IN THE MATTER of the Resource Management Act 1991, Subpart 6 concerning the Intensification Streamlined Planning Process

AND

IN THE MATTER of Plan Change 2, a Council-led proposed plan change to the Kapiti Coast District Plan under the Resource Management Act 1991, Schedule 1 Subpart 6.

STATEMENT OF EVIDENCE OF HARRIET BARBARA FRASER ON BEHALF THE WAIKANAE EAST SUBMITTERS S087

1. INTRODUCTION

Qualifications

1.1 My full name is Harriet Barbara Fraser. I hold the qualification of Chartered Professional Engineer and Chartered Member of Engineering NZ. I hold a Bachelor of Civil Engineering degree from Imperial College, University of London and a Master's degree of Science in Transportation Planning and Engineering awarded with distinction by the University of Leeds.

Experience

1.2 My background of experience includes over 29 years consultancy experience in traffic and transportation matters, initially in the UK and Hong Kong. From August 1998 to August 2012, I worked as a Transportation Planner in Lower Hutt in the firm of Traffic Design Group Limited (now Stantec) practicing as a transportation planning and traffic engineering specialist throughout New Zealand. Since September 2012 I have been working as a sole practitioner in the field of transportation planning and traffic engineering.

1.3 I am a certified Hearing Commissioner, having completed the MfE Making Good Decisions training and most recently was a commissioner

on the panel for the hearing of a private plan change application in Upper Hutt.

Background

1.4 I have been asked by Land Matters Ltd on behalf of a group of landowners in Waikanae East to provide traffic engineering and transportation planning advice as part of the submission requesting that the greenfield area in Waikanae East, shown in Figure 1, be included in Plan Change 2 (PC2).

Figure 1: Extent of Land Area Requested for Rezoning

1.5 This has involved:

(a) Design advice regarding potential roading and access arrangements to support the inclusion of the Waikanae East greenfield area for residential zoning and intensification;

(b) Sample traffic surveys of the existing local traffic characteristics and obtaining traffic count data from Council; and

(c) Analysis and assessment of the ability of the transport network to accommodate the travel activity associated with the

development of the greenfield area of Waikanae East for residential purposes.

2. CODE OF CONDUCT

2.1 Although not necessary in respect of council hearings, I can confirm I have read the Expert Witness Code of Conduct set out in the Environment Court's Practice Note 2023. I have complied with the Code of Conduct in preparing this evidence and I agree to comply with it while giving any oral evidence before the hearing committee. Except where I state that I am relying on the evidence of another person, this written evidence is within my area of expertise. I have not omitted to consider material facts known to me that might alter or detract from the opinions expressed in this evidence.

3. SCOPE AND STRUCTURE OF EVIDENCE

3.1 I have structured my evidence as follows:

(a) Brief description of the submitters' request.

(b) Summary of Waikanae East provisions included in PC2.

(c) Existing traffic conditions and household vehicle trip generation rates.

(d) Forecast traffic activity for Waikanae East.

(e) Options for providing additional vehicle capacity across the railway line.

(f) Conclusion.

4. SUBMITTERS' REQUEST

4.1 The submitters have requested the rezoning of the land shown in Figure 1 to General Residential Zone along with a Residential Intensification Precinct A overlay and provision for roading connections from Anne Street, Elizabeth Street and/or Reikorangi Road. Since the preparation of the submission, Mr Boffa and Ms Carter in consultation with the landowners consider it appropriate that the Industrial zoned land owned

by Goodman Holdings Ltd also be included in the General Residential zone in order to create a well-functioning urban environment.

4.2 The extent of the land owned by the submitters and shown in Figure 1 is generally aligned with area WA-04 included in the Boffa Miskell report Kapiti Coast Urban Development Greenfield Assessment July 2022 (Greenfield Assessment). The land now forming part of Waikanae East includes the purple coloured industrial zoned land between the railway line, Anne Street and the area shown as WA-04. Figure 2 below shows an extract from this report.

Figure 2: Extract from Kapiti Coast Urban Development Greenfield Assessment

4.3 The Greenfield Assessment identifies WA-04 as a Priority 1 area with the potential to provide 660 dwellings in the short to medium term, that is within 10 years. Priority 1 areas are noted in the Greenfield Assessment as having relatively few constraints to development in the area, and those that do exist could be managed through structure planning and/or other planning mechanisms.

4.4 Ms Carter in her evidence has assessed, based on the rezoning requested by the submitters, that some 613 to 1,785 dwellings could be developed within this greenfill area of Waikanae East over the next 30 years.

4.5 Mr Boffa in his evidence has shown options for how this potential area for rezoning might be accessed from the existing road network. Figure 3 shows an extract of Mr Boffa's drawing of an indicative arrangement for

the short to medium term and Figure 4 for the medium to long term. Both Figures show an internal roading layout connecting with Elizabeth Street in three new locations. This provides for good connectivity with Elizabeth Street and also to the existing northern area of Waikanae East. The internal arrangement demonstrates how a connected roading layout could provide access to all parts of the site.

4.6 The difference between the two arrangements is that the short to medium term layout provides for Goodmans to continue to operate from their site and does not include a direct roading connection through to the intersection of Te Moana Road and Old SH1. As I describe later in my evidence such a link is unlikely to be warranted within the next yen years.

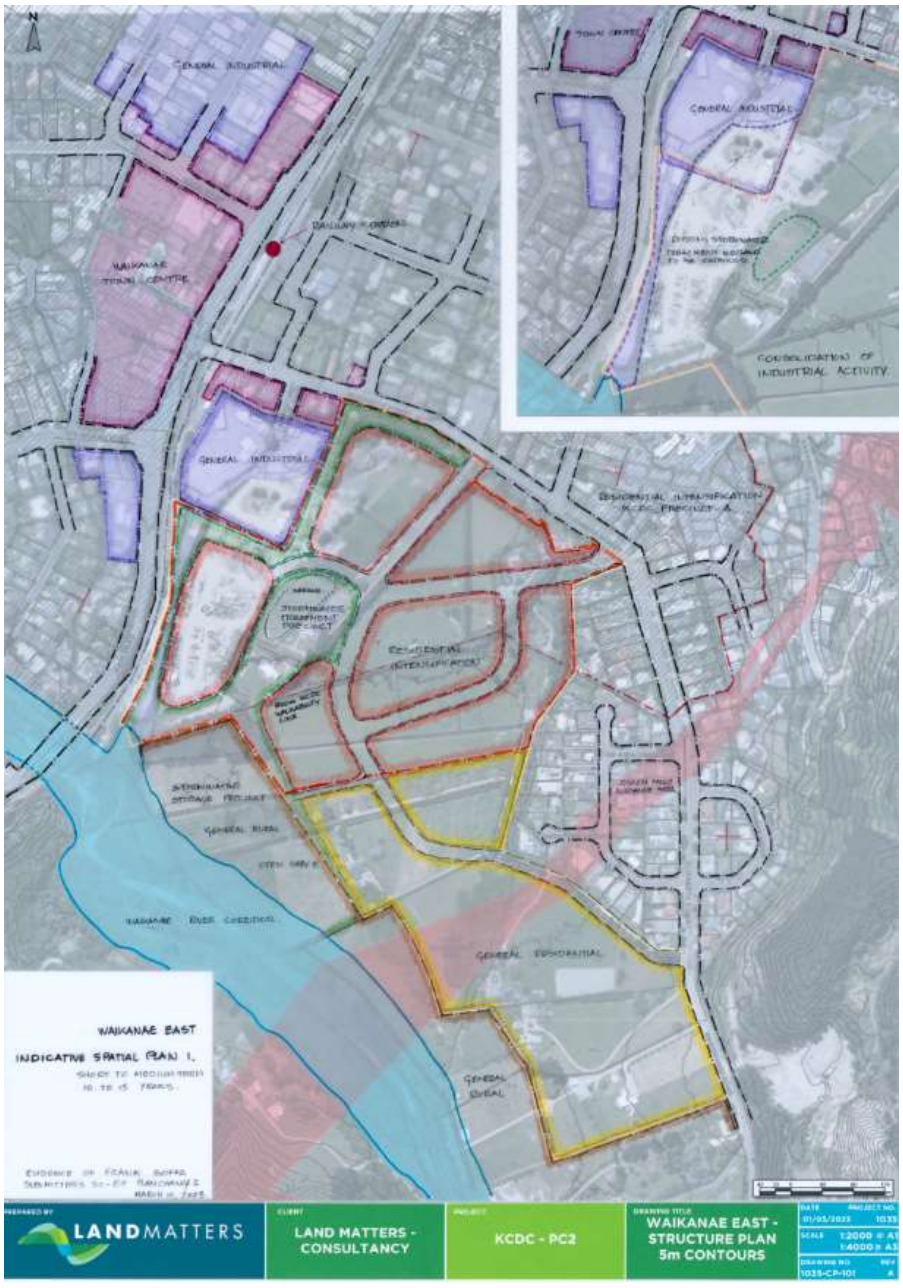


Figure 3: Indicative Short to Medium Term Roading Layout (Mr Boffa, Indicative Spatial Plan 1)

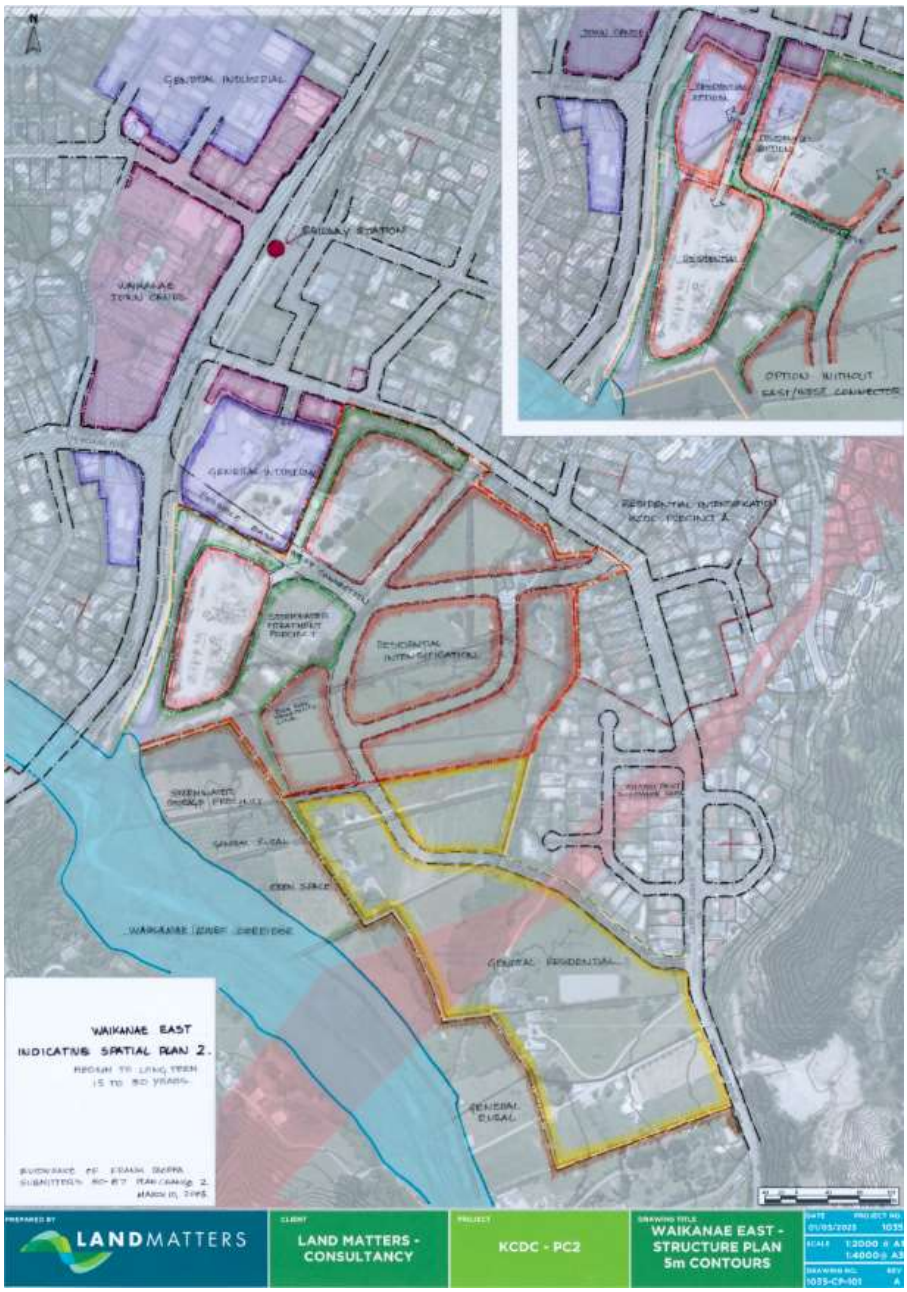


Figure 4: Indicative Medium to Long Term Roading Layout (Mr Boffa, Indicative Spatial Plan 2)

4.7 Mr Boffa includes in his evidence possible longer-term options for roading connections from the eastern side of the railway across into Waikanae North and also further to the north closer to the Peka Peka intersection with SH1, see extract in Figure 5 below.

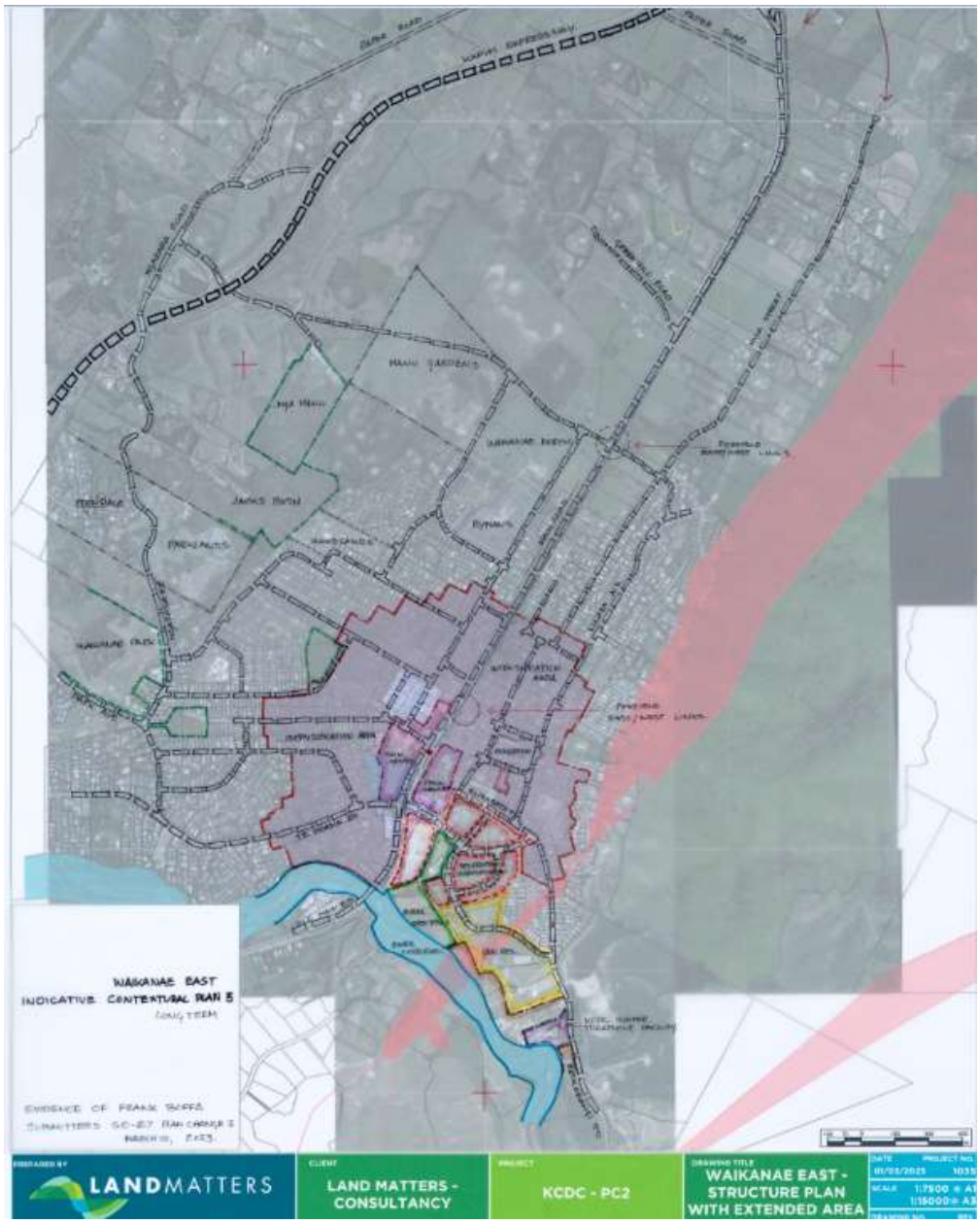
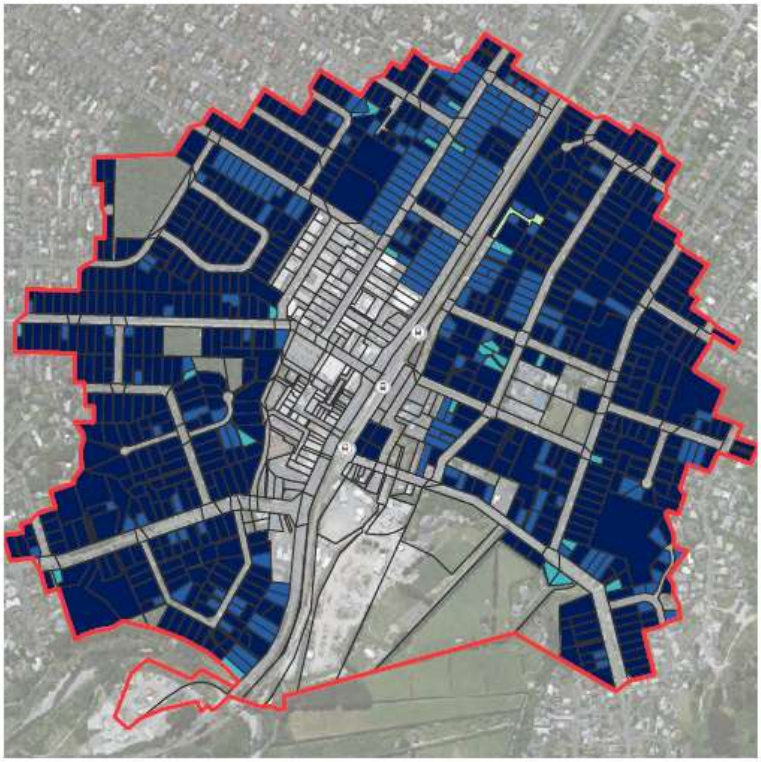


Figure 5: Longer Term Options for Roading Connections (Mr Boffa, Indicative Contextual Plan 3)

5. PLAN CHANGE 2 PROVISIONS FOR WAIKANAE EAST

5.1 PC2 provides for infill residential development within the Waikanae East urban area but not the greenfield residential development within the submitters' land. The Boffa Miskell report Kapiti Coast Urban Development Intensification Assessment July 2022 (Intensification Assessment), identifies the potential for 4,095 additional dwellings in Waikanae town centre as per the extract included here in Figure 6. I am advised by Ms Carter that this is a theoretical yield and that in practice

some 12 to 42% of the total might be practically realised, that is 491 to 1,720 additional dwellings.



SITE WIDTH	EXISTING # RESIDENTIAL UNITS	CAPACITY # STOREYS	AREA IN HA	APPLIED DENSITY DW/HA	APPROX YIELD
< 6.5m		up to 2	0.05	20	1
6.5m - 11m		3	0.16	30	5
11m - 14.5m		4	1.32	40	53
14.5m - 18m		5	14.38	50	719
18m <		6	67.97	60	4,078
	761		83.87		4,856
Additional dwellings (yield minus existing residential units)					4,095

Figure 6: Extract from Intensification Assessment

5.2 Based on Figure 6, I estimate that around 40% of the potential infill yield, some 196 to 688 additional dwellings, allowing for the 12-42% feasibility allowance, lies within Waikanae East, that is to the east of the railway line. Within the Intensification Assessment, Waikanae Town Centre was assessed to have an overall rating of 2A, which is described as the intensification of the area is likely to achieve a range of positive outcomes, however there are a number of constraints that need to be overcome. Only Paraparaumu Beach Town Centre and Raumati South Local Centre were assessed to have better overall ratings.

6. EXISTING TRANSPORT CHARACTERISTICS

6.1 The existing transport characteristics within and close to Waikanae East include:

(a) Close proximity to Waikanae train station with:

(i) regular train services to and from Wellington and intermediate stops;

(ii) bus stops with services running to and from Waikanae Beach and Otaki; and

(iii) inter-city bus stop with access to inter-regional services.

(b) Close and safe pedestrian access to Waikanae town centre given the 50km/h speed limits throughout and signalised crossing of Old SH1. Within Waikanae town centre there are two supermarkets, the library, the Marae, a health centre and many other services.

(c) Easy vehicle access to the regional road network either via Old SH1 or Te Moana Road and beyond to the Kapiti Expressway.

(d) Close proximity to Waikanae Primary School, community facilities, childcare facilities and the local dairy on Elizabeth Street.

(e) There are a number of reserves that can be accessed by foot or bicycle including Hemi Matanga Memorial Park, Matuhi Street Reserve, Karu Reserve along the Waikanae River and Motuiti Reserve. Waikanae Beach can be accessed by bus.

6.2 I consider that these existing transport characteristics contribute to Waikanae East having a well-functioning urban environment. The at-grade level crossing on Elizabeth Street places a constraint on the vehicle capacity across the railway line but as discussed later in my evidence, there are a number of ways in which this capacity could be increased and provided for in future planning provisions.

6.3 Council undertook traffic counts on Elizabeth Street, between Old SH1 and Pehi Kupa Street, during the week starting 10 November 2022. These counts show that the busiest hour-long period of westbound traffic movement across the railway line occurs between 8.15am and 9.15am on weekday mornings with around 482 vehicle movements per hour westbound towards Waikanae Town Centre. During the same period the eastbound flows were 393 vehicle movements per hour. Given the timing of the morning traffic peak, I consider it likely that part of the traffic activity is associated with school drop-off, including residents of Waikanae to the west of the railway line dropping off children to Waikanae Primary School and childcare centres on the eastern side of the railway line.

6.4 During the weekday period from 8.15am to 9.15am there are three scheduled train departures from Waikanae heading towards Wellington, at 8.25am, 8.45am and 9.05am. This results in the level crossing being closed six times during the hour, once as the train arrives and then again as it departs. I have estimated based on on-site observations that on average each time the level crossing is closed, westbound traffic on Elizabeth Street is held for two minutes. The level crossing closures for the 8.45am train (arrival and then departure), along with the school drop-off activity was observed to result in long queues extending back towards Winara Avenue.

6.5 The traffic signals at the intersection of Elizabeth Street with Old SH1 also have an effect on the flow of traffic across the railway line. Based on on-site observations, I estimate that the cycle time for the signals when there are no trains is on average around 85 seconds during the weekday morning peak with a green light for traffic turning left out towards Te Moana Road for around 65% of the cycle length. My analysis has focussed on the performance and capacity of the left turn out of Elizabeth Street as there are the highest demands for this turn.

6.6 During site visits I also estimated the rate vehicles could make the left turn out of Elizabeth Street, if unimpeded by trains on the level crossing or red light phases at the traffic signals. I estimated that on average one vehicle could make the turn every 2.6 seconds. This level of traffic flow would rely on a steady flow of traffic on the approach to the turn with a likely increase in length of the existing clearway on Elizabeth Street.

6.7 I have used the above information to estimate the existing capacity for vehicles turning left out of Elizabeth Street during the weekday morning peak, using the following steps:

(a) From the 3,600 seconds within an hour I have removed 720 seconds due to trains closing the crossing, leaving 2,880 seconds;

(b) During 2,880 seconds the signals would run 34 cycles based on an average cycle time of 85 seconds;

(c) With a green light for the left turn for 65% of the cycle time, there would be 1,879 seconds of green time for the turn;

(d) With one vehicle making the turn every 2.6 seconds, the capacity for the turn would be 723 vehicles per hour, or on average 181 vehicles within a 15 minute period.

6.8 The Council count from November 2022 showed an average of 482 vehicles per hour travelling westbound on Elizabeth Street towards Old SH1 on weekdays between 8.15am and 9.15am. The count that I undertook on Friday 17th February 2023 had 644 westbound vehicles during the same time period, of which 495(77%) turned left at the traffic lights and 149(23%) turned right. The difference between the two counts is significant, so I undertook an additional count on Wednesday 1 March 2023. This showed a westbound traffic flow on Elizabeth Street of 549vph between 8.15 and 9.15am with 417vph(76%) turning left and 132vph(24%) turning right. I have used this most recent count, which falls between the Council count and my earlier count in the analysis that follows. It is possible that the November 2022 count was lower as a result of NCEA exams having started and college students not travelling to school and with regard to the counts I undertook, traffic activity on Fridays is generally considered less typical than on midweek days.

6.9 Based on my most recent count the left turn out from Elizabeth Street onto Old SH1 is running at around 58% of the available capacity during the weekday morning peak hour. As such, there is some existing spare capacity, albeit that there are periods of up to 15 minutes around school drop off time when there are delays and local congestion.

6.10 The existing level of traffic activity on Elizabeth Street at the level crossing is associated with Waikanae East, the rural area further to the east known as Reikorangi and what is expected to be an insignificant amount of through traffic travelling from Upper Hutt over the Akatarawa Saddle. In order to estimate an existing household trip generation rate for Waikanae East, I have subtracted traffic activity recorded by Council at the urban/ rural boundary where Elizabeth Street becomes Reikorangi Road from my count of Elizabeth Street close to the railway line. On this basis some 463vph (549-86vph) westbound trips and 382vph (432-50vph) eastbound trips are associated with Waikanae East during the weekday morning peak hour.

6.11 The 2018 Census data includes 1,029 dwellings within Waikanae East which when combined with the traffic data results in the following household trip generation rates during the weekday morning peak hour:

(a) 0.82 vehicle movements per household (two-way towards Waikanae Town Centre)

(b) 0.45 vehicle movements per household westbound towards Waikanae Town Centre

(c) 0.37 vehicle movements per household inward from Waikanae Town Centre

6.12 It should be noted that these rates are conservative as the vehicle activity will include vehicle movements to and from the school and local businesses within Waikanae East that do not have a residential property within Waikanae East as the origin or destination of the trip.

7. FORECAST TRAFFIC ACTIVITY FOR WAIKANAE EAST

7.1 Based on the assumption that within a 30-year timeframe there could be an additional 196 to 688 dwellings as a result of intensification, along with 613 to 1,785 additional dwellings as a result of greenfield development within Waikanae East, as per Ms Carter's forecast, I have assumed the following staged residential development.

Timeframe	Infill	Greenfield	Stage Additional Total	Cumulative Additional Total
3 years	+21-69	0	+21-69	**+21-69**

10 years	+49-161	+161-462	+210-623	**+231-692**
30 years	+140-460	+460-1,320	+600-1,780	**+831-2,472**
Total	**+210-690**	**+621-1,782**	**+831-2,472**	

Table 1: Estimated Additional Dwellings within Waikanae East (dwellings)

7.2 These forecasts are based on the following assumptions:

(a) No greenfield dwellings will be delivered within the first three years; and

(b) A steady delivery of housing, 7-23 dwellings per year as a result of infill and 23-66 dwellings per year as a result of greenfield development.

7.3 Combining the forecast additional dwellings with the household trip generation rates it is then possible to forecast the level of traffic activity. I have assumed the following weekday morning peak hour trip generation rates which are slightly reduced from the existing observed rates to reflect the residential nature of the trips along with an assumed take up of public transport usage given the proximity to rail and bus services:

(a) 0.70 vehicle movements per hour per household (two-way)

(b) 0.41 vehicle movements per hour per household towards Waikanae Town Centre

(c) 0.29 vehicle movements per hour per household from the direction of Waikanae Town Centre

7.4 Applying these rates results in the following forecast levels of additional two-way traffic activity across the railway lines during the weekday morning peak hour.

Timeframe	Infill	Greenfield	Stage Additional Total	Cumulative Additional Total
3 years	+15-48	0	+15-48	**+15-48**

10 years	+34-113	+113-323	+147-436	**+162-484**
30 years	+98-322	+322-924	+420-1,246	**+582-1,730**
Total	**+147-483**	**+435-1,247**	**+582-1,730**	

Table 2: Estimated Additional Two-Way Weekday AM Peak Hour Vehicle Movements (vph)

7.5 With regard to the critical left turn out of Elizabeth Street, the estimated forecast additional demand for this turn is shown in the following table and has been determined based on the assumption that the demand for the left turn is 76% of the westbound traffic flow.

Timeframe	Infill	Greenfield	Stage Additional Total	Cumulative Additional Total
3 years	+7-21	0	+7-21	**+7-21**
10 years	+15-50	+50-143	+65-193	**+72-214**
30 years	+43-143	+143-409	+186-552	**+258-766**
Total	**+65-214**	**+193-552**	**+258-766**	

Table 3: Estimated Additional Left Turns out of Elizabeth Street during Weekday AM Peak Hour (vph)

7.6 As set out earlier, I have estimated that the existing available capacity for the left turn out of Elizabeth Street during the weekday morning peak hour is around 723 vehicles. With regard to the future capacity for this turn I have assumed no change to the rail services during the short term (next three years), then one additional train with an inbound and outbound crossing of the road in the medium term (within ten years) and two additional trains with two inbound and two outbound crossings of the road in the long term (within thirty years). The assumed available capacities for the left turn are:

(a) 723vph short term

(b) 660vph medium term

(c) 600vph long term

7.7 I have then considered the relationship between the demand and available capacity for the left turn out of Elizabeth Street. This is summarised in the table below. As shown, assuming no increase in train services in the short term, I consider that there is likely to be sufficient

spare capacity to accommodate additional housing within Waikanae East within the next three years. In the medium term, the adequacy of the available capacity will depend on the actual rate of delivery of additional households. At the low to middle end of the range, the available capacity will remain satisfactory. Beyond the 10-year timeframe, the capacity will be exceeded and there will be a need to provide additional capacity across the railway line.

Timeframe	Existing	Infill	Greenfield	Total	% of Capacity
3 years	417	+7-21	0	424-438	**59-61%**
10 years		+15-50	+50-143	489-631	**74-96%**
30 years		+43-143	+143-409	675-1,183	**113-197%**

Table 4: Estimated Forecast Capacity for Left Turns out of Elizabeth Street during Weekday AM Peak Hour

7.8 I discuss options for providing this additional capacity next.

8. OPTIONS FOR PROVIDING ADDITIONAL VEHICLE CAPACITY ACROSS THE RAILWAY LINE

8.1 As discussed in the previous section of this evidence, I consider that there is likely to be sufficient spare capacity for vehicle travel across the existing level crossing to accommodate additional housing within Waikanae East within the next three years and possibly up to the 10-year timeframe subject to the actual rate of delivery of houses.

8.2 Beyond the ten-year timeframe there will be a need for additional capacity across the railway line.

8.3 There are a number of potential infrastructure solutions to provide additional capacity across the railway line. One option would be to construct an additional or replacement at grade level crossing to the north of the existing station in a location where the crossing would not need to be closed as trains travel between Wellington and Waikanae. There would likely be a signalised intersection where the new crossing link connects with Old SH1. Based on my earlier calculations I would expect a left turn out to have weekday morning peak hour capacity of around 900 vehicles.

8.4 If a grade separated link were to be provided under the railway, this would most logically be located to the south of the existing crossing as the ground level starts to fall towards the river. In my view it would be most efficient to connect directly into Te Moana Road. I note that Kiwirail will have requirements regarding clearances, and ground levels for an underpass would need to consider flood risk along with tie-in with adjacent property frontages as a result of changes to the road levels. There would be the potential to increase the stop line capacity with separate turning lanes for each of the left turn into Old SH1, through into Te Moana Road and right turn onto Old SH1 towards the town centre. Based on an assumed potential arrival flow of around 1,500vph from Waikanae East and around 65% of the cycle time being allocated to traffic exiting Waikanae East, a capacity of around 1,000vph might be achieved.

8.5 If a grade separated link were provided over the railway line, I consider that this would most likely occur towards the north and likely tie in with roading associated with the ongoing development of Waikanae North. In this location it might be possible to provide a crossing that would not be constrained by adjacent intersections, unlike the previous options described. It should however be noted that the main travel desire lines are to and from the south (Paraparaumu and Wellington) and therefore a crossing in this location can only be expected to accommodate part of the demands. An overpass with a single westbound lane across the railway that is not constrained by adjacent intersections could be expected to have a capacity of around 1,500vph.

8.6 Towards the end of the 30-year period there will a need to provide significant additional travel capacity across the railway line. Given that it is likely that there would be additional train services per hour across the crossing along with longer trains within this timeframe, with an associated reduction in vehicle capacity across the existing crossing, I consider that there are two longer term options. Both would involve the existing at-grade crossing being relocated to the north of the train station such that the crossing is only affected by the less frequent longer distance passenger and freight trains. The benefits of the relocation of the at-grade level crossing will be reduced if frequent rail services start running through to Otaki. The difference between the two options is that

one would include an underpass approximately aligned with Te Moana Road and the other an overpass connecting in with Waikanae North.

8.7 Around the 10-year timeframe it then makes sense to provide for the relocation of the existing crossing further to the north.

8.8 There are also non-roading measures that could help delay the need for infrastructure interventions, these include:

(a) Working with the Ministry of Education to use school zoning and locations of primary schools to minimise the likelihood of children living on the opposite side of the railway to the school they attend;

(b) Minimising non-residential activity on the eastern side of the railway that does not serve the immediate needs of residents on the eastern side; and

(c) Improved bus services into and out of Waikanae East.

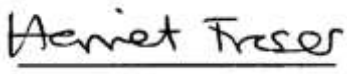
9. CONCLUSION

9.1 I consider that the existing transport characteristics which include access by a range of travel modes to a variety of destinations including work places, shops and services, public transport services, recreation, education and community facilities contribute to Waikanae East having a well-functioning urban environment.

9.2 The size of the submitters combined land area is such that there will be a number of options for providing an internal roading layout which delivers connectivity within the site as well as to the external roading network and beyond to the wider area.

9.3 While my assessment is simplified and relies on a number of assumptions that can be expected to change with time, the indication is that additional capacity for vehicle movement will be needed across the railway line in Waikanae in around 10 years from now. Some additional capacity can be gained by relocating the existing level crossing to the north but this on its own will not provide enough capacity in the longer term to meet the likely travel demands associated with the potential infill and/or greenfield development within Waikanae East.

9.4 In order to maximise the viability of providing the modified and additional infrastructure, I recommend that the potential greenfield development within Waikanae East also be included in the proposed residential zoning.



Harriet Fraser
9 March 2023