Before the Hearings Panel At Porirua City Council

Under	Schedule 1 of the Resource Management Act 1991
In the matter of	the Proposed Porirua District Plan
Between	Various
	Submitters
And	Porirua City Council
	Respondent

Statement of evidence of James Whittaker on behalf of Porirua City Council (Traffic)

Date: 14 April 2022

INTRODUCTION:

- 1 My full name is James Whittaker. I hold a Bachelor of Arts degree with Honours in Geography from the University of Leicester (United Kingdom). I have more than 17 years' experience in the field of transportation planning and traffic engineering, in both the United Kingdom and New Zealand.
- I am a Principal Transportation Planner at Stantec NZ, where I have worked for the past 16 years practising as a traffic planning/engineering specialist. I have been involved in a considerable variety of traffic and transportation planning projects throughout New Zealand covering matters relating to road design, traffic safety and traffic management. I have also undertaken many transportation assessments and provided traffic engineering advice for a large number of activities, including commercial, retail and residential development applications throughout New Zealand.
- 3 I have prepared this statement of evidence on behalf of the Porirua City Council (**PCC**) in respect of technical related matters arising from the submissions on the Proposed Porirua District Plan (**PDP**).

Code of conduct

I have read the Code of Conduct for Expert Witnesses set out in the Environment Court's Practice Note 2014. I have complied with the Code of Conduct in preparing my evidence and will continue to comply with it while giving oral evidence before the Court. My qualifications as an expert are set out above. Except where I state I rely on the evidence of another person, I confirm that the issues addressed in this statement of evidence are within my area of expertise, and I have not omitted to consider material facts known to me that might alter or detract from my expressed opinions.

Scope of Evidence

- 5 This statement of evidence relates to the matters in Hearing Stream 5 of the PDP 'Rural Zones'. I have prepared my evidence on traffic and transportation matters to assist the Section 42A report writer and provide expert analysis and advice to the hearing panel.
- 6 I was responsible for the 'PCC Rural Road Assessment' report (**RRA report** - refer attachment 1) dated 2 June 2020, which informed the 'Rural Zones' overlays adopted in the PDP.
- 7 In addressing each of the submissions raised, I provide a summary of the approach adopted within the RRA report, along with any associated recommendations.

INVOLVEMENT WITH THE PROPOSED DISTRICT PLAN

- 8 I have been involved in the PDP since 2019, when my company was engaged by PCC to undertake a capacity analysis for a number of rural roads within the District, to determine which (if any) had available residual traffic capacity to safely accommodate future growth associated with changes to the underlying rural zoning, that would enable the creation of additional residential lots.
- 9 In this matter, I have subsequently been engaged by PCC to prepare and deliver expert evidence responding to submissions received on the proposed 'Rural Zones', as far as they relate to matters of traffic and transportation effects.
- 10 In a separate capacity, I was engaged by Silverwood Corporation Limited in late 2020 to provide advice on a submission on the PDP to rezone land to the east of Waitangirua to 'Future Urban Zone'.
- 11 I note that I am familiar with the existing carriageway environments of the rural roads in question, having lived in Wellington for more than 15

years and visited each during my site investigations that informed the RRA report.

RURAL ROAD ASSESSMENT (2020)

- 12 In 2019/2020 my company was commissioned by PCC to undertake an assessment of 12 rural roads within the Porirua District that provide access to a mixture of rural and rural residential land use catchments. The purpose of this study was to determine which of these roads could in their current form (i.e. without mitigation) accommodate additional traffic, if changes to the underlying 'Rural' zoning were introduced that enabled establishment of additional residential lots.
- 13 Critically, to be able to accommodate additional residential growth associated with a change through the PDP from the current 'Rural' zone to either Rural Lifestyle Zone (**RLZ**) or Settlement Zone (**SETZ**), in my view these roads need to demonstrate the ability to accommodate additional traffic volumes in a safe and efficient manner, and without adversely impacting on the existing transport network.
- 14 The methodology adopted for the assessment included consideration of a number of road capacity and safety criteria, including:
 - a. <u>Road carriageway formation</u>: whether the existing formed road width is sufficient to accommodate any further traffic beyond that associated with existing dwellings (and future development provided for by the PDP zoning), relative to the industry standard NZS4404:2010 'Land Development and Subdivision Engineering'.
 - b. <u>Access to the Primary Road network</u>: whether the route has safe and convenient connection to the district's key primary road network, noting a number of the subject roads access directly onto State Highway.

- c. <u>'Road' and 'Route' Safety</u>: review of the crash history and current road safety record for the road alignment and key connecting intersection(s). In addition, the road safety metric 'Infrastructure Risk Rating' (IRR) used by the Waka Kotahi Transport Agency (Waka Kotahi) has been identified for each of the roads to determine relative 'route' safety. The IRR is a comprehensive risk assessment tool that considers carriageway width and alignment, traffic volumes, roadside hazards, land use and access/intersection density, and provides a risk rating on a sliding scale ranging between low, medium and high.
- 15 Of those roads assessed, around half were found to be unsuitable for accommodating further development traffic.

RESPONSE TO SUBMISSIONS

- 16 A total of 14 submissions seeking rezoning were received by PCC following notification of the PDP 'Rural Zones' chapter. I have read these submissions in the context of specific transport related matters and provide commentary and associated recommendations. In reviewing the submissions, I have considered each on a case-by-case basis, and draw from the methodology and conclusions of the RRA Report.
- 17 I note that in some cases submitters have raised essentially the same matters in relation to land accessed by the same road. In such cases, and where appropriate, I have grouped these together and provided a collective response.

Murphys Road

18 Two submitters have requested that land accessed off Murphys Road be considered for rezoning, including submitter 48 (Glen Johnston) who seeks properties along the first kilometre from the intersection with State Highway 58 (SH58) be rezoned RLZ, and submitter 232 (Jason Adler) who requests the property at #272A Belmont Road be zoned either RLZ or SETZ.

- 19 The carriageway on Murphys Road is generally between 3.5-4m wide and is therefore too narrow to accommodate two-way traffic. In addition, the 'high' IRR and history of crashes on this route serve to indicate that an increase in traffic would lead to adverse safety outcomes. Whilst the proposed upgrade of the Murphys Road / Flightys Road intersection with SH58 from a priority give-way to a roundabout will provide an improved safety outcome at this point on the network, the key issue is the narrow alignment of the road from this point on.
- 20 In my view the road would require widening works to deliver a carriageway capable of safely accommodating any increase in traffic volumes. It is therefore recommended the current PDP zoning remain unchanged.

Muri Road

- 21 Submitter 100 (Pamela Meekings-Stewart) seeks that part of the property at #144 Muri Road be rezoned to RLZ.
- 22 The assessment of Muri Road undertaken for the RRA report shows that sections of the road do not provide a formed and sealed carriageway width capable of safely accommodating two-way traffic, whilst the lack of a pedestrian footpath presents a safety risk, particularly for roads with a winding alignment such as this.
- 23 On the basis that the current carriageway formation does not meet the industry standards, and noting too that Muri Road has a 'high' IRR, in my view mitigation would be required in the form of widening to safely accommodate further development provided for by rezoning additional land to RLZ. I therefore recommend retaining the current PDP zoning.

Pikarere Street

- 24 Two submitters seek rezoning of land accessed off Pikarere Street, including submitter 66 (Arama Rochel) who seeks those properties at lots 3, 4 and 5 of Pikarere Farm be rezoned RLZ, whilst submitter 183 (Pikarere Farm Limited) also seeks parts of the Pikarere Farm site be rezoned to RLZ.
- 25 Again, drawing from the RRA Report, Pikarere Street is currently formed to between 5.8-7.5m along its length, being therefore capable of accommodating two-way traffic flow. With existing volumes west of Hiwi Crescent of less than 1,000 vehicles per day (**vpd**), there is residual capacity available.
- From a roading perspective then, the current Pikarere Road formation is in my opinion capable of accommodating a level of additional traffic that could be realised through rezoning of the land to RLZ, as sought by the two submitters. I understand however there are other environmental impacts that are relevant in this case, and I defer to the respective experts on these matters.

Moonshine Road

- 27 Two submitters are seeking amendments to the PDP zoning for land accessed off Moonshine Road, including submitter 61 (Mike and Christine Jacobsen) who request rezoning of land to the north and east of Judgeford Flats to RLZ, and submitter 230 (Carolyn Vasta and Carole Reus) who seek to rezone the properties at #1221 and #1249B Moonshine Road to RLZ. The properties identified by the submitters are located between SH58 and the Ahoroa Road intersection.
- 28 The assessment undertaken for the RRA report shows the Moonshine Road carriageway between Ahoroa Road and just north of the BRANZ site access is typically around 5m wide, with narrower sections and one-

lane bridges. As such, the current carriageway falls short of meeting the desirable industry standards for accommodating two-way vehicle flow.

- 29 Whilst the proposed new roundabout connection at SH58 will provide for an improved safety outcome for existing traffic accessing Moonshine Road, the current constrained carriageway width and 'medium high' IRR indicates further development traffic without some form of mitigation (i.e. widening) is not desirable.
- 30 In lieu of any detailed assessment of the potential number of new lots that could be created and the associated traffic effects that could arise through rezoning of the properties identified by submitter 61 to RLZ, and the associated impacts this could have on the traffic operation along the narrower sections of Moonshine Road between SH58 and Ahoroa Road, I recommend that the current PDP Rural zoning be retained.
- 31 In regard to Submitter 230, the initial section of Moonshine Road between SH58 and the BRANZ site entrance some 300m to the north, has a more generous carriageway width at around 6.5-7m. On the assumption that the potential two new lots created by rezoning #1221 Moonshine Road would access via the established property driveway opposite the BRANZ site, then I consider the associated traffic could be adequately accommodated. From a traffic perspective then I consider the zoning could be changed to RLZ.
- 32 The property at #1249B has frontage to both SH58 and the initial portion of Moonshine Road. Since access off SH58 is impractical for safety reasons, any access to serve the new lots would have to be established in close proximity to the intersection. In lieu of any detail from submitter 230 around how such access could be safely and feasibly achieved, I recommend the current PDP zoning be retained.
- I note there are other planning matters that require consideration along
 this lower portion of Moonshine Road, and I defer to the relevant experts
 on these matters.

State Highway 58

- 34 Submitter 180 (Judgeford Heights Ltd) seeks to rezone #346A, #346C and #352 Paremata Haywards Road to Future Urban and RLZ. These properties would access directly onto SH58 and could potentially comprise around 55 additional lots.
- 35 Waka Kotahi has opposed the submission¹ on the grounds that such development will generate additional traffic movements to/from SH58, and that no assessment of these additions has been provided to demonstrate how any adverse effects can be appropriately mitigated. Waka Kotahi seek that the rezoning be declined.
- 36 In lieu of any detailed traffic assessment provided by the submitter, and noting that individual property access onto a regional State Highway route such as SH58 can introduce safety issues and serves to undermine the through traffic function of such roads, I recommend the current PDP zoning be retained.

Pukerua Bay

- Submitter 181 (David William Ltd) seeks to rezone an approximately 277 hectare site to the southeast of Pukerua Bay, from General Rural Zone
 (GRUZ) to RLZ.
- 38 It is assumed that access would likely be onto SH59 via a local road connection through the future Northern Growth Area, although it is unclear from the submission how such access would be achieved and what traffic impacts the rural lifestyle development would have on the adjacent transport network. In the absence of any detailed analysis around site yield and traffic impacts, I recommend retaining the current PDP zoning.

¹ Waka Kotahi Further Submission 36

Grays Road

- 39 Submitter 233 (Quest Projects Limited) seeks to rezone parts of the properties at #243 and #271 Grays Road to RLZ, which could yield approximately 38 additional lots.
- 40 The Grays Road carriageway is generally formed to between 7-9m (with separate provision for walking and cycling) which satisfies the 'rural arterial' standard for such a route as this. With the opening of the Transmission Gully Motorway (**TGM**) alignment, the current volumes on Gray's Road are expected to halve to around 3,000vpd.
- 41 With sufficient road width to appropriately accommodate two-way traffic throughout its length, and a step change reduction in traffic volumes, Grays Road is assessed as having residual capacity to accommodate additional rural lifestyle development traffic. It is on this basis that I could support reclassification of the subject site to RLZ.

Paekākāriki Hill Road

- 42 A total of four submissions were received seeking the rezoning of land parcels accessed off Paekākāriki Hill Road.
- 43 Submitter 258 (Milmac Homes Limited) seeks to rezone a 162-hectare site to RLZ, which could potentially yield up to 81 new lots.
- 44 Paekākāriki Hill Road heading north out of Pāuatahanui includes a minimum 7m carriageway width as far as the Jones Deviation, whereupon it narrows to approximately 6m and indicates an IRR of 'medium high'.
- 45 The assessment undertaken for the RRA report provided an indication of the residual traffic capacity on Paekākāriki Hill Road, based on the forecast reduction in volumes anticipated to occur once the TGM alignment opened. Based on a reduction of approximately 2,000vpd

diverting to TGM, around 200² new lots could be developed along the route, without materially changing the historic traffic characteristics.

- 46 As proposed, the PDP zoning for RLZ would provide for approximately 172 new lots within the Paekākāriki Hill Road catchment, essentially using the bulk of the residual traffic capacity created by TGM, based on the route continuing to operate at a level of service and safety no worse than it has to date.
- 47 Further substantial growth enabled by rezoning then such as that proposed by the submitter, and particularly on the section north of the Jones Deviation where the IRR increases and safe driveway access becomes more challenging, would need to demonstrate that any adverse effects on the transport corridor arising from this traffic growth could be appropriately mitigated. In the absence of any such assessment, I recommend that the current PDP zoning for this site remain.
- 48 Three submitters seek to rezone land within the portion of Paekākāriki Hill Road just north of the Pāuatahanui village to RLZ, including submitter 234 (Graham and Janet Reidy) at #119 Paekākāriki Hill Road, submitter 237 (James McLaughlan) at #63 Paekākāriki Hill Road, and submitter 253 (Anita and Fraser Press) at #139 Paekākāriki Hill Road. In each case, around 1-2 new lots would be created.
- 49 This section of Paekākāriki Hill Road has a generous width of 7m or more, and a medium IRR. In view of the small number of traffic movements likely generated by the creation of new lots, in my view such a change in zoning could be accepted from a transport perspective. I do however note there are some other issues with these sites that may influence the ability to adopt the recommended zone change, and I defer to the other experts on these matters.

² Assuming each lot generated 10 vehicle trips per day, as per the industry guidance in the NZTA Research Report 453 (2011) 'Trips and Parking Related to Land Use'.

CONCLUSION

- 50 A total of 14 submissions seeking rezoning of land were received by PCC following notification of the PDP 'Rural Zones' chapter.
- 51 I have reviewed each of these in turn and, drawing from the work undertaken by myself and my company in preparing the Rural Roads Assessment report, from a transport / roading capacity perspective I recommend the following:
 - a. Submitter 230: accept rezoning of #1221 Moonshine Road to RLZ, but retain current PDP zoning for #1249B Moonshine Road;
 - b. Submitters 66 and 183: accept rezoning to RLZ;
 - c. Submitters 234, 237 and 253: accept rezoning to RLZ; and
 - d. Submitter 233: accept rezoning to RLZ.
- 52 In all other cases I recommend that the current PDP zoning remain unchanged.

Date: 14/04/2022

PCC RURAL ROAD ASSESSMENT

PREPARED FOR PORIRUA CITY COUNCIL

2 June 2020



1. Introduction

Stantec has been commissioned by Porirua City Council ("Council") to undertake a desktop analysis of a number of the district's rural roads, with respect to their ability to accommodate future traffic growth associated with the proposed new Rural Residential Zones ("RRZs"), which are currently being investigated as part of the District Plan Review.

An assessment of the capacity of these rural roads has been undertaken against relevant industry standards, to determine residual capacity (if any) and identify where mitigation will be required in order to accommodate future traffic growth associated with development of the RRZs.

1.1 Study Area

Based on the information received showing the proposed RRZs boundaries, the key rural roads that provide access to these catchments (and therefore require assessment) can be identified as follows:

- Airlie Road;
- The Track;
- Grays Road;
- Paekakariki Hill Road;
- Flightys Road;
- Mulhern Road;
- Moonshine Road
- Bradey Road
- Belmont Road
- Murphys Road;
- Pikarere Street; and
- Muri Road

1.2 Methodology

In liaison with Council's Roading team, analysis of RAMM data has been undertaken to determine the current carriageway width along each of the roads outlined above. Assessment of these road carriageway formations has then been undertaken against the industry standard NZS4404:2010 'Land Development and Subdivision Engineering' ("NZS4404:2010"), and available traffic count data¹, to determine residual capacity (if any) and to identify where mitigation is already required.

Using the proposed RRZ boundaries (and associated lot yields²), assessment of additional residential development traffic that could be generated on each of the roads has been undertaken, to inform where future residential activity could most easily be accommodated, and which catchments would require intervention/widening of existing carriageways to align with the industry standards for rural roads.

Commentary around these rural road connections to the primary network has also been included, again to inform where traffic growth can more easily be accommodated and where mitigation or additional consideration of network performance is warranted.

1.3 Assessment

 Table 1-1 provides a summary of the NZS4404:2010 rural roading classification for the purposes of providing context to the assessment that follows.

Whilst NZS4404:2010 does not specifically provide a prescriptive volume capacity, it does provide an indication of daily traffic associated with the catchment served (on a generally 10 vehicles per day ('vpd') per dwelling basis). In addition, it usefully identifies a number of other factors which need to be considered when designing carriageways and road geometry in the rural road context (as is the case here), including:

- provision of appropriate widening on bends;
- adequate shoulder widths relative to the speed environment, and to provide for other rural road user demands (such as pedestrians, cyclists and horses); and

¹ Including a number of counts undertaken in July 2019, specifically to inform this assessment

² Provided by Landmatters

• roads should be designed to satisfy standards identified in Table 3.2 or the relevant Austroads standards.

Assessment of the roads within the study area relative to existing carriageway formation, current traffic volumes, road safety, forecast additional RRZ development and connection to the external primary network, is provided in **Table 1-2**. In addition, **Appendix A** provides an illustrative representation of the current sealed carriageway widths and variations along each road.

With regard to consideration of route safety, NZTA has a number of methodologies for calculating 'Road Safety Risk' including Collective Safety Risk, Personal Safety Risk ("PSR"), and Infrastructure Risk Rating ("IRR"). The first two relate primarily to high-volume routes and rely on fatal and serious injury crash data to determine risk based on length of route and vehicle kilometres travelled. The IRR, which is a proactive measure of risk assessment that considers the specific road alignment characteristics including carriageway width, traffic volumes, roadside hazards, land use, and access/intersection density (but still aligns with the PSR), is considered to be more relevant to the typically lower volume rural road environments that are the study focus, and has therefore been adopted for the purposes of this assessment. In addition, however, the NZTA Crash Analysis System has also been interrogated and the associated crash history record (for the last 5-years) for each route analysed and commented on, alongside the PSR.

1.4 Summary

The assessment shows a number of the existing rural roads in the study area have geometries that fall below the industry standards in terms of carriageway width formation, relative to the daily traffic volumes they currently accommodate. Further development within these catchments (i.e. Belmont Road, Mulhern Road, Murphys Road and Muri Road) would therefore require some widening/upgrading of the existing carriageways to meet the desirable standard.

Other catchments (such as Grays Road, Bradey Road and Pikarere Street) where the current carriageway more closely aligns with industry standards, show an ability to accommodate some additional growth without requiring significant intervention.

The opening of Transmission Gully Motorway ("TGM") will have the effect of redistributing traffic on the district's road network, triggering associated decreases in volumes on routes such as the current SH1 alignment, as well as Grays and Paekakariki Hill Roads, presenting opportunities for growth in the surrounding catchments.

For those rural roads that currently access SH58 via priority intersections, the forecast increase in through traffic on this section of State Highway, post-TGM, will affect associated delay for turning traffic. Such access is expected to be better facilitated once the SH58 safety improvement works are completed, which includes turn restrictions at some intersections and roundabouts at others.

Table 1-1: Summary of NZS4404:2010 'Rura	al' Road Classifications
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Context	Locality Served (#dwellings)	Classification ADT (vpd)	Movement Movement Lane Width (m)	Lane/Shoulder Shoulder ⁴ Width (sealed width) (m)	Sealed Carriageway Width incl shoulder (m)	Road Cross Section Figure ³	Comment
Access to Lifestyle	1 to 6	-	2.5m	2 x 0.5m (0.5m)	3.5	E1	Low volume, one-way vehicle movement only, requires provision of passing places at 50m intervals
Access to Lifestyle/clustered housing	1 to 20	~200	5.5-5.7m	2 x 0.5m (0.5m)	6.5-6.7	E2	5.5-5.7m minimum required for two-way flow, allows vehicles to pass each other but typically at reduced speed.
Access to housing	1 to 150	~1,000	5.5-5.7m	2 x 1m (0.5m)	6.5-6.7	E3	Similar to E2 with wider shoulders, envisages potentially higher operating speeds
Rural (not otherwise specified)	>150	~2,500	5.5-5.7m	1.5m (1.0m)	7.5-7.7	E8	Much greater legal road width requirement, to accommodate services, separate footpaths etc.

 ³ Typical Plan and Road Cross Figure # from NZS4404:2010 Table 3.2
 ⁴ Interpreted that shoulder requirements are for both sides of the carriageway

Table 1-2:	PCC Rural	Road	Assessment
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			RAMM							RRZ Forecast	Lot Additions			
Road		Section Start	Section End	Carriageway Width (m)	ADT (vpd)	Infrastructure Risk Rating (IRR)	ONRC Category	Required Width Based on Current ADT ⁵ (m)	Capacity for Additional Lots? (without widening)	Forecast Additional Lot Yield	Forecast Additional Traffic ⁶	Primary Road Connection	Comments	Map No. ⁷
AIRLIE ROAD	1	Moana Rd	Gordon Rd	8	n/a	Medium	Secondary Collector			55 ⁸	550	SH1 (St Andrews Rd)	Choice of access to current SH1 corridor either via south (Plimmerton) or the north. Future traffic volumes on	
	2	Gordon Rd	Firth Rd	5	1,500	Medium		7.5-7.7	Yes			Moana Rd/ Steyne Ave/ SH1	current SH1 post-TGM expected to reduce from 24,000vpd to 7,000vpd, releasing associated capacity. The High IRR for the northern section of Airlie Road is related to the very winding alignment mid-way along the route; access to/from the north after SH1 revocation	1
	3	Firth Rd	SH 1	5.3	600	High	Secondary Collector	6.5-6.7	No – see comments				could provide an opportunity for growth. The crash record shows around 80% of accidents occurred at intersections (particularly at SH1), whilst a 'low' PSR' reflects the minor/non-injury nature of these crashes.	
THE TRACK	1	Motuhara Rd	End of Old Urban	6.5	300	Medium	Access	6.5-6.7	Yes	55 ⁸	550	Moana Rd/ Steyne Ave/	Good opportunity for growth with plenty of capacity within the existing infrastructure. Only one recorded accident has occurred in the last 5-years (non-injury)	1
	2	End Old Urban	End	7	100	Medium	Low Volume					5111	resulting in a 'low' PSR.	
GRAYS	1	SH 1	Taupo Cres	8.8	5,900	Medium High	Arterial	Rural Arterial	Yes - see	139	1,390	SH1 (TGM) /	Volumes on Grays Road post-opening of TGM12 are	
ROAD ¹⁰¹⁰	2	Taupo Cres	Mervyn Place	7.8		Medium High		routes	Comments			SH58	forecast to reduce by up to 3,000vpd (to approx.	
	3	Mervyn Place	Pope St	7.1		Medium High		required to					access on to this route could feasibly occur before	
	4	Pope St	Bridge No1	9	5,100	Medium High		provide 7-8m					volumes increase back to current levels and associated	
	5	Bridge No1	Motukaraka Pt	6		Medium High		trafficable width ¹¹					carriageway capacity (excluding any other land use	2
	6	Motukaraka Pt	Bridge No2	10		Medium High		Width					interchange or current SH1 alignment. Around 20% of	
	7	Bridge No2	Paekakariki Hill Rd	9	6,600	Medium High							recorded crashes have occurred at intersections with approximately 1 in 3 resulting in injury, giving the route a 'low medium' PSR.	
PAEKAKARIKI HILL ROAD ¹⁰	1	SH58 (Start island RHS)	Old SH58 (PP LHS)	12	11,000	Medium	Arterial	Rural Arterial routes	Yes	172	1,720	SH1 (TGM) / SH58	Convenient connection to TGM via SH58 interchange. Opening of TGM is forecast to	
	2	OLD SH58 (PP LHS)	Centre of Speed Hump	8.8	7,800	Medium		generally required to provide 7-8m					trigger a reduction in current volumes of around 2,000vpd (down to approx. 1,000vpd) north of Grays Road, As such, some 200 lots could potentially be	
	3	Centre of Speed Hump	Grays Rd	7.2	8,400	Medium		trafficable width11		_			developed before volumes begin to approach current ADTs on this section. Significant growth beyond this	
	4	Grays Rd	Jones Deviation	7	3,100	Medium High	Primary Collector	As above	Yes				would warrant further assessment on impacts of increased volumes north of Jones Deviation. North of Battle Hill, the narrower carriageway, higher IRR, and	2&3
	5	Jones Deviation	Barry's Place	6		Medium High							issues with safe driveway access onto the road,	
	6	Barry's Pl	Battle Hill	6	1,600	Medium High							constrain opportunities for growth. The section north of	
	7 8	Battle Hill Cattery	Cattery Kapiti Boundary	6 6	1,600 1,600	High High	Primary Collector	Collector Roads required to provide 6m- 7m trafficable widtb11	Collector No Roads required to provide 6m- 7m trafficable				Grays Road to Battle Hill shows a PSR of Medium, with around 1 in 4 recorded crashes occurring at intersections.	

⁵ Based on NZS4404:2010
⁶ Lot #'s multiplied by 10vpd in line with NZS4404:2010
⁷ Appendix A
⁸ Expected that 50% of Airlie Rd catchment would access via 'The Track' (with the balance connecting to Airlie Rd)
⁹ Personal Safety Risk
¹⁰ In calculating the Infrastructure Risk Rating, post-Transmission Gully Motorway volumes have been adopted on those parts of the network that are forecast to experience a significant change in traffic flow
¹¹ Operative District Plan Part H Road Hierarchy Specifications
¹² Transmission Gully Motorway

Road			RAMM							RRZ Forecast	Lot Additions			
		Section Start	Section End	Carriageway Width (m)	ADT (vpd)	Infrastructure Risk Rating (IRR)	ONRC Category	Required Width Based on Current ADT ⁵ (m)	Capacity for Additional Lots? (without widening)	Forecast Additional Lot Yield	Forecast Additional Traffic ⁶	Primary Road Connection	Comments	Map No. ⁷
flightys Road	1	SH 58	#107	6	600	Medium High	Secondary Collector	6.5-6.7	Yes	116	1,160	SH58	As with all the current SH58 priority intersections, the forecast increase in through traffic, post-TGM, will affect	
	2	#107	Williams Gate	6	400	Medium High							upgrade the SH58/Elightys Road intersection to a	
	3	Williams Gate	End of Road	5	400	Medium High	Secondary Collector	6.5-6.7	Yes – see comments				roundabout, with improved alignment that bypasses the current 1-lane bridge near the start of Flightys Road. Some localised widening likely required beyond Williams Gate. With a 'low' PSR, several accidents have occurred at the SH58 intersection, for which the proposed NZTA upgrade works would provide associated mitigation.	4
MULHERN ROAD	1	SH 58	Seal Join (#104)	3.5	300	Medium High	Access	6.5-6.7	No	68	680	SH58	Current SH58 intersection is challenging, with narrow entry and sightline visibility issues for exit manoeuvres	
	2	Seal Join (#104)	end (Fernhill Rd)	3		Medium High							from Mulhern Road. Future arrangement is expected to be left-in/left-out, with other movements served by new roundabouts to east/west (i.e. at Flightys Road and Moonshine Road). The road has a 'low' PSR with one (non-injury) crash occurring at the SH58 intersection.	4
MOONSHINE ROAD	1	SH 58	Ahoroa Rd	5	750	Medium High ¹³	Secondary Collector	6.5-6.7	Yes – see comments	10	100	SH58	NZTA proposes to upgrade the existing SH58/Moonshine Road intersection to a roundabout, that would provide	
	2	Ahoroa Rd	Upper Hutt Boundary	4.2	400	High	Secondary Collector	6.5-6.7	No				improved safety and capacity at Moonshine Road. Wider carriageway and lower IRR (due to less winding alignment) between SH58 and Ahoroa Road provides opportunity for the small-scale growth envisaged by RRZ yield in this area. The route between SH58 and Ahoroa Road shows a low PSR with recorded crashes being minor or non-injury, with 75% of these occurring at or close to the SH58 intersection.	4
BRADEY ROAD	1	SH 58	End	7	200	Medium High	Access	6.5-6.7	Yes	20	200	SH58	Some minor improvements have been made to the current SH58 intersection. NZTA safety improvement work includes median barrier installation on SH58, with associated left-in/left-out and right-turn in movements. The road has a 'low' PSR with a single (non-injury) crash, which occurred at the SH58 intersection.	5
BELMONT ROAD	1	SH 58	Bridge	4	250	High	Access	6.5-6.7	No	17	170	SH58	Belmont Road narrows beyond the intersection with SH58; sightlines for vehicles exiting Belmont Road are	
	2	Bridge	End of Flat Section	4		High							limited by the bend to the east. NZTA's planned future SH58 safety works include restriction to left-in/left-turn out only with other movements served by adjacent new	5
	3	End of Flat Section	Seal Join	3		High							roundabouts. The road has a 'low' PSR and shows two crashes (minor and non-injury) both within the vicinity of	
	4	Seal Join	End of Seal	3		High							the SH58 intersection.	
MURPHYS ROAD	1	SH 58	End of Access (Sign)	4	350	High	Secondary Collector	6.5-6.7	No	19	190	SH58	Murphys Road grades down to the intersection with SH58, where sightlines to the west are limited by the	
	2	End of Access (Sign)	End of Road	3.5		High	Access	6.5-6.7	No				existing bank. NZIA proposes to upgrade the SH58/Murphys Road intersection to a roundabout (with Flightys Road). The road has a 'low' PSR and indicates a record of five crashes (minor and non-injury) all recorded in the vicinity of the SH58 intersection.	5
PIKARERE STREET	1	Te Puke St	Hiwi Cres	7	2,100	Medium High	Secondary Collector	6.5-6.7	Yes	67	670	Titahi Bay Road	Good access through to the primary road network at Titahi Bay Road, noting volumes on this part of the network (i.e. Titabi Bay Road accessing 15,000 md)	
	2	Hiwi Cres (E)	Hiwi Cres (W)	5.8		Medium High							expected to change as a result of IGM. The road has a	4
	3	Hiwi Cres (W)	Start Subdvn	5.8	1,000	Medium High							'medium' PSR, with around half of accidents resulting in	0
	4	Start Subdvn	End of Urban	6.5		Medium High							injury.	
	5	End of Urban	Farm Gate	6.8	n/a	Low Medium								

¹³ IRR disaggregated to reflect the alignment between SH58 and Ahoroa Road

Road			RAMM							RRZ Forecast	Lot Additions			
		Section Start	Section End	Carriageway Width (m)	ADT (vpd)	Infrastructure Risk Rating (IRR)	ONRC Category	Required Width Based on Current ADT ⁵ (m)	Capacity for Additional Lots? (without widening)	Forecast Additional Lot Yield	Forecast Additional Traffic ⁶	Primary Road Connection		Map No. ⁷
Muri Road	1	Gray Street	Sea Vista drive	7.5	950 ¹⁴	Medium	Secondary Collector	6.5-6.7	Yes	18	180	SH1 at Gray Street	Good access to primary network at SH1/Gray Street. Taking account of the 'Rural Residential' land use	
	2	Sea Vista Drive	End of seal	4.2	500 ¹⁴	High ¹⁵	Secondary Collector	6.5-6.7	No				context, the upper section of Muri Road carriageway (i.e. east of Sea Vista Drive through to its termination), has an IRR classification of High. The route has a 'medium' PSR, with one recorded crash resulting in severe injury.	7

¹⁴ Using a combination of historic count data from RAMM and trip generation based on number of dwellings.
¹⁵ The current IRR is based on an 'Urban Residential' land use which, whilst appropriate for the lower section (i.e. west of Sea Vista Drive) it is considered the upper section (from Sea Vista Drive to its termination) aligns more closely with a 'Rural Residential' context, resulting in a High IRR.

Appendix A Rural Road Maps



						SURVEYED				Client:	
		+				DESIGNED	JAMIE WHITTAKER	07.19			PCC RURAL ROADS
		-				DRAWN	MATT HOPKINS	07.19			TOTAL CARRIGEWAY WIDTH (m)
		+				CAD REVIEW			Ctontoc		
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						DESIGN REVIEW	NOT ADDDO				AIRLIE ROAD
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						SURVEYED				Client:	
		++				DESIGNED	JAMIE WHITTAKER	07.19			PCC RURAL ROADS
						DRAWN	MATT HOPKINS	07.19			TOTAL CARRIGEWAY WIDTH (m)
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		+				DESIGN CHECK				poriruacity	
						DESIGN REVIEW					GRAYS ROAD / PAEKAKARIKI HILL ROAL
		++				APPROVED	NOT AFFRO	VED			1
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						DRAWN	MATT HOPKINS	07.19			TOTAL CARRIGEWAY WIDTH (m)	
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					DRAWN	MATT HOPKINS	07.19			TOTAL CARRIGEWAY WIDTH (m)
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						DRAWN	MATT HOPKINS	07.19			TOTAL CARRIGEWAY WIDTH (m)
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						DRAWN	MATT HOPKINS	07.19			TOTAL CARRICEWAY WIDTH (m)
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