Before an Independent Hearings Panel
Appointed by Waimakariri District Council

under: the Resource Management Act 1991

in the matter of: Submissions and further submissions on the Proposed Waimakariri District Plan

and: Hearing Stream 12: Rezoning requests (larger scale)

and: **Carter Group Property Limited**
(Submitter 237)

and: **Rolleston Industrial Developments Limited**
(Submitter 160)

Statement of evidence of Paul Farrelly (Greenhouse Gas) on behalf of Carter Group Limited and Rolleston Industrial Developments Limited

Dated: 5 March 2024

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STATEMENT OF EVIDENCE OF PAUL FARRELLY ON BEHALF OF CARTER GROUP LIMITED AND ROLLESTON INDUSTRIAL DEVELOPMENTS LIMITED

INTRODUCTION

1 My full name is Paul Michael Farrelly.

2 I have a BE Civil Engineering (Hons) from the University of Canterbury. I started my career as a traffic and road safety engineer and have subsequently had over 25 years commercial experience working across a number of industries. Over the past 10 years I have worked in the energy and carbon field.

3 For the past four years I have worked for Lumen, an engineering consultancy, as a Principal Consultant in their dedicated energy and carbon team. In this capacity I have developed greenhouse gas (*GHG*) inventories for a significant number of organisations, in a broad range of sectors. This includes infrastructure companies, an airport, several electricity distribution businesses, manufacturers, consulting firms and retail businesses. Through this work, I am well versed in calculating GHG emissions. I have previously provided GHG evidence for several plan changes in the Selwyn District Council area.

4 I am familiar with the submitters' request to rezone land bound by Mill Road, Whites Road and Bradleys Road (*the Site*).

5 I was involved in private plan change 31 (*PC31*) to rezone this land under the operative District Plan.

CODE OF CONDUCT

6 Although this is not an Environment Court hearing, I note that in preparing my evidence I have reviewed the Code of Conduct for Expert Witnesses contained in Part 9 of the Environment Court Practice Note 2023. I have complied with it in preparing my evidence. I confirm that the issues addressed in this statement of evidence are within my area of expertise, except where relying on the opinion or evidence of other witnesses. I have not omitted to consider material facts known to me that might alter or detract from the opinions expressed.

SCOPE OF EVIDENCE

7 My evidence will address:

7.1 What GHG emissions are and the National Policy Statement on Urban Development 2020 *(NPS-UD)* framework for considering GHG emissions;

7.2 Overview of the rezoning request relevant to my evidence;

7.3 GHG emissions from the current land use of the Site;

7.4 Anticipated GHG emissions from the development and land use enabled by the rezoning request.

8 In preparing my evidence, I have reviewed:

8.1 The evidence of **Mr Simon Milner**, **Mr Chris Jones** and **Mr Nick Fuller**;

8.2 The proposed provisions of the rezoning request;

8.3 Further submissions relevant to my expertise relating to the rezoning of the Site; and

8.4 The relevant documents from PC31.

SUMMARY OF EVIDENCE

9 I consider that the rezoning request development contributes to a well-functioning urban environment that 'supports a reduction in GHG emissions' (as per NPS-UD Policy 1(e)) due to both the removal of dairying activity from the land, and the practical steps being undertaken by the submitters to support a reduction in emissions arising from the development, including:

9.1 Tree planting throughout the Site;

9.2 Prohibition of LPG other than for barbeques, requirement for solar generation in residential units;

9.3 The provision of off-road pathways throughout the development, to support active (non-vehicular) travel;

9.4 The allowance for a school to be built within the Site;

9.5 The provision of a commercial area within the Site to meet some of the residents' day-to-day needs (reducing travel requirements);

9.6 Provision of a public transport solution, as set out in **Mr Milner's** evidence; and

9.7 The specification of a requirement that dwellings are EV charging ready, to support a faster uptake of EVs within the Site.

INTRODUCTION TO GREENHOUSE GASES

10 There are several gases that contribute to the problem of global warming, the most prevalent of these being carbon dioxide (CO_2), methane and nitrous oxide.

11 Each of these gases have differing abilities to trap extra heat in the atmosphere, and it is the trapping of this heat that leads to global warming.

12 When evaluating GHG emissions, it is useful to have a common measure to allow comparisons between gases. As CO_2 is by far the most prevalent of the GHGs, it is standard practice when measuring emissions to determine the level of each gas emitted, and then convert these emissions into their carbon dioxide equivalent, or CO_2-e.

13 The global warming potential (*GWP*) of a gas is a measure of its ability to trap extra heat in the atmosphere over time relative to CO_2. This is most often calculated over a 100-year period and is known as the 100-year GWP.

14 The GWP of CO_2 is 1.

15 By comparison, methane is a short-lived GHG but has a GWP that is 28-36 times that of CO_2 over a 100-year time frame. Over a shorter time frame its impact is much more significant, estimated at 84 times that of CO_2 over a 20-year period.

16 New Zealand is committed to reducing GHG emissions substantially in the coming years. The Climate Change Response (Zero Carbon) Amendment Act 2019 (Zero Carbon Act) sets in legislation the following targets for the country:

16.1 reduce net emissions of all GHGs (except biogenic methane) to zero by 2050; and

16.2 reduce emissions of biogenic methane to 24–47 per cent below 2017 levels by 2050, including to 10 per cent below 2017 levels by 2030.

17 In response to the Zero Carbon Act, the Government has developed a comprehensive Emissions Reduction Plan (ERP), which was released on 16th May 2022. This sets out how New Zealand will achieve emissions reduction targets and identifies a comprehensive set of actions and additional targets that will support achievement of the overall goals.

18 The ERP has been heavily guided by advice provided by the climate change commission, in their Ināia tonu nei: a low emissions future for Aotearoa[1] report (June 2021).

19 Key strategies for achieving the reduction targets include:

[1] https://www.climatecommission.govt.nz/our-work/advice-to-government-topic/inaia-tonu-nei-a-low-emissions-future-for-aotearoa/

(a) increasing the mix of renewables in our electricity generation network;

(b) conversion of fossil-fuelled industrial, manufacturing, and process heat to low emissions energy (electricity or biomass);

(c) electrification of our vehicle fleet;

(d) increasing the proportion of (personal) travel undertaken using active travel modes and public transport;

(e) reducing freight emissions; and

(f) reducing agricultural emissions, primarily through a mix of lower herd numbers (less dairy cows and sheep/cattle) and some technological innovations. The Climate Change Commission's demonstration pathway specifically shows that a 23% reduction in dairy cows across New Zealand would be required by 2050 (compared to 2021 numbers) for the 2050 target to be achieved.

NATIONAL POLICY STATEMENT ON URBAN DEVELOPMENT 2020

17 The NPS-UD requires planning decisions to contribute to well-functioning urban environments, which are environments that "support reductions in greenhouse gas emissions" (Policy 1(e)).

18 I consider this to be the most relevant policy in respect of GHG when considering rezoning applications in urban areas.

19 New Zealand has a growing population and a critical need to build more affordable housing. This is especially true in the Waimakariri district, one of the fastest growing areas in the country.

20 In this context, my opinion is that Policy 1(e) is not intended to mean that an absolute reduction in greenhouse gas emissions is required. If an absolute reduction were the requirement then it would likely not be feasible to develop any greenfield site, short of prohibiting any private vehicle use.

21 This is because emissions will be incurred during the development phase (building the infrastructure and the housing/commercial buildings), and then during the operational phase of the buildings for their lifetime (primarily due to energy use and travel of residents).

22 An exception might be where a current land-use is particularly carbon-intensive (e.g. industrial production or intensive dairy farming). In this case, a change to residential or commercial use could potentially result in an actual reduction in emissions.

23 Regardless, it is extremely difficult to accurately calculate future GHG emissions arising from a proposed land-use change with any precision given changes (technology, population, behavioural) that could occur in future.

24 Moreover, I do not believe such a calculation is required under the NPS-UD, as the key test is whether a proposed development "supports a reduction in greenhouse gas emissions." This could be by way of ensuring new development is of a form and design which practically takes steps to 'support a reduction in greenhouse gas emissions' such as those being proposed as per paragraphs 9.1 to 9.7.

25 Given this, this evidence does not attempt to make specific calculations about the future emissions of the land-use, and instead we focus on taking a 'big picture' look at how the development impacts on GHGs at a higher level.

OVERVIEW OF ŌHOKA VILLAGE RESIDENTIAL DEVELOPMENT

26 The Site is located at Ōhoka, an inland residential settlement to the north-west of Kaiapoi. Specifically, the Site is bordered by Mill Road, Bradleys Road, and Whites Road.

27 The rezoning request seeks to rezone approximately 156 hectares of land.

28 The rezoning request envisages the development of approximately 850 to 892 dwellings, a school and retirement village, as well as a commercial area providing local convenience goods and services for residents.

29 The proposed Settlement Zone (*SETZ*) occupies roughly two thirds of the plan change area and would accommodate approximately 704 residential allotments. It provides for a variety of lot sizes with the minimum allotment size being 600m^2. The general intent is for smaller properties to be located closer to the proposed LCZ with the density decreasing towards the LLRZ. This is advantageous from a GHG perspective as it means the bulk of residents are located within easy access to the commercial zone, and the public transport hub.

30 The development also contains a pedestrian/cycle network, with good connectivity to the centre of Ōhoka, the proposed commercial zone, and the Ōhoka Domain.

31 The Business-zoned area at Whites Road frontage is intended to form an extension of the existing Ōhoka Village with the provision of a range of small-scale commercial activities and local services to meet the daily needs of locals and visitors including services such as, a general store, bakery, café, hairdresser, pharmacy, etc. There is also an opportunity for work studios and upper-level office spaces,

which would cater for local services such as accountants, lawyers, medical and professional consulting businesses.

32 Measures that will help support the reduction of GHG emissions are proposed[2], including:

32.1 a requirement for additional tree planting on all residential sites;

32.2 additional native planting requirements (15% of site area) on Large Lot Residential sites (*LLRZ*) sites;

32.3 a prohibition on LPG use other than for outdoor barbeque use;

32.4 electric vehicle charging ability required for all residential units;

32.5 solar power generation required for all residential units;

33 These requirements are expressed in the proposed ODP text as being enforceable via a binding legal instrument, such as a developer covenant. A public transport service connecting Ōhoka to Kaiapoi[3] is also proposed which will help support the reduction of GHG emissions.

EMISSIONS FROM EXISTING LAND USE

34 When considering a proposed development's impact on GHG emissions, it is first important to establish the level of emissions arising from the existing use of the land.

35 I visited the area of the Site on 11 June 2023 and I have also read through the Geotechnical assessment, Preliminary Site Investigation and the Landscape and Visual Assessment reports associated with this rezoning request.

36 The land is largely flat, and mostly open. There is limited existing tree coverage across the Site, therefore limited carbon sequestration is currently occurring.

37 Information provided by the operators of the Sherraine Holsteins farm, currently occupying 152.5ha of the approximate 156ha of the Site, notes that the land currently supports a milking platform and support block for a herd of approximately 270 milking cows, 120 calves, and 3 breeding bulls (as of June 2023).

[2] Refer evidence of **Mr Walsh**, Appendix 3 ODP text.

[3] Refer evidence of **Mr Walsh**, Appendix 3 ODP text.

38 The emissions for a farming operation can be calculated using guidance provided by the Ministry for the Environment (*MFE*)[4]. In this guide, MFE provide annual emissions on a per animal basis.

39 GHG emissions from the current farming operations include the following:

39.1 Enteric fermentation – the process by which ruminant animals produce methane by digesting feed;

39.2 Manure management – the storage and treatment of manure produces emissions (including the emissions from manure which is applied to land);

39.3 Agricultural soils – soils emit nitrous oxide due to the addition of nitrogen to soils through manure, dung and urine;

39.4 Fertiliser use – applying nitrogen (urea-sourced or synthetic) fertiliser onto land produces nitrous oxide and carbon dioxide emissions. Applying lime and dolomite fertilisers results in carbon dioxide emissions; and

39.5 The use of energy in operating the farm – fossil fuels used in vehicles and electricity to power cow sheds/irrigators/pumps.

40 Using MFE factors, we can calculate that the total emissions resulting from activity on the farm per annum are 1,230 tons of CO_2-e, based on:

40.1 Total emissions from 270 milking cows, 120 calves and 3 breeding bulls of approximately 1,062 tons CO_2-e per year; and

40.2 Approximately 168 tons CO_2-e per year from fertiliser application (based on 36 tons of fertiliser per year[5]).

41 This total excludes any emissions from fossil fuels used on the land and electricity use, as these figures are not available.

42 This total also excludes fossil fuels, electricity use and vehicle fuel associated with processing the milk collected from the farm.

43 To put this into perspective, 1,230 tons CO_2-e is equivalent to the following:

[4] Measuring Emissions: A Guide for Organisations – 2023 detailed guide.

[5] Total applied fertiliser weight described in the Overseer report for Sherraine Holsteins Ltd – Sherriff P & R, year ending 2020

43.1 4.9 million vehicle kilometres travelled in a typical New Zealand vehicle (using the MFE's default private car emission factor (2023) per km of 0.252); and

43.2 The average annual electricity usage emissions of approximately 1,950[6] Canterbury households.

EMISSIONS FROM PROPOSED LAND USE

44 Like any new residential development, GHG emissions will occur across three different stages:

44.1 Emissions associated with the infrastructure required to support the development;

44.2 Emissions associated with construction and occupation of the dwellings and commercial buildings (primarily emissions arising from energy use); and

44.3 Emissions from travel-related activities of residents who live within the blocks.

Infrastructure emissions

45 The flat nature of the Site will limit the extent of earthworks required and therefore the amount of fossil fuels that will be used in preparing the Site for development.

46 The bulk of materials required in the infrastructure development stage (that have GHG emissions associated) are anticipated to be roading-related (concrete/asphalt) and piping.

47 The level of infrastructure related materials required for a subdivision is largely a function of the hectares to be developed, as opposed to the number of dwellings.

48 Therefore, from an emissions intensity perspective in a greenfield development (that is, the emissions per resident), there is a benefit of increasing the density of housing, which the proposed rezoning request supports.

49 In terms of the materials themselves, there is currently limited scope to avoid the use of GHG producing construction materials, however lower emissions materials are being developed over time, and it is likely that by the time the development commences that lower emissions materials could be available.

50 It also needs to be recognised that in practice even if emissions were not to occur from this Site, it is reasonable to assume that

[6] The average residential home in Canterbury uses 8,550kWh per annum – per Electricity In New Zealand, 2018, The Electricity Authority. Emissions per kWh are 0.074kg CO_2-e/kWh (latest MFE factors – July 2023)

similar emissions would occur elsewhere in New Zealand with people choosing to live/develop elsewhere.

Building lifecycle emissions

51 The second major component of GHG emissions are the emissions associated with the construction and operation/occupation of the buildings (dwellings and commercial buildings).

52 A major contributing factor to GHG emissions are the emissions "embodied" in materials that are used in the buildings. In the case of carbon, this relates primarily to the energy used to create building materials. Examples of materials with high embodied carbon are concrete and steel, compared to timber which has comparatively low embodied emissions.

53 A recent (2020) study undertaken by Massey University and BRANZ[7] assessed the expected life cycle emissions for three different types of residential dwellings: detached housing, medium-density housing, and an apartment.

54 A lifecycle analysis considers the emissions expected to be emitted across the various life stages of the development – this includes construction, operation, and end of life treatment.

55 The study considers that a New Zealand home is expected to last for 90 years and, therefore, a lifecycle analysis should consider emissions across this timeframe.

56 Key conclusions from the study were that the product stage (embodied carbon) is responsible for 16% of the life cycle emissions, with operational energy use responsible for 59%.

57 Embodied carbon was more significant for apartments, due to the greater use of high emissions materials such as concrete and steel in construction.

58 On a per m^2 basis, across a 90-year period, the lifetime emissions are highest for multi-storey apartments (21 kg CO_2-e/m^2/yr) when compared to lifetime emissions for detached housing and medium density housing (13 kg CO_2-e/m^2/yr).

59 As multi-storey apartments are unlikely to be built in the proposed rezoning area, I consider that the embodied emissions resulting from the type of dwellings envisaged on the sites to be relatively efficient from a GHG perspective.

60 There is also a difference in emissions associated with electricity use between the North and South Island. Although the 2020 study used

[7] Application of Absolute Sustainability Assessment to New Zealand Residential Dwellings - S J McLaren *et al* 2020 *IOP Conf. Ser.: Earth Environ. Sci.* 588 022064

a New Zealand average, in reality, emissions for electricity usage in the South Island are almost always lower than electricity in the North Island, due to the different mix of generation in the two islands.

61 When it comes to emissions from operational energy use, the main factors that influence this are:

61.1 how energy efficient a dwelling is;

61.2 the type of energy that is used in the dwelling;

61.3 the size of the dwelling; and

61.4 the use of on-site renewables.

62 With recent building code changes[8], new homes are more energy efficient than traditional New Zealand houses, due to better building materials and higher levels of insulation.

63 Energy-related emissions in the Site will be further minimised by rules requiring solar PV panel installation and the prohibition of LPG other than for barbeques.

64 The Site is well suited for solar PV due to its flat nature and limited obstructions (i.e. no hills) north of the Site.

65 Furthermore, as apartments are unlikely to be built within the Site, most houses are expected to be detached or semi-detached, and I would expect there to be a relatively high uptake of solar.

66 Taking these factors into account, I expect that dwellings built in the Site would be relatively energy efficient compared to other developments and consequently would have relatively low emissions per resident.

67 Again, and as I noted above, it also needs to be recognised that in practice even if emissions from building houses were not to occur at this Site, similar emissions would occur elsewhere in New Zealand with people choosing to live/develop elsewhere. In other words, if dwellings are not built here, they will be built elsewhere, with similar building lifecycle emissions likely in either case. I am satisfied that the developer has taken practical steps to minimise these emissions through the requirement for solar PV and the banning of LPG other than for barbeques.

[8] https://www.mbie.govt.nz/about/news/new-building-code-requirements-bring-biggest-energy-efficiency-change-in-over-a-decade/

Emissions from transportation

68 The rezoning request will result in new emissions from travel undertaken by residents.

69 Emissions from transportation related to the rezoning request are a function of the mode of transport (vehicle, bus, bicycle), distance travelled, and frequency of travel. Emissions from transportation primarily arise from trips undertaken in vehicles that use fossil fuels (primarily passenger vehicles).

70 Given the lifecycle of a residential development (90 years), it is important to consider how travel patterns may change as we look forward to the future. The way we travel in 2050, and 2075 will be very different to how we travel today.

71 The most comprehensive data for the types of trips that people undertake in New Zealand is provided by the Ministry of Transport.[9]

72 The following charts from that study show the average distances travelled per day for different purposes during both weekdays and weekend days:

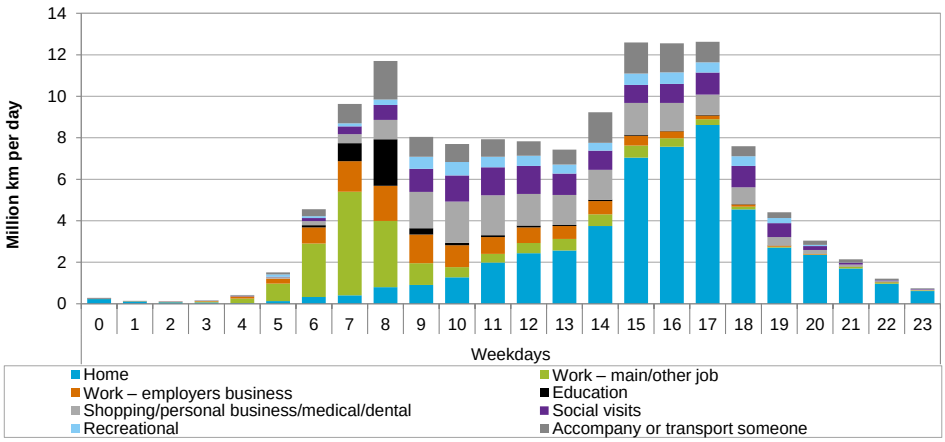

Figure 1: Why we Travel - Weekdays

[9] Ministry of Transport. (2015). 25 Years of New Zealand Travel: New Zealand Household Travel 1989-2014.

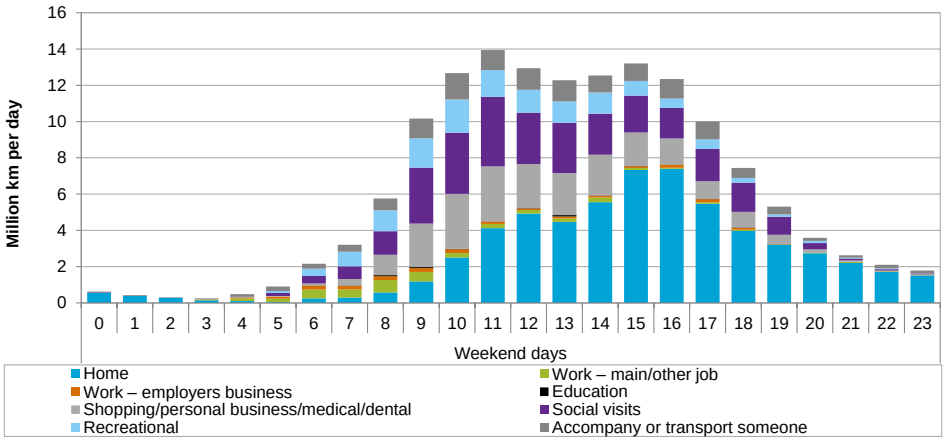

Figure 2: Why we Travel - Weekends

73 From this, we can group reasons for travel into 3 key categories – commercial/recreation (including social visits), work and education.

74 I look into at each of these in the following sections of this evidence.

Access to commercial and recreational activities

75 Ōhoka is currently not well-serviced with amenities and recreation facilities, so it is reasonable to assume that currently most "high frequency" trips originating in the area are made to the most conveniently located destination for the purpose of the trip (e.g., nearest dairy/takeaway outlet/café) whereas trips to "destination" locations – such as heading to a larger supermarket for weekly shop –occur less frequently.

76 The nearest medium-sized supermarket is located at Mandeville (approximately 3-4km), whereas the nearest large supermarket (Pak N Save) is located 7.3km away. These distances are relatively large distances compared to built-up urban areas.

77 A commercial area is planned for the development. I would anticipate that tenancies in the commercial area will likely be self-selected, accounting for their likely desirability and convenience to nearby residents, and that these tenancies will be well-utilised by residents. I expect that a convenience store (like a Four Square) could work well in this location and would minimise the requirement for residents to travel further afield for their day-to-day needs.

78 Additionally, the introduction of the proposed commercial area would benefit the existing residents of Ōhoka as well and could potentially reduce their travel-related emissions.

79 It is also likely, given the ODP design, that active modes of travel will be well used to access these facilities.

Access to employment

80 While a small number of residents can be expected to work in the new commercial area (and will be able to travel to work via active travel modes), other residents will commute for work, with the most likely destinations for employment being Christchurch, Rangiora and Kaiapoi.

81 The distance to central Christchurch is 25km, and is not suited to a cycling commute, meaning that the most common modes of travel are likely to be public transport and private vehicle travel (potentially car-pooled).

82 The introduction of a public transport service connecting the Site to Kaiapoi, with services timed to align with express bus services to Christchurch departing from Kaiapoi, provides a public transport option. Furthermore, connective buses can also take users to Christchurch and Rangiora from Kaiapoi.

83 My expectation is that a significant amount of workers (particularly those that are Christchurch-based) will also opt to work from home reasonably frequently.

84 I would further expect there will be a rapid uptake of electric vehicles by those that are required to commute, as the economic incentive to purchase an EV is greater for those that have a longer commute (as the cost of charging an electric car at home is likely to be less than the cost of running a fossil-fuelled vehicle). To provide an example in relation to other countries (akin to New Zealand) that are focussing on EVs as part of their emissions reduction plans, Norway is a world-leader, with EVs now making up approximately 80% of new vehicle registrations[10]. This shows the rate of EV uptake that could be possible in the future in New Zealand, with the right incentives.

85 Additionally, the Site has a requirement that provision is made for electric vehicle charging within all residential properties, and this will further support EV uptake.

86 These factors will serve to limit commuting emissions.

87 The other major employment centres are likely to be Rangiora and Kaiapoi which are both approximately 8km away.

88 It is likely that most commuter travel to Rangiora will be by private vehicle, until such time as suitable cycling infrastructure is provided (which is identified in the future walking and cycling network plan for Waimakariri – refer Figure 3). Alternatively, commuters could

[10] https://www.nytimes.com/2023/05/08/business/energy-environment/norway-electric-vehicles.html

also use the proposed bus service to connect to Rangiora through Kaiapoi.

89 Commuters to Kaiapoi could use the proposed bus service.

Access to Education

90 In terms of "education" trips, the Site is relatively close (1.7 km) to Ōhoka Primary School, with a separated pathway that runs from the Site to the school, along Mill Road. Ōhoka school caters for children up to year 8 (13-year-olds), so I expect that some trips to and from the existing school location from children who live in the plan change area would be via active modes (walking, scootering, or biking).

91 The rezoning request allows for a primary school to be located on the Site and were this to occur then it is probable that an even higher proportion of trips to school would be via active modes. The plan change design incorporates active travel modes, and so I expect that these pathways would be well-utilised for travel to a school, if located in the proposed rezoning area. The Site would be zoned for Kaiapoi High School, which is approximately 7.3 km distance, along a route that is not currently well suited to cycling, but which the Waimakariri District Council Walking and Cycling Network Plan indicates may be served by a cycle route along Mill Road in future (refer Figure 3 and my related discussion below).

92 However, there is an existing shuttle bus service that operates between Ōhoka and Kaiapoi High School, which would help to limit the emissions for school travel.

93 Additionally, the proposed public transport solution will provide another low-emissions option for students of Kaiapoi High to utilise, as well as providing a connection to existing bus services from Kaiapoi for students who travel to Christchurch high schools.

Cycling

94 The rezoning request includes the provision of shared paths along the Site frontage of Whites Road and Bradleys Road, along with a cycle network within the Site.

95 As described in **Mr Fuller's** evidence, the Council's recommended Walking and Cycling Network Plan indicates future cycle paths connecting Ōhoka with other parts of the District. The Site is well located within this future network. The relevant map showing future cycle paths is shown in Figure 3.

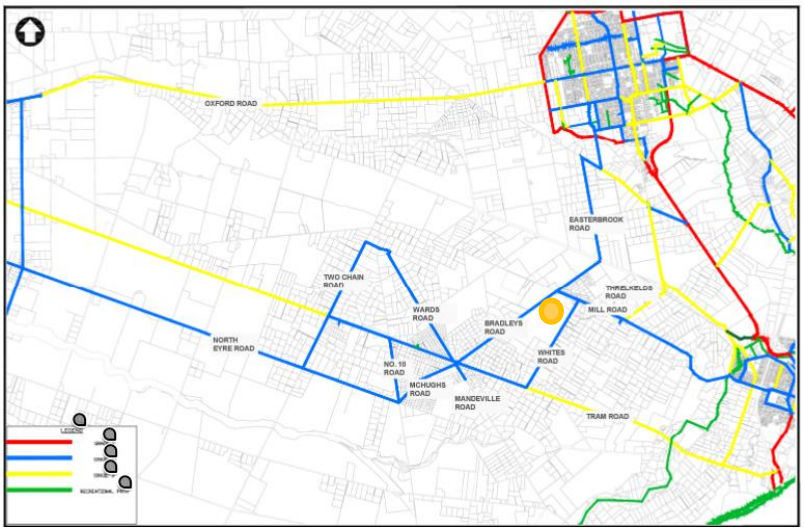

Figure 3 – Recommended Walking and Cycling Plan for Waimakariri District (2022). Location of Site shown in Orange

96 Encouragingly, this plan shows that direct access from the Site to both Kaiapoi and Rangiora is envisaged in future, via Grade 2 routes (shown in blue) – defined as suitable for riders with basic (riding) competence skills.

97 I consider that 8km is a distance that is relatively easily achievable on a flat-section of road for a commuter, particularly an e-bike rider, so there should be a reasonable uptake of cycling for residents of the Site that work in Rangiora and Kaiapoi (when cycle paths are developed).

98 These trips would not require any hills to be traversed and can be considered accessible via e-bike and e-scooter. Ideally, this off-road access to Rangiora and Kaiapoi should be designed with these more recent forms of micromobility in mind.

99 There has already been a substantial increase in the number of e-bikes[11] in New Zealand, with an estimate of between 100,000 and 200,000 across the country and a reported 50,000 imports in 2021 alone.

100 I expect the rise of e-biking to continue, and I believe that greater Christchurch is perfectly suited for this mode of transport and that we will see a significant proportion of trips in the region via e-bike over the next 10-20 years.

101 Research published by Waka Kotahi in 2021[12] concludes "the usage of shared paths and separated cycle facilities will be three to eight

[11] https://www.nzherald.co.nz/nz/on-your-bike-everything-you-need-to-know-about-e-bikes/QOHXNWYVPA2Q6AIE7J46AVBWTU/

[12] Mode shift to micromobility. NZ Transport Agency research report 674, February 2021

times higher than for forecasts of pushbikes alone" and that "the growth in availability and ownership of micromobility will lead to an increase in public transport patronage by up to 7% in urban contexts and 9% in suburban contexts as a result of first/last mile micromobility use."

102 Developing cycle paths to connect the Site to Rangiora and Kaiapoi would assist with an increase in both education and other trips via active modes.

Public Transport

103 Reducing vehicle travel emissions from the Site (to Christchurch City, Rangiora and Kaiapoi) can be supported by developing connections between the Site and the public transport network.

104 Presently, there are no public transportation options which pass directly through Ōhoka (besides school-related services). This is explainable by the relatively low numbers of residents in the area currently.

105 However, the developer has proposed to fund a public transport service to address this issue, and its provision is proposed as a requirement of the ODP for the Site.

I refer to the evidence of **Mr Milner**, who in his assessment has outlined the details of the proposed public transport service between the Site and Kaiapoi, and the evidence of **Mr Walsh** that outlines in Appendix 3 the proposed ODP.

Alternative locations

106 Based on the evidence of Mr Jones, the typical buyer of a future dwelling in the Site is a buyer who wishes to purchase a single-dwelling property on a reasonable section size, relatively close to a major metropolitan centre. As per that evidence, the type of buyer is unlikely to choose a townhouse in Christchurch City and if they were unable to purchase a section/dwelling in Ōhoka, would look elsewhere in the Waimakariri District (or Selwyn District).

107 The Site is located approximately 25km from the Christchurch Central City (defined as the Riverside market location). This is in line with other locations outside of Christchurch City that have greenfield development potential including Lincoln (22km), Rolleston (26km), West Melton (27km), Ravenswood (27km), Leeston (42km) and Amberley (46km).

108 However, I note, based on **Mr Walsh's** evidence, that there are a number of constraints that may/will prevent development occurring across swathes of the Waimakariri District, particularly in areas in and around Kaiapoi. This includes the Christchurch Airport noise contours, land that is of cultural significance to local iwi, and land at risk of flooding in a severe rainfall event.

109 Given these constraints, there is a risk that if there is not an adequate availability of property with the characteristics described above in greenfield locations in the Waimakariri District relatively close to Christchurch City, such as in Ōhoka, buyers will purchase in locations further away from Christchurch City and other activity hubs (Rangiora and Kaiapoi). This could result in GHG emissions increases compared to the development of the Site.

110 I note that a similar matter was covered in a recent Plan Change hearing in the Selwyn District, PC67, in relation to West Melton (a similar distance from Christchurch City as the Site). The commissioner, Mr Caldwell, stated in his recommendation (10 January 2022) that "*it is unlikely that if people are unable to purchase a single dwelling in West Melton, that they will move into Christchurch City. As discussed with Mr Metherell, those seeking the single dwelling option are more likely to go further afield within Selwyn to find it. In the case of West Melton, Darfield is a prime example. If such were to be a result of declining this plan change, then that could potentially result in a worse outcome from a greenhouse gas perspective".*

111 I agree with the commissioner and applying this in the context of Ōhoka, buyers may seek to purchase in areas such as Rangiora, or Ravenswood/Pegasus, each of which are further from Christchurch than the rezoning request area.

Assessment

112 I consider that the conversion of the proposed land from rural to residential development, enabled by the rezoning request, will lead to a reduction in emissions, because dairy cows will no longer be farmed on the land. This is especially true when compared to equivalent proposed rezonings/developments that don't result in the removal of dairy cows.

113 Additionally, based on the concept plans for the development, a greater level of sequestration will occur in future through the retention of as many existing trees as possible as the Site is developed, and through the (significant) additional plantings as identified in the ODP.

114 The submitters have also taken several steps to support a reduction in emissions, including:

114.1 Tree planting throughout the Site;

114.2 Prohibition of LPG other than for barbeques, requirement for solar generation in residential units;

114.3 The provision of off-road pathways throughout the development, to support active (non-vehicular) travel;

114.4 The allowance for a school to be built within the Site;

114.5 The provision of a commercial area within the Site to meet some of the residents' day-to-day needs (reducing travel requirements);

114.6 Provision of a public transport solution, as set out in **Mr Milner's** evidence; and

114.7 The specification of a requirement that dwellings are EV charging ready (as an ODP requirement, to be enforceable by a legal instrument). This will support a faster uptake of EVs within the Site.

CONCLUSION

115 I therefore consider that the rezoning request contributes to well-functioning urban environments that 'support a reduction in GHG emissions' (as per NPS-UD Policy 1(e)) due to:

115.1 the removal of dairying activity and its associated emissions from the Site.

115.2 the submitters taking practical steps in the design of the Site to support a reduction in emissions arising from the development and occupation of dwellings and commercial buildings, and emissions arising from transportation.

Dated: 5 March 2024

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Paul Farrelly