Before an Independent Hearings Panel at Waimakariri District Council

under:	the Resource Management Act 1991
in the matter of:	Proposed Private Plan Change Request 31 (PPCR31) to the Waimakariri District Plan

Evidence in Chief – Shane Binder, Senior Transportation Engineer
Waimakariri District Council
On behalf of Waimakariri District Council
Evidence on Transport and the Roading Network Relating to Private Plan Change PC31 – Rolleston Industrial Developments Ltd

Dated: 22 June 2023

INTRODUCTION

1. My name is Shane Isaac Binder, and I am the Senior Transportation Engineer for Waimakariri District Council, a position I have held since February 2021. In this role I manage the District's transport planning, strategy, and engineering functions, including road safety, traffic modelling, parking, and public transport elements.
2. My qualifications include Bachelors and Master of Science degrees in Civil Engineering. I have licensure as a Professional Engineer (Colorado and Washington State, USA), certification as a Road Safety Professional (Level 1) by the Institute of Transportation Engineers, and Chartered Membership in Engineering New Zealand. I am also a member of the Transportation Group and Safety Practitioners Sub-group of Engineering New Zealand. I have more than 20 years' experience in traffic engineering and road safety.
3. Although this is a Private Plan Change application hearing, I confirm that I have read the Code of Conduct for Expert Witnesses as contained in the Environment Court Practice Note dated 1 December 2022. I agree to comply with this Code. This evidence is within my area of expertise. I have not omitted to consider material facts known to me that might alter or detract from the opinions that I express.
4. I have reviewed:
    a. The Plan Change request
    b. Appendix H – Integrated Transport Assessment accompanying PPCR31
    c. The relevant sections of the Canterbury Regional Policy Statement (2013), operative Waimakariri District Plan (2022), proposed Waimakariri District Plan (2022), and National Policy Statement on Urban Development (2022) as these relate to the transport network
    d. Relevant submissions on PPCR31

ALIGNMENT WITH RELEVANT POLICIES AND OBJECTIVES

5. The operative WDC District Plan (July 2022) came into effect in 2005, during an era when effects on and by the transport network were considered in a very localised manner only. Present practice considers broader network and systemic effects. However, the operative District Plan still provides relevant guidance through Utilities[1] Objectives 11.1.1 and 11.2.1 and accompanying policies, as can be read in Annexure B1. These objectives and policies require that new development should be located to provide safe access for site traffic as

[1] For clarity, note that the operative WDC District Plan defines Utilities as including the construction and operation of roads, cycleways, bridges, pedestrian accessways, street lighting, and other street furniture.

well as the existing network minimise adverse effects caused by use and upgrading of roading links.

6. It is of note that Policy 18.1.1.1(w) in particular requires development proposals to assess the extent to which they will "provide choice in transport mode, particularly modes with low adverse environmental effects." As discussed in depth later, I consider that the transport assessment has included a high-level evaluation of these modes (chiefly, walking, cycling, and using public transport) but has not considered their use to get to most "day-to-day" activities.
7. The Canterbury Regional Policy Statement (October 2020) and proposed Waimakariri District Plan (December 2022), and National Policy Statement on Urban Development (May 2022) all provide more up-to-date objectives and policies to direct transport considerations associated with urban residential development. Relevant excerpts can be found in Annexures B2, B3, and B4.
8. The Canterbury Regional Policy Statement (CRPS) lays out expected outcomes for transport infrastructure in Objective 5.2.3 and Objective 6.2.4. The means for achieving these outcomes are demonstrated in, among others, Policies 5.3.3, 5.3.8, and 6.3.2. These objectives and policies focus on implementing infrastructure and land uses that reduce the adverse effects of transport use and encourage a shift from private motor vehicles to active and public transport modes.
9. The National Policy Statement on Urban Development 2020 (NPS-UD) is the most recent direction from Government to promote more development within urban areas by limiting certain restrictions and promoting "well-functioning urban environments." To further expand on the construct of a "well-functioning urban environment, the Ministry for the Environment released a factsheet[2] that provides more detail on Objective 1 and Policy 1. I have focused this commentary specifically on Policy 1 (c) which also requires "good accessibility" between housing and day-to-day activities such as jobs and community services, "including by way of public or active transport." Consideration should also be given to Policy 1 (e) requiring well-functioning urban environments that support reductions in greenhouse gas emissions.
10. The proposed WDC District Plan enables the excerpted objectives and policies from the CRPS and NPS-UD, by defining Development Areas with new residential and commercial development located within a short distance to employment, retail, education, public

[2] *National Policy Statement on Urban Development 2020 – well-functioning urban environments fact sheet*. July 2020, Ministry for the Environment publication INFO 961.

transport, and community services that enables access by means other than private vehicle (i.e., "by way of public or active transport").

11. I note the proposed Plan Change area is not included in the presently-defined Development Areas in operative or proposed District Plans. I further note that the location of the proposed Plan Change area is a significant distance from employment, retail, education, public transport, and community services and within an area that is not supported by non-vehicular facilities, making access by means other than private vehicle very challenging.
12. I thus consider that the proposed Plan Change, in locating a large residential development in Ohoka, far from established urban centres and "day-to-day" trip destinations, fails to enable the following local and regional policy directions:
    a. integrate development and transport networks to make best use of the existing network
    b. encourage non-motorised and public transport over private motor vehicle transport
    c. reduce greenhouse gas emissions
    d. provide a safe roading environment for all users (due to the higher-speed higher conflict peri-urban environment that has been proposed)
    e. mitigate adverse impacts from the increased traffic (chiefly increases in vehicle-kilometres travelled and crash risk)

INTEGRATED TRANSPORT ASSESSMENT

13. An integrated transport assessment has been prepared by Novo Group for this Plan Change. The Integrated Transport Assessment (ITA) in Appendix H describes the existing transport infrastructure and users, provides an overview of the proposed Plan Change, and assesses the potential transport effects that may result from it.
14. Traffic data collection from 2021 is generally in line with Council's October 2022 weeklong traffic counts. In general, I would consider the intersection delay data collection and validation fit for purpose to evaluate the vehicle-based mobility effects of the proposed Plan Change.
15. The COVID pandemic is too recent to draw definitive conclusions about its long-term effects on traffic volumes. However, shorter-term trends, based on annual traffic counts the Council undertakes at sites on nearby roads, can be considered in the two tables below. The first table shows annual traffic counts from 2019 to 2023 and suggests that the effects of the pandemic and associated lockdowns were limited when considering the five-year trend line.

Site	Location	Date Counted	Avg. Daily Traffic	Peak Hour
241A	Flaxton Road 400 m south of Fernside Road	May 2023	10,165	1,060
		May 2022	9,892	981
		May 2021	10,068	1,030
		June 2020	9,335	923
		May 2019	9,337	962
656B	Tram Road 400m east of Whites Road	April 2023	7,608	706
		May 2022	7,299	689
		May 2021	7,639	722
		June 2020	6,645	625
		May 2019	7,036	675
656A	Tram Road 725m west of SH1 motorway overbridge	May 2023	11,923	1,122
		May 2022	11,624	1,083
		May 2021	11,687	1,110
		June 2020	10,306	1,000
		May 2019	10,930	1,038

Annual Traffic Counts, 2019-2023

16. The second table compares peak hour traffic counts on Tram Road, from the Council's 2021 data collection to the data collection used in the Plan Change transport assessment; I consider these two sets of data to be generally alike and reflective of the natural day-to-day variance in traffic flows.

	Tram Road - East of Bradleys (0656C)			Tram Road – East of Whites (0656B)		
	Eastbound	Westbound	Total	Eastbound	Westbound	Total
Council AM	545	123	668	656	134	790
Applicant AM	552	122	674	640	123	763
Council PM	181	508	689	206	603	809
Applicant PM	216	562	778	198	629	827

Comparison of 2021 Traffic Counts from the Council and the Applicant

17. Trip generation for the transport assessment was carried out based on Waka Kotahi Research Report 453[3], and distribution of the generated trips was based on travel data from the 2018 Census (as summarised on the Commuter Waka website[4]). I consider this use of historical travel behaviour and its specific application to the proposed development to be common industry practice and appropriate for this analysis
18. The transport assessment includes evaluations of intersection and link operations on the surrounding roads (chiefly, Bradleys, Whites, Tram, and Mill Roads). I have the following comments on these evaluations:

[3] Douglass, M and S Abley (2011) *Trips and parking related to land use*. NZ Transport Agency research report 453. 156pp.
[4] Jono Cooper/Stats NZ website, https://commuter.waka.app/, accessed 31 May 2023

a. Given the magnitude of the projected increase in traffic on the two primary roads linking the proposed development with the metro area – a 40% increase on Tram Road and a 95% increase on Mill Road – I consider it necessary to evaluate operational impacts at constrained downstream intersections, as well as funding for required improvements. Chiefly, these would include the following locations:
    i. Mill Road / Ohoka Road intersection (where Mill Road has a give-way control)
    ii. Tram Road / SH1 motorway interchange (which has historical congestion issues and geometric constraints due to the existing overpass width).
b. The Council studied Tram Road in 2020 to evaluate operational and traffic safety issues and mitigations along the entire corridor. A programme of improvements was developed out of this study, including within the portion of the corridor between the proposed development and the SH1 motorway. A new roundabout has been programmed for design and construction by the Council in the next several years at the Tram Road / Bradleys Road / McHughs Road intersection. As the proposed development is expected to substantially increase the traffic at this intersection, I consider it appropriate that the developer contribute towards the roundabout project costs, should the proposal be approved. Financial contributions have not yet been defined by the Council.
c. The intersection of Tram Road / Whites Road was considered for only minor widening as part of the 2020 corridor study, due to the existing low volumes. The proposed development will add a considerable amount of traffic to the southbound left turn (from Whites Road) in the AM peak period and westbound right turn (from Tram Road) in the PM peak period. This substantial increase in traffic from the proposed development is forecast to have adverse effects on traffic operations for existing traffic on the north and south approaches of the intersection. The modelling in the transport assessment indicates that the overall delay on the north approach changes only nominally (AM peak period) or improves (PM peak period) with added traffic. I have reviewed the inputs and outputs at a high level and discussed the model with Council's traffic consultant (WSP) but have not viewed the full model so cannot make a full analysis of the intersection evaluation. I have not been able to confirm the validity of this modelling and have outstanding questions

about this intersection specifically[5] and the conclusions drawn from the model. Regardless, I consider it appropriate that the intersection be upgraded to mitigate for likely effects.

d. The link capacities in Point 91 (Table 24) include a comparison against the Austroads *Guide to Road Design Part 3* to define a "required carriageway" width. I note that, were Tram Road to be constructed as a new roadway in 2023, the carriageway requirements of District Plan Rule 30.1.1.9 / Table 30.1 would apply over any general guidance offered in an Austroads publication. However, as Tram Road is an existing road that is operating in a satisfactory manner without any operational impacts from the existing cross-section, I do not consider that the full "required carriageway" would be prioritised without the Plan Change (as noted in the transport assessment).

e. The Council upgraded Tram Road to full width as far west as Jacksons Road in 2009. No funding has been identified by the Council at present for any further roadway widening to the west of Jacksons Road. Given the magnitude of new traffic generated by the proposed development, I consider it appropriate that the developer contribute towards the cost of widening Tram Road between Jacksons and Bradleys Roads.

19. It is thus considered that the existing roading links have sufficient spare capacity to accommodate additional motor vehicle traffic generated by the proposed development. However, several intersections and road links will likely experience sizable impacts to their traffic operations from the traffic generated by the proposed Plan Change:

    a. Tram Road / Bradleys Road / McHughs Road
    b. Tram Road / Whites Road
    c. Tram Road carriageway between Jacksons Road and Bradleys Road

    As such, I consider financial contributions towards improvements of these intersections and links would be appropriate if the plan change were approved. I also consider that two downstream intersections with existing constraints will see considerable increases in traffic from the proposed development and need to be evaluated for effects and potential mitigation:

    d. Mill Road / Ohoka Road intersection

[5] The intersection appears to be modelled with the north approach having a thru/right lane and a "short" left lane, which could be appropriate under low traffic volumes. However, the modelling software may not account for thru/right turning queues blocking left turning traffic from entering the "short" lane, thus minimising the effects of the increased traffic volumes on the north approach of Whites Road.

e. Tram Road / SH1 motorway interchange

VEHICLE-KILOMETRES TRAVELLED AND EMISSIONS REDUCTION

20. I note that the application only briefly alludes to the effects of greenhouse gases (GHG) emissions in a qualitative manner only. Further, the transport assessment does not include any discussion of vehicle-kilometres travelled (VKT). While GHG emissions are broadly targeted by the multi-agency Emissions Reduction Plan (ERP)[6] to limit global warming, VKT is a specific measure for the transport sector, as noted in Chapter 10 of the ERP. The ERP has called out a 41% reduction in transport-related emissions and a 20% reduction in nationwide VKT (relative to 2019 measurements). The reduction of private vehicle-kilometres travelled plays a critical in transport-related emissions but also relates directly to safety, congestion, and accessibility effects. Private light vehicle usage, regardless of engine type (e.g., internal combustion or battery/hybrid electric), contribute to network congestion and crash risk. Finally, I am aware that it is more expensive to own and operate a private motor vehicle than to use other modes, and a reduction in vehicle-kilometres travelled by this mode would also reduce economic barriers to accessing the transport network.
21. The applicant refers to a trend towards electric vehicle ownership as potential mitigation for the increase in emissions due to the distance from Christchurch and other key destinations (p. 31 of the plan change request s.32 evaluation). I note that as of May 2023, electric vehicles make up 1.7% of the fleet, which has increased from 0.15% over the past five years[7]. I do not consider the trend of uptake of electric vehicles to be at a rate that they could be considered an effective mitigation for transport emissions within the foreseeable future. I further note that any potential uptake of electric vehicles will not impact vehicle-kilometres travelled and the resulting impacts on safety, health, accessibility, and congestion.
22. The Emissions Reduction Plan commits local councils to reduce vehicle-kilometres travelled (VKT) by light vehicles by 2035. A sub-regional VKT reduction target for the Waimakariri District is still being finalised and is not expected to be released until later in 2023; however, it is expected to be near 24%. The location of future development within the District is likely to have a direct correlation on VKT in terms both of distance travelled and attractiveness of modes other than private vehicle, as noted above in point 17. For context I note that the

[6] Ministry for the Environment (2022) *Te hau mārohi ki anamata, Towards a productive, sustainable and inclusive economy*. Publication ME 1639.
[7] Ministry of Transport fleet statistics website, https://www.transport.govt.nz/statistics-and-insights/fleet-statistics/sheet/monthly-mv-fleet, accessed 12 June 2023

identified Development Areas within the proposed District Plan have deliberately been collocated with Rangiora and Kaiapoi and are, at the furthest, about 3.0 km as the crow flies from established key activity centres (which include existing retail, employment, health, and education destinations). The furthest point of the proposed development is almost 4.0 km from the nearest retail (the Mandeville neighbourhood centre) and 8.0 km or more from the nearest key activity centre. This considerable distance would suggest the proposed site is not well-located to existing urban areas and thus, travel distances to key facilities are likely to be higher than those from identified Development Areas (which therefore increases VKT and likely GHG emissions).

23. I consider it highly likely that the proposed development will lead to an increase in VKT, given the distance between it and most "day-to-day" destinations. Given the reliance chiefly on private motor vehicles to cover this distance, and the overall composition of the New Zealand vehicle fleet, I consider it possible that GHG emissions will also increase with the proposed development. However, the transport assessment does not provide sufficient detail to quantify the baseline or proposed GHG emissions, increased VKT, or the effects on Council's obligation to reduce VKT. These effects need to be assessed in more detail in light of the requirements the Council will face shortly to reduce this travel.

NON-MOTORISED TRANSPORT EVALUATION

24. I consider that large-scale urban development (such as this proposal) is required to provide a safe and appropriate roading network that accommodates all users (not just single-occupant vehicle motorists) and encourages modes other than single-occupant vehicular travel for "day-to-day" activities. This is supported by the District Plan, Regional Policy Statement, and National Policy Statement elements found in Annexures B1 to B4.
25. I note the transport assessment lacks an evaluation of the existing non-motorised transport network. At present, the only existing non-motorised facility in the close vicinity to the Plan Change site is a shared-use path from Ohoka Village along Mill Road to Jacksons Road. This path is a narrow gritted path with a number of driveway crossings, which while fit for purpose at the time of construction, falls short of current best practices for shared-use paths. This path provides access to the Ohoka Domain and Ohoka School but no other community facilities, retail, jobs, education, or other "day-to-day" destinations. No other non-motorised facilities are accessible from the proposed Plan Change site.
26. In August 2022, the Council approved a Walking and Cycling Network Plan for the District as well as annual funding for the first several years of its implementation. This plan includes future facilities along Tram Road, Whites Road (Mill to Tram), Bradleys Road (Mandeville to

Rangiora via Easterbrook Road) and Mill Road (extending east from the existing terminus at Jacksons Road), as shown in Annexure A1. In late 2022, the Council was granted Transport Choices funding from Government to fund 2.0 km of shared-use path from No. 10 Road / Tram Road to the Mandeville shopping centre and further to the Mandeville Sports Grounds. When finished, this shared-use path will be no closer than 2 km to the Plan Change site, so will not provide direct access to the development.

27. No other Network Plan routes in the area have been prioritised within the current ten-year period, only limited future funding has been identified, and full Network Plan implementation in this area is not expected within the foreseeable future. In short, the Council does not have plans to construct any non-motorised network connections to enable additional off-site travel.
28. Given the near-total lack of non-motorised infrastructure connecting the proposed development with the rest of the transport network, it is considered that capacity of the existing network to accommodate non-motorised traffic is limited solely to the shared-use path linking to Ohoka School. People who walk or cycle must share the road corridor with vehicles to all other destinations as no other off-road facilities connect to the proposed Plan Change site. I do not consider the existing non-motorised network to be safe or appropriate for a new large-scale urban development as proposed.
29. Two small commercial zones are proposed for the site, although these are expected to be of a “modest scale” (Points 31, 121, Plan Change request) and not substantial enough to draw traffic outside the Plan Change site (Point 52, transport assessment). Based on these descriptors, I consider them unlikely to provide for most “day-to-day” needs for employment, retail, or health. The Plan Change further defines a new “Residential 8” zone which could be a retirement village or school. However, I note the Ministry of Education's submission alludes to insufficient consultation and a request to complete a needs assessment to determine if a school site is required. Further, there has been strong recent demand for retirement village construction within the Waimakariri District, coupled with a long-term demographic trend of an increasing elderly population. Considering a school on this site for purposes of trip generation presents a relatively conservative approach to such an analysis. However, I consider that a retirement village is more likely to be located at this site than a school. Thus, the journey-to-school distance will likely require most secondary school students to travel by private vehicle (or potentially bus) to Rangiora or Christchurch. Overall, based on the Applicant’s assessment of the proposal, I understand that it will not create the functions of a key activity centre or fulfil "day-to-day" requirements within a safe

and easily walkable / cyclable distance from the existing neighbouring or proposed residents.

30. As the proposal does not provide sufficient "day-to-day" activities on-site, the nearest key activity centres are in Kaiapoi (10km) and Rangiora (13km). The New Zealand household travel survey has found that on average, New Zealanders will cycle 4.8 km to work and 2.8 km to shop[8], while 90% of walking trips are 2.0km or less[9]. Thus, even if safe non-motorised connections were to be constructed to the regional key activity centres (e.g., Rangiora, Kaiapoi, and Christchurch), it would not mitigate the substantial distance required to access most "day-to-day" activities.
31. In summary, while the non-motorised network proposed within the Plan Change site appears to be sufficient to enable localised travel, the surrounding roading network used to access "day-to-day" activities has almost no safe separated facilities. Should the proposed development be approved, I consider it appropriate that the developer provide safe non-motorised connections to enable travel to the regional key activity centres, as these connections have no identified Council funding. However, regardless of the state of the surrounding roading network, the distance to reach key activity centres remains far higher than the average New Zealand walking or cycling catchment. I do not consider that the proposed development will generate measurable non-motorised mode share and thus will not enable the regional and national policy obligations to reduce private motor vehicle travel.

ROADING SAFETY EVALUATION

32. The transport assessment considered crash history on the roads immediately surrounding the proposed plan change site. While the timeframe for this history was not included, it would appear to be 2016-2020, based on my review of Crash Analysis System (CAS) records. It is noted that updating this history through 2022 includes a Minor Injury crash on Bradleys Road and two additional crashes along Tram Road (one Non-Injury and one Severe Injury crash).
33. However, while the assessed crash history covers only the immediate surroundings, I consider that it is more appropriate to include a wider assessment of the primary roads that will be required to be travelled to reach employment, education, and shopping, given the relative separation from the proposed development and these key destinations. This wider assessment is further justified by Objective 1 in the NPS-UD requiring a "well-functioning"

[8] Ministry of Transport (Sept 2015) *Cycling New Zealand Household Travel Survey 2011-2014*. 20 pp.
[9] Ministry of Transport (2018) *New Zealand Household Travel Survey 2015–2018*

environment that provides for health and safety. Thus, I have included further commentary on the safety of the two primary access roads to the nearest employment, education, and shopping opportunities in Rangiora and Kaiapoi, chiefly Mill Road and Tram Road from the development site to the SH1 motorway.

34. Tram Road is considered one of the highest-risk roads in the District, due in part to the long straight stretches without interruptions, higher driver speeds, and relatively higher traffic volumes. The risk of crashes increases through the peri-urban Mandeville area, with a higher frequency of side accesses and turning traffic. It is noted that CAS records between 2018 and 2022 show seven serious injury and one fatality crashes in the segment of Tram Road between McHughs Road / Bradleys Road and the SH1 motorway, as shown in Annexure A2. This crash rate is the highest for the corridor and for any other comparable rural Arterial or Strategic Road in the District.
35. Crash history is not considered an effective measure of *potential* risk, because crashes are randomised point-specific events where a confluence of events creates an incident at a specific location. I note the following quote from the Austroads *Guide to Road Safety Part 2 Safe Roads*[10]:

> [A] large proportion of more serious crashes occur at locations where there is no existing crash history. As an example, in New Zealand 56% of fatal and serious crashes occur at locations on roads with no other injury crashes recorded in the previous five years. Particularly on lower volume roads, crash locations tend to be more scattered making it harder to identify the location for future potential crashes. This is especially the case when considering fatal and serious crash locations.

36. The recent crash history is thus a low-confidence metric to use when projecting future safety performance, as considered in Points 82 and 83 in the transport assessment. Whereas the potential risk of infrastructure, driver behaviour, and other crash causal factors could be higher along a much larger portion of the network. Waka Kotahi has developed a potential risk assessment tool, the Infrastructure Risk Rating (IRR)[11], which proactively assesses a road's risk based on geometry and environment (e.g., carriageway width, curvature, roadside hazards, safety infrastructure, etc.) in five 20-percentile bands from High to Low. For example, Medium High-rated roads have injury crash rates more than twice as high as the next 20-percentile band, Medium.
37. As shown in Annexure A3, the two primary roads that new residents from the proposed development will use to reach employment, education, and shopping, have IRR ratings between Low Medium and Medium High. Mill Road has one segment of Low Medium

[10] Beer et al. (2021) *Guide to Road Safety Part 6: Safe Roads*. Austroads Report AGRS02-21. 242 pp
[11] Waka Kotahi (July 2022) *Infrastructure Risk Rating Manual: Road to Zero Edition 2022.* 24 pp

(between Whites and Jacksons Roads), but the rest of the road is rated Medium High. Tram Road is primarily rated Medium with one segment of Medium High (between Bradleys and Whites Roads). These ratings are specific to the quantitative characteristics of each roadway segment but follow the generally higher risk of a peri-urban roading environment, as previously noted.

38. In 2022, Waka Kotahi engaged the specialist transportation consultancy Abley to prepare a predictive model and risk assessment for rural crossroads across New Zealand, as rural crossroads crashes are often at high speed and disproportionately result in fatalities and serious injuries. The as-yet unpublished guidance note (*Application of the Rural Crossroads Analysis*, dated 23 September 2022 from Abley) notes that 1,719 rural priority-controlled intersections were surveyed with the predictive crash model and prioritised for treatment in five 20-percentile bands from High to Low.
39. Waimakariri District, by nature of being on the flat Canterbury plains with a historical gridded rural roadway network, was overrepresented on the prioritised risk (as is also evident in the rate of rural crossroads crashes in Waimakariri being well above the national average). Five of the Tram Road crossroad intersections from McHughs Road / Bradleys Road to the motorway rated as High (i.e., in the highest 20%) while one (Island Road / Griegs Road) rated Medium High (i.e., in the second highest 20%). The Council has prepared a programme of works to upgrade intersections along Tram Road and mitigate the crossroads risk, but at present, this programme has not been fully funded by Waka Kotahi and will likely take several decades to complete.
40. I consider the crash history evaluation used in the transport assessment (i.e., in the immediate vicinity of the Plan Change site) to be inappropriate as crash history does not reflect crash risk. The narrow site-based evaluation also does not cover the substantially longer vehicle-based trips that the proposed development will likely require for most daily needs (based on the relative isolation and lack of a non-motorised network, as discussed previously). Multiple independent metrics have identified elevated traffic safety risks on the two primary corridors (Tram Road and Mill Road) used to facilitate the bulk of these vehicular trips. I consider it inappropriate to site the proposed development so that it would substantially increase vehicular trips on these two corridors.

PASSENGER TRANSPORT EVALUATION

41. As noted in the transport assessment, Environment Canterbury (ECan) does not provide public transport services in the Ohoka area, and no service extensions are presently under

consideration. In the past, very limited service was provided along Tram Rd to Oxford, but this did not serve Ohoka and ultimately was discontinued.

42. Ohoka is located sufficiently far from existing public transport service that any provision of service to the proposed Plan Change site would have to be a dedicated service; deviation of existing service or extension to another terminus beyond Ohoka are not feasible options. I note the ECan submission has identified that the proposed Plan Change site is outside the existing urban public transport rating district, with no planned resources targeted for this area in the future. I further note that the household densities proposed for the site are unlikely to be high enough to fully fund operational expenses of new public transport service.
43. The transport assessment also includes a basic description of existing park and ride facilities in Kaiapoi, which have ECan's Metro bus service and are located 9km or more from the closest points in the proposed development.
44. I note the Council is also considering other future sites for park and ride facilities that would be located off existing Metro bus service but could help facilitate ride-sharing (and school bus service). This could include sites in the Tram Road corridor, but no locations or programme has been finalised. However, at present, no carpooling programme and limited facilities exist within the District and uptake for this mode is considered to be negligible.
45. In assessing the suitability of the existing facilities and network, I rely on the following publications:
    a. Waka Kotahi *Public transport design guidance*[12]
    b. Greater Wellington technical note 2 *When is Park and Ride the appropriate intervention?* [13]
    c. Waka Kotahi / Land Transport New Zealand research report 328 *Park and ride: Characteristics and demand forecasting*[14]
46. The *Public transport design guidance* suggests appropriate walking catchments for low-frequency public transport service (headways of greater than 15 minutes, which describes all existing Metro service in Waimakariri) is 400m. High-frequency service has a greater attraction, with up to 800m walking catchments. Cycling catchments may be up to 2.5 km.

[12] Waka Kotahi website, https://www.nzta.govt.nz/walking-cycling-and-public-transport/public-transport/public-transport-design-guidance/, accessed 25 January 2023
[13] *Technical Note 2: When is Park and Ride the most appropriate intervention?*, June 2018, MRCagney
[14] Vincent, Mike (2007) *Park and ride: Characteristics and demand forecasting*. Land Transport NZ Research Report 328. 131 pp.

47. A technical note from the Greater Wellington Regional Council, suggested anecdotal walking distances to train stations of up to 1.2km and to busway stations of up to 2.7km, ultimately suggesting a walking and cycling catchment of 3km radius around a station. The technical note pointed out that the 2.7km walking distance in Albany (Auckland) was likely an outlier and I would further point out that the peak period 15-minute headway public transport service within the Waimakariri District is far less of an attraction than the services noted in this technical note. Regardless of which value is chosen for an appropriate walking or cycling catchment, the 9km distance between the proposed Plan Change site and the nearest park and ride facility would suggest that walking and cycling is not a reasonable mode to connect to public transport.
48. Waka Kotahi research report 328 found that park and ride facility use correlated best with a "shortage of reasonably priced central area parking." It is considered that the Christchurch CBD, which is the largest destination noted in the ITA traffic distribution in Appendix 7, likely has an oversupply of carparks with occupancy below optimal levels. Christchurch City Council noted in 2020 that off-street parking supply doubled 2016-2020 and that occupancy was at 64%, below the industry target of 85%.
49. Thus, given the relative distance from the proposed development site to existing Metro bus service and Council park and ride facilities, I consider that single-occupant vehicle travel is necessitated for almost all "day-today" trips for employment, education, and shopping. I further consider that most single-occupant vehicle trips generated by the proposed development will continue to the Christchurch CBD (or Rangiora and Kaiapoi town centres) with plentiful parking supply, rather than being used as a "first- and last-km" connection to public transport.

PROPOSED DEVELOPMENT

50. From a transport perspective, the transport network proposed on-site within the ODP (reference figure 12 in the transport assessment) would appear to be generally appropriate to enable internal circulation.
51. I consider that the ODP will need more detail around a network for cycling (noting that only vehicular and walking networks have been called out). As well, the indicative roading connection to the south edge of the ODP area, terminating against 154 Bradleys Road, will need more consideration about how it terminates or interacts with the adjacent properties (which are not included in the ODP) and potentially connects with another road.
52. Points 38 and 67 in the transport assessment provide some indication of the proposed roading network within the development. A "bespoke" set of road cross-sections are

proposed to reflect an unspecified "nature" of the proposed Plan Change site. In reviewing the Plan Change documents, I have not seen any evidence of environment or development that is unique relative to the rest of the District or otherwise justifying "bespoke" roading standards. The roading cross-sections and tree-planting spacing[15] in use on the District's roading network provide a consistent road environment based on widely accepted engineering standards. As such, I would not support a deviation from these standards without substantive justification and further analysis of the impacts of a different standard of roadway.

53. It is of note that the density and section size in the proposed land use across Residential 3[16] and Residential 4a is likely to result in a "peri-urban" road environment, which occupies a space between a rural high-speed environment and an urban low-speed environment. The site's roads will have a higher frequency of residential driveways (when compared with the surrounding rural land), but lower-scale development set back from the road. This style of development combined with a lack of on-road parking, street trees and furniture, results in limited "side friction" (when compared with an urban environment) on the road. "Side friction" is an important factor noted in the Highway Capacity Manual for reducing speeds on urban roads and I would consider that the lack of "side friction" will likely lead to increased speeds on the "peri-urban" roads proposed for the development.
54. Speed limits across the District are in the process of being considered for consistency with the environment around each road. Urban residential environments across the district, with sections of 300-500 m^2 in size, kerbing and footpaths, are typically posted with a 50 km/hr speed limit. National speed setting guidance suggests a 30 or 40 km/hr speed limit is more appropriate in these areas. Given the section sizes in the proposed development and lack of "side friction" noted above, the roads in the development will likely be posted with a 60 or 80 km/hr speed limit. I also note this "peri-urban" road environment is also likely to be created along the site frontages where additional direct property access is proposed. The bulk of this frontage presently has a 100 km/hr legal speed limit.
55. The speed environment will not support a lower speed, as discussed previously, and the higher posted speed will correlate with increased crash severity, increased stopping distance, and reduced driver reaction times. I consider that these peri-urban road

[15] I note that street trees and accompanying berms provide transport-related benefits through traffic calming / speed management effects on urban streets as well as drainage, emissions-capture, and heat island mitigation.
[16] The proposed Outline Development Plan – Ohoka calls for a "minimum net density of 12 households per hectare, which averages 830m^2 per section

environments on site and along the site frontages are likely to lead to higher vehicular speeds and more frequent conflicts than are safe in a well-functioning urban environment.

56. Peri-urban roads in other parts of the District, including Hallfield, Oxford, and Sefton, have seen long-term maintenance issues due to the use of swales and berms in place of kerb and channel used in urban development. The Council has been required to retrofit quadrant kerbing, footpaths, and street lighting at additional cost to ratepayers, to address these maintenance and operational issues following ingoing maintenance concerns and service requests from the adjacent residents. I have not noted any elements of the proposed "bespoke" design that would appear to prevent these issues from occurring in the proposed development.
57. Points 39 and 68 in the transport assessment note that intersection spacing on site may not meet the Council's separation requirements. Minimum intersection spacing achieves separation to minimise overlap between the conflicting movements at adjacent intersections; this separation becomes more critical when road speeds are higher than in a typical urban setting. The transport assessment uses Christchurch District Plan rules to justify this non-compliance; I note these standards are not in-force in Waimakariri District. Further, they are not appropriate to apply within a lower-density higher-speed peri-urban environment.
58. In the event that new Medium Density Residential Standards (MDRS) were to be applied on site, each originally zoned section could hypothetically be split into three dwellings, resulting in a substantial increase to the residential density on site. I note that wholesale intensification of the site would likely result in a level of development and resulting side friction that could address speed concerns raised in point 43. However, intensification to that level would also lead to substantial increases in generated traffic and parking demand; this would result in operational and safety impacts on the "bespoke" site and District roading network (as well as VKT increases) far beyond anything evaluated in the present transport assessment.
59. At a high level, the internal transport network proposed in the ODP appears to meet transport needs for the proposed development. However, I do not consider that appropriate justification has been provided for the internal network to be built to standards other than those applied to the rest of the District roading network. And further, I have serious concerns around the safety and user behaviour (e.g., speeds and conflict avoidance) outcomes of the proposed roading network given the proposed peri-urban land use and household density.

SUBMISSIONS

60. Fifteen submissions have been received which refer to substantive transport matters.
61. Submissions from **Haines**, **D Myall**, and **McKay** raised questions about the accuracy of the modelling used in the transport assessment. I refer back to my commentary comparing the applicant's traffic volumes with the Council's routine data collection on Tram Road in points 15 and 16 and note that I consider the data presented in the transport assessment to reflect the natural variance in daily traffic flows but still fit for purpose for the assessment.
62. Submitters **Haines**, **Gardner**, **A Brantley**, **Waimakariri District Council, D Myall**, **Bascand**, **McKay**, **R Low**, **Stalker**, **Edge**, and **J Docherty** had concerns about the capacity of the local roading network and its ability to accommodate new traffic generated by the development. As discussed in point 19 above, the rural roads in the vicinity of the proposed development generally have sufficient capacity to accommodate new vehicular traffic with limited impacts. However, I consider that the two adjacent Tram Road intersections (Bradleys Road and Whites Road) intersections and Tram Road carriageway east to Jacksons Road will require upgrades to mitigate localised effects. And further, I recommend evaluation of effects from new vehicular traffic on two downstream intersections (Mill Road / Ohoka Road and Tram Road / SH1 motorway interchange) with existing capacity constraints.
63. Submissions from **Gardner**, **A Brantley**, **Foy**, **Waimakariri District Council, D Myall**, **Bascand**, and **R Low** raise concerns around insufficient and unsafe walking/cycling facilities in the area. As noted above in point 29, I agree in general with these concerns and question whether walking and cycling can be safety accommodated from the proposed development to external destinations as would be considered appropriate for a well-functioning urban environment.
64. A submission from **Fire and Emergency New Zealand (FENZ)** supports the Plan Change with the caveat that road cross-sections meet District Plan width requirements. As noted above in point 51, I agree in general with this change, and in principle with FENZ's justification for the relief sought.
65. A submission from **Waka Kotahi** questions whether travel outside the development will be undertaken by modes other than private vehicle, or whether the development can reduce vehicular emissions and vehicle-kilometres travelled. In general, I agree with the concerns raised in this submission.
66. Submissions from **P & M Driver** and the **Waimakariri District Council** brought up the distance to existing public transport services as a barrier to their uptake as a mode to travel to/from the proposed location. As discussed above in point 48, I agree with these concerns.

CONCLUSIONS

67. I conclude that the methodology and motor vehicle-related conclusions of the Plan Change's transport assessment are generally suitable. Based on the traffic-related effects established in this assessment, I believe the developer should be responsible for portions of the cost to improve several intersections and road links.
68. I consider that the proposed on-site transport network in the proposed development is likely appropriate for traffic operations. However, the higher-speed higher-conflict peri-urban environment will result in a poor safety outcome for road network users on site and on the surrounding frontage roads. Additionally, this network should be constructed to Council standards for safety and consistency reasons.
69. However, at a high level, I consider that the proposed site is not appropriate for this scale of new development due to the paucity of safe non-motorised connections; distance required to travel to "day-to-day" activities (e.g., employment, retail, education, and health); impractical public transport service; and high risk on roads connecting the proposed site with key centres.
70. This development is sufficiently far from "day-to-day" destinations that I consider almost all trips to and from the development will be by private motor vehicles. The high dependence on private motor vehicles will likely result in an increase in vehicle-kilometres travelled and potentially greenhouse gas emissions. This distance also means that even should safe non-motorised connections or new public transport service be extended to the proposed development, I do not consider it likely that they can be made attractive or competitive with private motor vehicles as the primary mode to and from the site.
71. In summary, I do not support a development of this scale in this location due to irreconcilable issues with over-reliance on and effects from increased private motor vehicle use. Further, while the on-site transport provisions appear to be appropriate at a network level, I have serious concerns about the proposed standard for individual roads resulting in poor safety and maintenance outcomes.

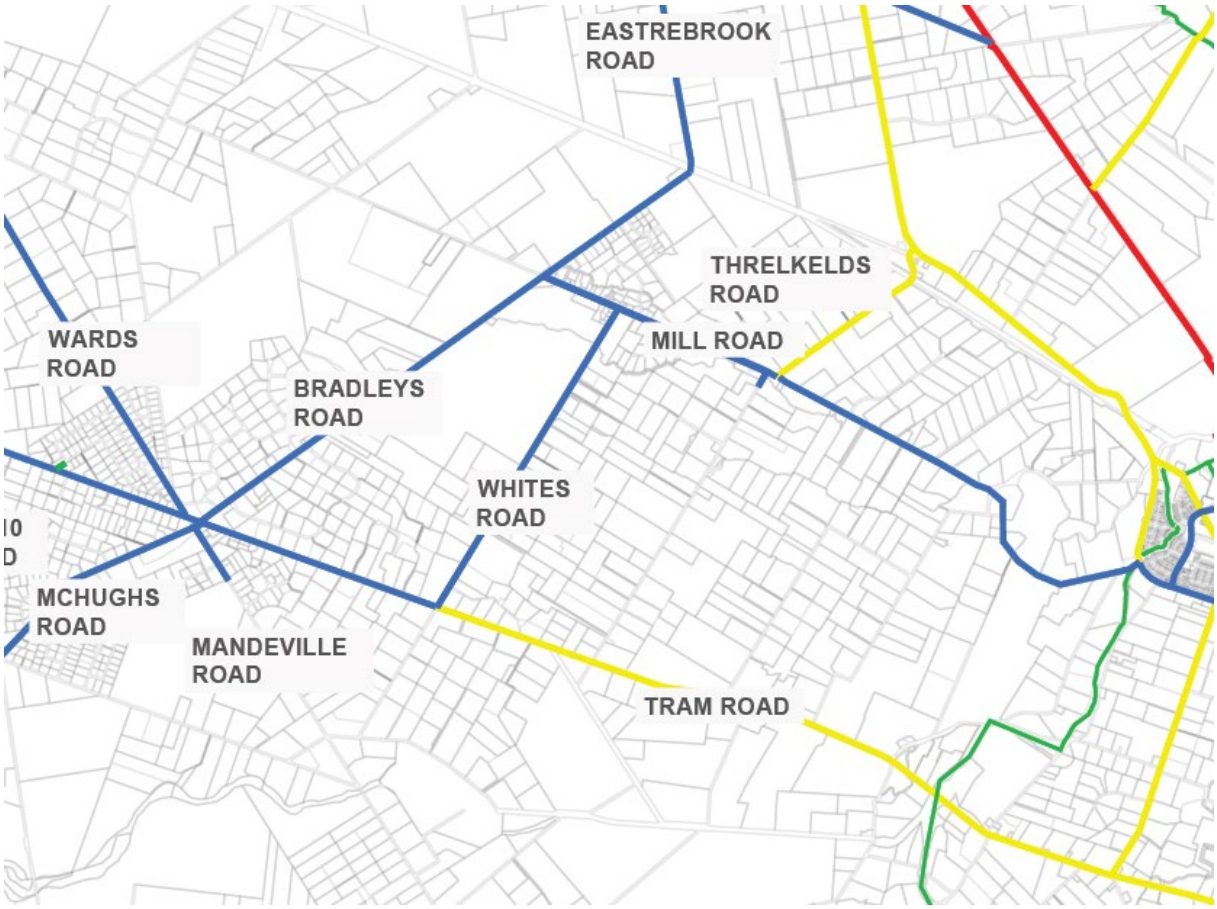
Name: Shane Isaac Binder

Signature: 

Date: 22 June 2023

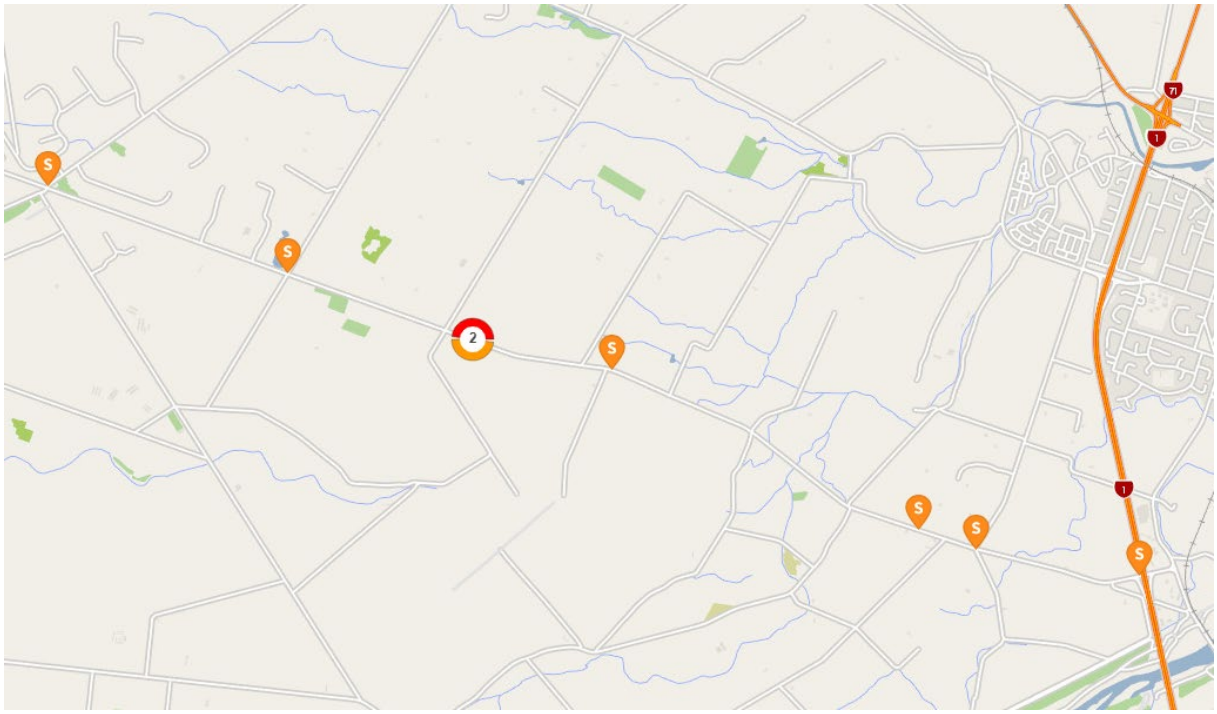
ANNEXURE A1 – WAIMAKARIRI DISTRICT COUNCIL WALKING & CYCLING NETWORK PLAN

(Inset of applicable area in vicinity of proposed development)



ANNEXURE A2 – CRASH ANALYSIS SYSTEM (CAS) OUTPUT

(January 2018 – December 2022, Tram Road between Bradleys / McHughs Roads and SH1 motorway)



ANNEXURE A3 – WAKA KOTAHI MEGAMAPS, INFRASTRUCTURE RISK RATING

(Inset of applicable area in vicinity of proposed development)

Speed Management Framework

Infrastructure Risk Rating

IRR Band

IRR Band

- High
- Medium High
- Medium
- Low Medium
- Low

ANNEXURE B1 – RELEVANT EXCERPTS FROM OPERATIVE WAIMAKARIRI DISTRICT PLAN

Objective 11.1.1

Utilities [*e.g., transport links*] that maintain or enhance the community's social, economic and cultural wellbeing, and its health and safety.

Policy 11.1.1.1

A utility [*e.g., a transport link*] should:

a. contribute to a safe environment;
b. maintain or enhance public health;
e. where it is necessary to service new development, be paid for by the developer, or as a condition of consent for the development; and

Policy 11.1.1.5

New developments and activities in relation to their traffic generation characteristics should:

a. locate on or establish primary access to an appropriate level of road within the road hierarchy;
b. not have vehicular access to an inappropriate level of road in the hierarchy; and
c. provide cycleways along arterial, strategic and collector roads where:
    a. necessary to provide an identified transport or recreation function; and
    b. alternative opportunities do not exist within the road hierarchy.

Policy 11.1.1.6

Every site should have access that provides safe entry and exit for vehicles to and from the site to a road without compromising the safety or efficiency of the road or road network. Where a site has two or more road frontages access should be from the lowest road classification within the road hierarchy.

Objective 11.2.1

Adverse effects on the environment caused by the provision, use, maintenance and upgrading of utilities [*e.g., transport links*] are avoided, remedied or mitigated.

Policy 11.2.1.1

Avoid, remedy or mitigate adverse environmental effects created by the provision, use, maintenance and upgrading of utilities [*e.g., transport links*] by:

c. integration with, and co-siting of, existing utilities where they are accessible and are, or can be, expanded to manage any additional loading and where such loading is technically and operationally feasible;
d. meeting accepted design standards;

Policy 18.1.1.1

In particular, [growth and development] proposals should not be inconsistent with other objectives and policies in the District Plan, and show how and the extent to which they will:

k. provide infrastructure for services and roading in a manner consistent with this District Plan;
v. affect the demand for transport;
w. provide choice in transport mode, particularly modes with low adverse environmental effects;

ANNEXURE B2 – RELEVANT EXCERPTS FROM PROPOSED WAIMAKARIRI DISTRICT PLAN

Objective TRAN-O1

An integrated transport system, including those parts of the transport system that form part of critical infrastructure, strategic infrastructure, regionally significant infrastructure, and strategic transport networks, that **reduces dependency on private motor vehicles, including through public transport and active transport**.

Policy TRAN-P2

Seek more environmentally sustainable outcomes associated with transport, including by promoting ... the use of public transport, active transport and sustainable forms of transport.

Policy TRAN-P4

New activities ... provide facilities for safe active transport, including through marked on-road cycle lanes, separated cycle lane, sealed road shoulders with sufficient width to safely accommodate cyclists, off-road formed cycle paths, cycling end-of-journey facilities for staff, shared use path and footpaths.

Policy TRAN-P5

Manage the adverse effects of high traffic generating activities on the transport system according to the extent that they ...are accessible by a range of transport modes and encourage public and active transport use; ... and provide patterns of development that optimise the use of the transport system.

Policy TRAN-P7

Achieve connections between public transport and new developments in major settlements by requiring ... new residential neighbourhoods to be designed to ensure convenient and safe walking distances from proposed residential allotments to public transport and other amenities; ... and roading design that facilitates the provision of an efficient and convenient public transport system into, out of, and around the development.

ANNEXURE B3 – RELEVANT EXCERPTS FROM CANTERBURY REGIONAL POLICY STATEMENT

Objective 5.2.1 Location, Design and Function of Development (Entire Region)

Development is located and designed so that it functions in a way that:

1. achieves consolidated, well designed and sustainable growth in and around existing urban areas as the primary focus for accommodating the region's growth

Objective 6.2.4 Integration of transport infrastructure and land use

Prioritise the planning of transport infrastructure so that it maximises integration with the priority areas and new settlement patterns and facilitates the movement of people and goods and provision of services in Greater Christchurch, while:

1. managing network congestion;
2. **reducing dependency on private motor vehicles;**
3. **reducing emission of contaminants to air and energy use;**
4. **promoting the use of active and public transport modes;**
5. optimising use of existing capacity within the network; and
6. **enhancing transport safety.**

Policy 5.3.3 Management of development (Wider Region)

Robust development maintains or improves well-being, health and safety. This includes:

3. Implementing traffic demand management measures, as appropriate;
4. Integrating the provision for public passenger transport with development, as appropriate;
5. Enabling people to meet their day-to-day needs within the local area;

Policy 5.3.8 Land use and transport integration (Wider Region)

Integrate land use and transport planning in a way … that promotes:

c. the use of transport modes which have low adverse effects;
d. the safe, efficient and effective use of transport infrastructure, and reduces where appropriate the demand for transport;

Policy 6.3.2 Development form and urban design

Business development, residential development (including rural residential development) and the establishment of public space is to give effect to the principles of good urban design below, and those of the NZ Urban Design Protocol 2005, to the extent appropriate to the context:

3. Connectivity – the provision of efficient and safe high quality, barrier free, multimodal connections within a development, to surrounding areas, and to local facilities and services, with emphasis at a local level placed on walking, cycling and public transport as more sustainable forms of [transport]

ANNEXURE B4 – RELEVANT EXCERPTS FROM NATIONAL POLICY STATEMENT ON URBAN DEVELOPMENT

Objective 3

Regional policy statements and district plans enable more people to live in, and more businesses and community services to be located in, areas of an urban environment in which one or more of the following apply:

a. the area is in or near a centre zone or other area with many employment opportunities
b. the area is well-serviced by existing or planned public transport

Objective 8

New Zealand's urban environments:

a. support reductions in greenhouse gas emissions

Policy 1

Planning decisions contribute to well-functioning urban environments, which are urban environments that, as a minimum:

c. have good accessibility for all people between housing, jobs, community services, natural spaces, and open spaces, including by way of public or active transport; and
e. support reductions in greenhouse gas emissions;