CKL

Planning | Surveying | Engineering | Environmental

Integrated Transportation Assessment

B23031 – 69a Main Road, Tirau

Tahua Properties Ltd

DOCUMENT CONTROL

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1 Introduction

1.1.1 CKL has been engaged by Tahua Properties Limited to provide a transportation assessment for a proposed drive through food and beverage development located at 69a Main Road, Tirau. The proposal comprises two drive through fast food restaurants, one a Starbucks and the other a Burger King. The two restaurants combined have a total floor area of 407sqm.

1.1.2 Main Road is part of the SH1 designation and is the primary road through Tirau. While the site has frontage to Main Road, it does not currently have direct vehicular access to the road network. The former activities on the site had an informal access through the school immediately north of the site. A new formal access to Main Road is therefore proposed for the site.

1.1.3 This report addresses the transportation matters of the proposal and includes the following:

- Levels of vehicular traffic likely to be generated by the proposed drive-through restaurants;
- Associated effects on the performance and safety of the surrounding road network;
- Adequacy and function of the parking and access provisions; and
- Consideration of the transportation related provisions within the Operative South Waikato District Plan (District Plan).

1.1.4 Consultation has also been undertaken with South Waikato District Council (SWDC) and NZTA based on earlier versions of this transportation assessment. The feedback from SWDC and NZTA has been taken into consideration and is addressed in this report.

1.1.5 These and other matters will be addressed in the detail of the report that follows. By way of summary, it is concluded that the proposed development can be established such that there will be less than minor effects to the function, capacity and safety of the surrounding transportation network.

2 Site Location

2.1.1 Figure 1 is an aerial photograph with the subject site at 69a Main Road outlined in blue. The aerial image is sourced from South Waikato GIS.

Figure 1: Aerial Photograph of Subject Site

2.1.2 The site is located at the northern end of the Tirau town centre with frontage to State Highway 1 (Main Road). It is approximately 2,700sqm in size and is currently occupied by two dwellings. The existing dwellings will be removed as part of the proposed development.

2.1.3 The site does not currently have direct access to the road network, with vehicular access being provided through the school site. Access through the school will be removed as part of the development.

2.1.4 A BP service station is located opposite the site, Tirau Primary School is immediately to the north and Tirau Community Church is immediately to the south. There are no other drive-through services currently within Tirau. The subject site is zoned as residential as stipulated in the District Plan.

2.1.5 Tirau Primary School operates from 8:50am to 3pm and has a school roll of 120-130 students. At the end of the school day, all children must be collected by a parent/caregiver from the classroom or escorted by a staff member to after school care. Access to the school is provided via Main Road, SH27 and Goodwin Street.

3 Existing Environment

3.1 Road Network

3.1.1 Figure 2 portrays the subject site outlined in pink in the context of the wider road network. The image is sourced from OpenStreetMap.

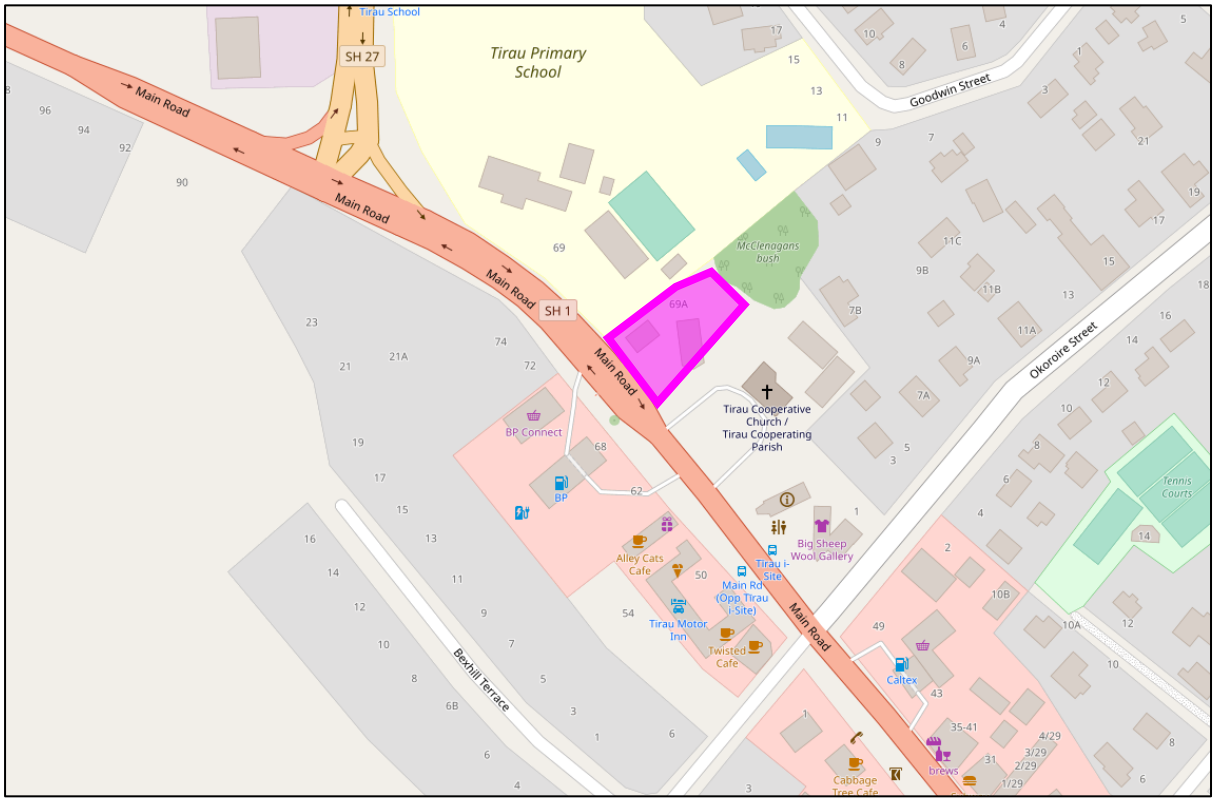

Figure 2: Surrounding Road Network

3.1.2 The subject site has frontage to Main Road which is part of the State Highway 1 designation. Under the One Network Framework (ONF), it is classed as an Interregional Connector. Interregional Connectors primarily cater to the movement of people of goods with less emphasis on a place setting function. Within Tirau however, Main Road has a higher place setting function with the inclusion of shops, parking and other activities that gain access

directly to Main Road. This creates conflict within the typical movement function of the road however this is common in rural towns which have historically been established to provide amenity to the through traffic.

3.1.3 Adjacent to the subject site, Main Road comprises a two-way, two-lane carriageway with a painted flush median south of the site and a raised traffic island north of the site separating the opposing traffic flows. On-street parking is generally permitted on both sides of the road shoulder with the posted speed limit being 50km/h. A typical cross section of Main Road is shown in Figure 3 with the subject site on the left-hand side of the image.

Figure 3: Main Road Looking South

3.1.4 It is noted that the SH27 / SH1 T-intersection is located north of Tirau and the SH5 / SH1 roundabout is located south of the town. This places Tirau at a convergence of regionally important state highways.

3.2 Public Transport

3.2.1 Figure 4 and Figure 5 below illustrate the public transport services which travel through and stop at the town, Tirau.

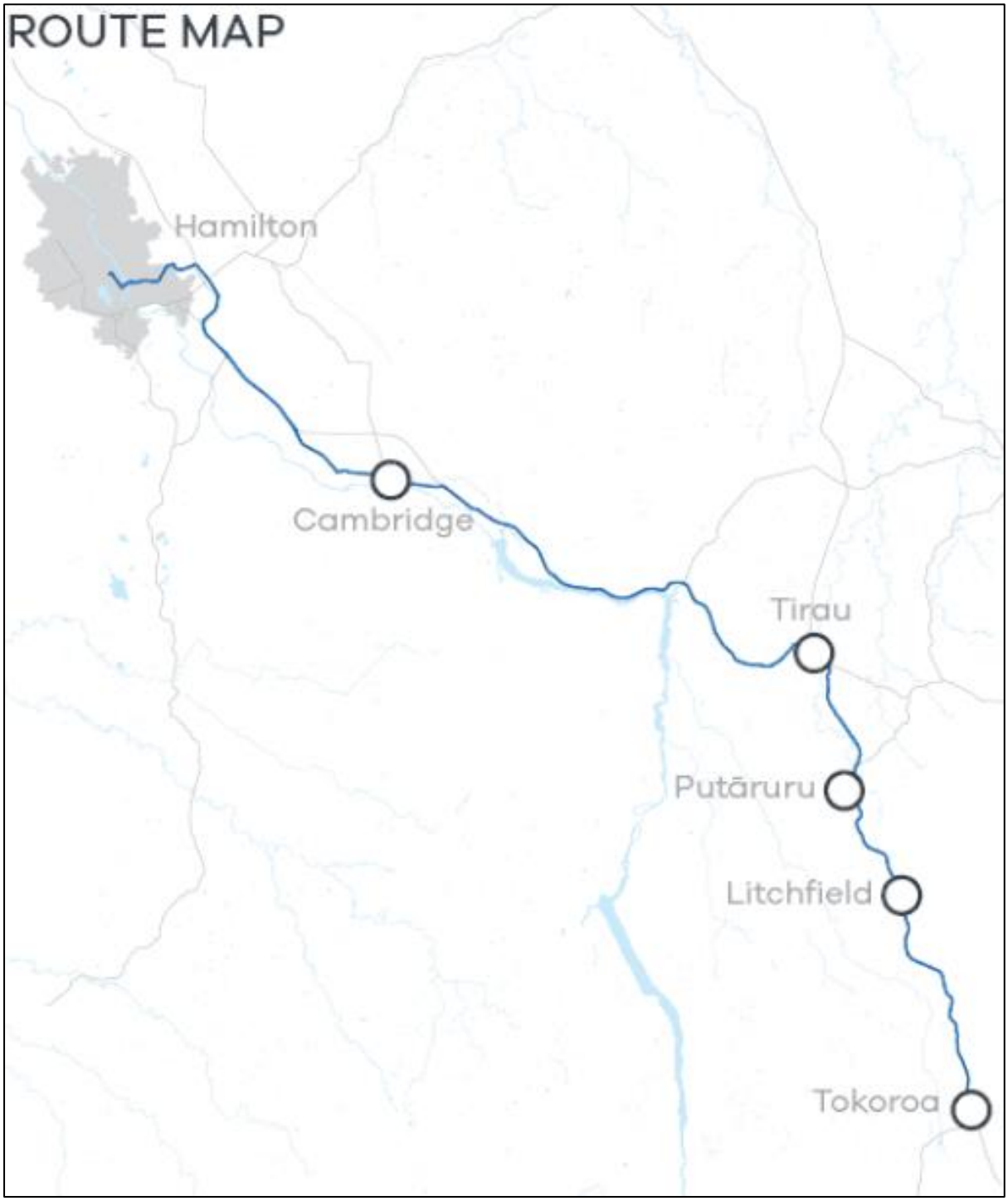

Figure 4: Bus Service 32 - Tokoroa Connector

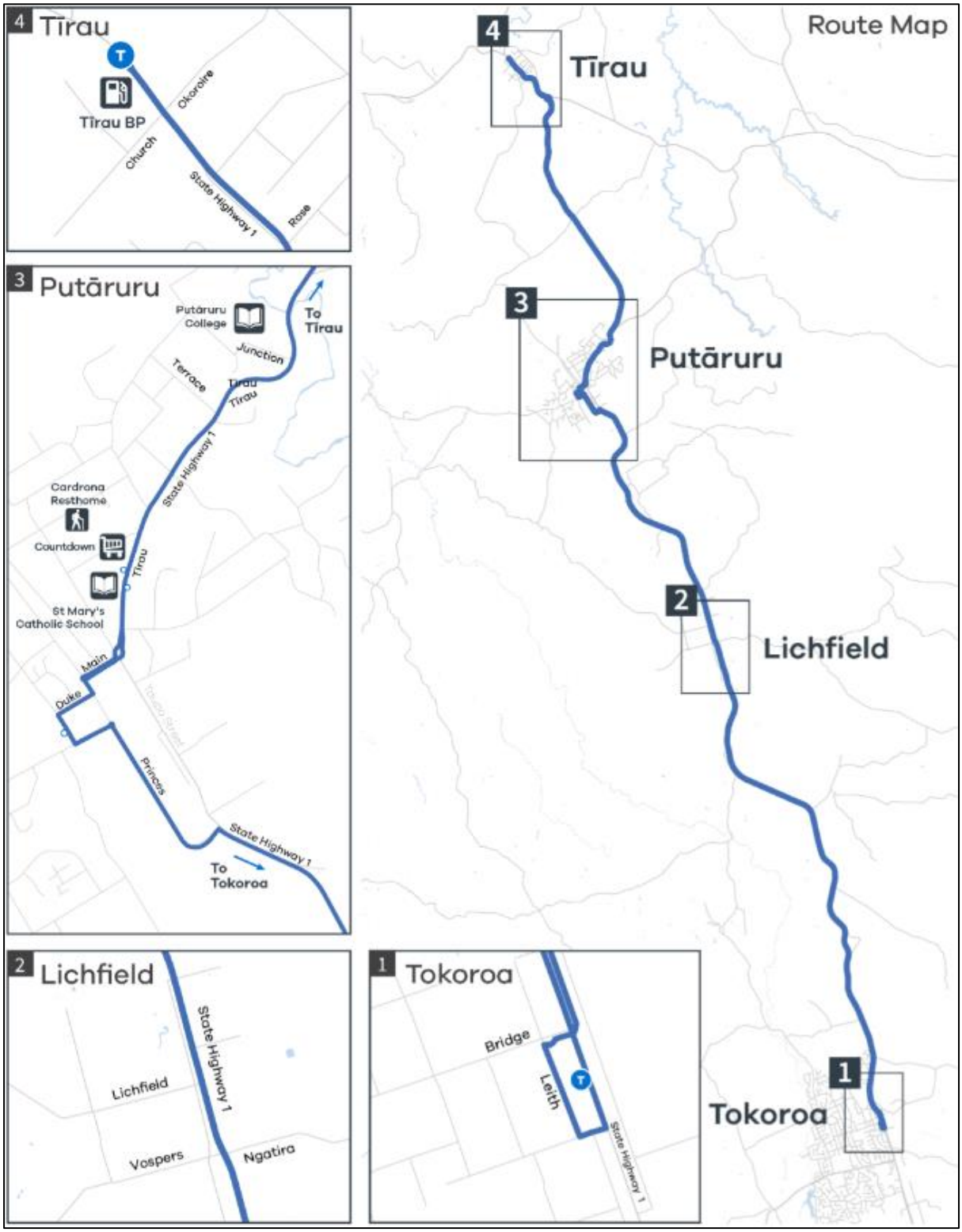

Figure 5: Bus Service 31 - South Waikato Connector

3.2.2 A pair of bus stops is located approximately 40m south of the subject site on Main Road. These bus stops are served by the 32 service which connects Hamilton to Tokoroa and operates twice a day. The bus stop is also served by the 31 service which connects Tirau to Tokoroa and also operates twice a day. The Intercity bus service and other buses for private tour groups also uses these bus stops for routes that pass through Tirau.

3.3 Walking and Cycling

3.3.1 Footpaths are provided on both sides of the surrounding roads, which enables local residents, students and tourists to walk to the subject site. A pedestrian crossing over Main Road is located adjacent to the bus stops to assist people crossing the road.

3.3.2 The *Austroads Guide to Traffic Engineering Practice Part 13 – Pedestrians* indicate that the practical walking distance for non-recreational walking trips is in the order of 1.5km. Notable amenities within a 1.5km walk are Tirau Community Church, BP petrol station, Home Sweet Home gift shop and Tirau i-SITE Visitor Information Centre.

3.3.3 The subject site receives a 'Car-Dependent' score of 39/100 from the Walkscore® website, reflecting that most errands require a car. However, it is noted that this Walkscore covers the entire Tirau town centre and the majority of the urban residential area. The lower score reflects the general availability of goods and services within the town, rather than a reflection of the accessibility of the site in that context. Figure 6 below shows the generated 20-minute walking catchment from the subject site.

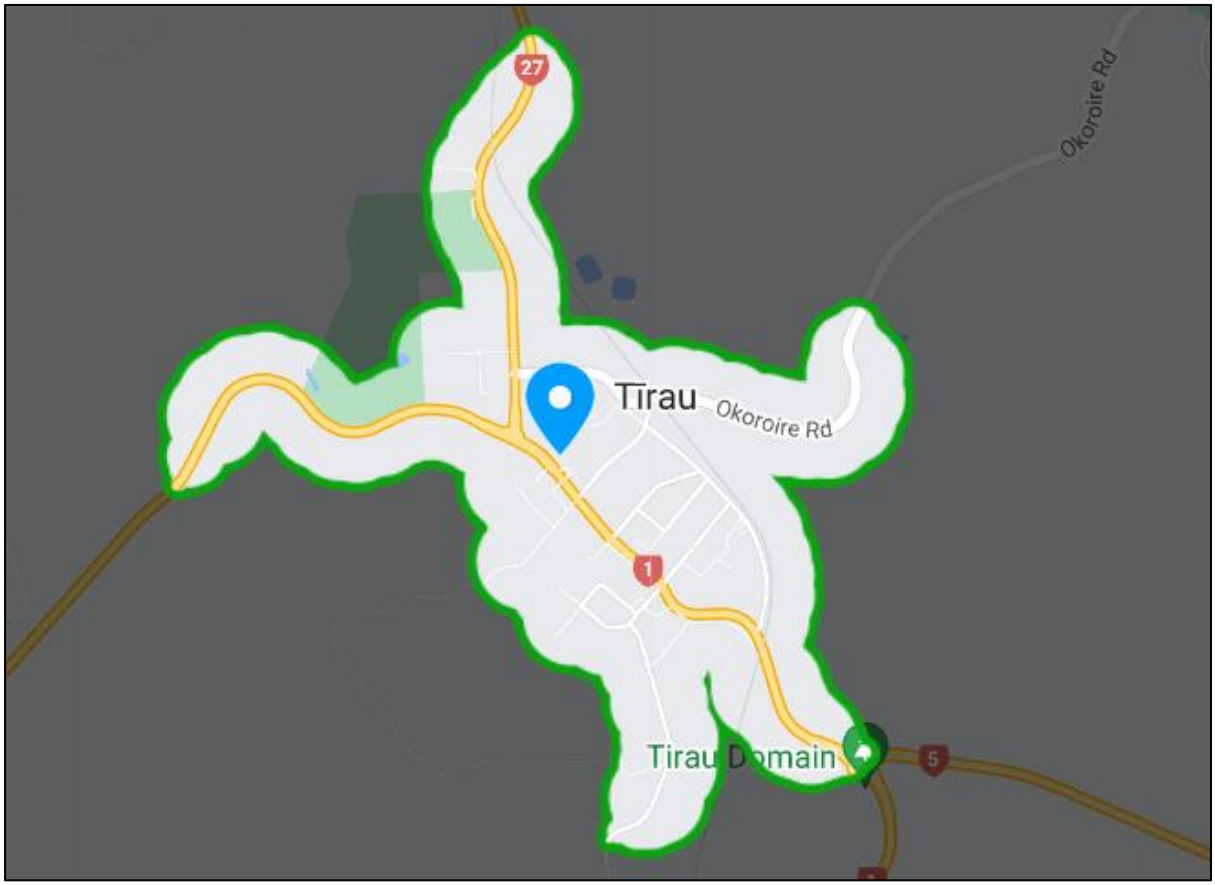

Figure 6: 20-Minute Walking Catchment

3.3.4 Given the nature of Tirau being a more rural town, cycling is generally permitted on street and shared with traffic on Main Road. This is typical for a residential and commercial environment. No dedicated cycling infrastructure is provided on Main Road proximate to the subject site.

3.4 Traffic Volumes

3.4.1 The Waka Kotahi Traffic Monitoring System (TMS) includes existing traffic count data for Main Road approximately 1km southeast of the subject site. The assessment undertaken for Main Road provides a five-day average daily traffic volume and peak hour volume during both the peak summer season and non-peak winter season. Table 1 below summarises the existing traffic volumes of Main Road.

Table 1: Existing Traffic Volumes

Road	Summer Peak (vph)	Summer Daily (vpd)	Winter Peak (vph)	Winter Daily (vpd)
State Highway 1 (Main Road)	1,491	13,543	1,499	12,566

3.4.2 The above traffic volumes show that demands on Main Road are similar for both the summer and winter seasons. HCVs typically form some 12.4% of the overall traffic volume. However, it is noted that Tirau can be congested during peak holiday periods and at weekends.

3.4.3 Figure 7 below shows the typical weekday profile of northbound and southbound hourly traffic demands on Main Road.

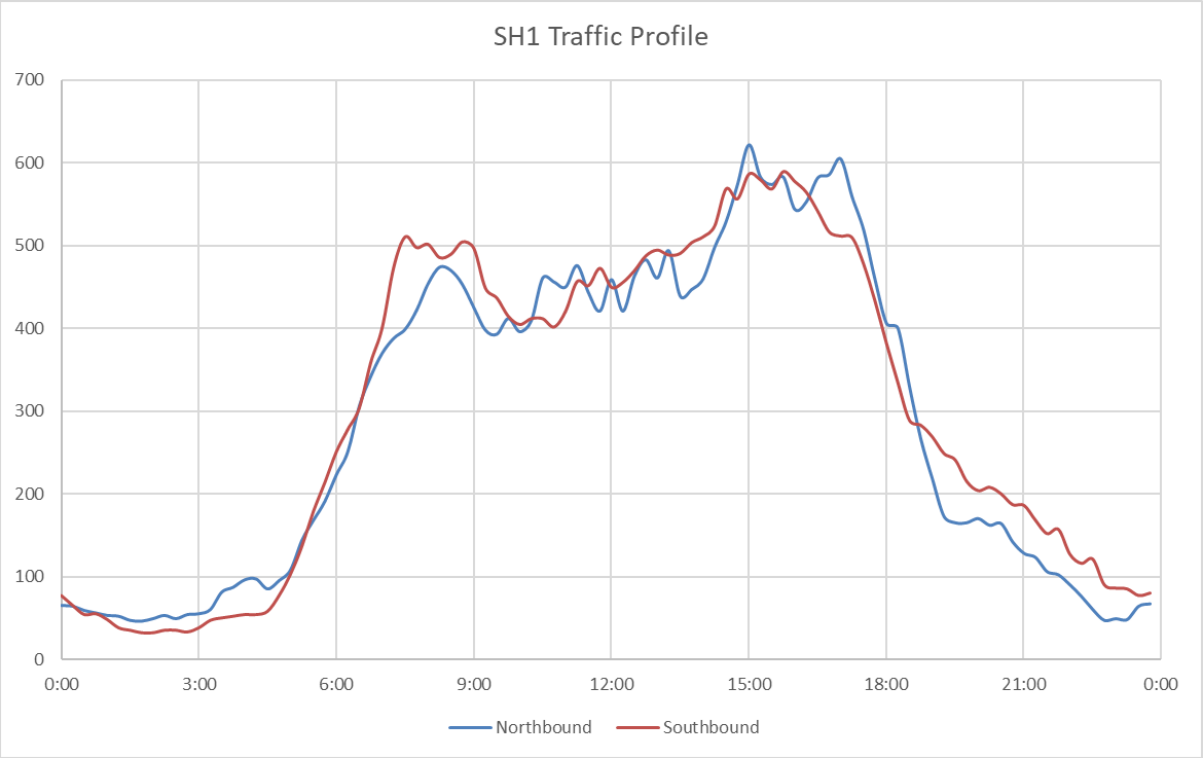

Figure 7: SH1 Traffic Profile

3.4.4 The above graph shows that traffic volumes in both directions are reasonably balanced throughout the day with no clear tidal flows. The profiles also show clear peaks occurring at around 8am – 9am and from 3pm – 6pm.

3.4.5 In addition to the above data, a survey of SH1 traffic was undertaken on Thursday 2nd May from 7am to 10am, 11am to 2pm and 2:45pm to 6pm and on Saturday 4th May from 10am to 2pm. This count included the following:

- Traffic volumes in both directions along SH1.
- Traffic volumes into and out of both access to the BP service station.
- Parking demands on SH1 between the school and the pedestrian crossing south of BP.
- Queuing for the right turn into BP.

3.4.6 The above data was captured to respond to additional queries from NZTA and is addressed in the relevant sections of this report. In terms of traffic along SH1, the observed weekday morning peak hour was 568 vehicles westbound and 391 vehicles eastbound. The weekday evening peak hour was observed to be 494 vehicles westbound and 593 vehicles eastbound. These values are consistent with what was recorded within the TMS database.

3.5 Road Safety

3.5.1 A search was made of the Waka Kotahi Crash Analysis System for all reported crashes that had occurred within 100m of the subject site over the last five-year period of 2018 – 2023 to date. The search found four crashes had been reported within the study area of which one resulted in minor injury and the others resulted in non-injury. It should be noted that the minor injury occurred within the BP petrol station site whilst the remaining non-injury crashes occurred on Main Road as shown in Figure 8 below.

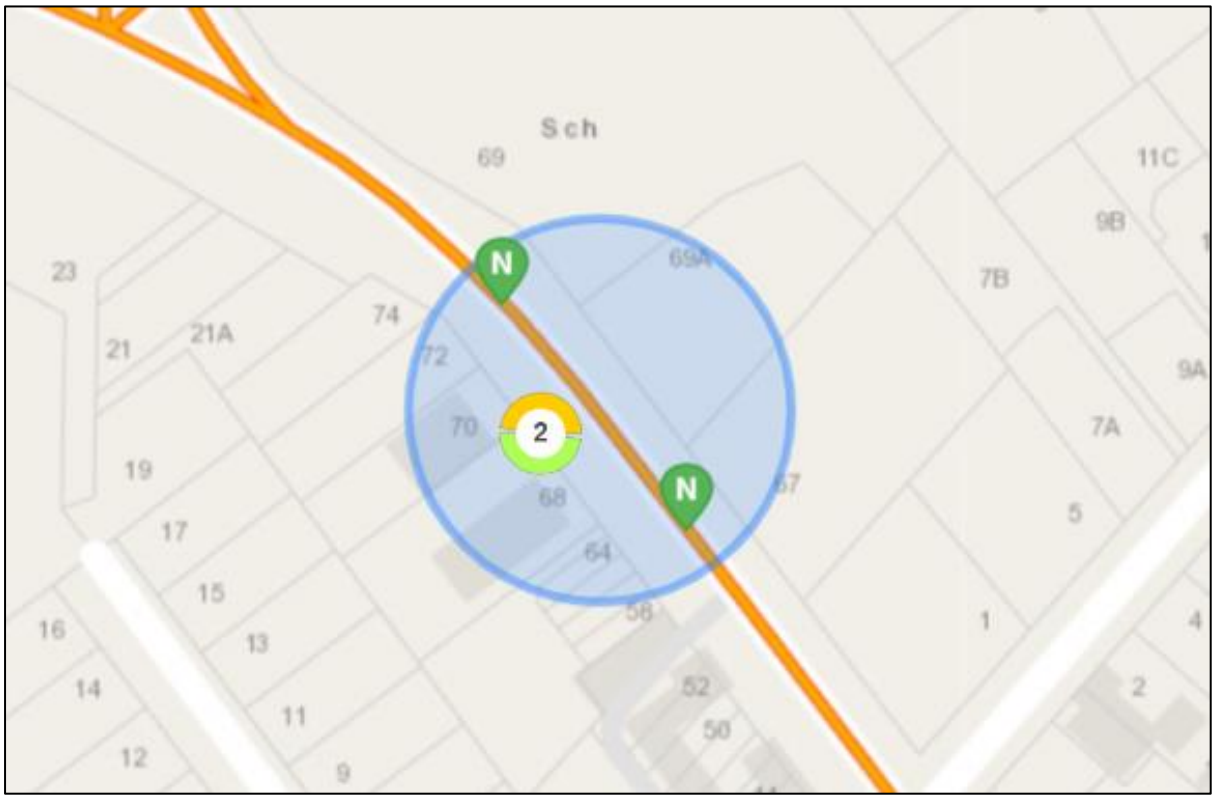

Figure 8: CAS Analysis of Site

3.5.2 The crash that resulted in minor injury occurred due to a driver's inexperience when they pressed on the accelerator and not the break, resulting in collision with a parked vehicle.

3.5.3 The first non-injury crash occurred where a driver failed to slow down and crashed into a vehicle which was stopped waiting for pedestrians to cross at a crossing. The second non-injury crash was due to an alcohol impaired driver failing to stop for a vehicle stopped at a pedestrian crossing. Both of these crashes occurred prior to the relocation of the pedestrian crossing in 2022.

3.5.4 The third crash that resulted in non-injury was due to a driver within the flush median failing to check for oncoming vehicles when merging with northbound traffic after indecision about where to go.

3.5.5 Overall, no crashes were reported that involved the subject site and no crashes involved vehicles turning into or out of adjacent properties. Given the overall low severity of crashes, no specific road safety issues have been identified in relation to the subject site and its current access arrangements.

3.5.6 The Waka Kotahi MegaMaps database has also been used to identify both the collective and personal risk ratings for Main Road. Collective risk is the measure of how likely a crash is to happen along a given stretch of road network. Personal risk relates to the chance that if a crash does occur that it involves a given individual. It is not unusual to see higher personal risks on a road, particularly when there are low traffic numbers.

3.5.7 Within the vicinity of the site, Main Road has an associated risk rating of medium collective and medium / high personal risk ratings. This risk rating does not align with the observed crash record in the vicinity of the subject site. However, this may be due to crashes or other issues elsewhere along Main Road. This combination of risk factors suggests that safety management by Waka Kotahi would be an appropriate response to the existing environment. Examples of this might be speed management, the introduction of pedestrian refuges or minor kerb realignments.

4 Committed Environmental Changes

4.1.1 No future projects are known to be committed or planned in the vicinity of the site that would affect the transportation environment in the area.

5 Proposal

5.1.1 A drive through food and beverage development is proposed at the site of 69a Main Road, Tirau. The proposal includes a separate Starbucks and Burger King which together have a total floor area of 407sqm. The Starbucks will be closer to the road frontage and primarily cater for morning traffic while the Burger King will be towards the rear of the sit and predominantly cater for afternoon/evening traffic. The proposed layout of the site is shown in Figure 9 below.

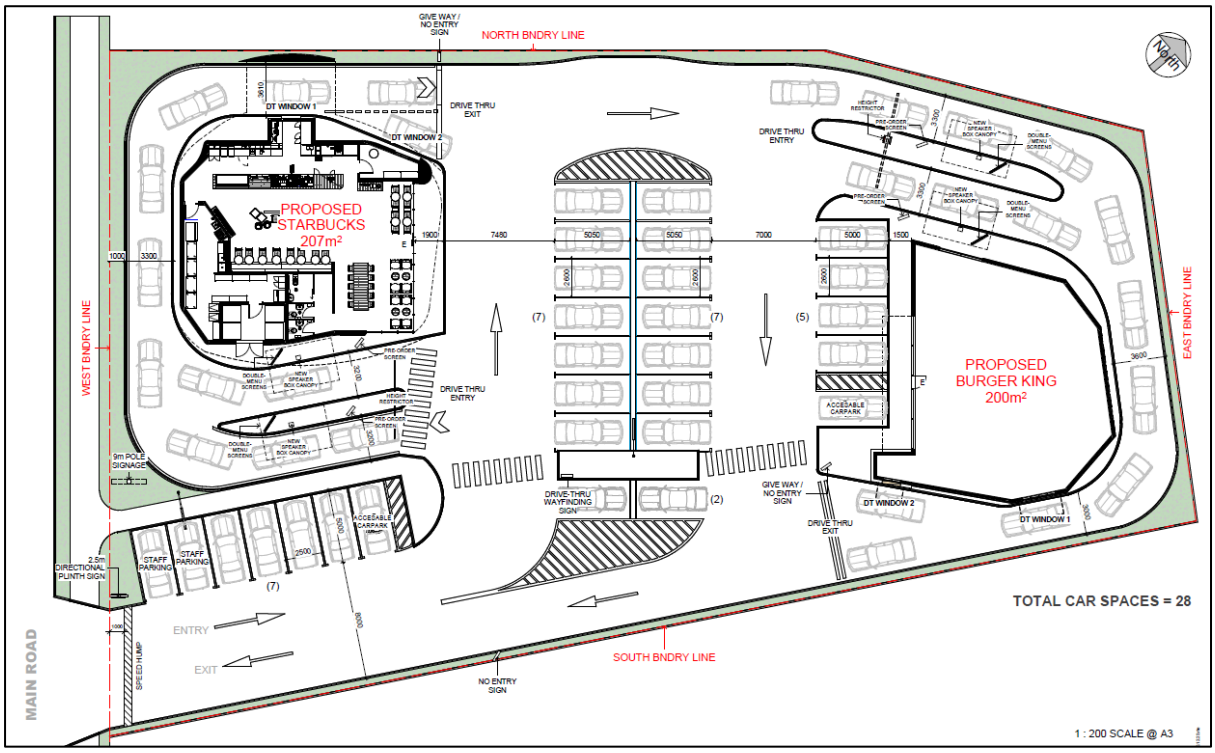

Figure 9: Proposed Site Layout

5.1.2 Pedestrian access has been provided into the site and across the car park to both restaurants. Each of the restaurants will include their own drive-through with two speakers for taking orders and one window for payment and delivery. Each drive through exit widens to allow a vehicle to temporarily park if the order is taking longer to process so that other vehicles can continue to be served. This arrangement is common for many other similar drive-through facilities.

5.1.3 The existing shared access which is within the property boundary of Tirau Primary School located at 69 Main Road will not serve the site. Vehicular access to the site will be provided via a new vehicle crossing located on the southern property boundary which adjoins Main Road.

5.1.4 A total of 28 parking spaces are provided of which two are accessible parking spaces. The car parking area between the two buildings will be fully mountable and traversable for loading trucks to be able to enter and turn around within the site to ensure that all vehicles are able to enter and exit in a forward's direction. Deliveries would only occur out-of-hours when the car park area would be empty. Refuse collection will be via a private contractor and will typically occur out of peak trading hours.

6 Traffic Effects

6.1 Trip Generation

6.1.1 Trip generation rates for the site have been based on surveys of similar sites. This included the Burger King in Frankton, Hamilton and the Starbucks store in Pukekohe, Auckland. The Burger King Store is located on SH1C (formerly SH1) where traffic demands past the site are approximately 25,000vpd. The Starbucks store is within the centre of Pukekohe and is the only current Starbucks with a drive-through in New Zealand at the time of preparing this report. Traffic volumes outside the Starbucks frontage in the order of 11,000vpd. Both stores are of similar size to what is proposed for Tirau. Given that some 13,500vpd pass the site on SH1 during the summer peak, the traffic environment for both existing stores are also considered to be a reasonable representation of the proposed Tirau site.

6.1.2 For the Burger King store, the survey was undertaken on Thursday 4th April 2024 which is considered to represent a typical weekday. The survey was undertaken from 11am to 2pm and 4pm to 8pm. The peak hour was identified to be 120vph (60 vehicle arrivals) which occurred at 5:15-6:15pm and again from 6:15 to 7:15.

6.1.3 For the Starbucks store, the survey was undertaken on Thursday 18 February 2024 from 6am to 9am and 11am to 2pm was considered to represent a typical weekday. The peak hour was identified to be 68vph (34 vehicle arrivals) which occurred at 7:45am to 8:45am. The lunch time peak hour was only 60 vehicles which occurred form 11:45am to 12:45pm.

6.1.4 For this assessment, the peak hours of the two sites have been combined together to give a total site trip generation of 188vph. This is considered to be very conservative given that the peak hours of the stores do not coincide with each other.

6.1.5 It is expected that many customers to the site would be traffic already driving on SH1. Such trips would be referred to as pass-by trips and would not be new trips on the network. Typically, the pass-by rate for fast-food type restaurants is 50% as stipulated in both the New South Wales Road and Maritime Services *Guide to Traffic Generating Developments* (RMS Guide) and the Institute of Transportation Engineers *Trip Generation Handbook* (ITE Handbook). However, no discount has been made to the trip generation values to account for pass-by trips and that all trips generated would be new to the network. This is considered to be a very conservative approach.

6.2 Trip Distribution

6.2.1 Based on the traffic surveys undertaken of the existing Burger King and Starbucks stores, the inbound/outbound split was identified to be 50%/50%. This is expected given that people typically arrive and depart the site within an hour.

6.2.2 The traffic survey of SH1 in Tirau identified that traffic volumes were broadly balance between northbound and southbound movements along SH1 for all time periods. As such, traffic generated by the site has also been distributed on this basis.

6.2.3 Figure 10 below summarises the expected hourly turning counts to and from the site based on the above calculations. The figure also includes the turning movements associated with the BP site for its busiest peak hour which was observed from 12pm to 1pm on the Saturday.

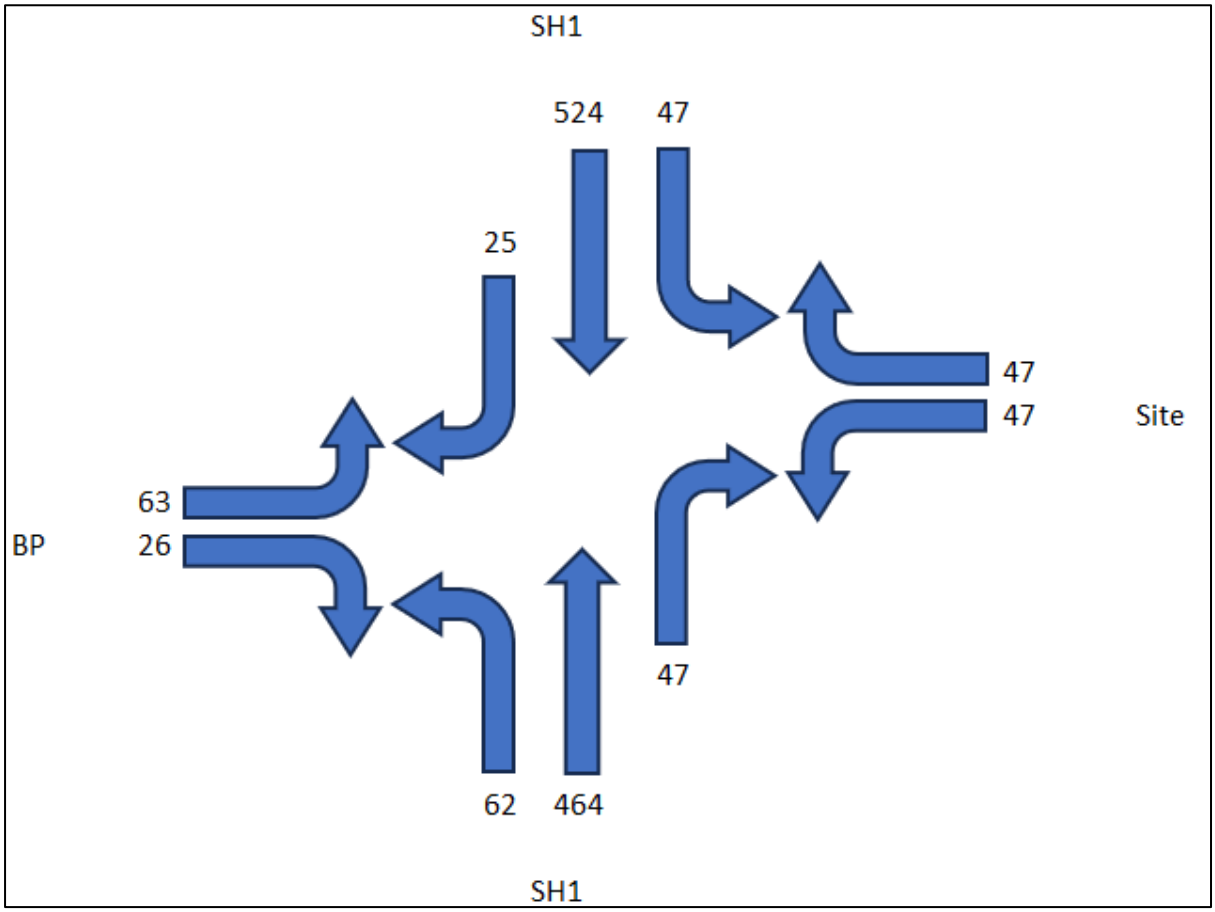

Figure 10: Peak Hour Site Turning Counts

6.3 Modelling

A microsimulation model of the road network adjacent to the site has been created using the AIMSUN software package to assess the effects of additional traffic including consideration of interaction between vehicles associated with the BP site opposite. The layout of the modelled area is shown in Figure 11 below:

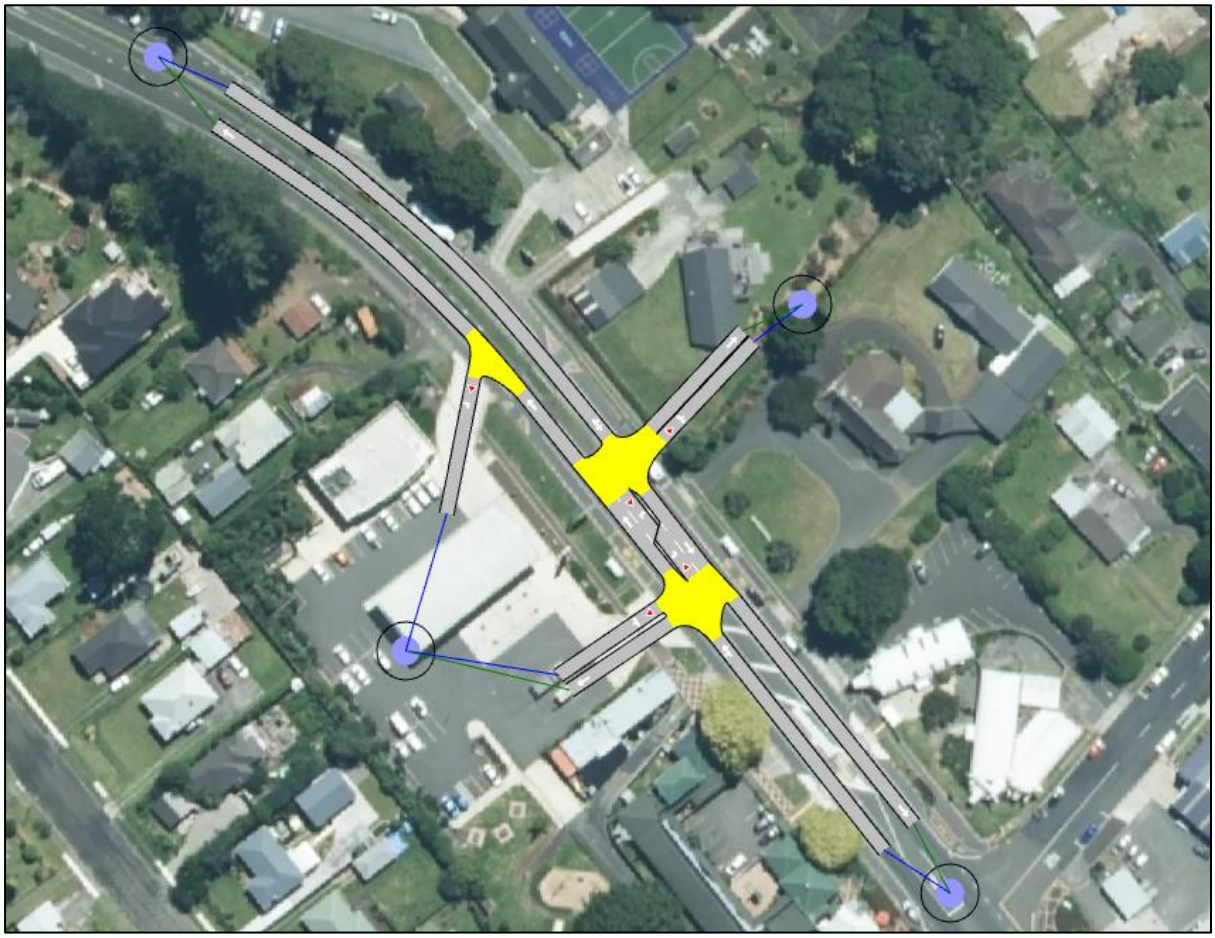

Figure 11: AIMSUN Modelled Layout

The modelling has adopted the trip generation rates and distribution outlined above. Four time periods have been modelled based on the survey times undertaken which are as follows:

- Thursday AM 7am to 10am.
- Thursday Midday 11am to 2pm.
- Thursday PM 2:45pm to 6pm.
- Saturday 10am to 2pm.

The traffic volumes associated with BP and those along SH1 within the modelled time period have been based on those observed as part of the survey. The peak hour trip generation from the proposed development, as calculated above, has been adopted for all modelled time periods. This is considered conservative given that customer demand would be less outside peak times.

The modelling assessment has considered a 10-year future horizon where background traffic, both along SH1 and that associated with BP, has been increased by 20% to represent a 2% growth rate over the forecast 10-year period.

A total of ten replications have been created for each time period modelling which have then been averaged to get a result for each period. Table 2 to Table 5 below summarise the results of the modelling undertaken for each time period assessed. The key parameters reported are the delay for movements, the corresponding Level of Service (LOS) and the average maximum queue during each time period (i.e. the maximum queue from each replication then averaged across the 10 replications).

Table 2: Modelling Results – Thursday AM

Approach	Movement	Baseline			Proposed		
		Ave Delay (s)	LOS	Ave Max Q (veh)	Ave Delay (s)	LOS	Ave Max Q (veh)
SH1 (East)	Left to BP	1.7	A	0.0	1.7	A	0.0
	Through	0.3	A	0.0	0.4	A	0.0
	Right to Site	-	-	-	5.4	A	0.1
Site (North)	Left	-	-	-	8.8	A	0.8
	Right	-	-	-	14.3	B	0.8
SH1 (West)	Left to Site	-	-	-	2.3	A	0.0
	Through	0.3	A	0.0	0.5	A	0.0
	Right to BP	5.0	A	0.1	5.7	A	0.1
BP (South)	Left	4.2	A	0.2	5.6	A	0.3
	Right	11.2	A	0.2	13.9	B	0.2
All Vehicles		0.8	A	-	1.8	A	-

Table 3: Modelling Results – Thursday MD

Approach	Movement	Baseline			Proposed		
		Ave Delay (s)	LOS	Ave Max Q (veh)	Ave Delay (s)	LOS	Ave Max Q (veh)
SH1 (East)	Left to BP	1.8	A	0.0	1.8	A	0.0
	Through	0.4	A	0.0	0.5	A	0.0
	Right to Site	-	-	-	5.4	A	0.1
Site (North)	Left	-	-	-	9.4	A	0.8
	Right	-	-	-	16.0	B	0.8
SH1 (West)	Left to Site	-	-	-	2.3	A	0.0
	Through	0.3	A	0.0	0.5	A	0.0
	Right to BP	6.8	A	0.1	7.6	A	0.1
BP (South)	Left	5.2	A	0.3	6.8	A	0.3
	Right	15.5	B	0.3	18.8	C	0.3
All Vehicles		1.0	A	-	2.0	A	-

Table 4: Modelling Results – Thursday PM

Approach	Movement	Baseline			Proposed		
		Ave Delay (s)	LOS	Ave Max Q (veh)	Ave Delay (s)	LOS	Ave Max Q (veh)
SH1 (East)	Left to BP	1.8	A	0.0	1.8	A	0.0
	Through	0.5	A	0.0	0.6	A	0.0
	Right to Site	-	-	-	6.3	A	0.1
Site (North)	Left	-	-	-	11.6	B	0.9
	Right	-	-	-	19.5	C	0.9
SH1 (West)	Left to Site	-	-	-	2.4	A	0.0
	Through	0.4	A	0.0	0.6	A	0.0
	Right to BP	8.4	A	0.1	9.2	A	0.1
BP (South)	Left	5.8	A	0.4	7.7	A	0.5
	Right	19.5	C	0.2	23.8	C	0.3
All Vehicles		1.1	A	-	2.2	A	-

Table 5: Modelling Results – Saturday

Approach	Movement	Baseline			Proposed		
		Ave Delay (s)	LOS	Ave Max Q (veh)	Ave Delay (s)	LOS	Ave Max Q (veh)
SH1 (East)	Left to BP	1.8	A	0.0	1.8	A	0.0
	Through	0.5	A	0.0	0.6	A	0.0
	Right to Site	-	-	-	6.2	A	0.1
Site (North)	Left	-	-	-	10.6	A	0.9
	Right	-	-	-	18.9	C	0.9
SH1 (West)	Left to Site	-	-	-	2.3	A	0.0
	Through	0.4	A	0.0	0.5	A	0.0
	Right to BP	8.7	A	0.1	10.0	A	0.1
BP (South)	Left	5.6	A	0.4	7.6	A	0.5
	Right	17.6	C	0.3	21.3	C	0.4
All Vehicles		1.2	A	-	2.2	A	-

The modelling above demonstrates that the proposed development does not create significant adverse effect on the road network. Delays do not materially change as a result of additional traffic volumes and delays for vehicles exiting the site are less than 20 seconds in all scenarios. Similarly, there is no notable queuing within the road reserve or within the adjacent sites with all queuing less than one vehicle.

It is reiterated that there are a number of conservative approaches within the modelling which are summarised as follows:

- Peak hour trip generation for the two stores have been combined despite their peaks being offset from each other.
- Peak hour trip generation has been applied throughout the whole modelled period rather than being profiled.
- All site trips are new to the network with no allowance for pass-by trips.
- No allowance for staged right turns.

Given the above factors, the modelling results are likely to be overestimating the future extent of delays and queues. Given that the results already demonstrate low levels of delay and queuing, it is concluded that the proposed site is unlikely to have a significant adverse effect on the efficiency of the road network.

NZTA also asked about the potential for unnecessary trips being made into the site. Such trips could arise if vehicles are not able to determine the business of the drive-through from the road, turn into the site and then change their mind by exiting without ordering. As noted above, there are a number of conservative measures included within the calculations for the number of trips generated by the site. This conservatism has therefore assessed a higher level of traffic generation than what is likely to occur within the site. Therefore, on the rare occasion that there are extra trips generated by the site, the number of trip movements are still likely to lie within the calculated values. Hence traffic effects would be no greater than what has already been assessed.

6.4 Calibration

To calibrate the modelling, queue lengths were observed as part of the survey being undertaken. Queuing within the median for vehicle turning right into BP was negligible with only one occasion where more than one vehicle was in the queue. This occurred when two road working vehicles arrived at the same time. The wide vehicle crossing gives vehicles more space when turning, resulting in some vehicle turning earlier or later depending on where the gap in the traffic stream presents itself. These observations are reflected in the modelled queuing where the average maximum queue is less than one vehicle with the delay time allows for vehicles slowing in advance of turning without being excessive.

The queuing for vehicles turning out of both BP accesses was also captured. There was no notable delay or queues of more than one vehicle observed for the western left -only exit access. A

maximum of two vehicles were observed for vehicles turning right which was observed four times throughout the survey periods. Occasionally, a right turning vehicles would undertake a staged right turn where they would first enter the median before joining the eastbound traffic stream. The modelled network does not allow for staged right turns and therefore is likely overestimating the delay and queuing for the right turn vehicles. However, the modelled queuing results show that the average maximum queue is still less than one vehicle which aligns with the observations.

The delay for vehicles turning right out of BP was also observed which resulted in an average of 11 seconds which aligns with the delays for this movement form the modelling.

Overall, the modelling is considered to appropriately reflect observed traffic patterns and behaviours.

7 Access

7.1 Location

7.1.1 An existing shared vehicle crossing is provided via the neighbouring school site at 69 Main Road and is not within the property boundary of 69a Main Road. No access is proposed from the site through this access.

7.1.2 The proposal provides a new vehicle crossing located at the southern property boundary. This crossing allows two-way opposing traffic movements, with the remaining accessway being the manoeuvring area for car parking.

7.1.3 The access is located at the southern boundary of the site to maximise separation from the school. This also ensures that turning movements at the vehicle crossing are not restricted by the raised planted median to the north of the site.

7.1.4 The proposed access will be assessed against the District Plan and also the Appendix 5b: Accessways standards and guidelines from the NZTA Planning Policy Manual (PPM). For the access assessment, the District Plan and PPM have the same visibility and separation requirements. The main difference between the District Plan and PPM is the access width required which is assessed in more detail below.

7.2 Separation

7.2.1 The proposed vehicle crossing which intersects Main Road which is a State Highway is required to comply to the standards set out in Table 3 – *State Highway Crossing Places* of the District Plan. For a posted speed limit of 50km/h on Main Road, Table 3 of the District Plan specifies a minimum separation distance of 30m between a vehicle crossing and intersection. The proposed vehicle crossing provides a separation distance of at least 100m south from the intersection between Main Road / Okoroire Street, which satisfies the rule.

7.2.2 The vehicle crossing also has 3m separation when measured at the property boundary to the nearest vehicle crossing south of the site. This provides an appropriate space for pedestrians walking along the road to take refuge and not have to cross multiple accesses at once.

7.3 Width

7.3.1 Table 2 – *Vehicle Crossing Widths* of the District Plan specifies commercial vehicle crossings to provide a minimum and maximum width of 4.5m and 12m respectively. The proposed vehicle crossing provides a crossing width of 8m, which satisfies the rule. This width is sufficient to allow two-way simultaneous vehicular movement.

7.3.2 The PPM states that an access generating more than 100 vehicle per day will typically be treated like an intersection and is generally designed to Austroads guides. Austroads does not specify minimum or maximum vehicle crossing widths therefore the design is based on what is practical for the site. Vehicle tracking has been undertaken using a 19.45m semi-trailer to demonstrate that the proposed access allows delivery trucks to enter and exit the site efficiently.

7.3.3 This can be seen in Figure 12 and Figure 13 below.

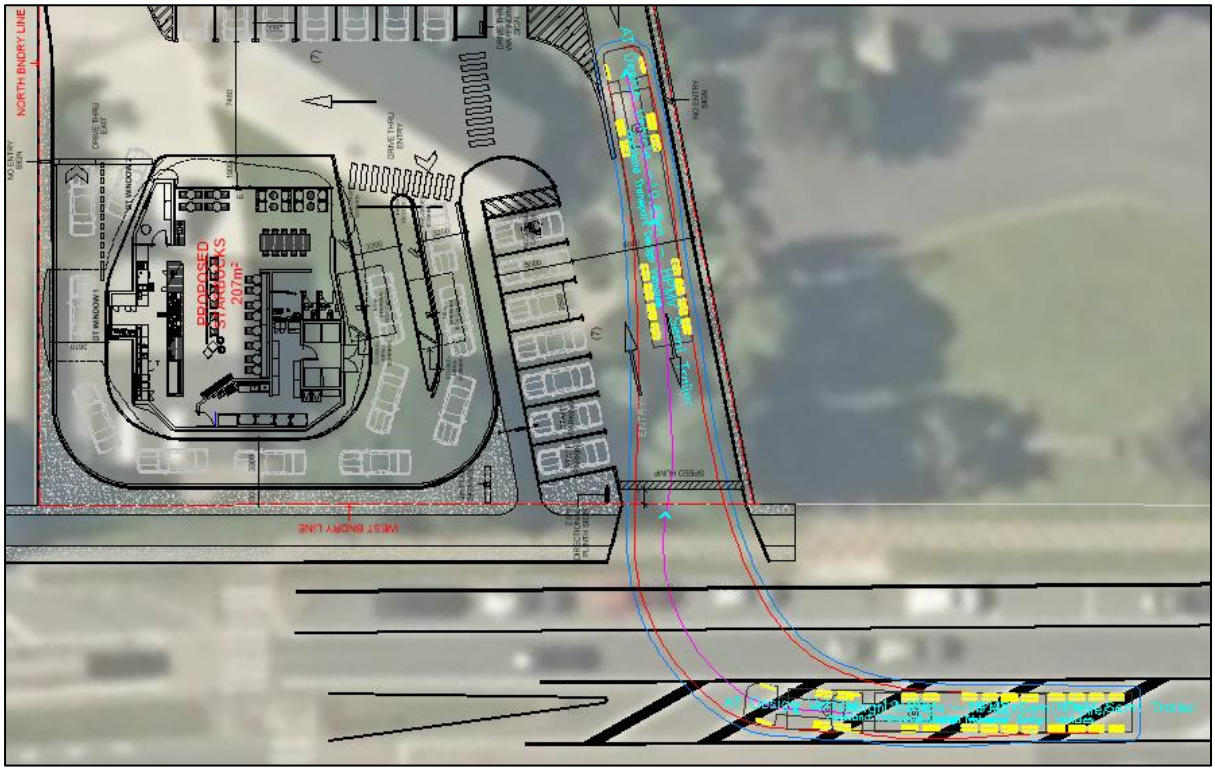

Figure 12: 19.45m Right Into Site

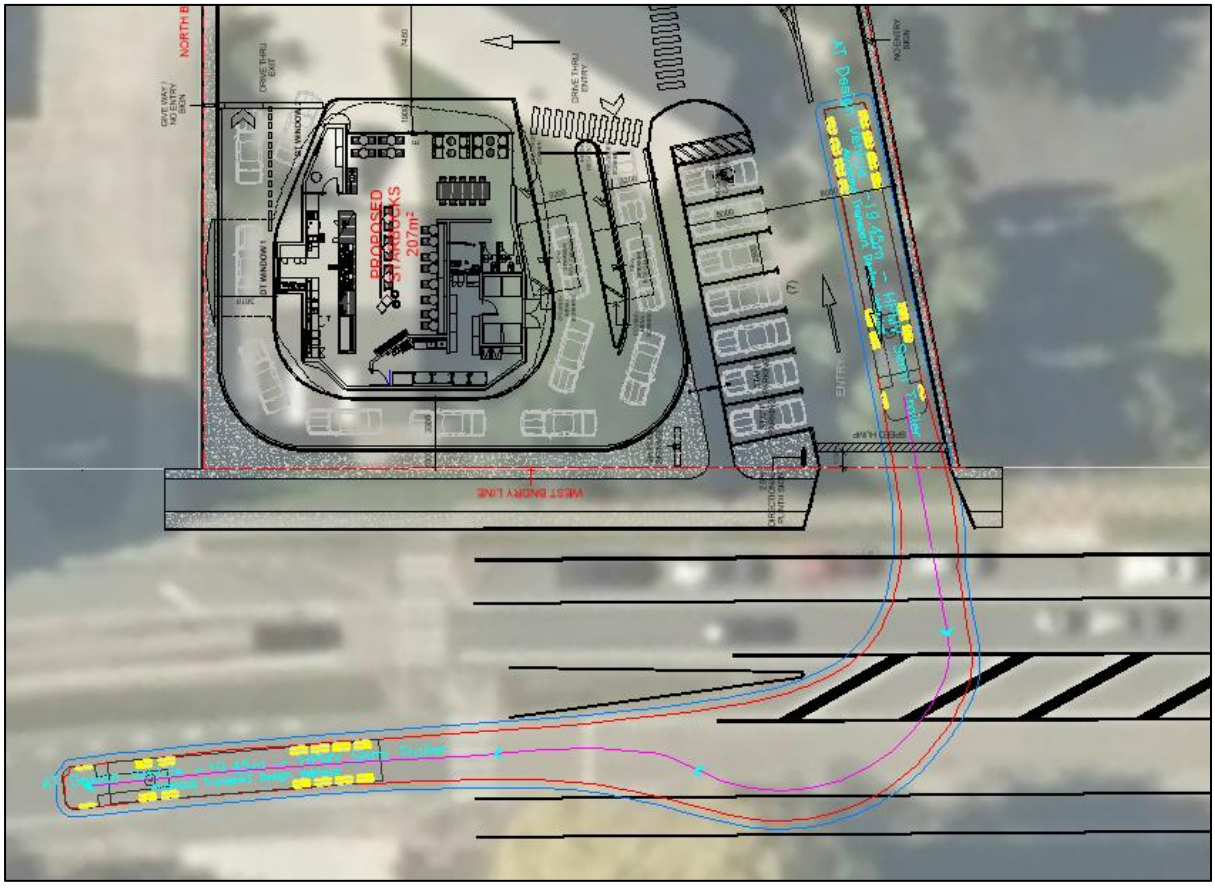

Figure 13: 19.45m Right Out of Site

7.3.4 The delivery truck is proposed to only turn right in and out of the site which minimises the overall vehicle crossing width required and this can be governed by a consent condition. As seen in Figure 13, the right-turn out manoeuvre does require the shoulder area on the opposite side of Main Road to complete the manoeuvre but there will be no parked cars within this space as there are no stopping lines. The SH5 / SH1 roundabout to the south of town provides a turning opportunity to enable HCVs to approach site from the correct direction. Those wishing to head south after leaving site can do so via Okoroire Road and Heatherington Road.

7.3.5 Consideration was given to permit left-turn movements at the access. Figure 14 and Figure 15 below shows a 19.45m semi-trailer turning left in and out of the site.

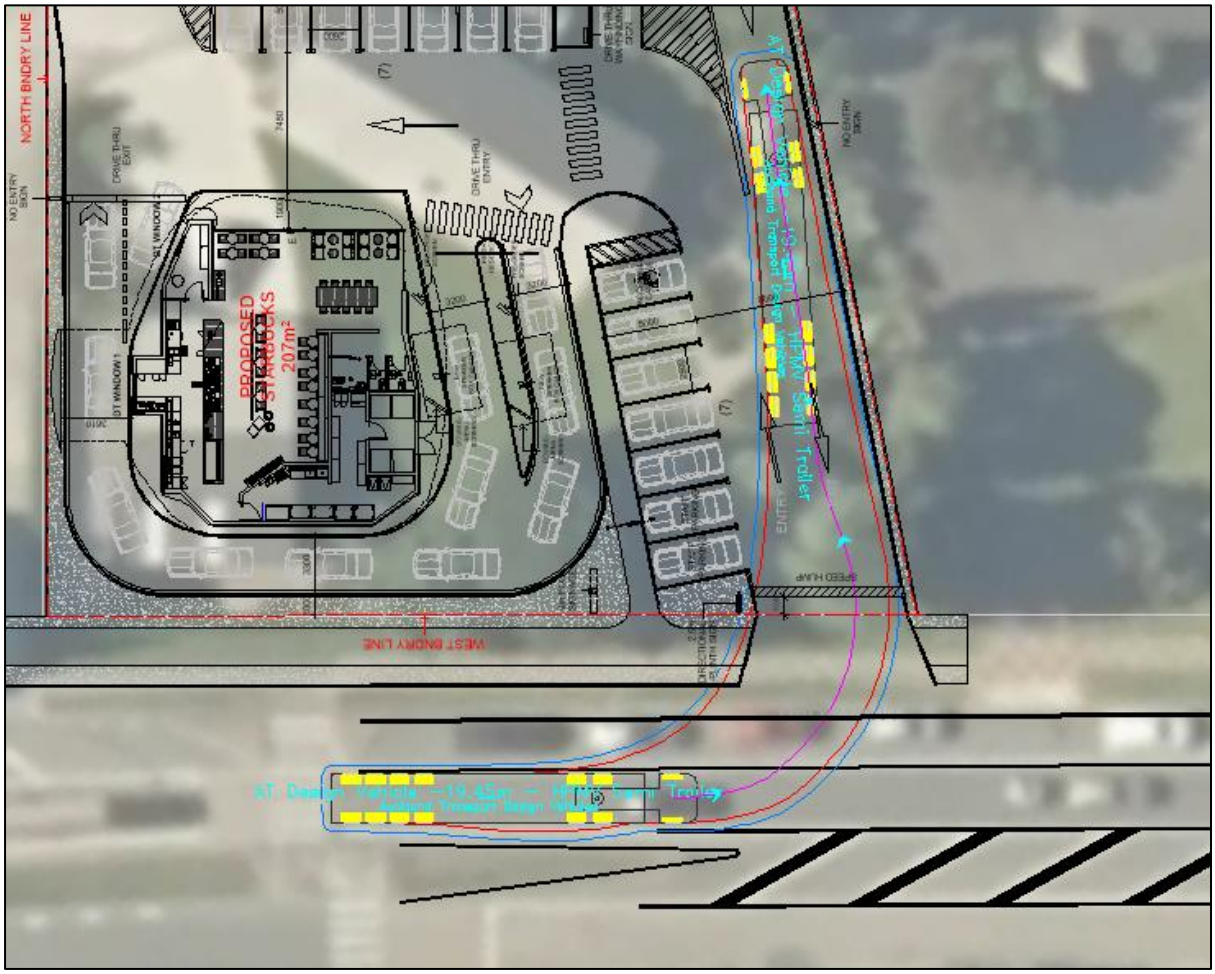

Figure 14: 19.45m Left into Site

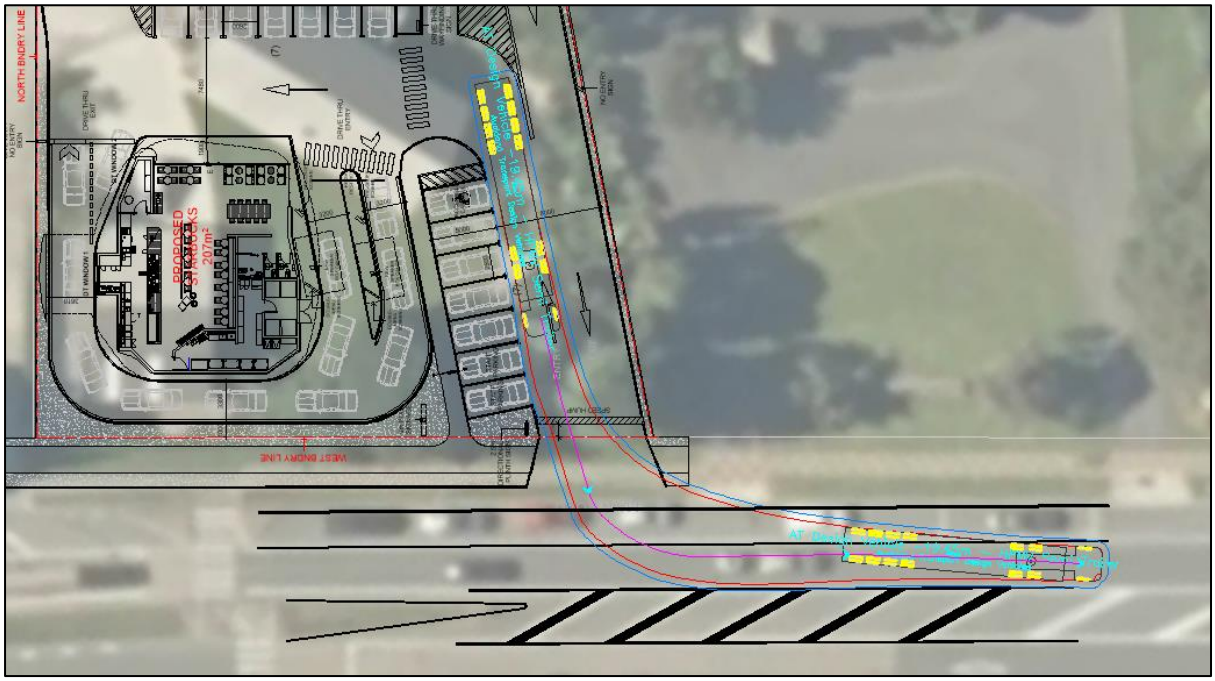

Figure 15: 19.45m Left Out of Site

7.3.6 The left turn manoeuvre would require at least a 9m wide vehicle crossing, the removal of up to seven on-street parking spaces, a much wider vehicle crossing splay and requires the use of the adjacent vehicle crossing to the east. Restricting truck movement to right turns would only apply for delivery vehicles. Private refuse collection will be undertaken by a smaller truck and can enter and exit the site via all turning movements without requiring a significantly wider vehicle crossing or affecting existing on-street car parking.

7.3.7 Through consultation, NZTA suggested that the vehicle crossing could be reduced to a 6m width to reduce potential effects on pedestrians. This was based on adopting an 8m truck to serve the site. However, a larger truck is required to service the site as the service vehicle would be serving multiple sites outside of main centres and adopting an 8m vehicles would not align with the site operations.

7.3.8 Initially, a wider vehicle crossing was considered in order to allow for trucks to turn left. The District Plan permits a width of up to 12m which would be more than sufficient to cater for trucks turning left into or out of the site. However, it is acknowledged that whilst this might be permitted it could lead to lower levels of service for pedestrians. As such, a balanced solution is proposed whereby the vehicle crossing has been minimised in width to 8m while still allowing for right turns into and out of the site with left turns being restricted.

7.3.9 In terms of pedestrian safety, all vehicles will be driven forwards across the footpath with no reversing required to or from the road. To further reduce vehicle speeds, a speed hump is proposed 0.5m inside the property boundary of the access. This will ensure vehicles are travelling at slow speeds when crossing the footpath, giving drivers sufficient time and space to observe and give-way to pedestrians.

7.3.10 Overall, the proposed vehicle crossing width of 8m is therefore considered appropriate given that the delivery truck will be restricted to turn right in and out of the site.

7.4 Visibility

7.4.1 For a posted speed limit of 50km/h on Main Road, Table 3 of the District Plan and the PPM specify crossings to provide a minimum sight distance of 113m. The proposed vehicle crossing provides at least 150m visibility in both directions on Main Road, which satisfies the rule.

7.4.2 There is currently capacity for five on-road car parks across the site frontage. Two of these will be removed to accommodate the new vehicle crossing leaving three spaces available. Through consultation, NZTA requested an assessment of whether these vehicles may inhibit visibility of vehicles exiting the site.

7.4.3 RTS6 *Guidelines for visibility at driveways* states that there should be no obstruction to visibility, including parked vehicles, for high volume driveways (more than 200 movements per day) on arterial roads. The remaining parking spaces on SH1 just north of the access to the site are within the visibility splay when looking west from the site. Therefore, these spaces will also be removed through the use of no stopping lines, similar to what are provided around the accesses to BP on the opposite side of the road. Further discussion on parking demands is provided in section 9 of this report.

7.5 Gradient

7.5.1 The District Plan states that the maximum accessway gradients shall not exceed 1 in 6. The site is relatively flat, and gradients are not expected to exceed 1 in 6 which satisfies this rule.

7.6 On-Site Queuing

7.6.1 The queuing required for each restaurant has been observed from the surveys undertaken at the existing stores. The queuing is measured as vehicles waiting before reaching the order box.

7.6.2 For the Burger King store, the maximum queue length observed was five vehicles which occurred during the evening peak period. The maximum queue observed during the lunch time period was two vehicles. Figure 16 below shows five vehicles queuing prior to reaching the order boxes with tracking showing that another vehicle is still able to circulate around the parking area while maintaining at least a 0.3m buffer from other vehicles, islands or other objects. As such, the Burger King internal queuing is unlikely to affect other site visitors or affect the public road.

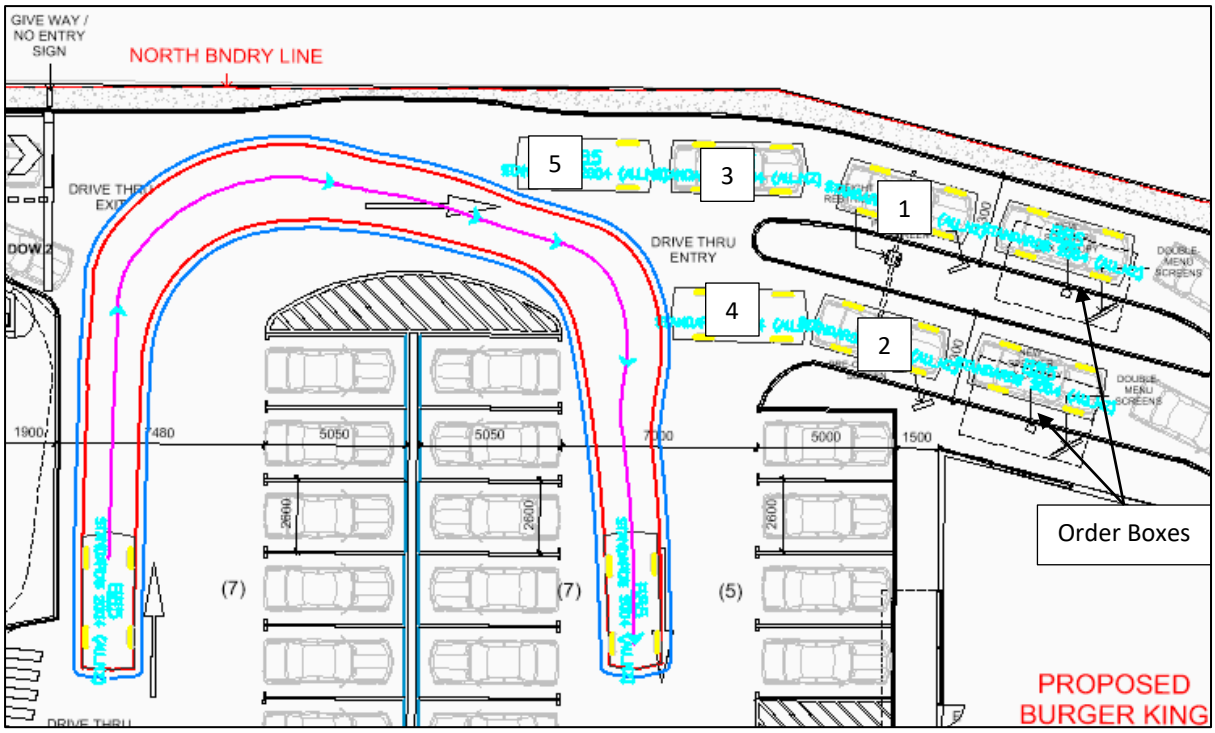

Figure 16: Burger King Queuing

7.6.3 For Starbucks, the maximum observed queue was two vehicles which occurred during the morning peak hour. No more than one vehicle was queued during the lunch time period. There is capacity for two vehicles to wait without encroaching beyond the pedestrian crossing. It is therefore expected that the typical peak queuing demands are containable within the queuing storage space provided. If queuing does exceed this value, there is capacity for up to four vehicles to queue while still allowing vehicles to bypass the queue which is double the expected maximum. This is shown in Figure 17 below.

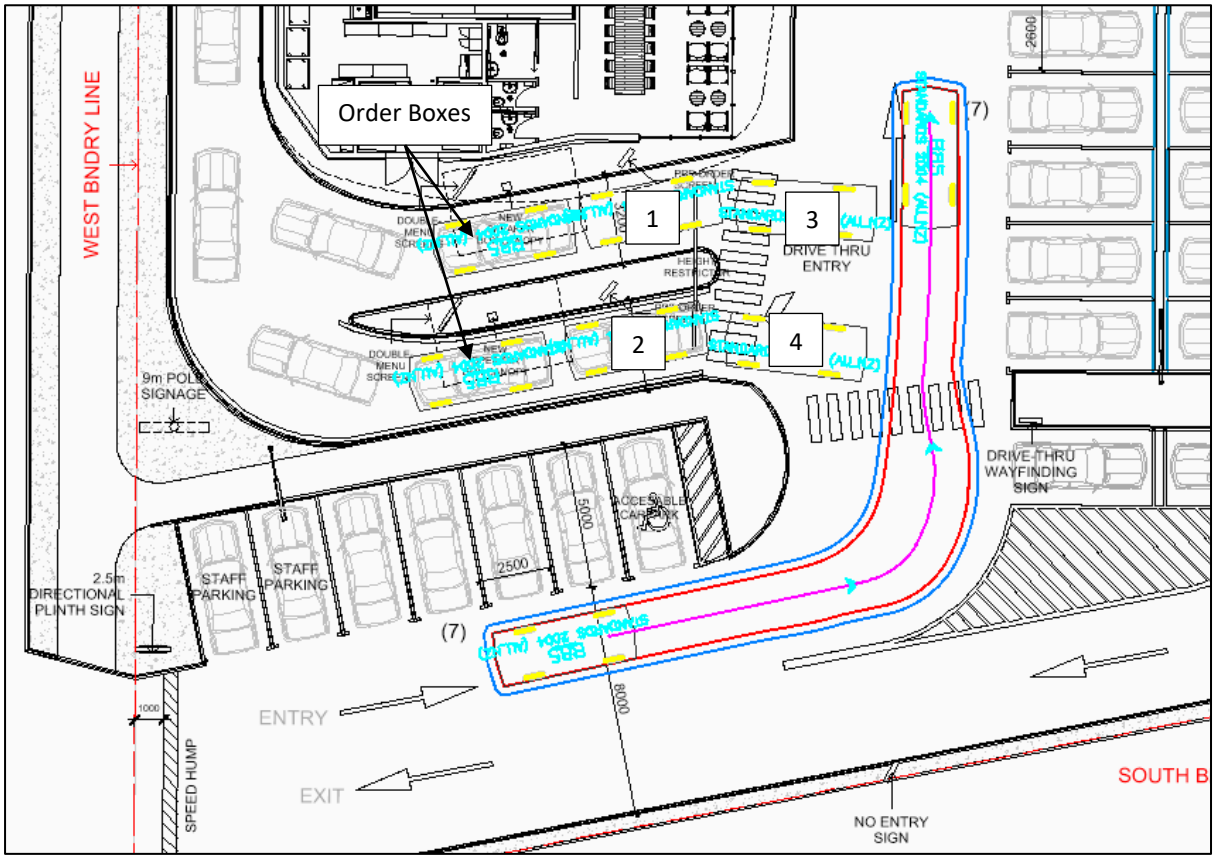

Figure 17: Starbucks Queuing

7.6.4 In addition to the above, there is an over 30m between the back of the queues illustrated above and SH1. This allows for another five-six vehicles to queue within the site without affecting traffic on SH1.

7.6.5 The RMS Guide recommends that there is at least capacity for 12 vehicles to queue back from the pick-up window and that there is capacity for at least four vehicles from the ordering point i.e. four vehicles including those placing their order. The Burger King stores has capacity for 13 vehicles form its pick-up point while Starbuck has capacity for 12 vehicles. Both stores also provide space for at least four vehicles from the order box with a minimum practical capacity of six spaces before potentially affecting the circulation of other vehicles. The queuing storages provided therefore satisfy the standards from the RMS Guide.

7.6.6 NZTA also requested analysis of the split between customers using the drive-through and those that park within the site. From the survey of the Burger King site, approximately 60% of customers used the drive through with 40% parking. For the peak hour demand of 60 arrivals, this would equate to 36 people using the drive through with 24 people parking. The time taken for vehicles to exit the drive through where the average processing time was 211

seconds or approximately three and a half minutes per vehicle per window. The proposed site has two drive-through windows and therefore is able to process an average of just over 34 vehicles per hour. The demands in the peak hour may slightly exceed this service rate which would lead to some queuing which is expected in peak times. However, any queuing is able to dissipate reasonably quickly as arrival rates reduce after the peak time rush. There is also the option of customers parking and ordering within the store if the drive-through is busy.

7.6.7 It was also observed during the survey that parking durations were short with most people either eating in their vehicles or leaving straight after collecting their order. Further discussion on parking demands is provided in section 8 of this report.

7.6.8 For the Starbucks site, 80% of customers used the drive-through with 20% parking. With a peak hour arrival of 34 customers, this equates to 27 people using the drive-through with 7 people parking. The time taken for people to be processed through the drive-through was not recorded for the Starbucks site as it was not possible to record exact arrival and departure times of each vehicle as the drive-through passed behind the building impeding visibility of capturing arrivals and departures of each vehicle. However, the Pukekohe site only has one order box and window and no significant queuing was observed with this arrangement which indicates that the average vehicle processing times are faster than for a Burger King. The proposed Starbucks has two order boxes and windows which enable faster processing times. Therefore, it is unlikely that the internal queuing would exceed what has been assessed in this report.

7.6.9 NZTA noted that there is the potential for vehicles parking/unparking near the site access to also cause queuing. To assist in mitigating this risk, it is proposed for the first two parking spaces inside the site boundary to be converted into staff spaces where the parking turnover rate is lower than for customer parking spaces. This ensures that there is over 8m between the footpath and the first customer car park within the site which is sufficient to allow for a vehicle to queue. There is also approximately 14m between the first customer car park and the through traffic land on SH1 hence two vehicles can comfortably queue without affecting through traffic. The time taken for a vehicle to park or unpark is unlikely to exceed 15 seconds. Adopting a Poisson distribution with a conservative peak arrival rate of 94 vehicles into the site, the probability of a vehicle arriving at the same time that a vehicle is attempting to park/unpark is 0.1%. The probability that a second vehicle arrives during this time is 0.04%. Therefore, it is very unlikely that queuing that extend into the road reserve from the site and even less likely that the queuing would extend into the through traffic lanes.

7.6.10 Overall, it is expected that queuing for the drive-throughs would be contained within the site without extending back to the road reserve.

7.7 Pedestrians

7.7.1 In addition to vehicular access, the site includes a pedestrian access which is adjacent but separate from the vehicle access. There are also pedestrian paths within the site that provide a direct connection from the pedestrian access to the entrances to each building. Within the site, there will be marked pedestrian crossings to indicate that pedestrians have right-of-way where the paths cross over vehicular manoeuvring areas. The inclusion of these paths is considered to appropriately cater for pedestrians, providing a safe route to each restaurant.

7.7.2 As noted above, the vehicular access to the site is located as far south as possible to maximise distance from the school. It is also noted that the pick-up procedure for the school is such that all students must be accompanied by a specific caregiver. As such, students would not be walking past the site unattended and there are other walking routes available such as via Goodwin Street that do not require the use of Main Road.

7.7.3 As outlined in section 7.3 above, the driveway to the site has been minimised to reduce the overall width to minimise crossing distance for pedestrians. Consideration was given to widening the access to allow truck to be able to turn left into the site however this was rejected as it would have had an adverse pedestrian effect by increasing the length pedestrians would walk across.

7.7.4 The exact travel modes for Tirau Primary school are not confirmed however based on census travel data to education for the Tirau area notes that 51% of students drive to school with 45% using a school bus and the other 4% walking. No students use the public bus service. Given that Tirau Primary School has a roll of up to 130 students, this would result in only five students walking to the site. Of these, some would likely use the access via Goodwin Street that avoids the need for walking along SH1.

7.7.5 During the peak hours for pick-up/drop off, the site is expected to generate 80-90 vehicles. This is approximately one vehicle every 40-45 seconds which is not considered to be excessive and provides time and space for pedestrians to walk across the site. There is good visibility from both approaches to the site and similarly there is no signage or fencing that would impede vehicles exiting the site from being able to observe and give-way to any oncoming pedestrians.

7.7.6 To further enhance pedestrian safety, it is recommended that a small speed hump is located across the access approximately 0.5m inside the site boundary to ensure that vehicles exiting the site do so at a slow speed. This speed hump can be a bolt-on design which is common for use on driveways.

7.7.7 With the above recommendation in place, the pedestrian access arrangements are considered to be appropriate and the effect on non-site related pedestrians is sufficiently mitigated.

7.8 BP Vehicle Crossing

7.8.1 Further analysis has been undertaken of the potential for queuing interactions within the median between the site and BP. There is approximately 20m separation between these accesses which is sufficient for three vehicles to queue before potentially extending back into the through lane.

7.8.2 If a vehicle is waiting to turn into the site, there is sufficient space behind it in the median for the vehicle entering BP to also turn into. This is shown in Figure 18 below. Similarly, if a vehicle is waiting to turn into BP, there is also sufficient median space to allow a vehicle to turn right into the site as shown in Figure 19.

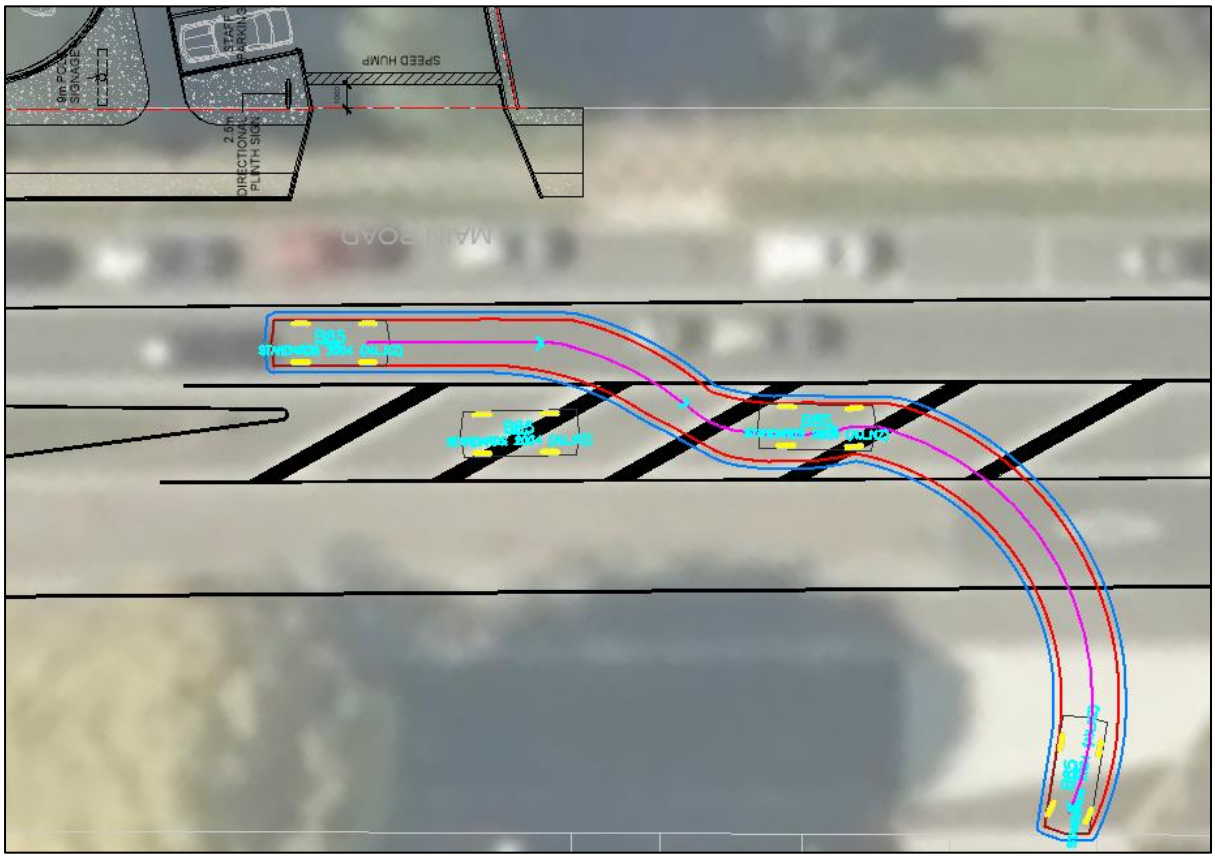

Figure 18: Vehicle Waiting to Turn Into Site with Tracking for Vehicle Turning Right to BP

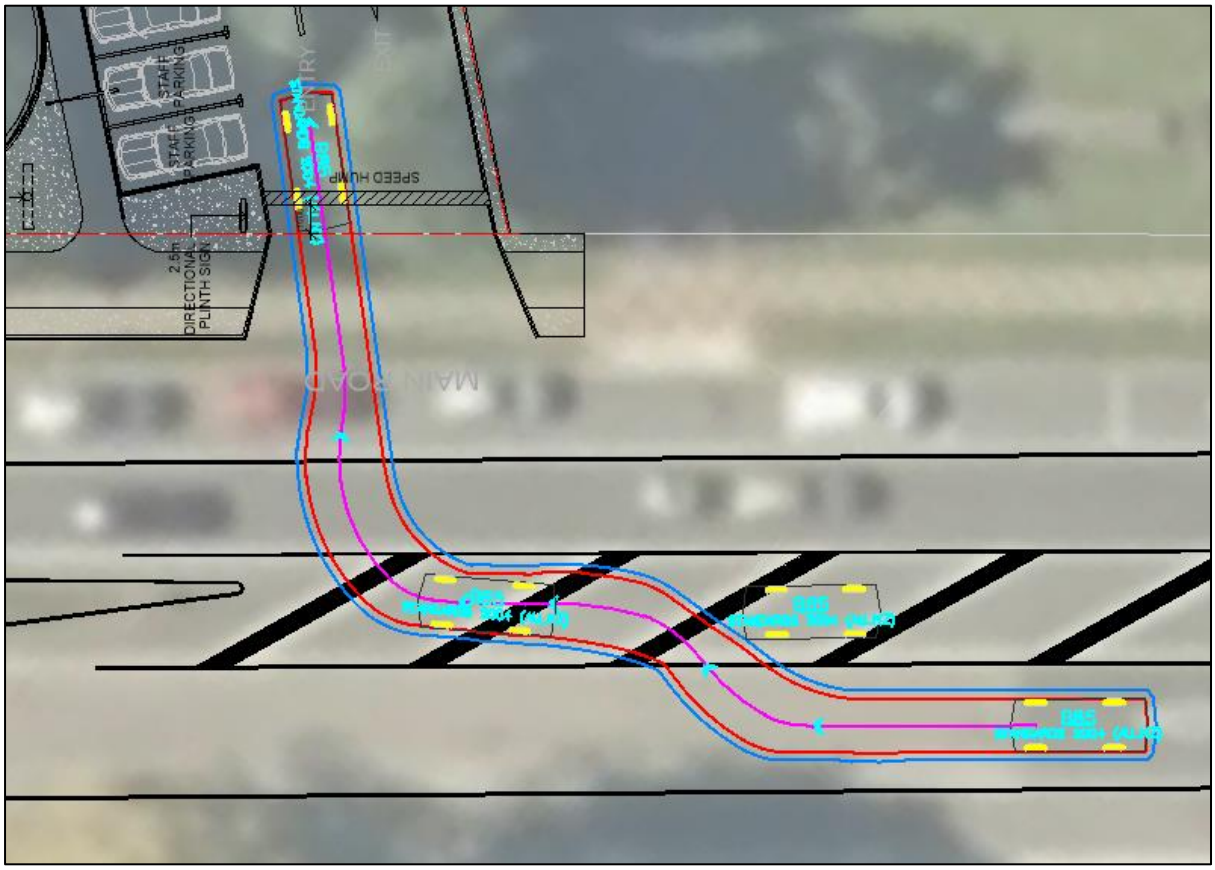

Figure 19: Vehicle Waiting to Turn into BP With tracking for Vehicle Turning Right into Site

7.8.3 From the modelling undertaken in the vicinity of the site, analysis has been undertaken for each one-minute time interval within each scenario to identify the number of occasions when at least three vehicles are within the median space, either queuing for the site, BP or a combination of both. There were no modelled instances where at least three vehicles were queued simultaneously. This is expected given the relatively low delays for right turning vehicles.

7.8.4 In the very rare event that there are multiple vehicles waiting to turn right, the median would not be available for right turns into the other driveway. However, in this situation, an arriving vehicle would have sufficient visibility that the median is full and be able to make an appropriate decision to not turn right. It is reiterated that this is an extremely rare event and is unlikely to occur.

7.8.5 Through consultation, NZTA asked for additional information in relation to whether queuing in the median would affect sight distance. The concern was that vehicles turning right either

out of the site or BP would have restricted visibility of vehicles in the far lane as illustrated by NZTA in Figure 20 below.

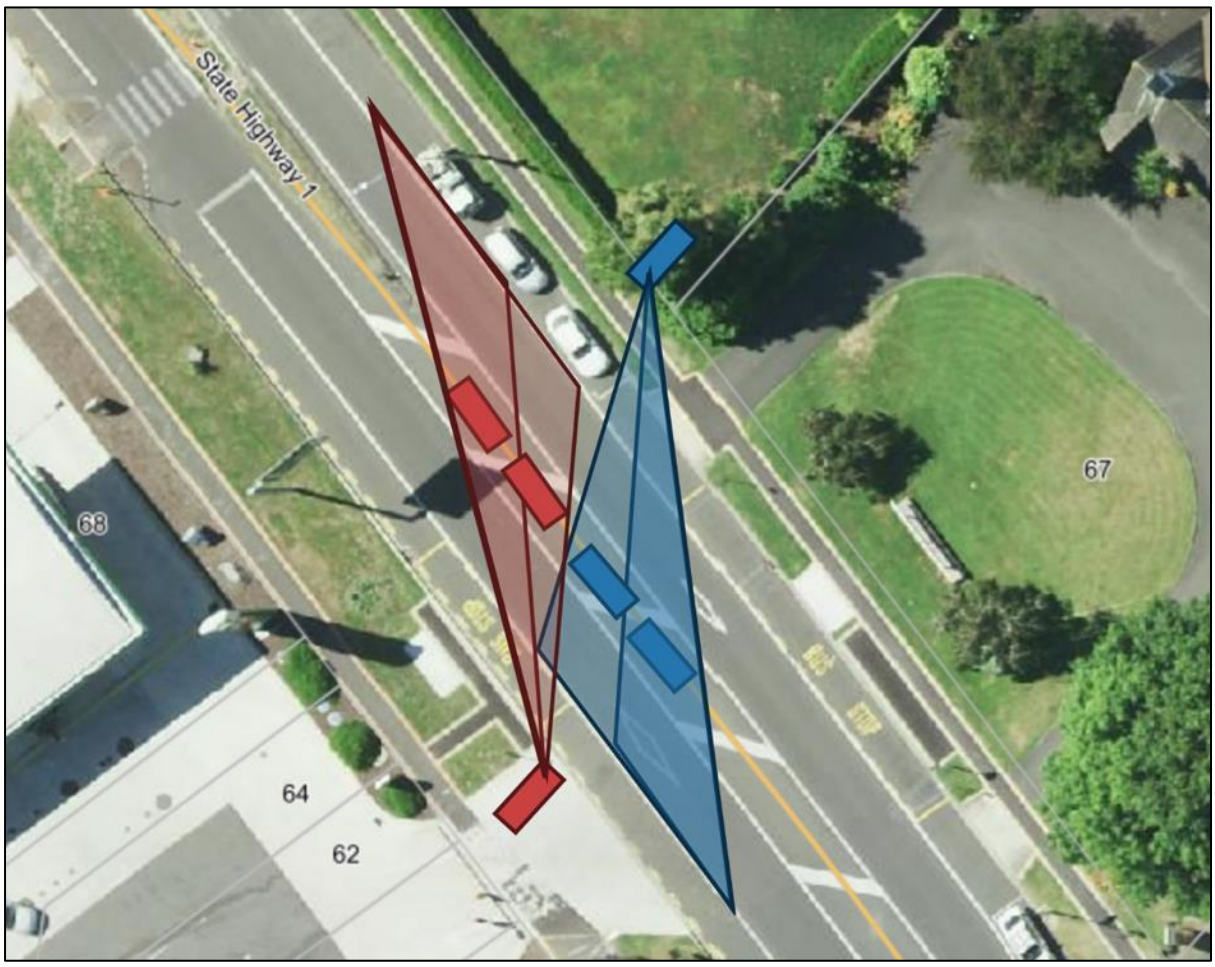

Figure 20: NZTA Median Visibility Restriction Figure

7.8.6 In the scenario where there is a queue waiting to turn right into BP and a vehicle is waiting to turn right out of the site (or vice versa), vehicles will still be able to see beyond the front of the queue for any oncoming vehicles. This is illustrated in Figure 21 which shows the visibility splays to an extent of 150m from the site and from BP. This figure shows that the presence of vehicles within the median does not affect the longer visibility outlook for exiting vehicles.

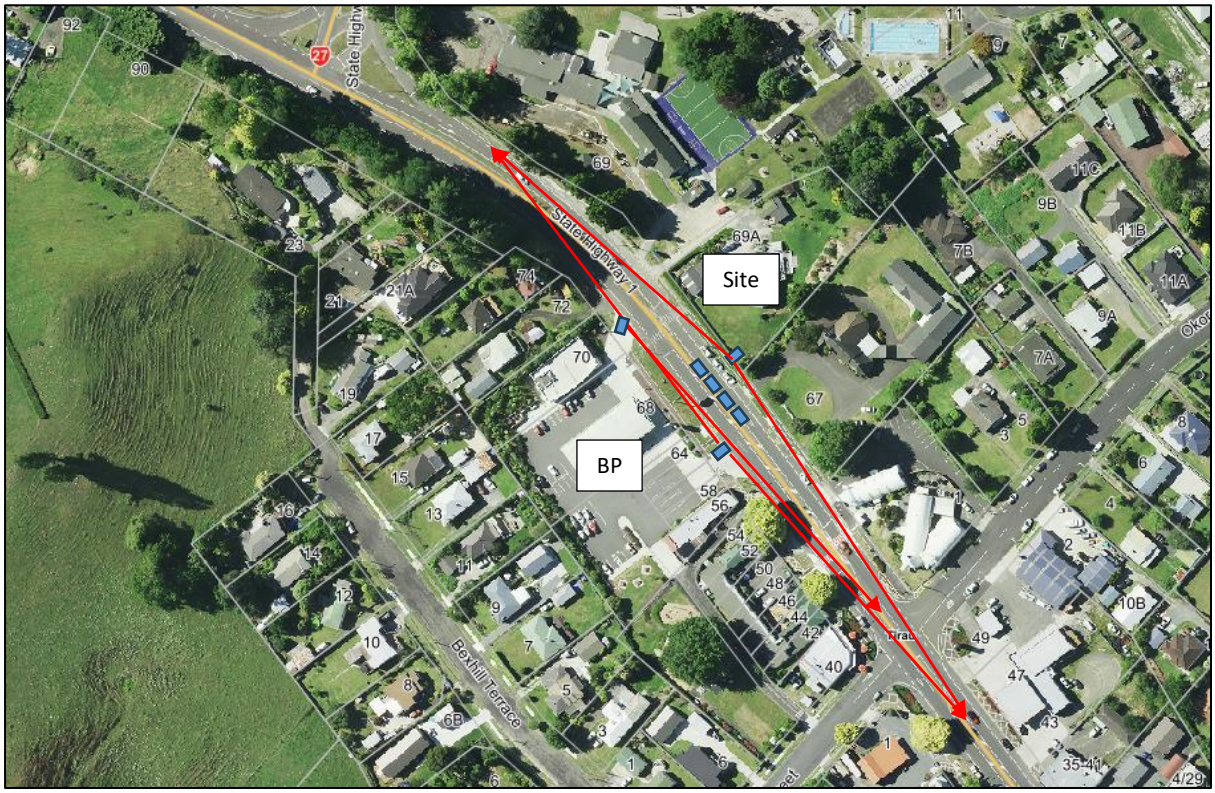

Figure 21: Visibility Splays

7.8.7 The above splays show that there is over 150m visibility in either direction hence drivers would still have sufficient visibility of approaching vehicles.

7.8.8 It is likely that even with vehicles in the median that exiting drivers would still be able through, over or between other vehicles. In the worst case where visibility is impeded by vehicles in the median as illustrated by NZTA in Figure 20 above, the length of road blocked with impaired is less than 30m. For vehicles travelling at 50km/h, this equates to a travel time of 2-3 seconds. Exiting drivers would take more than 3 seconds from when they are on approach to road to cross over to the opposing lane. From the survey undertaken, it would typically take 4 seconds for a vehicle to exit the BP site before joining the traffic stream which does not include time taken before and on the vehicle crossing.

7.8.9 It is therefore assessed that vehicle queuing within the median would not create a significant visual impediment to vehicles exiting from the site or BP.

7.9 Summary

7.9.1 Overall, the proposed access provision is fully compliant against the District Plan and appropriate for the proposed fast-food restaurants with drive-through facilities.

8 Safety Effects

8.1 Pedestrian Safety

8.1.1 Consideration has been given to pedestrian safety both on site and on Main Road. On site, there are footpaths across the car park linking to the footway on Main Road. These on-site paths include zebra style crossings to prioritise pedestrian access to the two facilities and across the car park. This ensures that pedestrians have route available within the site from the road to the entrance to each restaurant.

8.1.2 In terms of pedestrian safety at the vehicle crossing, traffic management conditions are proposed to govern the direction of entry for delivery vehicles so that the width of the crossing can be kept an operational minimum. Deliveries will also occur out of hours so that only light vehicles should be accessing site during normal pedestrian activity periods. Main Road is level and straight, with minimal berm planting. The on-site landscaping adjacent to the vehicle crossing will also be kept to low level to ensure good intervisibility between drivers and pedestrians, particularly small children. It is also noted that pedestrians have right of way at vehicle crossings.

8.1.3 The vehicle crossings will also be designed so that the footpath on Main Road remains flush, level and constructed using the same material as the rest of the footpath. This will visually remind drivers that pedestrians have right-of-way across the driveway.

8.1.4 Particular consideration has been given to potential interactions with school children during peak drop off and pick up periods. As assessed earlier, the peak hour traffic movements from the site are assessed to be up to 188vph. During school pick-up/drop-off times, demand is expected to be notably lower as these are not peak times for customers to the site as Burger King ins unlikely to attract high customer numbers in the morning peak and similarly, Starbucks is expected to be less popular in the afternoon peak. However, the 188vph demand has been assessed for pedestrian safety. Tirau Primary school offers education to Years 1 – 6 children i.e. 5 – 11 year olds, with the current school roll being 120-130 students. Typically, at this age, children are accompanied when they walk to school, however, it is acknowledged that this may be ‘hands off’ as children get older and seek more independence. Based on the census data for Tirau, it is calculated that five students would walk to school. A Poisson distribution assessment shows that the likelihood of a child wishing to cross the crossing at the same time as a car is less than 0.1%.

8.1.5 NZTA also sought additional information regarding the potential for pedestrians to cross SH1 to the site from BP. It is unlikely that there would be any notable demand for people to park at BP to cross into the site. BP also has food and coffee offerings within its site and therefore, people are more likely to use this store rather than specifically cross the road. From the assessment in section 6 of this report, traffic demands are such that people can turn right into or out of the site without significant delay and therefore people are less to park within BP to avoid having to turn right.

8.1.6 There is also a pedestrian crossing within 50m south of the BP that can serve as a crossing location if there is demand for people to cross the road. A pedestrian crossing also used to be located just north of the site however this was relocated to provide more direct pedestrian access to the information site which is a key destination in Tirau while still catering for people walking to school.

8.1.7 Overall, it is assessed that the site layout is appropriate to support pedestrian safety and that it is unlikely that there would be any significant effect on pedestrian safety as a result of the proposals. As noted previously, it is recommended to add a speed hump inside the site boundary to ensure that vehicles exit the site at slow speed.

8.2 Vehicle Safety

8.2.1 The key matters in relation to vehicle safety relate to the ability to:

- Turn right in safely;
- Turn right out safely; and
- No impact on the BP crossing opposite.

8.2.2 The vehicle swept path assessment and consideration of the BP crossing in section 7.8 have demonstrated that these manoeuvres can occur safely during normal operations. It is acknowledged that during peak holiday season, the ability to turn right in or out may be constrained, however under these conditions, it is likely that people will turn left out and U-turn at the SH5 roundabout south of Tirau or forgo a visit as the right turn in becomes too difficult. In this way, the potential effects become self-regulating.

9 Parking

9.1 Car Parking

9.1.1 The proposal comprises 28 parking spaces of which two are accessible parking spaces and two are designated to staff only. Figure 22 below shows the two car parks that will be allocated for staff use.

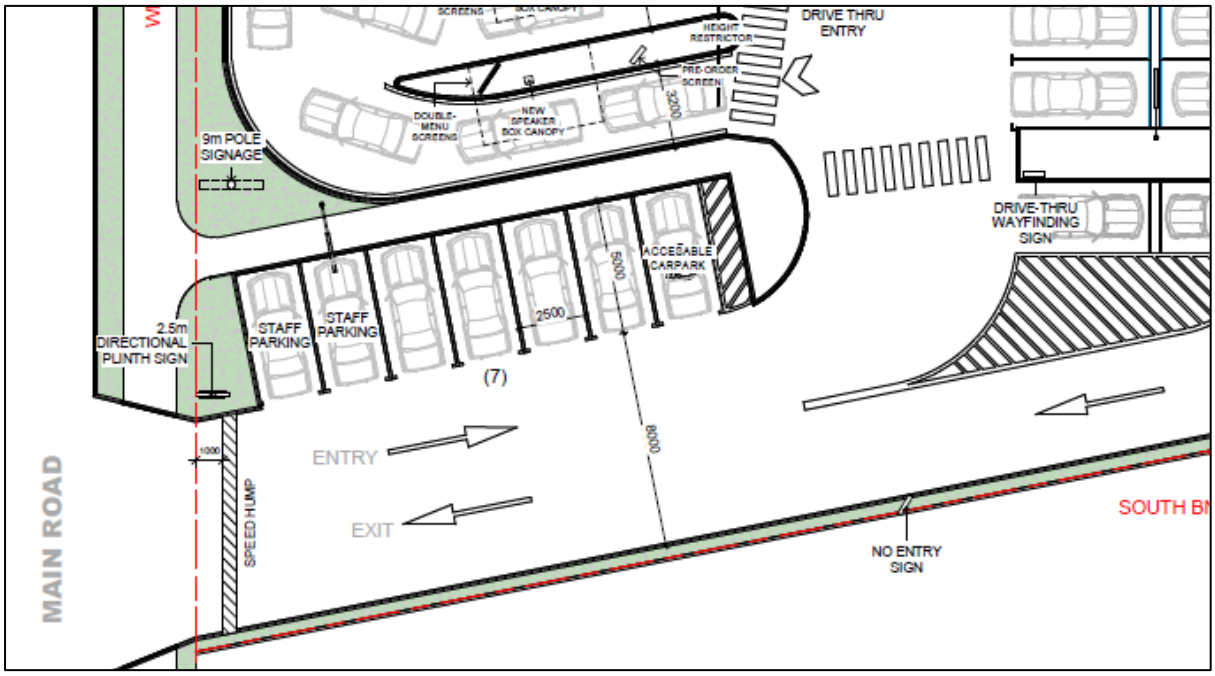

Figure 22: Staff Car Parking Allocation

9.1.2 Parking demands were also included as part of the surveys of the existing Burger King and Starbucks stores. For Burger King, the peak parking demand was 13 spaces during the lunch time peak and 15 during the evening peak. For Starbucks, the breakfast peak parking demand was observed to be six vehicles with a lunchtime peak of nine vehicles. Combining the peaks of the two stores gives a total of 24 vehicles. Similar to the approach for assessing traffic generation, this is conservative as it does not consider the fact that the peaks of the two stores do not coincide. The proposed 28 parking spaces exceed the combined peak parking demand and are therefore able to accommodate the anticipated parking demands of both stores.

9.1.3 Table 1 – *Parking Requirements* of the District Plan specifies restaurant activities to provide one parking space per 15sqm of restaurant GFA. The total GFA of both drive through restaurants is 407sqm which equates to a requirement of at least 27 parking spaces. The proposal comprising of 28 parking spaces satisfies this rule.

9.1.4 Figure 1 – *Parking Dimensions* of the District Plan specifies the dimensional requirements for all parking spaces. For a 90-degree parking space with a stall width of 2.6m, the District Plan specifies a parking space requires a stall depth of 4.91m and manoeuvring space of 7.3m, totalling to a depth of 12.2m. The proposed 21 parking spaces within the site which are 2.6m wide, 5m long, and have 7.5m of manoeuvring space which satisfies this rule. The District Plan does not have any parking dimensions specifically for 2.5m wide parking spaces. The remaining seven spaces adjacent to the site access to Main Road which are 2.5m wide, 5.0m long, and have 8.0m of manoeuvring space do not satisfy this rule. Vehicle tracking of the non-compliant 2.5m parking spaces is provided in Figure 23 and Figure 24 below where the red lines represent the body of the vehicle, the blue lines are a 0.3m buffer to ensure that there is sufficient clearance between the car and any adjacent walls/fences/vehicles etc.

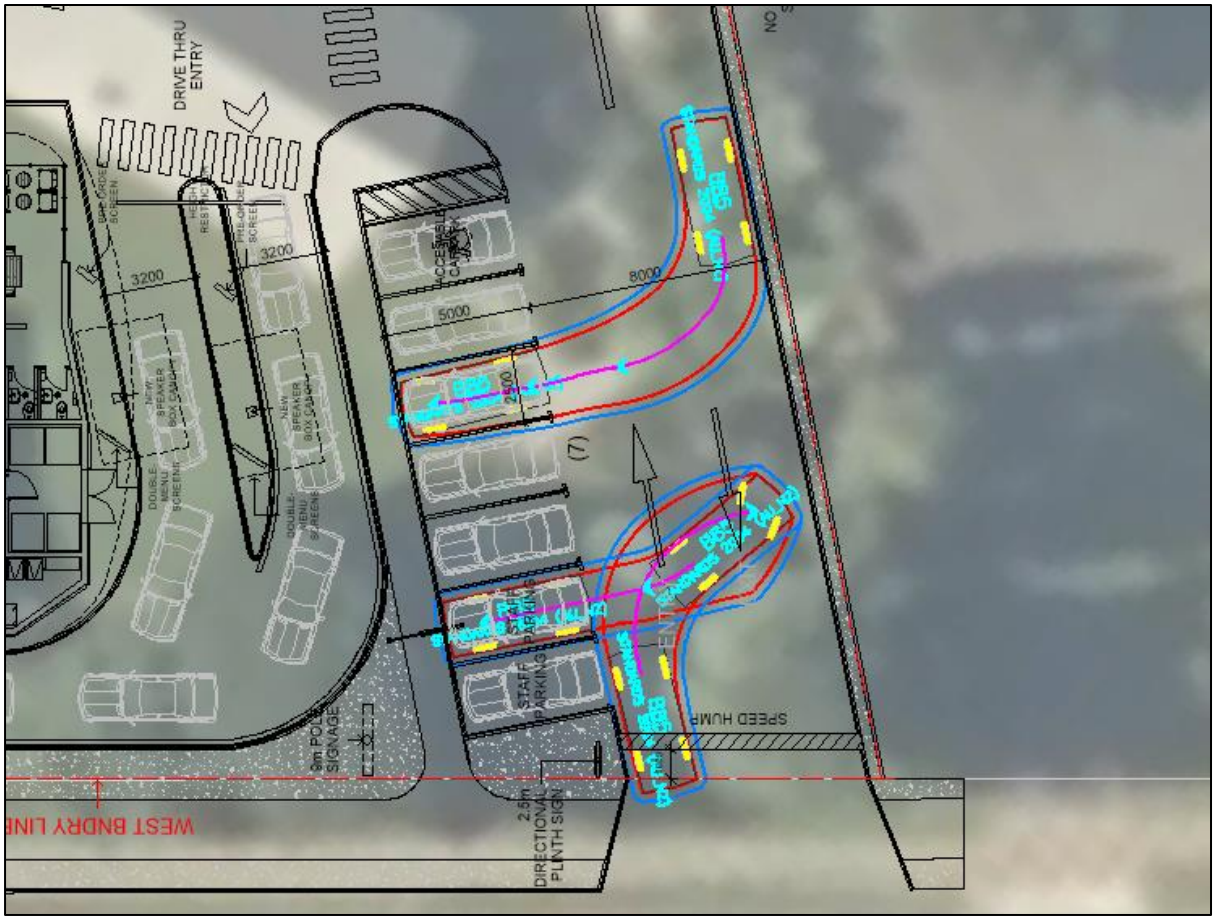

Figure 23: 2.5m Wide B85 Entry Tracking

Figure 24: 2.5m Wide B85 Exit Tracking

9.1.5 The tracking assessment undertaken demonstrates that a B85 vehicle can enter and exit a 2.5m wide parking space in an efficient and safe manner while maintaining at least a 0.3m gap to any vehicles. As such, a stall width shortfall of 0.1m is considered to be negligible.

9.1.6 Consideration was given as to which spaces should be allocated to staff. As discussed in section 7.6, a preference from NZTA was for the spaces closet to SH1 to be allocated to staff to reduce potential for conflict between vehicles parking/unparking in these spaces and vehicles entering/exiting the site. Based on this feedback, the two staff car parking spaces have been located to be the first two spaces within the site.

9.2 Accessible Spaces

9.2.1 The New Zealand Standard for Design for Access and Mobility – *Building and Associated Facilities* (NZS4121) specifies no less than two accessible parking spaces for developments which provide between 21 and 50 parking spaces. The proposal provides two accessible parking spaces, which satisfies the rule.

9.3 Loading and Servicing

9.3.1 The proposed development is within a residential zone and does not fall under the zonings stated within Section 11.3.2(a) of the District Plan which relate to loading space provision. As such, the proposed development is not required to provide a formal loading space. The proposal does not provide a loading space however delivery vehicles are able to stop temporarily within the parking area between the two buildings for loading/unloading.

9.3.2 Deliveries would only occur outside of operating hours to ensure that the car parking area is empty and therefore creating sufficient space for a delivery truck to turn around within the site and exit in a forward's direction. This also ensures that loading vehicles would not visit the site during school pick-up and drop-off times. This area will also be fully mountable to that tracks are able to circulate efficiently. The frequency of delivery vehicles is expected to be two trucks visiting the site per week. Forklifts or other assisting vehicle would not be required for loading/unloading with drivers or other staff able to use hand trucks if required for heavier loads.

9.3.3 It is proposed for delivery vehicles to turn right into the site. The delivery vehicles servicing the site are expected to turn right into and out of the site which reduces the overall width required. A tracking assessment has been undertaken to determine whether a 19.45m semi-trailer can safely and efficiently manoeuvre within the site. This is shown in Figure 25 below. The red lines on the figures show the outline of the vehicle body and the blue lines are a 0.5m buffer.

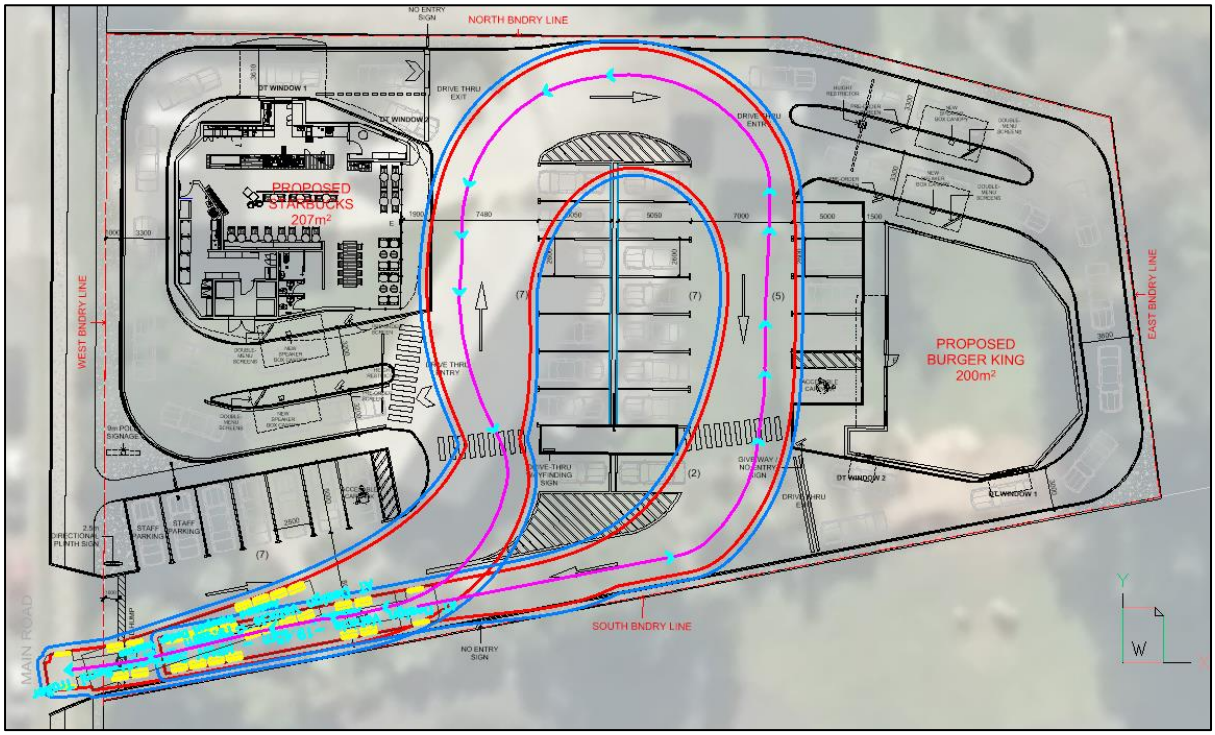

Figure 25: 19.45m Semi-Trailer Through the Site

9.3.4 The tracking assessment demonstrates that a 19.45m semi-trailer can move through the site in an efficient manner while maintaining at least a 0.5m gap to any buildings. No reverse manoeuvres are required, and vehicles can enter and exit the public road in a forward's direction.

9.3.5 Deliveries are proposed to be undertaken out of hours when the site will be vacant. As such, there is no reason why the parking areas cannot be used for HCV manoeuvring. This can be governed by a consent condition. For the avoidance of doubt, delivery and/or refuse vehicles which service Burger King also service Starbucks by the same vehicle.

9.3.6 Refuse collection will be undertaken by a private contractor. Refuse will be stored within each respective store rather than being a dedicated outdoor facility which has been taken into account as part of the building design. Refuse collection will typically occur outside of peak operational hours with up to four trucks visiting the site per week. It should be noted that unlike the delivery vehicles, refuse collection will be undertaken via a smaller truck. A tracking assessment has been undertaken to determine whether an 8m truck can safely and efficiently manoeuvre within the site. This is shown in Figure 26 below.

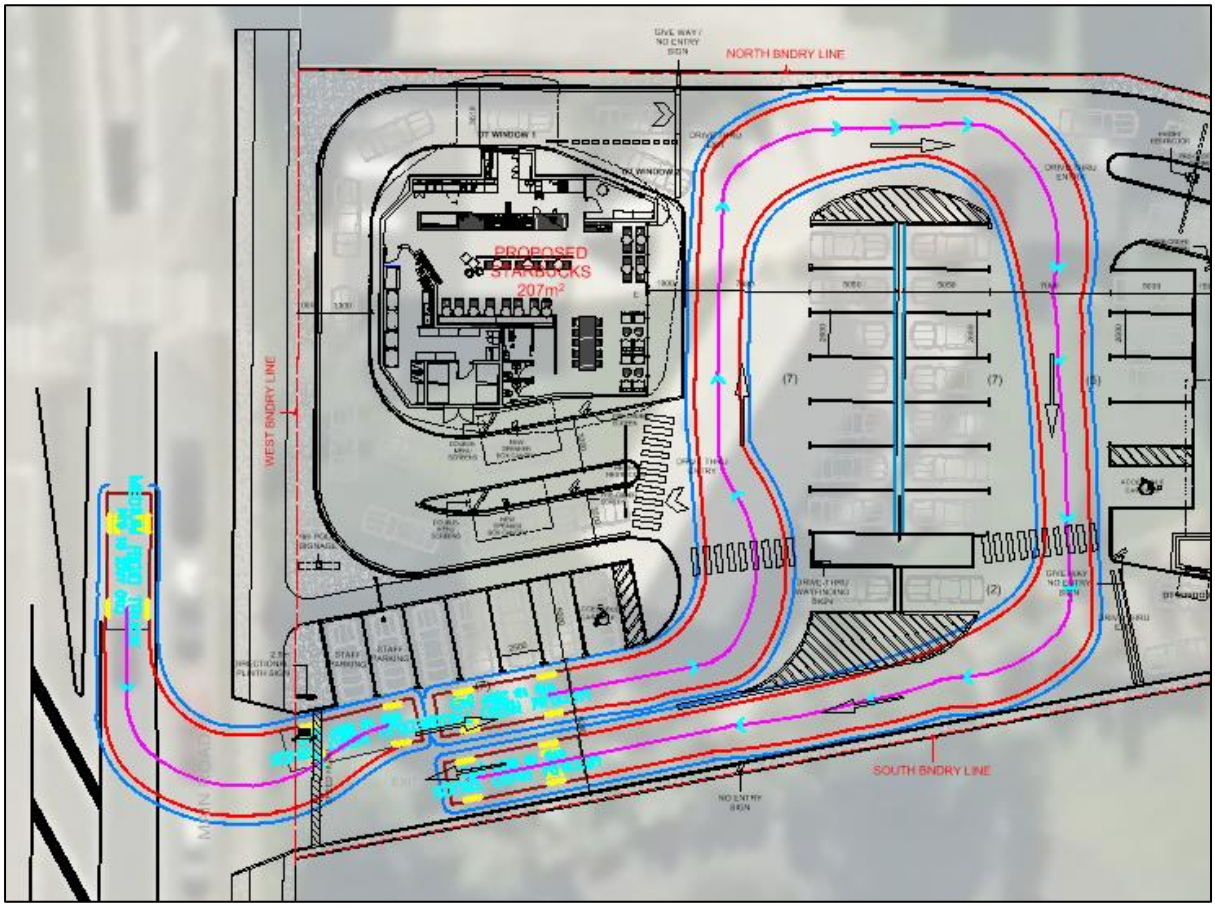

Figure 26: 8m Truck Through the Site

9.3.7 The tracking assessment demonstrates that an 8m truck can move through the site in an efficient manner while maintaining at least a 0.5m gap to any buildings or parking spaces. Unlike delivery vehicles, an 8m refuse truck is able turn left or right into and out of the site. As such no turning restriction or timing conditions are required for refuse trucks.

9.3.8 Through consultation, NZTA suggested that all loading and servicing is undertaken by an 8m rigid truck. However, the truck that is likely to deliver product to the site is also likely to serve a number of sites around the North Island from a central distribution centre. Therefore, restricting truck size does not align with the site operations. The design of the site is to allow for the larger trucks to circulate to ensure that no reverse manoeuvres are required. As noted above, such trucks will visit the site outside of peak times. If the truck arrives and these spaces are occupied, staff within each restaurant would be able to identify and ask for vehicles to be shifted as required. This ensures that truck circulation is maintained and therefore restricting truck size is not necessary.

9.4 On-Road Parking

9.4.1 As noted previously in section 7.4, there are currently five parking spaces across the site frontage on SH1. These will be removed to accommodate the new vehicle crossing along with providing additional visibility from the vehicle crossing when looking west.

9.4.2 During the survey of the area, a maximum of two vehicles were parked in this location at any one time. A review of historical aerial and streetview footage shows some instances of up to three vehicles parked in the area. During the survey, the typical people parking in these spaces were those taking a short rest from driving to stretch their legs.

9.4.3 Therefore, there will be an increase in demand of three parking spaces. Within the site, the parking provision is at least four spaces above the anticipated peak parking demands, noting that this conservatively assumes both stores are operating at peak when in reality the peak parking demands would not coincide. It is therefore possible that people could park within the site if needing to take a rest from driving. The loss of the on-road parking spaces is therefore not expected to exacerbate existing parking demands in Tirau.

9.4.4 Overall, the proposed access provision is assessed as being appropriate for the proposed fast-food restaurants despite the non-compliances in relation to the overall parking provision and the 0.3m manoeuvring space shortfall.

10 Signage

10.1 Overview

10.1.1 A 9m sign is proposed along the road frontage of the site approximately 10m west of the site access along with a small entry sign identifying the entrance. These signs will be similar to signs at other Burger King stores throughout the country with an artistic impression shown in Figure 27 with Figure 28 showing the dimensions of the two signs. NZTA requested an assessment be undertaken of the sign be undertaken in accordance with NZTA signage rules. The TCD3 Document is the relevant standard when assessing signage.

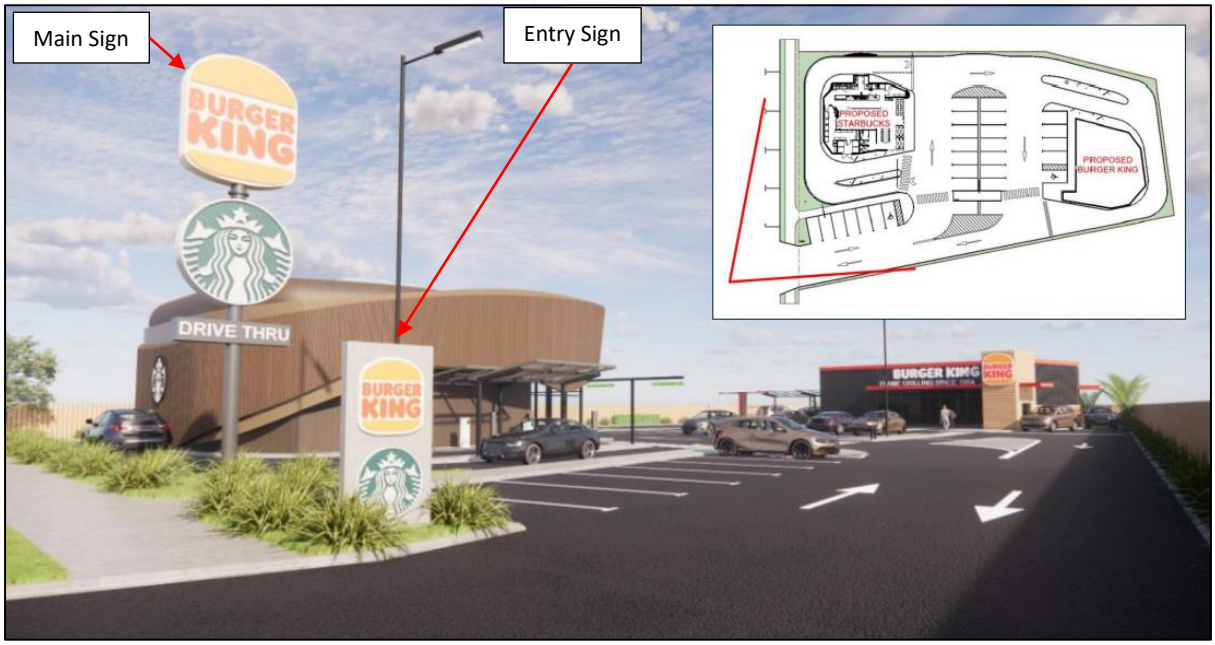

Figure 27: Example Existing Burger King Signage

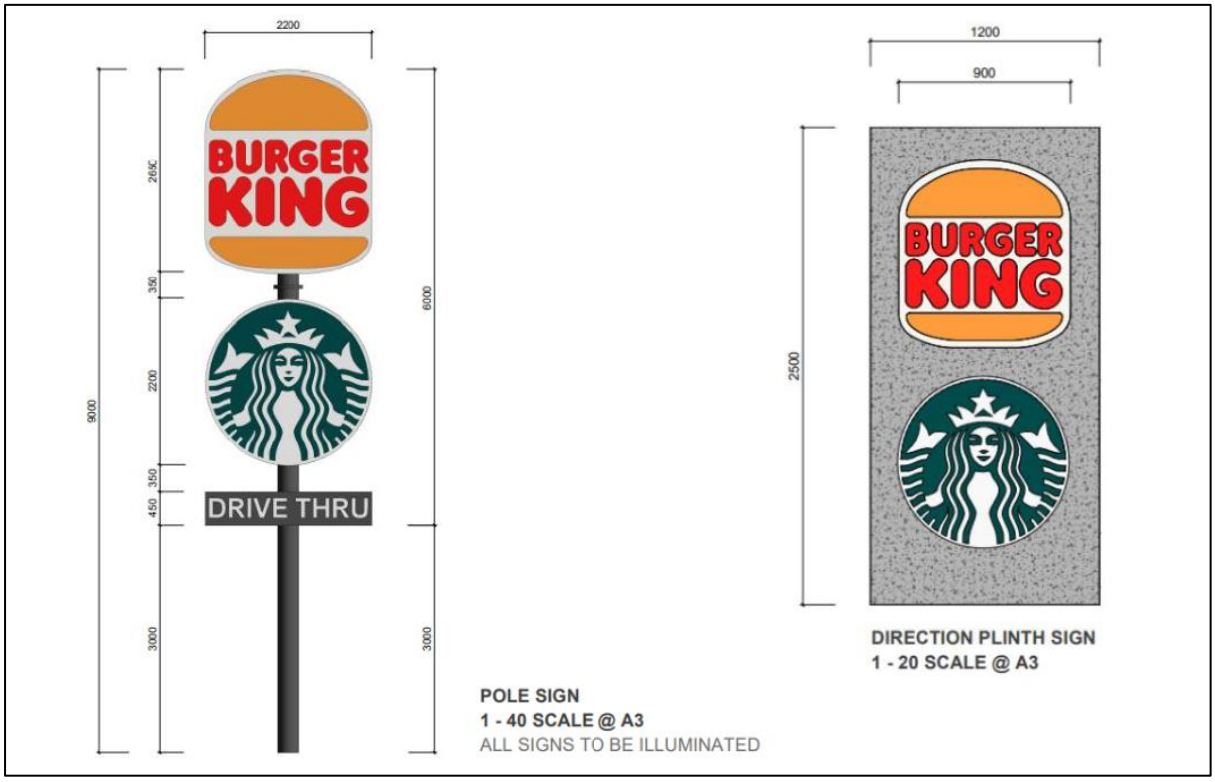

Figure 28: Proposed Signage Dimensions

10.1.2 There are four categories where a signage may affect road safety. These are direct driver distraction, indirect driver distraction, potential to impede visibility and visual clutter. These aspects are assessed in detail below.

10.2 Direct Driver Distraction

10.2.1 Direct driver distraction can be considered as the distraction that occurs when a new object enters the driver's field of vision. As an example, driver experience suggests that an object that suddenly appears after being obscured by another object or bend in the road has the potential to cause a greater distraction than an object that can be seen over a long distance.

10.2.2 Signage, including advertising images, should therefore be located in such a way that they are within a driver's field of view and visible over a long distance in order to minimise their distraction impact. The TCD3 document requires a minimum visibility of 80m for a posted speed limit of 50km/h so that advertising can be seen from a sufficient distance. There is at least 150m of sight distance available from Main Road which complies with TCD3 and reduces the potential to cause driver distraction.

10.3 Indirect Driver Distraction

10.3.1 Indirect driver distraction can be considered as distraction that is associated with drivers taking time to interpret the imagery on the sign. Clear and simple messages with minimal text minimise the amount of indirect driver as drivers are able to quickly understand the message being conveyed. Based on TCD3, the image on the sign should not imitate traffic signs or contain text that is hard to read.

10.3.2 The image would be within the viewshaft for 50km/h so in essence is directly ahead of the driver. In this instance it is reasonably concluded that driver attention may be drawn to these images for longer periods however there is no evidence to suggest (through existing crash analysis records or external reports) that it would have an adverse enough effect to promote crashes or decrease safety. The image would be within the driver's field of view without having to divert their gaze from the road ahead.

10.4 Potential for Signs to Impede Visibility

10.4.1 The proposed signs are within the site and are not located between drivers and other signage. Similarly, the sign locations are not between where drivers would be looking for other vehicles or pedestrians. The location of these signs do not result in any physical obstructions. Therefore, the proposed signs do not impede visibility between drivers and other road users.

10.5 Visual Clutter

10.5.1 The TCD3 includes recommended separation distances to be provided between signs to reduce visual clutter and ensure that drivers are able to interpret one message before being presented by another. There is one existing advertising sign within 50m of the proposed signs which does not satisfy the separation recommended in TCD3 for an 50km/h speed limit. The existing sign in question is for the BP service station opposite the site and does not visually conflict with the proposed signs. The road safety assessment in section 3.5 has not identified any crashes which were caused by signage causing driver distraction.

10.5.2 The two signs proposed within the site are within 50m of each other. However, the function of the main sign is to give approaching motorists notice well in advance of the site of where the site is located. The smaller entry sign is to indicate to motorists where the entry to the site is located. Combining the signs together where the entry sign is located may create the potential for visual impedance while shifting the entry sign away from the access would not align with its function. The signs do not overlap each other and are therefore not assessed as creating visual clutter.

10.5.3 TCD3 also recommends that advertising signs are located at least 100m from intersections in an urban environment. TCD3 states the purpose of the intersection separation is to prevent advertising signs obscuring a traffic sign or detracting from the traffic sign's effectiveness which have potential to result in safety issues due to driver distraction. The proposed signs are at least 100m from adjacent intersections. There is no direct overlap between the proposed signs and other road signs.

10.5.4 The signs are located within the site and do not overlap visually, which provides motorists with sufficient time to interpret the messages together without having to process one message then being presented with a second message that was previously obscured.

10.5.5 The road safety chapter in section 3.5 suggests that there are no discernible existing road safety issues associated with this part of Main Road related to advertising signs. As such, the proposed signs are assessed as being unlikely to have a detrimental effect on road safety.

10.6 TCD3 Assessment

The relevant criteria from the TCD3 document are summarised in Table 6.

Table 6: TCD3 - Relevant Assessment Criteria

Criteria	Compliance	Comment
Placement Considerations		
5.3.1 Field of Vision (Signs to be located within driver's field of vision)	Complies	The proposed signs are all close to the edge of the carriageway and well within the field of vision.
5.3.2 Sight Distances (80m required on 50km/h road)	Complies	There is at least 120m of sight distance to both signs from Main Road.
5.3.3 Visibility Obstruction	Complies	The signs are within the site and will not obstruct the view of vehicles, cyclists or pedestrians. The proposed signs are also sufficiently set back to not be an obstruction.
5.4.1 Lateral Position/Clearance (Signs should be set back at least 3m from the carriageway)	Complies	The existing sign is at least 3m from the carriageway.
5.4.2 Sign Height (Minimum 2.5m vertical clearance recommended))	N/A	The existing sign is not within the road reserve or above a footpath.
5.4.3 Longitudinal Advertising Sign Spacing (50m minimum recommended spacing for 50km/h speed limit)	Non-compliance.	There is one advertising sign within 50m of the retained sign. See section 10.5 of this report.
5.5 Location in Relation Other Road Features (Signs should not be within 100m of an urban intersection)	Complies	The proposed signage is at least from adjacent intersections.
5.6 Sign Supports (Sign supports should not be located where they may be hit or within path of pedestrians)	Complies	Sign supports are not located in a position where they are likely to be hit by an errant driver or obstruct pedestrians.
5.7 Number of Signs (Sign effectiveness may be compromised by too many signs)	Complies	Only one main sign is proposed and a smaller entry sign which does not overlap with official signage.
Sign Design		
6.1 Sign Legibility	Complies	Images on the sign are legible given the speed environment of the surrounding roads.
6.2 Sign Message	Complies	Images on the signs display a clear message. Images will not include symbolism that imitates and traffic control devices or give instructions that conflict with any surrounding traffic control devices.
6.3.1 Colour of Advertising Signs and Devices	Complies	Images on the signs do not use colouring that may be confused or conflict with surrounding traffic control devices.
6.3.2 Illumination and Glare from Advertising	N/A	The proposed signs are internally illuminated.
6.3.3 Animated, Flashing and Variable Message Signs	N/A	The proposed signs are static.
6.3.4 Inappropriate Advertising Sign Styles	Complies	The existing sign does not portray any inappropriate images that imitate traffic control devices, give the appearance of motion or contain any flashing or animation.
6.4.1 Letter Size (Minimum 250mm letter height for main message, 175mm for property name, 125mm for secondary message)	Complies	Images on the sign display suitably sized lettering.
6.4.2 Letter Style	Complies	Images on the sign display lettering using a suitable font that is easily readable.

6.4.3 Letter Hierarchy	Complies	Appropriate hierarchy is used on the sign.
6.4.4 Sign Background (Message on sign should not exceed more than 40% of sign area)	Complies	The message takes up less than 40% of the existing sign area.
6.4.5 Contrast between Message and Background	Complies	The background of the image is clear and provides a contrast to the message on the sign.

10.6.1 The assessment against the rules in TCD3 has identified one non-compliance. The non-compliance relates to the sign being within 50m of another advertising sign.

10.6.2 The proposed sign locations within the site does not result in visual clutter as it is past official signs. There is also no direct visual conflict between the sign and other road signs. The road safety assessment in section 3.5 has not identified any crashes which were caused by signage causing driver distraction. The proposed signs are not expected to result in any adverse material effects on the surrounding road network.

11 Consultation

11.1.1 Consultation was undertaken with SWDC to discuss the proposal. The initial feedback provided highlighted concerns in relation to vehicle safety and turning manoeuvres into and out of site, how traffic entering and leaving site will interact with other vehicle crossing operations, and pedestrian safety, particularly in relation to the school. These matters have been assessed in this report.

11.1.2 One of the comments discussed with SWDC related to through vehicle efficiency along Main Road. It is noted that existing congestion is predominantly caused by vehicles parking and unparking from the on-street parking spaces provided along Main Road. Many of the commercial activities along Main Road do not include off-street parking. In contrast, the proposed facility includes off-street parking in excess of District Plan requirements and also more than observed demands from similar sites and is therefore unlikely to contribute to the existing cause of congestion along Main Road.

11.1.3 Consultation has also been undertaken with NZTA. Various matters were raised and additional information requested which has been included within this report. Of note, this has resulted in the proposed removal of parking spaces on SH1 along the frontage of the site and reallocation of staff parking within the site.

12 Planning Framework

12.1 Objectives and Policies

12.1.1 Section 7 of the District Plan includes infrastructure related objectives and policies, including those related to transportation. The relevant objectives and policies are summarised in Table 7 below along with commentary stating whether the proposed fast-food restaurant with drive-through facilities align with the objective or policy.

Table 7: District Plan Objectives and Policies Assessment

Ref	Objective	Comment	Alignment
7.2.1	To ensure that an integrated, efficient, safe and sustainable transportation network is maintained and enhanced to support the social and economic wellbeing of people and communities in the District including provision for active transport and physical activity options.	The site is located within walking distance of the Town Centre and nearby residential dwellings. Proximate to the site is a bus stop which reduces reliance on private vehicle modes when travelling between towns.	Aligns
7.2.2	To ensure safe and efficient land use, subdivision and development, well-integrated with the functions of different roads, and which is designed to provide for appropriate alternative transport modes (particularly walking and cycling).	The site is within walking distance of a commercial area with an off-road path that reduces reliance on private vehicle modes.	Aligns
Ref	**Policy**	**Comment**	**Alignment**
7.3.2	Establish networks of parks and walkways along the urban streams to provide linkage between neighbourhoods.	There are no parks or walkways proximate to the site.	N/A
7.3.11	Development should be located, designed and managed to minimise the need to travel, minimise conflict to and across arterial routes, and provide appropriate access.	The Tirau Town Centre is located within 200m radius of the site. Only one access is proposed from the site to SH1.	Aligns
7.3.12	Protect the safety and efficiency of the land transport network from the adverse effects of inappropriate noise-sensitive activities located close to State Highways and designated rail corridors.	The proposed development is not expected to generate inappropriate noise levels.	Alignment expected
7.3.13	Ensure vehicle access onto the transportation network does not adversely affect to a more than minor extent the safety, efficiency operation and maintenance of these roads and other road users.	As outlined in Section 6, the surrounding road network is considered to readily accommodate the traffic associated with the site.	Aligns

12.1.2 The proposed development aligns with the objectives and policies.

12.2 Compliance Assessment

12.2.1 The proposed development has been assessed against the relevant transportation provisions set out in Section 11 of the District Plan in Table 8 below.

Table 8: District Plan Compliance

Rule	Requirement	Proposed	Compliance
11.3.1 Provision of Vehicle Parking			
a)	Restaurants, bars and cafes – one space per 15sqm GFA of customer area	Requirement of 27 parking spaces. Proposal provides 28 parking spaces.	Complies
b)	All parking spaces shall be formed and sealed or otherwise maintained to the satisfaction of Council so as to avoid creating a dust nuisance or permit vehicles to carry material such as mud, stone, chip or gravel onto the public road or footpath	Parking spaces are sealed and formed.	Complies
c)	The dimensions and layout of parking spaces shall be in accordance with Figure 1, and the spaces shall be marked to delineate the parking space	Some parking spaces do not comply with stall width dimensions. See Section 9 of this report.	Non-compliance
d)	Every parking space shall be provided with the necessary manoeuvring space and access from and to the road, without requiring another vehicle to be moved	All parking spaces are able to access the public road without requiring another vehicle to be moved.	Complies
e)	All required parking and manoeuvring space shall be kept clear to ensure it is able to be used for its intended purpose	Parking and manoeuvring space used for its intended purpose.	Complies
f)	Parking spaces shall have a gradient of no more than 1 in 8 in any one direction	No parking spaces exceed a gradient more than 1 in 8 (12.5%).	Complies
g)	Where the assessment of the number of parking spaces results in a fractional space being required, any fraction less than half shall be disregarded. Fractions of one half or greater shall be considered as a requirement for one more parking space	Rounding undertaken accordingly.	Complies
h)	Where activity on the site involves more than one category of land use, and those uses are unlikely to occur at the same time, parking will be calculated in relation to the activity having the greatest requirement. For a multi-purpose site where more than one facility may be used at the same time, the total parking requirements for each facility will have to be provided	Parking requirements of both drive through restaurants are included.	Complies
i)	All on-site parking spaces and manoeuvring areas shall be located on the site containing the activity that they are intended to serve	Parking spaces and manoeuvring areas are located on-site.	Complies
11.3.2 Provision of Loading Spaces			
a)	Where a change of use occurs that would increase the amount of goods handling by an activity, or where the floor area of a building is increased, an off-street loading space shall be provided in the following circumstances: i) on every site in the Industrial Zone, the Tokoroa Business Zone, and the Putāruru Business Zone, except those sites where loading can be undertaken from an adjoining formed service lane, and except where the landowner is able to demonstrate	Site not in these zones. Loading space not proposed.	N/A

	that there are sufficient loading spaces on-site for the demand generated by any change of use or increase in floor area. ii) on every site in the Town Centre zones, except those sites where loading can be undertaken from an adjoining formed service lane.		
b)	Loading spaces shall have at least a minimum width of 4 metres and a minimum depth of 8.5 metres	Loading space not proposed.	N/A
c)	All loading spaces shall be accessible at all times and not used for other purposes	Loading space not proposed.	N/A
d)	Loading spaces are not required in rural areas, however all stock loading races and other loading/unloading facilities shall be located to avoid any vehicles undertaking loading or unloading on a public road.	Loading space not proposed.	N/A
11.3.3 Vehicle Manoeuvring			
a)	On-site vehicle manoeuvring (such that reversing onto a road is avoided) is required to be provided for every parking and loading space provided on-site, in the following circumstances: Where a site bounds a state highway	Sufficient manoeuvring area is provided for vehicles to enter and exit the public road in a forwards direction.	Complies
b)	Where a site bounds a road with a posted speed limit of 70km per hour or greater	Already triggered by 11.3.3(a).	N/A
c)	Where any vehicle entrance serves more than 3 required parking and/or loading spaces; or	Already triggered by 11.3.3(a).	N/A
d)	Where a site is a rear site with vehicle access provided by an accessway in excess of 30 metres in length.	Already triggered by 11.3.3(a).	N/A
11.3.4 Access			
a)	A formed vehicle crossing shall be provided to each site in accordance with Table 2, including on sites where there is an existing crossing but where the character, intensity or scale of the land use activity increases	Proposed 8m wide commercial vehicle crossing satisfies the requirement.	Complies
b)	Accessway gradients shall not exceed 1 in 6	Site is relatively flat and gradients are not expected to exceed 1 in 6.	Compliance expected
c)	Vehicle crossings onto state highways shall comply with Table 3, or comply with NZTA requirements.	Proposed vehicle crossing complies with all standards within Table 3.	Complies

12.2.2 The assessment against the District Plan has identified one non-compliance in relation to the stall width shortfall. The District Plan does not have any parking dimensions specifically for 2.5m wide parking spaces. The proposal provides seven spaces adjacent to the site access to Main Road which have a stall width of 2.5m. The tracking assessment undertaken demonstrates that a B85 vehicle can enter and exit these parking spaces in an efficient and safe manner while maintaining at least a 0.3m gap to any vehicles. As such, a stall width shortfall of 0.1m is considered to be negligible.

13 Conclusion

13.1.1 It is proposed to develop the site at 69a Main Road in Tirau into a Starbucks and Burger King drive-through. The two restaurants have a combined floor area of 407sqm and their drive through facilities operate independently of each other.

13.1.2 Access to the site will be provided via a new vehicle crossing to Main Road which is fully compliant and appropriate for the proposal. The proposed access is located as far south as possible to maximise separation to the school immediately to the north. School students are expected to be accompanied by caregivers and the number of students walking to school is low with alternative routes available that avoid Main Road. No access will be provided via the school as currently occurs for the on-site dwellings.

13.1.3 A separate access for pedestrians is also proposed with internal marked pedestrian crossings to indicate that pedestrians have right-of-way. There are no visual impediments near the access to ensure that exiting vehicles are able to observe and give-way to any pedestrians walking along the road as required. It is proposed for large trucks to only turn right into the site which enables a narrower vehicle crossing width, reducing the crossing length required for pedestrians. Overall, the site supports pedestrian safety.

13.1.4 A total of 28 parking spaces are included on-site which complies with the overall parking provision of one space per 15sqm of GFA.

13.1.5 The on-street parking spaces across the site frontage will be removed to ensure that there is sufficient visibility from the site when looking west. This change was based on feedback from NZTA. The on-site parking provision exceeds anticipated parking demands by more than then demand for use of these parking spaces. This ensures that there is no overall net loss of parking resource.

13.1.6 Based on surveys of similar existing Burger King and Starbucks stores, the Burger King is expected to have a peak hour of 120vph in the evening while the Starbuck has a peak hour of 68vph in the morning. A microsimulation model of the adjacent road network has been created to assess effects of the additional traffic volumes. The microsimulation has enabled detailed assessment of interactions between potential queuing in the area. A number of conservative approaches have been included within the modelling which are summarised as follows:

- Peak hour trip generation for the two stores have been combined despite their peaks being offset from each other.
- Peak hour trip generation has been applied throughout the whole modelled period rather than being profiled.
- All site trips are new to the network with no allowance for pass-by trips.
- No allowance for staged right turns.

13.1.7 Even allowing for the above, the modelling has identified that there is unlikely to be any significant queuing or delays crated as a result of the proposed development.

13.1.8 An assessment of the potential for vehicle interaction between the proposed site access and access to BP on the opposite side of the road was undertaken. The probability of vehicles interacting within the Main Road median is very low. There is sufficient space within the median on rare occasions that opposing vehicles are turning for both vehicles to not overhang into the through lane.

13.1.9 The proposal is unlikely to exacerbate the existing road safety record and includes pedestrian pathways between the site and the front doors of the respective stores. Similarly, the signage proposed at the site frontage is not out of context for a town centre and unlikely to cause undue distraction.

13.1.10 From the assessment, five traffic related conditions are recommended to maintain safety of road users:

- Delivery trucks serving site are only permitted outside of opening hours.
- Delivery trucks must turn right into the site.
- Provide a speed hump across the access 0.5m offset from the property boundary.
- Remove on-street parking along the site frontage.

13.1.11 With the above consent conditions in place, it is concluded that there are no traffic engineering or transport planning reasons to preclude approval of the proposed development.

CKL