

**BEFORE THE KAIKOURA DISTRICT COUNCIL**

**UNDER** the Resource Management Act 1991

**IN THE MATTER** of applications under section 88 of the Act to the **Kaikoura District Council** by **Vicarage Views Limited** for resource consents for a 67 allotment Subdivision and Land Use to build on each residential allotment (**SU-2023-1874-00 and LU-2023-1875-00**)

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**EVIDENCE OF MATHEUS BOARETTO ON BEHALF OF VICARAGE VIEWS LIMITED**

**TRAFFIC ENGINEERING**

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## **1 INTRODUCTION**

- 1.1 My full name is Matheus Felipe Boaretto.
- 1.2 I hold a Graduate Diploma in Engineering (Highways) from the New Zealand Institute of Highway Technology (NZIHT) in partnership with the Western Institute of Technology at Taranaki and a Bachelor of Civil Engineering from the Assis Gurgacz University Centre in Brazil.
- 1.3 I hold the position of Transport Engineer at Urban Connection Limited, a transportation consultancy firm.
- 1.4 My work experience includes 15 years in highway design, traffic engineering and road safety, working both in New Zealand and Brazil. In New Zealand, my work experience adds up to four and a half years.
- 1.5 During this time, I have been responsible and part of a wide range of transport projects and developments, both for transport agencies and developers. Examples of developments include residential, hospitals, film studios, and commercial and industrial.
- 1.6 I have also been responsible for a range of safety assessments for the Waka Kotahi New Zealand Transport Agency, including road safety audits, safe system audits, assessments and designs for the speed management panel.

### **Involvement in the project**

- 1.7 Urban Connection was engaged by the Applicant in October 2022 to prepare a traffic assessment of the proposal, for which I had primary responsibility. I was assisted by my colleague Jacques Steyn, who undertook traffic counts in the roading network on 08 November 2022.
- 1.8 In preparing this evidence, I have read the following documents:
- (a) The Application and Assessment of Environmental Effects;
  - (b) The submission by the Ministry of Education; and
  - (c) The submission by LA Margetts & WM Smart Partnership.

## **2 PURPOSE AND SCOPE OF EVIDENCE**

- 2.1 My evidence addresses the effects of the proposal as a High Traffic Generating activity under the Kaikoura District Plan, with specific reference to the following assessment matters contained within the Plan:
- (a) Effects on traffic, pedestrian and cyclist safety

- (b) Effects of vehicle movements on amenity values of any residential units
- (c) Effects of vehicle movements on any surrounding land uses
- (d) Efficiency of roads and state highways

2.2 My evidence is structured as follows:

- (a) Description of site and surrounding environment (Section 3).
- (b) Assessment of traffic effects of the proposal (Section 4).
- (c) Recommendations to avoid, remedy or mitigate adverse effects (Section 5).
- (d) Comments on issues raised in submissions (Section 6).
- (e) Comment on s 42A Recommendation Report (Section 7); and
- (f) Conclusions (Section 8).

2.3 This evidence incorporates the relevant content from the Traffic Impact Assessment (TIA) attached to the application.

### **3 DESCRIPTION OF PROPOSED SUBDIVISION AND ROADING LAYOUT**

#### **Site**

3.1 The site is within Council's Residential B Zoned Land, on the western flanks of Kaikoura township.

3.2 Access to the existing residential dwelling on the site from Mt Fyffe Road. A single vehicle crossing is located at the southern boundary of the site. This is located approximately 350 m south of the Ludstone Road/ Mt Fyffe Road intersection. The vehicle crossing is approximately 6.5 m wide and sealed. A speed hump is provided at the connection with Mt Fyffe Road.

3.3 The site is close to various urban facilities and amenities. By road, Kaikoura High School is approximately 900 m east of the site, located on the corner of Ludstone and Rorrison Roads. St Joseph's School is also on Ludstone Road and approximately 1 km from the site by road. The town centre is approximately 1.5 km away by road. The Public Hospital is approximately 2.4 km by road.

#### **Adjacent roading network**

3.4 The sealed portion of Mt Fyffe Road is approximately 350 m long south of the intersection with Ludstone Road. The road carriageway is approximately 6 m wide and sealed at the

site frontage, with shallow stormwater swales on both sides of the road. There are no centreline or edgeline markings in the vicinity of the site.

- 3.5 A railway overbridge crosses Mt Fyffe Road in the vicinity of the intersection with Ludstone Road. The railway overbridge runs parallel to Ludstone Road.
- 3.6 The road cross-section on Mt Fyffe Road is narrowed to 4.6 m wide in the vicinity of the overbridge, with a 50 m long single-lane flow established from 40 m south of the overbridge to immediately north of it. Centreline markings are provided throughout this section.
- 3.7 The posted speed limit is 30 km/h immediately south of the overbridge and 60 km/h north of this point.
- 3.8 Single-lane/give-way signs (RG-19) are provided south of the railway overbridge, and single-lane priority signs (RG-20) are provided north of it, establishing, therefore, the priority for southbound traffic (departing the intersection with Ludstone Road).
- 3.9 The cross-section underneath the railway overbridge is 7.8 m wide between piers, with 2.3 m wide lanes and 1.6 m wide berms. The vertical clearance under the bridge is 4 m.
- 3.10 An informal shared path is currently provided in the vicinity of the site on the eastern side of Mt Fyffe Road. This shared path was formed as part of the North Canterbury Transport Infrastructure Recovery (NCTIR) Alliance (i.e. Kaikōura Earthquake Rebuild).
- 3.11 Mt Fyffe Road is unformed south of the existing accessway to the site. It is noted that a paper road is shown in the Kaikōura District Council maps south of the site. Therefore, an extension to the south and connection to SH1 could potentially occur in a future opportunity.
- 3.12 Ludstone Road provides the east-west connection to Kaikōura and SH1 (east of the site). It is approximately 7 m wide in the vicinity of the intersection with Mt Fyffe Road, with 3.5 m wide lanes.
- 3.13 The posted speed limit is 60 km/h through the intersection, increasing to 80 km/h approximately 50 m west of it.
- 3.14 Ludstone Road and Mt Fyffe Road form a crossroads intersection. The priority flow is east-west, through Ludstone Road. The intersection is stop-controlled at its southern side and give-way controlled on the northern side. No right-turn facilities are provided. A short section of shoulder widening is constructed on the south side of the road to assist left-turn movements onto Mt Fyffe Road (south). The intersection is unlit.
- 3.15 The Waka Kotahi's Crash Analysis System database recorded only one minor crash throughout Mt Fyffe Road, between the site and Ludstone Road and within 200 metres of

the intersection in the last 10 years. Therefore, the crash history suggests no safety issues along Mt Fyffe Road and at the intersection with Ludstone Road.

#### **4 ASSESSMENT OF EFFECTS**

- 4.1 I assess below the traffic effects from the proposed development. I note that Revision 1 of the Traffic Impact Assessment (TIA), originally attached to the application, has been reviewed due to a calculation error that overestimated daily trips and existing trips in the future scenario. The traffic effects of the development have been somewhat exaggerated. The sight distances at the Ludstone Road/Mt Fyffe Road intersection have also since been reassessed. However, due to the relatively low traffic volumes in the existing network and to be generated by the proposal, the changes do not materially alter the original assessment. The reviewed TIA (Revision 2) is attached to this evidence.

##### **Traffic Generation**

- 4.2 The site is proposed to be developed to accommodate 67 residential lots. Two of the lots are to accommodate 20 elderly people's housing. The other 65 lots are to accommodate single residential dwellings.
- 4.3 The trip generation for the proposed development is based on trip generation rates for residential dwellings and senior adult housing (or elderly people's housing) given by the New Zealand Transport Agency (NZTA): *Trips and Parking related to land use November 2011* and the Institute of Transportation Engineers (ITE) Trip Generation Manual 10th Edition September 2017, respectively.
- 4.4 Single residential dwellings are typically expected to generate 8.2 to 10.9 vehicles per day (vpd) and 0.8 to 1.2 vehicles per hour (vph) in the peak hour. Senior adult housing units are generally predicted to generate 2.6 to 5.6 vpd and 0.3 to 0.49 vph in the peak hour.
- 4.5 Traffic generation for the proposed site is therefore expected to range from 585 to 821 vpd and 65 to 88 vph in peak periods. The higher daily and peak hourly trips have been adopted to provide a more robust and conservative assessment of traffic effects. Therefore, the trip generation applied for this site is 821 vpd and 88 vph in the peak hour.

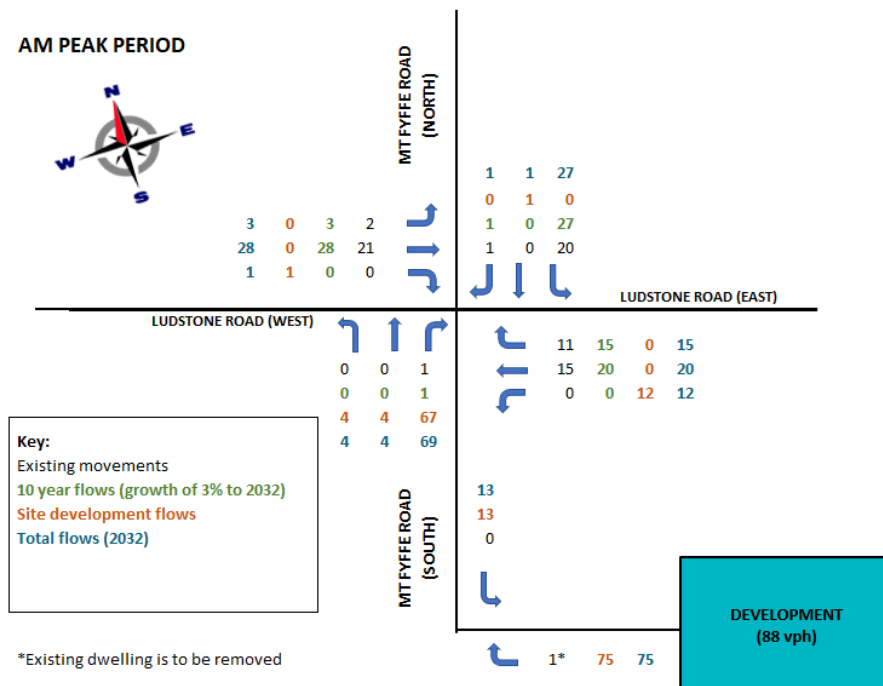
##### **Traffic Distribution for the Development**

- 4.6 The trip generation by the proposed site in the AM and the PM periods differs slightly and generally reflects people leaving home in the morning and returning home in the evening.
- 4.7 Due to the fact that Mt Fyffe Road is a no-exit road, the traffic to be generated is expected to travel 100% to and from the north, towards the Ludstone Road intersection.
- 4.8 At the Ludstone Road/Mt Fyffe Road intersection, the directional split of 90% to and from the east, 5% to and from the west and 5% to and from the north is predicted. This

directional split reflects the site's location in relation to urban facilities and amenities in Kaikoura, considered the main destination points.

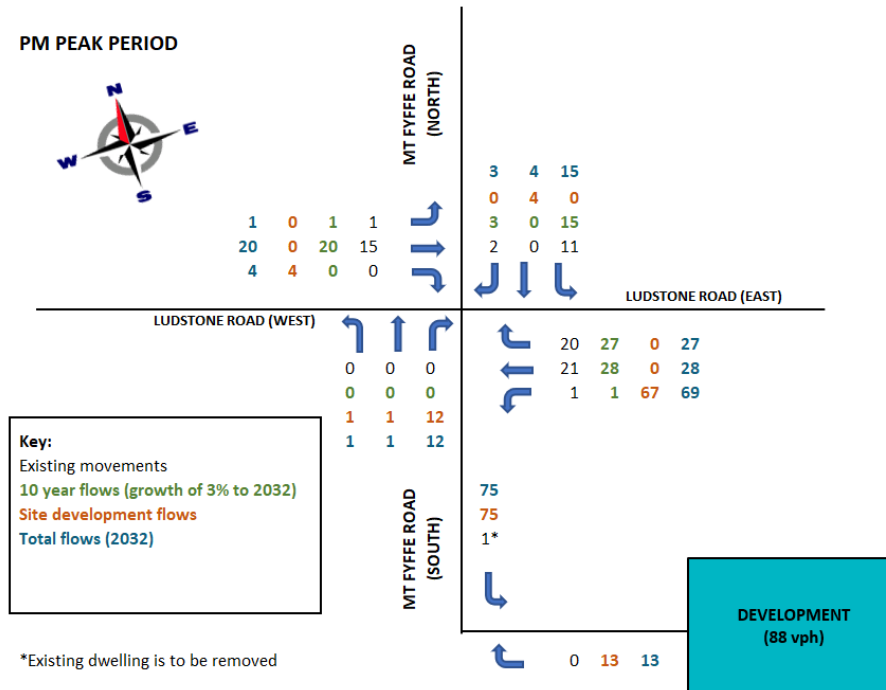
- 4.9 The in-out split in the AM peak period is expected to be 85% of trips leaving the site, with 15% arriving. In the PM peak, this ratio is reversed, with 85% arriving back at the site and 15% leaving. This in-out split is typically used for residential developments.
- 4.10 The vehicle trips predicted to be generated by the site, and considering the traffic distribution above, have been applied to the existing traffic flows to generate traffic diagrams. Existing traffic flows were obtained in a traffic survey at the Ludstone Road/Mt Fyffe Road intersection. The traffic survey was undertaken in the AM peak period, from 8 to 9 am, on Tuesday, 8 November 2022.
- 4.11 A standard growth rate of 3% has been applied to the existing traffic flows obtained in the traffic survey. This has the purpose of assessing future traffic effects. A period of 10 years has been used, representing traffic flows in 2032.
- 4.12 The traffic diagram for the AM peak period is set out below.

(a) Traffic flows in the AM peak period



- 4.13 The existing traffic flows obtained in the AM peak period have been assumed to be the reverse in the PM peak period. This engineering judgement reflects road users typically travelling back to the point of origin from which they departed in the AM peak.
- 4.14 The traffic diagram for the PM peak period is set out below.

(a) Traffic flows in the PM peak period



### Traffic Effects

- 4.15 The capacity of the Ludstone Road/Mt Fyffe Road to accommodate the additional traffic flows to be generated by the developed site has been assessed using practical absorption calculations. This tests the ability of the intersection to absorb the traffic generated by the proposed development in worst-case conditions, being that during peak hours.
- 4.16 The traffic volumes presented in the traffic diagrams above have been used to calculate the capacity of the intersection under existing and developed conditions.
- 4.17 The traffic expected to be generated by the development has been applied to the forecast traffic flows in 2032 (10-year growth, as per 4.14).
- 4.18 The calculations resulted in the required capacity (or demand) being significantly less than the capacity of the intersection to absorb the traffic flows. The ratios of demand to capacity, known as the degree of saturation, range from 23% in the existing condition to 27% in the developed condition in the future scenario.
- 4.19 It is therefore revealed that the intersection would operate at a maximum of 27% of the available capacity in the developed condition in 2032, suggesting that vehicles would be very unlikely to experience poor levels of service. Delays and queueing would likely be minimal. Therefore, the traffic effects of the proposal at the intersection are acceptable.

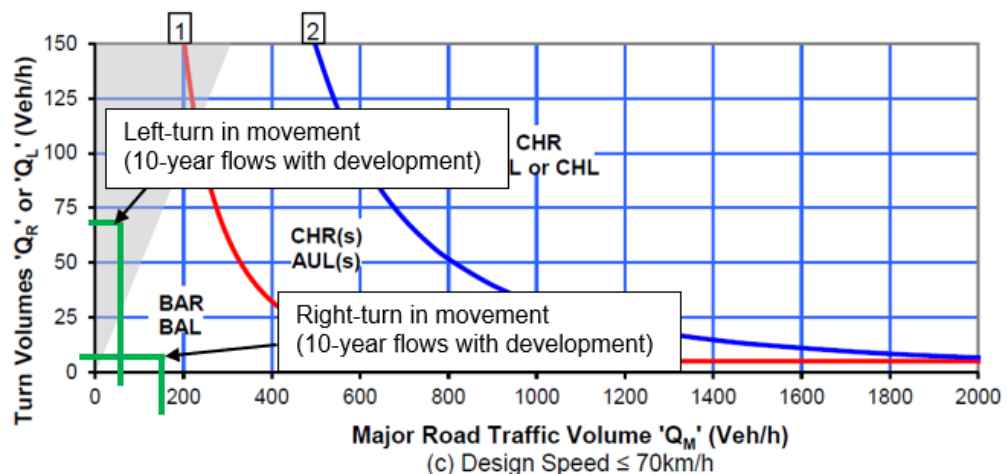
### Intersection Treatment

- 4.20 An assessment focused on safety performance outcomes has been undertaken at the Ludstone Road/Mt Fyffe Road intersection. The assessment is used to determine if the turning volumes at the main road of an intersection, in this case, Ludstone Road, trigger a

specific turn treatment, for example, a right-turn bay. This assessment follows the guidance of *Austrroads Guide to Traffic Management Part 6: Intersections, Interchanges and Crossings*, 2019.

- 4.21 This intersection treatment assessment used the traffic flows for the PM peak period illustrated in the diagram in 4.17. The traffic flows for the PM peak period have been used since the turning movements toward the site are the greatest.
- 4.22 The assessment shows that no turn treatment, either left-turn or right-turn treatment, is required at the intersection. This is a result of the combination of relatively low traffic volumes on the main road (Ludstone Road) and turning volumes toward the developed site.
- 4.23 The figure below illustrates the intersection treatment assessment. It is shown that no auxiliary lane or channelised turn treatments are required.

(a) Turning warrants at the Ludstone Road/Mt Fyffe Road intersection



- 4.24 As noted above, the Ludstone Road/Mt Fyffe Road intersection is operating safely in the present condition, with only one minor injury crash in the last 10 years.
- 4.25 The Ludstone Road/Mt Fyffe Road intersection is currently unlit. As the development will increase traffic flows at the intersection, flag lighting is recommended to be provided to increase overall safety in dark conditions.

#### **Intersection visibility – Access onto Mt Fyffe Road**

- 4.26 The Kaikoura District Plan requires minimum sight distances of 85 m and 115 m for posted speeds of 50 km/h and 60 km/h, respectively.
- 4.27 A new road intersection is proposed to be formed between the new road that will provide access to the development and Mt Fyffe Road.



- 4.28 The visibility to the north from this proposed intersection exceeds the requirements of the Kaikoura District Plan, assessed to be in excess of 150 m. Although no traffic flows are expected to travel to and from the south, the visibility from the intersection in this direction also exceeds the District Plan requirements.
- 4.29 The current posted speed limit is 30 km/h on Mt Fyffe Road. This is expected to result in a reduced visibility requirement. A Safe Intersection Sight Distance (SISD) of approximately 52 m is required for an operating speed of 30 km/h. This is based on guidance by *Austrroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections*.

#### **Intersection visibility – Ludstone Road/ Mt Fyffe Road**

- 4.30 The visibility of the Ludstone Road/Mt Fyffe Road has also been assessed.
- 4.31 The posted speed limit on Ludstone Road through this intersection is currently 60 km/h.
- 4.32 The visibility from the intersection is assessed at approximately 170 m to the west and 120 m to the east, complying with the requirements of the Kaikoura District Plan.
- 4.33 The intersection control on the north side of the intersection, presently give-way controlled, has been assessed to be incorrect in the present condition. This is due to the fact that appropriate visibility is not achieved from a point 9 m from the limit line for this intersection control to be adopted, as per the requirement of the Traffic Control Devices Manual Part 4. As a result, stop control is recommended to be adopted on the north side of the Ludstone Road/Mt Fyffe Road intersection.
- 4.34 Vegetation in the vicinity of the intersection is also expected to adversely affect sight distances. The vegetation was overgrown during the site visit. Vegetation is recommended to be trimmed/removed and permanently maintained in the vicinity of the intersection to improve visibility, works which I would expect to be part of the Council's annual maintenance programme.

#### **Adequacy of Road Design**

- 4.35 Mt Fyffe Road presently has a sealed road carriageway of 6 m wide, as described in 3.6.
- 4.36 The site's development is expected to add approximately 585 to 821 vehicles per day on Mt Fyffe Road. Daily traffic flows on this road are expected to range from 605 to 841 vpd in total taking into account the existing traffic flows.
- 4.37 The current road cross-section, in its present form, does not comply with the requirements of the Kaikoura District Plan for primary vehicle access considering the increase in traffic volumes.
- 4.38 In order to comply with the Kaikoura District Plan, the road carriageway has to be widened to 8 m wide. This is recommended to be adopted for the site's development.

### **Effects on Railway Overbridge – Single Lane Section**

- 4.39 A railway overbridge crosses Mt Fyffe Road in the vicinity of the intersection with Ludstone Road. The road carriageway on Mt Fyffe Road is narrowed to 4.6 m wide in the vicinity of the overbridge, establishing a single-lane flow for a distance of approximately 50 m from 40 m south of the overbridge to immediately north of it. Centreline markings are provided throughout this section.
- 4.40 The width between piers underneath the railway overbridge is approximately 7.8 m. A width of approximately 1.6 m is provided between the road carriageway and each pier.
- 4.41 The separation between the road carriageway and the overbridge's piers is considered required to prevent collisions against the piers, which are non-frangible/rigid objects. This separation reduces the risk of collisions against the piers, which could result in injury crashes, and also maintains the overbridge's integrity. The separation also allows space for stormwater drainage and road delineation (edge marker posts) through the narrower section.
- 4.42 An assessment has been therefore undertaken to identify the probability of opposing vehicles meeting simultaneously throughout the single-lane 50 m long section. This aimed to establish the probability of potential issues in the vicinity (for instance, conflicts between opposing vehicles and queueing back onto Ludstone Road).
- 4.43 Peak hour volumes of 75 vph departures and 13 vph arrivals to and from the site are predicted to occur in the AM peak period, as in 4.15. This equates to one vehicle every 48 seconds and 277 seconds for departures and arrivals in the peak hour, respectively.
- 4.44 A vehicle takes 12 seconds to travel through the 50 m long section at 15 km/h. This is referred to as exposure time. If departures occur on average every 48 seconds and arrivals at 277 seconds, the probability of 25% of a vehicle departing this one-way section is calculated. For arrivals at every 277 seconds, the probability of a vehicle arriving in this one-way section is 4.3%.
- 4.45 Therefore, the probability of departures and arrivals occurring at the same time is calculated at 1.1%.
- 4.46 No adverse effects are therefore expected to be generated due to increased traffic volumes added by the development through the single-lane section, given the low probability of departures and arrivals occurring simultaneously.

### **Site's Internal Rooding Layout**

- 4.47 The internal rooding layout, including the proposed new public road, complies with or exceeds the requirements of the Kaikōura District Plan.

- 4.48 The existing posted speed limit of 30 km/h on Mt Fyffe Road is recommended to be adopted and extended through the site.
- 4.49 The Kaikōura District Plan requires a minimum separation distance between intersections from 125 m to 160 m on 50 km/h and 60 km/h posted speed limit zones, respectively. The District Plan does not establish requirements for a 30 km/h posted speed limit.
- 4.50 The new road intersection within the site is located approximately 80 m east of the Mt Fyffe Road/New Road intersection, as shown in the figure below.

(a) Separation distances



- 4.51 This represents a shortfall from the requirements of the District Plan for a 50 km/h speed limit. However, no adverse effects are expected to occur as a result due to the following:
  - (a) A posted speed limit of 30 km/h is recommended to be adopted within the site. This is expected to reduce the separation distance requirement and the shortfall;
  - (b) Separation distances are typically required to provide enough observation time for safe turning movements at intersections. The proposed distance between intersections in relation to the posted speed limit is assessed to be adequate for safe movements to be undertaken at the intersection. The distance exceeds Safe Intersection Sight Distances (SISD) for a 30 km/h speed environment. The available distance also exceeds Stopping Sight Distances (SSD) for a 60 km/h design speed given by Austroads Guide to Road Design Part 3: Geometric Design.

- (c) A horizontal curve is proposed in the approach/departure of the new intersection off Mt Fyffe Road. This is expected to further reduce vehicles' operating speeds, controlling their speeds. This is expected to create more safe gap opportunities for turning movements at the new intersection within the site.

4.52 The factors above establish a very unlikely probability of any issues occurring due to the proposed separation distance.

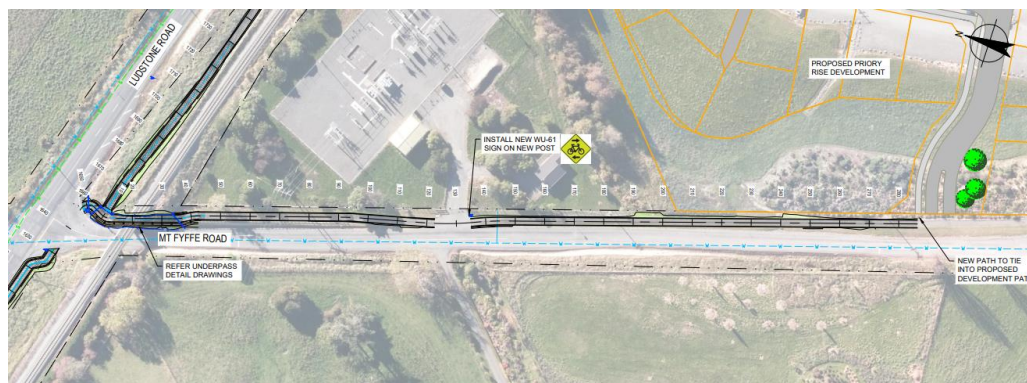
### Walking and Cycling facilities

4.53 Currently, Mt Fyffe Road has no formal walking and cycling facilities. An informal shared path is currently provided on Mt Fyffe Road and Ludstone Road. This shared path was formed as part of the NCTIR (Kaikōura Earthquake Rebuild) but has been virtually inoperative since then.

4.54 A formal shared-use path is currently being designed for Mt Fyffe Road and Ludstone Road. This shared path will connect pedestrians and cyclists from the site to Ludstone Road. From Ludstone Road, these vulnerable road users will be able to walk or cycle to both east and west. The construction is expected to start in 2023.

4.55 The figure below illustrates the shared path configuration on Mt Fyffe Road, demonstrating the connection to the site.

- (a) Shared path on Mt Fyffe Road

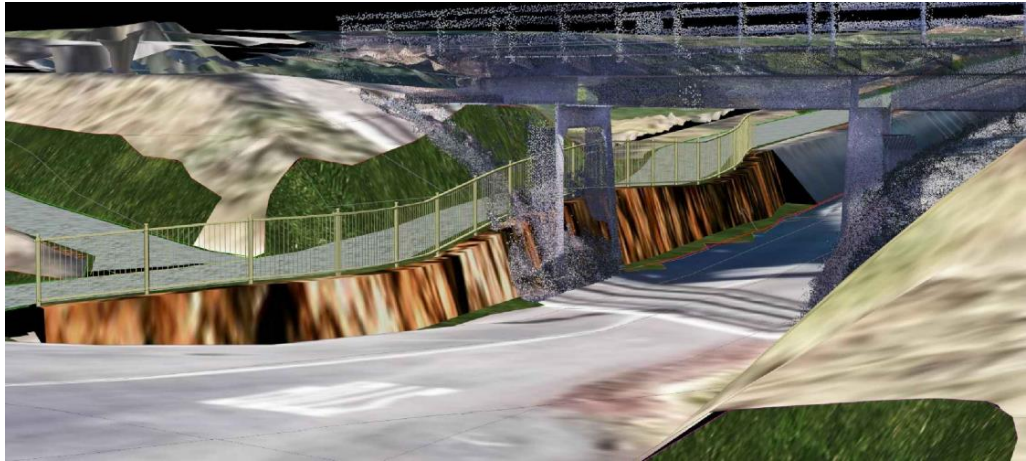


4.56 At the railway overbridge, the shared path is proposed to be separated from the road carriageway. The shared path is designed on the east side of the overbridge's eastern pier.

4.57 The separation between the road carriageway and the shared path positively influences safety for pedestrians and cyclists throughout the overbridge, reducing the likelihood of conflicts between vehicles and these vulnerable road users.

4.58 The perspective of the shared path through the railway overbridge is shown in the figure below.

- (a) Perspective of the shared path through the railway overbridge



## **5 RECOMMENDATIONS TO AVOID, REMEDY OR MITIGATE ADVERSE EFFECTS**

- 5.1 Based on the assessment of traffic effects above, I provide recommendations to avoid, remedy or mitigate them below.
- 5.2 In reference to 4.25, flag lighting is recommended to be provided to increase overall safety in dark conditions due to increased traffic flows generated by the development. This is agreed upon by the Applicant.
- 5.3 In reference to 4.33, the Kaikoura District Council is recommended to consider updating the intersection control on the north side of the Ludstone Road/Mt Fyffe Road intersection to stop control.
- 5.4 In reference to 4.34, the Kaikoura District Council is recommended to consider trimming/removing overgrown vegetation in the vicinity of the Ludstone Road/Mt Fyffe Road intersection and permanently maintaining it.
- 5.5 In reference to 4.38, Mt Fyffe Road is recommended to be widened to 8 m between the site and the railway overbridge to accommodate the additional traffic flows to be generated by the developed site. This is agreed upon by the Applicant.
- 5.6 In regard to the site's internal layout, the following recommendations are made:
- (a) Vehicle crossings are to be sealed and between 3 and 6 m wide;
  - (b) Vehicle crossings for corner lots are to be provided from the lower volume road;
  - (c) A minimum turning head radius of 9.5 m is to be constructed at the end of the road;
  - (d) The speed limit throughout the site is to be 30 km/h.
- 5.7 All of (a)-(d) above are agreed upon by the Applicant.

## **6 ISSUES RAISED IN SUBMISSIONS**

- 6.1 Jono Gemmell, on behalf of the Ministry of Education, raised traffic issues in regard to the construction traffic and traffic movements to be generated by the development. I address these issues below.
- 6.2 The submission states that traffic movements caused by heavy vehicles during construction will cross over the school vicinity and have an adverse effect on the safety of students, staff and visitors accessing Kaikoura High School.
- 6.3 In line with the above, the submitter requested consideration of the following mitigation measures:
- (a) Heavy vehicles are not to use the Ludstone Road route to and from the site between 8.15 – 9.15 am and 2.45 – 3.25 pm; during those times, heavy vehicles are to use an alternative route; and
  - (b) Acknowledgement of the posted speed limit of 30 km/h past Kaikoura High School.
- 6.4 In regard to 6.3(a), it is recognised that the use of an alternative route by heavy vehicles during the school peak periods is expected to result in amenity and safety benefits in the school's vicinity. I support this request and recommend that it be included as a condition of consent.
- 6.5 In regard to 6.3(b), it is noted that the posted speed limit through the school is 40 km/h. This 40 km/h speed zone is approximately 300 m long and covers the Kaikoura High and St Joseph's schools. Speed limit signs are provided in both directions, making road users aware of the speed limit ahead, with nothing further to be noted.
- 6.6 The submitter also states that the approximately 88 vehicle movements per hour in peak periods to be generated by the site, which coincides with school start and finish times, is likely to add congestion and safety concerns outside Kaikoura High School.
- 6.7 In line with the above, the submitter requests a traffic assessment that gives regard to the effect of the increased total and peak hour traffic movements on the safety of Kaikoura High School.
- 6.8 Firstly, I note that, whilst the development's AM peak period (8 to 9 am) is expected to coincide with the school start, the development's PM peak period differs from the school finish. The site's PM peak hour is expected to be 4.30 to 5.30 pm, whilst the school finish time is expected to be from 2.45 to 3.25 pm. Therefore, the development's traffic effects on school finish times are expected to be less than minor.
- 6.9 In addition, the traffic generation from the site during peak hours corresponds to 79 vehicle movements past the school. This corresponds to one vehicle every 46 seconds on

average during network peak hours. The site's traffic generation, added to the existing traffic flows of approximately 68 vph in the peak hour on Ludstone Road, corresponds to one vehicle every 25 seconds on average. This traffic generation during peak periods on Ludstone Road is considered low. No adverse effects on road safety or capacity are therefore anticipated as a result of the traffic to be generated by the development in addition to the existing traffic flows on Ludstone Road.

- 6.10 Outside peak periods, the average interval between vehicles is anticipated to be higher than the values of peak periods presented above. Similarly, no adverse effects are expected to occur due to the traffic movements generated by the site outside peak periods.

### **LA Margetts & WM Smart Partnership**

- 6.11 Dave Margetts, on behalf of LA Margetts & WM Smart Partnership, raised traffic issues in regard to the traffic effects to be generated by the developed site. I address these issues below.
- 6.12 The submitter has concerns regarding safety issues due to the narrower road carriageway through the railway overbridge, considering the additional traffic generated by the development. Mr Margetts considers it adequate that road widening be provided for the full width between the overbridge's piers. I address these concerns in 4.48 and 4.51 to 4.54. In summary, there is a very low probability of departures and arrivals occurring simultaneously through the single-lane section, resulting in very low likelihood of conflicts between vehicles. Furthermore, the separation between the road carriageway is considered required to reduce the risks of collisions with the overbridge, and accommodate stormwater drainage and road delineation.
- 6.13 Mr Margetts has concerns about the configuration of the shared path underneath the railway overbridge. The submitter wants to be reassured that separation between the road carriageway and the shared path is provided. I address this concern from 4.64 to 4.66. In summary, a separation between the carriageway and the shared path is expected to be provided as part of the new design.
- 6.14 The submitter has concerns about the visibility from his driveway at 21 Mt Fyffe Road due to the vertical alignment to the south, considering the traffic volumes to be generated by the site. As a result, Mr Margetts requests recontouring of the existing road. As in 4.34, sight distances of 52 m are required for a 30 km/h speed environment. The visibility to the south from 21 Mt Fyffe Road is estimated at 65 m. Therefore, safe turning movements are expected to be undertaken to and from this driveway. Furthermore, the available visibility exceeds car stopping sight distances for a 50 km/h design speed given by *Austrroads Guide to Road Design Part 3: Geometric Design*. This provides reassurance that conflicts involving vehicles turning to and from this driveway and traffic from the site are unlikely to occur.

- 6.15 Mr Margetts considers that the posted speed limit of 30 km/h is suitable for this section of Mt Fyffe Road and requests this to be retained. The TIA recommended that the posted speed limit of 30 km/h be provided within the subdivision. Therefore, I agree that this request is reasonable for this road and within the subdivision due to the fact that reduced speeds are expected to reduce the likelihood and severity of crashes, providing a safer environment.

## **7 ISSUES RAISED IN THE S 42A RECOMMENDATION REPORT**

- 7.1 The s 42A Report summarises the TIA and refers to the content of submissions, which I have discussed above. The Report then assesses the application against the various objectives and policies of the District Plan, including those with a transportation focus.

- 7.2 I disagree with the comment in section 5.7 that in respect of Policy UFD-P2 *Urban growth integrates with traffic safety*, the proposal:

*Does not comply – this does not affect SH1 however, surrounding roads would see significant effects – application suggests that MT Fyffe Rd is to see an increase in 905 vehicle movements per day (vpd) from 20 vpd*

- 7.3 While there will be a significant increase in vehicle movements on Mt Fyffe Rd and, to a lesser extent, on Ludstone Road, this is not the same as saying there will be significant traffic effects. As mentioned above, I consider that the road network around the site can safely and efficiently accommodate this increase in vehicles per day.

- 7.4 Also, as analysed above, I do not agree that the proposal is: *likely to cause more traffic congestion due to proximity of schools and small road and intersection*. The increase in traffic on Ludstone Rd close to schools is expected to be difficult to detect.

- 7.5 In other parts of the Report, a comment is made that little provision is made for pedestrian or cycling access to the subdivision. The development will benefit from the shared-use path to be constructed along Ludstone Rd and Mt Fyffe Road. Residents of the site will have easy access to this path for short journeys to local facilities and into the town centre.

## **8 CONCLUSION**

- 8.1 For the reasons above, I conclude that the proposed development can be readily accommodated within the adjacent traffic and transportation environment with no more than minor effects, and the proposed development can be safely supported from a transportation perspective. This conclusion is made on the assessment that the development is predicted to generate up to 821 vehicles per day with a peak hour volume of 88 vehicles per hour.



- 8.2 While the peak hour traffic flows at the site are likely to coincide with the surrounding network peak, the expected effects from this traffic at the surrounding intersection have been assessed as no more than minor.
- 8.3 The internal roading layout, including the proposed new public road, complies with or exceeds the requirements of the Kaikōura District Plan.
- 8.4 An evaluation has been undertaken to focus on safety performance outcomes of the adjacent intersection. With the additional flows to be generated by the development, no right- or left-turn facilities are warranted at the Ludstone Road/Mt Fyffe Road intersection. This is primarily driven by the relatively low traffic volumes at the intersection and to and from the site.
- 8.5 The separation distance between the intersection within the site and Mt Fyffe Road does not meet the requirements of the District Plan for a 50 km/h posted speed limit. However, the posted speed limit of 30 km/h is recommended to be adopted throughout the site. Therefore, no adverse effects are expected to be generated due proposed separation distance. The turning movements are expected to be safely undertaken at the intersection, with appropriate observation time due to the relatively low speed environment throughout the site.
- 8.6 Mt Fyffe Road is currently predominately 6 m wide to the south of Ludstone Road, except for the single-lane section through the railway overbridge. This road is recommended to be widened to 8 m wide to accommodate the additional traffic flows and alignment with the Kaikōura District Plan.
- 8.7 An assessment of the single-lane underneath the railway overbridge section has been undertaken to confirm that safe movements can be undertaken considering the increased traffic flows generated by the site's development. The assessment resulted in a very low probability of conflicts between opposing vehicles occurring through this short single-lane section.
- 8.8 A future shared path is intended to connect to the site along Mt Fyffe Road and Ludstone Road. This is expected to safely provide for walking and cycling trips to and from the site, enabling connectivity to nearby shops and schools without motorised vehicles. The shared path is proposed to be separated from the road carriageway, increasing safety for pedestrians and cyclists.

**Matheus Felipe Boaretto**

**12 April 2023**