Resource Consent Review - Transport

D220001 – alteration to Waka Kotahi Designation at Rakaia

Prepared for	Selwyn District Council
Job Number	SDC-J045-11
Issue Date	19 August 2022
Prepared by	Fraser Dixon, Transportation Planner
Reviewed by	Dave Smith, Technical Director

1. Introduction

Abley Limited (Abley) was engaged by Selwyn District Council (Council) to provide independent transport planning advice in respect of a resource consent variation application to alter a designation (Designation TR7 in the Operative Selwyn District Plan (SDP) and Designation NZTA-7 in the Proposed Selwyn District Plan) for the construction, operation, and maintenance of a Commercial Vehicle Safety Centre (CCSV). The site location is indicated in Figure 1.1.

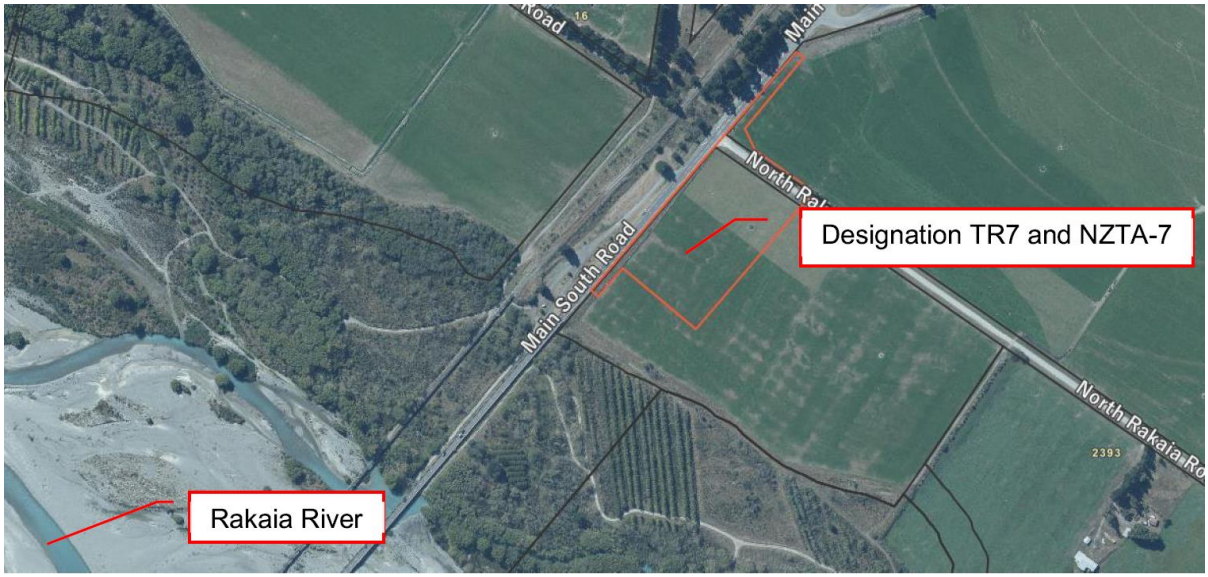

Figure 1.1 Site location

The key features of the proposal with respect to the potential transport-related effects are:

- The size and scale of the development will be reduced and will only be used by southbound vehicles.
- Access is proposed to be from North Rakaia Road adjacent to State Highway 1 (SH1) with a maximum of nine truck and trailer movements during morning peak hour and eight vehicle trips during evening peak hour.
- The site will have three heavy vehicle bays and six car parking spaces, including one disabled car parking space.

This review of the transportation effects of the proposal has been informed by an assessment of the transport rules and other transport related rules in the Operative Selwyn District Plan (SDP). In preparing this review Abley has taken into consideration the following documents and correspondence:

- The Transport Assessment, prepared by Jacobs dated 5th February 2020.
- The NOR Outline Plan, prepared by Waka Kotahi dated 27th May 2022.
- Section 92 response prepared by WSP, dated 29th July 2022

The overall activity status is Discretionary. Abley's assessment proceeds on the basis of this stated activity status.

2. Operative Selwyn District Plan Assessment

Abley has assessed the proposal in accordance with the transport rules and other transport related rules of the SDP. The rules are listed below in Table 2.1 with comments on the compliance of the proposal with each rule.

Table 2.1 SDP Transportation Rules Assessment

Transport Rule in the AUPOP		Complies (Y/N)	Comment
Rural Volume – C4 Roading			
4.1 Roads and Outstanding Natural Areas		N/A	No roads are proposed to be constructed.
4;.2 Roads and Natural Hazards		N/A	No roads are proposed to be constructed.
4.3 Roads and Sites of Significance to Tāngata Whenua		N/A	No roads are proposed to be constructed.
4.4 Road and Engineering Standards			
4.4.1 The forming, installation, upgrading, maintenance or replacement of any road shall be a permitted activity if the following standards are met:		Applies	North Rakaia Road is proposed to be upgraded outside the designation frontage.
4.4.1.1 Any part of any road does not have a gradient greater than: (a) 1:6 vertical; or (b) 1:20 horizontal.		Y	The road does not exceed these gradients.
4.4.1.2 Any road is formed to the relevant standards set out in Appendix E10.3, except that E10.3.1 shall not apply to works to existing roads undertaken by	E10.3.1.1 Any new road shall be laid out and vested in the Council in accordance with the standards contained in Table E10.5. Table E10.5 States for Local Roads a road reserve minimum of 15m and maximum of 20m is required	N/A	The road is existing and has a road reserve width of 19.5m.

Transport Rule in the AUPOP		Complies (Y/N)	Comment
Council pursuant to the Local Government Act;	E10.3.1.2 For determining the carriageway width in Table E10.5, the minimum carriageway widths shall be measured from the edge of seal to edge of seal. Table E10.5 states for Local Roads a minimum and maximum of 6.7m and 7m of carriageway width is required respectively.	N/A	The carriageway width of the road is proposed to be 7m.
	E10.3.1.3 The carriageway of any new road laid out and vested in accordance with the above shall be formed and sealed.	N/A	North Rakaia Road is proposed to be sealed within the designation area.
	E10.3.2.1 The spacing between road intersections shall comply with Table E10.6 below. Table E10.6 states that the minimum distance between intersections is 800m for 100km/h roads.	N/A	The road is existing.
	E10.3.2.2 In determining intersection spacing's from Table E10.6 in accordance with E10.3.2.1, where new roads are proposed as part of any Outline Development Plan, the intersection spacing's can be designed for the proposed (future) speed limit (typically 50km/hr if within the urban limits) within the Outline Development Plan area and on immediately adjoining roads.	Y	No new roads are proposed.
	E10.3.2.3 The distance between any two road intersections shall be measured along the centre line of the road which has both the intersections: (a) From the point where the centre lines of two of the roads intersect; (b) To the point where the centre lines of the other two roads intersect.	-	Noted.
4.5 Vehicle Accessways and Vehicle Crossings			
4.5.1 The forming, installation, upgrading, maintenance or replacement of any vehicle accessway or vehicle crossing shall be a permitted activity if the following conditions are met:		-	Noted

Transport Rule in the AUPOP		Complies (Y/N)	Comment
4.5.1.1 Any part of any vehicle accessway does not have a gradient greater than: (a) 1:6 vertical; or (b) 1:20 horizontal.		Y	The vehicle accessway complies.
4.5.1.2 Any vehicle accessway is formed to the relevant design and formation standards set out in Appendix E10.2.	E10.2.1.1 The minimum requirements for any shared private vehicle accessway for a site(s) shall be in accordance with Table E10.2.	Y	The accessway is not a shared private access.
	E10.2.1.2 Where Table E10.2 requires turning areas, turning within the shared accessway may be facilitated through the use of a hammerhead arrangement. Note: refer to the Council's Code of Practice for the design standard required.	N/A	Not required.
	E10.2.2.1 No part of any vehicle crossing shall be located closer to the intersection of any road than the minimum distances specified in Table E10.3 except that where the boundaries of a site do not allow the provision of any vehicle crossing whatsoever in conformity with the above distances, a single vehicle crossing may be constructed in the position which most nearly complies with the provisions of Table E10.3. (the Road Hierarchy for the District is set out in Appendix 9). Table E10.3 states that the minimum distances of a vehicle crossing located on a local road from a State Highway road intersection is 75m.	**N**	The centre of the vehicle crossing is approximately 50m from State Highway 1.
	E10.2.2.2 No part of any vehicle crossing shall be located closer than 30 metres to the intersection of any railway line as measured from the nearest edge of the vehicle crossing to the limit line at the level rail crossing.	Y	No railway crossings are within 30 metres of the vehicle crossing.

Transport Rule in the AUPOP		Complies (Y/N)	Comment
	E10.2.2.3 The distance between any vehicle crossing and road intersection shall be measured along the centre line of the frontage road: (a) From the point where the centre lines of the two roads intersect; (b) To the point where the centre lines of the vehicle crossing and the frontage road intersect.	-	Noted
	E10.2.2.4 Notwithstanding Rule E10.2.2.1 above, for any: (a) service station; or (b) truck stop; or (c) any activity which generates more than 40 vehicle movements in any one day; No part of any vehicle crossing onto any State Highway road or arterial road shall be located closer than: (d) 60m to the departure side of any intersection; and/or (e) 30m to the approach side of any intersection.	Y	The activity will generate more than 40 vehicle movements a day. The vehicle crossing will be located on North Rakaia Road.
4.5.1.3 Any vehicle accessway complies with the relevant separation and sight distance standards set out in Appendix E10.2.	E10.2.3.1 Vehicle crossings onto roads must provide the required minimum sight distances in Table E10.4 and Diagram E10.A1.	**N**	Sightlines of 282 metres are required for roads with a posted speed limit of 100km/h. Due to the proximity of the North Rakaia Road/ State Highway 1 intersection this is not possible.
4.5.1.5 Any vehicle crossing providing vehicle access to a sealed road is sealed: (a) The full length of the vehicle crossing (from the edge of the sealed carriageway to the road boundary of the property), or; (b) For the first 10 metres from the sealed carriageway.		Y	The vehicle crossing and accessway will be sealed.

Transport Rule in the AUPOP		Complies (Y/N)	Comment
4.5.1.6 Any access to a State Highway or Arterial Road complies with the following: (a) No legal access is available from another lower classification road; (b) For State Highways only, the traffic generated through the access to the State Highway is less than 100 ecm/d; (c) The vehicle accessway or vehicle crossing complies with the performance criteria given in Appendix E10.2.2, 10.2.3 and E10.2.4; (d) Provision is made for manoeuvring on site, so that reverse manoeuvring onto the State Highway or Arterial Road is not required.		Y	No access is proposed onto the nearby State Highway 78.
4.5.1.7 Shared access to more than six sites shall be by formed and vested legal road and not by a private accessway.		Y	One site is served.
4.5.1.8 Any site with more than one road frontage to a road that is formed and maintained by Council, shall have access to the formed and maintained (and legal) road with the lowest classification.		Y	The site fronts both State Highway 1 and North Rakaia Road (Local). Access will be from North Rakaia Road.
4.6 Vehicle Parking and Cycle Parking			
4.6.1 Any activity in the Rural Zone which provides car parking in accordance with the following standards shall be a permitted activity.		-	See below.
4.6.1.3 For any other activity: (a) all car parking associated with an activity must be located either on-site or on land adjoining the site and not on the road reserve; and (b) all loading (including unloading) associated with an activity must be undertaken on-site or on land adjoining the site and not within the road reserve; and		Y	All parking and loading will be within the site
4.6.1.4 All carparking and loading areas shall comply with all standards set out in Appendix E10.1.	E10.1.1.1 Any on-site car parking or loading space located between the road frontage and the main entrance of any educational facility or any activity involving the retailing of goods and services to the public shall not have a metalled surface.	Y	The activity is not educational or involve the retailing of goods and services to the public.
	E10.1.2.1 Any area required for on-site parking or loading, other than for a residential activity, shall be available at all times for staff and visitors during the hours of operation of the activity and shall not be diminished by any subsequent erection of any structure, storage of goods, or any other use.	Y	On-site parking and loading areas will be available for staff and visitors during the hours of operation.

Transport Rule in the AUPOP		Complies (Y/N)	Comment
	E10.1.4.1 The gradient of any on-site parking or loading area for any non-residential activity, shall be no more than: (a) At 90° to the angle of parking - 1:16; or (b) Parallel to the angle of parking - 1:20	Y	The site is flat.
	E10.1.5.1 The manoeuvring area to and from any parking space shall be designed to accommodate at least the design motor car as set out in the Council's Engineering Code of Practice. E10.1.5.2 The manoeuvring area to and from any loading space shall be designed to accommodate at least the design truck as set out in the Council's Engineering Code of Practice. E10.1.5.3 No loading space shall obstruct any on-site car parking space or any vehicle or pedestrian access. E10.1.5.4 No vehicle shall be required to reverse out of any site onto a road.	Y	Vehicle tracking has been provided demonstrating manoeuvring is possible for all parking and loading spaces. The proposed loading spaces do not obstruct the car parking spaces or accesses. Vehicles are not required to reverse out of the site onto the road.
4.6.2 Any activity on a site which has a vehicle manoeuvring area of sufficient size to enable any vehicle to turn on the site and not have to reverse onto the road shall be a permitted activity if: 4.6.2.1 The site is used for any activity other than residential activities; or 4.6.2.2 The site has access to a State Highway or an arterial road listed in Appendix 9.		Y	Vehicles will not be required to reverse manoeuvre off site.
4.6.3 Any activity which involves the provision of goods or services to the general public shall be a permitted activity if the following conditions are met: 4.6.3.1 One disabled carpark is provided with the first 10 carparking spaces; and one additional disabled carpark space for every additional 50 carparking spaces provided. 4.6.3.2 The disabled carparks are: (a) Located as close to the entrance to the building or the site of the activity as practical; (b) Sited on a level surface; and (c) Clearly marked as being for mobility-impaired persons.		Y	Visitors are expected to visit the site. One mobility parking space will be provided on site and is located close to the entrance, on a level surface and is clearly marked for mobility impaired persons.
4.7 Traffic Sightlines – Road/Rail Crossings			

Transport Rule in the AUPOP	Complies (Y/N)	Comment
4.7.1 The following shall be permitted activities: 4.7.1.1 Any building if the building is positioned so that it does not encroach within the line of sight for any railway crossing as shown in Appendix 10 Diagram E10.E 4.7.1.2 Any tree if the tree is planted so that it does not encroach within the line of sight for any railway crossing as shown in Appendix 10, Diagram E10.E Note: The NZTA Traffic Control Devices Manual provides further guidance on level crossings.	Y	There are no railway crossings close to the site.
9.12 Activities and Carparking, Vehicle Crossings, Access and Egress		
9.12.1 The activity shall comply with the rules for carparking, vehicle crossings, vehicle access and egress set out in Rule 4, and Appendix 10 for specific provisions applying to State Highways to be a permitted activity.	N/A	Previously assessed
9.13 Activities and Vehicle Movements		
9.13.1 Any activity which does not exceed the following maximum number of vehicle movements shall be a permitted activity: 9.13.1.1 Road Unformed and, or not maintained by Council: (a) For any commercial or industrial related activity where access is required off an unformed and un-maintained road, excluding normal farming activities: Nil. (b) For any individual property access off an unformed and un-maintained road: 15 equivalent car movements per day (ecm/d) per site. 9.13.1.2 Road Formed, Sealed and maintained by Council: (a) State Highway and Arterial Roads (as identified in Appendix 9): 30 ecm/d per site averaged over any one week period). b) Local and Collector Roads: 60 ecm/d per site (averaged over any one week period). 9.13.1.3 Road Formed, Unsealed and maintained by Council: (a) 60 ecm/d per site (averaged over any one week period).	**N**	The activity is predicted to have up to nine trucks enter and exit the site during peak hour. Scaled up (assuming peak hour is 10% of daily vehicles) there will be 90 trucks per day and 14 light vehicles per day. The activity is expected to generate 1,094 ecm/d exceeding the permitted 60 ecm/d for a local road.

3. Matters for Assessment

3.1 Trip Generation

The SDP states access to a local road is not permitted if it generates over 60 equivalent car movements per day (ecm/d) under Rule 9.13, in which the activity will generate 1,094 ecm/d including light vehicle trips.

The activity is proposed to generate 90 truck and trailer movements per day and 14 light vehicle movements per day. A SIDRA analysis of the SH1 and North Rakaia Road intersection has been undertaken by the applicant, with two scenarios; 5% of trucks on SH1 using the site and 20% of trucks on SH1 using the site.

Modelling in SIDRA for the SH1 and North Rakaia Road intersection demonstrates that the LoS will be B for both right turning movements and A for the left turn onto SH1 from North Rakaia Road for the 5% scenario, and the right turn movement from North Rakaia Road onto SH1 drops to a LoS of C within the 20% scenario. Delay times range from 9 to 14 seconds which is considered acceptable. The left turning movement from SH1 into North Rakaia Road also operates at LoS of A for both scenarios. Modelling was also conducted for an 80km/hr speed environment on SH1 and found to be consistent with the 100km/hr modelling results.

The number of trips associated with the activity can be accommodated by SH1, however North Rakaia Road is an unsealed rural local road. Increasing the number of trips (especially heavy vehicles) will carry debris onto SH1 creating a hazard for vehicles on a high-volume road. As mitigation the applicant has proposed to seal North Rakaia Road to be 7m wide for 20m beyond the site's vehicle crossing to the southeast. This is recommended to be maintained by Waka Kotahi as part of the State Highway maintenance agreement with council.

It is noted that the speed of the left turn movement from SH1 into North Rakaia Road is below 30km/hr compared to the through traffic operating at 100km/h. This presents a safety risk as drivers may attempt to overtake a left turning truck using the opposite side of the road due to frustration increasing the risk of a head on collision. Due to the number of trucks expected to visit the site and volumes on SH1 there is a notable safety risk. This concern has been raised in Council's transport RFI and the applicant has responded by proposing a left turn auxiliary lane on SH1 for decelerating vehicles within the site. It is understood that the applicant has accepted this mitigation for the safety concern however no design has been provided. It is recommended that a left turn auxiliary lane design is included as a condition of consent subject to engineering approvals by Council.

3.2 Sight Distance

The SDP requires a sight distance at the vehicle crossing of 282 metres on roads with a posted speed limit of 100km/h under Rule 4.5.1.3. This is not possible due to the site's proximity to the SH1/North Rakaia Road intersection.

This is not considered to be a safety issue due to the following reasons:

- North Rakaia Road has low traffic volumes of around 118 vehicles per day[1], therefore the chance of conflict is considered to be low.
- Vehicles exiting the site will predominantly be turning left out of the site towards SH1, therefore these left turning vehicles will be required to only look right for oncoming vehicles on North Rakaia Road where sightlines exceed the required 282 metres.

[1] https://www.mobileroad.org/desktop.html

- If a vehicle were to turn right out of the site, vehicles will be travelling at low speeds when turning into North Rakaia Road from SH1 to take the corner and will still be accelerating past the proposed vehicle crossing. If a vehicle were to pull out unexpectedly, based on a speed of 40km/h and reaction time of 2 seconds a safe stopping distance of 44m would be required for a truck to stop under the *Austroads Guide to Road Design Part 3: Geomtertic Design*. There is approximately 50m of separation between the proposed vehicle crossing and intersection.

The restricted sight distance towards the SH1/ Nort Rakaia Road intersection is considered to be acceptable.

3.3 Proximity to State Highway 1

The SDP under Rule 4.5.1.2 requires vehicle crossings to be at least 75m from State Highway intersections. The proposed vehicle crossing is located 50m away from the State Highway 1/ North Rakaia Road intersection. Vehicle crossings located close to high-speed intersections create concerns around sight distances, vehicle conflict (e.g. queueing and opposing vehicle manoeuvring), vehicle speeds and road safety.

Vehicle speeds can be reduced by installing a deceleration lane for left turning vehicles often in the form of a left turn auxiliary lane. This is recommended to be provided not only to reduce the vehicle speeds of vehicles turning left from SH1 into North Rakaia Road but to also reduce driver frustration on SH1 allowing for safe passing of left turning vehicles in a high-speed environment. A right turn bay is also proposed for southbound traffic on SH1 improving the safety of right turning vehicles at the intersection.

Adequate queueing space is provided based on the SIDRA modelling outputs demonstrating that queue lengths at the intersection will be no greater than 6m (20% scenario) on the North Rakaia Road approach, therefore the non-compliant separation between the proposed vehicle crossing and intersection is acceptable, and the crossing will not be blocked. Vehicle trips will require management to ensure vehicles do not leave all at once preventing other vehicles from exiting the site via a site management plan.

The safety record of the surrounding area is poor as two fatal crashes have occurred on the Rakaia Bridge over the past five years (one in 2017 and one in 2021). Both crashes were head on collisions with heavy vehicles. It is understood that there are plans to reduce the speed limit to 80km/hr and install queuing vehicle warning signs, flexible safety barriers, audio tactile profiled (ATP) markings, improved road markings, and a widened centreline installed however no location for these improvements has been confirmed. It is proposed that there will be a right turning median on SH1 and the inclusion of an auxiliary left turn lane on SH1 is highly recommended to reduce the likelihood of head on collisions as a vehicle will not have to perform an overtaking manoeuvre to pass a left turning vehicle into North Rakaia Road. Additionally, it is recommended that the speed limit on SH1 is reduced to 80km/h before the activity commences given the poor surrounding safety record (although this is a matter for the road controlling authority).

4. Conclusions

This technical note describes a review of the transport effects of a proposal to alter a designation (Designation TR7 in the Operative Selwyn District Plan (SDP) and Designation NZTA-7 in the Proposed Selwyn District Plan) for the construction, operation, and maintenance of a Commercial Vehicle Safety Centre (CCSV). The proposal is stated to be a Discretionary activity, and complies with the transport rules of the SDP, except for the rules listed below and the following conclusions from the assessment.

- Rule 4.5.1.2 – The minimum distance between the vehicle crossing and the SH1/North Rakaia Road intersection is 50m where 75m is required.
- Rule 4.5.1.8 - A sight distance at the vehicle crossing of 282 metres on roads with a posted speed limit of 100km/h whereas only 50m is provided looking towards the SH1/ North Rakaia Road intersection
- Rule 9.13.1 - Vehicle crossings are to be at least 75m from State Highway intersections. The proposed vehicle crossing is located 50m away from the SH1/North Rakaia Road intersection.

After an assessment of the proposal, the following conclusions have been made:

- The modelling of the SH1/North Rakaia Road intersection operates at a minimum LoS C with conservative assumptions with delays being a maximum of 14 seconds and found to be acceptable.
- Due to the safety record, high speed environment, head on collision risk and potential driver frustration over decelerating left turning vehicles a left turn auxiliary lane on SH1 is required.
- The non-compliant sight distance is acceptable as there is enough distance between the intersection and vehicle crossing for a truck to stop if a vehicle accidently pulled out and vehicles will predominately be turning left when exiting the site which has sufficient visibility.
- The proposed right turn median on SH1 will improve the safety of right turning vehicles from SH1. The safety record of the surrounding environment is poor and there have been recorded fatalities of head on collisions with heavy vehicles. The speed limit on SH1 is recommended to be reduced from 100km/hr to 80km/hr although this is a matter for Waka Kotahi as the road controlling authority.

Therefore, there are no transport-related reasons why consent should not be granted, subject to the following recommended conditions of consent:

1. The provision of an appropriate Construction Traffic Management Plan (CTMP) to mitigate any potential adverse effects of construction traffic, including deliveries, and the displacement of any vehicles due to loss of parking spaces during construction.
2. Prior to the operation of the activity, a left turn auxiliary lane and right turn median shall be installed on State Highway 1 at the State Highway 1 and North Rakaia Road intersection before construction of the activity. The designs shall be submitted to Council prior to consent for approval.
3. A site management plan is to be prepared and submitted to Council for approval prior to the operation of the activity and reviewed annually. It shall include:
    - Staging of heavy vehicle departures within the site to prevent convoying.
    - Appropriate on-site procedures for oversized vehicles within the site

4. During commencement of the activity, the proposed sealed section of North Rakaia Road is to be maintained by Waka Kotahi as part of the State Highway Maintenance agreement with Council.