



Date: 15 May 2023

TRAFFIC ENGINEERING MEMORANDUM

Prepared for

Auckland Shooting Club Incorporated

Prepared by: Nui McGregor (CPEng - Transportation Engineer)

Address: 287 Tuhirangi Road, Kakanui

RE: Traffic Impact Assessment for a Shooting Range (Auckland Shooting Club)

1 BACKGROUND

Terra Consultants have been engaged by *the Auckland Shooting Club Incorporated* to provide an assessment of traffic safety to operate an organised sport and recreation activity in the form of a Shooting Range. The total site area is 37.91 hectares and located in the remote rural area of Kakanui.

The Auckland Shooting Club (ASC) will operate between 7:00-22:00 Monday to Saturday and 09:00-18:00 on Sundays and complies with the applicable noise standards. It is important to note that the site has been substantially modified by past activities on site, namely accessway, large earth bunds, deep and extensive excavations, and ramps.

2 EXISTING ROAD NETWORK

The subject site is located approximately 65km from Auckland city centre and can be accessed via State Highway 16. Approximately 10 kilometres north of the Kaukapakapa township.

2.1 TUHIRANGI ROAD

Tuhirangi Road is a public road with metal surfaced. It is classified as an **Access** in the One Network Road Classification (ONRC) by NZTA¹. It has an ADT estimate of 65 vehicle per day (recorded in 2020) with a ratio of 5.4% heavy vehicle. The carriageway width adjacent to the site is varied between 4.5m to 5.5m.

¹ Information from Mobileroad.org, viewed 01/05/2023.

Most of rural roads including Tuhirangi Road have a default speed limit of 100km/h unless posted. However, it is common that vehicles will travel with a slow speed within rural unsealed road. From site investigation, the operating speed has been observed at 70-80 km/hr on the straight stretch of road and reduced to 40-60 km/hr within bends.

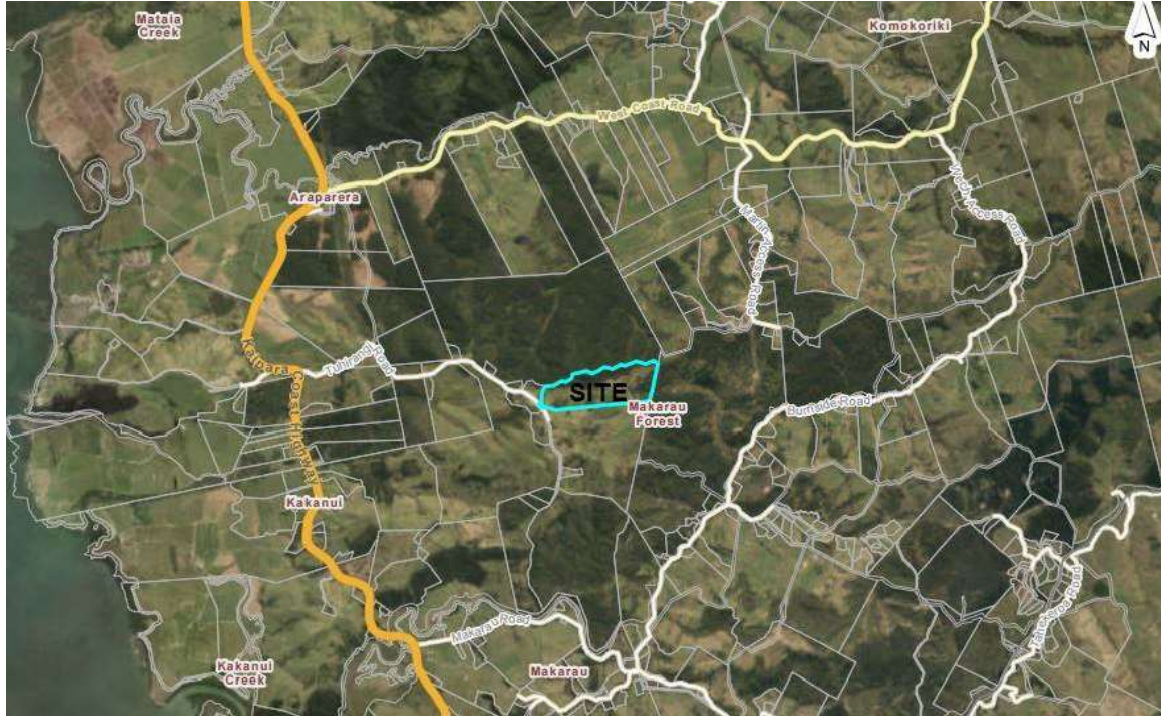


Figure 1: Site location – Google Map

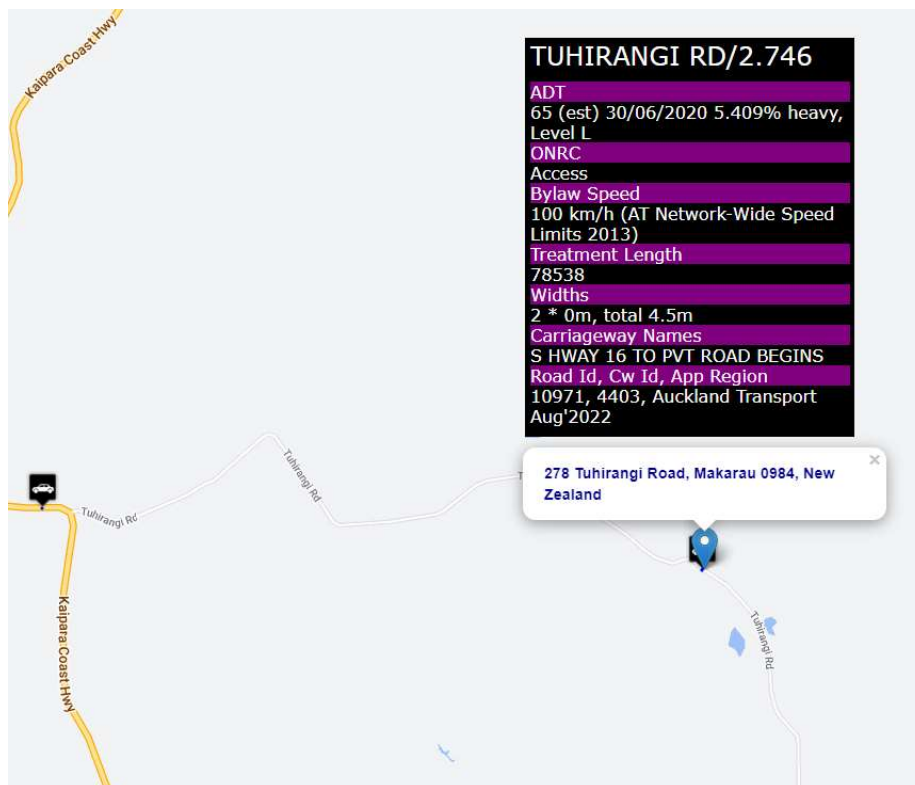


Figure 2: Mobileroad information



Figure 3: Looking right from vehicle crossing onto Tuhirangi Road



Figure 4: Existing Tuhirangi Road

2.2 SH16 – TWIN COASTAL DISCOVERY HIGHWAY

The SH16 adjacent to the Tuhirangi Road has ADT recorded in 2021 to be 3114² vehicles per day with 5.85% Heavy vehicles ratio. It is classified as a Primary Collector Road in the ONRC. It has a carriage way width of 10.2m with 2 lane traffic (1 lane in each direction).

² Information from Mobileroad.org, viewed 01/05/2023.



Figure 5: SH16 – Google Map Street View

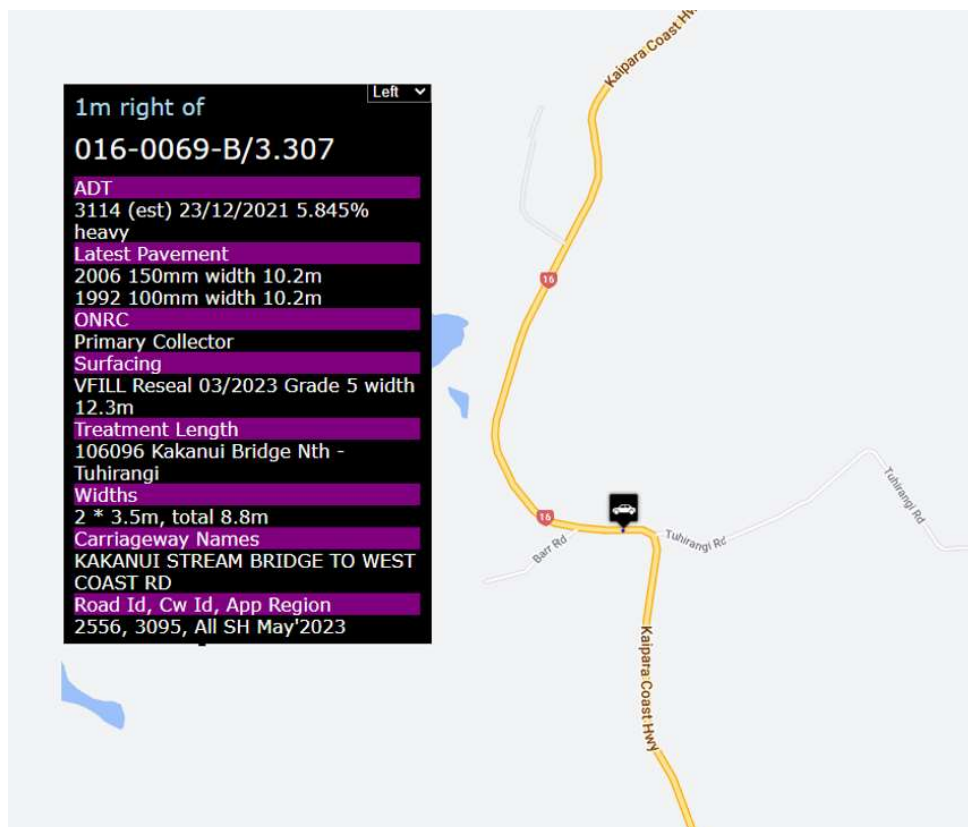


Figure 6: Mobileroad information

2.3 SH16 / TUHIRANGI ROAD INTERSECTION

A Give-way control intersection is established for the State Highway 16 and Tuhirangi Road intersection. From the site investigation, sufficient Approaching Sight Distance and Stopping Sight Intersection Distances as per Austroads Standard are available at the existing intersection.



Figure 7: Intersection – Google Map Street View



Figure 8: Looking left from Tuhirangi Road onto SH16 – Google Map Street View



Figure 9: Looking right from Tuhirangi Road onto SH16 – Google Map Street View

2.4 EXISTING ACCESS DRIVEWAY

The ASC is currently being accessed via a gravel private driveway off Tuhirangi Road. The access driveway at the access point has carriageway width of 5.0m – 6.0m. The driveway width varies between 3.3m to 6.0m or more.



Figure 10: Looking from Tuhirangi Road to the existing access.



Figure 11: Engineering plan with existing entrance layout

3 THE PROPOSAL

The purpose of this application is to obtain land use consent to establish an outdoor shooting range complex with regarding to new and retrospective works. The existing shooting bay 1 to 4 to be remain and a new shooting bay 5 is proposed.

The proposed works relate to transportation components are listed below:

- Establish car park area within existing gravel hardstand for parking spaces.
- Propose widening few sections of the existing driveway to increase safety level of internal traffic movements.
- Propose passing bays where it is suitable.

Refer to Assessment of Environmental Effects report prepared by Terra Consultants for more information of the proposal.

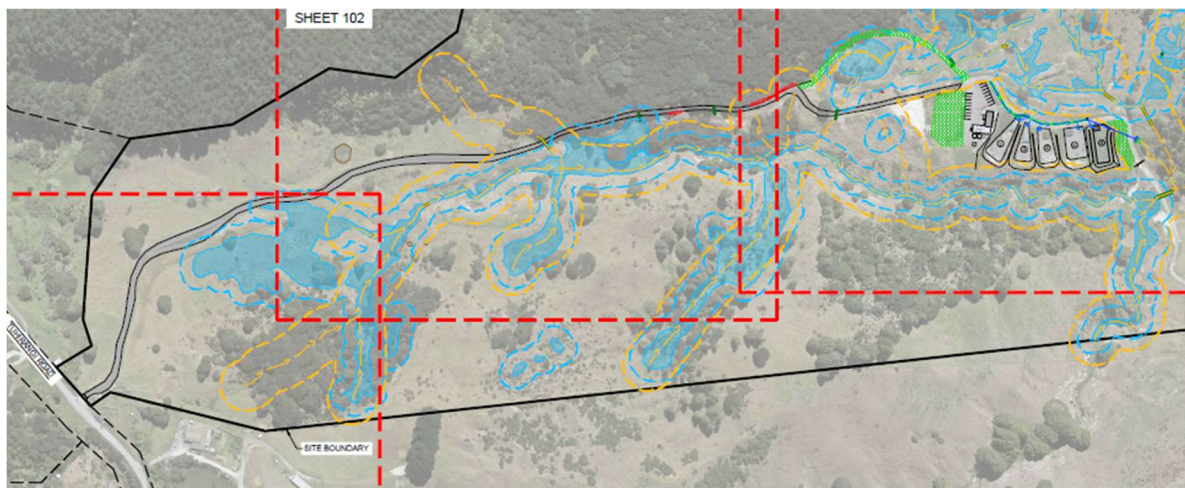


Figure 12 - Overall demonstration of the proposal

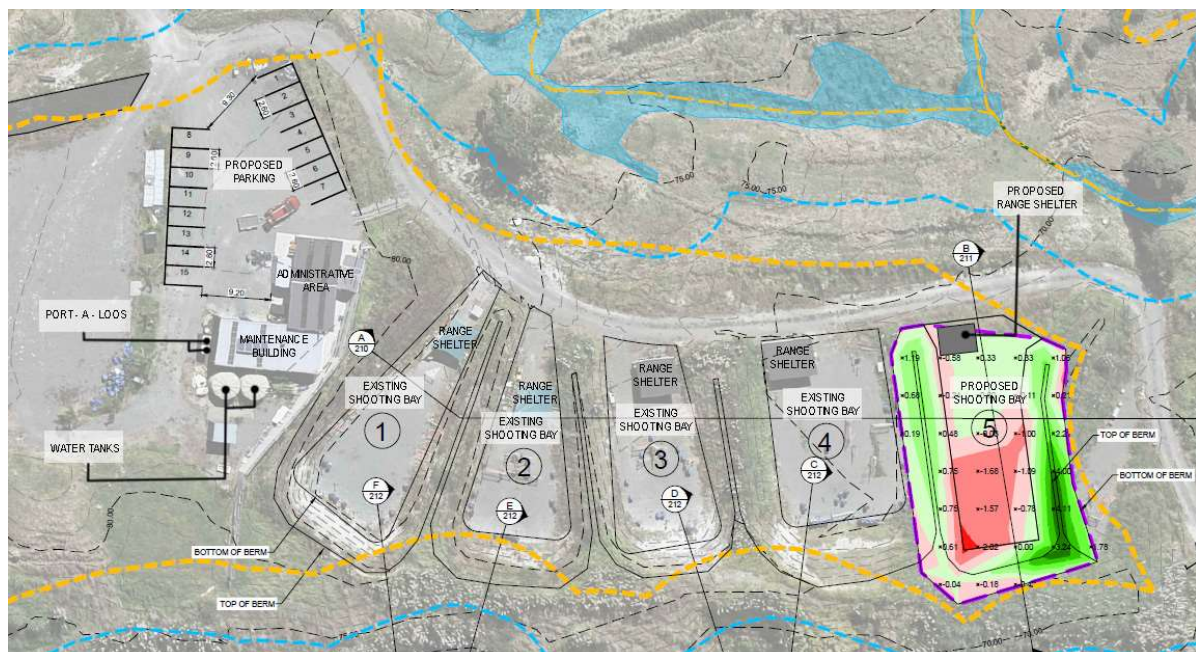


Figure 13 – Shooting bays and parking arrangement.

4 CAS ANALYSIS

All reported crashes within 100m radius of the SH16/Tuhirangi Road intersection and the entire length of Tuhirangi Road for the period 2018 to 2023 have been obtained from the Crash Analysis System (CAS)³.

There have been two minor crashes reported at the SH16/Tuhirangi Road intersection in 2022 and 2023. The incidents involved a car and a motorcycle that lost control at the bend on SH16. One non-injury crash was reported in 2019 on Tuhirangi Road. The incident involved a car that lost control from inappropriate traveling speed on unsealed road and hit a fence.

No crash reported associated with the subject site access location. Based on the research results, the number of crashes is minor compared to the existing traffic volume on the existing roads. This implies that the existing surrounding roads are providing a good safety function.

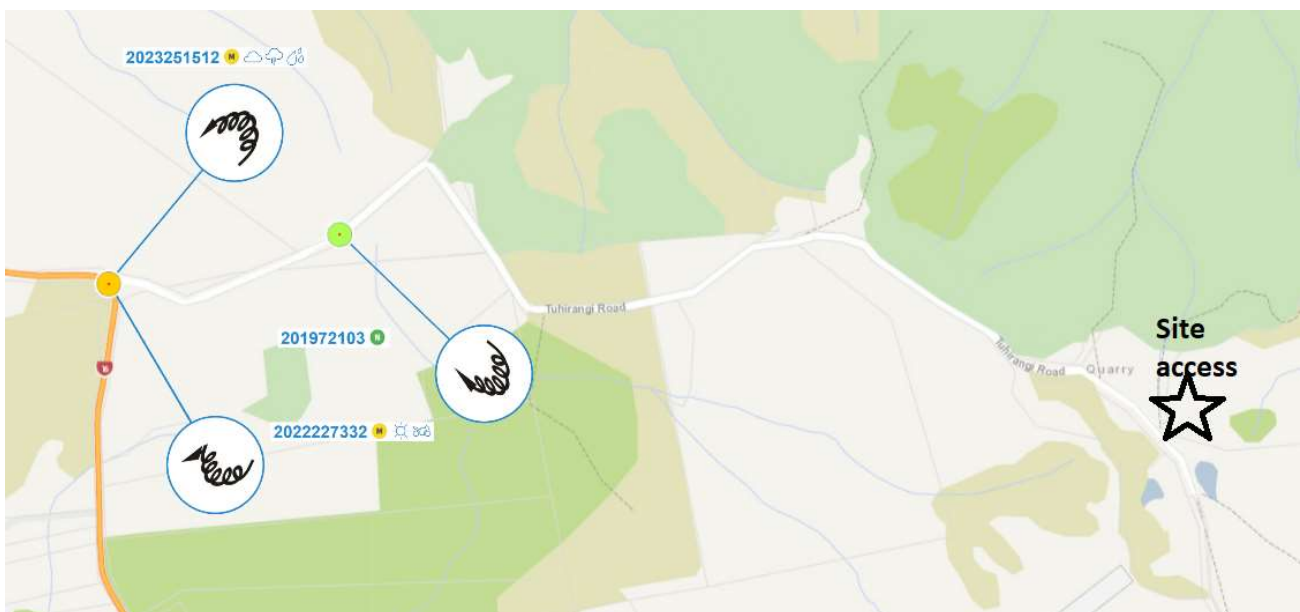


Figure 14: CAS map

ID	Date	Day of Week	Time	Description of events	Crash factors	Surface condition	Natural light	Weather
2023251512	21/03/2023	Tue	16:31	Car/Wagon1 NDB on KAIPARA COAST HIGHWAY lost control turning left; went off road to left, Car/Wagon1 hit ditch	CAR/WAGON1, alcohol test below limit, lost control when turning	Wet	Overcast	Light rain
202227332	27/06/2022	Mon	13:15	Motorcycle1 EDB on KAIPARA COAST HIGHWAY lost control turning right; went off road to left	MOTORCYCLE1, alcohol test below limit, lost control - road conditions, ENV: loose material on seal	Dry	Bright sun	Fine
201972103	25/06/2019	Tue	21:30	Car/Wagon1 WDB on TUHIRANGI ROAD, MAKARAU, AUCKLAND missed inters or end of road, Car/Wagon1 hit fence	CAR/WAGON1, alcohol test below limit, inappropriate speed for road conditions	Dry	Twilight	Fine

Figure 15: CAS – English Plain Report

³ Latest crash data obtained in May 2023.

5 SIGHT DISTANCE ASSESSMENT AT VEHICLE CROSSING

5.1 AUSTRROADS - SIGHT DISTANCE AT PROPERTY ENTRANCES

As per the guideline⁴ section 3.4, the minimum sight distances at driveway access should comply with the following:

- the sight distance requirements for intersections, i.e., that approach sight distance (ASD),
- minimum gap sight distance (MGSD) is achieved.

In addition to the above specific intersection sight distance requirements, stopping sight distance (SSD) in accordance with AGRD Part 3⁵ (Austroads 2016b) should be available if ASD is restricted.

Based on the above, ASD, SSD, MGSD and NZTA RTS6⁶ have been chosen for confirming the minimum sight distances at the existing vehicle crossing.

Calculations based on the operating speed of **80km/h** for vehicle traveling southbound and operating speed of **60km/h** for vehicle traveling northbound on Tuhirangi Road are demonstrated below.

5.1.1 ASD and SSD

$$ASD = \frac{R_r \times V}{3.6} + \frac{V^2}{254 \times (d + 0.01 \times a)}$$

where

ASD = approach sight distance (m)

R_r = reaction time (sec), refer to *AGRD Part 3* (Austroads 2016b) for guidance on values

V = operating (85th percentile) speed (km/h)

d = coefficient of deceleration, refer to Table 3.3 and *AGRD Part 3* for values

a = a longitudinal grade in % (in direction of travel: positive for uphill grade, negative for downhill grade)

⁴ Austroads Ltd., (2021). Guide to Road Design Part4A Unsignalised and Signalised Intersections. Sydney, Australia: Austroads Ltd.

⁵ Austroads Ltd., (2021). https://austroads.com.au/publications/road-design/agrd03/media/AGRD03-16_Guide_to_Road_Design_Part_3_Geometric_Design_Ed3.4.pdf

⁶ NZTA, (1993). RTS6 – Guidelines for visibility at driveway, Wellington, NZ

$$SSD = \frac{R_T V}{3.6} + \frac{V^2}{254(d + 0.01a)}$$

where

- R_T = reaction time (sec)
- V = operating speed (km/h)
- d = coefficient of deceleration (longitudinal friction factor)
- a = longitudinal grade (% , + for upgrades and – for downgrades)

Note: coefficient d for unsealed road is recommended at 0.27⁷. Medium to High awareness level of $R_t - 2s$ is adopted for the calculations.

Rt	2	s
V	80	km/h
d	0.27	
a	0	%
ASD	137.8	m

Rt	2	s
V	60	km/h
d	0.27	
a	0	%
ASD	85.8	m

5.1.2 MGSD

Table 3.6 of Austroads Part 4A, the minimum gap sight distance for 80km/h and 60km/h 85th percentile speed is **111m and 83m** ($T_a = 5$ sec) respectively.

5.1.3 NZTA RTS 6

RT6 Guideline Table 1 gives the minimum sight distance for low volume driveway with local road frontage at 80km/h and 60km/h operating speed to be **105m and 55m** respectively.

5.2 SIGHT VISIBILITY

Based on the site investigation, approximately sight distance of 140m or more is provided to the north, where the minimum of 105 to 140m is required and 90m to the south toward the end of Tuhirangi Road where the minimum of 55m to 85m is required.

⁷ Austroads Part 3 Geometric Design, Table 5.3



Figure 16: Looking right from the existing access.



Figure 17: Desktop study sight distance to the south from site's access

6 DRIVEWAY DESIGN AND PASSING BAY

There is only a brief section of the driveway that has the carriage way width less than 4.5m. A passing bay and a road widening have been proposed to mitigate the lack of clear sight lines within the narrow driveway sections. Location of the proposed passing bay and road widening are identified within the Engineering plans prepared by Terra Consultants.

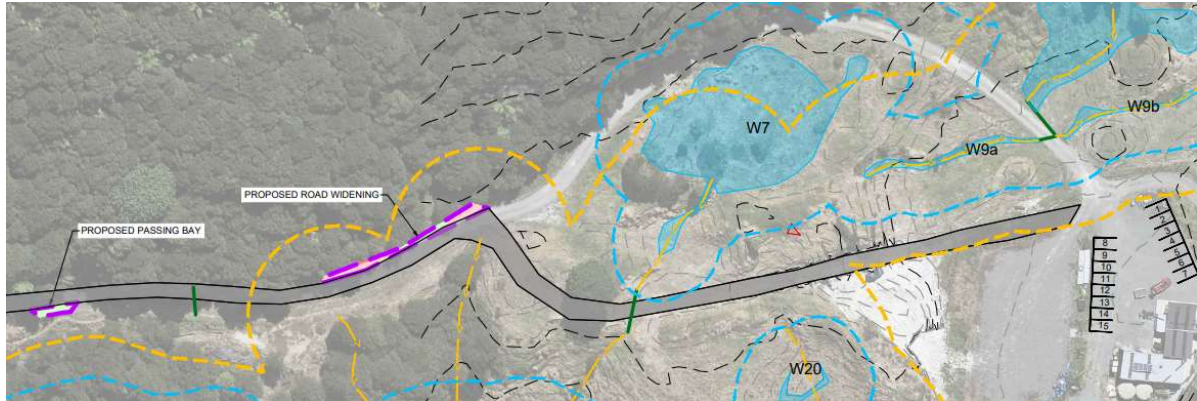


Figure 18: Passing Bay and road widening.

7 PARKING REQUIREMENTS

7.1 PARKING DEMANDS

As per E27 Transportation Table E27.6.2.4 Parking rates - area 2 (T74), there is no minimum and maximum parking demand rate for the organised sport and recreation activities.

Based on the number of shooting bays and the information provided by the applicant, a total of 15 parking spaces are suitable for staff and visitors. It is noted that in the event of overflow parking space is required, the site can cater the overflow demand without effecting the public road.

7.2 PARKING ARRANGEMENT

As per E27 Transportation Table E27.6.3.1.1 Minimum Car parking space and manoeuvring dimensions (T122), the minimum manoeuvring depth for casual users is 7.0m for 2.6m parking space width. The proposed development has proposed the parking spaces (2.6m width x 5.0m depth x minimum 8.4m manoeuvring depth) which meets the minimum requirements.

8 TRIP GENERATION

The AUP E27 transportation section and NZTA Trips and parking related to land use research 453⁹ have not provided trip generation rates for an organised sport and recreation activities that suitable to be adopted for the shooting range. Further international (USA) research of trip generation study for shooting range¹⁰ has been carried out and findings are listed below.

- The trip generation for the proposed gun shooting range (34,702 sf with 42 shooting lane) is less than the gas station and commercial retail (15,000 sf) land use in their traffic study.
- Minimal am peak (0 trips) and 80 trips for pm peak with an estimate of 290 vehicles per day were used for the gun shooting range.
- Peak trips are generated during the weekends and evenings.

Based on the Urban Crossroads trip generation study, it is assumed that each shooting bay will generate 4 trips at peak hour (vph) and up to 14 trips per day.

Therefore, it is estimated a maximum of 20vph will be generated during the peak hours and up to 70 traffic movement per day.

The expected number of peak hour trip does not exceed that would generate? from the development is considered minimal and will not create any safety concerns for the surrounding road network.

⁹ <https://www.nzta.govt.nz/assets/resources/research/reports/453/docs/453.pdf>

¹⁰ Urban Crossroads, Gun Shooting Range/Tactical Training Facility TIA report, 2019, https://cdnsm5-hosted.civiclive.com/UserFiles/Servers/Server_9894739/File/Government/Other%20Information/Planning%20Commission%20Agendas%20&%20Minutes/2019%20Planning%20Commission/12-18-19/Items%202.2/Attach%20A-Ex2%20-Appendix%2013%20-%20TIA%20and%20Supplemental%20Memo.pdf

9 E27 STANDARDS ASSESSMENT

Below table provides AUP(OP) Section E27 Standard Assessment:

Rule	Assessment	Complies?
<p>E27.6.1. Trip generation</p> <p>(1) Where a proposal (except where excluded in Standard E27.6.1(2)) exceeds one of the following thresholds:</p> <p>(a) a new development in Table E27.6.1.1;</p> <p>(b) 100 v/hr (any hour) for activities not specified in Table E27.6.1.1 requiring a controlled or restricted discretionary land use activity consent in the applicable zone where there are no requirements for an assessment of transport or trip generation effects. This standard does not apply to development activities provided for as permitted in the applicable zone; or</p> <p>(c) a proposed subdivision of land which has capacity under this Plan to accommodate more than 100 dwellings</p> <p>Resource consent for a restricted discretionary activity is required.</p>	<p>The development is estimated to generate 20veh/hr at any peak hour at the fully development stage.</p>	<p>Yes</p>
<p>(2) Standard E27.6.1(1) does not apply where:</p> <p>(a) a proposal is located in the Business – City Centre Zone, Business – Metropolitan Centre Zone, Business – Town Centre Zone, or Residential – Terrace Housing and Apartment Building Zone or Centre Fringe Office Control as shown on the planning maps;</p> <p>(b) development is being undertaken in accordance with a consent or provisions approved on the basis of an Integrated Transport Assessment where the land use and the associated trip generation and transport effects are the same or similar in character, intensity and scale to those identified in the previous assessment;</p> <p>(c) the activity is permitted in the H7 Open space zones; or</p> <p>(d) there are requirements to assess transport, traffic or trip-generation effects for the activity in the applicable zone rules or precinct rules for any controlled or restricted discretionary land use activities.</p>	<p>N/A</p>	<p>N/A</p>

Rule	Assessment	Complies?
<p>E27.6.2. Number of parking and loading spaces</p> <p>(1) The number of parking spaces:</p> <p>(a) must not exceed the maximum rates specified;</p> <p>(b) must meet the minimum rates specified; or</p> <p>(c) must meet the minimum rates and not exceed the maximum rates specified</p> <p>which apply to the zone or location specified in Table E27.6.2.1, Table E27.6.2.2, Table E27.6.2.3 and Table E27.6.2.4.</p>	<p>No minimum and maximum parking space required.</p>	<p>Yes</p>
<p>(2) Where a minimum rate applies and a site supports more than one activity, the parking requirement of each activity must be separately determined then combined to determine the overall minimum site rate.</p> <p>Provided that where the parking demands of the two activities allow for the sharing of parking resources, the total parking requirement for the site shall be based on the higher of the parking requirements of the two activities.</p>	<p>N/A</p>	<p>N/A</p>
<p>(3) For the purposes of meeting the requirements of the vehicle parking rules, a parking space includes those provided for in a garage or car port or any paved area provided for the sole purpose of parking a motor vehicle.</p>	<p>The proposed parking space within paved area are provided for the sole purpose of parking a motor vehicle.</p>	<p>Yes</p>
<p>(4) Table E27.6.2.3 sets out the parking rates which apply in the following zones and locations:</p> <p>(a) Business – Metropolitan Centre Zone;</p> <p>(b) Business – Town Centre Zone – excluding the following town centres where Table E27.6.2.4 applies: ...</p> <p>(c) Business – Local Centre Zone – excluding the following local centres where Table E27.6.2.4 applies ...</p> <p>(d) Business – Mixed Use Zone (excluding where the Business – Mixed Use Zone is adjacent to the town centres ...</p> <p>(e) Residential – Terrace Housing and Apartment Buildings Zone.</p>	<p>N/A</p>	<p>N/A</p>

Rule	Assessment	Complies?
(4A) The minimum parking requirements in Table E27.6.2.3 do not apply in any of the following circumstances	N/A	N/A
(5) Table E27.6.2.4 sets out the parking rates which apply to the Business – Neighbourhood Centre Zone and all other zones and areas not specified in Table E27.6.2.1, Table E27.6.2.2 and Table E27.6.2.3.	No minimum and maximum parking space required.	Yes
(6) Bicycle parking: (a) the activities specified in Table E27.6.2.5 must provide the minimum number of bicycle parking spaces specified; and (b) the following bicycle parking requirements apply to new buildings and developments.	The proposed development will comply with the requirements E27.6.2.5 – T103. Minimum of 2 short stay bike racks and no secure parks are required for the site.	Yes
(7) End-of-trip facilities: (a) the activities specified in Table E27.6.2.6 must provide end-of-trip facilities as listed below; and (b) the following end-of-trip facilities requirements apply to new buildings and developments.	N/A	N/A
(8) Number of loading spaces: (a) all activities must provide loading spaces as specified in Table E27.6.2.7.	T116 - No requirement of loading space.	Yes
(9) Fractional spaces: (a) where the calculation of the required or permitted parking results in a fractional space, any fraction that is less than one-half will be disregarded and any fraction of one-half or more will be counted as one space. If there are different activities within a development, the parking required or permitted for each activity must be added together prior to rounding.	Parking space requirement has been calculated as per this rule.	Yes
(10) Accessible parking: (a) where parking is provided, the Building Code requires parking spaces to be provided for people with disabilities and accessible routes from the parking spaces to the associated activity or road. The dimensions and accessible route requirements are detailed in the New Zealand Building Code D1/AS1 and NZS:4121-2001.	1 accessible park is required and will be provided.	Yes

Rule	Assessment	Complies?
<p>E27.6.3. Design of parking and loading spaces</p> <p>E27.6.3.1. Size and location of parking spaces</p> <p>(1) Every parking space must:</p> <p>(a) comply with the minimum dimensions given in Table E27.6.3.1.1 and Figure E27.6.3.1.1; and</p>	<p>(T122) The minimum width of the parking space is 2.6m and the minimum length of the garage is 6m with the minimum manoeuvring width of 9.2m.</p> <p>The parking spaces comply with the Table E27.6.3.1.1</p>	<p>Yes</p>
<p>(b) be located on the same site as the activity to which it relates unless one of the following criteria is met:</p> <p>(i) the parking is located in an H7 Open Space Zone and the reserve, park or recreation area consists of more than one adjoining Certificate of Title. In that case, the parking must be located within the same reserve, park or recreation area as the activity to which it relates; or</p> <p>(ii) resource consent is granted to an alternative arrangement, such as shared parking, offsite parking, or non-accessory parking.</p>	<p>comply</p>	<p>Yes</p>
<p>(c) not be used for any other purpose; and</p> <p>(d) be kept clear and available at all times the activity is in operation, except where stacked parking is permitted by Standard E27.6.3.3(3) below; and</p> <p>(e) be located outside any area designated for road widening; and</p> <p>(f) parking located in part of any yard on the site (where it is permitted in the zone) must not:</p> <p>(i) impede vehicular access and movement on the site; and</p> <p>(ii) infringe any open space and landscape requirements for the relevant zone; and</p>	<p>Comply.</p>	<p>Yes</p>
<p>(g) not to be sold or leased separately from the activity for which it provides parking required under a resource consent.</p>	<p>comply</p>	<p>Yes</p>

Rule	Assessment	Complies?
<p>E27.6.3.2. Size and location of loading spaces</p> <p>(1) Every loading space must:</p> <p>(a) comply with the minimum dimensions given in Table E27.6.3.2.1; and</p> <p>(b) be located on the same site as the activity to which it relates and be available at all times while the activity is in operation; and</p> <p>(c) be located outside any area designated for road widening; and</p>	<p>No loading space is required.</p>	<p>N/A</p>
<p>Cont.</p> <p>(d) comply with the following when any yard of a site is used to provide the loading space (where it is permitted within the zone):</p> <p>(i) ensure that the footpath or access to the rear of the site or access to an adjacent property is not blocked at any time; and</p> <p>(ii) the use of the loading space does not create a traffic hazard on the road at any time.</p>	<p>No loading space is required.</p>	<p>N/A</p>
<p>E27.6.3.3. Access and manoeuvring</p> <p>(1) Every parking space must have driveways and aisles for entry and exit of vehicles to and from the road, and for vehicle manoeuvring within the site. Access and manoeuvring areas must accommodate the 85 percentile car tracking curves in Figure E27.6.3.3.1</p> <p>(2) Every loading space and where access and manoeuvring areas must accommodate heavy vehicles, a tracking curve for an appropriately sized truck for the type of activities to be carried out on the site must be assessed. Heavy vehicle tracking curves are set out in the following NZTA guidelines: RTS 18: NZ on-road tracking curves (2007).</p> <p>(3) Where a dwelling provides more than one parking space, these may be stacked. Stacked parking means access is required through another parking space.</p>	<p>(1) Complies</p> <p>(2) N/A</p> <p>(3) N/A</p>	<p>Yes</p>

Rule	Assessment	Complies?
<p>E27.6.3.4. Reverse manoeuvring</p> <p>(1) Sufficient space must be provided on the site so vehicles do not need to reverse off the site or onto or off the road from any site where any of the following apply:</p> <p>(a) four or more required parking spaces are served by a single access;</p> <p>(b) there is more than 30m between the parking space and the road boundary of the site; or</p> <p>(c) access would be from an arterial road or otherwise within a Vehicle Access restriction covered in Standard E27.6.4.1.</p>	<p>(a) and (b)</p> <p>Complies. No reverse movement required.</p> <p>(c) N/A</p>	<p>Yes</p>
<p>E27.6.3.5. Vertical clearance</p> <p>(1) To ensure vehicles can pass safely under overhead structures to access any parking and loading spaces, the minimum clearance between the formed surface and the structure must be:</p> <p>(a) 2.1m where access and/or parking for cars is provided for residential activities;</p> <p>(b) 2.3m where access and/or parking for cars is provided for all other activities;</p> <p>(c) 2.5m where access and/or accessible parking for people with disabilities is provided; or</p> <p>(d) 3.8m where loading is required.</p>	<p>Complies – no vertical clearance restriction on site.</p>	<p>Yes</p>
<p>E27.6.3.6. Formation and gradient</p> <p>(1) Except for Standard E27.6.3.6(2) below, the whole area of parking and loading spaces, and manoeuvring areas and aisles must be formed, drained, provided with an all-weather surface to prevent dust and nuisance, and be marked out or delineated. This must be done before the activity to which those parking and loading spaces relate commences and maintained for as long as that activity is continued.</p>	<p>(1) the whole area of parking has been formed with gavelled pavement and it will be marked out for parking spaces.</p>	<p>Yes</p>

Rule	Assessment	Complies?
<p>(2) Parking and loading spaces and manoeuvring areas and aisles do not need to be provided with an all-weather surface in the following zones:</p> <p>(a) Rural – Rural Conservation Zone;</p> <p>(b) Rural – Rural Coastal Zone;</p> <p>© Rural – Mixed Rural Zone; and</p> <p>(d) Rural – Rural Production Zone.</p>	(2) N/A	N/A
<p>(3) The gradient for the surface of any parking space must not exceed:</p> <p>(a) 1 in 25 in any direction for accessible spaces for people with disabilities; or</p> <p>(b) 1 in 20 (five per cent) in any direction for other spaces.</p> <p>(4) The gradient for the manoeuvring area must not exceed 1 in 8.</p>	<p>(3) The gradient of parking spaces is less than 1 in 20 in any direction.</p> <p>(4) The gradient of manoeuvring area is less than 1 in 8.</p>	Yes
<p>E27.6.3.7. Lighting</p> <p>(1) Lighting is required where there are 10 or more parking spaces which are likely to be used during the hours of darkness. The parking and manoeuvring areas and associated pedestrian routes must be adequately lit during use in a manner that complies with the rules in Section E24 Lighting</p>	Lighting is not required as the activities will not be operated during hours of darkness.	N/A
<p>E27.6.4.1. Vehicle Access Restrictions</p> <p>(1) Vehicle Access Restrictions apply, and <u>new vehicle crossings</u> must not be constructed to provide vehicle access across that part of a site boundary which is subject to:</p> <p>.....</p>	(1) N/A	N/A
<p>E27.6.4.2. Width and number of vehicle crossings</p> <p>(1) The maximum number of vehicle crossings permitted for any site and separation distance between crossings is specified in Table E27.6.4.2.1</p> <p>(2) The width of a vehicle crossing(s) must meet the minimum width and not exceed the maximum width as specified in Table E27.6.4.3.2.</p>	(1) and (2) existing vehicle crossing will be reutilised.	Yes

Rule	Assessment	Complies?
<p>(3) With the exception of vehicle crossings on unsealed roads, all vehicle crossings must be designed and constructed to maintain the level, colour, and materials of the footpath to clearly identify to vehicles that pedestrians have priority</p> <p>(4) Vehicle crossings on unsealed roads:</p> <p>(a) where the vehicle crossing is served by an access steeper than 1 in 8, the vehicle crossing must be sealed for 6m between the site boundary and the unsealed road.</p> <p>(b) vehicle crossings not covered by Standard E27.6.4.2(3)(a) above must be formed using materials similar to the existing road surface or better.</p>	<p>(3) N/A – no footpath on the public road</p> <p>(4) the access is not steeper than 1 in 8 at the front section. The access material is similar to the existing public road surface.</p>	<p>Yes</p> <p>Yes</p>
<p>(5) Where a vehicle crossing is altered or no longer required, the crossing, or redundant section of crossing, must be reinstated as berm and/or footpath and the kerbs replaced. The cost of such work will be borne by the owner of the site previously accessed by the vehicle crossing.</p>	<p>(5) N/A</p>	<p>N/A</p>
<p>E27.6.4.3. Width of vehicle access and queuing requirements</p> <p>(1) Every on-site parking and loading space must have vehicle access from a road, with the vehicle access complying with the following standards for width:</p> <p>(a) passing bays are provided in accordance with Table E27.6.4.3.1; and</p> <p>(b) meeting the minimum formed access width specified in Table E27.6.4.3.2.</p> <p>2) Access must be designed so that vehicles using or waiting to use fuel dispensers, ticket vending machines, remote ordering facilities and devices, entrance control mechanisms, or other drive-through facilities do not queue into the adjoining (road reserve or obstruct entry to or exit from the site.</p>	<p>(1)(a) - Passing Bay is proposed.</p> <p>(1)(b) – the minimum formed width of private driveway is 3.4m.</p> <p>(2) N/A</p>	<p>Yes</p>

Rule	Assessment	Complies?
<p>E27.6.4.4. Gradient of vehicle access</p> <p>(1) The gradient of the access must not be steeper than specified in Table E27.6.4.4.1:</p> <p>(2) To avoid the underside of the car striking the ground, as illustrated in Figure E27.6.4.4.2, access with a change in gradient exceeding 1 in 8 (greater than 12.5 per cent change) at the summit or a 1 in 6.7 (15 per cent change) at a sag must include transition sections to achieve adequate ground clearance, refer to Figure E27.6.4.4.3. Typically, a transition section requires a minimum length of 2m.</p>	<p>Complies</p> <p>(1) The gradients of the existing access are less than 20%.</p> <p>(2) Transition grades are provided as per the standard requirements.</p>	<p>Yes</p>
<p>(3) All vehicle access must be designed so that where the access adjoins the road there is sufficient space onsite for a platform so that vehicles can stop safely and check for pedestrians and other vehicles prior to exiting. This is illustrated in Figure E27.6.4.4.4. The platform must have a maximum gradient no steeper than 1 in 20 (5 per cent) and a minimum length of 4m for residential activities and 6m for all other activities.</p>	<p>(3) A safety platform is provided within the private driveway and at the access point.</p>	<p>Yes</p>
<p>E27.6.4.5. Sightlines for road/rail level crossings</p> <p>....</p>	<p>N/A</p>	<p>N/A</p>
<p>E27.6.5. Design and location of off-road pedestrian and cycling facilities</p> <p>(1) The design and location of the proposed facility is to ensure good connections to existing facilities.</p> <p>(2) The width of the path is designed to accommodate the anticipated number and type of users.</p> <p>(3) The surface of the path is designed to safely provide for the anticipated number and type of users.</p>	<p>N/A</p> <p>The proposed activities are not expecting pedestrian in the area. The existing Tuhirangi Road has no footpath established adjacent to the site.</p>	<p>N/A</p>

10 CONCLUSIONS

The development is potentially creating an additional 4 traffic movements during peak hour from an additional shooting bay. The total traffic movement that would generate from 5 shooting bays are estimated to be 20vph at peak hours.

The existing condition of the vehicle crossing, and private driveway have been reviewed. During the site investigation, a minor safety concern has been raised within the existing driveway. To increase the safety level for internal traffic movement, a passing bay and driveway widening have been proposed.

The minimum sight distances at the existing vehicle crossing have been checked and confirmed sufficient sight distances are provided at the vehicle crossing.

The existing road network and the existing intersection have been reviewed and discussed in this report. No safety concern has been raised for the existing road network.

On this basis, the proposal is being supported from the traffic engineering matters. The proposed 5 shooting bays will not create any effects to the existing surrounding road networks and any other road users.



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