk Score	Commentary & Closure Statement
5	9	Consents (FNDC)	<ul> <li>Description: There is a threat that Klinac Lane upgrade project may not go ahead.</li> <li>Cause: The cause of the threat is that the project site is on a floodplain / flood overland flowpath.</li> <li>Consequence: The consequence of the threat is that the design will have to incorporate 100year ARI (which is not economically feasible for the site) and may not be consented.</li> </ul>	Keith Kent	FNDC	21/03/2017	Draft	Pre Implementation	To assess the viability of the proposed options for Kilnac Lane early in the Design process and incorporate flood solutions that are technically viable and economically reasible.	VeryHigh	Low 20		Very High	Very Low	13	
4	10	Contaminated Land - Former Orchard	<ul> <li>Description: There is a threat that the land intake from the former orchard will be contaminated.</li> <li>Cause: The cause of the threat is that additional land is required to be taken to the SE of the intersection to allow for the upgrade (roundabout or head to head right turn bays).</li> <li>Consequence: The consequence of the threat is that the land may require remediation and therefore impact on the project costs and programme.</li> </ul>	Sebastian Reed	NZTA	21/03/2017	Drafe	Pre	Confluct Preliminary Site Investigation early in the project (Pre-Implementation).	High	High 21		Medium	Medium	15	
8	11	Contaminated Land - PFS	<ul> <li>Description: There is a threat that the land intake from the Petrol Filling Station (PFS) will be contaminated.</li> <li>Cause: The cause of the threat is that additional land is required to be taken to the NE of the intersection to allow for the upgrade (roundabout).</li> <li>Consequence: The consequence of the threat is that the land may require remediation and therefore impact on the project costs and programme.</li> </ul>		NZTA	2 (103/2017)	Draft	Pre Implementatior	Conduct a Preliminary Site Investigation early in the project (Pre-Implementation).	High	Medium 19		Medium	Low	11	
14	12	Geotechnical Issues	<ul> <li>Description: There is a threat that there may be some geotechnical issues identified during the construction phase.</li> <li>Cause: The cause of the threat is that no geotechnical investigation (desktop and / or site investigation) has been conducted for the site.</li> <li>Consequence: The consequence of the threat is that if any geotechnical issues are identified they will have an impact on the cost and programme of the project.</li> </ul>			21/03/2017	Draft	Pre Implementation	Conduct a Preliminary Geotechnical Investigation early in the project (Pre-Implementation).	Medium	Low 11		Low	Very Low	2	

<b>Risk Regis</b>	ster
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Project/Contract:	SH10 Waipapa Road Intersection				
Project/Contract ID:	PN4234				
NZTA Office:	Northland				
NZTA Lead:	Sebastian Reed				

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Document Date:	21 June 2017					
Supplier Lead:	Chris Parker	Opus				
RM Specialist:	Naushaba Todd-Jones	Opus				
Risk Tolerance Threshold:	Moderate					

						mesnoia.				Cu	rrent Expos	ure		Residu	al (Target) E	xposure	
							Treatment Strategy										
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Rank	RID	Risk Title	Description/ Cause/ Consequence	Risk Owner	Risk Owning Org	Date Raised (xx/xx/xxxx)	Risk Status	Phase	Established Controls	A lossed	Likelihood	Risk	Individual actions to be recorded in the Actions Register (Tab 4)	Consq.	Likelihood	Risk Score	Commentary & Closure Statement
14	13	Archaeological Issues	<ul> <li>Description: There is a threat that there may be some archaeological issues identified during the construction phase.</li> <li>Cause: The cause of the threat is that only a very high level archaeological assessment has been conducted as part of the Planning and Environment Desktop Study.</li> <li>Consequence: The consequence of the threat is that if any archaeological issues are identified they will have an impact on the cost and programme of the project.</li> </ul>		NZTA	21/03/2017	Draft	Pre Implementation	Ceneruck a Preliminary Archaeologijaal mvestigation early invhe preject (Pre-Implementation).	Medun	Low	11		Low	Very Low	2	
14	14	Accommodating 24 hour Businesses durin Construction	has a 24 hour Petrol Filling Station (PFS).		NZTA / TBC	21/03/2011	Draft	peration	The Contractor to have with the business owners and other stakeholders early on in the organizer and keep them abreast with the timeline of the construction phases. The Contractor to also find the business owners' requirements and, accommodate & account for these within their management plans.	Medium	Low	11		Medium	Very Low	4	
11	15	Parking Changes	Description: There is a threat that the local businesses may object to the design.         Cause: The cause of the threat is the change in the intersection treatment that will change the parking situation (arrangement, number, etc.)         Consequence: The consequence of the threat is that the design may have to be changed or additional intake of land may be required to provide additional parking.	Sebastian Reed	NZTA	103/2017	Draft	Pre Implementation	Involve the key stakeholders (business owners, residents, etc.) in the process early through Open days, etc. to get their buy-in into the design.	Medium	Medium	15		Medium	Low	11	
11	16	Water / Stormwater Culverts	<ul> <li>Description: There is a threat that there may be previously unknown / unaccountable SW / mains water culverts in the project site.</li> <li>Cause: The cause of the threat is that there are water service of suppliers who have not been able to be contacted and there are no services plans available for these services.</li> <li>Consequence: The consequence of the threat is that it will have an adverse impact on the cost and time of the project.</li> </ul>	S Sebastian Reed / Chris Parker	NZTA / Opus	22/03/2017	Draft	Pre Implementation	To liaise with the service providers and asset owners in the locality of the project to assess impact and associated costs, etc. early on but also throughout the design development.	Medium	Medium	15		Medium	Low	11	

# **Risk Register**

Project/Contract:	SH10 Waipapa Road Intersection				
Project/Contract ID:	PN4234				
NZTA Office:	Northland				
NZTA Lead:	Sebastian Reed				

Document Date:	21 June 2017					
Supplier Lead:	Chris Parker	Opus				
RM Specialist:	Naushaba Todd-Jones	Opus				
Risk Tolerance Threshold:	Moderate					

				J		rineshold.			_	Cu	rrent Expos	ure		Residu	al (Target) Ex	kposure	
										Se	mi-Quantitat	live	Treatment Strategy	S	emi-Quantitat	ive	
?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
Rank	RID	Risk Title	Description/ Cause/ Consequence	Risk Owner	Risk Owning Org	Date Raised (xx/xx/xxxx)	Risk Status	Phase	Established Controls		Likelihood	Risk	Individual actions to be recorded in the Actions Register (Tab 4)	Consq.	Likelihood	Risk Score	Commentary & Closure Statement
8	17	Shared Footpath Cycleway	<ul> <li>Description: There is a threat that the Agency has not decided whether they would like to have the shared footpath / cycleway and consequently not agreed on its dimensions (meet/depart from the requirements?)</li> <li>Cause: The cause of the threat is the early stage of the design phase.</li> <li>Consequence: The consequence of the threat is that as this project is going through a Single Stage Business Case process, the design may change following the project funding having been approved.</li> </ul>	Sebastian Reed / Chris Parker	NZTA / Opus	22/03/2017	Draft	Pre Implementation	Key design aspects to be decided upon as scon as possible.		Medium	19		Medium	Very Low	4	
						Risk Statu Dran Live Perfed Vinpacted Closed Rejected Bain			JRH		Current F Extreme Moderate Low Zero TOTAL	9 3 0 8			Residual F Extreme Moderate Low Zero TOTAL	5 7 4 8	

# APPENDIX L Land Requirement Plans





Original Sheet Size A1 [841x594] Plot Date 2017-03-20 at 12:05:33 p.m. Path G:101 Clients/NZTA11-11751.00 PN4234 SH10 Wajapapa Road Intersection Improvements/200 Technical/210 Drawings/(V) Surveyl+AutoCAD/1-11751.00	V01-05,20.dwg - V/
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LAND REGISTRATION DISTRICT : NORTH AUCKLAND LOCAL AUTHORITY : FAR NORTH DISTRICT

	SCHEDULE	ES	
	LAND REQUIRED FO	OR ROAD	
SHOWN	DESCRIPTION	СТ	AREA
A	Pt. LOT 2 DP 22952	NA6C/1449	167m²
B	LOT 2 DP 72659	NA28C/1053	19m²
C	LOT 1 DP 153739	NA91C/871	88m²
D	LOT 1 DP 153739	NA91C/871	71m²
TOTAL A	REA		345m²

# **DRAWING IN PROGRESS**

PLOTTED ON 2017-3-20 AT 12:05 p.m.

PRELIMINARY	(
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ank S	Street	Project NZ TRANSPORT AGENCY STATE HIGHWAY 10 / WAIPAPA ROAD INTERSECTION IMPROVEMENTS		
<pre>c 553 arei 0110 Approved Date -</pre>		RIGHT TURN BAY OPTION LAND REQUIREMENT PLAN		
		Project No.	Sheet. No.	Revision
		1-11751.00	V01	A
		1-11/51.00	VUI	A

C. NIXON

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Original Sheet Size A1 [841x594] Plot Da	ate 2017-03-20 at 12:05:35 p.m. Path G:\01 Clie	ts\NZTA\1-11751.00 PN4234 SH10 Waipapa Road Intersection Improvement	s\200 Technical\210 Drawings\(V) Survey\+AutoCAD\1-11751.00_V01-05,20.dwg - V0
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LAND REGISTRATION DISTRICT : NORTH AUCKLAND LOCAL AUTHORITY : FAR NORTH DISTRICT

	SCHEDULE	S	
	LAND REQUIRED FO	R ROAD	
SHOWN	DESCRIPTION	СТ	AREA
A	Pt. LOT 2 DP 22952	NA6C/1449	167m²
B	LOT 1 DP 95010	NA50C/862	15m²
C	LOT 2 DP 153648	NA91C/965	332m²
D	LOT 1 DP 153739	NA91C/871	990m²
TOTAL A	REA		1504m²

C. NIXON

1:500 AT A1

# **DRAWING IN PROGRESS**

PLOTTED ON 2017-3-20 AT 12:05 p.m. PRELIMINARY

	Project		
:	NZ TRANSPORT AGENCY STATE HIGHWAY 10 / WAIPAPA ROAD INTERSECTION IMPROVEMENTS		
	Sheet		
oved Date	ROUNDABOUT OPTION		
	LAND REQUIREMENT PLAN		
	Project No.	Sheet. No.	Revision
	1-11751.00	V02	А



Original Sheet Size A1 [811x594] Plot Date 2017-03-20 at 12:05:37 p.m. Path G:101 Clients/NZTA11-11751.00 PN4234 SH10 Waipapa Road Intersection Improvements/200 Technical/210 Drawings(V) Surveyl-AutoCAD11-11751.00\_V01-05;20.dwg - V03

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LAND REGISTRATION DISTRICT : NORTH AUCKLAND LOCAL AUTHORITY : FAR NORTH DISTRICT

SCHEDULES					
	LAND REQUIRED FO	R ROAD			
SHOWN	DESCRIPTION	СТ	AREA		
A	Pt. LOT 2 DP 22952	NA6C/1449	161m²		
B	LOT 1 DP 95010	NA50C/862	45m²		
C	LOT 2 DP 72659	NA28C/1053	21m²		
D	LOT 2 DP 153648	NA91C/695	94m²		
E	LOT 1 DP 153739	NA91C/871	1024m²		
F	LOT 1 DP 164804	NA97B/374	48m²		
TOTAL A	TOTAL AREA 1393m <sup>2</sup>				

# TOTAL AREA

C. NIXON

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# **DRAWING IN PROGRESS**

PLOTTED ON 2017-3-20 AT 12:05 p.m.

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		Project		
ank Street 553 arei 0110		NZ TRANSPORT AGENCY STATE HIGHWAY 10 / WAIPAPA ROAD INTERSECTION IMPROVEMENTS		
		Sheet		
		SIGNALS OPTION		
	-	LAND REQUIREMENT PLAN		
		Project No.	Sheet. No.	Revision
		1-11751.00	V03	A



Original Sheet Size A1 [841x594] Plot Date 2017-03-20 at 12:05:39 p.m. Path G:101 Clients/NZTA11-11751.00 PV4234 SH10 Waipapa Road Intersection Improvements/200 Technical/210 Drawings(V) Survey)+AutoCAD/1-11751.00_VC
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LAND REGISTRATION DISTRICT : NORTH AUCKLAND LOCAL AUTHORITY : FAR NORTH DISTRICT

SCHEDULES				
	LAND REQUIRED FO	R ROAD		
SHOWN	DESCRIPTION	СТ	AREA	
A	Pt. LOT 2 DP 22952	NA6C/1449	167m²	
B	LOT 2 DP 72659	NA28C/1053	45m²	
C	LOT 2 DP 153648	NA91C/695	17m²	
D	LOT 1 DP 153739	NA91C/871	734m²	
E	LOT 1 DP 164804	NA97B/374	37m²	
TOTAL A	REA		1000m²	

# **DRAWING IN PROGRESS**

PLOTTED ON 2017-3-20 AT 12:05 p.m. PRELIMINARY

		Project		
Bank Street		NZ TRANSPORT AGENCY STATE HIGHWAY 10 / WAIPAPA ROAD INTERSECTION IMPROVEMENTS		
ox 553		Sheet		
garei 0110 Approved Date -		HEAD TO HEAD RIGHT TURN BAY OPTION LAND REQUIREMENT PLAN		
		Project No.	Sheet. No.	Revision
		1-11751.00	V04	A

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LAND REGISTRATION DISTRICT : NORTH AUCKLAND LOCAL AUTHORITY : FAR NORTH DISTRICT

SCHEDULES				
	LAND REQUIRED FO	R ROAD		
SHOWN	DESCRIPTION	СТ	AREA	
A	Pt. LOT 2 DP 22952	NA6C/1449	187m²	
B	LOT 1 DP 153739	NA91C/871	785m²	
TOTAL A	REA		972m²	

# **DRAWING IN PROGRESS**

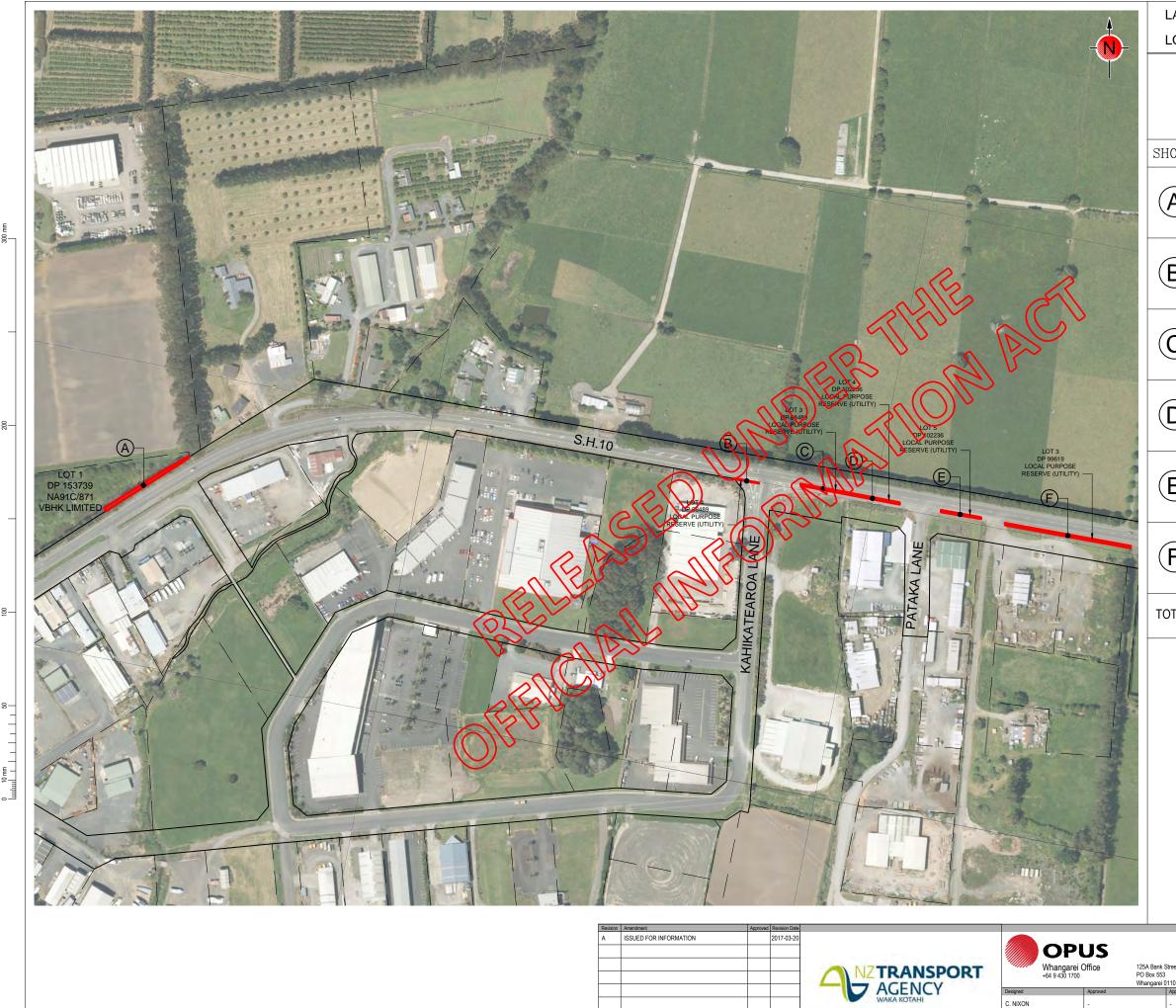
PLOTTED ON 2017-3-20 AT 12:05 p.m. PRELIMINARY

	Project		
ank Street	NZ TRANSPORT AGENCY STATE HIGHWAY 10 / WAIPAPA ROAD INTERSECTION IMPROVEMENTS		
553	Sheet		
Approved Date	CLOSE WAIPAPA LOOP ROAD NORTH OPTIC	NC	
	Project No.	Sheet. No.	Revision
	1-11751.00	V05	А

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C. NIXON

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LAND REGISTRATION DISTRICT : NORTH AUCKLAND LOCAL AUTHORITY : FAR NORTH DISTRICT

SCHEDULES					
	LAND REQUIRED FO	R ROAD			
SHOWN	DESCRIPTION	СТ	AREA		
A	LOT 1 DP 153739	NA91C/871	177m²		
B	LOT 4 DP 98489		4m²		
C	LOT 3 DP 98489		49m²		
D	LOT 4 DP 102236		64m²		
E	LOT 5 DP 102236		42m²		
F	LOT 3 DP 99619		155m²		
TOTAL A	TOTAL AREA 491m <sup>2</sup>				

# **DRAWING IN PROGRESS**

PLOTTED ON 2017-3-20 AT 12:05 p.m. PRELIMINARY

	Project		
et	NZ TRANSPORT AGENCY STATE HIGHWAY 10 / WAIPAPA ROAD INTERSECTION IMPROVEMENTS		
	Sheet		
) oproved Date	WAIPAPA CORRIDOR TREATMENT		
	LAND REQUIREMENT PLAN		
	Project No.	Sheet. No.	Revision
	1-11751.00	V20	А

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# **APPENDIX M Preliminary Planning and** Environmental Assessment RELEASED UNDER THE RELEASED UNEORMATION REPRESENTED INTRODUCED



NZ Transport Agency

# Waipapa Intersection Upgrade

Planning and Environment Desktop Review

March 2015 BELEAR MAR



NZ Transport Agency



Chris Parker Roading Team Leader



# Contents

1	Introduction1	
	1.1	Scope and Objectives
	1.2	Methodology
2	Engineering Investigations, Designs and Construction Requirements	
	2.1	Engineering Investigations
	2.2	Design and Alignment
	2.3	Possible Construction Requirements
3	Env	ironmental, Heritage Constraints
	3.1	Environmental Constraints
	3.2	Heritage Constraints
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4	Pla	nning Constraints
	4.1	Far North District Council
	4.2	Northland Regional Council
		()) $(b)$
5	Con	senting Considerations
	5.1	Investigative Works
	5.2	Design and Alignment. 16
	5.3	Design and Alignment
	5.4	Affected Parties
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	61	Geotechnical Investigation
	6.2	Design and Alignments
	6.3	Construction
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# **1** Introduction

The New Zealand Transport Agency (NZTA) have an interest in upgrading the intersection between State Highway 10 and Waipapa Road. Opus has been requested to undertake an upgrade options assessment which is of sufficient detail to support the NZTA business case.

Possible upgrades for the intersection being considered include:

- A roundabout
- Traffic signals
- Head to head right turn bays
- Close Waipapa Loop Road South
- Add a right turn bay

The effectiveness and feasibility of each option can be impacted by planning and environment constraints. Accordingly, it is vital to identify such constraints and account for these up front during the concept design options assessment.

# 1.1 Scope and Objectives

The scope of this report is limited to a desitor planning assessment. The desitor assessment will aim to identify planning constraints that may be encountered during:

- 1. The engineering investigation stage- i.e. potential for disturbance and consents during the geotechnical investigation
- 2. The design phase i.e. the potential for different designs to have different effects on the environment and trigger different consents.
- 3. The construction phase- a cough forward estimate of differing construction methods required for different designs) will be made. Different construction methods may again cause different impacts on the environment and trigger different consents.

The objective of this desktop assessment will be to identify where constraints can be avoided and how impact can be minimised. This work will identify the most favourable options (in terms of planning and environmental constraints).

# 1.2 Iethodology

Opus Planners have assessed all proposed alignments, designs and potential investigation or construction methods against relevant District and Regional Planning Provisions and National Environmental Standards. These have included:

- Far North District Council, District Plan;
- Northland Regional Council, Regional Plans;
  - Regional Water and Soil Plan
  - Regional Air Quality Plan
  - Regional Policy Statement
- National Environmental Standards for Air Quality; and

• National Environmental Standards for Assessing and Managing Contaminants in Soil to Protect Human Health.

The planning assessment is also supported by a desktop archaeological investigation, attached in **Appendix A**.

# 2 Engineering Investigations, Designs and Construction Requirements

# 2.1 Engineering Investigations

Before certain designs can be considered, a geotechnical investigation of the site needs to be undertaken. Geotechnical investigation typically involves a number of tests:

- Pavement Testing. A small section of road and underlying gravel is extracted and tested for integrity
- SCALA Testing. A solid small diameter probe (approximately 10mm diameter) is pushed into the ground to a depth of 4-5m. This probe is then hit with a weight to measure the amount of resistance the soil has. No extraction of soil is required
- Cone Penetration Testing. This is similar to SCALA testing, except to a deeper level of approximately 12m. No extraction of soil is required
- Hand Auger Testing. An auger (typically <100mm diameter) is hand driven down a few meters. The soil core is extracted and sent to a laboratory for testing.

# 2.2 Design and Alignment

The designs may vary during detailed design, however the likely options are as follows:

- Option 1A: Replace the existing intersection with a roundabout.
- Option 1B: Add traffic signals to the existing intersection.
- Option 1C: Remove the existing head to be d turn bays by realigning Waipapa Road so that the eastern approach to State Highway 10 is moved further south.
- Option 10: Close Waipapa Loop Road South.
- Option VE: Add a right turn bay on State Highway 10 for traffic turning right onto Waipapa Road.

# 2.3 Possible Construction Requirements

The construction works with consenting significance could include:

- A small amount of vegetation clearance (for the road realignment required for Option 1C and Option 1D).
- Works associated with upgrades to intersection approaches possible need for extension/upgrade of water course crossing to the south.
- Stormwater diversion and discharge
- Some excavation in potential HAIL sites.

# 3 Environmental, Heritage Constraints

# 3.1 Environmental Constraints

# 3.1.1 Ecosystems

# **Terrestrial Environment**

The site is heavily disturbed, with the majority of the works envelope being previously cleared and disturbed during the development of the industrial area and the existing road. The only vegetation remaining acts as a buffer screen on the boundary of the Orchard Lot (on the South East of the intersection) **Figure 1**. The lot boundary on the State Highway contains a tall row of bamboo the lot boundary on Waipapa Road consists of a tall row of what looks to be a mix of native/non-native species. Neither row of vegetation is considered sufficient enough to offer ecological or habitat values.

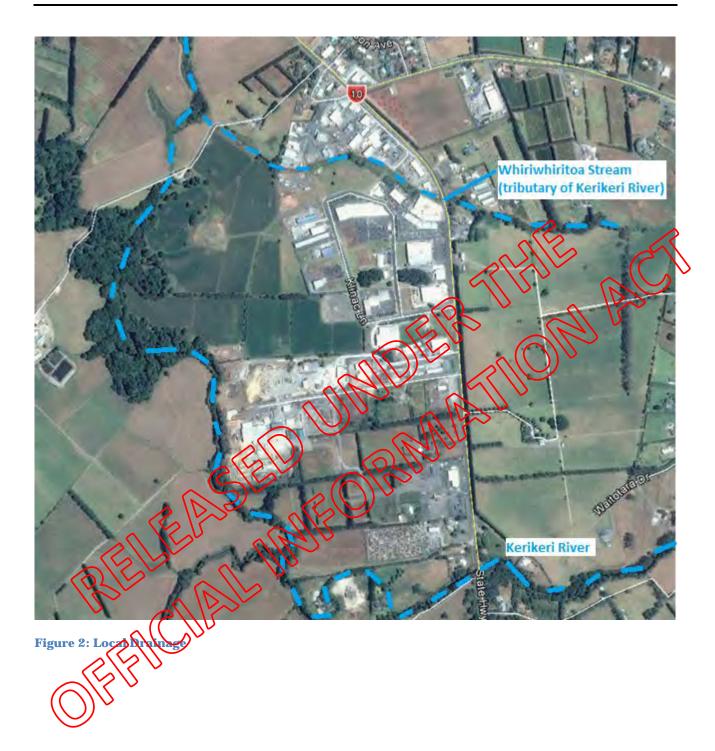
As the site does not provide any significant terrestrial habitat, there will be limited ecological constraints associated with the construction works and operation of the upgraded intersection. However the vegetation on the boundaries of the Orchard do have visual screening value, therefore it is ideal to avoid disturbing this vegetation, or replace the vegetation if it needs to be cleared.

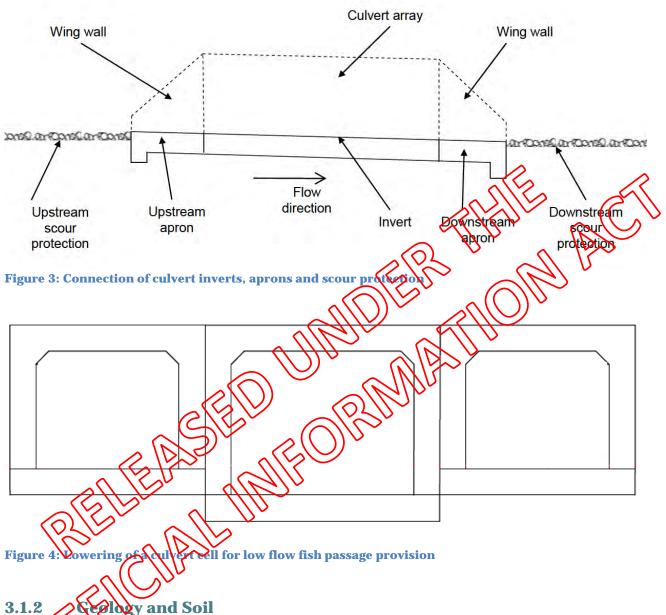
# Aquatic Environment

The only aquatic ecological values identified, exist to the south of the site where a tributary of the Kerikeri River is situated (Whirivkhiritoa Stream) (Figure 2). This tributary has been subjected to a significant amount of urban encroachment and disturbance, however it would still provide passage for aquatic species such as fish. Accordingly any work on the culvert over this tributary must account for fish passage. Overall when catering for lish passage the following principles are considered:

- Maintaining fish passage during low/base flow events.
- Maintaining fish passage during high flow events (at least up to the 1 year ARI event). This is measured by:
  - » No increase in flow velocity on the stream edges compared to existing; OR
  - » Noncrease in flow velocity on the stream edges above 0.3m/s.
- In order to comply with the above guiding principles the following measures are recommended:
- Ensure culvert array spans the full width of the stream this avoids narrowing flows.
- Avoid the use of base slabs on culverts this maintains the natural "low flow" channel which fish can utilise for passage during base flow scenarios.
- If a base slab is required, bury it below the stream bed, otherwise:
  - » Ensure invert is installed on upstream/downstream gradient no steeper than natural existing gradient.
  - » Ensure invert meets apron and any upstream or downstream scour protection at the same height (no hydraulic jumps or "lips") (**Figure 3**)
  - » Provide for low flow provision (usually achieved by installing the centre culvert cell slightly lower than the outside cells) (**Figure 4**)







logy and Soil

The Department of Lands and Survey Soils Map Whangaroa – Kaikohe provides the following soils information:

- Northern side of intersection: Okaihau gravelly friable clay
- Southern side of intersection: Waipapa Clay

The Department of Lands and Survey Rock Types Map Whangaroa - Kaikohe provides the following geological information:

- Northern side of intersection: Basalt flows and cones of very fine to medium grained crystalline • basalt, dense and moderately fractured; hard to very hard. Weathered to soft red brown or dark grey brown clay to depths of 20m with many rounded corestones:
  - A Bauxite outcrop is noted on land a few lots to the East on Waipapa Road »

• South side of intersection: Alluvium; mud sand and gravel with minor peat, forming river bed and flood plain deposits up to 10m above stream. In places forming a thin (1-3m) veneer over rugged surfaces of lave flows; unconsolidated to very soft. Un-weathered.

Overall it can be seen that the geology/soils support a lot of clay, therefore the site is dominated by very fine sediment. Fine sediment must be managed carefully during construction as it is prone to erosion and is difficult to capture in sediment control devices.

Bauxite is an aluminium ore which can often be mixed with iron and titanium oxides, therefore it may be natural to encounter elevated concentrations of aluminium, iron and titanium in the soil at this site.

There are a number of listed HAIL sites and potential HAIL sites in the vicinity of the intersection (**Figure 5**):

- The BP Service Station directly north of the intersection which stores large quantities of fuel underground. There is potential for mismanagement of fuels and leaking of underground tanks at this site. If this has occurred, the typical contaminants released can include petroleum hydrocarbons, mono aromatic hydrocarbons and metals such as lead (previously used in leaded petrol).
- Two corners on the intersection cater for a range of industrial land uses which may undertake activities which could be considered potentially contaminating.
- There is also an orchard directly east of the intersection which may have been subject to chemicals in the form of fertilizers and pesticides. Therefore, the site has a risk of containing contaminated soil/groundwater and is therefore classified under the Ministry for the Environment, Hazardous Aclivities and Industries List (HAIL).



Figure 5: HAIL Sites Adjacent to the Existing Intersection

# 3.1.3 Topography and Drainage

The project site has an elevation of approximately 80 m above sea level. The land from the intersection to the south is flat in nature, it is considered an alluvial plan (as per the geology describes) associated with the Kerkikeri River 1.4km to the south of the intersection. To the north of the intersection the geology changes, and there is a gentle incline upwards.

All water from the site would eventually drain southwards towards the Kerikeri River tributary (Whiriwhiritoa Stream) which is situated ~400 m south of the intersection (**Figure 2**) This tributary will be sensitive to any erosion and sediment runoff from site works. However, one advantageous feature of the site, is its flat nature, this makes erosion prevention much less complex than a hilly site.

# **3.2 Heritage Constraints**

The Archaeological Assessment in **Appendix A** identifies that the site has low archaeological value. A search of the Heritage New Zealand Pouhere Taonga register found that there are no known heritage sites in the vicinity of the project. In addition, the site has already been subject to significant disturbance associated with the existing intersection and surrounding industrial area. Therefore, it is unlikely that any undiscovered archaeology remains.

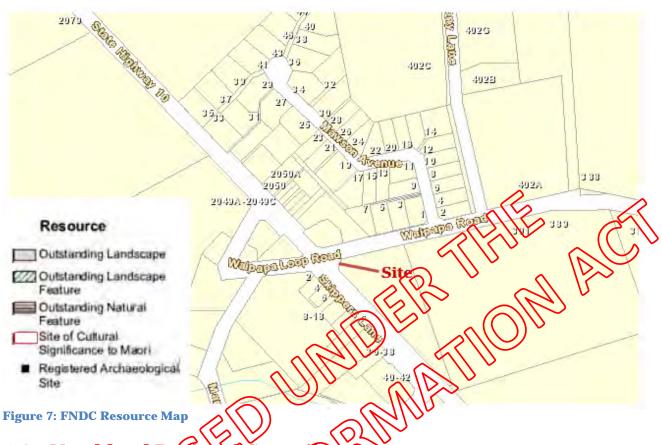
# **4** Planning Constraints

# 4.1 Far North District Council

The relevant District Council planning maps have been reproduced below. It can be seen in **Figure 6** that the current intersection is designated as road reserve. The adjoining land is made up of commercial, industrial and rural production zones.



The resource map for Waipapa (**Figure 7**) shows that there are no outstanding landscapes, features or sites of cultural significance and therefore no constraints are relevant to this site in regards to resources.



## 4.2 Northland Regional Council

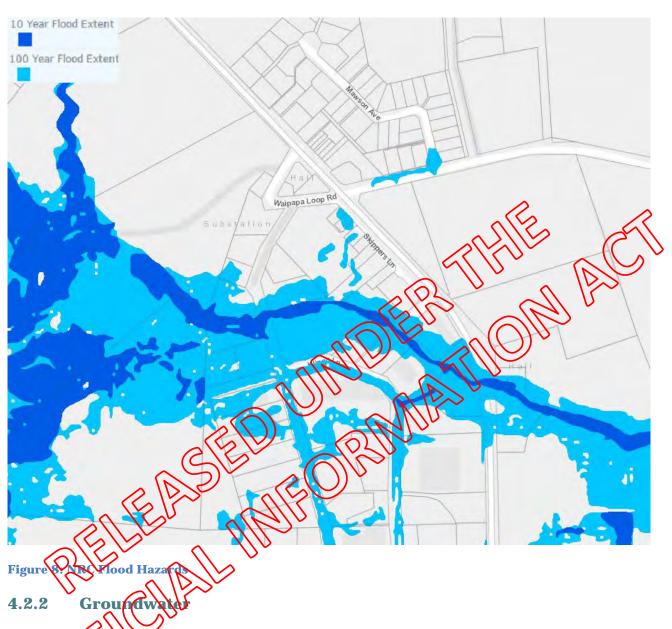
The relevant Regional Council information maps have been reproduced below.

## 4.2.1 Flooding

**Figure 8** shows the floor hazards for the 10 year and 100 year flood extent. The 100 year flood level is close to the site, therefore the impact on the overland flow paths will be taken into consideration in the design.

The intersection itself is not heavily constrained by flooding, the map simply shows that some backing up through the current stormwater system can occur in a 100 year event which isn't a major concern. However, flooding is a significant constraint towards the south of the intersection around the tributary of Kerikeri River (Whiriwhiritoa Stream). Any works over this tributary may have potential to alter the flooding regime.

• Any changes to the state highway culvert crossing, or adjacent council roads over this tributary will need to allow for the unimpeded passage of the 1 in 100 year event (i.e. not worsen the upstream flood level).



It can be seen that the current intersection and surrounding area has low groundwater allocation (**Figure 9**) by catchment. **Figure 10** shows that the area is one of Northlands main aquifers and includes one active bore log directly south east of the intersection and several active and inactive bore logs further north. Together, these two images indicate that there is low groundwater allocation, however there are a number of bores in the local vicinity. Low groundwater allocation means that less than 25% of the groundwater table is assigned to a certain use.

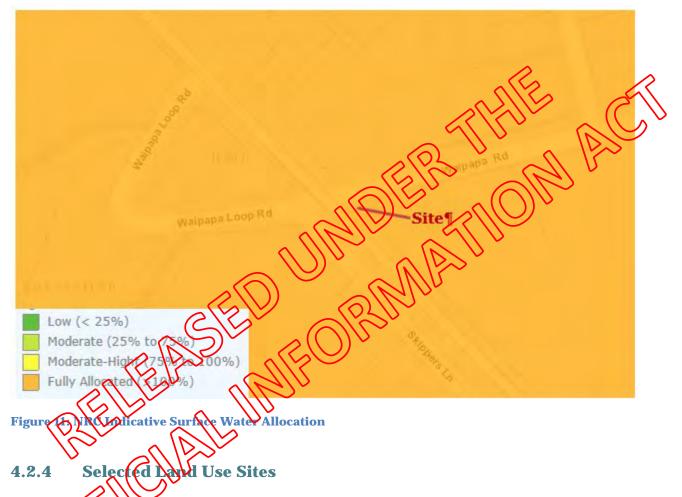
Although the use of groundwater in the area is not high, there are still some local users. Therefore the project must ensure that the quality/quantity of groundwater for local users is not adversely impacted. This can primarily be ensured by appropriate management of any contamination at the site.



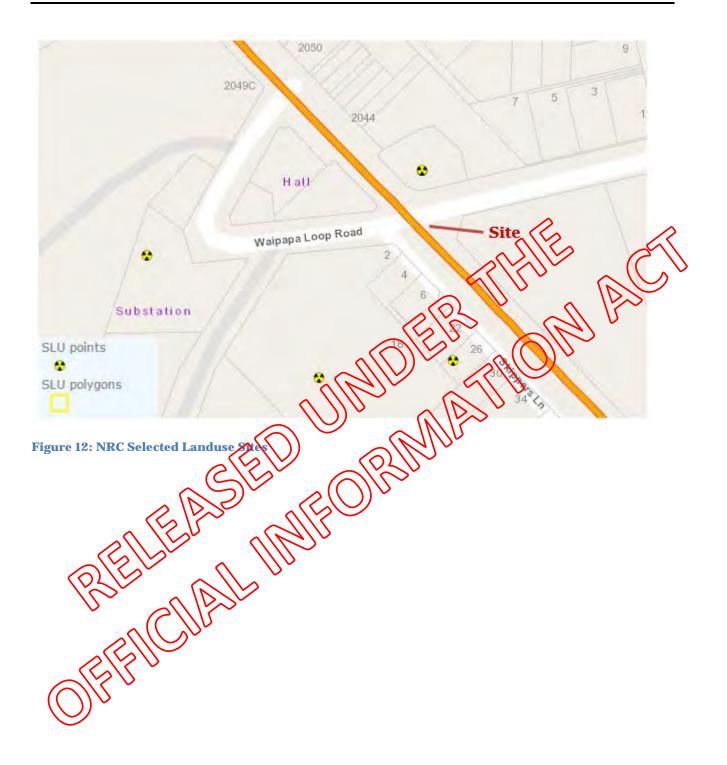
Figure 10: NRC Water Resources

#### 4.2.3 Surface Water

It can be seen that the current intersection and surrounding area has fully allocated surface water (**Figure 11**) by catchment. This means that a high number of people are reliant on extracting water from the river and its tributaries. As a result, it is of up most importance that the quality of the surface water near the project site is not negatively impacted by sediment runoff or other contaminants.



**Figure 18** shows that there are two selected land use (SLU) sites in close proximity to the works envelope. These are HAIL sites which have been recorded by NRC. The SLU directly north of the intersection is a verified HAIL site due to the service station. The other SLU on State Highway 10 is further south from the site, it is a verified HAIL site due to a motor vehicle workshop and paint manufacturer or formulation.



# 5 Consenting Considerations

## 5.1 Investigative Works

As described above in Section 2.1, some drilling and soil extraction will be required.

#### 5.1.1 Terrestrial Investigations

#### Non HAIL Sites

Consent for geotechnical investigation will not be required. It is highly unlikely that 5000 m3 needs to be disturbed in a period of 12 months. Accordingly it is a **permitted activity** 

#### HAIL Sites

Consent for geotechnical investigation will not be required for

- Soil sampling
- Small scale and temporary disturbance of solt ( 25 m<sup>3</sup> per 500 m<sup>2</sup>, the 2 months)

It is therefore likely that geotechnical investigation in HAIL sites can proceed as a **permitted activity**.

#### 5.1.2 **Riparian Zone**

Provided that:

- The area of exposed soil is  $<200m^2$  and  $<50m^3$ ; AND
- The disturbed area is reinstated and revegetated a.s.a.p.

Then the geotechnical investigation can proceed as a **permitted activity**.

## 5.2 Design and Alignment

## 5.2.1 Far North District Council

## Alteration to Designation

Provided that the works remain within the road designation, the NZTA avoids the requirements for a land use consent under the District Plan. Therefore, the most efficient and timely way to progress with a development is to utilise the existing designation as much as possible without encroaching on other land.

- The traffic signals is the most favourable option in this respect, as the designation will not need to be altered.
- The roundabout is the next most favourable option as the designation will only need to be extended a small amount; towards the corner of the petrol station and the orchard.
- The head to head right turn bays and loop road options are the least favourable equally. Both these options require alteration to the designation towards the orchard and from the industrial land on the west side of the state highway.

#### Outline Plan of Works

An outline plan is not always necessary for works within a designation. Under s176A(2) an outline plan is not necessary if:

- The proposed public work, project, or work has been otherwise approved under the RMA, or
- The details of the proposed public work, project or work, are already incorporated into the designation,
- The territorial authority waives the requirement for an outline plan. This is usually because adequate details sufficient to supply 176A (3) have already been provided in designation.

176A(3) of the RMA requires that an outline plan must show:

- a. The height, shape, and bulk of the public work, project or work; and
- b. The location on the site of the public work, project or work; and
- c. The likely finished contour of the site; and
- d. The vehicular access, circulation, and the provision for parking, and
- e. The landscaping proposed; and
- f. Any other matters to avoid, remedy, or mitigate any adverse effects on the environment.

In this case, sufficient detail of all of the above can likely be provided with the alteration to designation. Discussions will be required with Far North District Council Consents Manager to agree on this approach.

O

## 5.2.2 National Reviewnmental Standard for Assessing and Managing Contaminants in Soil (NESCS)

As described above in **Section 3.1.2**, the petrol station is considered basically all land surrounding the intersection is either a formally listed HAIL site or potentially considered a HAIL site.

With the exception of the traffic signals, all options will require some encroachment on HAIL sites. Given that there is no doubt these sites are HAIL sites, the most efficient course of action would be to:

- Proceed with a Stage 2 investigation (sample the soil to determine if contamination is actually present)
- **Treon**tamination is present, produce a management plan which will identify how contamination will be managed during works to ensure it is not spread or worsened.
  - » Remediation is unlikely to be necessary as the exposure risk to the end user will not raise (i.e. the land will continue to be used as a road, the land will not be used for residential purposes, childcare, food growing etc).

#### 5.2.3 Northland Regional Council

The alignment is primarily on terrestrial land and therefore the design is not heavily constrained by regional rules. However, there is a tributary Tributary of the Kerikeri River (Whiriwhiritoa Stream) approximately 400 m to the south of the intersection.

The Regional Council requires **consent for any culvert longer than 25m**. And any works on the culvert need to consider Fish Passage provisions (as outlined in Section 3.1.1 of this report) and Flooding Provisions (as outlined in 4.2.1 of this report). The Environmental Standards for structures under the plan also apply.

- Environmental Standards are outlined in Section 29.1.11 of the Regional Water and Soil Plan:
  - 1. The structure does not prevent fish passage under any flow conditions.
  - 2. Any placement of a new structure from 27 October 2001 shall not take place within any indigenous wetland; and
  - 3. The repair, alteration, use or removal of an existing structure shall not take place within any indigenous wetland; and
  - 4. No activity or structure shall adversely affect any area of significant indigenous vegetation or significant habitats of indigenous fauna.
  - 5. The structure does not cause the diversion, damming or blockage of any river or stream.
  - 6. The short term visual clarity of any permanently flowing river or wetland shall not be reduced by more than 40% after reasonable mixing, due to sediment or sediment laden discharge originating from the site of the land discurbance activity.
  - 7. There is no damage to, or restriction of the use of, any existing river or lake protection works, or any other lawfully established structure as a result of this activity.
  - 8. There is no significant erosion of the bed of the river or lake as a result of the activity.
  - 9. Any associated embankments are maintained to prevent sediment entering the river or lake.
  - 10. No contaminants (including but not limited to oil, petrol, diesel, paint or solvent) are released into the water or to the bed of the river or lake from equipment being used for the activity, and no requiring of equipment takes place on any area of the river or take bed

1P. All demolition debris from the river or lake bed structure is removed from the site.

12. Existing lawful public access rights to and along rivers and lakes are not restricted.

The activity shall not interfere with or destroy any waahi tapu, as defined in the definitions or any other sites known to the local iwi that are of spiritual or cultural significance to Maori which have been identified to the Council. Should archaeological remains or features be uncovered the activity shall cease and the Regional Council notified as soon as practicable. Also as soon as practicable the Regional Council will then notify the appropriate tangata whenua entity. The activity shall not be recommenced without the authority of the New Zealand Historic Places Trust.

At this stage **sufficient information is not yet available to determine likelihood of meeting the above criteria**.

## 5.3 **Possible Construction Requirements**

Construction methods can only be assumed at this stage, however construction activities with consenting relevance have been assumed in the following sections.

## 5.3.1 Far North District Council

The district plan is considered by the regional council for noise/vibration limits set in the district plan.

Provided that the construction noise meets the limits specified in NZS 6803:1999 (**Table 1**) and the vibration meets the limits in ISO 4866 (**Table 2**), the activity is <u>permitted</u>.

The noise limits in the industrial and commercial areas are quite lenient as general activities at these locations are not highly noise sensitive (i.e. workers do not need silence to sleep). Therefore it is quite likely that these limits can be met.

 Table 1: Recommended Upper Limits for Construction Noise Received in Industrial or Commerce

 Areas for all Days in the Year

Time Period	Duration of Wark				
	Typical Duration	Short-Torm	Long-Tom		
		Duration	<b>L</b> ivration		
	L <sub>eq</sub> (dBA)	( , , , dRA)	Leg (dBA)		
0730 - 1800	75	80	70		
1800 - 0730	80	85	75		
	C				

The vibration limits associated with occupied dwellings do not apply as the site is surrounded by commercial/industrial activities. Therefore the lowest gaideline timit applicable is 2 mm/s PPV which is not a complex target to achieve particularly in clay soils. It is likely this limit can be met, however it is standard practice to ensure pre and post work condition surveys are undertaken on adjacent structures and buildings.

Table 2: ISO 4866: X Vibration Guinelines					
Receiver	Details	Category A	Category B		
BIR	AL	(Peak particle Velocity, PPV)	(Peak particle Velocity, PPV)		
Occupied dwerlings	Night time (8pm to 6am)	0.3 mm/s PPV	1 mm/s PPV		
OFF	Daytime (6am to 8pm)	1 mm/s PPV	5 mm/s PPV		
Other occupied buildings	Daytime 0630h - 2000h	2 mm/s PPV	10 mm/s PPV		
All other buildings	Vibration - transient	5 mm/s PPV	BS 5228-2*		
			Table B2		
	Vibration - continuous		BS 5228-2*		

#### Table 2: ISO 4866: XMD Vibration Guidelines

			50% of table B2 values
Underground Services	Vibration – transient	20 mm/s PPV	30 mm/s PPV
	Vibration - continuous	10 mm/s PPV	15 mm/s PPV

#### 5.3.2 Northland Regional Council

The following construction activities are subjected to rules under the Northland Regional Air Quality Plan and the Regional Water and Soil Plan:

- Generation of dust.
  - » Rule 9.1.4.2: The discharge of dust into air arising from read construction and maintenance is a **permitted activity** provided that the discharge shall not result in any offensive or objectionable dust deposition, or any noxious or dangerous levels of airborne particulate matter, beyond the boundary of the subject property. Provided dust management measures are in place, these criteria can be complied with.
- A small amount of vegetation clearance (limited vegetation remaining within the envelope).
  - Rule 33.1.1: Any vegetation clearance that is not on erosion prone land, and is not in a Riparian Management Zone, is a permitted activity, provided that:
    - a) The Environmental Standards in Section 32 are complied with; and
    - b) Vegetation clearance by burning does not take place on peat soils, nor on any contiguous area in excess of 5 nectares on other soils.

It is fikely these criteria can be complied with, therefore permitted activity.

- Road construction widening including excavation and filling.
  - Rule 33.1.3. Any earthworks that are not in a Riparian Management Zone, are a permitted activity, provided that:

(a) The volume moved or disturbed in less than 5,000 m<sup>3</sup> in any 12 month period where the activity is not undertaken on erosion prone land;

- b) The volume moved or distributed is less than  $1,000 \text{ m}^3$  in any 12 month period and the surface area of the soil exposed is less than  $1,000 \text{ m}^2$  where the activity is undertaken on erosion prone land;
- c) There are no more than minor adverse effects on soil conservation beyond the property boundary; and
- d) The Environmental Standards in Section 32 are complied with.

It is likely that earthworks will exceed these limits, therefore a **resource consent may be required**.

• Taking, use, damming or diverting of surface water may be required during works:

- » Rule 24.3.3: The taking, use, damming or diverting of surface water which does not meet the requirements of the permitted activity rules, or is not covered by the non-complying activity rules, and is not otherwise covered by a rule in any other section of this Plan, is a discretionary activity. It is likely **resource consent may be required for this activity**.
- » Rule 34.1.2: Vegetation clearance within the Riparian Management Zone is a permitted activity, provided that:
  - a) The Environmental Standards in Section 32 are complied with; and
  - b) The vegetation;
    - i. Impedes or is likely to impede flood flows; or
    - ii. Causes or is likely to cause stream bank erosion; or
    - iii. Is a plantation forest planted prior to this Plan becoming operative; or
    - iv. Is a plantation forest planted after this Plan became operative and the clearance is outside a setback of 5 m from a water body; or
  - c) The vegetation clearance;
    - i. Is the minimum necessary to give effect to the permitted activity rules in this Plan; and
    - ii. Does not exceed  $200 \text{ m}^2$  in total, or
    - iii. It is the minimum necessary for track and road maintenance.

This activity it likely to meet criteria c, and therefore is likely to be **permitted activity**.

- » Rule 34.1.3: Earthworks in the Riparian Management Zone are a permitted activity, provided that:
  - a) The Environmental Standards in Section 32 are complied with;
  - b) The earthworks are the minimum necessary;
    - i. To give effect to the permitted activity rules in this Plan; and
    - i. The area of exposed soil is less than 200 m<sup>2</sup> and the volume of earth disturbed is less than 50 m<sup>3</sup>; or
    - iii. For track or road maintenance;
  - c) Following the completion of any earthworks those parts of the Riparian Management Zone that are not required for the permitted activity are reinstated to a stable contour and revegetated as soon as practicable; and

As a result of the earthworks in the Riparian Management Zone there are no adverse flooding or drainage effect on any property owned or occupied by another person.

- Alteration to stormwater; stormwater discharge points may be required.
  - » Rule 21.1.1: The diversion and discharge of stormwater by way of an open constructed stormwater collection system or piped stormwater collection system into water or onto or into land where it may enter water, where the stormwater collection system is connected to, or part of, a stormwater system for which a resource consent exists is a <u>permitted activity</u>.

#### 5.3.3 National Environmental Standards for Assessing and Managing Contaminants in Soil to Protect Human Health

As described in **Section 4.2.4** the construction has the potential to take place within two HAIL sites and therefor the following constraints from the National Environmental Standards apply.

Rule 8.3: Disturbing the soil of the piece of land is a permitted activity while the following requirements are met:

- a) Controls to minimise the exposure of humans to mobilised contaminants must:
  - i. Be in place when the activity begins;
  - ii. Be effective while the activity is done;
  - iii. Be effective until the soil is reinstated to an erosion-resistant state;
- b) The soil must be reinstated to an erosion-resistant state within 1 month after the end of the course of sampling for which the activity was done;
- c) The volume of the disturbance of the soil of the piece of land outst be no more than 25 m<sup>3</sup> por 500 m<sup>2</sup>;
- d) Soil must not be taken away in the course of the activity, except that:
  - i. For the purpose of laboratory analysis, any amount of soll may be taken away as samples;
  - ii. For all other purposes combined a maximum of 5 m<sup>2</sup> per 500 m<sup>2</sup> of soil may be taken away per year;
- e) Soil taken away in the course of the activity plast be disposed of at a facility authorised to receive soil of that kind:
- f) The duration of the activity must be no longer than 2 months;
- g) The integrity of the structure designed to contain contaminated soil or other contaminated materials must not be compromised.

It is unlikely that the requirements for volume and timeframe will be met and therefore, the project will require investigation and consent for these activities.



In respect to the natural environment, overall it is considered that the existing site is already significantly disturbed, design/construction, provided it occurs in accordance with all recommendations in this report, can likely occur with no more than minor effect on the environment.

• It is of course recommended that consultation occurs with the local tangata whenua

In respect to the built environment, the traffic detours/delays during works can have the potential to negatively impact on the businesses operating adjacent to the site.

• The adjacent business owners should be consulted with and informed of the potential for disruption to their customer base, and how this can be avoided and mitigated.

# 6 Summary Recommendations

The following key recommendations can be concluded from the above investigation:

## 6.1 Geotechnical Investigation

• Geotechnical Investigation Activities (provided they roughly align with the assumptions provided in Section 2.1) can proceed as a permitted activity.

## 6.2 Design and Alignment

- Given that there is no doubt the sites surrounding the intersection are HAIL sites, the most efficient course of action would be to:
  - » Proceed with a Stage 2 investigation (sample the soil to determine if contamination is actually present)
  - » If contamination is present, produce a management plan which will identify how contamination will be managed during works to ensure it is not spread or worsened.
    - Remediation is unlikely to be necessary as the exposure risk to the end user will not raise (i.e. the land will continue to be used as a road, the land will not be used for residential purposes).
- Pursue an option which requires the least amount of encroachment/disruption on land outside of the existing road designation. The signals of the roundabout option seem to require the least amount of land requirement.
  - » This can also be tayourable when dealing with HAIL sites, as the less disturbance required in these sites, the less complications arise.
- Works on adjacent to the Kertkeri River Tributary (Whiriwhiritoa Stream) will need to consider fish passage impacts (recommendations have been provided in Section 3.1.1), and flooding impacts (recommendations have been provided in Section 4.2.1)
- Given that the site consists of fine clay soils focus should be placed on preventing erosion as sediment capture devices are almost ineffective against fine soil. Design and works should avoid large cuttings, steep slopes or steep/long drainage paths.
- Tangata Whenua should be consulted and involved in design, particularly regarding any works within watercourses.

## 6.3 Construction

• Given that the site is a state highway and is surrounded by commercial/industrial uses, noise/vibration management requirements will not be highly restrictive. The works would be likely to meet permitted criteria, however pre and post work condition surveys on surrounding buildings/structures are still recommended.

- The risk of encountering archaeology on this site is considered low, therefore works can proceed under an Accidental Discovery Protocol.
- The adjacent business owners should be consulted with and informed of the potential for disruption to their customer base, and how this can be avoided and mitigated.

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