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

Summary Statement – Shane Binder, Senior Transportation Engineer
Waimakariri District Council
On behalf of Waimakariri District Council

Summary Statement on Transport and the Roading Network Relating to Private Plan Change PC31 – Rolleston Industrial Developments Ltd

Dated: 8 August 2023

INTRODUCTION

1. The purpose of this summary statement is to provide to the Commissioners comment on the Applicant's evidence relating to Private Plan Change PC31 – Mill Road, Ōhoka.
2. My full name is Shane Isaac Binder, and I am the Senior Transportation Engineer for the Waimakariri District Council. My qualifications and experience are set out in full in my evidence-in-chief.
3. My summary statement has predominantly been based on assessing the information presented in the Applicant's Evidence to PC31 as follows:
    a. Mr Tim Walsh – Planning
    b. Mr Gareth Falconer – Urban Design
    c. Mr Nicholas Fuller – Transport
    d. Mr Simon Milner – Public Transport
    e. Mr Paul Farrelly – Greenhouse Gas
4. I have also reviewed evidence from the following submitters:
    a. Mr Leonard Fleete – Canterbury Regional Council
    b. Mr Andrew Metherell – Waimakariri District Council

SUMMARY

5. I remain concerned that the proposed Plan Change locates a large residential development far from established transport corridors and urban centres. I consider that the Plan Change is not "well-connected" or even proximate to "transport corridors" as the NPS-UD requires of new urban development and thus fails to meet the NPS-UD standards for development appropriate for unanticipated areas.
6. I have carried out a high-level calculation of vehicle-kilometres travelled and greenhouse gas emissions from a full build-out of the Plan Change, based on details from the applicant's transport assessment and present-day emissions data. I consider the cumulative impacts of travel and energy from the proposed Plan Change to remain well above the existing use.
7. Further, I also note that while equivalent development adjacent to Woodend or Rangiora may be further from Christchurch than Ōhoka, it would be closer to existing key activity centres, "day-to-day" activities, and existing public transport, so I consider development in these areas will likely generate less private vehicle based GHG emissions and VKT.
8. I consider that because the current Ōhoka community is not of a scale or density that would be able to support viable all-day public transport, it is not suitable to locate new higher-density residential development here, isolated from existing public transport and other urban areas with public transport demand.

9. Based on existing funding commitments, I consider it will be several decades before any transport connections can be constructed to the Plan Change site. Regardless of the quality of links between the Plan Change site and the district's urban centres, I remain concerned that the separation distance is great enough to discourage travel by walking or cycling.
10. I consider that Plan Change-generated traffic will necessitate capacity-based improvements at the Tram Road / Bradleys Road and Tram Road / Whites Road intersections, as well as the Tram Road carriageway west of Jacksons Road. I further note that Council has identified over $17M in unfunded safety improvements along Tram Road, and the additional traffic generated by the Plan Change will exacerbate the safety risks on the roading network unless additional funding is identified or provided by the development.
11. I consider that there are significant varied risks to assuming capacity improvements can be undertaken at the SH1 motorway interchange. If Waka Kotahi, who has jurisdiction over the interchange, does not approve any changes, development within the Plan Change area could be limited to 250 sections.
12. I consider that the roading layout changes in the latest iteration of the urban design report have addressed some safety issues with the proposed layout. However, the overall layout proposed in the Plan Change is still a peri-urban roading environment, which I consider will likely lead to higher speeds, higher conflict frequency, and long-term maintenance issues.

ALIGNMENT WITH RELEVANT POLICIES AND OBJECTIVES

13. In my evidence-in-chief, I raised concerns about transport use from the proposed Plan Change, specifically the location of the proposed site and the effects of its separation from the existing transport network on mode choice, road safety, emissions, and congestion. I remain concerned that the actual and potential effects from this separation prevent the proposed development from contributing to a "well-functioning urban environment."
14. While local and regional policies address transport assessments to varying degrees, the National Policy Statement on Urban Development 2020 (NPS-UD) and its associated guidance documents provide better expectations for transport use and response to new development. Clause 3.8(2) sets three specific considerations when evaluating unforeseen development:

> *Every local authority must have particular regard to the development capacity provided by the plan change if that development capacity:*
>
> *a. would contribute to a well-functioning urban environment; and*
> *b. is well-connected along transport corridors; and*
> c. *meets the criteria [that determine what plan changes will be treated as adding significantly to development capacity].*

15. The NPS-UD fact sheet on responsive planning[1] notes that requirements for a "well-functioning urban environment" in Policy 1 include that a proposed "plan change must also show how the development is well-connected along transport corridors to ensure development is not disconnected or isolated [which] will encourage responsive developments in appropriate, accessible locations."
16. From my perspective, the key phrases are "well-connected" and "transport corridors." I consider that "well-connected" requires safe and appropriate facilities for all users. I further consider the lack of non-motorised facilities, existing or with committed future funding, connecting the Plan Change site to the transport network, as a failure to meet this requirement. Mr Nicholson, in his urban design report[2], concurs with my concerns on the lack of a good connection with Tram Road. Mr Walsh[3] agrees with this statement, noting that it also would apply to consideration of unanticipated development in Waikuku Beach or Tuahiwi. I agree with Mr Walsh's conclusion on connectivity and note that I would not likely consider new development in these areas as meeting the intent of Clause 3.8(2).
17. More importantly, the term "transport corridor" appears to have been deliberately chosen as opposed to "road corridor" (which is commonly used in district plans and other policy documents to refer to road reserve). I consider that a "transport corridor" is one that provides safe and appropriate access for all users (including people who walk, cycle, or bus), whereas a "road corridor" could refer to any link within the roading network, including unformed legal roads (i.e., "paper roads"). I do not agree with Mr Fuller's assumption[4] that a road's District Plan hierarchy classification is related to whether it is a "transport corridor."
18. The two primary roads serving the Plan Change area - Tram Road classified in the District Plan as an Arterial Road and Mill Road classified as a Collector Road - only have vehicular facilities (i.e., no walking or cycling facilities) and no public transport service. I would consider both roads as "road corridors" but not as "transport corridors" in the NPS-UD context. As an alternative example, I consider that Lineside Road (SH71) and Rangiora-Woodend Road both qualify as "transport corridors" given that they accommodate most transport users, not just motor vehicles, through shared-use paths and regular public transport service. Thus, I would generally consider sites utilising these roads as meeting the requirement of sub-point (b).

[1] Ministry for the Environment (July 2020) *National Policy Statement on Urban Development 2020 – responsive planning fact sheet*. Publication INFO 957.
[2] Evidence of Hugh Nicholson, paragraph 7.6
[3] Evidence of Tim Walsh, paragraph 154
[4] Evidence of Mr Fuller, paragraph 85

19. The NPS-UD supporting document "*Understanding and implementing responsive planning policies*"[5] provides detail on, and more pertinently, the policy intent behind the NPS-UD. It notes the following regarding unanticipated development:

> *Plan changes for urban development initiated under this policy should ensure the development is (or has clear and realistic plans to be) well connected to jobs and amenities along transport corridors. These corridors would support a range of transport modes, ideally both public and active transport.*

20. I remain concerned that the proposed Plan Change locates a large residential development far from established transport corridors and urban centres. I consider that this distance cannot contribute to a "well-functioning urban environment" from a transport perspective – it would not be "well-connected" or even proximate to "transport corridors" as the NPS-UD expects of new urban development. To be clear, I consider that this Plan Change does not meet the NPS-UD standards for development appropriate for unanticipated areas.

PRESENT-DAY VEHICLE-KILOMETRES TRAVELLED AND EMISSIONS REDUCTION

21. In my evidence in chief, I was concerned about the lack of quantitative analyses of the effects of the proposed development on greenhouse gas (GHG) emissions and vehicle-kilometres travelled (VKT) from the Waimakariri District. The Council has been committed to reducing both GHG emissions and VKT as part of Government's Emissions Reduction Plan. I have reviewed the evidence of Mr Farrelly on transport-based GHG emissions from the development. Mr Farrelly concludes that the proposed development will give effect to the NPS-UD Policy 1 requirement to "support reductions in greenhouse gas emissions" by:
    a. Providing plugs for resident-procured electric vehicles (EVs);
    b. Prompting ECan to provide new public transport to the plan change area;
    c. Planting trees;
    d. Providing an on-site walking & cycling network for residents to choose to use in place of driving;
    e. Providing space for potential commercial and educational facilities; and
    f. Removing the existing dairy farm operation and its associated emissions.
22. Mr Farrelly has calculated[6] approximate present-day annual GHG emissions from farm activity, not including dairy processing or electricity use, of 1,257 tons CO2-e. He notes this is equivalent of 5.0 million vehicle-kilometres travelled or annual electricity usage for 1,324

[5] Ministry for the Environment (September 2020) *Understanding and implementing responsive planning policies*. Publication INFO 976.
[6] Summary of evidence of Paul Farrelly, paragraphs 26-28

Canterbury homes. I understand that the dairying industry is presently engaged in research on both breeding and fertiliser technology to reduce future GHG emissions, but accept this does not impact a present-day baseline. However, I also note that Mr Farrelly does not provide an equivalent present-day quantitative calculation of GHG emissions from transport, noting that future behaviour and travel could change.

23. I disagree with Mr Farrelly's qualitative assessment on several points, although recognise that projections of future economic and consumer behaviour are outside Mr Farrelly's and my expertise as engineers. However, I am aware that sufficient present-day data exists to be able to inform a quantitative assessment of likely GHG emissions and VKT produced by residents of the proposed development in a present-day context for comparison purposes.
24. Based on the numbers provided in the Plan Change transport assessment and Mr Farrelly's evidence, the present-day transport-related GHG emissions and VKT from the Plan Change can be calculated as follows:
    a. 850 dwellings
    b. 8.2 total daily trips/dwelling (reference Appendix H Transport Assessment, p. 18)
    c. While the Transport Assessment, based on Commuter Waka data, assumed 65% of peak hour trips were destined to Christchurch and 18% of people worked from home, overall daily trips for work, education, shopping, dining, and entertainment take on a slightly different profile. I thus consider the following trip breakdown to be a conservative projection of future all-day travel patterns:

Percent Split	Destination	Distance (km)
10%	Christchurch	28
75%	Rangiora/Kaiapoi	10
15%	Work/Stay at home	0

    d. 365 days / year (made up of a higher number of shorter weekday trips and a smaller number of longer weekend trips, as noted by Mr Farrelly)

2. This calculation results in 26 million vehicle-kilometres travelled and 6,500 tons CO2-e. I note there is a double impact of both GHG emissions and VKT, with its separate set of effects as I outlined in my evidence-in-chief.

25. The above figure does not include travel generated by the businesses and school, electricity use from 850 homes (539 tons CO2-e, using the same calculations provided in Mr Farrelly's evidence), electricity use from the businesses and school, emissions from construction, or the landscaping and maintenance of homes and infrastructure across the 156-hectare site. I thus consider my GHG emissions above to be very conservative.

26. Further, while converting the land from agricultural to residential use will remove GHG emissions at this site, I understand the market for dairy products remains unaffected by the Plan Change and new farmland could be added elsewhere in New Zealand or abroad to meet that demand (which means the reduction in GHG emissions calculated by Mr Farrelly would not be realised).
27. My colleague, WDC principal planner Mark Buckley, has arrived at a present-day GHG emissions calculation through a different approach and assumptions. While I consider his approach to be more conservative than my approach, both of our calculations are appropriate means to estimate GHG emissions and VKT generation. Regardless of which calculation approach is selected, or even the underlying assumptions on trips generated by the development (their number, length, and destination) or uptake of future trends in travel modes or working behaviour, I consider the cumulative impacts of travel and energy from the proposed Plan Change, based on present-day figures, to remain far in excess of the existing land use. Further, I also note that while equivalent development adjacent to Woodend or Rangiora may be further from Christchurch than Ōhoka, it would be closer to existing key activity centres, "day-to-day" activities, and existing public transport, so I consider development in these areas will likely generate less private vehicle VKT. I also note that many submitters from the Ōhoka area noted to the hearing panel that they already primarily utilise services and retail in Rangiora.

FUTURE TRENDS IN TRAVEL BEHAVIOUR AND IMPACT ON VKT AND GHG EMISSIONS

28. I acknowledge that work-from-home is a growing and substantive trend at many workplaces across New Zealand, but I cannot quantify this beyond personal observation (as post-pandemic research is relatively limited). The most recent edition of the University of Sydney's semi-annual Transport Opinion Survey[7] noted that work-from-home in Australia appears to be stabilising, with 27% of respondents reporting working days from home. However, it is important to note that on average workers are only spending 2.14 days working from home per fortnight, and the vast majority of them still travel on work-from-home days (88%), typically by private motor vehicle. I consider these trends to likely be applicable to New Zealand workers as well, suggesting the influence of work-from-home on VKT and GHG emissions may be fairly limited.
29. Carpooling from the Waimakariri District (e.g., Census data for "passengers" travelling to work) has slowly but consistently dropped from the 2001 Census (4.7%) to the 2018 Census

[7] Institute of Transport and Logistics Studies (March 2023) *Transport Opinion Survey*. University of Sydney Business School.

(3.2%). At the same time, annual Council vehicle occupancy counts taken on Tram Road have remained stable between 2013 and 2018, not indicating any historical uptake of carpooling. While there are many factors that could influence the uptake of carpooling in the future, I consider the travel patterns from last two decades would not support a rapid increase in the future necessary to significantly influence GHG emissions or VKT.

30. Mr Farrelly notes[8] the rapid increase in EVs in New Zealand since 2002. I completely agree with Mr Farrelly that electric vehicles and bicycles will likely be attractive to some of the future residents and the uptake will continue to increase. I also support the proposed requirement that all dwellings in the development are EV-charging ready; I do note that cost of an EV plug is on average, about 4% of the cost of the cheapest EVs available in New Zealand so would not expect this to influence EV uptake within the development. I consider the experience of the larger market in Australia to support my original conclusions – while EV sales have effectively doubled each year for the past two years, they still make up less than 0.5% of the Australian light vehicle fleet[9]. While I do not have the background or expertise to project the magnitude of such an uptake, these modes are used by a very small portion of the market at present and would require a massive increase in new sales to *overtake* traditional vehicle use in the market and have any noticeable effect on GHG emissions or VKT.
31. Norway's parliament started active support of EV uptake in 1990 through the first financial incentives. By late last year, after almost 33 years, plug-in electric vehicles made up 25% of the on-road fleet. This is newsworthy because analysts at McKinsey[10] considered it a "critical mass" and Norway is the only country to have achieved this thus far. I note that a 25% reduction in internal-combustion vehicles in Ōhoka, if (or when) we are able to achieve this, still would be far greater than the GHG emissions of the present dairy farm, using any assumptions. It also would represent a substantial increase in VKT, with the wide variety of associated traffic-related effects, as I've noted previously.
32. Finally, as I discuss in later sections, I still do not consider that public transport or active transport will generate sufficient mode share for travel from the proposed development to have any impact on GHG emissions or VKT.

[8] Evidence of Paul Farrelly, paragraphs 101-106
[9] Electric Vehicle Council (February 2023) *Australian Electric Vehicle Industry Recap 2022*.
[10] Hertzke, P. et al (May 2018). "*The global electric-vehicle market is amped up and on the rise*". McKinsey & Company.

33. Mr Farrelly bases his conclusion[11] that the Plan Change "supports a reduction in GHG emissions" on a calculation of existing GHG emissions and a qualitative discussion of the potential measures within the development that could mitigate new emissions arising from the development. As concluded above in my quantitative discussion, I consider that the transport-related GHG emissions from the development, based on present-day evidence, to be far in excess of the existing agricultural GHG emissions from the site, regardless of the assumptions made. I consider that the magnitude of these GHG emissions results directly from the distance between the Plan Change area and major urban destinations, the requirement to travel for services, and opportunities not likely to be available in Ōhoka, and the resulting private motor vehicle generation. I consider it unacceptable to ignore the creation of new GHG emissions (from new construction, energy use, as well as my calculations on transport) and claim minor reductions when evaluating whether the Plan Change will support a reduction in GHG emissions.
34. Finally, I note that while engineers are not futurists; one could consider our long-range modelling, network planning, and input into land use as the profession's best guess for a future we will need to respond to. With that context, I note that the regional traffic models for Christchurch have considered work-from-home trends but do not show any resulting significant decrease in future volumes.

VEHICLE-KILOMETRES TRAVELLED

35. In my evidence-in-chief, I noted that I was concerned about the lack of a quantitative evaluation of new VKT generated by the Plan Change and the effects on Council's obligation to reduce it. In response to my concerns, Mr Fuller[12] "acknowledge[s] that the site is some distance from employment centres, high schools and larger retail areas when compared to locations such as Rangiora and Kaiapoi." Mr Walsh[13] notes "VKT may increase because of the proposal, [but] it is difficult to determine by how much." Mr Milner[14] says that "development of the PC31 site will likely increase VKT, any new development will generate travel, so that is to be expected." Mr Farrelly[15] concludes "reducing VKT is a challenge experienced across New Zealand and is not a challenge that is not unique to this application." I remain concerned about the effects of VKT. The applicant's responses have been uniformly unhelpful in explaining or providing a basis for assessing these effects.

[11] Summary of evidence of Paul Farrelly, paragraph 17, and opening legal submission, paragraph 60
[12] Evidence of Nicholas Fuller, paragraph 76
[13] Evidence of Tim Walsh, paragraph 171
[14] Evidence of Simon Milner, paragraph 97
[15] Summary of evidence of Paul Farrelly, paragraph 21

36. I note that local government must have regard to the effects of climate change[16] and, more specifically the Emissions Reduction Plan[17] when changing a District Plan. To assess the transport effects, I have made certain assumptions around future travel behaviour, and have done so based on the specific details and assumptions made by Mr Fuller in the transport assessment and his evidence. In my experience, standard procedures for a plan change transport assessment include trip generation, which is effectively an assumption of VKT. As noted above in point 24, I have conservatively calculated that the Plan Change would contribute an additional 26 million VKT to the network when it reaches full residential build-out. I acknowledge that the Plan Change includes some minor mitigation measures (as discussed above in point 21, where measures to reduce GHG emissions will, for the most part, also reduce VKT, with the exception of EVs). However, as I have discussed in my evidence-in-chief, I consider that this substantial generation of new private vehicle VKT, in direct opposition to the Emissions Reduction Plan, will result because the Plan Change site is so far removed from urban centres, most "day-to-day" activities, and the existing transport (i.e., by active and public transport as well as private motor vehicle) network. I want to reiterate this last point to note that future development adjacent to Woodend or Rangiora may be further from Christchurch than Ōhoka, but is clearly closer to existing key activity centres, “day-to-day” activities, and existing public transport, so I consider development in these areas will likely generate less private vehicle VKT.
37. In summary, I remain concerned that the proposed Plan Change is likely to generate more GHG emissions than the existing land use. The magnitude of GHG emissions from annual electricity and vehicle use of 850 households using present-day data is far greater than the GHG emissions Mr Farrelly calculated for the existing dairy farm. While I agree with the mitigating factors outlined by Mr Farrelly, I am not convinced that the trends he hypothesised for the future will be great enough to mitigate the high present-day GHG emissions from the transport sector. Finally, the private motor vehicle use of 850 households will generate entirely new VKT that, independent from GHG emissions, contribute to network congestion and crash risk. I am aware that private motor vehicle use is one of the highest-cost means to access the transport network and is an economic barrier for a portion of the region’s population.

[16] Resource Management Act, s.7(i)
[17] Ministry for the Environment (2022) National adaptation plan and emissions reduction plan: Resource Management Act 1991 guidance note. Wellington: Ministry for the Environment.

PUBLIC TRANSPORT

38. I note the hearing panel has instructed the relevant experts to conference on public transport matters and I am scheduled to attend this conference.
39. In my evidence-in-chief, I noted that the proposed site has no existing public transport service and a very limited non-motorised network (just the shared use path to Ōhoka School). I also considered that provision of new public transport service and non-motorised network improvements was not realistic.
40. Mr Milner agrees that existing services are not appropriate given the low demand from the development, distance from existing service, and varied all day demand. Instead, Mr Milner proposes[18] two potential services could be viable to service the Plan Change area - an extension of the existing 92 peak hour express service and a new on-demand service. He also notes that the peak hour express service would not meet the all-day demands of the development so could not be a standalone service offering. For the on-demand service, he proposes combining Ōhoka with the west sides of Rangiora and Kaiapoi to mitigate the lack of "stand alone" demand in Ōhoka.
41. I have mapped out existing urban area bus stops and 400m radius walking catchments in Attachment B to show where the urban areas within the district are lacking public transport service. I acknowledge that the west sides of Rangiora and Kaiapoi are not well served by existing public transport but the larger areas lacking service are on the east side of Rangiora, northeast side of Kaiapoi, and large portions of Woodend / Ravenswood / Pegasus.
42. Regardless, combining Ōhoka with Rangiora and Kaiapoi requires any on-demand service to traverse long distances between isolated suburbs, which does not match any of the recent on-demand trials across NZ. I note recent trials in Auckland (Devonport and Papakura), Hastings, and Wellington (Tawa) had chiefly urban service areas approximately 4-5km across, while the MyWay service in Timaru does cover the urban Timaru area which is about 8km at its longest distance. For reference, a trip from west Rangiora to Kaiapoi via Ōhoka is about 18-20km long (via the Plaskett Road bridge), with more than half of the distance in rural areas with almost no public transport demand.
43. Finally, there is little demand for residents of west Rangiora and west Kaiapoi to go to Ōhoka; rather on-demand service in those towns would likely go to town centres, shopping, and bus stops (i.e., the opposite direction from Ōhoka). Thus, I consider that these residents gain limited benefit from an on-demand service that includes Ōhoka in their service areas, in fact it would be a disbenefit from longer trip times or wait times for distant vehicles.

[18] Evidence of Simon Milner, paragraphs 60-62, 67-72

44. Mr Milner estimates[19] that new development may provide at least $200,000 in passenger transport funding under urban rate subsidies. I note the total based on 850 households and the present Waimakariri urban rate of $197 is $167,450 but acknowledge that there could be additional funding from future businesses within the Plan Change. I understand that operating costs of other recent on-demand service trials in New Zealand range from $650,000 (Devonport) [20] to $743,000 (Tawa) [21] to $2.7M (Timaru)[22].
45. Mr Milner estimates the operating costs of the peak hour service to be around $100,000 annually but does not have an estimate of operating costs for new on-demand service. I understand based on trials in Timaru, Wellington, and Auckland that on-demand public transport service has substantial on-going operating expenses, requiring per-passenger subsidies of 2x to 7x greater than traditional bus services. I also understand that these ongoing operational expenses are based in a large part on the cost of labour (e.g., the bus drivers), so reducing vehicle sizes has a limited effect on reducing operating expenses. Given the operating costs and subsidies required in other New Zealand on-demand trials, and the public transport funding that could potentially be raised through rates in the Plan Change area, I consider that there will likely be substantial unfunded and continuing costs to run an on-demand service.
46. Mr Milner draws the following conclusions:

> *If PC31 is approved, it will require some form of public transport to be present from the outset to provide new residents with this option from the beginning of their occupation – otherwise a car dominated culture is reinforced from the outset and that is hard to change at a later date.*[23]
>
> *If PC31 is approved, it needs to have public transport services to support it. Whilst this is not currently in any plans or future funding programmes, this is because PC31 does not exist and the current Ōhoka community is not of a scale or density that would be able to support any form of viable all-day public transport operation.*[24]

47. I fully agree with Mr Milner and consider that *because the current Ōhoka community is not of a scale or density that would be able to support any form of viable all-day public transport*, it is not suitable to locate new higher-density residential development here, isolated from

[19] Summary of evidence of Simon Milner, paragraph 14
[20] Cost key reason for AT Local axing (10 February 2021). *Devonport Flagstaff*
[21] Greater Wellington (22 June 2023) *Transport Committee Meeting.* Retrieved from https://www.gw.govt.nz/assets/Documents/2023/06/Transport-Committee-22-June-2023-order-paper.pdf
[22] Leask, J. (20 June 2023). Do it MyWay: Mayor advocates on-demand bus. *Otago Daily Times*
[23] Evidence of Simon Milner, paragraph 94
[24] Summary of evidence of Simon Milner, paragraph 29

existing public transport and urban areas with public transport demand. Finally, I also note the development-generated funding and ridership noted above is based on full build-out, which I understand is envisioned to take ten years. I want to reiterate Mr Milner's point above that if the Plan Change is approved, public transport service has to be present from the onset to minimise reinforcing private vehicles as the only means of transport, which may be challenging with limited funding and ridership in the early years of development.

ACTIVE TRANSPORT

48. I have noted that broader cycling connectivity was raised in the hearing as well as by Mr Fuller and Mr Walsh in their evidence. As noted in my evidence-in-chief, I had concerns that no safe walking/cycling links exist between the Plan Change and the rest of the network, and even were such links to be constructed, the distances between the Plan Change site and urban centres was too great for cycling to be a realistic alternative mode to private motor vehicle use.
49. Mr Fuller notes[25] that the Plan Change site is located adjacent to proposed links in the Walking and Cycling Network Plan. While Council has adopted this long-term vision for walking and cycling, all available funds for the next decade have already been committed and no connections to the Plan Change area are included. I have included the adopted long-term full network and committed 10-year programme in Attachment A. The demand for funding is such that I consider it will be several decades before any connections can be constructed to the Plan Change site. Given discussions on development contributions (below in points 62 to 64), the Plan Change will only generate a small amount of additional funding, so it is not realistic to expect Council-funded connections within a reasonable timeframe. Finally, similar to concerns raised by Mr Milner above in point 46, I consider it to be important to have walking and cycling as viable modes from the onset of development to minimise reinforcing a car-dominated culture.
50. I recognise that specific details of cycle path design will be addressed in later stages of any approved development, but the quality of cycling links was raised in the hearing and by Messrs Metherell and Fuller. While Mr Fuller does not expect[26] that cycling links to the Plan Change area should be sealed "given the nature of the area," I note that Waka Kotahi's best practices in *Cycle Network Guidance*[27] call out unsealed trails as not being appropriate for

[25] Evidence of Nicholas Fuller, paragraphs 58 and 60
[26] Summary of evidence of Nicholas Fuller, paragraph 45
[27] NZ Transport Agency, Cycle Network Guidance, Trails, accessed 8 August 2023, https://www.nzta.govt.nz/walking-cycling-and-public-transport/cycling/cycling-standards-and-guidance/cycling-network-guidance/designing-a-cycle-facility/between-intersections/trails/

all-ages-all-abilities (the target audience for general cycling) and also not typically included in urban cycle networks.

51. Regardless of whether future provision of safe walking and cycling connections can be arranged above the Council's existing commitments, my concerns around the distance between the Plan Change site and key activity centres remain the same, and would appear to be in alignment with the applicant's conclusions. Mr Fuller acknowledges[28] that this distance is sufficiently far that "it is unlikely that many residents would choose to cycle for purposes other than recreation," and Mr Farrelly considers[29] that only "some New Zealanders would be prepared to travel further than 2.8km to shop, using motorised forms of non-road transport." Mr Walsh considers[30] that the Plan Change "will benefit relatively few existing/future residents in terms commuter cycling given the distance to the larger centres," with an outcome that "rates of commuter cycling will be lower compared to locations closer to the larger urban centres."
52. I remain concerned that the separation between the Plan Change site and the district's urban centres is great enough to discourage travel by walking or cycling, regardless of the quality of links bridging this separation. If private motor vehicles are left as the only viable mode, I consider that the Plan Change will not be able to give effect to the NPS-UD's policies to provide for good accessibility, health, safety, and reductions in GHG (as discussed in my evidence-in-chief).

CAPACITY ISSUES ON EXISTING ROADING NETWORK

53. I note that appropriate levels of service for traffic operations were discussed at the hearing. Mr Fuller considers[31] that the levels of service (LOS) for the two Tram Road intersections (with approaches operating at LOS E during peak periods) as acceptable. While the Council does not have established traffic LOS targets, I note that the Canterbury Regional Land Transport Plan[32] has set LOS C as the desired minimum level of service on the regional strategic road network. LOS C or D is most commonly used as a threshold for acceptable operations by road controlling authorities in New Zealand and abroad, due in part to the increase in vehicle interactions and unstable flow as volumes approach LOS E. Thus, I do not consider LOS E to be an acceptable level of service and expect that it would create material impacts to the road network users.

[28] Evidence of Nicholas Fuller, paragraphs 61, 71
[29] Evidence of Paul Farrelly, paragraph 153
[30] Evidence of Tim Walsh, paragraphs 160 and 164
[31] Evidence of Nicholas Fuller, paragraphs 22-23
[32] Canterbury Regional Council (July 2021) *Canterbury Regional Land Transport Plan*, p. 81

54. As discussed previously, Council has plans to upgrade the intersection of Tram Road / McHughs Road / Bradleys Road, which will see additional traffic generated by the Plan Change. The intersection of Tram Road / Whites Road was noted by Mr Fuller to have approaches operating at LOS E. My concerns from the evidence-in-chief around the modelling of delay at this intersection remain unaddressed, but regardless of the outputs of intersection modelling, I consider that this intersection will require improvements to address capacity constraints (independent of planned safety-related improvements in the LTP). I also consider that additional traffic from the full build-out of the proposed Plan Change could potentially impact intersection operations to the point that a roundabout is required (which would have significant land and construction costs) as the intersection upgrade.
55. I have reviewed the high-level traffic modelling for the intersection of Mill Road and Ohoka Road; based on this evidence I am now more comfortable that this intersection will operate within a desired level of service. I acknowledge comments from Mr Metherell[33] for the Waimakariri District Council as a submitter that the transport assessment could underestimate the demand going to/from Rangiora via Threlkelds Road and Plaskett Road, based on the potential traffic distribution in the regional traffic model (CTM). I also recognise that Mr Fuller has modelled both Threlkelds Road / Flaxton Road and Mill Road / Ohoka Road intersections. I have not analysed the models behind the results Mr Fuller included in his summary of evidence at this time. However, based on present-day traffic volumes, I consider that the intersections included in these routes likely will not require capacity-based improvements.
56. In summary, as discussed in my evidence-in-chief, I still consider that the additional traffic generated by the Plan Change will necessitate capacity-based improvements at the Tram Road / Bradleys Road and Tram Road / Whites Road intersections, as well as the Tram Road carriageway west of Jacksons Road.

ROADING SAFETY ISSUES ON EXISTING NETWORK

57. While traffic modelling is one way to ascertain effects of new traffic on existing traffic operations (which I group as road or intersection capacity improvements), these models do not consider the effects on road safety (which I group as safety improvements). Traffic operations is evaluated in terms of capacity and has thresholds and quantitative-based levels of service. Road safety is evaluated in terms of risk, so while additional traffic does not push over a quantitative threshold, it increases the risk of a conflict occurring.

[33] Evidence of Andrew Metherell, paragraph 42

58. Mr Fuller has said that he is unaware of specific road safety concerns exacerbated by increased VKT[34]. I note that the Safe System Assessment Framework (developed by Austroads and adopted by Waka Kotahi to achieve the Road to Zero safety strategy) ties road volume directly to road user exposure, one of the three elements that define crash risk. I am also aware of substantial research undertaken by Waka Kotahi to develop rural road crash prediction models[35,36], which also directly link traffic volume with crash risk. In other words, more traffic on a road leads to a higher potential for a crash occurring, or a simple road user error compounding into a crash. In the context of the rural road network in which the Plan Change is proposed, increased VKT would exacerbate this risk along all sections (i.e., intersections and roadways in between).

59. Mr Fuller[37] and Mr Walsh[38] both make reference to partial funding (Council-only) for safety-related intersection improvements along Tram Road. In 2020, a Council report[39] identified $29.3M ($34.2M in 2023 dollars) worth of safety improvements to intersections and carriageway along Tram Road. Of this total, the Council identified funding for $12M ($13.6M in 2023 dollars) worth of improvements in the 2021 Long Term Plan (LTP). No carriageway widening has been funded, but committed improvements include a new roundabout at Bradleys Road / McHughs Road and intersection minor safety upgrades as follows:

Intersection	20-Year Crash Data		Risk Band	Funded Improvement
	All crashes	Fatal + Serious Inj.		
Tram Rd - McHughs Rd - Bradleys Rd	13	3	High	Roundabout
Tram Rd - Whites Rd	4	2	High	Widening‡
Tram Rd - Edmunds Rd - Jacksons Rd	0	0	High	None
Tram Rd - Raddens Rd	1	0	*Not rated*	Widening
Tram Rd - Woods Rd	0	0	*Not rated*	None
Tram Rd - Jeffs Drain Rd	0	0	*Not rated*	None
Tram Rd - Gardiners Rd - Burgesses Rd	1	0	Low	Widening
Tram Rd - South Eyre Rd - Giles Rd	17	4	High	Interim Signs†
Tram Rd - Heywards Rd	4	1	*Not rated*	Widening
Tram Rd - Island Rd - Greigs Rd	12	3	Medium High	Interim Signs†
Note † - This interim improvement is a smaller-scale intervention before a full upgrade can be programmed Note ‡ - The evaluation of the Tram Rd / Whites Rd intersection did not include any effects of the Plan Change; funded widening is for left turn lanes on Tram Rd only				

[34] Evidence of Nicholas Fuller, paragraph 78

[35] Turner, S, R Singh and G Nates (2012) *The next generation of rural road crash prediction models: final report*. NZ Transport Agency research report 509. 98pp.

[36] NZ Transport Agency (June 2018) *Crash Estimation Compendium*. First edition, Amendment 1

[37] Evidence of Nicholas Fuller, paragraphs 35, 66

[38] Evidence of Tim Walsh, paragraph 165

[39] Waimakariri District Council, Utilities and Roading Committee, 17 November 2020 agenda, from p. 49.

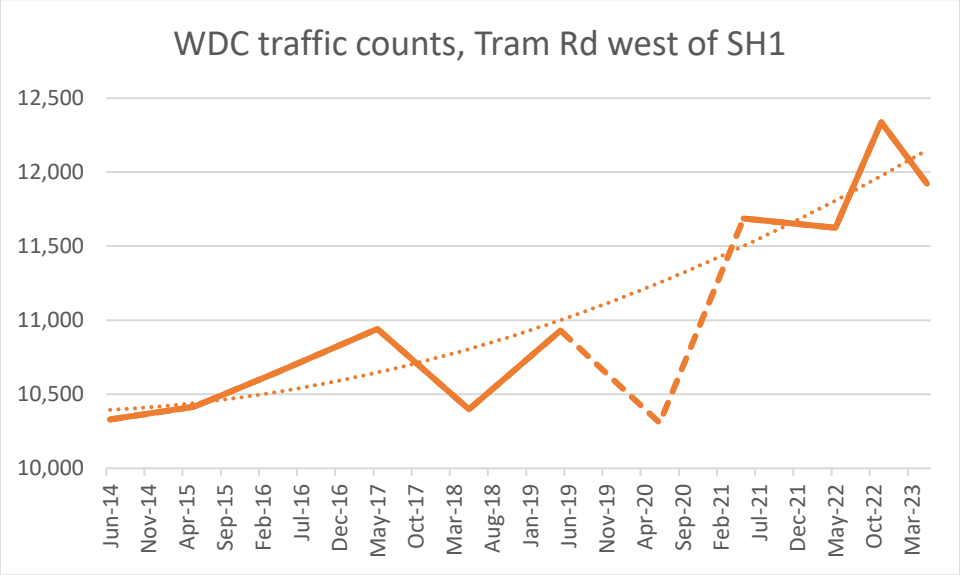
60. Of the five intersections with High or Medium High risk profiles, only one (Tram Road / McHughs Road / Bradleys Road) has committed LTP funding for the full safety mitigation. The Tram Road / Whites Road intersection has committed LTP funding for turn lanes on Tram Road only and does not account for any increased risks from Plan Change-generated traffic. The other three intersections have limited or no safety mitigation funded in the LTP.
61. I note that none of the capacity-based improvements identified in point 56 are in the LTP.
62. Mr Fuller notes[40] that any roading improvements can be accommodated through "the usual development contributions process." While this is true at a conceptual level, in reality actual development contributions are limited to projects identified in the LTP and any such funding is typically limited to the proportion of traffic generated by the development relative to existing traffic.
63. In this instance almost no upgrades have been funded in the LTP for this area (because Council has not previously considered it suitable for development of this magnitude). Should the safety and capacity improvements above be considered for inclusion in the LTP prior to the subdivision resource consent for the site, the Council would still be responsible for finding funding for a substantial portion of the cost.
64. Given the magnitude of unfunded costs for both capacity and safety-related improvements, I consider there to be three likely outcomes moving forward. First, the applicant could offer to pay for the unfunded projects. Second, the unfunded projects could be proposed for addition into the LTP, which would go out to public consultation, giving residents the opportunity to provide feedback before Council makes the ultimate decision. If they choose to add the projects, then ratepayers will be required to pay a substantial portion of the new costs (which would likely be costed in the millions of dollars) to mitigate these effects. The third outcome would be that the safety and capacity projects are not added to the LTP, in which case all drivers (both existing and future Plan Change residents) will have higher exposure to crash risk on a daily basis.

EFFECTS AT TRAM ROAD MOTORWAY INTERCHANGE

65. In response to comments at the hearing on the Tram Road / SH1 motorway interchange, I have considered Mr Fuller's modelling and Mr Metherell's concerns about the assessment.
66. Mr Fuller has considered further growth from future development west of Tram Road in his summary of evidence, based on areas identified in Swannanoa and Oxford[41]. I note that traffic on Tram Rd west of the motorway has been increasing on average at 1.9% per annum

[40] Evidence of Nicholas Fuller, paragraphs 38-39, 68
[41] Summary of evidence of Nicholas Fuller, paragraphs 19-22

over the last decade, a rate that itself has increased over that time period, as shown below. While Mr Fuller has captured some of the future development potential, I note he missed the Mandeville area, which could see reduced lot sizes and increased development[42] if the proposed District Plan is made operative without major changes. As well, several areas within Mandeville are included in submissions on the proposed District Plan for even more intensification. I consider that there is a high likelihood that background traffic volumes on Tram Road will continue to increase beyond Mr Fuller's assumptions.



67. In the hearing, Mr Fuller mentioned that he used a relatively simple intersection model to evaluate the traffic operations at the two Tram Road intersections. As noted by Mr Metherell[43], the challenge in having two intersections close together is modelling overlapping effects from one to the other. Mr Fuller acknowledged that the morning peak hour model showed a 112m AM average queue back up from the east intersection through the west intersection (there is approximately 80m between intersections). While I have not undertaken a substantive review of Mr Fuller's modelling, I was unable to see how queues from the east intersection were accounted for in modelling of the west intersection. The more detailed microsimulation modelling that Mr Metherell referenced would be able to provide a more precise simulation of how the two intersections impact one another.
68. The consequences of a queue blocking the west intersection could be severe as this would block offramp traffic from turning right onto eastbound Tram Road. Noting that the morning peak period on average is expected to have queues blocking the west intersection, I

[42] The proposed District Plan expands Residential 4A zoning across the bulk of Mandeville, reducing minimum section sizes to 2500m^2

[43] Evidence of Andrew Metherell, paragraph 50

would be concerned that any above-average blockage could lead to a queue forming down the off-ramp, which could back stopped traffic onto the high-speed motorway lanes.

69. I note Tram Road is identified on the Council's Walking and Cycling Network Plan and thus would require space for cyclists and pedestrians. Unfortunately, none of the options presented by Mr Fuller in his summary safely provide for pedestrians and cyclists based on current practice. Shared-use paths are a minimum of 2.5m wide to minimise conflicts between users, while on-road cycle lanes are generally not acceptable to accommodate cyclists of all abilities. I would further consider that use of non-separated shoulder space through a motorway interchange for cyclist use leads to unacceptable risks of conflicts with ramp traffic. Thus, I am concerned that any option to put an additional lane onto the Tram Road overpass will require structural changes to widen the deck.
70. As I do not have first-hand knowledge of the condition of the Tram Road overpass, I cannot comment on its ability to accommodate an additional lane or clip-on structure (as Mr Fuller has suggested[44]). I note that the age of the bridge (more than fifty years old) may make any structural works challenging.
71. I consider that the proposed restricted discretionary rule[45] to assess interchange upgrades when more than 250 allotments are proposed has some merit as a trigger. I note that Waka Kotahi has full jurisdiction over the overpass and interchange. I cannot comment on whether they would consider changes to either intersection or the overpass, or the timeframe to commence any construction. Further, Waka Kotahi is not a party to this Plan Change so I do not have their views on the proposed restricted discretionary rule. I note Waka Kotahi is very sensitive to motorway interchange operations and safety.
72. Overall, I consider that there are significant varied risks to assuming capacity improvements can be undertaken at the SH1 motorway interchange, some beyond control of the Plan Change parties (e.g., third party approval and construction). This has the potential consequence of capping development within the Plan Change area to 250 sections.
73. In order to have sufficient certainty that the intersection upgrade could be undertaken, the applicant would need to liaise with Waka Kotahi to get their views on the proposal and potential mitigations.

[44] Evidence of Nicholas Fuller, paragraph 28
[45] Evidence of Tim Walsh, paragraph 103.17

PROPOSED ROADING NETWORK

74. Based on the detail provided in the applicant's evidence (chiefly the indicative walking & cycling network[46] in Mr Falconer's urban design evidence), I accept the Design Report's proposed walking and cycling networks are appropriate for the development as well as the interface (or lack thereof) on the southern boundary of the ODP area.
75. I note that the revised site includes provision for the farmers market to move within the development. This would provide benefit as the existing operation at the Ōhoka Domain has experienced issues with accessibility, parking, and congestion. I am presently involved in a Council-led effort to work with the market and Ōhoka residents to address these issues and continue to allow the market to thrive.
76. I consider that the proposed increase in Residential 2 land use with increased residential density and tighter street grid (as noted in Mr Falconer's urban design report) may help to influence a lower speed environment. Reducing direct access to Bradleys and Whites Road will also reduce the risk of conflicts on the existing road network.
77. However, the site-wide roading cross-sections in the same design report still lack side friction features (e.g., kerbs, on-street parking) that have been shown to moderate speeds in urban areas. I also consider roads in the Residential 4a zoning to still have the higher peri-urban crash risk I discussed in my evidence-in-chief.
78. Mr Fuller suggests[47] speed thresholds to manage excessive speed. I agree that speed thresholds play an important role in communicating *speed changes* and as such, the Council has used them often where the speed limit reduces, such as when entering an urban area. However, their impact on driver speeds is limited to the immediate threshold vicinity and my experience suggests that installing speed thresholds at speed change locations will not result in area-wide speed reductions if the surrounding area still has a high-speed environment.
79. Mr Fuller[48] and Mr Walsh[49] both rely on the Council's future Speed Management Plan, as a means to reduce speeds on the adjacent roads and reduce the adverse safety effects of the development – increased traffic, substandard intersection spacing, and peri-urban roading environment. The Speed Management Plan is a mandated requirement of the Setting of Speed Limits Rule 2022 and has not yet been released for public consultation. I have led the development of the Plan over the past eight months, and I consider it highly unlikely that the speed limits in the Ōhoka area or on the primary roads used to access major urban centres

[46] Evidence of Garth Falconer, page 39
[47] Evidence of Nicholas Fuller, paragraphs 42-43, 91
[48] Evidence of Nicholas Fuller, paragraphs 41, 48, 67
[49] Evidence of Tim Walsh, paragraph 156

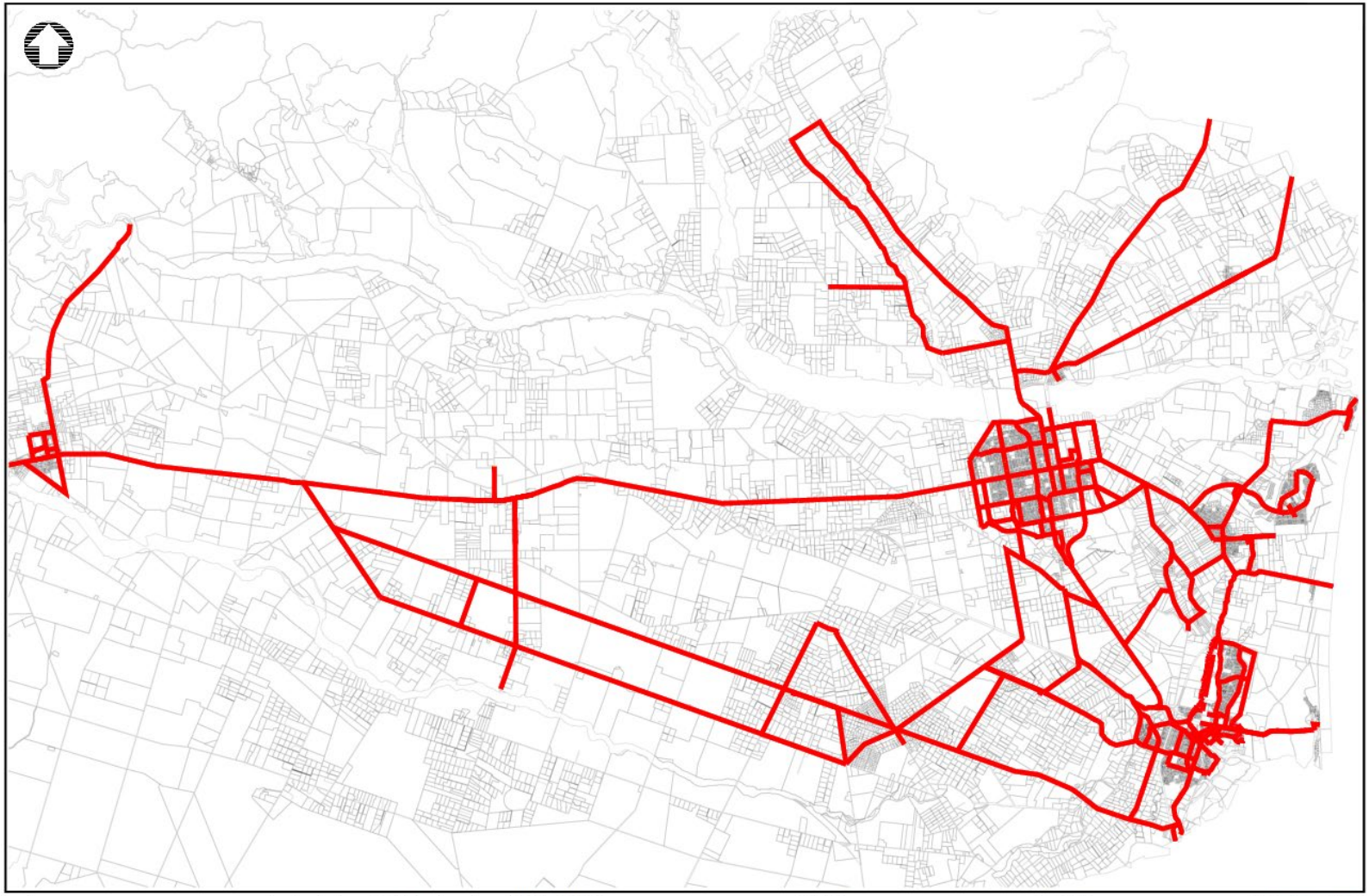
will be modified within the foreseeable future. As such, the safety improvements expected by Mr Fuller and Mr Walsh are not likely to eventuate in the short to medium term.

80. Regardless of any changes that may or may not result from the independent process of the Speed Management Plan, my concerns from my evidence-in-chief remain. The Plan Change is proposing a peri-urban roading environment with a more urban-scale driveway frequency and rural-style road cross-sections lacking “side friction” to slow traffic, which I consider is a combination that will likely lead to higher speeds and higher conflict frequency.

CONCLUSION

81. I have reviewed the evidence from the applicant and submitters and consider that placement of a large urban residential development in the rural environment of Ōhoka will:
    a. Exacerbate congestion and safety risks on the existing roading network;
    b. Result in private motor vehicle-dominated travel patterns due to the lack of appeal of walking, cycling, or public transport;
    c. Likely increase GHG emissions over the life of the development relative to existing land use; and
    d. Certainly increase vehicle-kilometres travelled relative to existing land use.
82. I note that the adverse effects above may not fully eventuate if the proposed Plan Change is stopped at 250 allotments by a lack of Waka Kotahi approval for improvements to the Tram Road interchange.
83. Per Objective 1 of the NPS-UD, "well-functioning urban environments" should " provide for...social, economic, and cultural wellbeing, and for...health and safety, **now** [my emphasis] and into the future." I consider it inappropriate to site this development in an area that does not provide a safe and well-functioning transport network for all users now without sufficient certainty that it may do so in the future.

ATTACHMENT A1: ADOPTED WALKING AND CYCLING NETWORK PLAN



ATTACHMENT A2: WALKING AND CYCLING NETWORK 10-YEAR FUNDED PROGRAMME

REV	REVISION DETAILS	DRN	CHK	APP	DATE
A	FOR INFORMATION	AMC	—	—	27/07/2023

SURVEYED			PROJECT No PD001583
DRAWN			CON No
DRAWING CHKD			SCALE (A3) NOT TO SCALE
DESIGNED			DATUM ORIGIN
DESIGNED CHKD			HORIZONTAL NZTM (GD2000
APPROVED			VERTICAL

WAIMAKARIRI DISTRICT COUNCIL

PROJECT: WALKING AND CYCLING NETWORK PLAN

SHEET TITLE: 10 YEAR PROGRAMME OVERVIEW PLAN

FOR INFORMATION
NOT FOR CONSTRUCTION

DRAWING	
	4297
SHEET	REVISION
00	A

ATTACHMENT B: EXISTING BUS STOPS AND CATCHMENTS (400m RADII)