Under	the Resource Management Act 1991
In the matter	of Hearing of Submissions and Further Submissions on the Proposed Porirua District Plan

Evidence of Angela Crafer on behalf of Kāinga Ora – Homes and Communities

21 January 2022

Hearing Stream 4 –11 February 2022 at 11am



Solicitors: Nick Whittington PO Box 90750, Victoria Street West, Auckland 1142 DX CP24063 T: +64 9 336 7500 nick.whittington@mc.co.nz

Evidence of Angela Crafer on behalf of Kāinga Ora – Homes and Communities

1 Introduction

- 1.1 My full name is Angela Louise Crafer. I have 29 years' experience as a Transportation Planner and Engineer in New Zealand and the United Kingdom, including the last 25 years based in Auckland.
- 1.2 I hold a Master of Science degree in Transportation Planning and Engineering from the University of Southampton (1995) and a Bachelor of Science degree from the University of Bristol (1990).
- 1.3 I am a Chartered Member of Engineering NZ and registered as a Chartered Professional Engineer and an International Professional Engineer. I am a Fellow of the Chartered Institutions of Highways and Transportation and a Chartered Member of the Institute of Logistics and Transport.
- 1.4 I am the Managing Director at Flow Transportation Specialists Ltd and have held this position since February 2005, when the company was established. Prior to February 2005 I was employed by Traffic Design Group for almost seven years and by Beca for three years in Auckland. Prior to that I was working for MRM Partnership in England.

2 Expertise

- 2.1 I have been involved in many projects that have required transport planning and transport engineering inputs including for public and private sector transport and land development projects where I used and gained experience with strategic land use and transport planning, transport engineering and design, operational assessments, bus, bicycle and pedestrian projects, integrated transport assessments and associated consenting for notices of requirements, plan changes, resource consents and engineering plan approvals.
- 2.2 My experience includes providing transport planning and transport engineering advice to Waka Kotahi NZ Transport Agency, Auckland Transport, Auckland Council, Kāinga Ora, Whangarei District Council, Kāpiti Coast District Council,

Queenstown Lakes District Council, District Health Boards, schools, and various private developers. This work has involved:

- (a) Undertaking masterplanning, design and integrated transport
 assessments for plan change and resource consent applications for land
 use developments including:
 - (i) integrated transport planning and assessment for the Whenuapai Structure Plan, including identifying key transport infrastructure and service provisions that would be needed to support the proposed location and form of likely land use development and attending the Plan Change hearings as a consultant to Auckland Council.
 - (ii) integrated transport planning and assessment, and transport engineering design for proposed housing, employment and schools at the Hobsonville Peninsula for Hobsonville Land Company Limited (later incorporated into Kāinga Ora), including presenting evidence at the Waitakere City Council hearing.
 - (iii) integrated transport planning and assessment associated with land use consents for major suburban developments at Northcote, Oranga, Aorere, Waikowhai, and Roskill South for Kāinga Ora.
 - (iv) integrated transport planning and assessment, and transport engineering design for proposed housing and mixed use development at Ara Hills, north of Auckland.
 - (v) integrated transport planning and assessment, transport engineering design and travel planning for schools, including the new Albany Senior High School.
 - (vi) transport planning and assessment and transport engineering design associated with land use consent for a distribution centre in Palmerston North.

- Providing transport planning advice to the Independent Hearings Panel for the Proposed Auckland Unitary Plan around matters concerning Waka Kotahi in relation to the proposed Rural Urban Boundary.
- (c) Presenting evidence on behalf of Auckland Transport in relation to the notice of requirement for the Lincoln Road Corridor Improvements project.
- (d) Providing advice to Kāpiti Coast District Council in relation to Waka Kotahi's proposed use of the Western Link Road designation, and in relation to plan change applications for land use development, including attending mediation.
- Providing advice to Waikato District and Hamilton City Councils in relation to notice of requirement and statutory applications for the Waikato Expressway Hamilton Section, Tamahere East-West Link Road, Ruakura Interchange and Southern Interchange, including providing technical specialist advice at mediation and at the hearings
- (f) Providing advice to Waka Kotahi in relation to private development applications including for expansion of the port at NorthPort, a service centre on State Highway 1 at Ruakaka, a proposed plan variation and Qualifying Development in Drury, a Mitre 10 Mega in Lincoln Road, including attending mediation and presenting evidence at hearings
- (g) Working on numerous projects that involve the design of transport infrastructure, safe system assessments, road safety audits, for all modes of transport.
- 2.3 I have read the Code of Conduct for Expert Witnesses in the Environment Court Practice Note 2014. I have complied with the Code of Conduct in preparing this statement of evidence. Unless I state otherwise, this evidence is within my sphere of expertise and I have not omitted to consider material facts known to me that might alter or detract from the opinions I express.
- I have been involved with Kāinga Ora's submission on the Porirua City Council's
 (PCC) Proposed District Plan (PDP) since 29 September 2021.

3 Scope of my evidence

- 3.1 My evidence relates to transport matters associated with the Transport ("TR") and Infrastructure ("INF") Chapters as part of the PCC PDP.
- 3.2 My evidence addresses certain outcomes or changes proposed in the s 42A TR and INF reports, as related to Kāinga Ora's submissions on the proposed plan. My evidence is structured by reference to the following rule and standards:
 - (a) Rule Vehicle access connection to roads [revised TR-R2]
 - (b) Standard Design of roads
 - (c) Standard Vehicle access connection to roads [revised TR-S5]
 - (d) Standard Design of Vehicle Access [revised TR-S2, TR-S3 & TR-S4, TR-Tables 1, 2 & 3]
 - (e) Standard Vehicle maneuvering [revised TR-S7]
- 3.3 For each rule or standard I briefly summarise Kāinga Ora's submission and the relevant s 42A report recommendations, before explaining my own views of the appropriate outcome.

4 Rule – Vehicle access connection to roads

Summary of Kāinga Ora's submission and PCC's recommendation relating to INF-R23 [revised and updated TR-R2]

- 4.1 Kāinga Ora's submission (81-295) on INF R23 seeks the relocation of the rule to the Transport Chapter, and the introduction of a notification preclusion statement (for both public and limited notification), albeit that road controlling authorities may be notified. The basis for this change is that any consenting assessment under the rule would be of a technical nature, requiring technical and/or engineering assessments. Public participation by way of limited or public notification will unlikely add anything to the consideration of the effects by the applicant and road controlling authorities.
- 4.2 As part of its s 42A report, PCC rejected Kāinga Ora's submission that public and limited notification should be precluded in relation to resource consents required as a result of non-compliance with the specified standards.

My view relating to INF-R23 [revised and updated TR-R2]

- 4.3 I note that this rule and the associated standard are proposed to be moved to the Transport chapter.
- 4.4 I support the Kāinga Ora submission that public and limited notification should be precluded in relation to resource consents required as a result of noncompliance with the rule.
- 4.5 The PCC reporting officer states the reason for rejecting the submission is that "non-compliance with the relevant standards may have safety implications which could affect adjacent land uses".
- 4.6 In my experience, issues of road safety are best determined by the road controlling authority through the engineering approval process and road safety audits.
- 4.7 I consider it unlikely that public or limited notification would result in the identification of any safety issues that would not be picked up in the engineering approval process and road safety audits.
- 4.8 Consequently I agree with Kāinga Ora that public and limited notification should be precluded in relation to resource consents required as a result of noncompliance with the specified standards.

5 Standard – Design of Roads

Summary of Kāinga Ora's submission and PCC's recommendation relating to INF-S23

- Kāinga Ora's submission (81-340 to 81-343) opposes S23, seeking its full
 reconsideration including the associated road design standards (INF-Table 1).
- 5.2 In the s 42A report, the PCC reporting officer notes in relation to retaining structures within roads and the submissions from KLP [59.17], Carrus Corporation Ltd [68.19] and Kāinga Ora [81.340], that where necessary, a development can be designed so that any required retaining structures are located within the adjoining private properties. He considers that the Council should not have to take on responsibility for these assets and that retaining structures located within the road reserve have caused identified resource management issues, with historic retaining structures causing potential safety

issues in relation to access to existing properties which are sought to be further developed. Harriet Fraser in her evidence on behalf of PCC notes that the key road safety matter is the potential restriction of sightlines and recommends that any retaining structure within the road reserve should trigger an assessment of the effects on road safety.

- 5.3 The reporting officer agrees that allowance for road gardens within residential areas should be provided, as sought by KLP [59.16] and Kāinga Ora [81.340].
- 5.4 The reporting officer proposes amendments to INF-S23 and Table-1 as follows:
 - (a) Maximum gradient now 10% for all roads (was 12.5% for up to 85m)
 - (b) Target operating speeds, minimum carriageway widths, total berm widths, and legal road widths, and the dimensions of the components that make up the carriageways and berms are now specified for eight different road classifications.

My view relating to INF-S23

- 5.5 As noted in paragraph 5.1 above, the Kainga Ora submission requests full reconsideration of S23. This is more appropriate now, given the changes now proposed in the s 42A Report.
- 5.6 The proposed changes to INF-Table 1¹now specify target operating speeds for access roads and collector roads. In my view, these target speeds are generally too high, when considered from a safe speed environment perspective. As referenced in the evidence of Ms Fraser, Road to Zero is the New Zealand Road Safety Strategy 2020-2030. The vision of Road to Zero is "a New Zealand where no one is killed or seriously injured in road crashes" and has the target of reducing death and serious injuries on New Zealand roads by 40% over the next decade.
- 5.7 The lowest volume access road target speed of 20 km/h is, in my opinion, an appropriate safe speed for this classification of road.
- 5.8 However, access roads serving up to 200 residential units in the general and medium density residential zones, are proposed to have a target operating

¹ s 42A Report, p 86.

speed of 40 km/h. I consider that a 30 km/h target speed should be applied to these access roads as

- (a) These residential roads will have a place as well as movement function for those living and visiting here, with travel by foot, pedal and other micro-mobility modes that should be enabled and encouraged for health, wellbeing and climate change reasons.
- (b) Risk of injury to pedestrians and people cycling or on e-bikes/scooters if struck by a car becomes substantially less likely at interaction speeds of no more than 30 km/h.²
- 5.9 INF Table 1 specifies amended road design standards for access roads and collector roads. In my view, these standards are too prescriptive and do not appear to leave room for roads to be designed to match the specific requirements of a particular location. For example, the table specifies that parking should be provided on both sides of collector roads, along with two cycle lanes, and two traffic lanes of 4.2m (except for lower volume rural zones). The implications include:
 - (a) The requirements will result in a wide carriageway width, especially if the cycle lanes are on street, and adjacent to 4.2m wide traffic lanes. This appears in conflict with the desire for a target operating speed of 50km/h on these roads. In other words, speed management measures are likely to be required to ensure that this target is achieved, but the need for such measures could be reduced if a more appropriate speed sensitive design is provided at the outset;
 - (b) The provision of excessively wide roads will work against the increasing desire for greater intensity of development in appropriate locations within urban areas, as set out in the NPS-UD;
 - (c) The specification of two parking lanes along all collector roads may also contradict the aim of reducing dependency on travel by private car. The NPS-UD requires the removal of minimum parking standards in Tier 1 areas, but it should not necessarily be expected that on street parking is

² Research Report AP-R560-18 published in March 2018 by Austroads - the Association of Australian and New Zealand Road Transport and Traffic Authorities.

provided on all streets, to accommodate parking. In locations where parking is well used, this may reduce the speed environment, but in some locations, parking may not be well used, which could lead to further speed challenges.

- 5.10 The evidence of Ms Fraser acknowledges that road design standards should not simply be duplicated in or referenced from the District Plan, and she gives good reasons for this, including the evolution of standards, such as guidance from Waka Kotahi on providing wider footpaths and cycle lanes³. It is surprising, then, that the new proposed provisions include such specificity in terms of the required road reserve widths and the widths of the various components within the reserve. This approach can be compared to, for example:
 - (a) The Christchurch District Plan, which includes ranges for the overall road reserve widths and road carriageway widths, and it is less specific around the provision of on street parking⁴;
 - (b) The proposed Selwyn District Plan, which similarly sets out ranges for the overall road reserve and carriageway widths. It refers to parking on one or both sides (depending on the area) and refers to the council's Engineering Code of Practice for the design requirements⁵. Those design requirements include narrower traffic lane widths, with maximum values of 3.5m to 3.7m⁶.
- 5.11 I recommend that INF-Table 1 be amended as shown in Appendix A of my evidence.
- 5.12 A further issue with the new standard relates to the maximum gradients. Ms Fraser acknowledges issues relating to the hilly nature of Porirua, but recommends maximum gradients that are in many cases less steep than those specified within NZS4404:2010⁷. I accept that this may be desirable for pedestrians and those cycling, but it may also constrain the design of new roads

³ Evidence of Ms Fraser, paragraph 55

⁴ https://districtplan.ccc.govt.nz/Pages/Plan/Book.aspx?exhibit=districtplan&hid=25155

⁵ https://eplan.selwyn.govt.nz/review/default.html#Rules/0/304/1/0/0

⁶ https://www.selwyn.govt.nz/__data/assets/pdf_file/0014/35402/Part08_Roadingtransport_final.1908.pdf

⁷ Evidence of Ms Fraser, paragraph 54

within Porirua, leading to greater changes to the landform or reducing development potential.

- 5.13 I recommend that INF-S23 (7) be deleted and the maximum gradients for road categories consistent with NZS4404:2010 be reinstated within INF-Table 1 as shown in Appendix A of my submission.
- 5.14 With regard to retaining structures in the road reserve I agree with Ms Fraser in her recommendation that any retaining structure within the road reserve should trigger an assessment of the effects on road safety.

6 Standard - Vehicle access connection to roads

Summary of Kāinga Ora's submission and PCC's recommendation relating to INF-S26 [Revised TR-S5]

- 6.1 Kāinga Ora's submission (81-352) on S26 opposes the restriction to the number of permitted vehicle crossings. Limiting to one per site is restrictive, particularly in situations where a site has multiple frontages.
- 6.2 Kāinga Ora requests an amendment to the standard, inserting the word "frontage", to read: "The number of vehicle crossings per site frontage must not exceed one".
- 6.3 In the s 42A report, the PCC reporting officer states:

In relation to the submissions from Kāinga Ora [81.352] on INF-S26-1, I consider that the limitation of one access per site is appropriate, as this works in association with INF-S26-3 to limit the number of potential conflict points along roads, and ensure that new vehicle crossings are located where the potential risk will be lowest. Allowing for a vehicle crossing per frontage would negate INF-S26-3. The submitter has not provided any specific reasons for the amendment sought, other than the stating that it is 'too restrictive'. I acknowledge that there may be activities where more than one vehicle crossing is appropriate, or even necessary; however, I consider that in these cases it would be appropriate for a resource consent process to be undertaken to ensure that any potential safety risks are identified and appropriately avoided, remedied or mitigated.

My view relating to INF-S26 [Revised TR-S5]

6.4 I acknowledge the desire to reduce the number of permitted vehicle crossings, for reasons of safety and amenity. However, I support Kāinga Ora's submission on this issue, as the proposal in the Plan is too restrictive and inflexible. For example, five vehicle crossings serving five sites, which would be permitted by

the Plan, would be likely to have similar effects as five vehicle crossings serving one large site, assuming that the level of development is similar. However, the latter would not be permitted.

- 6.5 I consider that a more appropriate approach is to address the spacing of crossings, which allows more accesses to larger sites, while taking into account those walking, cycling and driving past.
- 6.6 As stated, I accept the concept of restricting the number of accesses, and note that several other city and district plans allow for the differences in site sizes by specifying requirements regarding the proximity between adjacent crossings, or by specifying the maximum number of crossings per site or per length of road frontage. For example:
 - (a) Table 27.6 4 2 1 of the Auckland Unitary Plan (AUP) specifies a maximum of one vehicle crossing for a single site per 25m of road frontage, with at least 6m separation;⁸
 - (b) Appendix 7.5.11 of the Christchurch District Plan⁹ sets out similar requirements to the AUP. For example, Table 7.5.11.2 states that sites outside the central city with 16 to 100m frontage to a local or collector road can have two vehicle crossings, while three crossings are permitted for frontages over 100m.
- 6.7 I recommend the revised TR-S5 item 1 be amended to state:

1. There must be no more than one vehicle crossing per 25 m of road frontage.

7 Standard – Design of Vehicle Access

Summary of Kāinga Ora's submissions and PCC's recommendations relating to TR-S2 and TR-S3

7.1 Kāinga Ora s [81.386] seeks deletion of TR-Table 1 for the reasons that the residential thresholds and associated required legal widths are excessive. Full review of the table is sought so that the classifications are set to manage the

⁸

https://unitaryplan.aucklandcouncil.govt.nz/Images/Auckland%20Unitary%20Plan%20Oper ative/Chapter%20E%20Auckland-wide/4.%20Infrastructure/E27%20Transport.pdf ⁹ https://districtplan.ccc.govt.nz/pages/plan/Book.aspx?exhibit=districtplan&hid=285901

safety and efficiency of the transport network, while recognising and providing for residential intensification.

- 7.2 Kāinga Ora [81.387, 81.388 and 81.389] seeks deletion and full review of TR-S3, TR-Table 2 and TR-Table 3, for the reasons that the standards are overengineered for residential scale development, with the minimum widths resulting in excessive landform modification, stormwater and creation of highspeed vehicle environments, which is not consistent with the strategic direction of the Plan. The submitter seeks review and amendment of the provisions so that the safety and efficiency of the transport network is appropriately managed while recognising and providing for residential intensification.
- 7.3 The evidence of Ms Fraser recommends several changes to the standards for vehicle accesses, and the officer's report generally agrees with the proposed changes.

My view regarding the Kāinga Ora submissions and PCC recommendations relating to TR-S2 and TR-S3

- 7.4 The proposed changes to TR-Table 1 in Ms Fraser's evidence¹⁰ increase the threshold between Vehicle Access Level 3 and Level 4 from 10 to 20 residential units consistent with NZS4404:2010 Table 3.2, and the traffic flow thresholds for non-residential developments have been changed to be better aligned with the residential unit thresholds. Consequently, I agree with the proposed change to TR-Table 1.
- 7.5 The proposed changes to Tables TR-Table 2 reduce target operating speeds and crucially reduce the minimum legal width of a Level 4 access from 21 to 11 metres. I agree with the proposed changes and the greater consistency with NZS4404:2010.
- 7.6 I agree with the proposed deletion of TR-Table 3.

¹⁰ Evidence of Harriet Fraser, para 91.

8 Standard – Vehicle manoeuvering

Summary of Kāinga Ora's submission and PCC's recommendation relating to TR-S6 [revised TR-S7]

- 8.1 Kāinga Ora [81.396] seeks that TR-S6-1 is deleted and replaced with two clauses to only require a vehicle to exit in a forward direction when accessing a site from a National or Regional Road, or the vehicle access is servicing six or more car parking spaces. The reasons stated are that there is no documented issue with reverse exits in Porirua, compliance would be difficult due to Porirua's topography, and the standard would result in poor urban design outcomes, visual effects, stormwater runoff, and disproportionate development costs. Deletion of TR-S6-3 is also sought, for the reason that it is unduly restrictive, and the function of the road reserve is to provide for vehicle manoeuvring.
- 8.2 In the s 42A report, the Council officer's report states:

I do not agree with the amendments sought in the submission from Kāinga Ora [81.396], as these ignore the potential adverse effects on the safety and efficiency of the transport network from vehicles reversing onto roads and the need to ensure the safety and efficiency of lower order roads as well as regional and national roads. I note that AS/NZS 2890.1:2004 states that reversing movements to public roads are to be prohibited wherever possible."

- 8.3 However, Ms Fraser's evidence is that the standard, which allows for reverse manoeuvres onto a road from a site where that site contains one residential unit and the road is an Access Road, can be amended to also provide for these manoeuvres onto Collector roads. This would still require on-site turning facilities where the site connects to an Arterial, Regional or National road. Ms Fraser also recommends that the allowable reversing distance be limited to 30 metres.
- 8.4 The reporting officer generally adopts Ms Fraser's evidence on these points.

My view relating to TR-S6 [revised TR-S7]

- 8.5 I note the proposed amendment to allow for vehicles to exit sites by a reverse manoeuvre onto Access and Collector roads, but that this still applies only if the site serves a single residential unit.
- 8.6 The effects on safety generated by reverse maneuvering are mainly related to sight distance, numbers of passing pedestrians, cyclists and vehicles, and speed,

as well as the number of vehicle movements on a driveway. Visibility standards for driveways are included in the PDP.

- 8.7 Limiting the exception to one residential unit may be overly restrictive, and other District Plans are not so onerous (eg, the Auckland Unitary Plan is for more than 4 parking spaces served by a single access (E27.6.3.4 (1)(a)), and the Whangarei District Plan is for where the site requires 3 or more parking spaces (operative plan, 47.2.4 (b); appeals version of the proposed plan, TR-R7 1.a).
- 8.8 While the number of vehicle movements on a driveway is somewhat related to the number of dwellings, it is also affected by household size and make-up and the accessibility of the site to complementary land uses and to suitable public transport. There is a trend towards low or no car residential developments which is expected to continue, where alternative transport mode accessibility is high.
- 8.9 Accordingly, I recommend that clause 1 of Revised TR-S7 be amended as follows:

1. Where a site has vehicle access provided, on-site manoeuvring areas must be provided so that vehicles can enter and exit the site in a forward direction, except where:

- a) The access serves three or fewer residential units or four or fewer parking spaces;
- b) the road is an Access Road or Collector Road, and
- c) the distance to or from the road frontage where a vehicle is required to reverse is no more than 30m.

Date: 21 January 2022

Angela Louise Crafer

Appendix A : Recommended Changes to INF-Table 1 (As Amended within PCC Section 42A Report – Infrastructure)

Proposed changes are shown in blue text.

INF-Table 1		Road design stand	dards							
Classification		Access Road				Collector Road				
Classification criteria (must meet all criteria	Typical daily traffic (annual average daily traffic movements)	1-200	1-2,000			1-1,000	2,000-8,000	2,000-8,000	1,000-2,500	
	Residential units	20	200	-	150	800	-		250	
	Maximum length	100m where the road is a no-exit road								
Zone		General Residential Zone, Medium Density Residential Zone	General Residential Zone, Medium Density Residential Zone	General Industrial Zone	All other Urban Zones	General Rural Zone, Rural Lifestyle Zone, Settlement Zone, Open Space Zone, Māori Purpose Zone (Hongoeka) and Special Purpose Zone (BRANZ)	General Residential Zone, Medium Density Residential Zone, General Industrial Zone	All other zones	General Rural Zone and Rural Lifestyle Zone	
Target operating speed (km/h)		20 ¹	40 ¹ 30	40 ¹ 30	40 ¹ 30	60 50	50	50	60 50	
Maximum Gradient		16%	12.5%	10%	12.5%	12.5%	10%	10%	12.5%	
	Parking	1 x 2.1	1 x 2.1	2 x 2.1	1 x 2.1	-	2 x 2.5 1 x 2.5	2 x 2.5 1 x 2.5	-	
Minimum width (m)	Traffic (must provide unhindered vehicle access)	2 x 3.0 ²	2 x 3.0 ²	2 x 4.2 2 x 3.5	2 x 3.0 ²	2 x 3.0 + 2 x 0.5 sealed shoulders	2 x 4.2 2 x 3.5	2 x 4.2 2 x 3.5	2 x 3.5 + 2 x 0.75 sealed shoulders	
	Cycles	Shared in traffic lane	Shared in traffic lane	Shared in traffic lane	Shared in traffic lane	1 x 2.5 Shared	2 x 1.8	2 x 1.8	1 x 3.0	
	Footpath	1 x 1.8	2 x 1.8	2 x 1.8	2 x 2.5 ³	– path	2 x 2.0	2 x 2.5 ³	Shared path	

Legal width	14.0 13.4 As per INF-Table	16.0 15.2 As per INF-Table	20.0 18.3 As per INF-	19.0 16.6 As per INF-	15.0 14.0	25.0 21.1 As per INF-Table	26.0 22.1 As per INF- Table 2	20.0 15.5
Total berm width	1 x 2.5 1 x 2.8	1x 2.8 1 x 4.3	1 x 2.8 1 x 4.3	1 x 3.5 1 x 5.0	2 x 3.5	1 x 3.0 1 x 5.0	1 x 3.5 1 x 5.5	2 x 3.5
Street tree berm	2.0	2.5	2.5	2.5	-	3.0	3.0	
Infrastructure berm	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

Notes:

¹Speed management measures may be required to achieve the specified target operating speed ² The carriageway width must be widened to 6.7 metres for bends where the outer radius of the traffic lane is 50 metres or less

³ The footpath width must be a minimum of 3.5 metres within Commercial and Mixed Use Zones identified with an Active Street Frontage control shown on the planning maps