TRAFFIC PLANNING CONSULTANTS LTD

PROPOSED RESIDENTIAL DEVELOPMENT
TRANSPORT ASSESSMENT

LOT 1 DP53506
PUKETONA ROAD (STATE HIGHWAY 11)
HARURU, WAITANGI

Project Information:

Client	Andre Galvin and Victoria Yorke
Job Number	240545
Title	Proposed Residential Development, Lot 1 DP53506, Puketona Road (SH11), Haruru, Waitangi
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1.0 INTRODUCTION

This report examines a proposed development, predominantly residential in nature at Lot 1 DP53506 in Haruru, Waitangi. The site is zoned General Coastal under the Far North District Plan. The report describes the existing transport environment, proposed activity, and the ability to accommodate a vehicle access for the site.

The proposal looks to develop Lot 1 DP53506 to establish up to 44 dwellings, with a supporting café and visitor's centre. **Figure 1** illustrates the subject site location.

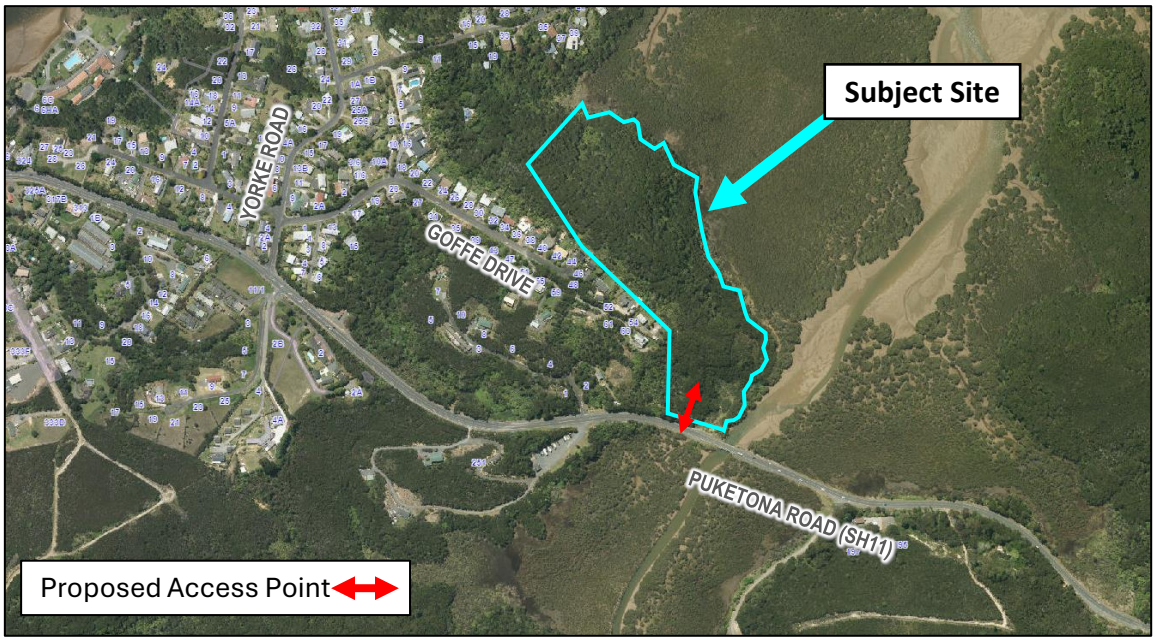

Figure 1: Site Location
Image Source: Far North District Council GIS

2.0 EXISTING TRANSPORT ENVIRONMENT

2.1 Road Network

2.1.1 Puketona Road (State Highway 11)

Puketona Road (SH11) runs from State Highway 1 near Kawakawa, through Paihia, and then to State Highway 10 near Puketona. Puketona Road is an arterial road and a limited access road. It has a carriageway width of approximately 7.0 metres providing one traffic lane in each direction. A footpath is provided on the north side of the road. It has a posted speed limit of 60 km/h, closer to Yorke Road and a speed limit of 80 km/h outside the site's frontage.

Information from Mobile Road suggests that in December 2023, Puketona Road had an ADT of 5,500 vehicles (4% heavy vehicles), which is estimated to correspond to 550 peak hour vehicle movements. Reviewing downstream count data from WK-NZTA near Puketona, supports the Mobile Road estimate.

Vehicle operating speeds were collected along SH11, near the site's potential access point for vehicles travelling both eastbound and westbound. Vehicle speeds were measured utilising a "Bushnell – Velocity" which utilises Doppler Radar technology to determine vehicle speeds within a 1 km/h degree of accuracy. Vehicle speeds were collected discretely so as not to encourage slower vehicle speeds and best represent likely conditions. Vehicle speeds were recorded only if driver behaviour was not impacted by others. Examples of behaviour influences includes, vehicles slowing to turn into an access or vehicles within a platoon – where the first vehicle dictates the speed. At least 100 speed observations were collected in each direction.

Figure 2 provides the breakdown of vehicle operating speeds along SH11 near the subject site. From the data collected, the following is noted:

- For eastbound vehicles:
  - The lowest observed speed was 39 km/h.
  - The 50th percentile speed was 74 km/h.
  - The 85th percentile speed was 83 km/h.
  - The 95th percentile speed was 86 km/h.
  - The highest observed speed was 100 km/h.
- For westbound vehicles:
  - The lowest observed speed was 56 km/h.
  - The 50th percentile speed was 74 km/h.
  - The 85th percentile speed was 83 km/h.
  - The 95th percentile speed was 86 km/h.
  - The highest observed speed was 94 km/h.

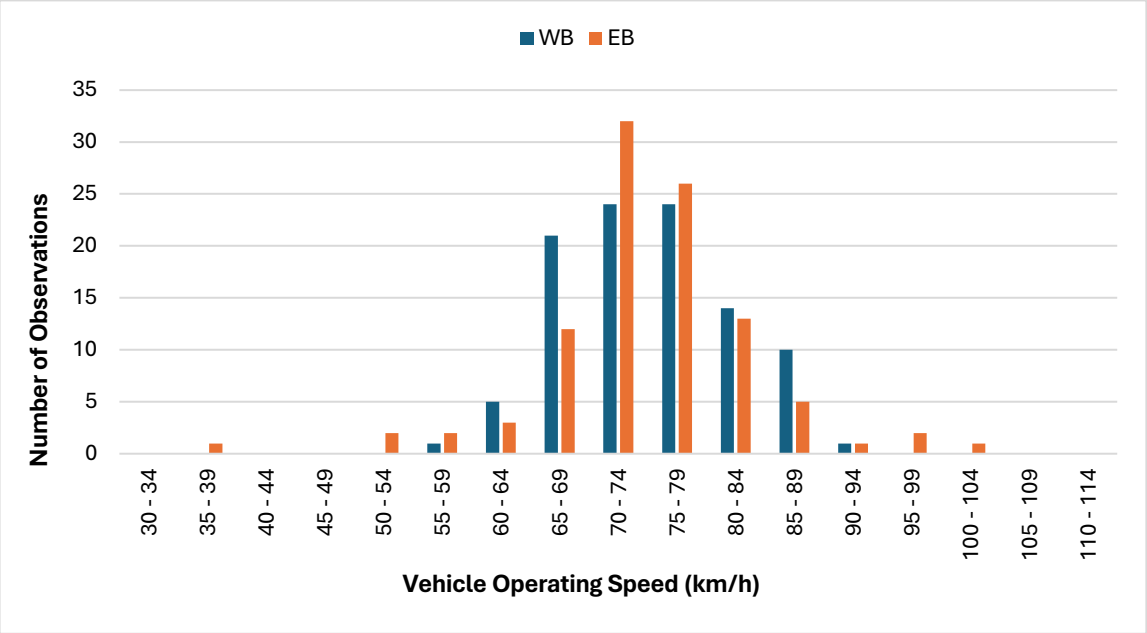

Figure 2: Vehicle Operating Speed Distribution
Source: Traffic Planning Consultants

2.1.2 Yorke Road

Yorke Road runs in a general north-south direction and forms an intersection with Puketona Road at its southern end and terminates approximately 550 metres to the north. Yorke Road acts as a collector road but carries traffic volumes consistent with a local road. It serves as the main road access to the Haruru residential area. It has a carriageway width of approximately 8.0 metres providing one traffic lane in each direction. A footpath is provided on the east side of the road and Yorke Road has a speed limit of 40 km/h.

Information from Mobile Road suggests that in June 2024, Yorke Road had an ADT of 1,100 vehicles, which is estimated to correspond to 110 peak hour vehicle movements.

2.1.3 Goffe Drive

Goffe Drive runs in a general east-west direction and forms an intersection with Yorke Road at its western end and ends a cul-de-sac head approximately 440 metres to the east. Goffe Drive is a local road and serves access to abutting properties. It has a carriageway width of approximately 8.0 metres providing one traffic lane in each direction. A footpath is provided on the south side of the road and Goffe Drive has a speed limit of 40 km/h.

Information from Mobile Road suggests that in June 2024, Goffe Drive had an ADT of 400 vehicles, which is estimated to correspond to 40 peak hour vehicle movements.

2.2 Crash History

Information from the New Zealand Transport Agency's "Crash Analysis System" for the ten+ year period, from January 2014 to present (2024 data subject to reporting delays), indicates that 25 crashes have been reported within the study area along Puketona Road, between Old Wharf Road and Kaipatiki Roadway (**Figure 3**). The reported crashes are summarised in **Table 1** below.

Table 1: Study Area Crash History

Location	Reported Crashes			Key Factors
	Total	Injury	Non-Injury	
Midblock SH11: Old Wharf Road to Garden Court	3	2 minor	1	22.07.15 – driver lost control when turning 29.09.15 – driver sideswiped vehicle turning into property (minor injury) 08.04.23 – driver being inattentive lost control and left carriageway (minor injury)
Intersection: Puketona Road and Garden Court	2	1 serious 2 minor	-	26.04.18 – driver failed to notice vehicle in front slowing, hitting its rear-end (minor injury) 25.09.22 – driver under influence of alcohol lost control and hit ditch/tree (serious and minor injury)
Midblock SH11: Garden Court to Yorke Road	1	-	1	28.09.19 – driver overtaking on the left via slow-vehicle bay hit vehicle in travel lane
Intersection: Puketona Road and Yorke Road / Ash Grove Circle	7	1 serious 3 minor	3	02.06.16 – driver lost control and went off road 29.06.16 – driver failed to give-way to oncoming motorcycle (serious injury) 13.03.19 – driver failed to notice vehicle in front slowing, hitting its rear-end (minor injury) 20.02.20 – fatigued driver lost control and hit embankment 21.05.20 – driver failed to give-way to oncoming vehicle (minor injury) 19.12.20 – driver under influence of alcohol and travelling at inappropriate speed lost control and hit traffic island (minor injuries) 04.11-21 – driver failed to give-way to oncoming vehicle (minor injury)
Midblock SH11: Yorke Road to Kaipatiki Rise	6	1 serious 1 minor	4	17.12.14 – driver lost control under wet conditions hitting the embankment 16.14.15 – driver lost control due to inappropriate speed, hitting embankment 13.04.16 – driver lost control under due to inappropriate speed, hitting embankment 17.11.17 – driver lost control due to loose metal on the roadway 21.12.17 – fatigued driver lost control and hit embankment (minor injury)

Location	Reported Crashes			Key Factors
	Total	Injury	Non-Injury	
				15.03.20 – driver lost control when braking with trailer load jack-knifing, hitting embankment
Intersection: Puketona Road and Kaipatiki Rise	1	1 minor	-	08.02.20 – driver failed to give-way to oncoming motorcycle (minor injury)
Midblock SH11: Kaipatiki Rise to Kaipatiki Roadway	3	-	3	16.11.17 – driver lost control due to loose metal on the roadway 11.03.17 – driver lost control due to inappropriate speed, hitting embankment 07.01.18 – motorcyclist failed to notice vehicle in front slowing, hitting its rear-end (serious injury)
Intersection: Puketona Road and Kaipatiki Roadway	2	1 serious	1	23.12.18 – driver under influence of alcohol and travelling at inappropriate speed lost control and went into ditch
TOTAL	25			

Reviewing the crash history, many crashes were attributed to loss-of-control type crashes, which could be a result of drivers in general travelling too fast along this section of Puketona Road. Of the 25 reported crashes 15 were 'loss of control' with 12 occurring pre-august 2020 (when a speed limit reduction occurred, bringing speeds from 70-100 km/h to 60-80 km/h). Since this time, only three loss of control crashes have been reported in the approximate 4-year period. Prior to this change, approximately 1.7 loss of control crashes happened each year, compared to 0.75 per year post speed limit reduction, which equates to a 56% reduction.

Considering this, and the other available crash data, there does not appear to be any inherent road safety concerns within the existing environment.

Figure 3: Study Area Ten+ Year Crash History
Image Source: NZTA Crash Analysis System

3.0 THE PROPOSAL

The proposal looks to establish up to 44 dwellings, with a supporting café and visitor's centre. The site will be accessed predominantly via Puketona Road, with the potential for a secondary supporting access via Goffe Drive. The general plan used for the basis of this assessment is shown in Figure 4.

Figure 4: Proposed Site Plan
Image Source: Creative Intentions

3.1 Trip Generation

Residential trip generation data taken from the Road and Marine Services' (New South Wales) publication "Guide to Traffic Generating Developments", provides trip generation estimates based on dwelling sizes within low and medium-density developments, as well as retail activities:

- For larger standalone residential dwellings, it indicates a rate of 9 daily trips (0.85 peak hour trips) per dwelling.
- For restaurants, such as a café, it indicated a rate of 60 daily trips per 100 m^2 (estimated 10 / 100 m^2 during peak hours).

Utilising these rates, the trip generation for the site was estimated. No estimation was made for the visitor's centre as the nature of this activity is unknown and can be quite variable dependent on the specific proposed use; however it's trip generation is not considered to be overly significant within the context of the wider site. The estimated trip generation is summarised in Table 2.

Table 2: Site Estimated Trip Generation

Land-Use	Number / Size	Daily Generation Rate	Estimated Daily Generation	Peak Hour Generation Rate	Estimated Peak Hour Generation
Standalone Dwelling	44 dwellings	9.0	**396**	0.85	37
Café	200 m^2	60	**120**	10	20
Total			**516**		**57**

The proposed scenario is estimated to generate 516 daily vehicle trips and 57 peak hour trips. This trip generation has been utilised in determining the design of the access for the subject site.

The result of the proposals 516 daily vehicle movements (57 peak hour movements) is not considered to have any significant effect on the local or wider environment (when spread out across the day), as this would be unnoticeable within the daily/seasonal fluctuations in local traffic flows. Most likely the additional trips would occur during the morning peak period (7am-10am), mid-day peak period (11am-1pm) and the afternoon peak period (3pm-6pm). During these periods, traffic volumes are generally higher, and as a result, the additional movement would represent a smaller portion of the existing hourly volume.

For these reasons, the site's trip generation is forecast to have less than minor effects on the surrounding road environment.

3.2 Vehicle and Pedestrian Access

The site is provided with two options for vehicle access under the current design layout. One access to Puketona Road (SH11) and one onto Goffe Drive via the existing property at No. 42 Goffe Road. In reviewing the potential access options, it was considered that an access onto Puketona Road, subject to roading upgrades would be possible, but an access onto Goffe Drive would be more challenging and potentially unable to be provided due to the proximity to dwellings at No. 42 and No. 44 Goffe Drive; the level differences between the development site and Goffe Drive; as well as level differences between the properties on Goffe Drive, which would require structural barriers to prevent unrecoverable falls from occurring.

As it is considered that vehicle connection to the site from Goffe Drive is unlikely to be accommodated, there is potential to utilise this connection for pedestrian and cyclist connectivity. This would reduce the pedestrian/cyclist demands along Puketona Road, which would have positive road safety effects due to the speed environment differences between Goffe Drive and Puketona Road.

With respect to access onto Puketona Road, it is imperative that appropriate sightlines are provided to facilitate the safe turning movements to and from the site, as well as appropriate shoulder widths to provide increased lateral clearance area, should it be required to avoid a collision.

3.3 Access to Puketona Road Visibility

Sightlines at the proposed intersection were reviewed from the indicative hold position along the new road in order to assess the available visibility. From the hold position, it was determined that more than 250 metres of sight distance is available between drivers on the side street and drivers approaching the intersection from the east. Additionally, it was determined that approximately 150 metres of sight distance is available between drivers on the side street and drivers approaching the intersection from the west, with this being able to be increased to approximately 165 metres, with the removal of relatively small amounts of vegetation on the south side of Puketona Road, or 185 metres, with more extensive vegetation removal. **Figure 5** displays the indicative sightlines from the new side road hold position.

Based on the identified operating speeds along SH11, for an 85th percentile speed of 82 km/h (eastbound traffic) a Safe Intersection Sight Distance (SISD) of 187 metres is required and for an 85th percentile speed of 83 km/h (westbound traffic) a SISD of 210 metres is required (with allowance for a 7% downhill gradient).

Based on this, the access provides suitable visibility to the east but is deficient from the SISD under typical conditions. When applying the Extended Design Domain (EDD), the observation time is permitted to be reduced from 3.0 seconds (typical) to 2.0 seconds, as the access will be a T-junction, and the main road (Puketona Road) will carry more than 5,000 vehicles per day. From this, the eastbound SISD requirement reduces to 185 metres. Reviewing the existing area and the vegetation on the south side of Puketona Road, sightlines could be increased to meet the 185-metre requirement through the removal of approximately 750 m^2 of roadside vegetation, depicted in **Figure 6**. Removal of this vegetation would also increase the visibility towards the intersection with Kaipatiki Rise, thereby increasing road safety overall.

Alternatively, to reaching the SISD requirement under the existing speed environment, further measures could be investigated to reduce vehicle operating speeds to target an 85th percentile speed of 70 km/h, which under the EDD would require a SISD of 145 metres, which can be achieved.

Figure 5: Indicative Visibility from Proposed Road Connection
Image Source: Traffic Planning Consultants Limited

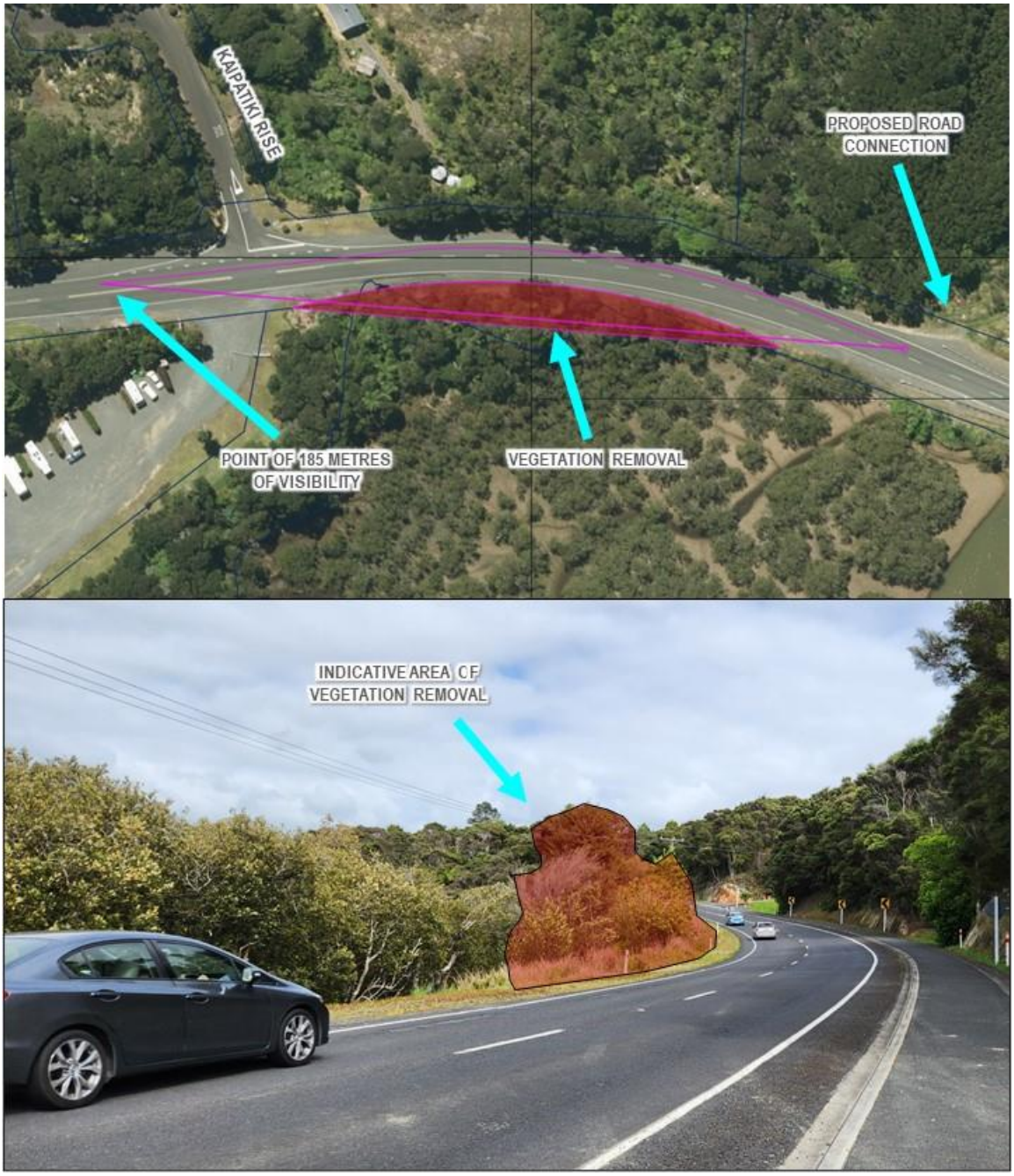

Figure 6: Indicative Vegetation Removal for Sightlines
Image Source: Traffic Planning Consultants Limited

3.4 Intersection Formation

With the site estimated to generate over 500 daily vehicle trips, the intersection should be formed to a standard consistent with the design parameters set out in Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections. From this, guidance was taken for a Rural basic left-turn treatment (BAL). Additionally, shoulder widening on the south side of Puketona Road was taken from Diagram E of NZTA's Appendix 5B – Accessway Standards and Guidelines. Figure 7 displays the indicative intersection design. From this, there is sufficient space to accommodate the BAL treatment within the intersection, without impacting onto the formation of the existing bridge approximately 40 metres east of the potential road connection.

On the south side of Puketona Road, the Appendix 5B recommended should widening would extend into the bridge, and if a compliant design was pursued the bridge would require widening. With a span of 20 metres, replacement of this bridge, which appeared to be approaching the end of its service life, is considered to be within the realm of feasible remedial measures. Figure 8 displays the existing bridge.

Alternatively, a departure from standards could be pursued to reduce the parallel shoulder length where near the intersection by approximately half (35 metres). As there is very good forward visibility for westbound vehicles (250 metres+), drivers approaching the site will be able to identify if there are any vehicles queued to turn right or approaching and signalling to turn right and thereby appropriately reduce their speed to avoid a collision.

Figure 7: Indicative Intersection Design
Image Source: Traffic Planning Consultants Ltd.

As part of any intersection design, the existing guardrails protecting the bridge embankments will need to be realigned in response to the changes to the surrounding environment. There is sufficient space available for this realignment to occur.

Figure 8: Existing Bridge
Image Source: Traffic Planning Consultants Limited

4.0 CONCLUSION

Based on the assessment described in this report, the following conclusions can be made in respect of the proposal to develop Lot 1 DP53506, Haruru, Waitangi:

- The development concept is estimated to generate 516 daily vehicle movements.
- The site has the potential to access to both Puketona Road and Goffe Road. Due to physical constraints at Goffe Road, use of this location as a vehicle access is not likely to be physically practical. Access onto Puketona Road is considered to appropriate as:
  - Sightlines at the proposed access point extend more than 250 metres to the east.
  - Sightlines at the proposed access point extend more than 145 metres to the west and can be increased to 185 metre through vegetation removal.
  - A BAL intersection treatment can be provided for the site, without impacting onto the physical formation of the bridge to the east.
  - Shoulder widening on the south side of the road, if reduced below the distance defined by the standard, can be safely accommodated due to the available forward visibility.
- In the event that a reduced shoulder widening treatment is not acceptable, the bridge east of the site will be required to be widened. As this bridge has a span of approximately 20 metres, the replacement of the bridge is considered to be within the realm of realistic remedial measures.

Overall, it is considered that the site is able to be accessed via Puketona Road (SH11), provided that appropriate remedial measures onto the existing environment are undertaken to ensure the future safety of the road environment for all users.

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