HUGHES
TRAFFIC &
TRANSPORTATION

Beachlands South Project
Fast Track Substantive Consent

Integrated Transportation Assessment

Control Page

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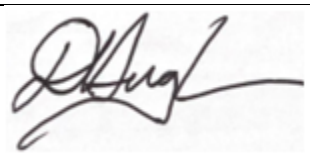
Authors:	Daryl Hughes Director, Hughes Traffic & Transportation  Paarth Rajpal Transportation Engineer, Subconsultant to Hughes Traffic & Transportation
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1. Author Qualifications

My name is Daryl Hughes. I am the owner / Director of Hughes Traffic & Transportation Limited. I have 31 years' experience in the field of traffic and transport engineering. I obtained an honours degree in Civil Engineering from the University of Teesside (1995) and I am a Chartered Member of Engineering New Zealand and the Institution of Civil Engineers (UK).

I have been providing traffic & transport advice regarding Beachlands South Precinct since 2019, including the preparation of the Plan Change ITA, overseeing all traffic modelling and transport design deliverables, providing expert witness evidence through the Council Hearing process, and attending Transport Conferencing sessions through the Council Hearing and subsequent Environment Court appeal processes.

I confirm that I have read the Code of Conduct for expert witnesses contained in the Environment Court of New Zealand Practice Note 2023 and that I have complied with it when preparing this report. Other than when I state I am relying on the advice of another person, this report is within my area of expertise. I have not omitted to consider material facts known to me that might alter or detract from the opinions that I express.

2. Introduction

This report has been prepared in support of a substantive application submitted by Beachlands South Limited Partnership (BSLP) under the Fast-track Approvals Act (FTAA). The Project name is “Beachlands South” and is included in Schedule 2 of the FTAA as a Listed Project with significant regional or national benefits. The Project location or Site is located across approximately 159.58ha of live zoned land and approximately 108.6ha Future Urban zoned land at 110 Jack Lachlan Drive, and 620, 712, 758 and 770 Whitford-Maraetai Road, Beachlands.

In summary, the Project will provide for the development of live zoned land at Beachlands into a comprehensively planned and public transport focussed community to achieve a well-functioning urban environment comprising residential dwellings, a hotel and conference venue, community and commercial activities, protected ecological restoration areas, walking and cycling networks, and community facilities, and enable the potential development of two schools, as well as all associated earthworks and all associated infrastructure including transport facilities, intersection upgrades and roading, telecommunications, power, and water supply, stormwater, and wastewater infrastructure

(including any treatment or storage facilities, drainage, pipes, pump stations, outfalls and discharges). A portion of Future Urban zoned land will be used for wastewater management purposes.

This ITA addresses the following matters:

- An update to the existing transport environment, including the road network, public transport, walking and cycling facilities, and road safety record;
- the PC88 background, including the approved transport staging framework and the relevant outcomes of the hearing decision;
- committed and emerging changes to the public transport and ferry environment;
- the proposed development, access strategy, and active mode/public transport integration;
- traffic generation, internalisation, trip rate assumptions, trip distribution and modelled traffic effects;
- the relevant statutory and policy framework, including the Auckland Unitary Plan, Beachlands South Precinct provisions, Regional Public Transport Plan, Regional Land Transport Plan, Transport Emissions Reduction Pathway and Auckland Transport Design Manual;
- the compliance with relevant transport standards, including parking, loading, cycle parking, access, manoeuvring, and heavy vehicle access;
- construction traffic effects and management measures; and
- a Travel Management Plan framework for employment generating activities within the development.

By way of summary, it is concluded that the development enabled by the Project can be established such that there will be acceptable effects to the function, capacity and safety of the surrounding transportation network that can be appropriately managed.

3. Background

The Beachlands South area was the subject of a private plan change process which included transport modelling, expert conferencing, independent peer review and hearing process. Plan Change 88 (PC88) rezoned approximately 307ha of land south of the existing Beachlands township from Rural – Countryside Living to a combination of live residential, business and open space zones, and established a new Beachlands South Precinct and a Future Urban Zone over the southern portion of the land. **Figure 3-1** shows the development in its Auckland and local context.

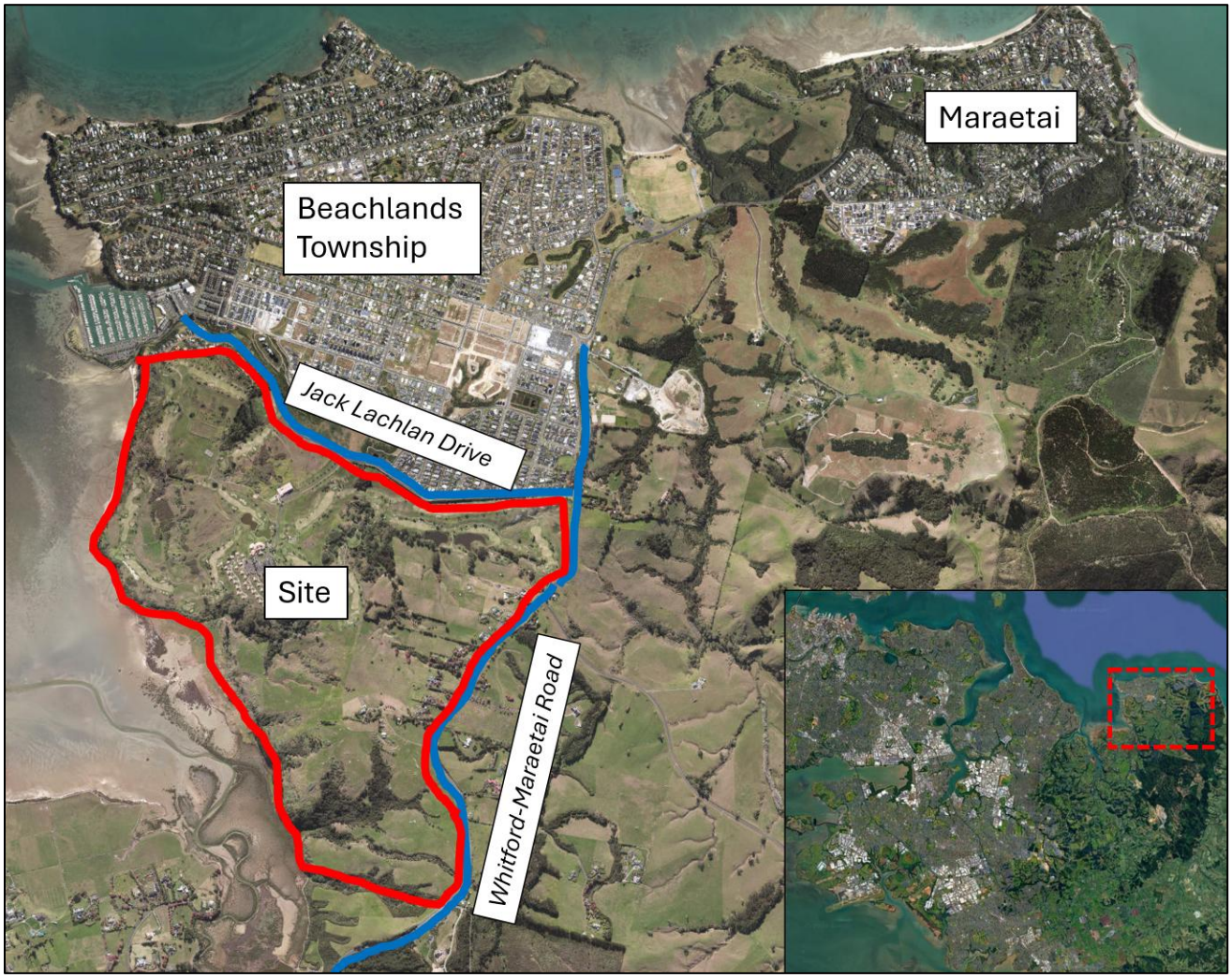

Figure 3-1: Site location in Auckland and Locality Context (Source: Google Maps)

The transport assessment supporting PC88 was prepared by Stantec in December 2022 and assessed the ability of the existing and future road, ferry, bus, walking and cycling networks to accommodate the proposed urbanisation of Beachlands South. That assessment recognised that the existing Whitford-Maraetai Road corridor is the principal road connection from the main Auckland urban areas to Beachlands and Maraetai, and that the existing settlement is currently highly dependent on private vehicle travel. It also identified Pine Harbour ferry services as a critical transport opportunity, particularly for city centre travel, and identified the need for staged transport upgrades as development proceeds.

Following a public hearings process, PC88 became operative in January 2025. The operative zoning plan and sub-precinct plan is shown in **Figure 3-2** below.

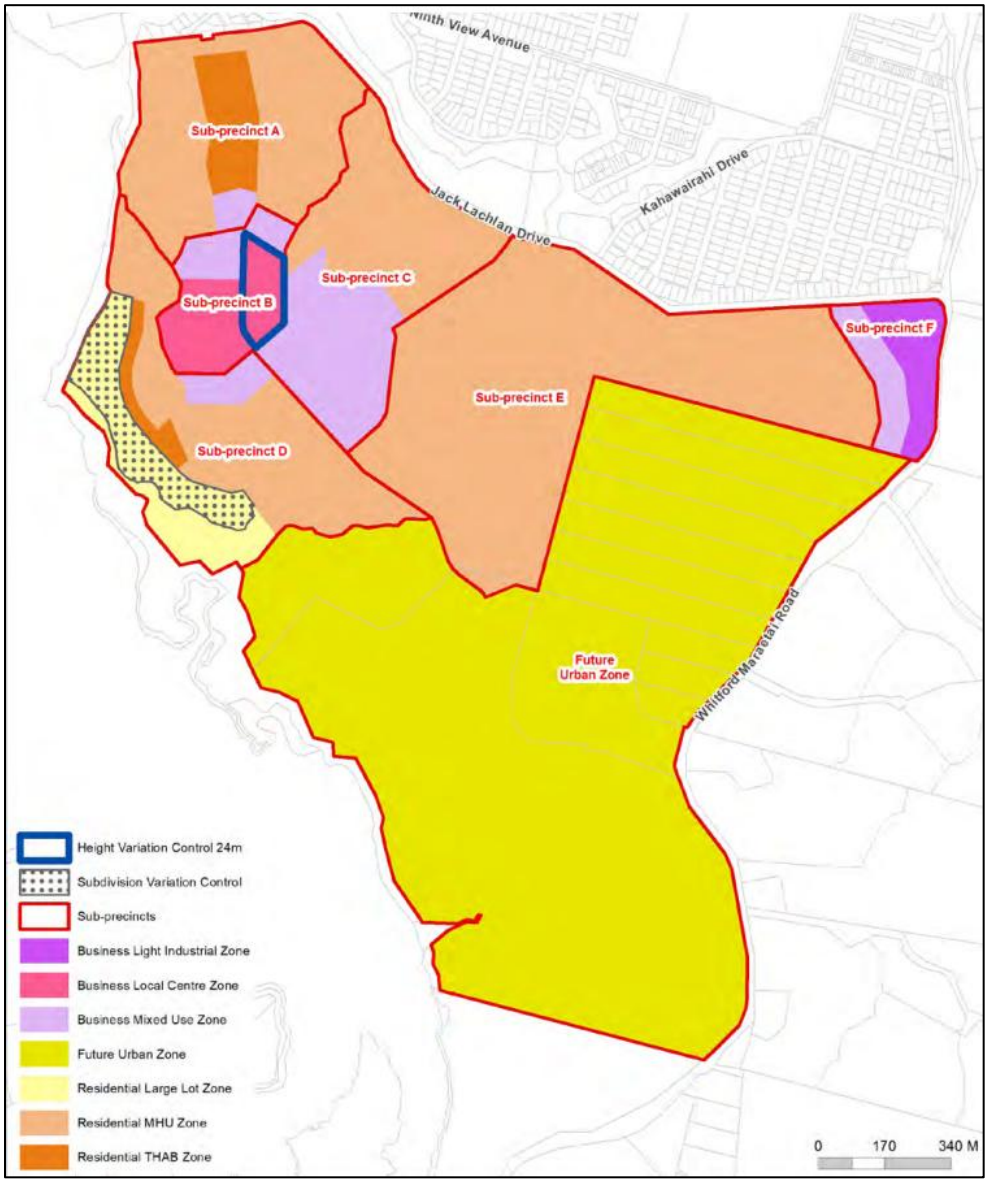

Figure 3-2: Beachlands South Precinct Zoning Plan

The provisions of the Beachlands South Precinct include a staged transport trigger regime. At a high level, the framework requires key transport upgrades before occupation of activities, further intersection improvements and ferry service capacity increases as subdivision and development yields for residential dwellings or lots yields increase. This ITA assesses the Project, including the proposed yield, staging, access arrangements, active mode network and traffic effects against the precinct provisions and FTAA statutory framework.

It uses the PC88 modelling and precinct provisions as the base framework, while updating assumptions where there is more current and locally relevant information. The approach

adopted in this ITA is consequently deliberately conservative in those areas that remain uncertain, while recognising the material changes in travel behaviour that have occurred since the original PC88 modelling was prepared.

4. Existing Transport Environment

4.1 Existing Road Network

Whitford-Maraetai Road is the principal arterial road connecting Beachlands and Maraetai with Whitford, Howick, Botany, East Tāmaki and the wider Auckland network. It is generally a two-lane, two-way rural arterial road with a winding alignment and limited active mode provision. The road passes through a sequence of constrained rural and village environments, including Whitford Village, before connecting the more urbanised parts of east Auckland via Whitford Road or Whitford Park Road and Sandstone Road.

Within the vicinity of the Site, Whitford-Maraetai Road provides the eastern and south-eastern transport frontage of the Beachlands South area. The road currently provides property access to rural and countryside living properties and has several existing side road connections, including Jack Lachlan Drive, Trig Road, Clifton Road and Henson Road.

Speed limits along Whitford-Maraetai Road were reduced in 2019 and 2020 in response to the rural road environment and road safety history. The current posted speed environment varies along the corridor, with a 50kph limit applying through Whitford Village, 60kph on the northeastern approaches to the village, and 80kph along the majority of the route and into Beachlands township.

Jack Lachlan Drive is a 60kph east-west road that connects Whitford-Maraetai Road with Pine Harbour Marina. It forms the northern boundary and principal access corridor for the Site. Jack Lachlan Drive currently has a two-lane carriageway, intermittent footpath provision, and a predominantly local/collector function. Its existing road reserve and carriageway width vary, with some constrained sections at the western end near existing buildings and boat-related activities. It currently does not provide the level of walking and cycling infrastructure that would be expected of an urban collector street serving a major residential and mixed-use development.

Several local roads connect with the northern side of Jack Lachlan Drive along its length, and an existing Site access to Formosa Golf Club connects on the southern side.

The wider external road network includes the Whitford-Maraetai Road / Jack Lachlan Drive intersection, the Whitford-Maraetai Road / Trig Road intersections, the Whitford Road / Whitford-Maraetai Road / Whitford Park Road roundabout in Whitford Village, the Whitford Park Road / Sandstone Road / Saleyard Road roundabout, and the Whitford Road / Somerville Road / Point View Drive roundabout. These intersections were the focus of the PC88 traffic modelling and are also relevant to the staging of this Project.

4.2 Existing External Network Queuing

The wider Whitford-Maraetai Road and Whitford Road corridor is affected by severe existing peak period queuing at key downstream intersections, particularly the Whitford Park Road / Whitford Road / Whitford-Maraetai Road roundabout (Whitford Roundabout) and the Somerville Road / Whitford Road / Point View Drive roundabout (Somerville Roundabout). These queues occur under existing traffic conditions and are of course not caused by Beachlands South demands. Rather, they reflect existing network constraints on the principal commuter route between Beachlands / Maraetai and the wider East Auckland employment areas.

The PC88 ITA modelling recorded that there were existing long queues on Whitford Road on the approach to Somerville Roundabout during the morning peak, and on Whitford Road on the approach to Whitford Roundabout during the afternoon peak. The same modelling recorded maximum observed queues of up to approximately 2km at Somerville Roundabout during the AM peak and up to approximately 1.6km at Whitford Roundabout during the PM peak.

Those existing queues are relevant because the Beachlands South transport trigger framework does not simply respond to development traffic. It also requires early delivery of upgrades to intersections that are already constrained under existing traffic conditions. The proposed external intersection upgrade package (discussed later in this report) will therefore provide significant improvements to existing Beachlands, Maraetai and Whitford traffic, as well as accommodating the additional traffic generated by Beachlands South.

4.3 Existing Public Transport

The existing public transport environment is focused on bus and ferry services. There is no railway service in Beachlands or Maraetai, and the nearest rapid transit services are located outside the immediate catchment. The bus network has historically provided limited frequency services connecting Beachlands and Maraetai with Botany and wider

east Auckland. At the time of the PC88 ITA, Route 739 was the main bus route serving Beachlands and Maraetai, operating between Botany, Beachlands and Maraetai via Ormiston and Whitford.

Auckland Transport has subsequently improved bus-ferry connectivity at Pine Harbour. The new Route 738 now runs between Maraetai and Pine Harbour, providing connections between Beachlands, Maraetai and the Pine Harbour ferry service. This change is directly relevant to this Project because it reinforces Pine Harbour as a public transport interchange for the local area and supports the development's reliance on improved ferry access and feeder bus connections. Route 739 is hourly, whereas route 738 operates every 20 minutes during peak periods to coordinate with ferry departures. **Figures 4-1** and **4-2** below show the existing bus routes serving the Beachlands and Maraetai areas.

Figure 4-1: Route #738 – Maraetai to Pine Harbour via Beachlands (Source: AT Website)

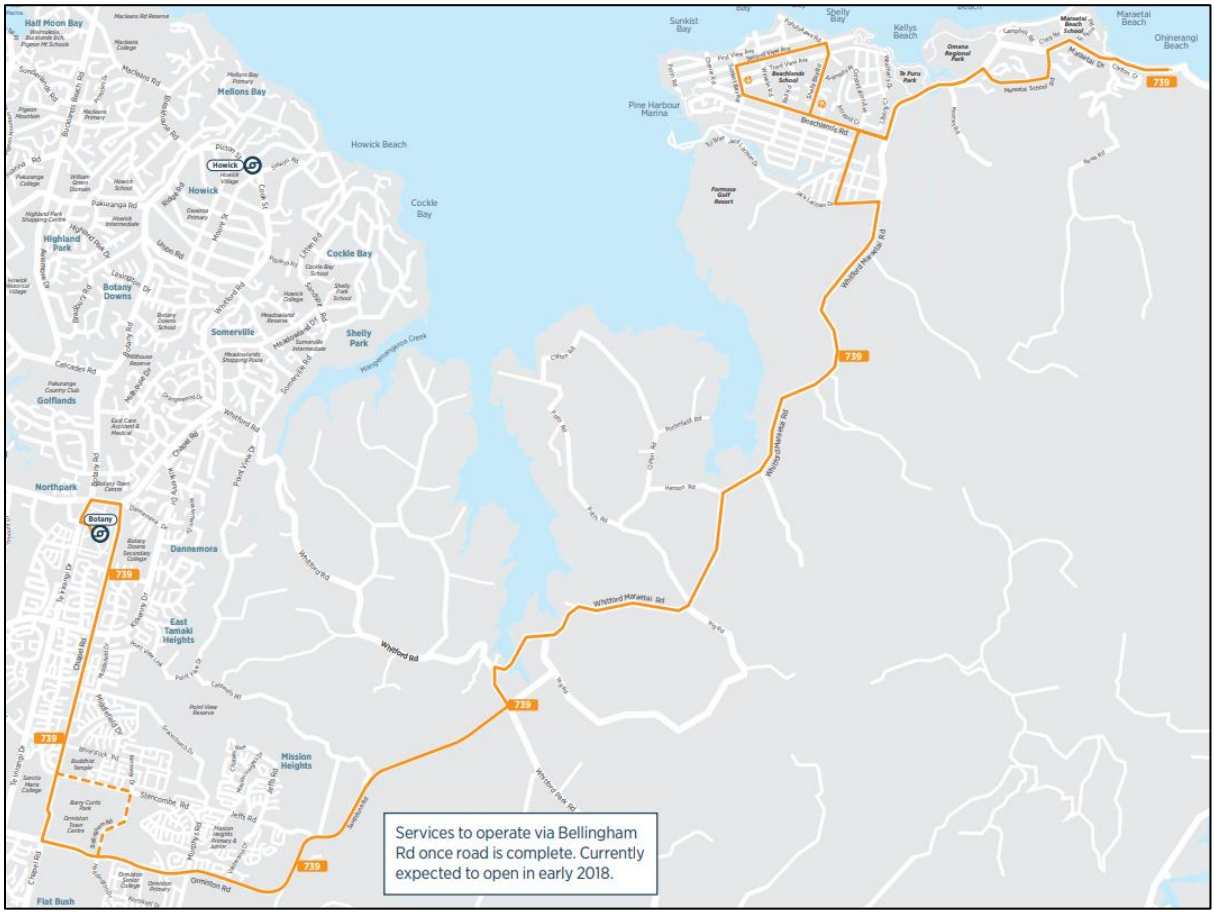

Figure 4-2: Route #739 Maraetai to Botany via Beachlands (Source: AT Website)

Pine Harbour ferry services operate between Pine Harbour and the Auckland city centre. The service is well-established and provides a competitive alternative to driving for city centre trips, particularly during peak periods. The existing ferry fleet currently includes smaller vessels of approximately 50 and 99 passenger (pax) capacity, and this service had constraints relating to berth capacity, vessel capacity, customer level of service and integration with walking, cycling and bus access.

Overall, the public transport provision to Beachlands is mixed. The ferry service provides a realistic and rapid alternative travel mode for commuters and other trip purposes and is supported by a feeder bus service, but is constrained by size of ferries and lack of active mode connectivity.

4.4 Existing Active Modes

The existing active mode environment is limited. Within the Site itself there are no formal public walking or cycling facilities. Along Whitford-Maraetai Road, the rural arterial

environment generally does not provide continuous footpaths, separated cycleways, active mode paths, or formal crossing facilities. The combination of traffic speeds, rural road geometry, limited shoulders, and lack of lighting means that walking and cycling on Whitford-Maraetai Road is currently unattractive and unsuitable for everyday transport trips.

Jack Lachlan Drive provides some pedestrian infrastructure along parts of its northern side, particularly within the established township and near Pine Harbour, but the provision is discontinuous and does not provide a complete urban active mode corridor. There are no continuous separated cycle facilities along Jack Lachlan Drive at present. The existing walking and cycling network therefore does not currently provide a high-quality connection between the existing Beachlands township, Beachlands South and Pine Harbour ferry terminal, which limits existing township residents' opportunity to safely access the ferry terminal.

Accordingly, the existing active mode facilities around the Site are considered to be poor.

4.5 Road Safety

A search was undertaken of the New Zealand Transport Agency (NZTA) Crash Analysis System (CAS) for all reported crashes that had occurred along Whitford-Maraetai Road between Whitford Park Road and Jack Lachlan Drive at its western and eastern ends respectively, and also a short section of Whitford Road between the Whitford Park Road roundabout and the Whitford Road / Wades Road intersection. Within the search area, the following intersections (50m radius) were also included:

- Whitford – Maraetai Road / Wades Road.
- Whitford-Maraetai Road / Whitford Park Road / Whitford Road.
- Whitford-Maraetai Road / Trig Road (eastern and western ends).
- Whitford – Maraetai Road / Matthias Place.
- Whitford – Maraetai Road / Clifton Road.
- Whitford-Maraetai Road / Henson Road.
- Whitford-Maraetai Road / Waikopua Road.
- Whitford-Maraetai Road / Pukerangi Rise.
- Whitford-Maraetai Road / Jack Lachlan Drive.

The extent of the safety assessment area has been shown in **Figure** below, and the crash history has been analysed and summarised by both the entire route and the individual

intersections. A detailed analysis has been completed for the reported fatal, serious and minor injury crashes, and also crashes involving vulnerable road users (VRUs).

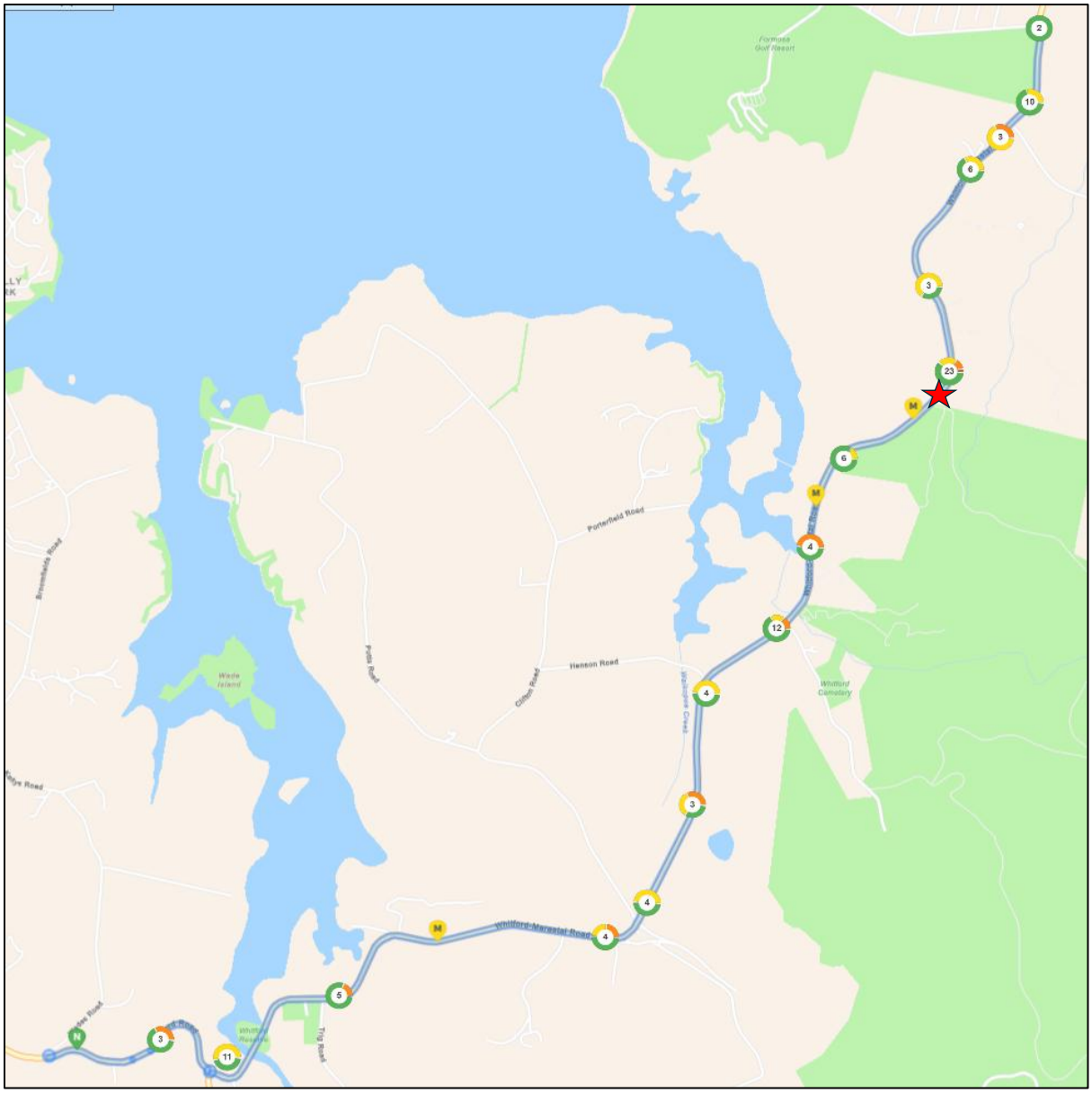

Figure 4-3: CAS Analysis - Extent of Safety Area Showing all Crashes (Source: NZTA CAS System)

Entire Route

The search included all crashes over the last five-year period from 2021 to 2025 (including all available results from 2026). **Table 4-1** provides a summary of crashes by severity and year.

Table 4-1: Breakdown of Crashes by Year and Severity

Year	Number of crashes by Severity				Total
	Fatal	Serious	Minor	Non-injury	
2021		1	6	11	18
2022		2	5	12	19
2023		4	1	8	13
2024	1	1	11	15	28
2025		3	7	13	23
2026 (reported as of 17/06/2026)		3	3	3	9
Total	**1**	**14**	**33**	**62**	**110**

The CAS search recorded a total of 110 crashes in the search area consisting of one fatal, 14 serious and 33 minor and 62 non-injury crashes. The highest number of both injury and non-injury crashes were recorded in 2024, including one fatal crash.

Fatal Injury Crash

The fatal crash occurred in June 2024 along Whitford-Maraetai Road north of the Forest Road intersection, between Okaroro Drive and Waikopua Road (marked with a red arrow in **Figure** below. The fatal crash involved a driver heading northbound along Whitford-Maraetai Road losing control of the vehicle on the curve, crossing the centreline and colliding with an oncoming vehicle travelling southbound along the same corridor. The crash occurred at 6:30AM in the morning, in dark lighting, but fine weather conditions. It is suspected that wet roading surface and/or excessive speeds may have caused loss of friction resulting in the crash. The area has since been resurfaced.

Serious Injury Crashes

Of the 14 serious crashes, eight have occurred at the series of curves between Okaroro Drive and Waikopua Road along the Whitford-Maraetai Road corridor. Four of these crashes occurred at the bend closest to Waikopua Road, three along the bend north of the Forestry Road intersection (same location as the fatal crash), and one near the Okaroro Drive intersection. The remaining injury crashes are spread along the Whitford – Maraetai Road (three) and Whitford Road corridor (one). Nine of the 14 serious injury crashes involved a driver losing control of their vehicle and either crashing into an oncoming vehicle or the wider roadside environment. The remaining crashes occurred due to driver fatigue, a driver suffering a medical event, and a following vehicle not maintaining a safe following distance resulting in a rear-end crash.

Figure 4-4: CAS analysis of the serious and fatal injury crashes (Source: NZTA CAS System)

It should be noted that the three serious injury crashes at the curve north of the Forestry Road intersection all occurred when the road was at least partially wet. It is noted this curve is marked with an advisory speed sign of 65km/h, including a supplementary advisory speed sign before the curve, and two chevron signs during the curve.

Of the four crashes near the Waikopua Road intersection, one occurred due to a vehicle following the leading vehicle too closely resulting in a rear-end crash due. One crash occurred due to a fatigued driver falling asleep behind the wheel and colliding with a cyclist travelling in the same direction. The remaining two crashes occurred due to a driver losing control of their vehicle. Environmental or road conditions were not a contributing factor to either of these crashes.

Minor Injury Crashes

The 33 reported minor injury crashes are spread along the Whitford-Maraetai Road corridor with 19 of these crashes occurring between the Okaroro Drive and Waikopua Road intersections. A further three crashes have occurred in proximity of the Whitford Park Road roundabout, along the mid-block section between Trig Road and Whitford Park Road, and in proximity of the Clifton Road intersection each. Two crashes have also occurred at the Henson Road intersection.

25 of the 33 crashes occurred due to a loss of control. Four of the 33 crashes involved a driver attempting a crossing/turning movement. Two crashes involved vehicles not maintaining a safe following distance, causing rear-end collisions with the leading vehicle. One crash occurred due to a driver attempting to overtake another vehicle along a straight section of Whitford-Maraetai Road corridor.

Vulnerable Road Users:

Of the 110 total crashes recorded within the CAS search area, five crashes were reported to involve vulnerable road users (VRUs) including one pedestrian crash (non-injury), one cyclist crash (serious injury) and three motorcyclist crashes (one serious, and two minor injury). Upon closer review, it was found the crash involving a pedestrian has been recorded incorrectly onto the CAS system, hence is omitted from the discussions below.

Of the three crashes involving motorcyclists, two resulted in minor injuries, and one resulted in a serious injury. The serious injury crash occurred due to a motorcyclist losing control of their vehicle on a curve along Whitford Road before travelling across the centre line and colliding into an oncoming vehicle.

The serious injury crash involving a cyclist occurred due to a driver travelling along Whitford-Maraetai Road falling asleep at the wheel before colliding with a cyclist riding in the northbound live traffic lane resulting in serious injuries to the cyclist. The two minor injury crashes occurred due to drivers attempting to turn onto Whitford-Maraetai Road corridor from a side road or private accessway, failing to notice an approaching motorcyclist along Whitford-Maraetai Road resulting in a collision.

Intersections

A total of 21 crashes were recorded within 50m of intersections along Whitford-Maraetai Road, including 3 serious injury, 6 minor injury, and 12 non-injury crashes. The breakdown of these intersection crashes is outlined in **Table 4-2** below:

Table 4-2: Breakdown of Crashes per Intersection

Intersection:	Number of crashes by Severity				Total
	Fatal	Serious	Minor	Non-injury	
Whitford Park Rd/ Whitford – Maraetai Rd			1	1	2
Whitford-Maraetai Rd / Trig Rd (west end)		1		1	2
Whitford-Maraetai Rd / Trig Rd (east end)		1		1	2
Whitford-Maraetai Rd / Clifton Rd				2	2
Whitford-Maraetai Rd / Henson Rd			2	1	3
Whitford-Maraetai Rd / Waikopua Rd		1	2	4	7
Whitford-Maraetai Rd / Okaroro Dr			1		1
Whitford-Maraetai Rd / Jack Lachlan Dr				2	2
Total	**-**	**3**	**6**	**12**	**21**

A breakdown of the three serious injury intersection crashes is provided below:

- Whitford-Maraetai Rd / Trig Rd (west end): Driver travelling northbound along Trig Road had a medical event causing them to lose consciousness, and drive straight through the intersection.
- Whitford-Maraetai Rd / Waikopua Rd: Two vehicles travelling northbound along Whitford-Maraetai Road. The following vehicle was not maintaining a safe following distance causing a rear-end crash when the leading vehicle slowed down to turn onto Waikopua Rd.
- Whitford-Maraetai Rd / Trig Rd (east end): Vehicle travelling northbound along Whitford-Maraetai Road lost control at the curve near the Trig Rd (east end) / Clifton Rd intersections.

A breakdown of the six minor injury crashes is provided below:

- Whitford Park Rd/ Whitford-Maraetai Rd: Driver travelling southbound along Whitford-Maraetai Road had a medical event, resulting in the vehicle travelling straight through the roundabout.
- Whitford-Maraetai Rd / Henson Rd: Both minor injury crashes at this intersection were very similar as they included a driver travelling northbound along Whitford-Maraetai Road losing control of their vehicle on the curve near Henson Road. One crash occurred due to driver pressing the accelerator instead of the brake pedal.
- Whitford-Maraetai Rd / Waikopua Rd: One crash involved driver waiting to turn onto Whitford-Maraetai Road failed to identify and giveway to a motorcyclist travelling southbound along Whitford-Maraetai Road. The second crash involved a driver travelling southbound along Whitford-Maraetai Road losing control of their vehicle.

- Whitford-Maraetai Rd / Okaroro Dr: Driver travelling northbound along Whitford-Maraetai Road has lost control of their vehicle on the curve near Okaroro Drive. Speed and wet road are likely to be contributing factors to the crash.

Summary

The following conclusions can be drawn from the completed CAS analysis for the five-year period from 2021 to 2025 (plus all available results from 2026):

- A total of 110 crashes have been recorded in the search area as shown in Figure above. This consists of one fatal (1%), 14 serious (13%), and 33 (30%) minor injury crashes. The remaining 62 (56%) were non-injury crashes.
- 73 of the 110 crashes (66%) were loss of control crashes. The most frequent location of these loss of control crashes were at the curve just north of the Whitford-Maraetai Rd / Forestry Rd roundabout, and the curve outside #732 Whitford-Maraetai Rd.
- 21 of the 110 crashes (20%) occurred within 50m of an intersection along Whitford-Maraetai Road. It should be noted that despite occurring in proximity of an intersection, most of these crashes occurred due to drivers travelling along Whitford-Maraetai Road losing control at a curve.
- Only one crash involved a cyclist, and three crashes involved motorcyclists. The crash involving a cyclist, and two of the crashes involving a motorcyclist occurred due to driver error (as discussed above). One crash occurred due to a motorcyclist losing control of their vehicle along Whitford Road.

The CAS analysis demonstrates typical patterns for higher speed, busy rural roads. Auckland Transport has been undertaking several interventions over the last few years to continue to address areas of concern. This includes the reduction of speed limits in 2019, and the treatment of particular locations that crashes occur. In terms of the proposed development, conditions will ensure that the road safety record is regularly monitored, and a financial contribution has been set aside to address any road safety issues that may occur once the development becomes operational, to be coordinated with Auckland Transport.

The Proposal will improve the transport safety environment within and adjacent to the site compared with the existing rural / golf course access environment. The internal network will be designed as a low-speed urban street environment with separated active mode facilities on collector roads, traffic-calmed local streets, raised crossings, controlled intersections on Jack Lachlan Drive and a left-in / left-out access to Whitford-Maraetai Road. The Jack Lachlan Drive upgrade will also provide a continuous active mode corridor

between the Proposal, the existing Beachlands township and Pine Harbour. Those measures will reduce conflict risk for pedestrians and cyclists in the immediate development area and provide a safer, more legible access environment than exists today. Conditions will also ensure that the wider Whitford-Maraetai Road safety record is regularly monitored, with any required safety response coordinated with Auckland Transport.

5. Committed Ferry Capacity Upgrades

The key committed change to transport infrastructure in the area is the pending upgrades to the ferry provision at Pine Harbour. It is understood that a marina reconfiguration is underway that will enable it to accommodate larger 24m vessels; and that larger, 168pax vessels, have been purchased by Auckland Transport and are currently under construction. It is understood that both the marina reconfiguration and the supply of the new vessels will be completed in 2027.

Figure shows the proposed marina configuration following these works, including the larger vessel positions and a turning circle to assist with their manoeuvring.

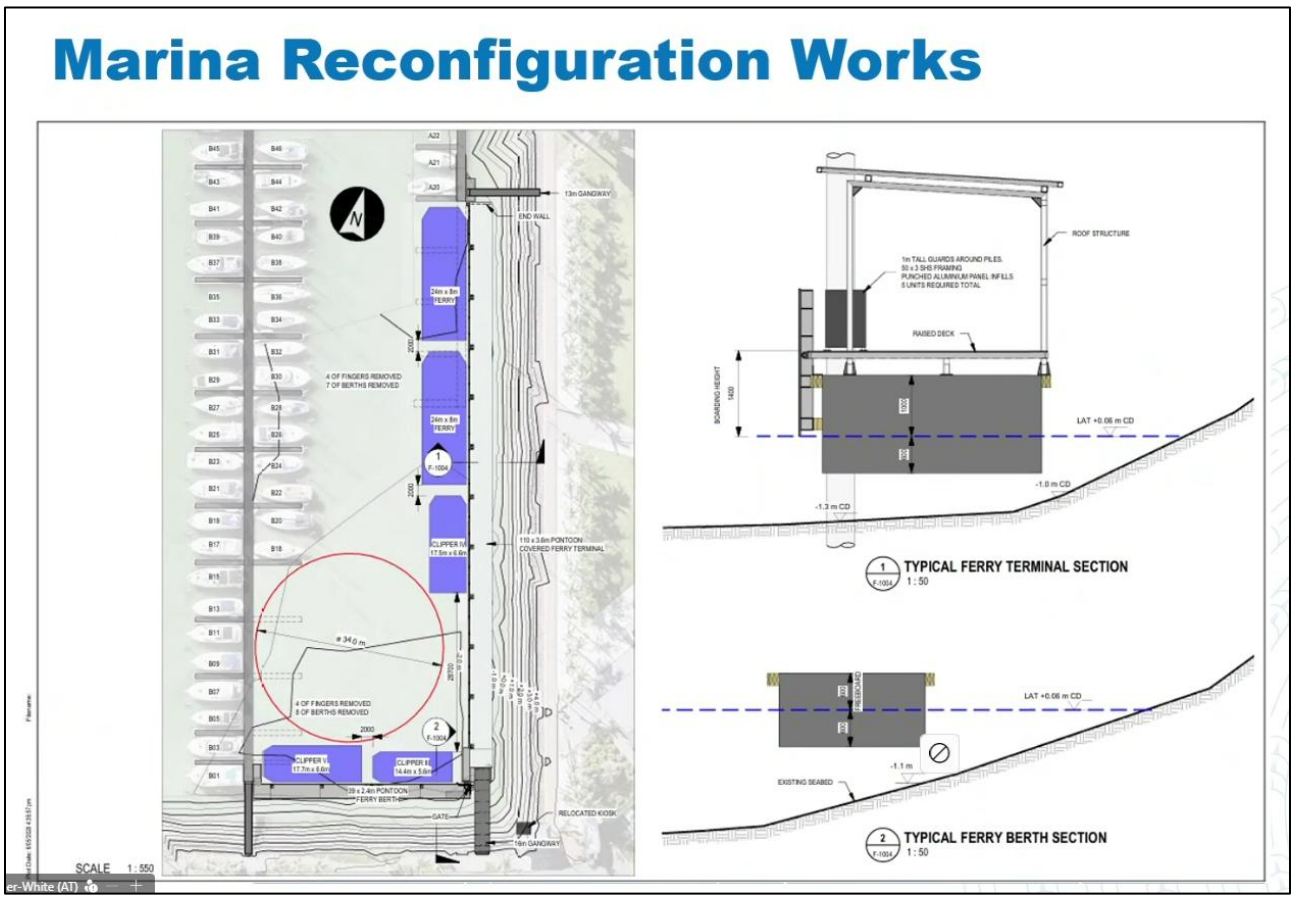

Figure 5-1: Proposed Marina reconfiguration works

The existing ferry service network operates on a total of four ferries consisting of two 49pax and two 99pax vessels. Both these vessels provide an approximately 40-minute travel time between Pine Harbour Marina (Beachlands) and Auckland CBD (1hr 20-minute return trip). Accordingly, within the 2-hour AM peak period between 6:20AM - 8:20AM, the existing ferry network provides a total of seven sailings at 20-minute intervals with a maximum capacity of 543 passengers as shown in **Figure** below.

Morning peak capacity

Departuture time - PH	Arrival Time - Down	Arrival Time - back at PH	Boat	Current	Boats - Stage 1	Stage 1 2 x new boat
6:20	7:00	7:40	Clipper IV	99	New Boat 2	168
6:40	7:20	8:00	Clipper II	49	Clipper IV	99
7:00	7:40	8:20	Clipper V	99	New Boat 1	168
7:20	8:00	8:40	Clipper III	49	Clipper V	99
7:40	8:20	9:00	Clipper IV	99	New Boat 2	168
8:00	8:40	9:20	Clipper II	49	Clipper IV	99
8:20	9:00	9:40	Clipper V	99	New Boat 1	168
8:40	9:20	10:00	Clipper III	49	Clipper V	99
9:10	9:50	10:20				
7				**543**		**969**

Figure 5-2: AM Peak Ferry Scheduling and Capacity

With the proposed marina reconfiguration works, and purchase of the two 168pax vessels, the ferry scheduling is unlikely to change significantly as these larger vessels can also complete the journey in approximately 40 minutes each way (1hr 20-minute return trip). The updated fleet will then consist of two 99pax and two 168pax vessels, and provide an increased capacity of 969pax, representing a 78% increase in capacity.

Table I458.6.3.2 of the precinct requires particular ferry capacities to be achieved prior to certain development stages. **Figure 5-3** below shows the table.

	Column 1 Development and/or subdivision enabled within the area identified on Precinct Plan 6 by transport infrastructure in column 2	Column 2 Transport infrastructure required to enable development and/or subdivision in column 1
(a)	A provision of more than 250 up to 500 dwellings or residential lots	Provision for a total capacity of at least 600 ferry passengers from Pine Harbour during the two-hour peak period between 0620 – 0820 on weekdays.
(b)	A provision of more than 500 up to 850 dwellings or residential lots	Provision for a total capacity of at least 700 ferry passengers from Pine Harbour during the two-hour peak period between 0620 – 0820 on weekdays.
(c)	A provision of more than 850 up to 1500 dwellings or residential lots	Provision for a total capacity of at least 825 ferry passengers from Pine Harbour during the two-hour peak period between 0620-0820 on weekdays; and
(d)	A provision of more than 1500 up to 1900 dwellings or residential lots	Provision for a total capacity of at least 950 ferry passengers from Pine Harbour during the two-hour peak period between 0620 – 0820 on weekdays.
(e)	A provision of more than 1900 and up to 2700 dwellings or residential lots	Provision for a total capacity of at least 1150 ferry passengers from Pine Harbour during the two-hour peak period between 0620 – 0820 on weekdays

Figure 5-3: Table I458.6.3.2 – Residential Development Enabled by Ferry Capacity

The ferry upgrades proposed by Auckland Transport by 2027 see the two-hour AM peak provision increase to 969pax, which satisfies rows (a) through to (d) (950pax), but not Row (e) (1,150pax). Accordingly, a condition of consent is proposed to ensure the ferry capacity and demands are reassessed prior to 1,900 dwellings being consented.

Associated with the marina and vessel upgrades, Auckland Transport has also progressed planning for new bus stops in Pine Harbour to support the relatively new Route 738 bus service between Maraetai and Pine Harbour via Beachlands township. This is a relevant committed change because it improves first-and-last-leg access to the ferry for the existing communities, and provides a stronger public transport basis for the Project.

6. The Project

The Project will provide for the development of live zoned land at Beachlands into a comprehensively planned and public transport focussed community to achieve a well-functioning urban environment comprising residential dwellings, a hotel and conference venue, community and commercial activities, walking and cycling networks, and community facilities, and enable the potential development of two schools, as well as all associated earthworks and all associated infrastructure including transport facilities, intersection upgrades and roading, telecommunications, power, and water supply, stormwater, and wastewater infrastructure. A portion of Future Urban zoned land will be used for wastewater management purposes.

Key elements of the Project include:

- Residential activities comprising approximately up to 2,000 dwellings in a variety of housing types, densities and vacant sites for future residential development;
- Establishment of a commercial local centre supported by employment opportunities within and around the periphery of the local centre and on the Whitford-Maraetai Road frontage comprising approximately 27,000sqm of commercial GFA and 30,000sqm of light industrial GFA;
- Education facilities comprising the development of both primary and secondary schools;
- Establishment of an Ecological Protection Area Network (EPAN) comprising approximately 75 hectares of land being replanted, restored, maintained and enhanced including preservation of streams and their margins;
- A series of open spaces including a suburban park, neighbourhood parks, the Fairway Reserve, golf course, esplanade reserve and riparian margins;
- Provision of public access to and along the coastal marine area and the creation of a quality coastal pathway;
- Public transport enhancements and integrations including expanded ferry passenger capacity;
- Staged road upgrades including the provision of pedestrian and cycling facilities along Jack Lachlan Drive, the upgrade of Whitford roundabout, a series of intersection upgrades; and
- Establishment of infrastructure to service the project including wastewater, water supply, stormwater, telecommunications and power.

The final distribution of dwellings and GFA may be refined through detailed design, subdivision staging and market response. However, the traffic modelling and statutory assessment in this ITA are based on the quantum of proposed activities and therefore provide an appropriate basis for assessing the Proposal.

The proposed illustrative masterplan is shown below in **Figure 6-1**.

Figure 6-1: Illustrative Masterplan Showing Setting to the south of the existing Beachlands Township

7. Transport Design Report

As per the I458.9 Special Information Requirements of the Beachlands South Precinct, clause I458.9 (9) requires the provision of a Transport Design Report. This section provides all required information to fulfil that requirement.

7.1 Masterplan, Road Hierarchy and Site Access

The proposed illustrative masterplan showing the road hierarchy is provided below as **Figure 7-1**.

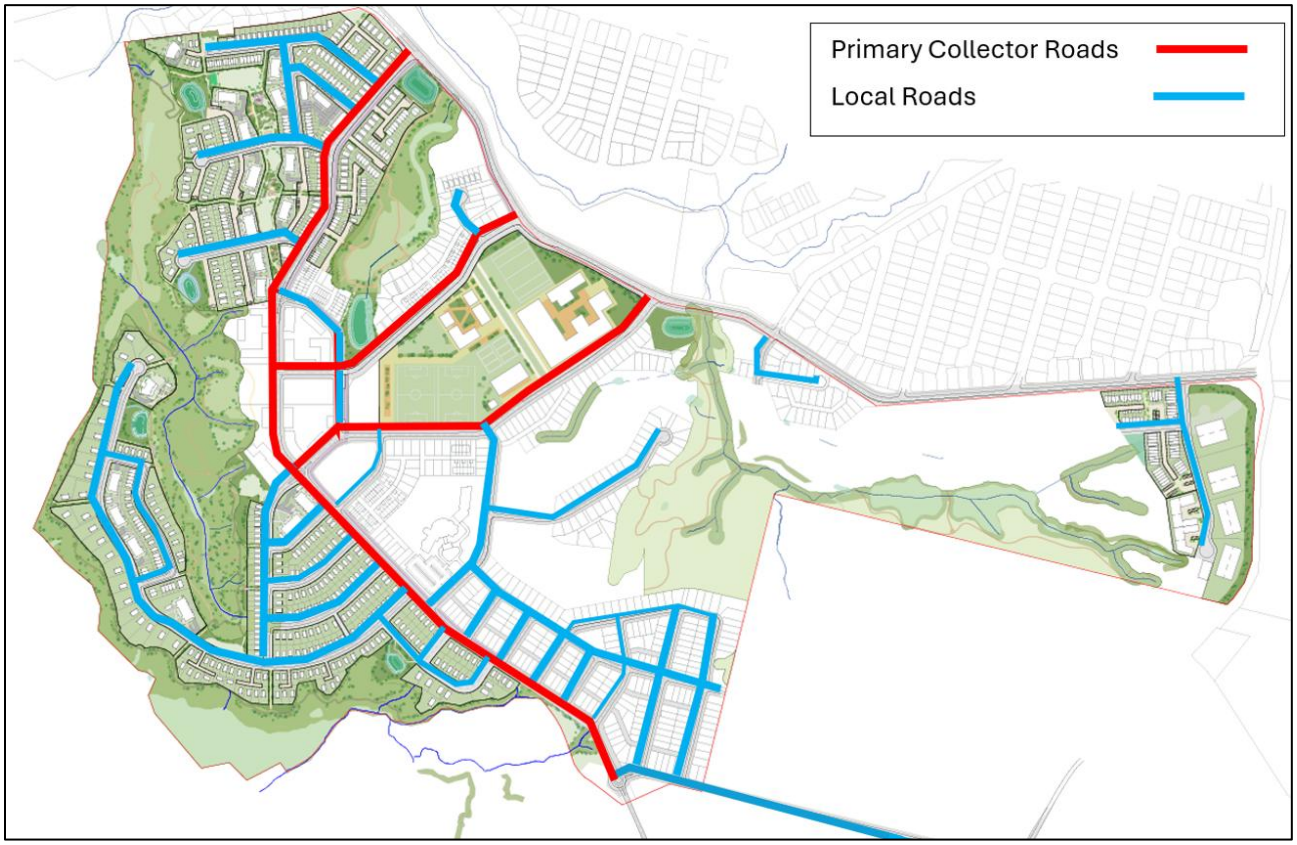

Figure 7-1: Illustrative Masterplan Showing Road Hierarchy

As shown in **Figure 7-1**, it is proposed to provide several local and collector road corridors within the development. Within the local and collector road corridors, there are several sub-categories such as:

- Primary Collector Road (Spine Road): Spine Road which connects the various residential, and commercial zones within the development site, with footpaths, a bi-directional cycleway, planted berms.

- Primary Collector (School Road): Road corridor with footpaths, bi-directional cycleway, planted berms, resulting in a pedestrian focused street.
- Primary Collector (Village Centre): Spine road within the Village Centre zone which encourages a slow-speed zone and a pedestrian focused environment, but enables public transport.
- Village Centre Secondary Road (Local Street): Similar to the Primary Collector (Village Centre) which encourages a slow-speed zone, pedestrian/cyclist focused environment and safe mid-block crossing facilities, but with a local road hierarchy.
- Local Street: Road corridor typically serving residential activities connecting residential zones to collector routes (where retail and commercial activities are located).
- Wide Local Street – Residential: Similar to a Local Road, however provides a 3m active mode path on one side of the corridor instead of a 1.8m wide footpath.
- Wide Local Street – Industrial: Similar to a Local Road, however provides a wider carriageway (6.6m instead of 6m) to accommodate HCV movements.

The proposal includes six vehicle access points to the public road network, five on Jack Lachlan Drive and one on Whitford-Maraetai Road through the 712 Whitford-Maraetai Road landholding. This access strategy, which remains consistent with I458.10.5 Precinct Plan 5 (Movement Network), provides a high level of permeability and distributes traffic across the northern frontage, while avoiding over-reliance on a single gateway. **Figure 7-2** shows the location and type of site access intersections.

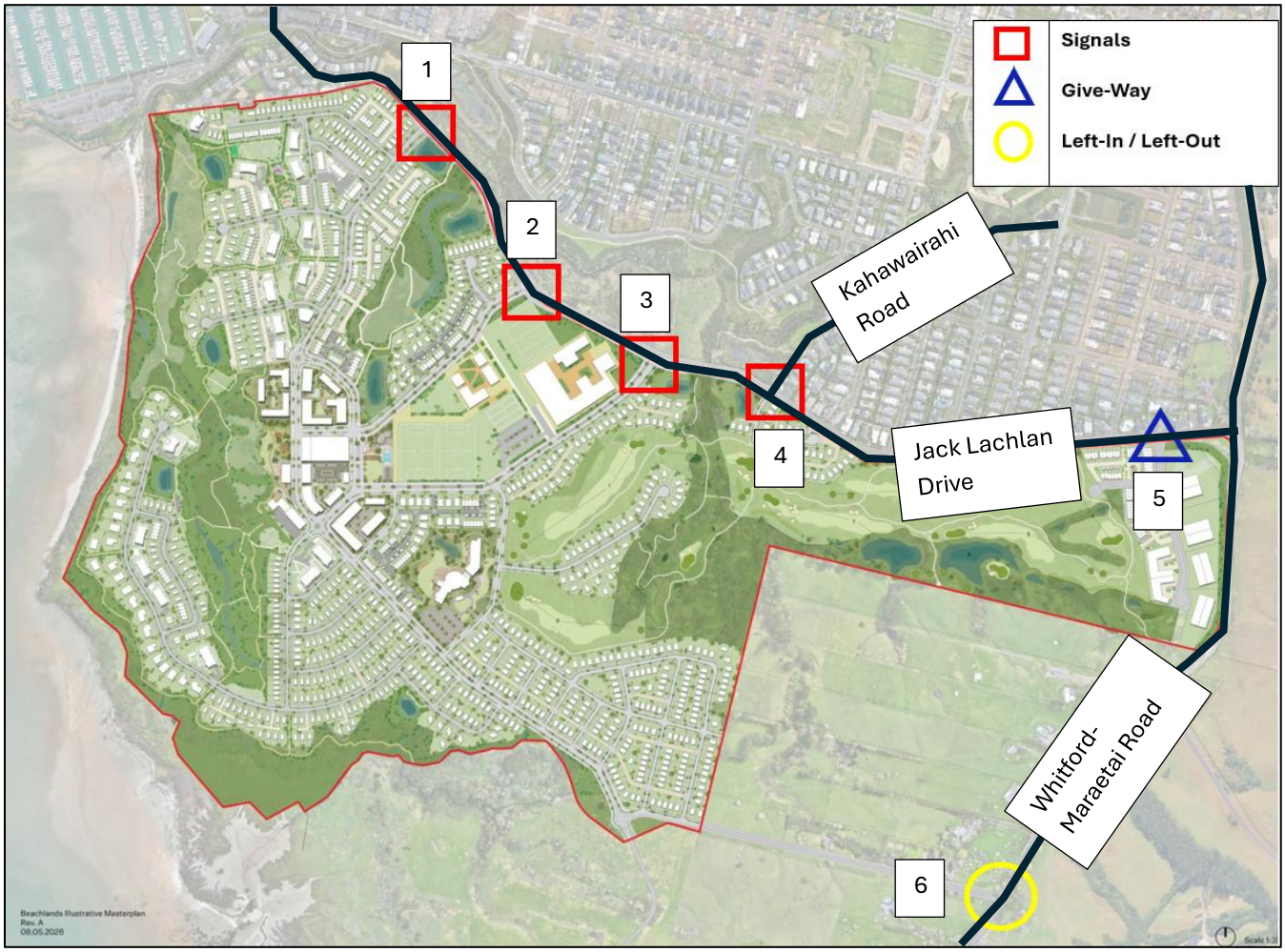

Figure 7-2: Site Accesses by Control Type

The three Site collector road intersections with Jack Lachlan Drive will provide the principal access structure for the internal road network. The fourth signalised intersection, opposite Kahawairahi Road, will provide an important connection between the existing Beachlands township and the new development. It will also provide a controlled crossing point for pedestrians and cyclists, and a logical location for the Jack Lachlan Drive two-way cycleway to transition from the northern side of the road to the southern side. A fifth priority-controlled intersection is also provided (marked by a triangle) which provides access into employment activities.

The 712 Whitford-Maraetai Road access (marked by a yellow circle) is proposed as a left-in / left-out connection. This is appropriate for the arterial function and safety context of Whitford-Maraetai Road and avoids introducing full-movement turning conflicts on a corridor with an existing loss-of-control and rural arterial safety profile. The access will

provide secondary access and network resilience, but the principal Site access function will remain focused on the signalised Jack Lachlan Drive intersections.

The final intersection layouts will be subject to detailed design, traffic modelling, vehicle tracking, safety audit and approval through the relevant engineering plan approval process. At this stage, the number, location and form of the accesses are appropriate for the Project and are consistent with a comprehensive and active-mode-supportive urban access strategy.

7.2 Active Modes and Public Transport Integration

The Project has been designed to make walking, cycling, micro-mobility and public transport realistic options for a much greater proportion of local trips than is currently possible in Beachlands. The masterplan provides a connected internal active mode network, low-speed local streets, collector roads with dedicated cycle facilities, direct off-road links, and improved access to Pine Harbour Marina and ferry services for both the Project and existing Beachlands residents.

Active Modes

Jack Lachlan Drive will be upgraded to provide continuous active mode facilities along the Site frontage, including footpaths and a two-way cycle facility on one side of the road. At the eastern end of Jack Lachlan Drive, the two-way cycleway will be located on the northern side of the corridor so that it connects with the more populated northern catchment of the existing Beachlands township. At the proposed signalised Kahawairahi Road intersection, the cycleway will cross to the southern side of Jack Lachlan Drive to directly serve the Beachlands South residential catchments at the western end of the corridor, where there is no corresponding residential catchment on the northern side.

At the western-most extent of Jack Lachlan Drive, near the existing boat houses and constrained corridor environment, a 3m active mode path will be provided instead of separate pedestrian and cycle facilities. This reflects the physical width constraints in that location while maintaining a continuous active mode connection to Pine Harbour. The detailed design of this section will manage pedestrian and cyclist interactions and maintain suitable visibility at access points. Cross-sections for the varying Jack Lachlan Drive corridor designs are discussed in more detail in Section 7.3 below. **Figure 7-3** shows the dedicated cycle facilities along Jack Lachlan Drive and within the Site.

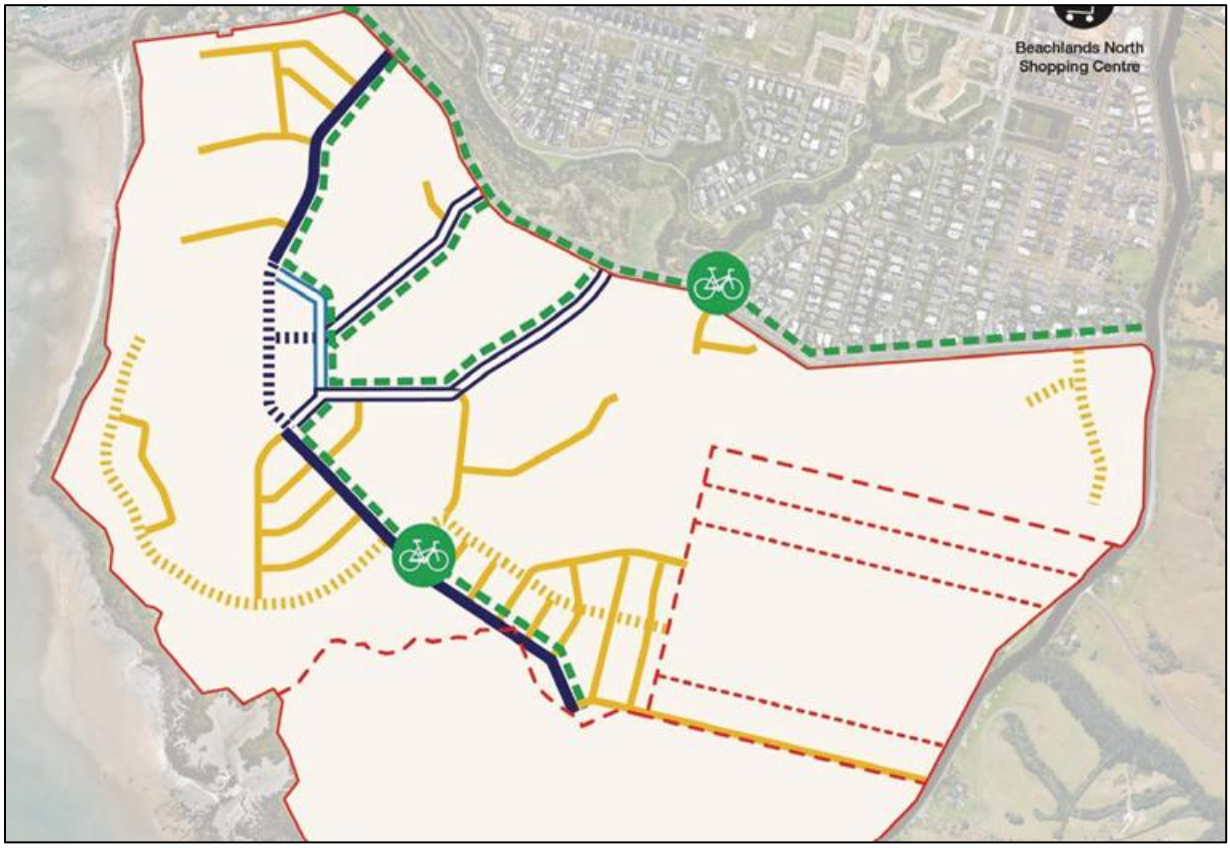

Figure 7-3: External / Internal Cycle Provision

Within the Site, all local roads will provide footpaths on both sides of the corridor and will be designed as low-speed, traffic-calmed environments that support safe on-road cycling. Collector roads will include separated pedestrian facilities and dedicated cycleways, generally in the form of one-sided bi-directional protected cycleways. Raised crossings will be provided where local roads intersect with cycleways so that the continuity and priority of the walking and cycling network is maintained.

The Project will also include a network of internal off-road active mode connections around open space, ecological areas and coastal edges. These include a direct path to Jack Lachlan Drive from the north-eastern part of the Site, and a direct accessible path and optional staircase down the cliffs at the far western end of the Site to connect the development with Pine Harbour Marina and ferry services. The western connection is particularly important because it shortens the walking and cycling distance to the ferry and strengthens the ability of the development to support public transport mode share.

Overall, the proposed active mode network will provide a high standard of accessibility and safety for walking, cycling and scootering within the development, between the

development and the existing Beachlands township, and between the development and Pine Harbour.

Public Transport

Public transport integration will be undertaken in coordination with Auckland Transport, however, one potential option is to divert the existing Route 739 bus connection between Maraetai, Beachlands, Whitford, Ormiston and Botany to Pine Harbour to improve access to ferry services, as shown in **Figure 7-4** below.

Figure 7-4: Potential Diversion of Route 739 Through the Project

The internal movement network has been designed to accommodate future bus provision into the Site as the development grows. The proposed bus route would allow buses to travel along the collector road through the Village Centre, continue along the southern /

eastern collector road, and then connect to Jack Lachlan Drive before rejoining the wider Beachlands public transport network. This arrangement would place a substantial proportion of dwellings, employment activities and the Village Centre within a practical walking catchment of bus services. Although Auckland Transport has been shown the potential bus route concept, detailed comments have not yet been received, therefore this remains one item for further discussion.

Bus stop locations will be confirmed through detailed design in consultation with Auckland Transport. However, the collector road network has been structured to support efficient bus circulation, legible routes, and convenient access to the Village Centre, residential catchments, employment areas, and Pine Harbour ferry connections. Accordingly, the development is expected to have a superior level of connectivity to the public transport network, with the ability for services to be enhanced or extended over time as demand increases.

7.3 Internal Road Cross Sections

Primary Collector with Public Transport (Spine Road)

The primary collector road corridor is the main spine road serving and connecting the proposed Beachlands South development to the existing Beachlands township and the wider transport network. The road corridor extends from Jack Lachlan Drive at its northern end, around the Village centre, to the southern 'Live Zone' boundary at its southern end. It is anticipated that in the future, the road corridor will extend further south beyond the current Live Zone boundary, however this is beyond the scope of this application.

The primary collector is proposed to have a 23m cross-section along its entire length including provision for a 7m wide, two-way, two-lane carriageway, 3.3m wide front berms to accommodate street furniture, trees, on-street parking and bus stops, a 3.4m bi-directional cycleway, and 2m footpaths and 1m back berms on both sides of the road corridor. A 7m wide carriageway has been provided as the road corridor will frequently facilitate bus movements and other large heavy commercial vehicles (HCVs) accessing the Village Centre for loading and servicing requirements. The road has been designed to conform to the 40kph design speed specified in Appendix 1 (Road Function and Design Details Table) of the I458 precinct provisions. The proposed cross-section of the primary collector (spine road) is shown in **Figure** below and complies with the *Collector Road* design requirements as outlined *in I458.6.14 Appendix 1: Beachlands South Precinct, Road Function and Design Details table*.

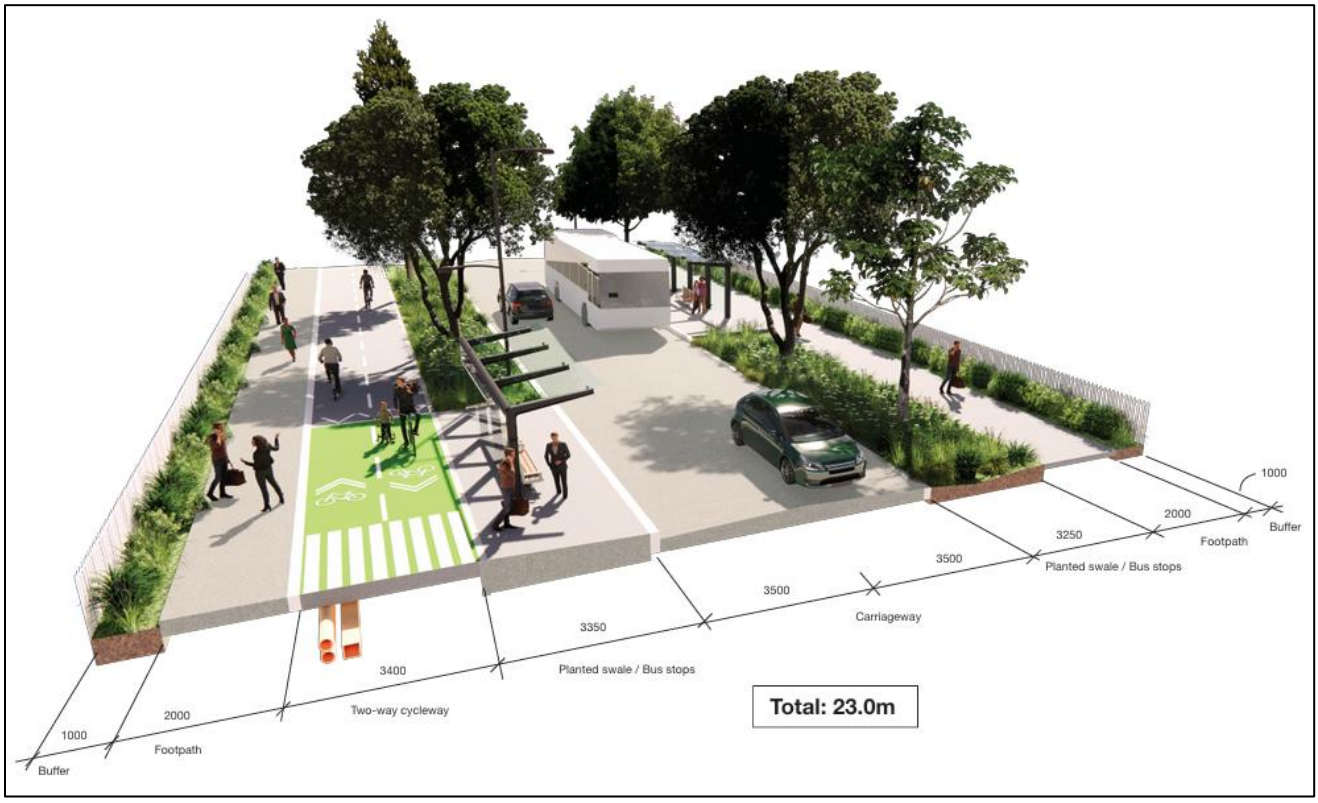

Figure 7-5: Collector Road (Spine Road) Cross-Section

Primary Collector (Adjacent to Schools)

The proposed development also includes provision for two primary collector road corridors extending between the village centre at the southern end, and Jack Lachlan Drive at the northern end. These two road corridors extend approximately parallel to encompass the area reserved for a primary school and secondary school.

These two road primary collector (school) corridors are proposed to have a 23m cross-section along their entire length including provision for a 7m wide, two-way, two-lane carriageway, 3.3m wide front berms to accommodate street furniture, trees, on-street parking and bus stops, a 3.4m bi-directional cycleway and a 2.3m footpath on the side adjacent to the educational facility, a 1.8m wide footpath on the opposite side and 1m back berms on both sides of the road corridor. A 7m wide carriageway has been retained as the road corridor will likely facilitate school bus movements. A separated bi-directional cycleway and a wider 2.3m wide footpath have been provided on the school side of the corridor to allow for the high pedestrian movement during peak times (school opening and closing times). The road has also been designed to conform to the 40kph design speed specified in Appendix 1 of the precinct provisions.

The proposed cross-section of the primary collector (school road) is shown in **Figure** and complies with the *Collector Road* design requirements as outlined *in I458.6.14 Appendix 1: Beachlands South Precinct, Road Function and Design Details table*.

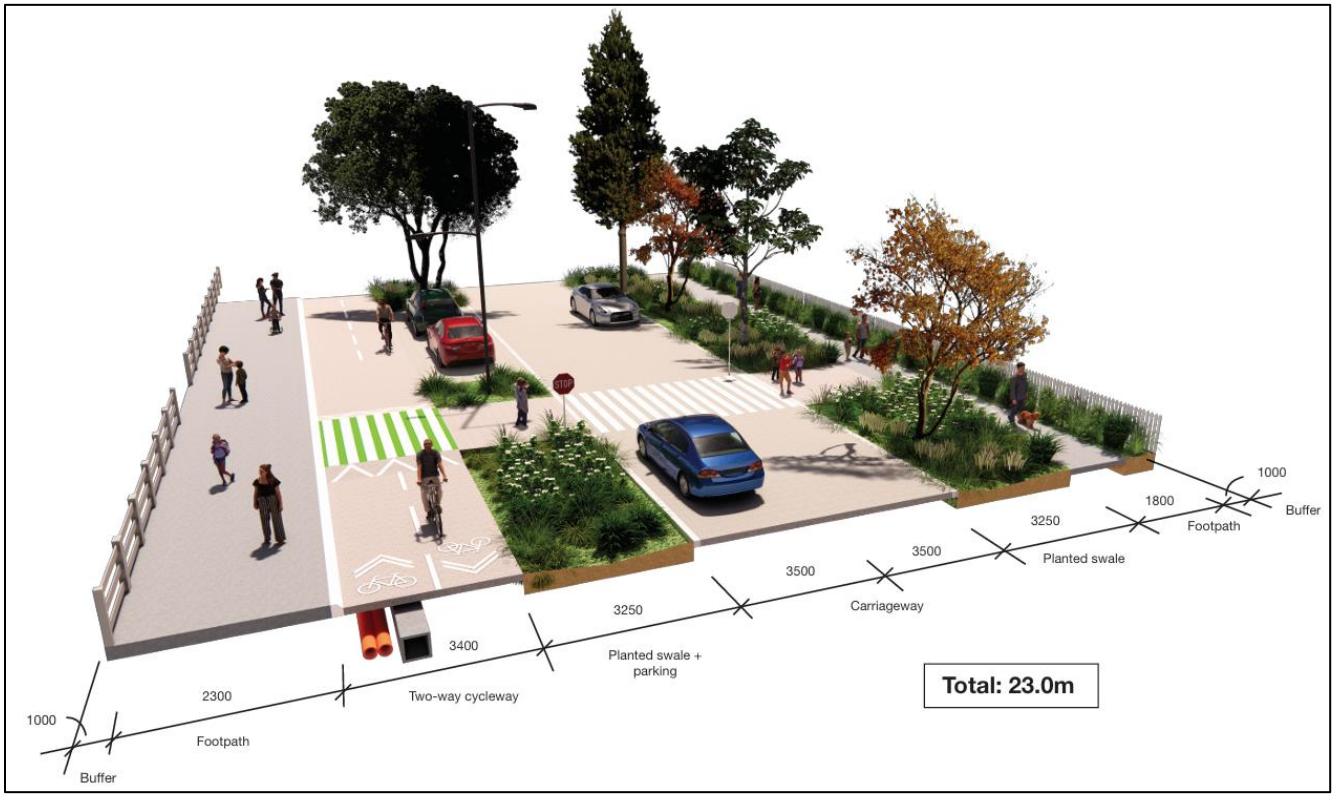

Figure 7-6: Primary Collector (school) Cross-Section

Primary Collector (Village Centre)

The Primary Collector (Village Centre) extends through the Village Centre within the proposed Beachlands South development. The road is designed as a slow-speed zone which prioritises pedestrians due to the area having high levels of foot traffic, and a wide variety of users such as children and elderly. As such, it is expected that cyclists will use the carriageway within the Village Centre.

The Primary Collector (Village Centre) is proposed to have a 20m cross section including provision for a 7m wide, two-way, two-lane carriageway, 2.65m wide front berms, 2.85m wide footpath and a 1m back berm on both sides of the road corridor. The carriageway will be demarcated by a change in the surface treatment, no road markings, and a flush carriageway to reinforce slow traffic speeds. Several mid-block road crossings will also be provided for safe pedestrian crossing. The front berm will accommodate vehicular parking, trees, planting strips, cycle parking and street furniture and a wider footpath will ensure a

pedestrian focused street environment. The road has been designed to conform to the 40kph design speed specified in Appendix 1 of the precinct provisions.

The proposed cross-section of this road is shown in **Figure** below. It is noted that Appendix 1 requires collector road corridors to have a minimum road reserve width of 23m and cycle provisions, however this cross section does not provide dedicated cyclist provisions, and has a width of only 20m, resulting in a non-compliance against the Precinct provisions. However, given the high level of foot traffic expected in this area, the road corridor has been designed to place an emphasis on pedestrian priority by providing wide (2.85m) footpaths. Cyclists will travel within the 7m carriageway which has also been designed to provide a slow speed zone resulting in increased safety for all road users. As such, despite the non-compliance, the proposed cross-section is considered appropriate for the environment.

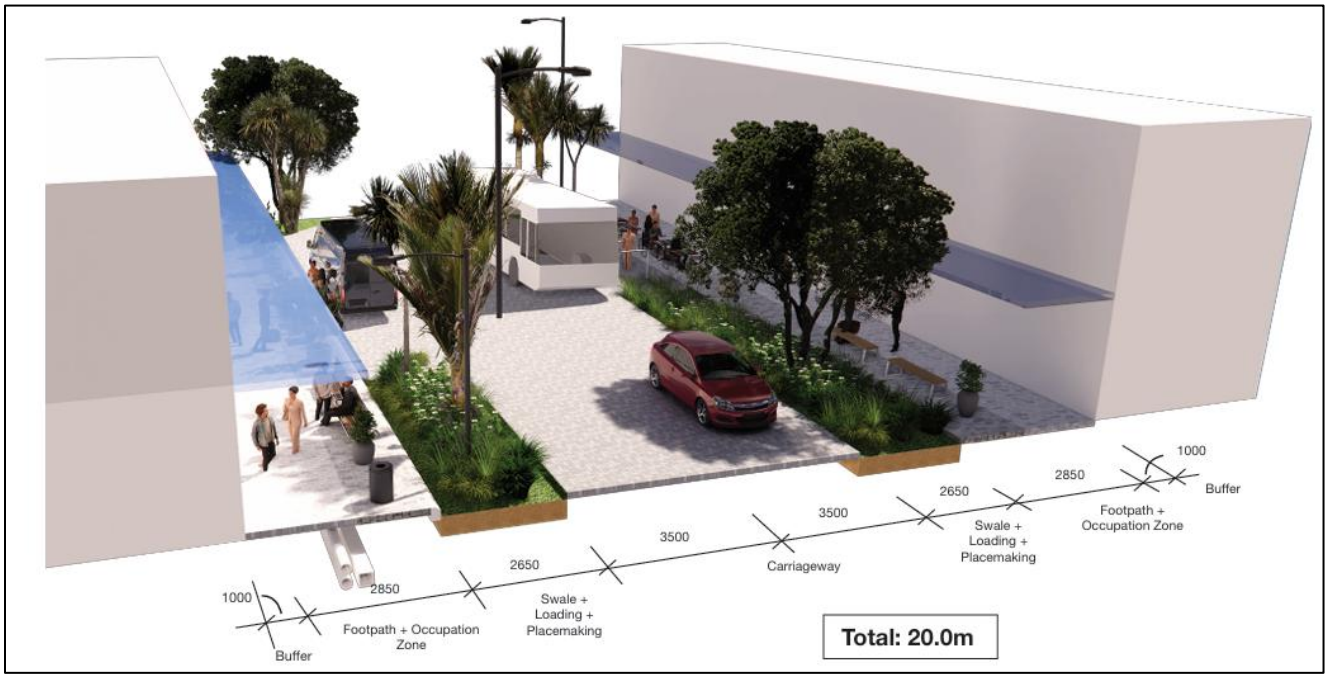

Figure 7-7: Primary Collector (Village Centre) Cross-Section

Village Centre Secondary Road (Local Street)

The Village Centre Secondary will provide a slow-speed zone which prioritises active mode movements and safety.

Within the Village Centre, the Local Street is proposed to have a 21.7m cross-section including provision for a 6m carriageway, a 3.2m front berm, 3.6m cycleway and 1.8m wide footpath on the village centre side of the carriageway, and a 2.7m front berm, and 2.4m wide footpath on the alternate side of the carriageway. A 1m wide back berm will also be provided on both sides within the road reserve. The front berm will accommodate

vehicular parking, trees, planting strips, cycle parking and street furniture and provisions for a cycleway, and wider footpath will ensure a pedestrian focused street environment.

Similar to the Primary Collector (Village Centre), the road surface will be demarcated by a change in the surface treatment, no road markings and a flush carriageway. The road has been designed to conform to the 30kph design speed specified in Appendix 1 of the precinct provisions for local streets. The proposed cross-section of the Village Centre Secondary Road (Local Street) is shown in **Figure 7-8** below and complies with the Village Centre Local design requirements as outlined in Appendix 1.

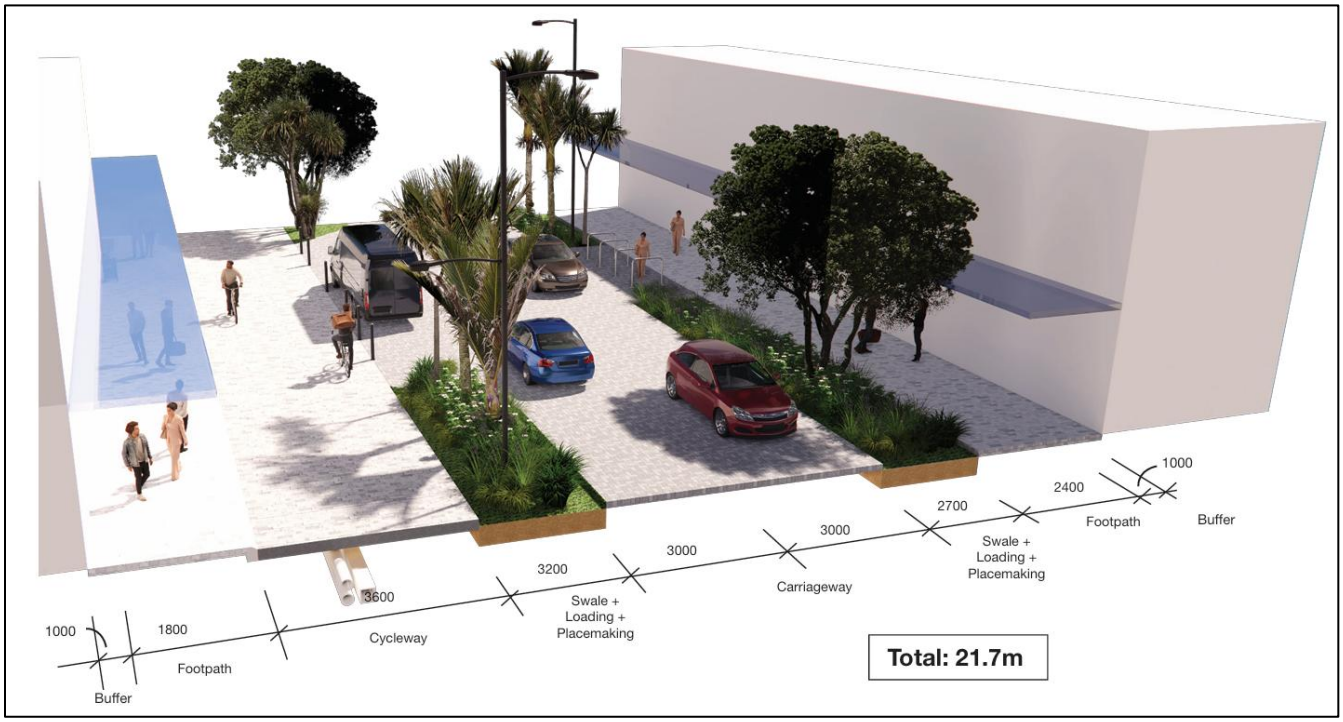

Figure 7-8: Village Centre Secondary Cross-Section

Local Roads

The proposed development includes several local roads mainly providing access to the residential zones within the Site, all of which have been designed with a 30kph design speed as per Appendix 1. The primary function of these road corridors is to connect dwellings within these residential zones to secondary and primary collector roads.

Local roads are proposed to have a 16.6m cross-section including provision for a 6m wide carriageway, 2.5m wide front berm, 1.8m wide footpath, and 1m rear berm on both sides of the road corridor. The carriageway width is designed to be 6m to encourage a slow-speed street environment. The 2.5m wide front berm will accommodate on-street parking, street

furniture and landscaping along the length of the corridors. The proposed cross-section of the local road is shown in **Figure 7-9** below and complies with the Local Road design requirements as outlined in Appendix 1.

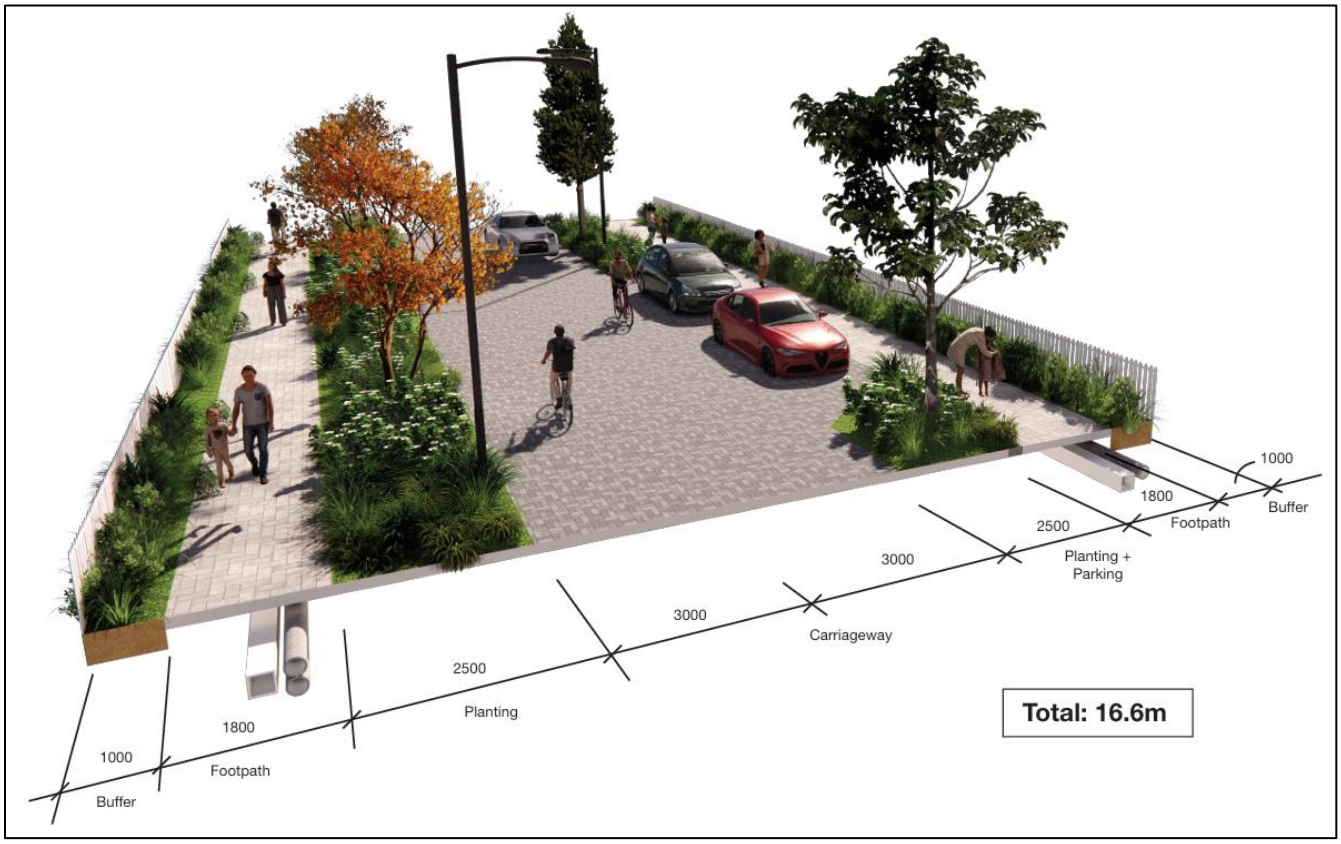

Figure 7-9: Local Road cross-section

Local Road (Wide - Residential)

In addition to the standard Local roads, the proposed development also proposes wide local roads in both the residential and industrial zonings. Within the residential zone, the wide local road extends from the eastern boundary of the live zoned land to a cul-de-sac at its western end. It is anticipated, that in the future, the wide local road will extend further east beyond the current live zone boundary.

The primary difference between a wide local road – residential and a standard local road is replacement of a 1.8m wide footpath on one side of the corridor with a 3m active mode path resulting in an overall road reserve width of 17.8m (increase of 1.2m compared to standard local road). The active mode path will provide better connectivity for cyclists travelling within the development Site by providing an enhanced off-road cycling facility.

The proposed cross-section for a wide Local Road – Residential is shown in **Figure 7-10** below and complies with the Local Road design requirements as outlined Appendix 1.

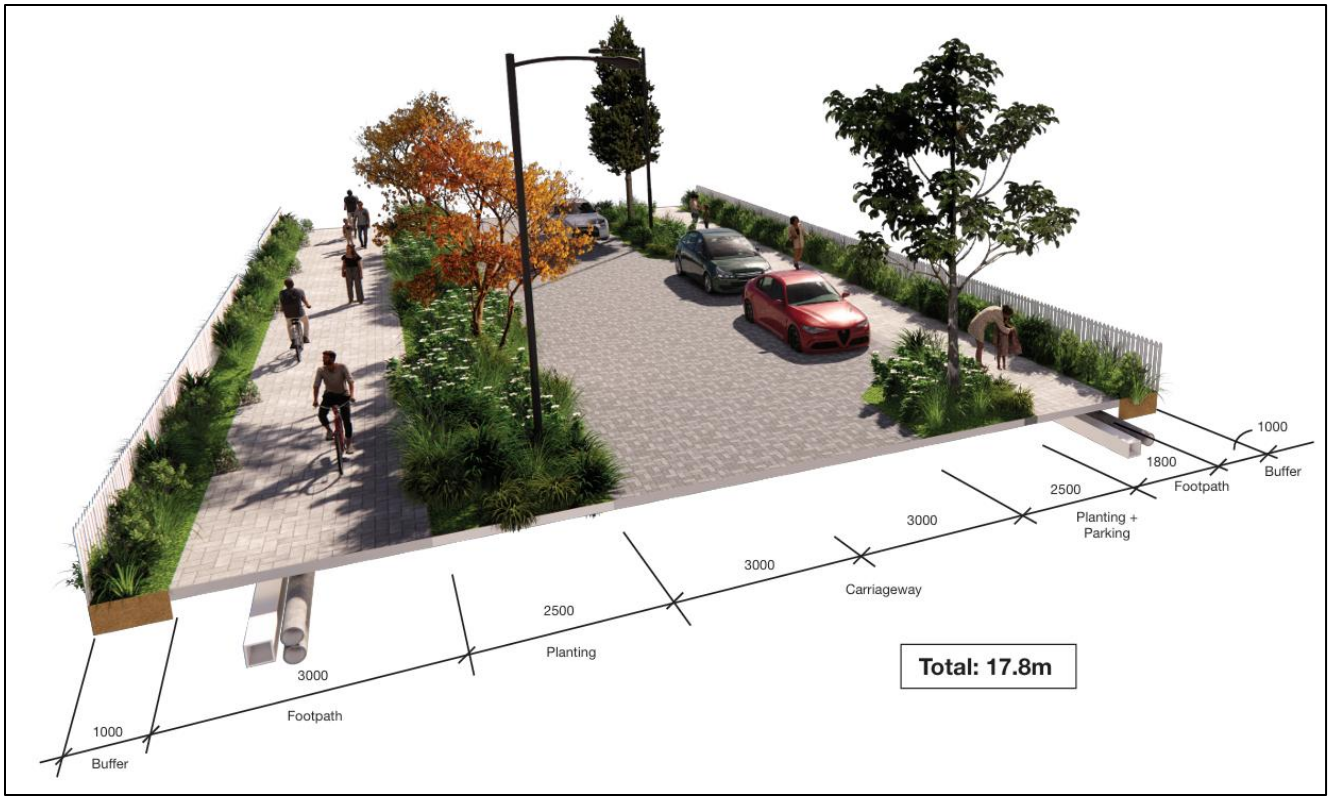

Figure 7-10: Wide Local Road (Residential) Cross-Section

Local Road (Wide – Industrial)

A wide local road is also proposed within the industrial area near the eastern boundary of the Site. This road corridor is proposed to have a 17m wide cross-section including provision for a 6.6m wide, two-way, two-lane carriageway, 2.3m berm on one side, 2.5m berm on alternate side, and 1.8m wide footpath, and 1m back berm on both sides. The primary differences compared to a standard local road are the wider carriageway, and a slightly narrower front berm on one side of the carriageway. The wider carriageway has been designed to accommodate larger vehicles which can be expected for roads serving industrial activities. The proposed cross-section of the wide Local Road (Industrial) is shown in **Figure 7-11** below and complies with the Business Local Road design requirements as outlined in Appendix 1.

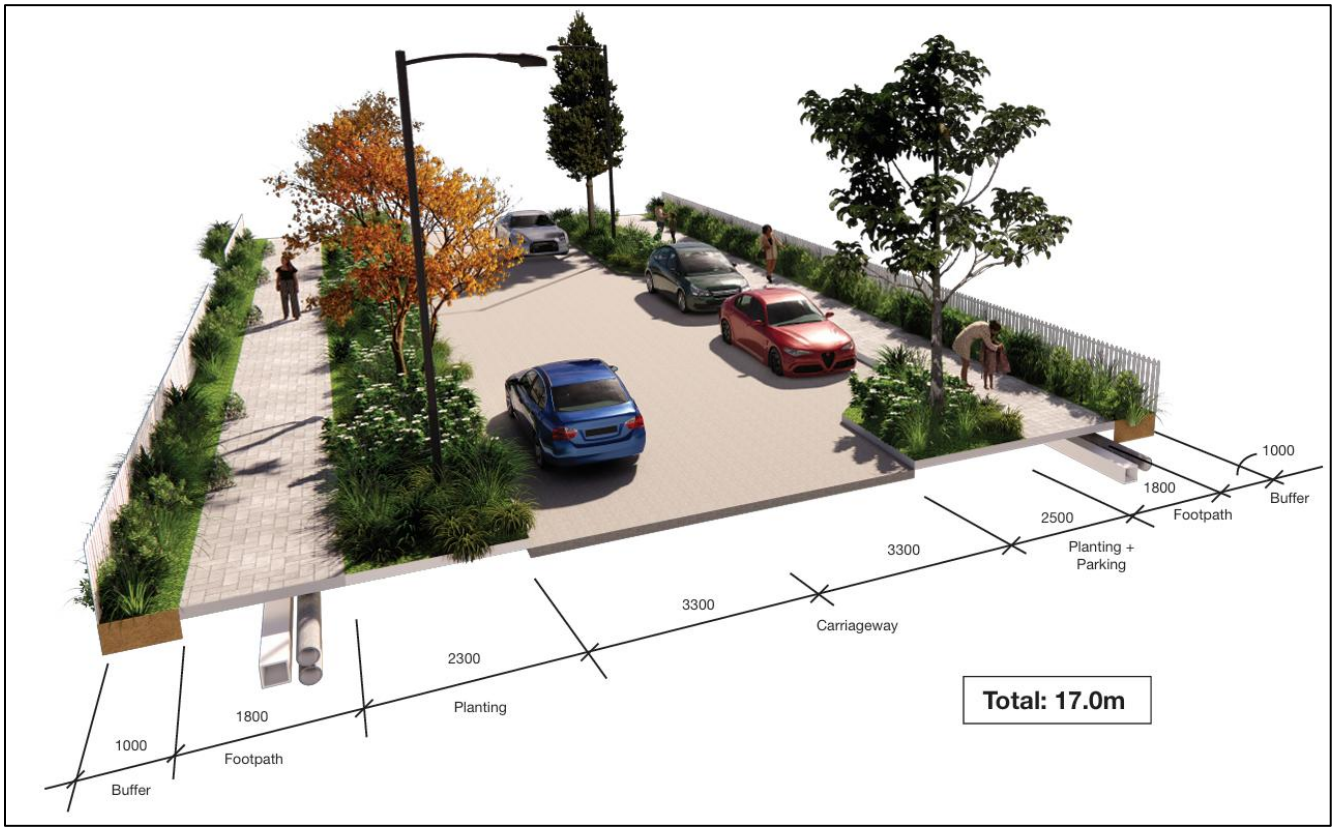

Figure 7-11: Wide Local Road (Industrial) Cross-Section

Jointly Owned Access Lots

The Project includes provision for several jointly owned access lots (JOALs) to provide property access. JOALs are favourable as they provide a shared accessway to multiple properties whilst restricting the total number of vehicle crossings onto the road corridor. Several JOALs are proposed within the Site with a legal width of either 6m or 9m depending on the number of dwellings served from each JOAL.

A JOAL with a legal width of 9m includes provision for a 6m wide trafficable carriageway (two-way vehicular flow), a 1.5m wide back berm on one side, and a 1.5m grade separated primary pedestrian access route (footpath) as shown in **Figure** below.

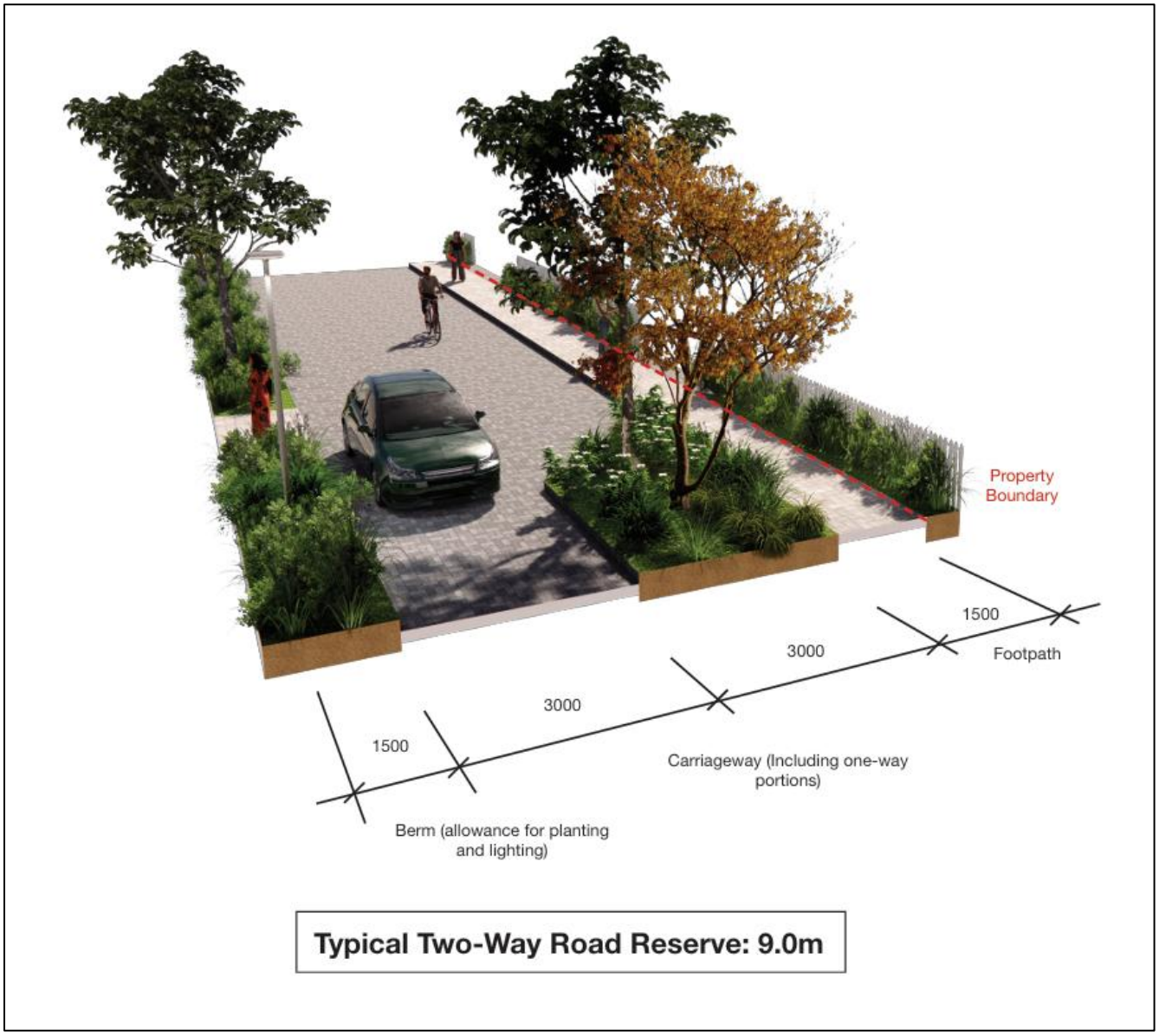

Figure 7-12: 9m Legal width JOAL - Cross Section

A JOAL with a legal width of 6m includes provision for a 3m wide trafficable carriageway (one-way vehicular flow), a 1.5m wide back berm on one side, and a 1.5m grade separated primary pedestrian access route (where the JOAL is serving 6 or more lots) as shown in **Figure** below. Where a JOAL is serving less than 6 lots, the 6m wide JOAL will consist of a 4.5m wide active mode path to be used by all road users, and a 1.5m berm as shown in **Figure 7-14** below**.**

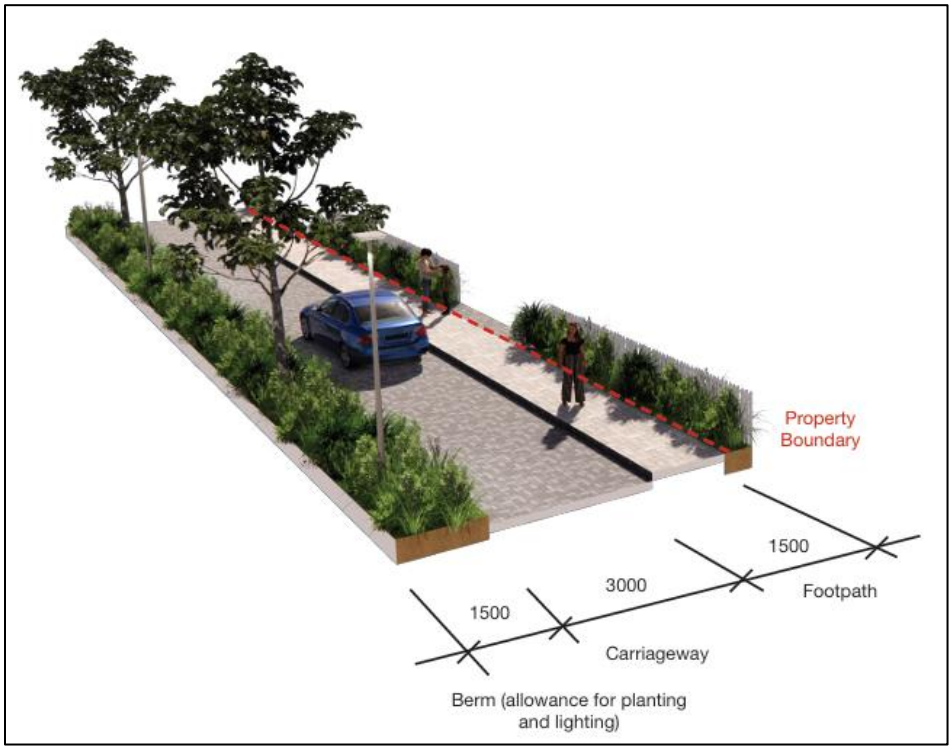

Figure 7-13: 6m Legal width JOAL - cross section (JOAL serving 6 or more lots)

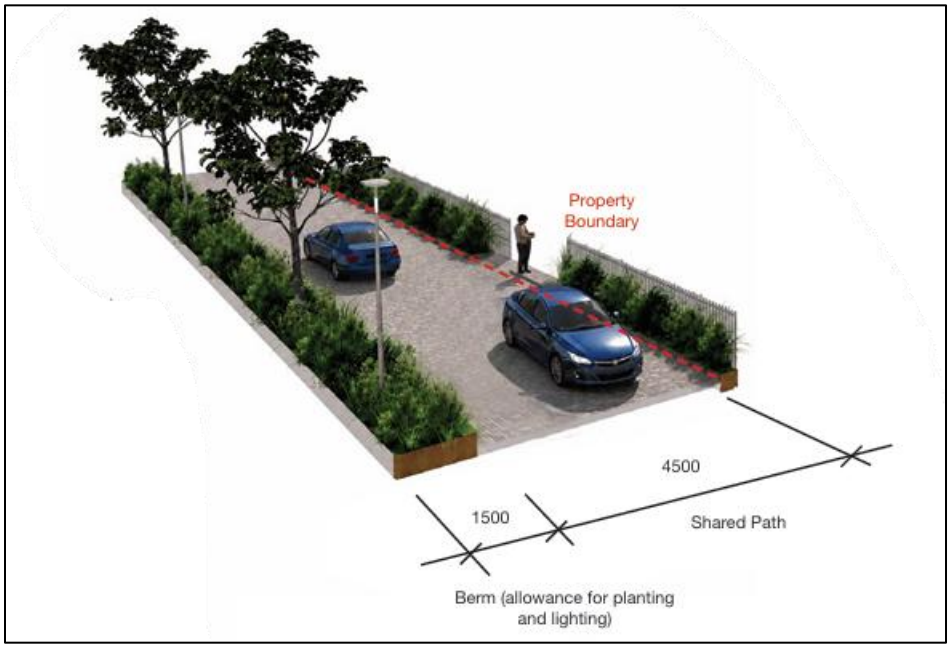

Figure 7-14: 6m Legal width JOAL - cross section (JOAL serving fewer than 6 lots)

All proposed JOALs comply with the updated requirements outlined in the consent order version of PC79 which became fully operative and integrated in the AUP as of 8 May 2026. This is also discussed in the Statutory Requirements Section later in this report.

Jack Lachlan Drive

Jack Lachlan Drive currently provides a two-way, two-lane carriageway, and an unsealed footpath on the northern side of the road corridor between the Whitford-Maraetai Road and Kahawairahi Drive intersections. The speed limit is currently 60kph along its length, but it is intended to reduce this to 50kph as part of this Project. However, Auckland Transport has control over speed limits so will need to undertake the speed reduction process. Appendix 1 specifies a 50kph speed limit for this road. Currently, no footpath is provided west of Kahawairahi Drive. This is typical as much of the roadside environment is currently rural in nature. As part of the Project, the JLD corridor will be upgraded, however due to spatial and topographical constraints surrounding the road reserve, the design of upgrades along the road corridor will vary as shown in **Figure 7-15** and discussed below.

Figure 7-15: Jack Lachlan Drive Upgrade Sections

Segment A (East of Kahawairahi Drive)

East of the Kahawairahi Drive intersection (segment A in Figure 7-15), the proposed 20.7m road reserve width will provide a 7m wide two-way, two-lane carriageway, 2.35m wide front berm, a 1.8m wide footpath, a 1m wide back berm on both sides of the road corridor and a 3.4m wide bi-directional cycleway on the northern side of the road corridor as shown in **Figure 7-16** below**.** The carriageway has been retained at a 7m width to allow for HCVs and

buses to comfortably travel along the corridor. It is noted that the proposed 20.7m wide cross-section does not comply with Appendix 1 of the precinct provisions which requires JLD to have a minimum road reserve width of 23m. However, despite the non-compliance, the 20.7m wide road corridor is considered sufficient to meet all required uses of the corridor, including bus provision, cycle provision, and pedestrian provision in line with the precinct provision requirements, therefore having no material impact on the safe and efficient operation of the road corridor. Further, note 1 of the Appendix 1 table specifies that the typical minimum road reserve width "*may need to be varied in specific locations where required to accommodate network utilities, batters, structures, stormwater treatment, intersection design, significant constraints or other localised design requirements*".

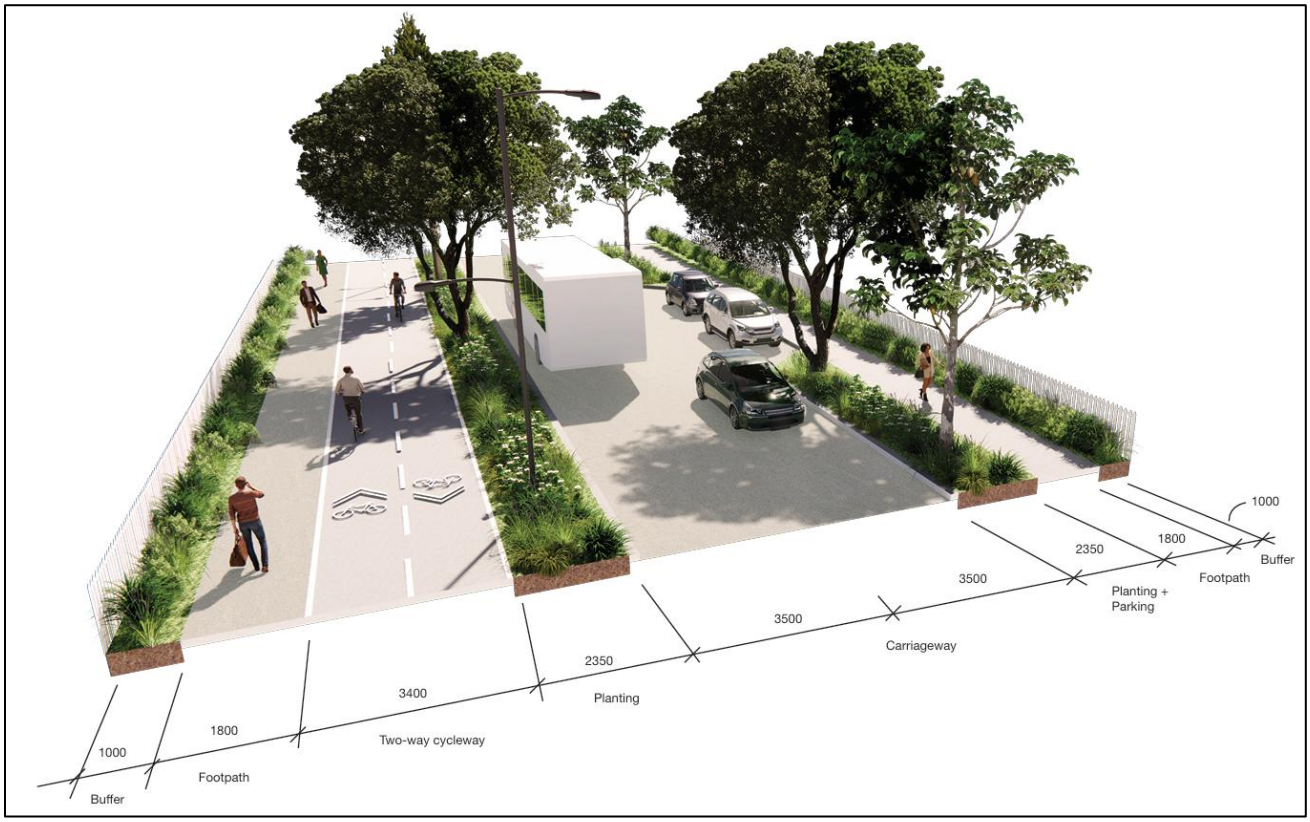

Figure 7-16: Proposed Jack Lachlan Drive Cross Section (Segment A – East of Kahawairahi Drive)

Segment B (Kahawairahi Drive to Boat Houses)

Between the Kahawairahi Drive/JLD intersection and the boat houses at the western end (segment B in Figure 7-15), it is proposed to upgrade the existing Jack Lachlan Drive corridor to provide a 7m wide two-way, two-lane carriageway, a 2.3m wide front berm, 3.3m wide bi-directional cycleway, 1.8m wide footpath and a 1m back berm on the southern (development) side of the road corridor. A signalised cyclist crossing facility will be

provided on the western leg of the JLD/Kahawairahi Drive intersection allowing cyclists to switch from the cycleway on the northern to the southern side of the corridor. The proposed cross-section of this section of the road corridor is shown in **Figure 7-17** below.

The northern side of the road corridor does not provide any active mode facilities due to topographical constraints limiting any development and earthworks on this side. The existing road reserve boundary on the northern side of the corridor also varies along the section resulting in the overall road reserve width of Segment B varying between 21.7m – 23m. As a result of the varying width, this segment of JLD does not fully comply with the Arterial road requirements as outlined in Appendix 1 which requires a minimum road reserve width of 23m and pedestrian provision on both sides of the road corridor.

The omission of a footpath on the northern side of the corridor is unlikely to have any adverse impact on the operation or safety of the JLD corridor as a separated bi-directional cycleway, and a 1.8m wide footpath is provided on the southern side which will connect the proposed development to the existing Beachlands town and Pine Harbour ferry terminal. Additionally, despite the varying road reserve width, well-connected active mode facilities, and a 7m wide carriageway is provided along the entire segment B of JLD, therefore it is unlikely to have any adverse material impact on the safety and operation of JLD corridor.

It is noted that Auckland Transport was requested to review this aspect of the Project, and indicated general agreement (pending detailed design confirmation) due to the evident constraints.

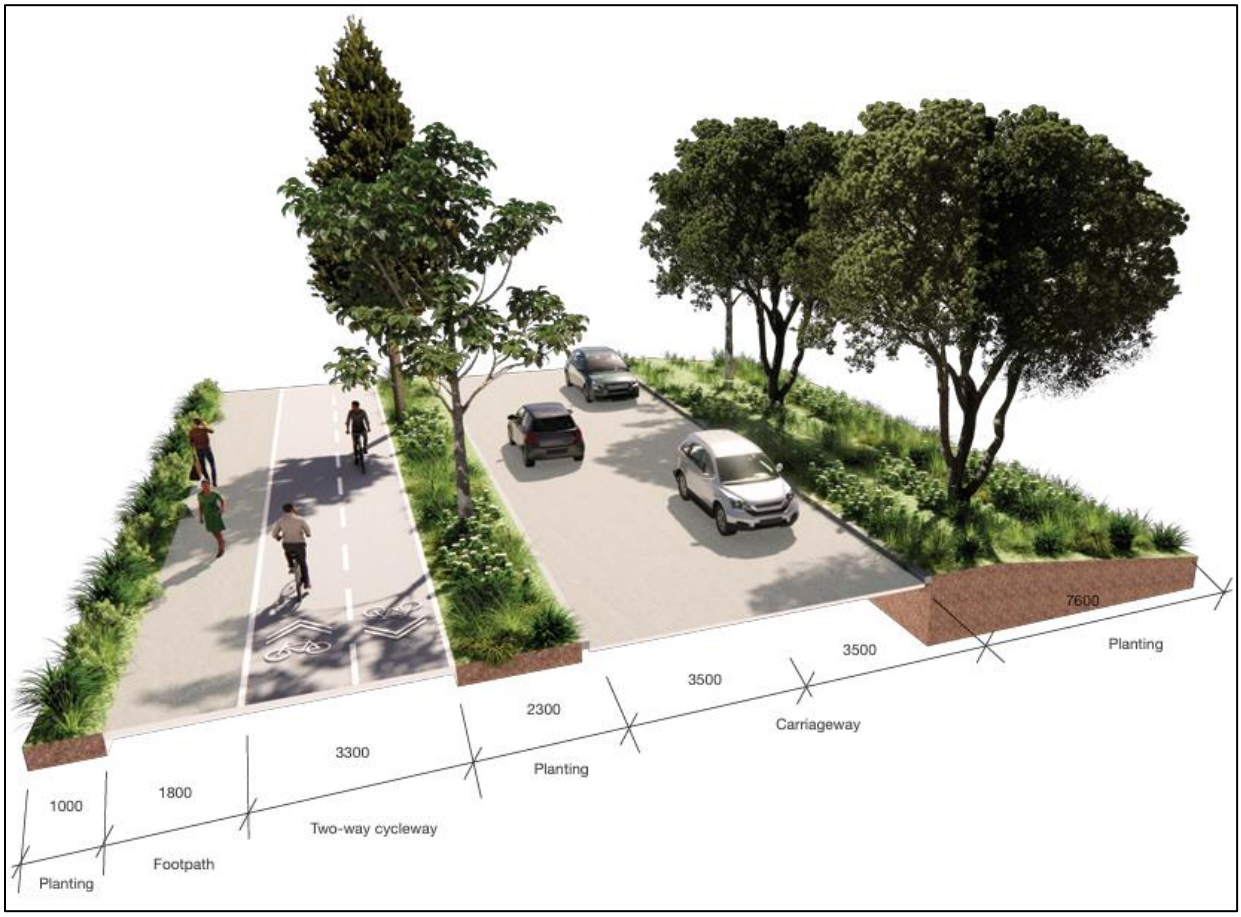

Figure 7-17: Proposed Jack Lachlan Drive Cross Section (Segment B - Between Boat Houses and Kahawairahi Drive)

Segment C (Boat Houses)

Near the boat houses at the western end of the road (segment C in **Figure 7-15**), spatial constraints limit the road reserve width to a maximum of 20m. As such, through this section the existing corridor will be upgraded to retain its existing 10m wide carriageway, and its 1.8m footpath on the northern side of the road corridor. A new 3m active mode path on the southern side of the corridor will be added to connect the Project to Pine Harbour. The 10m wide carriageway through this segment represents a curve treatment of its existing alignment. A 1m and 4.2m back berms will also be provided on the southern and northern sides respectively where possible, as the road reserve width varies through this segment. The proposed cross-section of this section of the road corridor is shown in **Figure 7-18** below.

The retained 20m wide proposed cross section does not comply with Appendix 1 as it is not possible to achieve a 23m wide road reserve, however the road corridor has been designed to accommodate the proposed bus route, and a shared active mode path on the southern side, hence minimising any adverse impact on the safe and efficient operation of the road

corridor. It is noted that Auckland Transport was requested to review this aspect of the Project, and indicated general agreement (pending detailed design confirmation) due to the evident constraints.

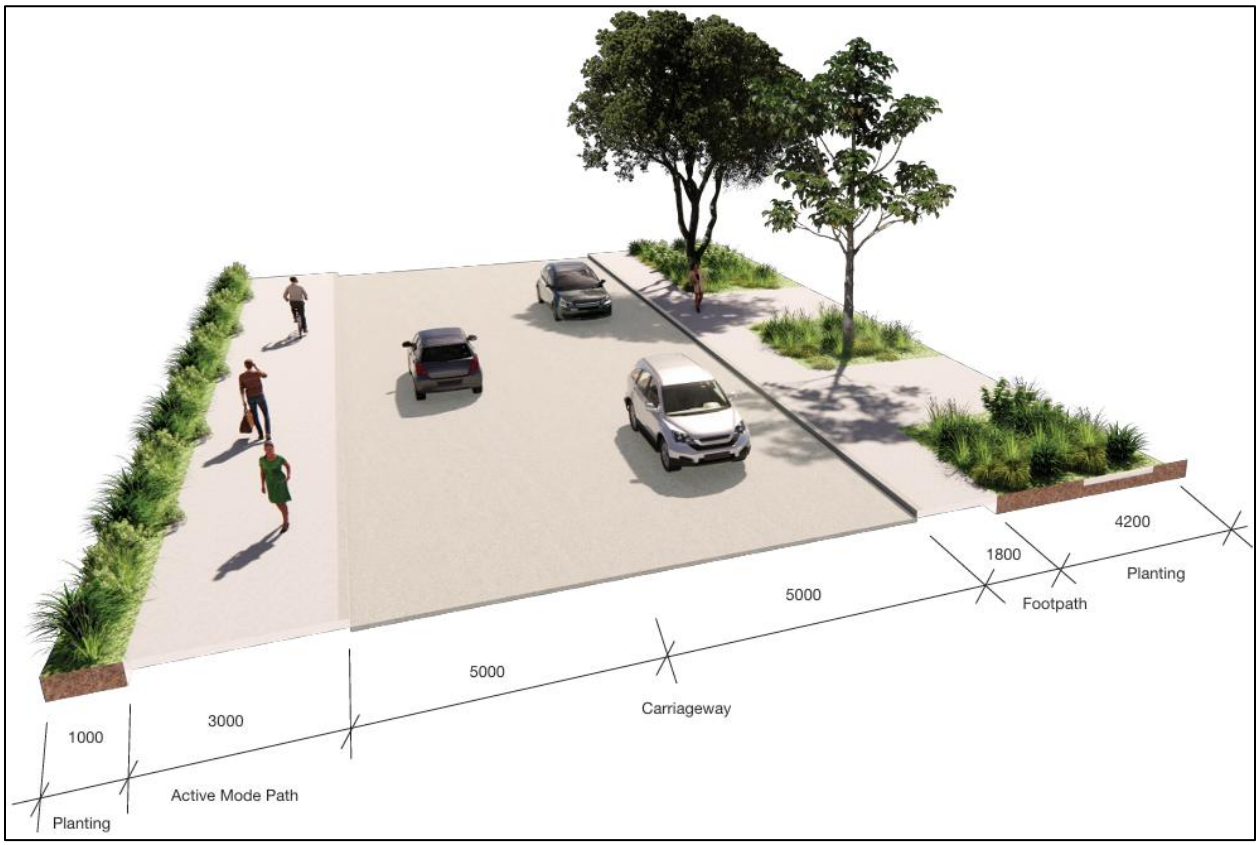

Figure 7-18: Proposed Typical Jack Lachlan Drive corridor Cross Section (Segment B boat houses)

7.4 External Connection Intersections

As summarised earlier, and as circled in red in **Figure 7-19** below the proposed internal roads within the Site will connect onto Jack Lachlan Drive at five different locations and onto Whitford-Maraetai Road through the 712 Whitford-Maraetai Road landholding. This sub section presents the design of each. The full design package including vehicle tracking is provided in the HG Civil Design set.

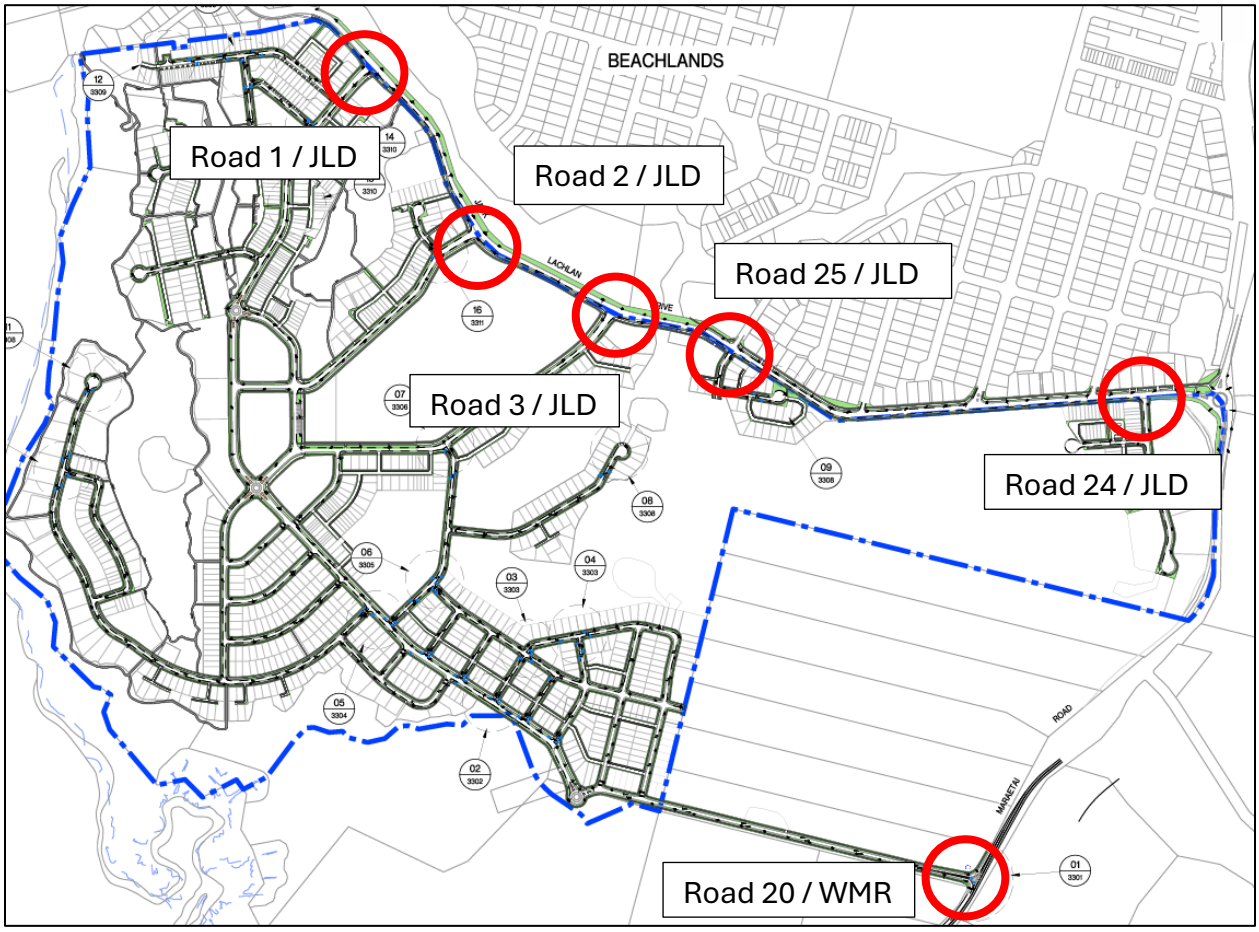

Figure 7-19: Overview of Proposed Site Connection Intersections

Road 1 / Jack Lachlan Drive Intersection

Road 1 Collector Road (Spine Road) / Jack Lachlan Drive intersection (intersection 1 in Figure 7-2 above) is proposed to be a signalised T-intersection, as shown in **Figure 7-20** below. The two Jack Lachlan Drive approaches have separate through and turning lanes for vehicles turning onto Road 1. The Road 1 approach has separate lanes for vehicles turning left and right onto Jack Lachlan Drive. All approaches have one departure lane. Signalised pedestrian and cyclist crossing facilities are only provided across Road 1 and not across the two Jack Lachlan Drive approaches, as the bi-directional cycle lane and footpath is only proposed along the southern side of Jack Lachlan Drive. As such, no pedestrian crossing facilities are required across Jack Lachlan Drive at this location.

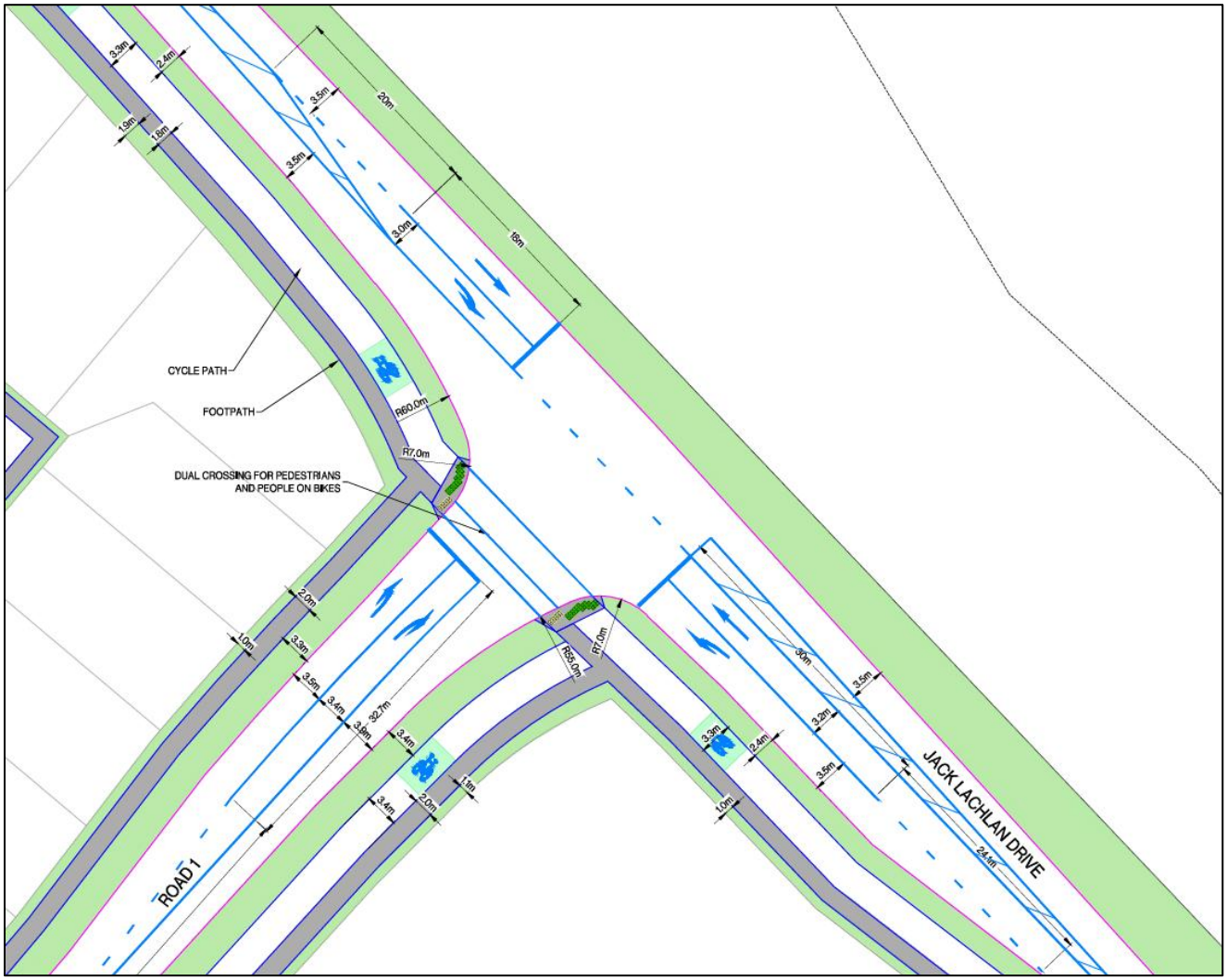

Figure 7-20: Road 1 / Jack Lachlan Drive intersection

Road 2 and 3 / Jack Lachlan Drive intersection

The Road 2 Primary Collector / Jack Lachlan Drive and Road 3 Primary Collector / Jack Lachlan Drive intersections (intersection 2 and 3 respectively in Figure 7-2 above) have the same design characteristics as the Road 1 / Jack Lachlan Drive intersection. As shown in **Figures 7-21** and **7-22**, separate through and turning lanes are provided for both Jack Lachlan Drive approaches, and two turning lanes are provided for Road 2 at both intersections. An assisted crossing facility is provided for both pedestrians and cyclists across the Road 2 and Road 3 corridors on the southern legs of both intersections. No assisted crossing facilities have been provided across Jack Lachlan Drive as no active mode facilities are proposed on the northern side of the road corridor.

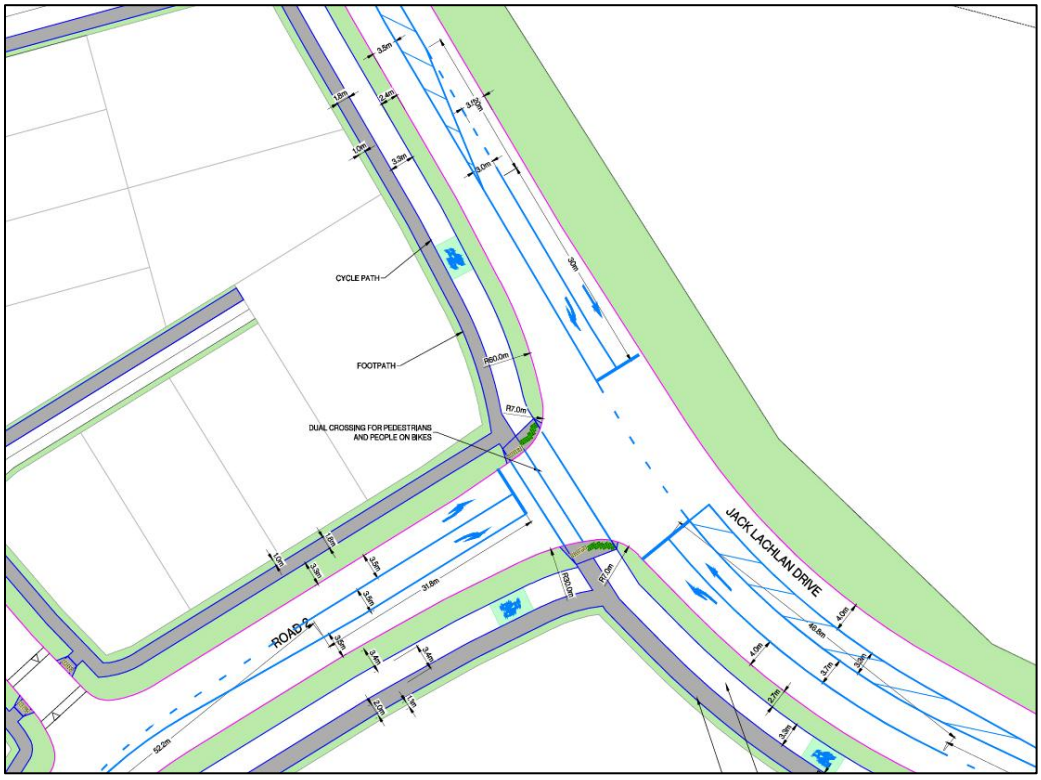

Figure 7-21: Road 2 / Jack Lachlan Drive intersection

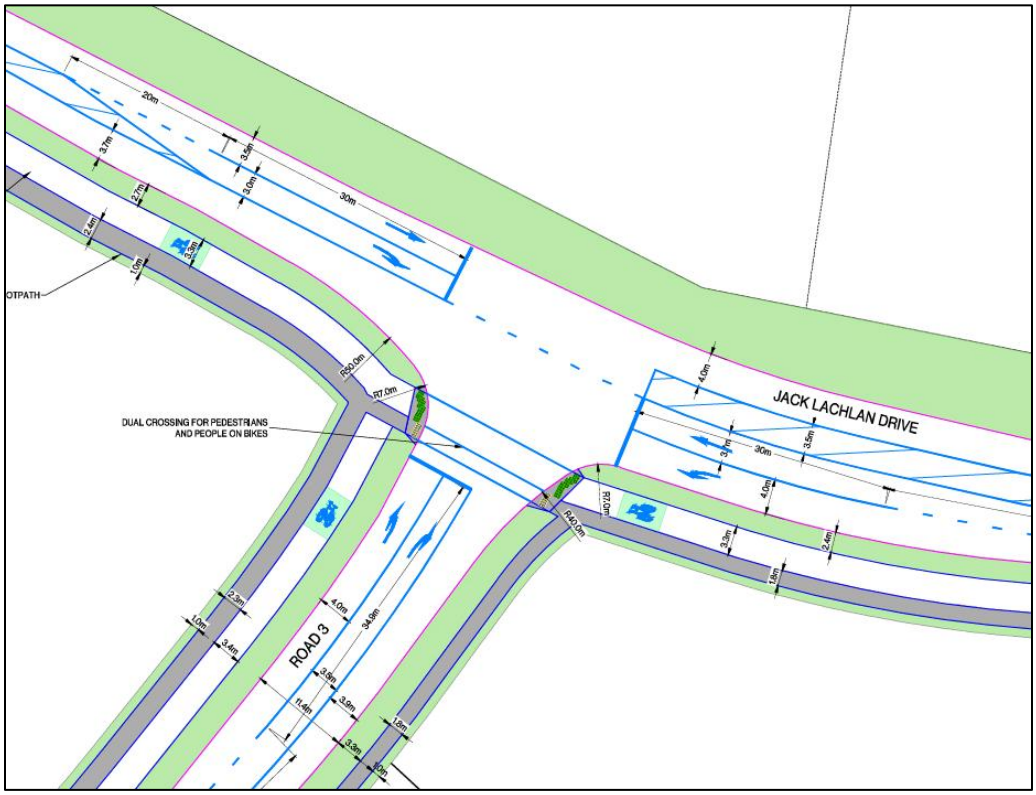

Figure 7-22: Road 3 / Jack Lachlan Drive intersection

Road 25 / Jack Lachlan Drive intersection

As shown in **Figure 7-23** below, the Road 25 Local Road / Jack Lachlan Drive intersection (intersection 4 in Figure 7-2 above) is proposed to be a signalised cross-roads intersection with Jack Lachlan Drive existing as the eastern and western approaches, Kahawairahi Drive (existing road corridor) as the northern approach and the proposed Road 25 corridor as the southern approach. Both approaches of Jack Lachlan Drive will provide a combined through and left-turn lane, and a separate right-turn lane. Both Road 25 and Kahawairahi Drive will provide one combined approach lane for turning and through movements. All approaches will provide one departure lane.

In its existing environment, an unsealed footpath is provided on the northern side of Jack Lachlan Drive to the east of this intersection. As part of the proposed development, the existing unsealed footpath will be upgraded to provide a 1.8m sealed footpath and 3.4m wide bi-directional cycleway on the northern side of the corridor and a 1.8m sealed footpath on the southern side. However, as shown, the cycleway will switch from the northern to the southern side of the Jack Lachlan Drive at this intersection. Accordingly, assisted crossing facilities have been provided across Kahawairahi Drive and the western approach of Jack Lachlan Drive. West of this intersection, the bi-directional cycleway and footpath will be provided on the southern side of this road corridor.

It should be noted that Figure 7-23 shows a footpath on the northern side of the corridor to the west of the intersection, but that is not a northern roadside footpath, it is a recreational path through the reserve to the north of Jack Lachlan Drive. As described earlier, the footpath does not continue along Jack Lachlan Drive to the west due to topographical constraints.

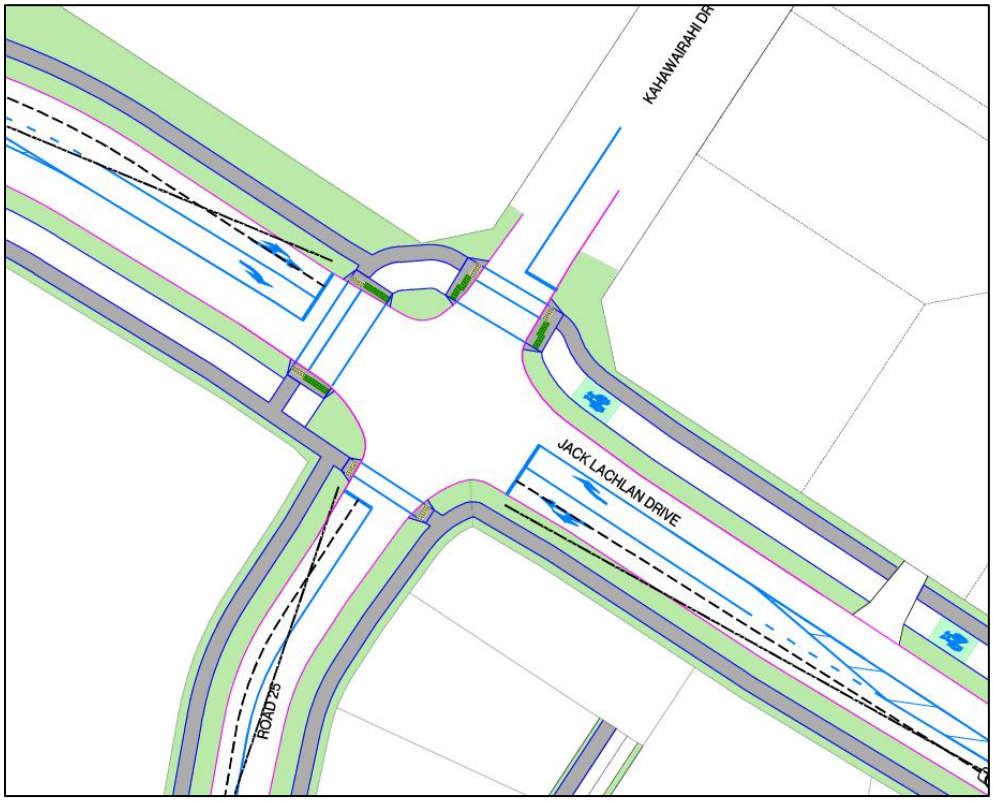

Figure 7-23: Road 25 / Jack Lachlan Drive / Kahawairahi Drive Intersection

Road 24 / Jack Lachlan Drive Intersection

The Road 24 Industrial Local / Jack Lachlan Drive Intersection (intersection 5 in Figure 7-2 above) is designed as a give-way priority intersection. It will provide a right turn bay on Jack Lachlan Drive to ensure right turners do not block through traffic. **Figure 7-24** below shows the general arrangement.

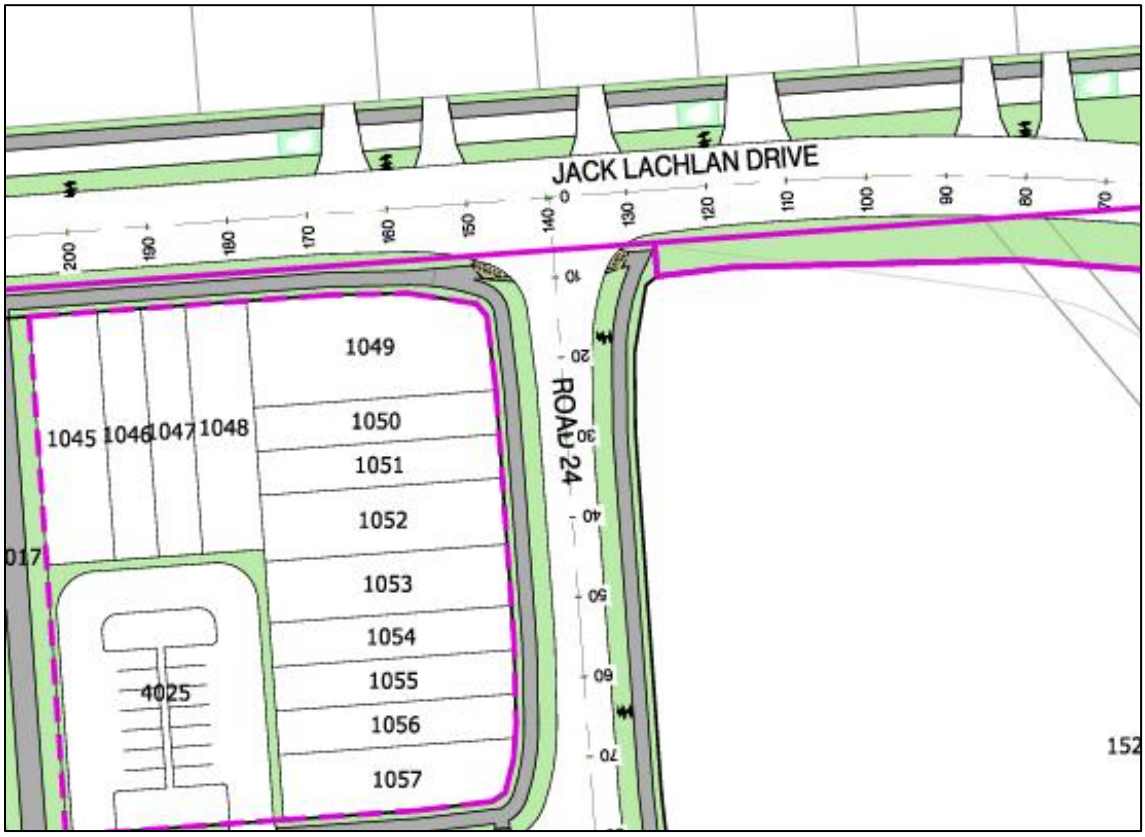

Figure 7-24: Road 24 Industrial Local / Jack Lachlan Drive Intersection

Road 20 / Whitford-Maraetai Road Intersection

Road 20 Local runs through the 712 Whitford-Maraetai Road site to intersect as a left-in / left-out (LILO) intersection (intersection 6 in Figure 7-2 above) with Whitford-Maraetai Road, as shown in **Figure 7-25**.

The intersection provides:

- A solid median through the intersection to enforce the prohibition of right turns;
- An 165m auxiliary acceleration lane to the north, plus an 80m taper; and
- A 93m auxiliary deceleration lane from the south, plus a 25m taper.

These dimensions are sufficient to satisfy visibility requirements, assuming a 90kph operating speed (speed limit 80kph).

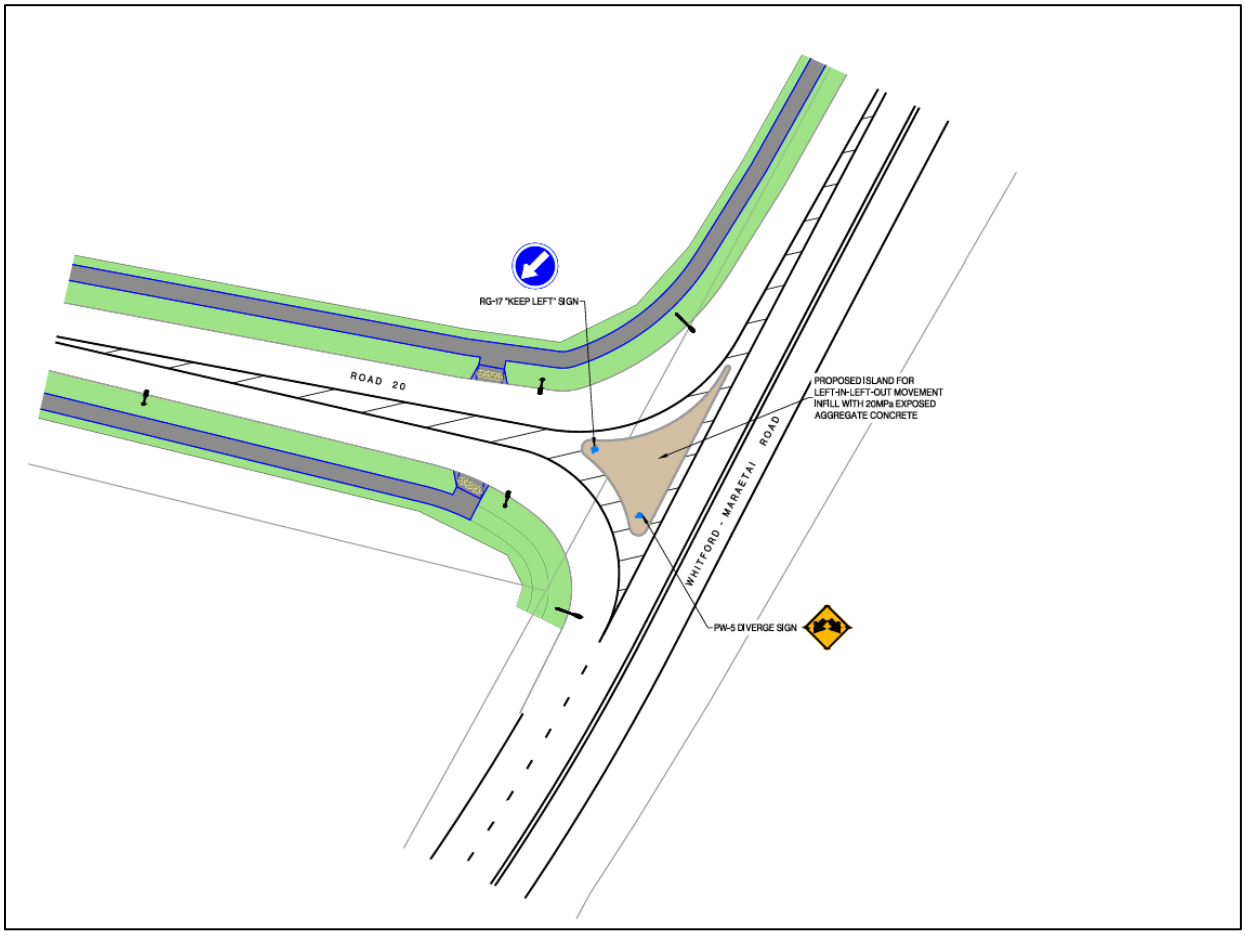

Figure 7-25: Road 20 / Whitford-Maraetai Road Intersection

7.5 Internal Give-Way Intersections

The Site includes several priority controlled, stop controlled and roundabout (RAB) intersections. **Figure 7-26** below shows the overview Site plan showing internal intersection locations. This section outlines the design characteristics of each of the internal intersections identified in red and labelled in yellow below.

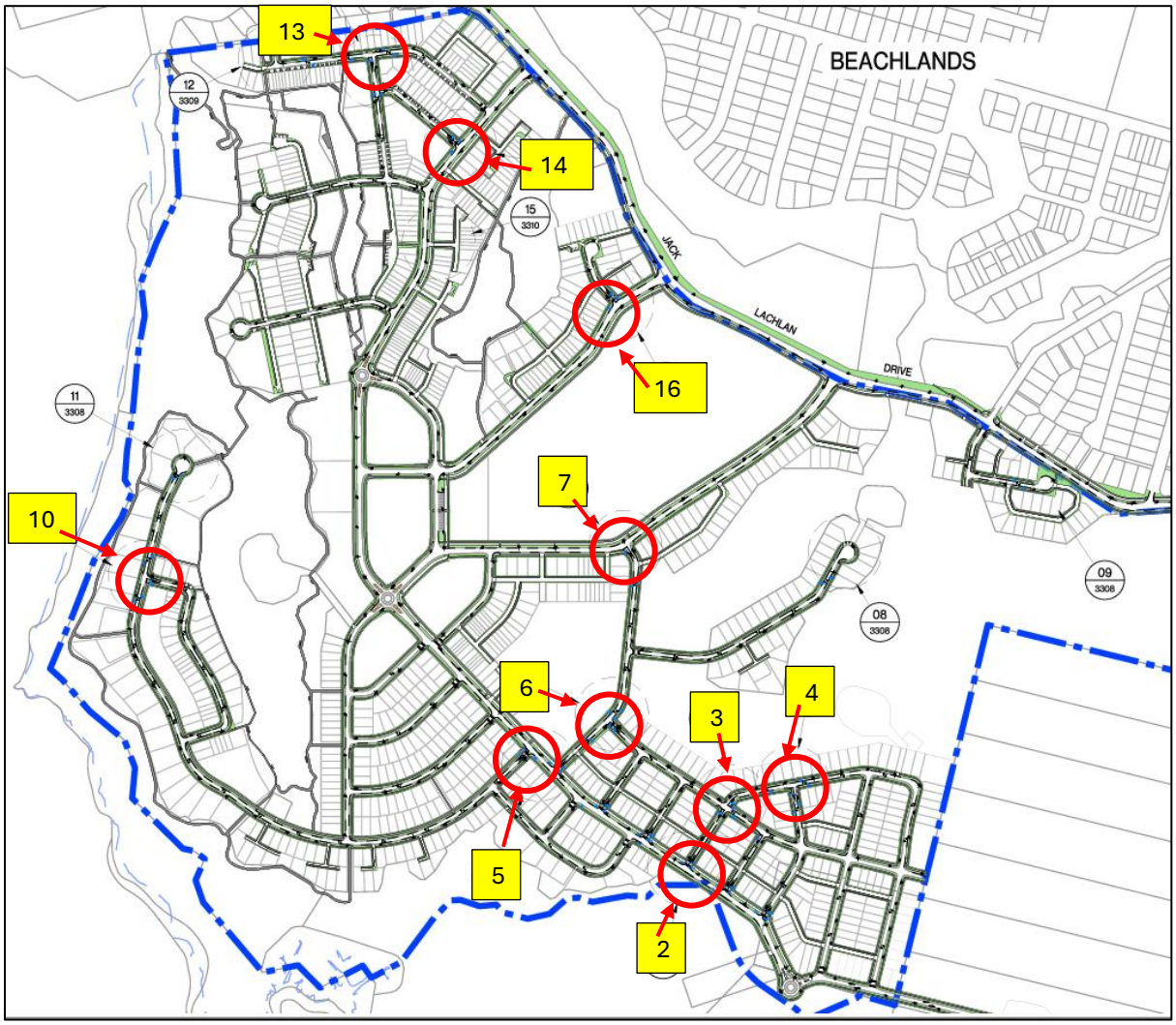

Figure 7-26: Overview of Internal Priority or Stop-Controlled Intersections

Intersection 2

Figure 7-27 below shows the typical T-intersection proposed between the primary collector (spine) road and a local road as proposed within the CE4 super lot. Road 20 has priority as it is a higher hierarchy road corridor. As shown, a raised, and unassisted pedestrian and cycle crossing facility is provided across each of the intersecting local road corridors. No speed calming devices are provided on the collector road corridor in vicinity of the intersection.

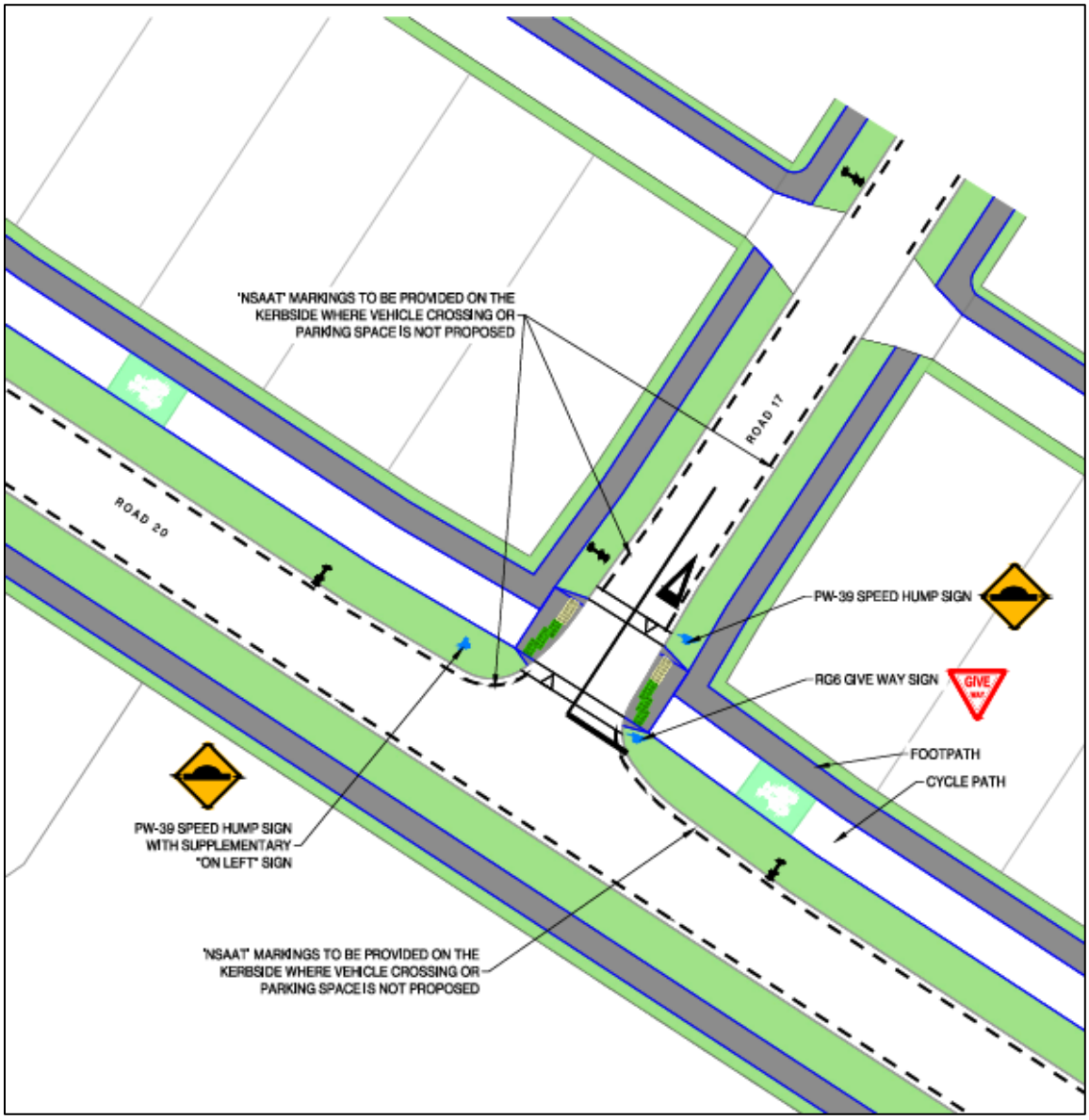

Figure 7-27: Intersection 2

Intersections 3 and 4

Figures 7-28 and **7-29** below show the priority-controlled cross-roads and T-intersection proposed between the wide local road and a regular local road as proposed within the CE4 and CE5 super lots. The wide local road has priority with vehicles travelling along the regular Local Road giving way to vehicles on the priority approach. As shown, several speed bumps are also proposed in vicinity of the intersections to provide a slower design speed environment resulting in improved safety for active mode users and other motorists.

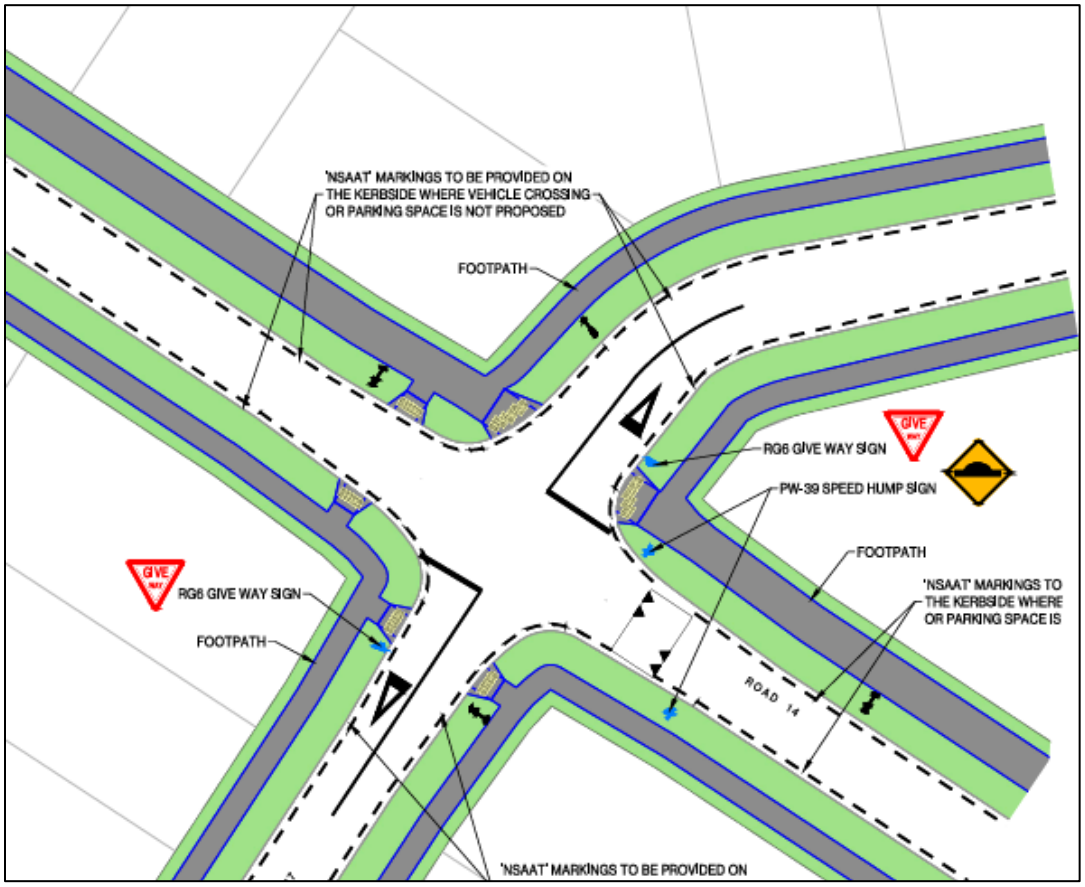

Figure 7-28: Intersection 3

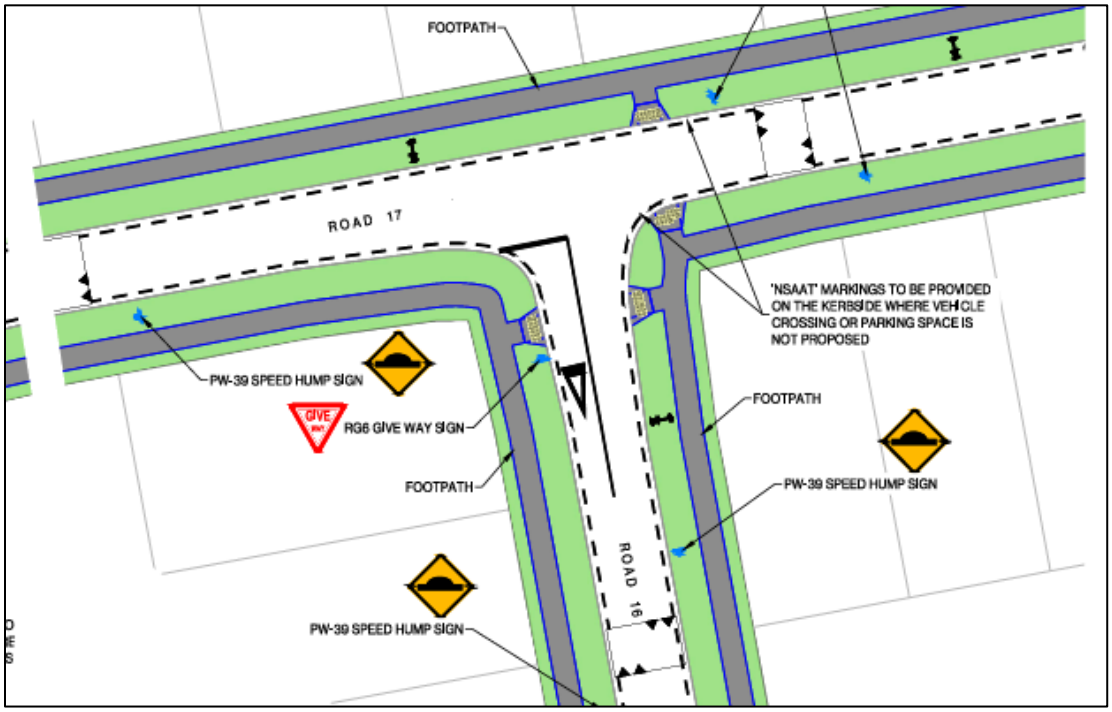

Figure 7-29: Intersection 4

Intersection 5

Figure 7-30 below shows the priority-controlled T-intersections proposed between the primary collector Road and the wide local roads near the western end of the CE4 super lot. Vehicles travelling along the east-west collector road have priority with vehicles on the Wide Local Road having to give-way. As shown, a raised (unassisted) pedestrian and cycle crossing facility is provided across the northern local road, and a speed bump across the southern Local Road of the intersections resulting in a slower vehicle approach speed and improved safety. It is noted no vertical speed calming devices are provided on the collector road corridor in vicinity of the intersection.

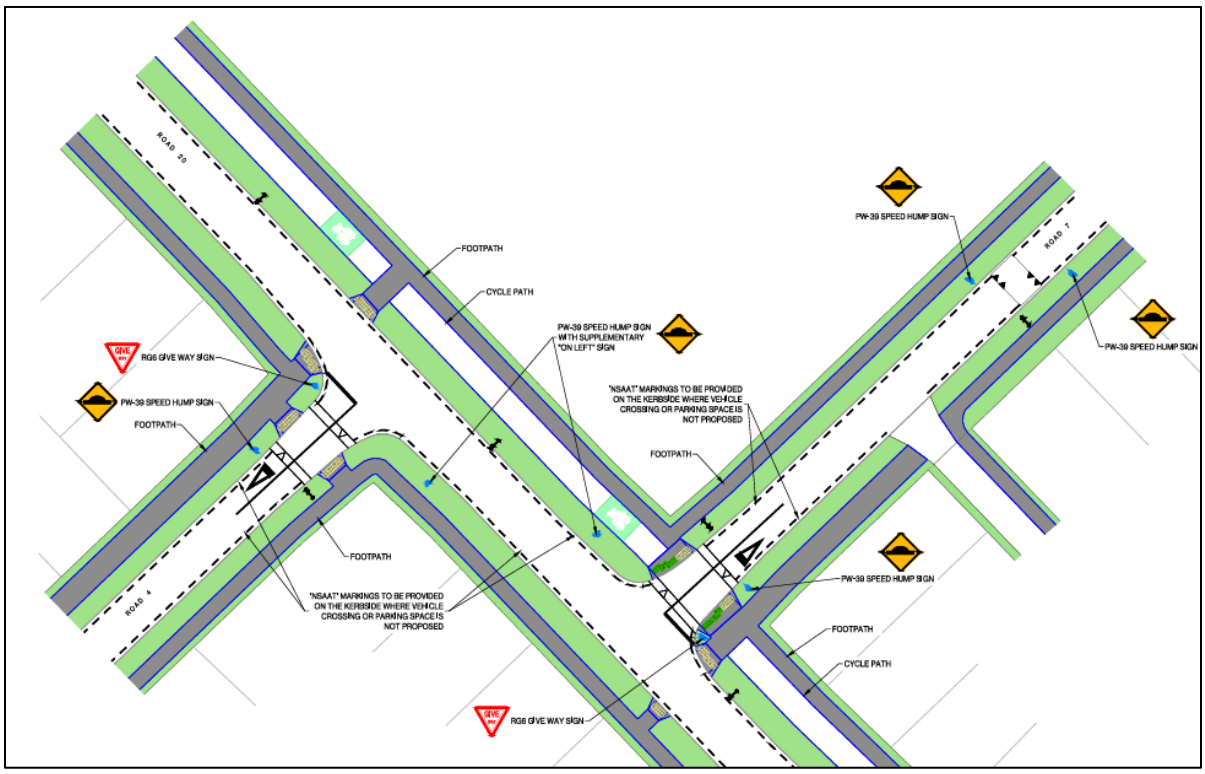

Figure 7-30: Intersection 5

Intersection 6

Figure 7-31 below shows the priority-controlled T-intersections proposed between the wide local road and regular local road. As shown, the north-south connection has priority despite the southern and eastern legs of this intersection existing as the wide Local Road. Speed humps have been provided on all three approaches to this intersection resulting in a slow speed environment, and therefore improved active mode safety.

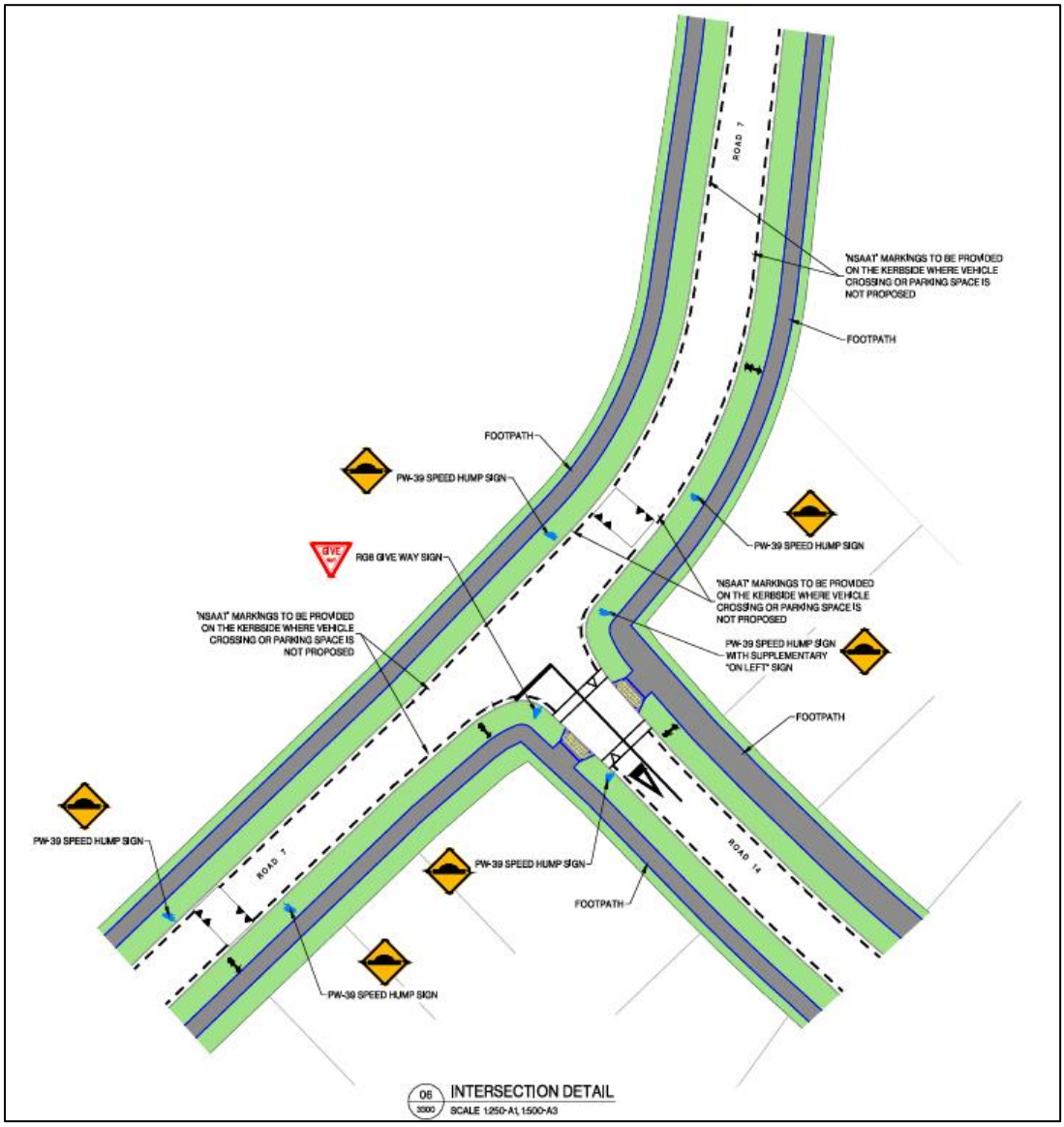

Figure 7-31: Intersection 6

Intersection 7

Figure 7-32 below shows the priority-controlled T-intersections proposed between the Primary Collector school road and a Local Road. Given the collector road is the higher hierarchy road, vehicles travelling along this corridor have priority. A speed hump has been provided along the local road to provide traffic calming, but not on the collector road corridor. It is noted that no vertical speed calming devices are provided on the collector road corridor in vicinity of the intersection.

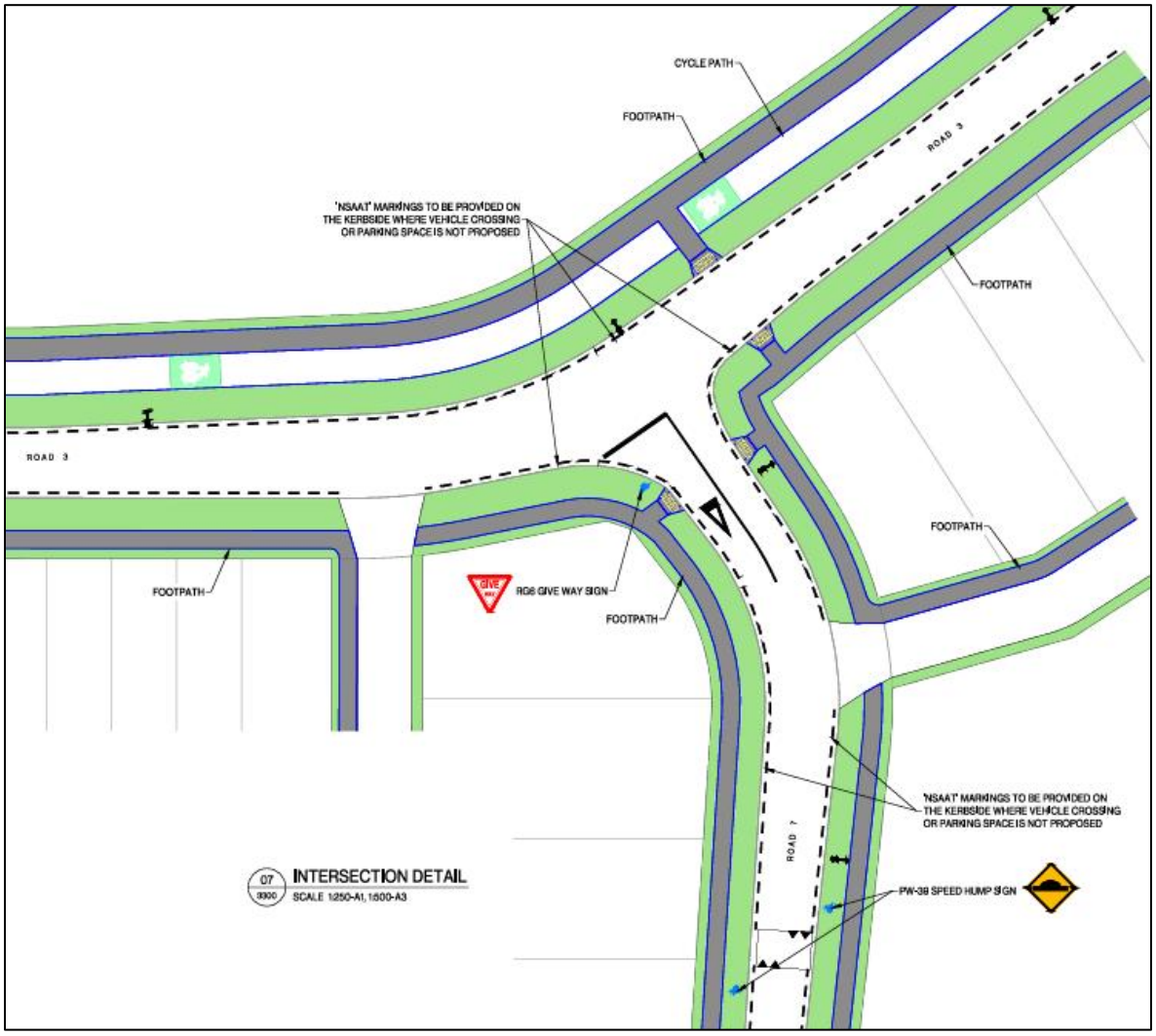

Figure 7-32: Intersection 7

Intersection 10

Figure 7-33 below shows the priority-controlled T-intersections proposed between the wide local road and regular local road. As shown, the wide local road has priority, however traffic calming speed humps are proposed on all approaches to reduce vehicle speed through the intersection. It is noted the design for this intersection is very similar to that of Intersection 4.

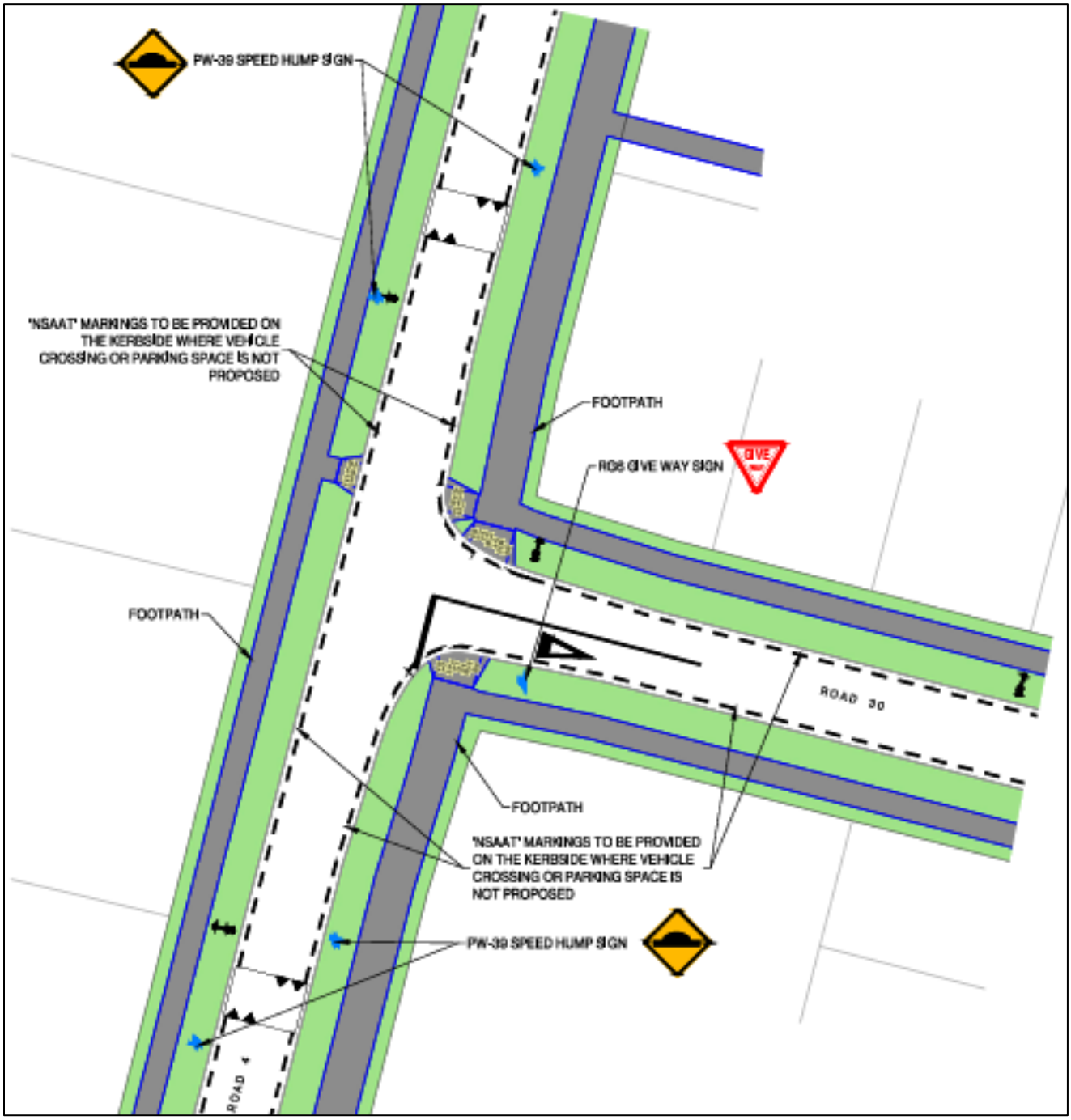

Figure 7-33: Intersection 10

Intersection 13

Figure 7-34 below shows the priority-controlled T-intersections proposed between the two local roads. As shown, the east-west road corridor has priority, with traffic calming speed humps proposed on all approaches to reduce vehicle speed through the intersection. It is

noted the design for this intersection is very similar to that of Intersection 4 and intersection 10.

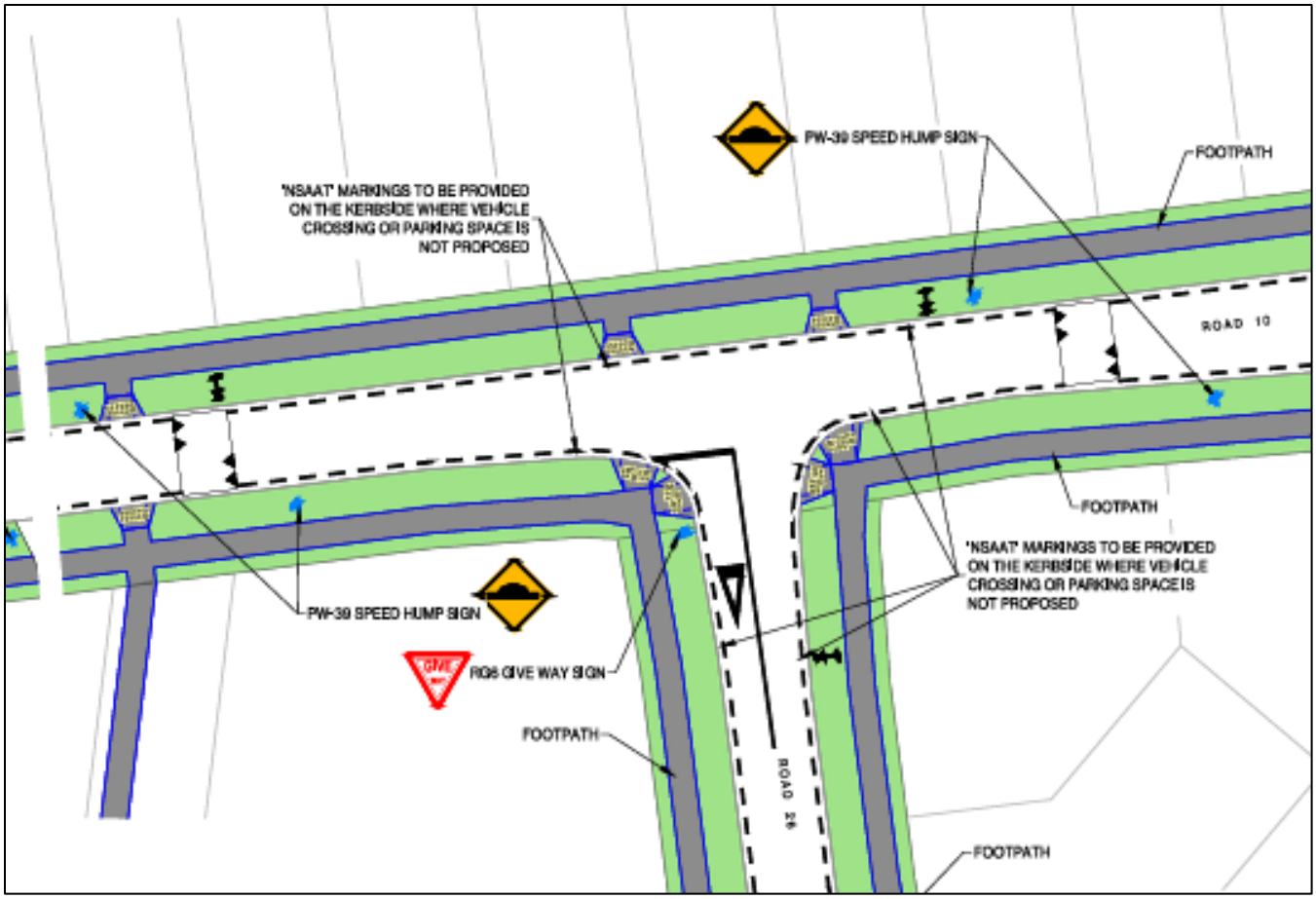

Figure 7-34: Intersection 13

Intersections 14 and 16

Figure 7-35 and **7-36** below shows the typical T-intersection proposed between the primary collector road and local road. In both intersections, the collector road has priority as it is a higher hierarchy road corridor. As shown, a raised, and unassisted pedestrian crossing facility is provided across the western local road leg of the intersection. No speed calming devices are provided on the collector road corridor in vicinity of either intersection.

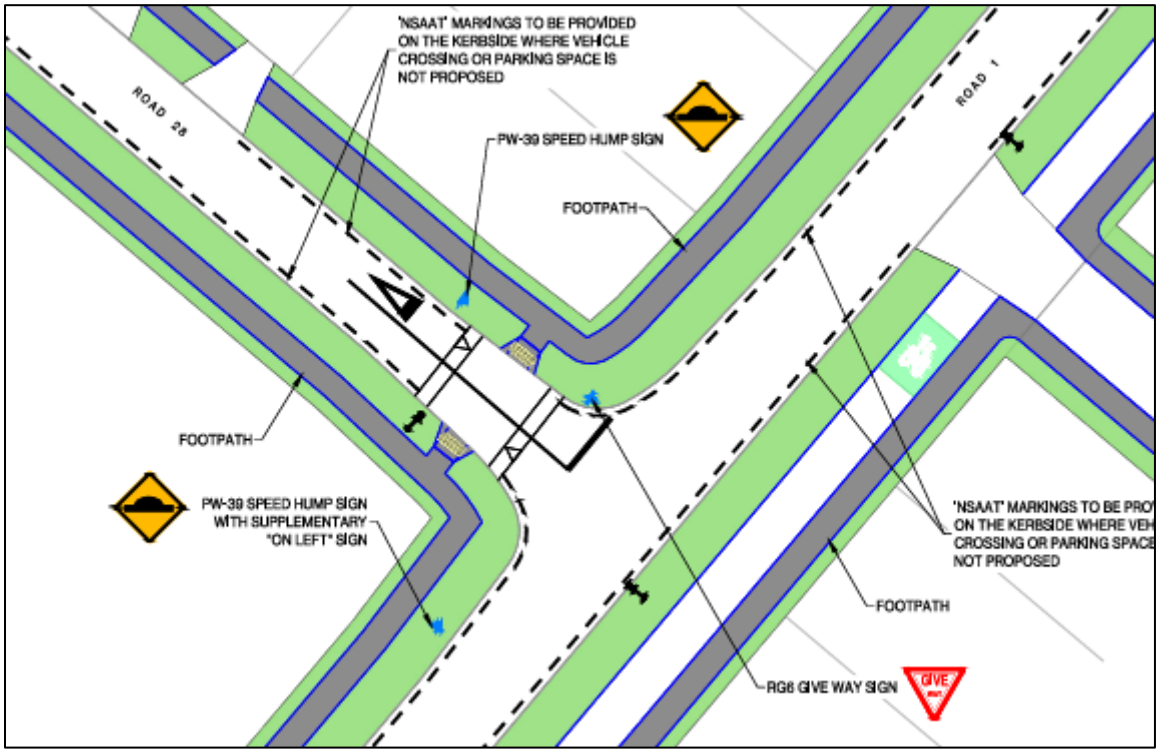

Figure 7-35: Intersection 14

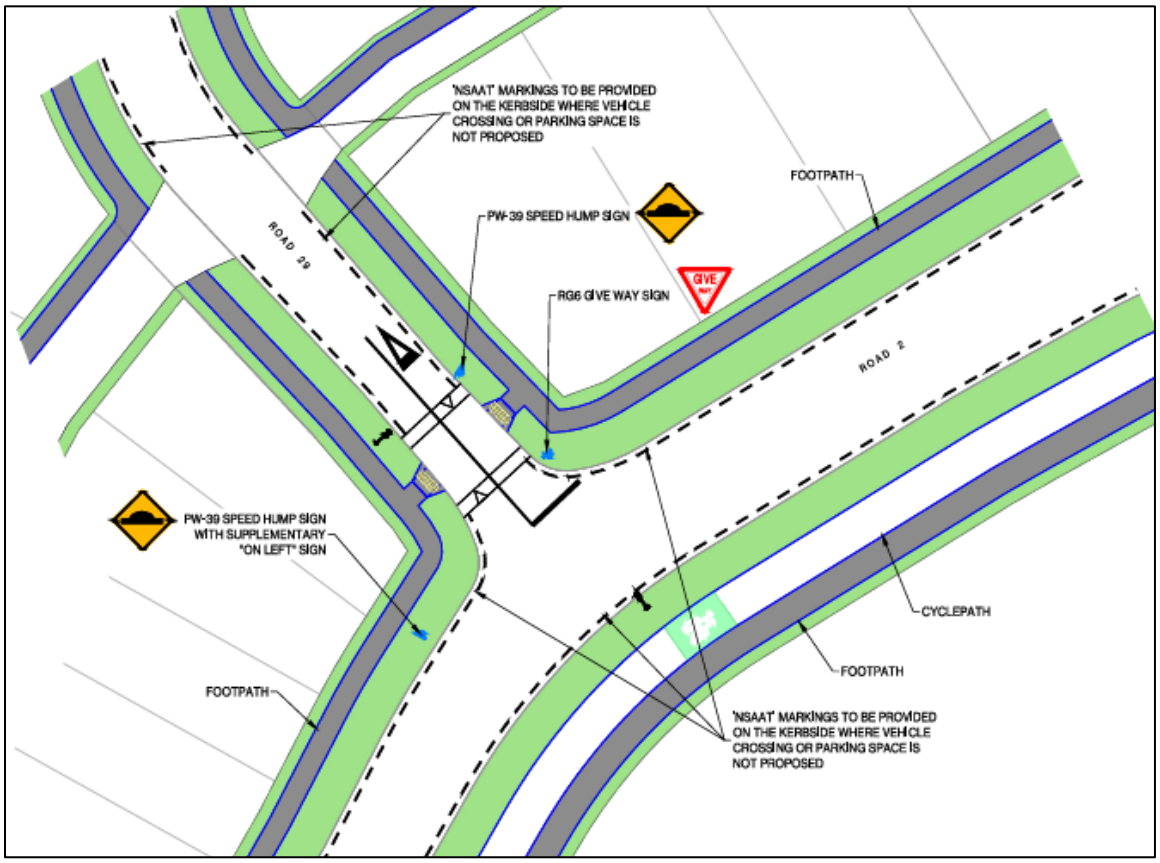

Figure 7-36: Intersection 16

7.6 Internal Roundabout Intersections

Three intersections within the Site are also proposed as roundabouts. **Figure 7-37** below shows their locations.

Figure 7-37: Internal Roundabout Locations

Road 1 / Road 5 Roundabout Intersection

Figure 7-38 below shows the Road 1 / Road 5 roundabout intersection. Each leg of the intersection provides one approach lane and one departure lane. Median island crossings with a 2.2m refuge space are provided on all three legs of the intersection. The proposed roundabout will be partially mountable to allow for tracking of heavy commercial vehicles.

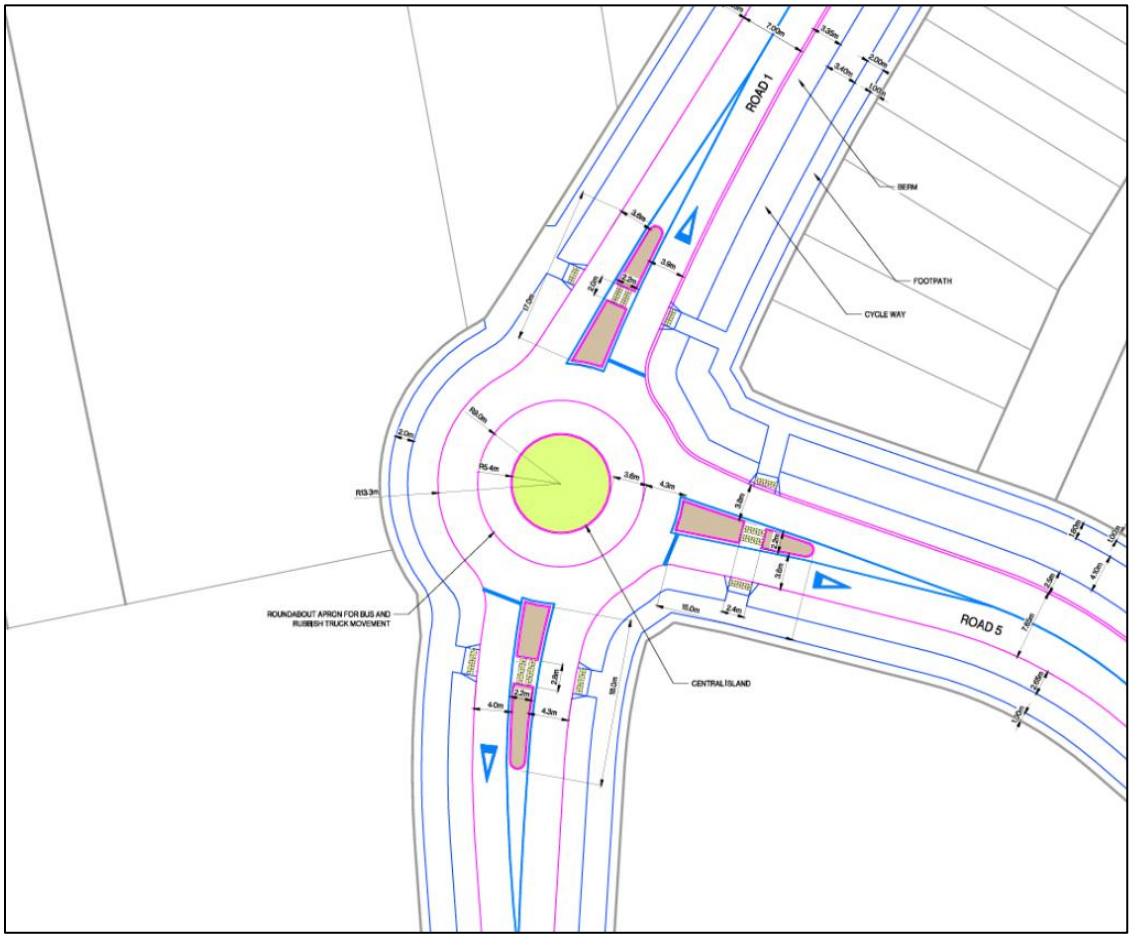

Figure 7-38: Roundabout at Road 1 / Road 5

Road 1 / Road 3 / Road 8 Roundabout Intersection

Figure 7-39 below shows the Road 1 / Road 3 / Road 8 roundabout intersection. As with the Road 1 / Road 5 intersection, each leg of the intersection provides one approach lane and one departure lane. Median island crossings with a 2.3m/2.4m refuge space are provided on all four legs of the intersection. The proposed roundabout will be partially mountable to allow for tracking of the AT 12.6m Truck or 12.6m Urban Bus design vehicles.

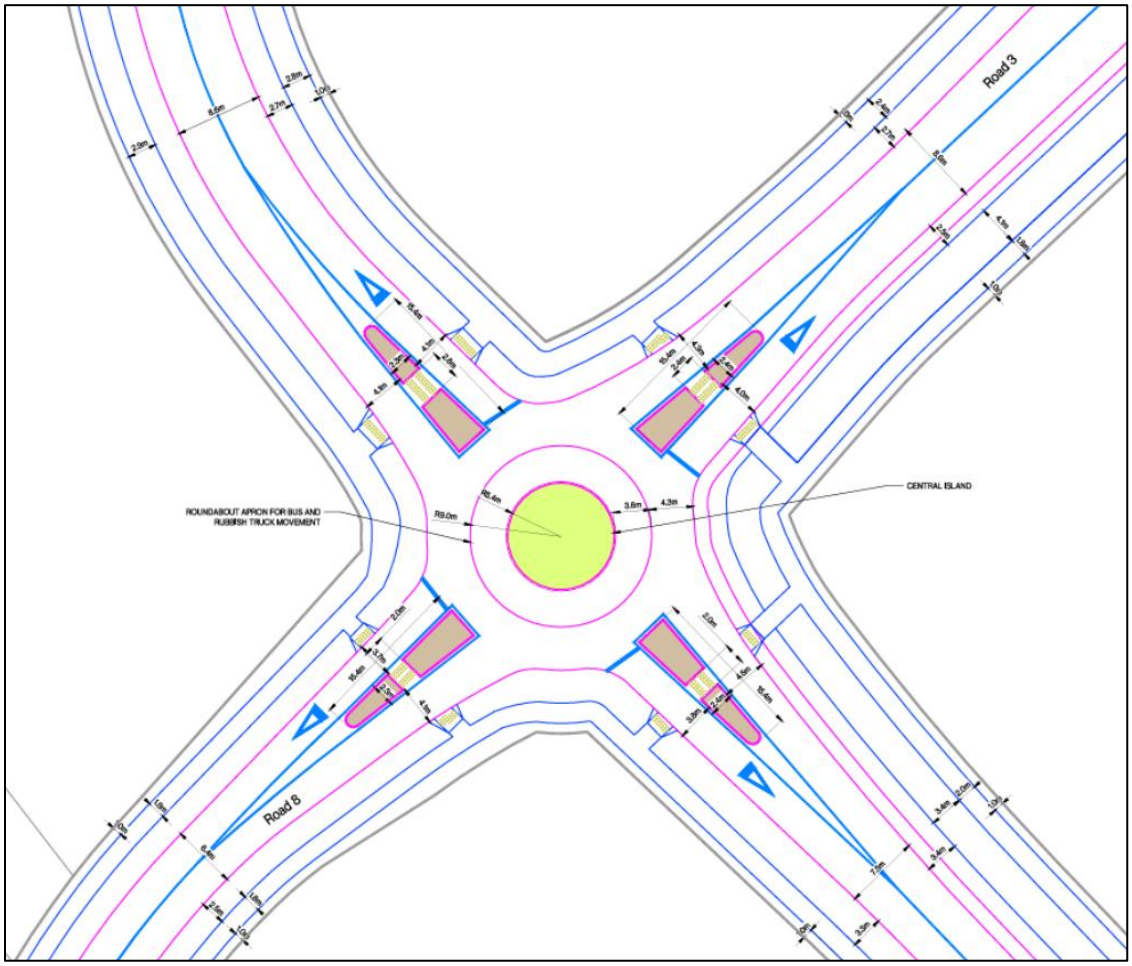

Figure 7-39: Roundabout at Road 1 / Road 3 / Road 8

Road 1 / Road 20 Roundabout Intersection

Figure 7-40 below shows the Road 1 / Road 20 roundabout intersection. The intersection is currently proposed to have two legs only. However, once the Live Zone boundary for the Beachlands south development extends further south, an additional third southern leg will be provided to this intersection. Similar to the other roundabout intersections, median island crossings are provided to both legs of the intersection, and the proposed roundabout will be partially mountable to allow for tracking of the AT 12.6m Truck or 12.6m Urban Bus design vehicles

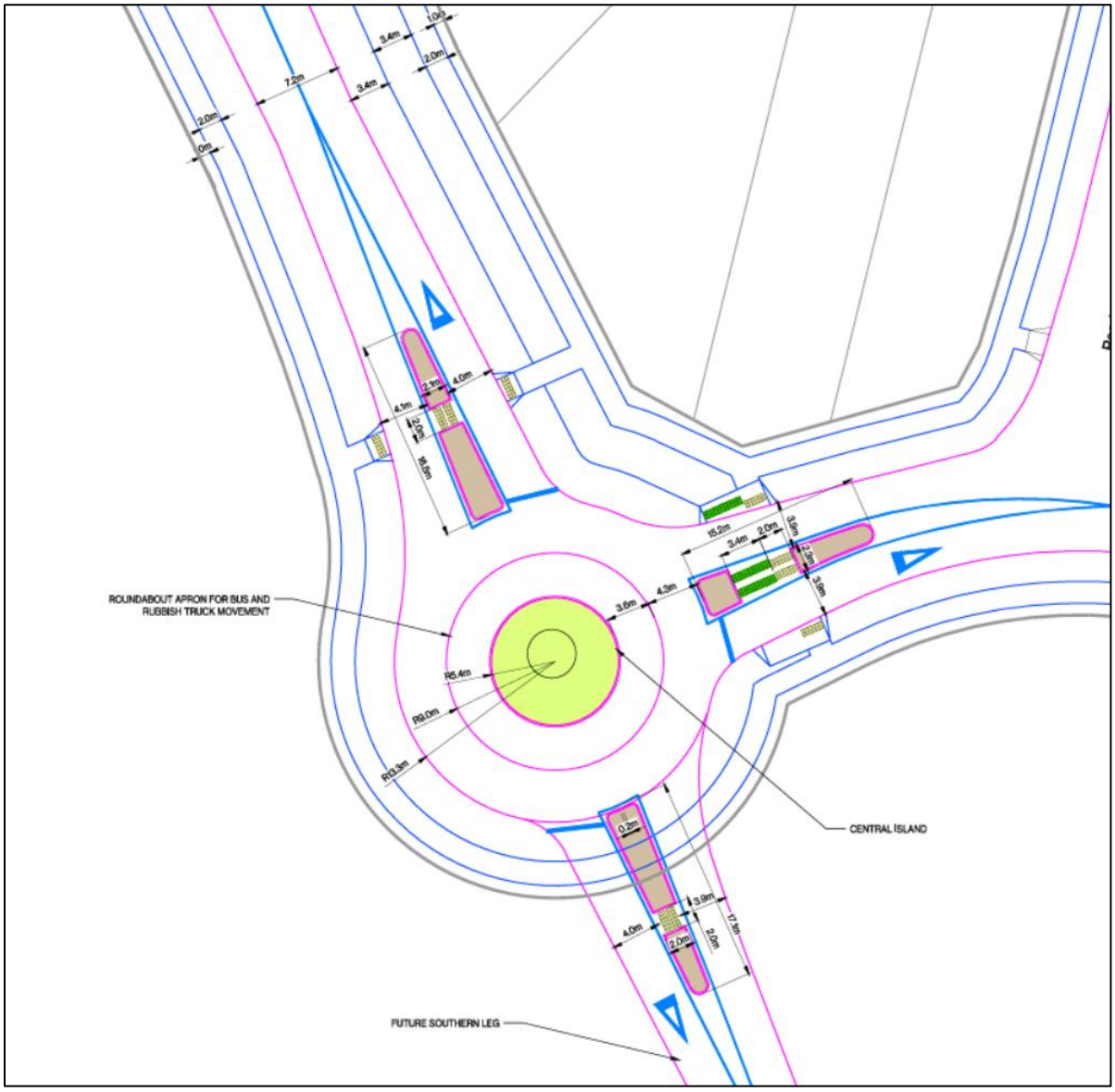

Figure 7-40: Roundabout at Road 1 / Road 20

7.7 External Intersection Upgrades

Table I458.6.3.1 of the Beachlands South Precinct Provisions outlines the required transport infrastructure upgrades to enable certain levels of development, and Appendix 2 of the provisions shows the location of each and provides an indicative concept for each. **Figures 7-41** and **7-42** below replicate Table I458.3.1 and Appendix 2 respectively for ease of reference.

Column 1 Development and/or subdivision enabled within the area identified on Precinct Plan 6 by transport infrastructure in column 2,		Column 2 Transport infrastructure required to enable development and/or or subdivision in column 1
(a)	Up to a maximum of 500 dwellings and/or residential lots	Upgrade of Jack Lachlan Drive to provide two-way cycling facilities along the full length of one side of the road; and a footpath on the northern side of the road as shown in Appendix 2; and Site (A) on Precinct Plan 6: Upgrade of Whitford-Maraetai Road / Jack Lachlan Drive intersection as shown in Appendix 2 and Site (B) on Precinct Plan 6: Upgrade of Whitford Park Road / Whitford Road / Whitford-Maraetai Road roundabout to provide an additional traffic lane on the Whitford Road (western) approach and traffic signal metering of the same approach with queue detectors on the Whitford-Maraetai Road (eastern) approach as shown in Appendix 2 **; and Site (E) on Precinct Plan 6: Upgrade of Somerville Road / Whitford Road / Point View Drive roundabout to provide a double north-west bound through-lane for additional capacity as shown in Appendix 2.
(b)	A provision of: i. More than 500 and up to 850 dwellings or residential lots	Upgrades in (a) above; and Site (D) on Precinct Plan 6: Provision of an additional left-turn approach lane on the northbound approach to the Whitford Park Road / Saleyard Road / Sandstone Road roundabout as shown in Appendix 2*.
(c)	A provision of: i. More than 850 and up to 1,200 dwellings or residential lots	Upgrades in (a) – (b) above; and Site (C) on Precinct Plan 6: Upgrade to Trig Road (south) / Whitford-Maraetai Road intersection as shown in Appendix 2.*
(d)	A provision of: i. More than 1,200 and up to 1,900 dwellings or residential lots	Upgrades in (a) – (c) above; and Site (B) on Precinct Plan 6: Further upgrade of Whitford Park Road / Whitford Road / Whitford-Maraetai Road roundabout to provide an additional lane on the Whitford-Maraetai Road (eastern) approach, and the removal of the traffic signal metering equipment as shown in Appendix 2. *
(e)	A provision of: i. More than 1,900 and up to 2,700 dwellings or residential lots	Upgrades in (a) – (d) above; and Site (F) on Precinct Plan 6: Whitford Bypass providing a two- way single lane each way between the Trig Road (south) / Whitford- Maraetai Road intersection and the Saleyard Road / Whitford Park Road / Sandstone Road intersection, including upgrades to the intersections at both ends.

Figure 7-41: Table I458.3.1 Threshold for Subdivision and Development for Road Upgrades

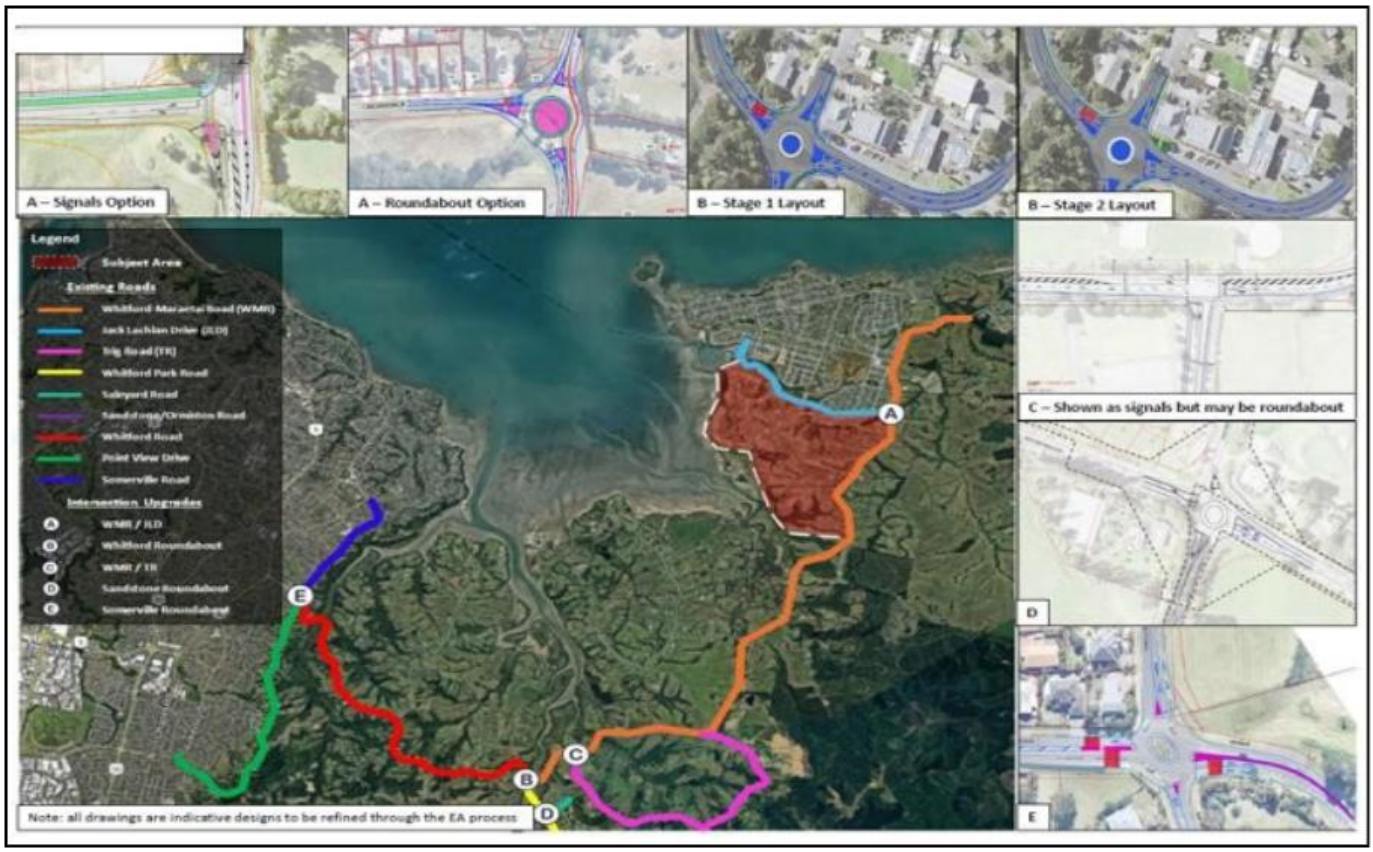

Figure 7-42: Appendix 2 Intersection Upgrade Concept Plans

The upgrades required are summarised as:

- Site A – Jack Lachlan Drive / Whitford-Maraetai Road: Signals or Roundabout.
- Site B – Whitford Roundabout: Upgraded Roundabout.
- Site C – Whitford-Maraetai Road / Trig Road (South): Signalisation.
- Site D – Sandstone Roundabout: Upgraded arm.
- Site E – Somerville Roundabout: Upgraded Roundabout.

As part of this Project, detailed designs have been produced and are provided as part of the civil engineering design set. The exception to this package is the Trig Road / Whitford-Maraetai Road intersection, which is no longer proposed for the reasons described in Section 8 (Traffic Effects) and this non-compliance against the provisions is assessed in Section 10 (Statutory Requirements).

Each remaining intersection is provided below, along with a brief description of design particulars and a summary of updated modelling results, with full Sidra outputs provided as **Attachment 1**.

Jack Lachlan Drive / Whitford-Maraetai Road (Site A)

The Jack Lachlan Drive / Whitford-Maraetai Road intersection is currently a give-way priority-controlled T-intersection. It is proposed to upgrade this to a double roundabout intersection, as shown in **Figure 7-43** below.

Both approaches of the Whitford-Maraetai Road corridor provide two approach lanes, and the Jack Lachlan Drive approach provides one lane supporting both left- and right-turning movements. This is a slight change from the concept design provided at PC 88, which had a single separated southbound through lane, which was removed due to potential property access issues to the east, although the design is still considered consistent with the roundabout upgrade concept and therefore complies with appendix and table requirements. The southern approach provides separate lanes for left-turning vehicles and through vehicles. The northern approach provides one lane for through vehicles only, and an additional combined lane allowing both the right-turn and through movements, enabling a double through movement, which requires a double southbound receiving lane to the south of the roundabout. All approaches have one departure lane.

The figure in Appendix 2 of the precinct provisions provides two upgrade options for Site A – signalised or roundabout. The roundabout was selected due to the location's more rural interface, and a clear preference from Auckland Transport. The roundabout can be constructed without encroaching upon third party land, but it utilises some of the Site.

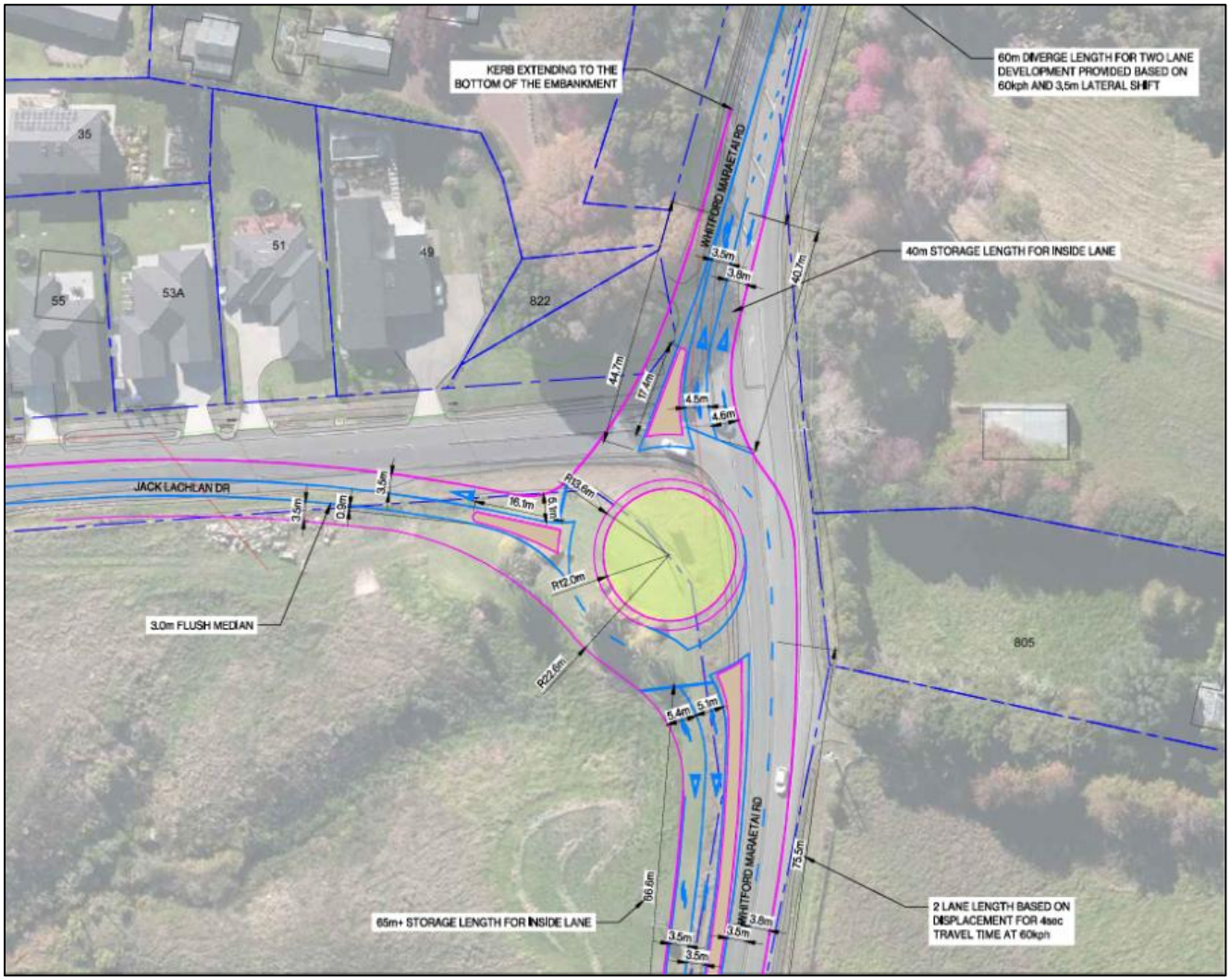

Figure 7-43: Jack Lachlan Drive / Whitford - Maraetai Road Roundabout Upgrade

In terms of performance, the intersection performs well during the AM and PM peak hours, with the full proposed development. **Table 7-1** below summarises the SIDRA results (including results for Degree of Saturation (DoS); Intersection Level of Service (LOS); Maximum Queue (Max Q); and Average Delay).

Table 7-1: Jack Lachlan Drive / Whitford-Maraetai Road intersection performance before and after development

Scenario	Peak Hour	DoS	Intersection LOS	Max Q(m)	Average Delay (s)
Existing give way layout and traffic flows	AM	0.971	LOS F	64m (west)	89s
	PM	0.951	LOS F	43m (west)	85s
Full development flows + roundabout upgrade	AM	0.642	LOS A	44m (north)	6s
	PM	0.572	LOS A	30m (south)	6s

Overall, even with full development traffic added, the roundabout upgrade significantly improves the intersection performance compared to the existing situation.

Whitford Roundabout (Site B)

The Whitford Roundabout currently operates as a single lane roundabout and is affected by substantial existing queuing during peak periods. The PC88 ITA identified this as one of the key existing downstream constraints for Beachlands and Maraetai traffic.

Table I458.3.1 and Appendix 2 describe and illustrate a staged approach to this roundabout upgrade: Stage 1 being improvements to the western arm with associated metering signals as required by row (a) of the table; and Stage 2 being improvements to the eastern arm (and removal of the metering signals) as required by row (d) of the table. This staged approach was proposed to minimise initial upgrades required prior to development being enabled.

However, to reduce disruption, the Project will carry out both upgrades simultaneously, thus fully satisfying both requirements. The proposed upgrade provides an additional lane on both the western and eastern approaches, by separating the left-turn and through / right-turn lane on the eastern approach, and separating the right-turn and through / left-turn lane on the western approach. The proposal reflects a balanced outcome between transport capacity, constructability, village character and the community preference to avoid unnecessary over-engineering of the roundabout environment.

The proposed design is shown in **Figure 7-44** below, and complies with the requirements outlined in Table I458.6.3.1 of the Precinct. Pedestrian enhancements through Whitford Village are an integral part of this upgrade.

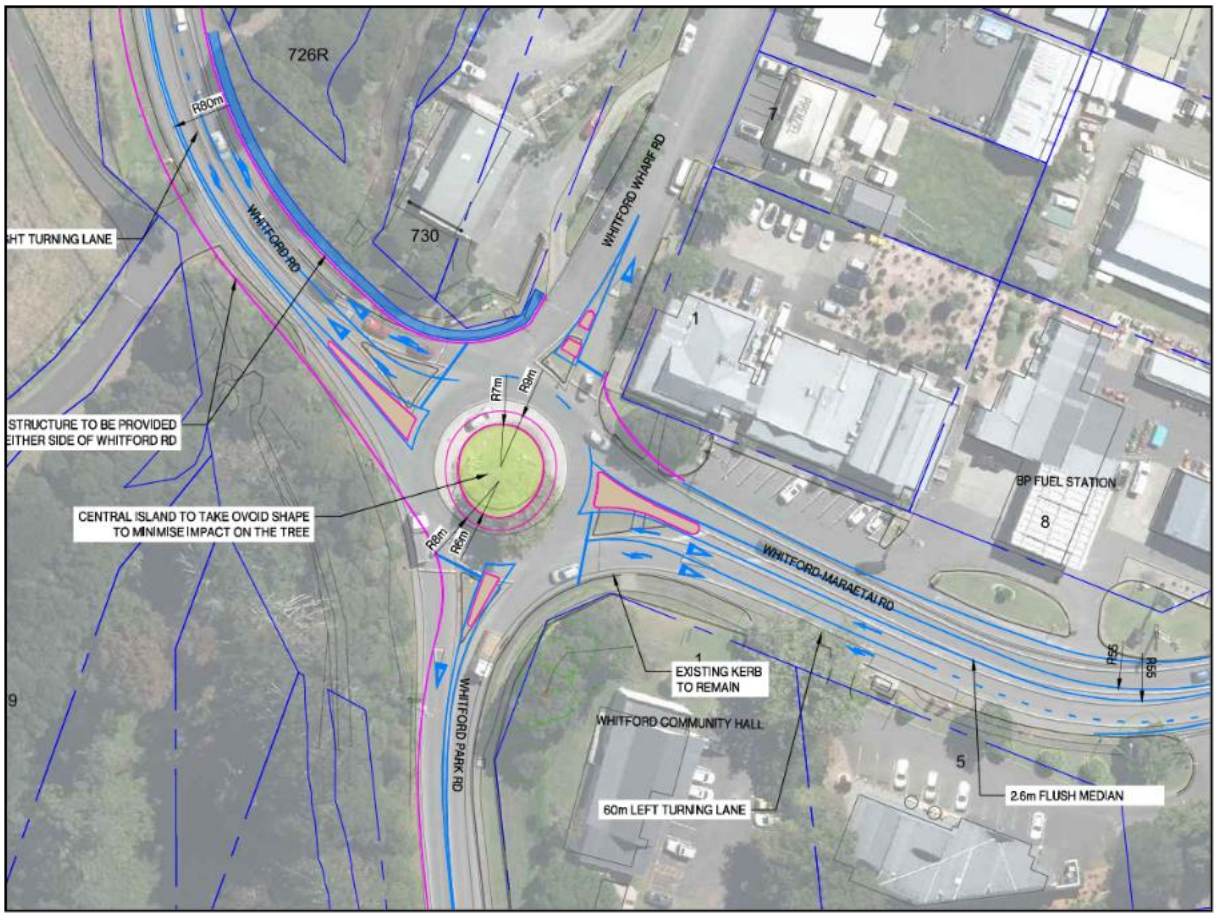

Figure 7-44: Whitford Park Road / Whitford - Maraetai Road / Whitford Road roundabout Upgrade

Table 7-2 below summarises the SIDRA results.

Table 7-2: Whitford Roundabout performance before and after development / upgrade

Scenario	Peak Hour	DoS	Intersection LOS	Max Q(m)	Average Delay (s)
Existing layout and traffic flows	AM	1.167	LOS F	1,002m (east)	168s
	PM	1.175	LOS E	554m (west)	189s
Full development + upgrade	AM	1.096	LOS C	439m (south)	124s
	PM	1.004	LOS C	291m (south)	36s

Overall, the degree of saturation decreases with the upgrade and full development traffic in place, and the maximum queues and average delays also improve, thus resulting in significantly better overall intersection efficiency than its current operation. It is noted that with the full development in place and the upgraded intersection, the peak queueing occurs on the southern approach in both the AM and PM. This is likely due to the constant through traffic approaching from the eastern Whitford-Maraetai Road approach in both the AM and PM peaks.

Somerville Roundabout (Site E)

The Whitford Road / Point View Road / Somerville Road intersection currently exists as a roundabout with single approach and departure lanes on each leg of the intersection. As part of the Project, it is proposed that the roundabout will be upgraded to provide two approach lanes on Whitford Road (eastern approach), and Somerville Road and retain the single approach lanes on Whitford Road (western approach) and Point View Road. This is entirely consistent with the description in Table I458.6.3.1 and Appendix 2. The western leg of the intersection (Whitford Road) will be slightly widened to allow two departure lanes. All other legs will provide one departure lane each. As such, the proposed design shown in **Figure 7-45** complies with the requirements outlined in row (a) of Table I458.6.3.1 of the Precinct.

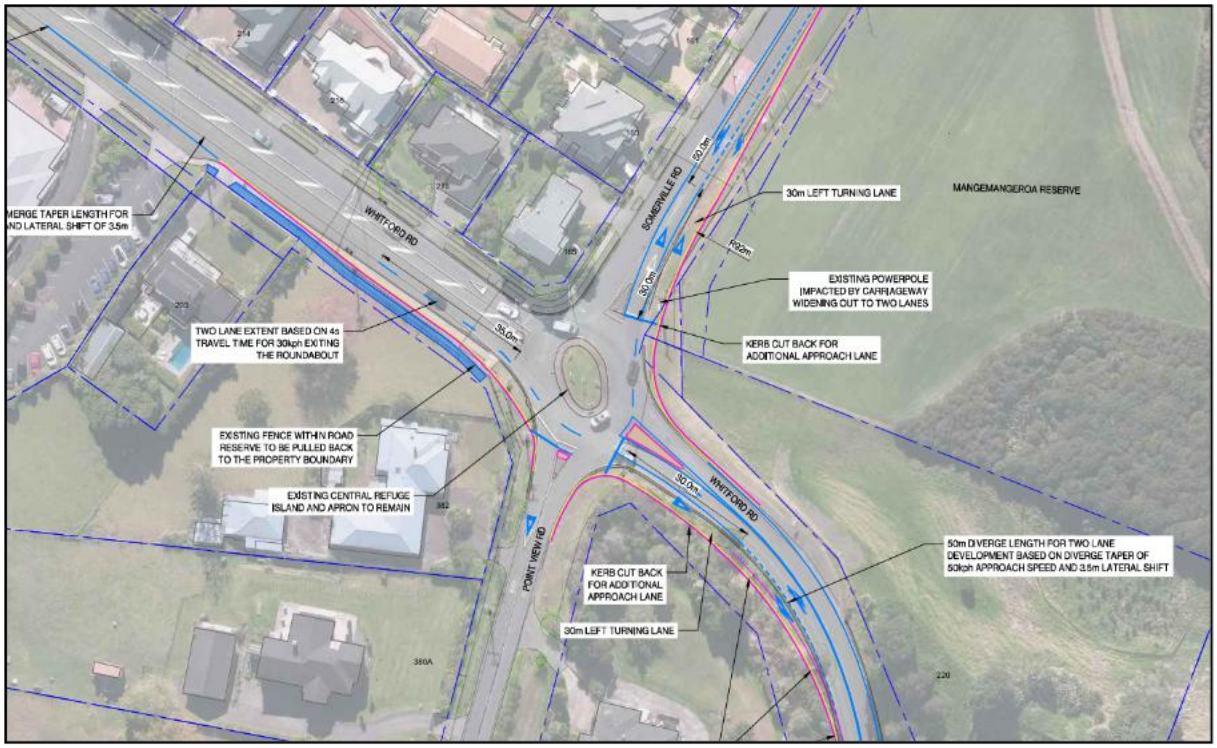

Figure 7-45: Somerville Rd / Whitford Rd / Point View Rd intersection

Table 7-3 below summarises the SIDRA results for Somerville Roundabout.

Table 7-3: Somerville Roundabout performance before and after development / upgrade

Scenario	Peak Hour	DoS	Intersection LOS	Max Q(m)	Average Delay (s)
Existing layout and traffic flows	AM	1.218	LOS F	1047m (east)	211s
	PM	0.702	LOS C	155m (north)	27s
Full development + upgrade	AM	0.749	LOS B	75m (east)	9s
	PM	0.717	LOS A	55m (west)	4s

Overall, even with full development traffic added, the roundabout upgrade significantly improves the intersection performance compared to the existing situation.

Whitford Park Road / Sandstone Road / Saleyard Road (Site D)

The Whitford Park Road / Sandstone Road / Saleyard Road roundabout currently exists as a roundabout with single approach and departure lanes on each leg of the intersection. As part of the development, it is proposed that the southern approach (Whitford Park Road) will be upgraded to provide two approach lanes. One lane will be solely for left-turning vehicles, and an additional lane supporting combined through/right-turning movements. The other three approaches will remain unchanged. The proposed design is shown in **Figure 7-46** below and complies with the requirement outlined in row (b) of Table 1458.6.3.1 of the Precinct.

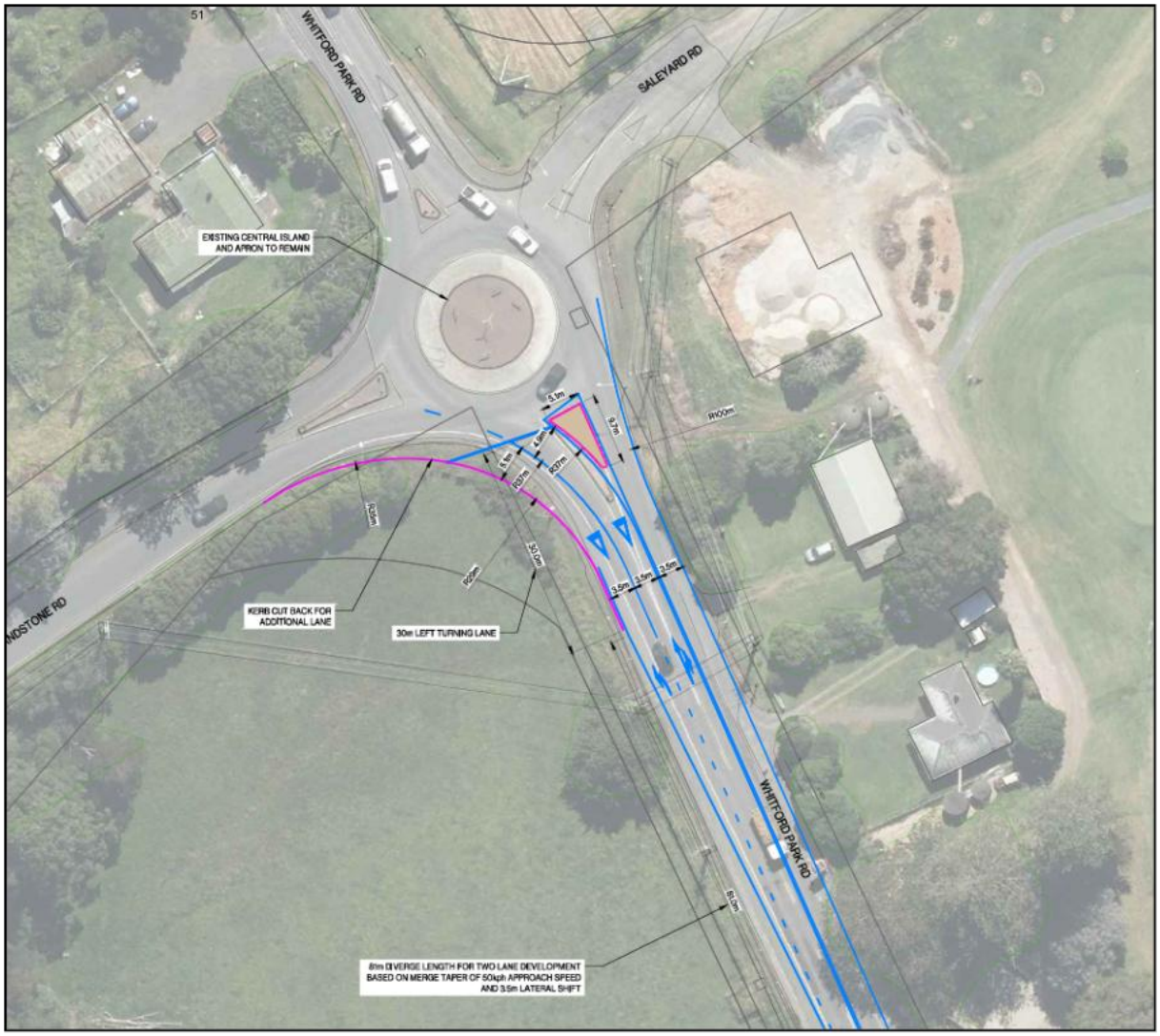

Figure 7-46: Whitford Park Rd / Sandstone Rd / Saleyard Rd intersection

Table 7-4 below summarises the SIDRA results for Sandstone Roundabout.

Table 7-4: Sandstone Roundabout performance before and after development / upgrade

Scenario	Peak Hour	DoS	Intersection LOS	Max Q(m)	Average Delay (s)
Existing layout and traffic flows	AM	0.807	LOS C	91m (north)	17s
	PM	0.702	LOS B	59m (south)	9s
Full development + upgrade	AM	0.725	LOS A	73m (north)	7s
	PM	0.848	LOS B	110m (south)	9s

Overall, even with full development traffic added, the roundabout upgrade significantly improves the intersection performance compared to the existing situation and is consistent with the description in Table I458.6.3.1 and Appendix 2.

External Upgrades Summary

Overall, each of the upgrades proposed satisfy Table I458.6.3.1 and Appendix 2, including the roundabout selection at Jack Lachlan Drive / Whitford-Maraetai Road intersection; the Stage 1 + Stage 2 full upgrade of the Whitford Roundabout. They will each be carried out to comply with the construction timing of development yields as set out in the table.

The only non-compliance with the table and appendix is the upgrade of Whitford-Maraetai Road / Trig Road, which is no longer proposed for the reasons described within Section 8 (Traffic Effects). This non-compliance against the provisions is also assessed in Section 10 (Statutory Requirements).

7.8 Individual Lot Access

Vehicle Crossing Widths

Table E27.6.3.4.2 of the Auckland Unitary Plan (AUP) (Operative PC79 version) outlines the required vehicle crossing widths across several different zones. These are summarised in **Table** below:

Table 7-5: Vehicle Crossing Width requirements

Zone:	Number of parking spaces served	Minimum Width:	Maximum Width:
Residential	1 or 2	2.75m	3m
	3 to 9	3m (one way)	3.5m (one way)
	10 or more	5.5m (two way)	6m (two way)
Centres, mixed Use and all other zones	9 or less	3m (one way)	3.5m (one way)
	10 or more	5.5m (two way)	6m (two way)
General Business, Business Park or Industrial Zones	9 or less	3.7m (one way)	4m (one way)
	10 or more	6m (two-way)	7m (two-way)*

**A maximum width of 9m is permitted where the crossing needs to accommodate heavy commercial vehicles (HCVs)*

The Proposal is zoned as a combination of Residential, Business-Mixed Use, Business – Local Centre and Business – Light Industry. Several vehicle crossings are proposed to serve the different lots within the Project. The widths of these vehicle crossings (at the property boundary) and their compliance with the requirements outlined in E27 of the AUP are provided in **Table** below.

Table 7-6: Proposed Vehicle Crossing Widths

Apartment Number / Lot Number	Permitted Vehicle Crossing Width	Vehicle Crossing width provided (m)
MP1-A	5.5m - 6m	5.5m
MP3-A	5.5m - 6m	6m
MP3-B	5.5m - 6m	6m
MP3-B (Loading Zone)	2.75m – 3m	3.5m
MP8-A/B/C	5.5m - 6m	6m
MP13-A/B	5.5m - 6m	6m
MP15-A	5.5m - 6m	6m
MP24-A	5.5m - 6m	6m
MP16-A	5.5m - 6m	6m
MP16-B	5.5m - 6m	6m
MP25-A/B	5.5m - 6m	6m
MP26-A	5.5m - 6m	6.5m
MP26-A (eastern boundary)	3m - 3.5m	5.5m
C1-A	5.5m - 6m	6m
C5-A	5.5m - 6m	6m
C5-B	5.5m - 6m	6m
C5-C	5.5m - 6m	6m
C7-A	5.5m - 6m	6m
C9-A/B	5.5m - 6m	6m
E1 (western)	5.5m - 6m	6.3m
E1 (central)	5.5m - 6m	5.5m
E1 (eastern)	5.5m - 6m	5.5m
E3 (northern boundary)	5.5m - 6m	6m
E3 (eastern boundary)	5.5m - 6m	6m
E4	3m-3.5m	Three crossings are 7m width. One vehicle crossing is 7.6m width.
JOAL 4001	5.5m - 6m	5.5m (both eastern and western)
JOAL 4002	5.5m - 6m	5.5m
JOAL 4003	5.5m - 6m	5.5m
JOAL 4004	5.5m - 6m	5.5m
JOAL 4005	5.5m - 6m	5.5m
JOAL 4006	5.5m - 6m	5.5m (both eastern and western)
JOAL 1103	5.5m - 6m	3.5m
JOAL 4010	5.5m - 6m	6m
JOAL 4013	5.5m - 6m	5.5m
JOAL 4014	5.5m - 6m	5.5m
CE1	5.5m - 6m	6m
CE2	5.5m - 6m	6m
CE3	5.5m - 6m	6m

CE4	5.5m - 6m	6m
CE5	5.5m - 6m	6m
JL1 – Long JOAL	5.5m - 6m	6m
JL1 – Short JOAL	5.5m - 6m	6m
CM1 – Long JOAL	5.5m - 6m	6m (both eastern and western end)
CM1 – Short JOAL (connected to long JOAL)	3m - 3.5m	3.5m
CM1 – Eastern JOAL	5.5-6m	6m
CM1 – Northern JOAL	5.5-6m	6m
CM2 – 20 space carpark	5.5m - 6m	6m
CM3 – Ground Level (2-way)	5.5m - 6m	6m
CM3 – Ground level (1-way)	3m – 3.5m	3.5m
CM3 – Basement Level	5.5 - 6m	5.5m
CM4 – Southern boundary crossing	5.5m – 6m	6m
CM4 – Western boundary (southern crossing)	5.5m – 6m	6m
CM4 – Western boundary (northern crossing)	5.5m – 6m	6m
CM4 – Northern boundary (central crossing)	5.5m – 6m	6m
CM4 – Northern boundary (eastern crossing)	5.5m – 6m	6m
CM5	5.5m – 6m	6m
VC 1 – Ground Level (eastern boundary)	5.5m – 6m	7.5m
VC 1 – Ground Level (northern boundary)	5.5m – 6m	7.5m
VC 1 – Basement (northern)	5.5m – 6m	6m
VC 1 – Basement (southern)	5.5m – 6m	6m
VC2 – Lower Ground	5.5m – 6m	6m
VC3 – Basement	5.5m – 6m	6m
VC4 – Basement	5.5m – 6m	6m
VC4 – Ground Level (one-way)	3m – 3.5m	3m
VC4 – Ground Level (two-way)	5.5m – 6m	6m
VC5 – Both crossings	5.5m – 6m	6m

As shown above, there are six vehicle crossings which do not comply with the width requirements as outlined in the AUP. Each of these non-compliances are discussed below.

MP3-B (Loading Zone)

As per Table E27.6.4.3.2 of the AUP, the vehicle crossing serving the dedicated loading space serving apartment 3 is technically only permitted to have a maximum width of 3m as it is located in a residential zone and serves just one parking space. However, this vehicle crossing will facilitate inbound/outbound movements for an 8.3m design vehicle and given the size of this vehicle, as shown in **Figure 7-47**, the additional width is required to accommodate inbound and outbound vehicular movements. The 0.5m additional width is not likely to have any adverse impact on the safe and efficient operation of the road corridor.

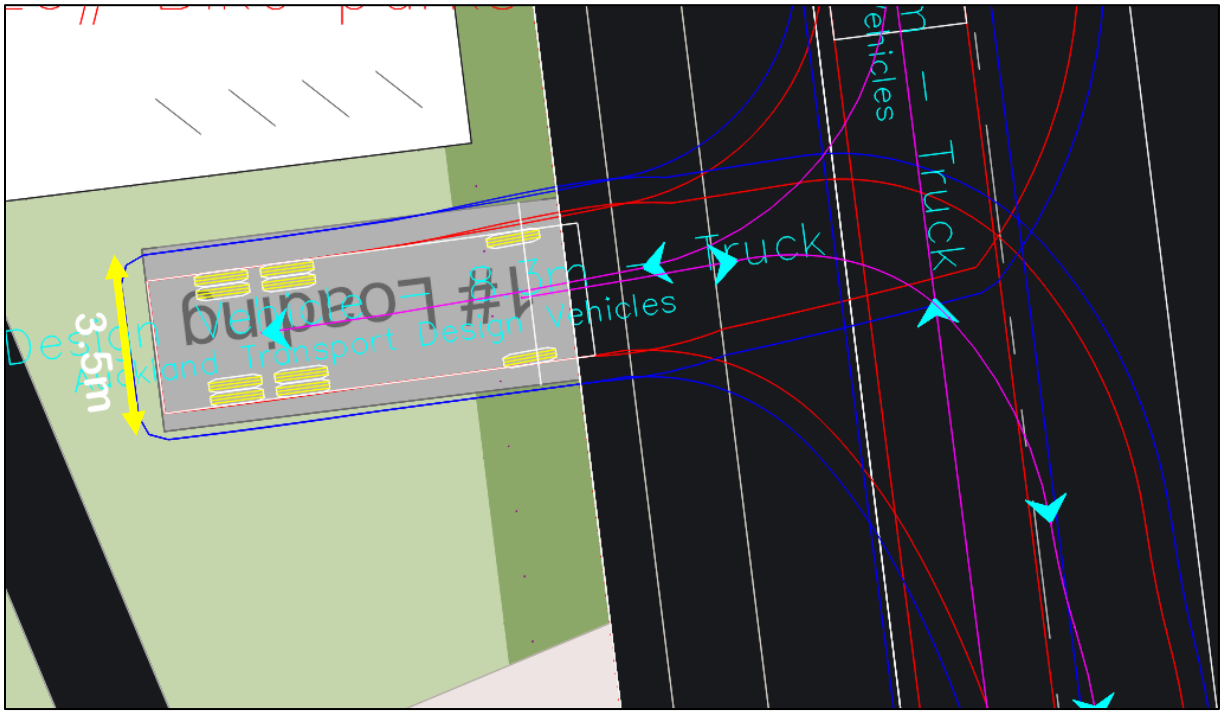

Figure 7-47: Apartment 3 - Loading Zone Vehicle crossing

MP26-A (eastern boundary carpark)

As per Table E27.6.4.3.2 of the AUP, the vehicle crossing along the eastern boundary of the MP26-a superlot is permitted to have a width between 3m – 3.5m as it is located in a residential zone, and serves fewer than 10 parking spaces. However, this vehicle crossing also provides access to a loading zone which will be accessed by an 8.3m design vehicle. As shown in **Figure 7-48** below, the design vehicle requires the full 5.5m width in order to enter the Site, turn around (to avoid a reversing manoeuvre onto the corridor), and exit the Site in a forwards direction. The additional width of the vehicle crossing is unlikely to have any adverse effects on the safe and efficient operation of the road corridor.

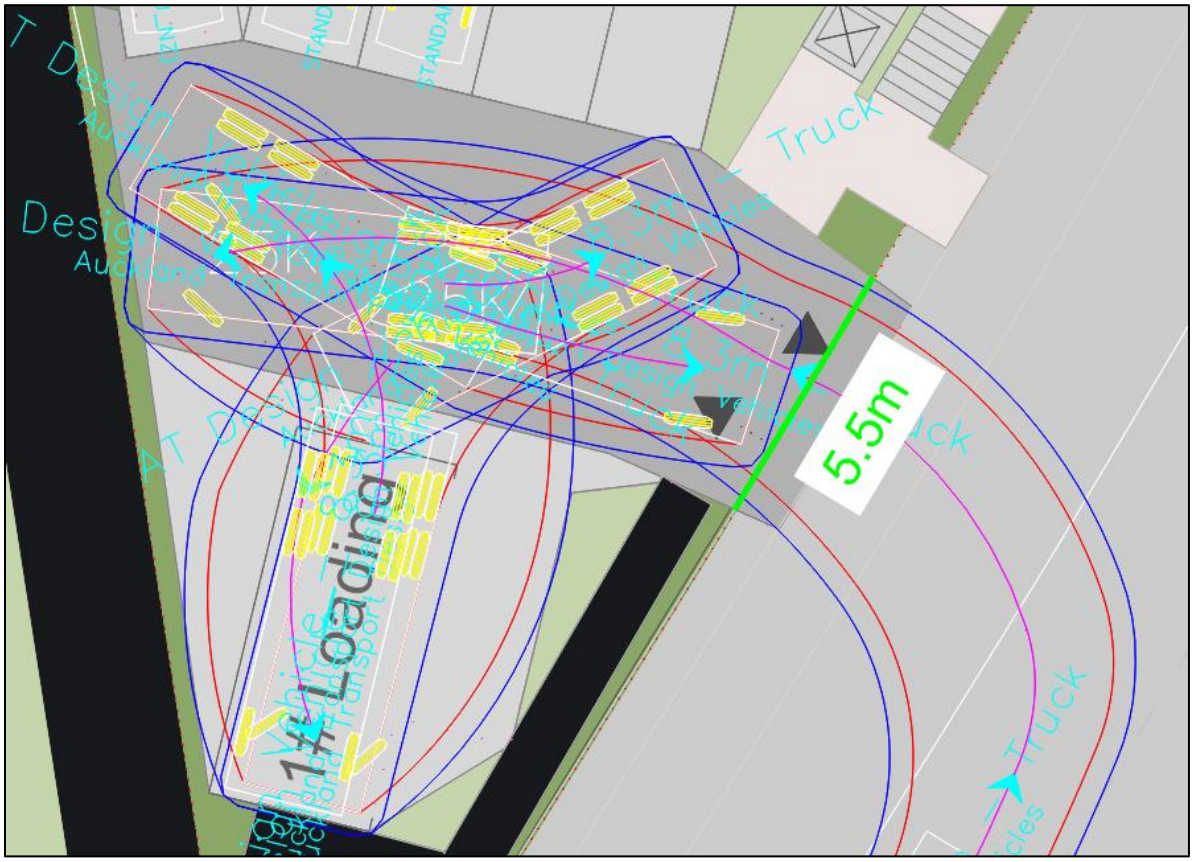

Figure 7-48: Vehicle Tracking for Apartment MP-26A

E1 – Western

As per Table E27.6.4.3.2 of the AUP, the western vehicle crossing along the southern boundary of the E1 precinct is permitted to have a width between 5.5-6m as it is located in a residential zone, and serves more than 10 parking spaces. The proposed width is 6.3m resulting in a 0.3m non-compliance. However, as shown in **Figure 7-49** below, this additional width is required to ensure simultaneous two-way vehicular movement of the B85 design vehicles. The additional width of the vehicle crossing is unlikely to have any adverse effects on the safe and efficient operation of the road corridor.

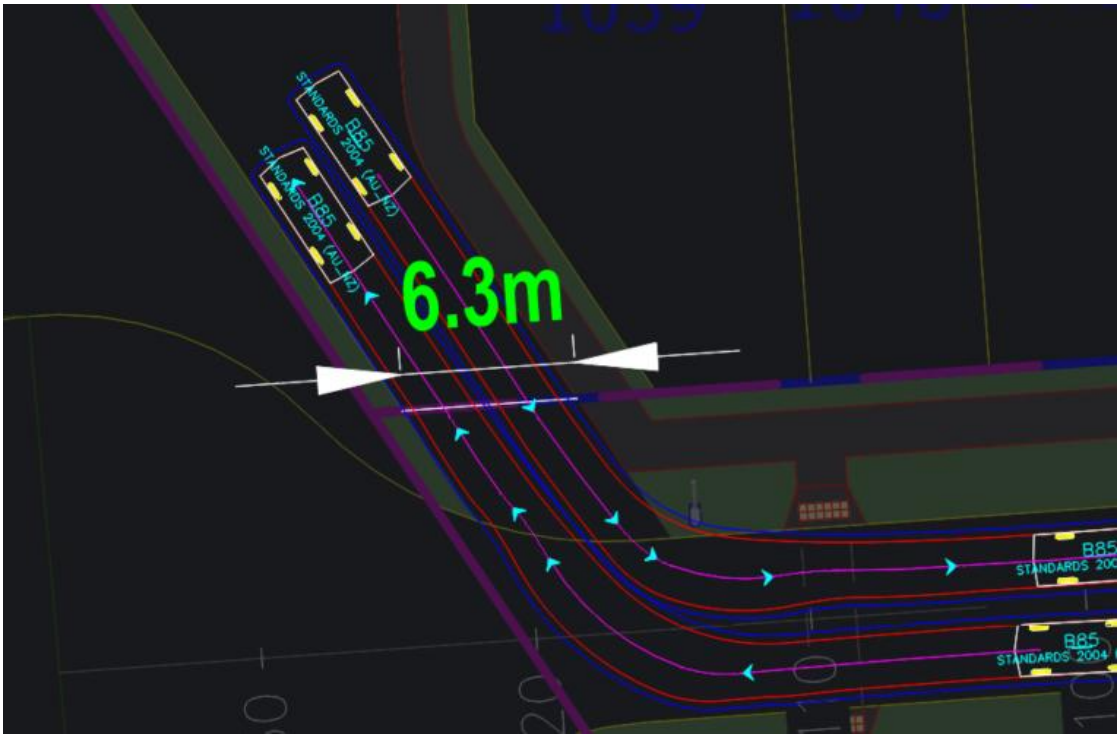

Figure 7-49: Super lot E1 - western vehicle crossing

E4

As per Table E27.6.4.3.2 of the AUP, the vehicle crossings along the eastern boundary of the E4 precinct is permitted to have a width between 3m-3.5m as it is located in a Business – Mixed Use Zone, and serves fewer than 10 parking spaces. However, the proposed width of these vehicle crossings is between 7m-7.6m resulting in a non-compliance. However, as shown in **Figure 7-50** below, this additional width is required to ensure simultaneous two-way vehicular movement of the B85 design vehicle and the 8.3m design vehicle.

Given the Business-Mixed Use zoning of this superlot, it is expected that larger vehicles such as the 8.3m truck could frequently visit the Site, hence these vehicle crossings have been designed to accommodate these movements. Despite the non-compliance, the additional width of the vehicle crossing is unlikely to have any adverse effects on the safe and efficient operation of the road corridor.

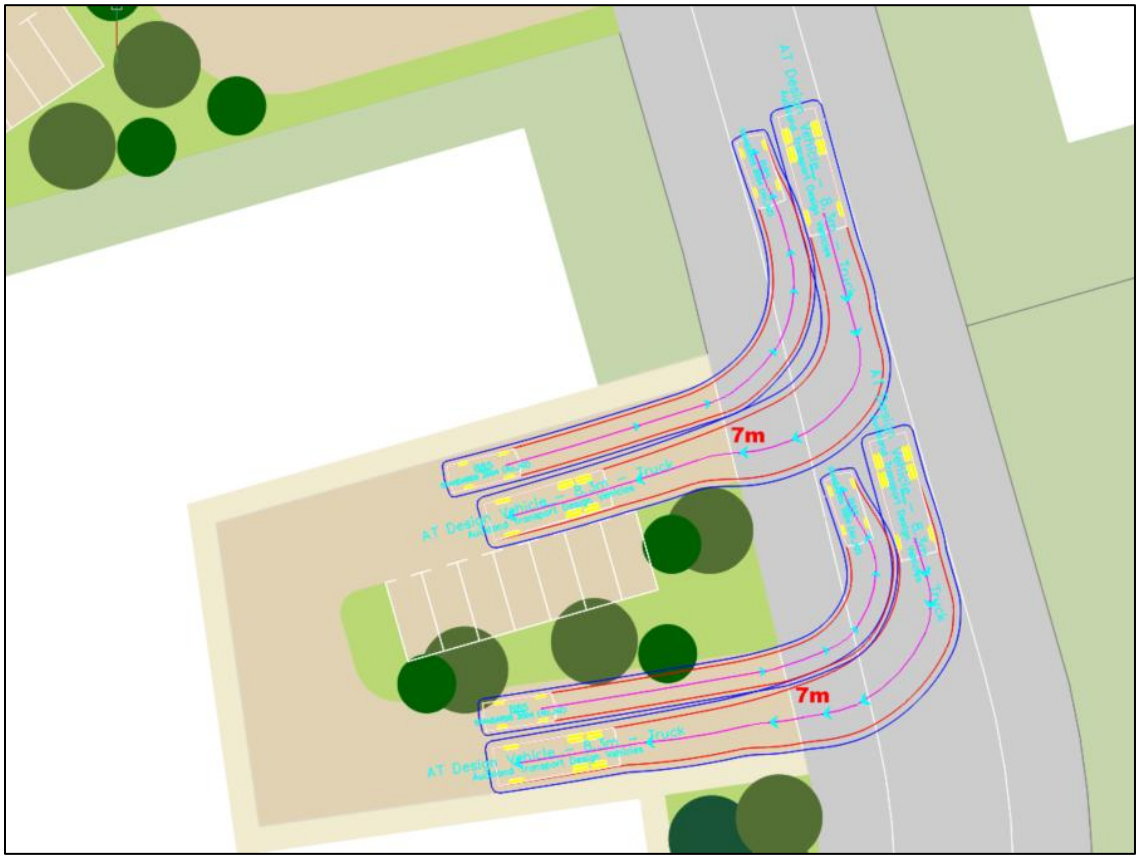

Figure 7-50: Super lot E4 - vehicle crossing width

JOAL Vehicular Crossing – CE1, CE2, CE3, CE4, CE5, JL1, CM1, CM4

Table E27.6.4.3.2 of the AUP requires vehicle crossings serving more than 10 parking spaces to have a width between 5.5m and 6m. However, many of the JOALs serving the dwellings located within the CE1, CE2, CE4, CE5, and JL1 superlots have a legal width of 9m. Despite the legal width of these JOALs being 9m, it should be noted that the practical width of the trafficable area is a maximum of 6m. As shown in **Figure 7-12** above, the 9m legal width consists of a 6m wide carriageway in the centre, and a 1.5m pedestrian footpath and berm on either side of the carriageway. As such, the effective width of the vehicle crossing is only 6m, and therefore compliant with the requirements in the AUP.

VC1 – Ground level crossings

As per Table E27.6.4.3.2 of the AUP, the vehicle crossing serving the upper ground floor carpark and loading space in VC1 is permitted to have a maximum width of 6m. However, these vehicle crossings will frequently facilitate inbound/outbound movements for a 17.9m and 19.45m semi-trailer design vehicle, hence the additional vehicle crossing width is required to accommodate these vehicle movements as shown in **Figures 7-51** and **7-52** below.

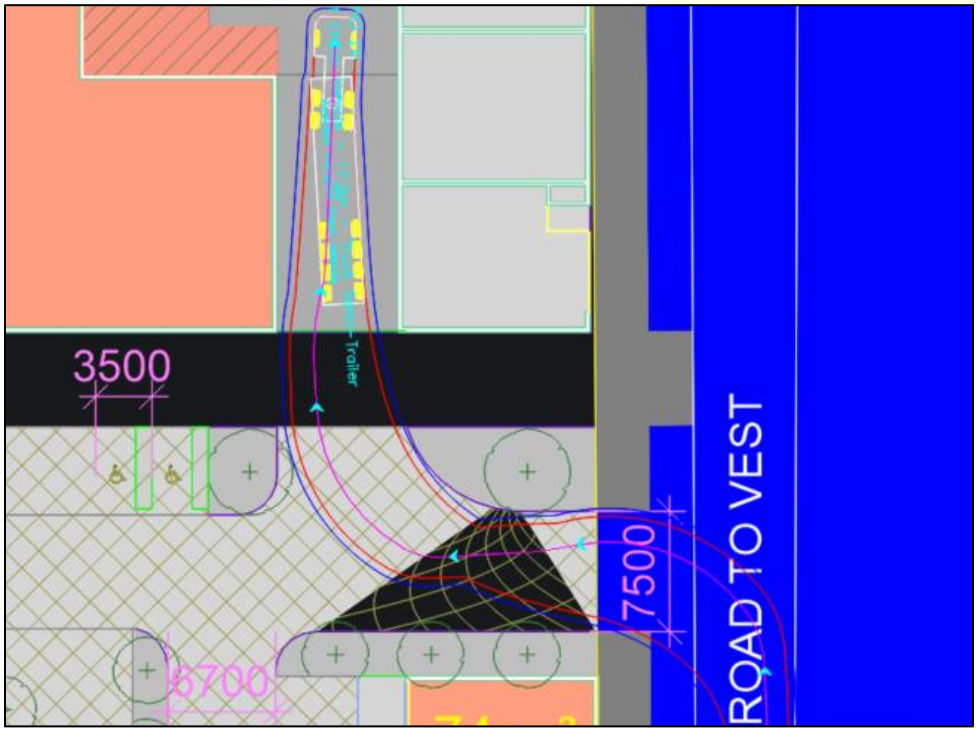

Figure 7-51: VC1 - Eastern vehicle crossing width

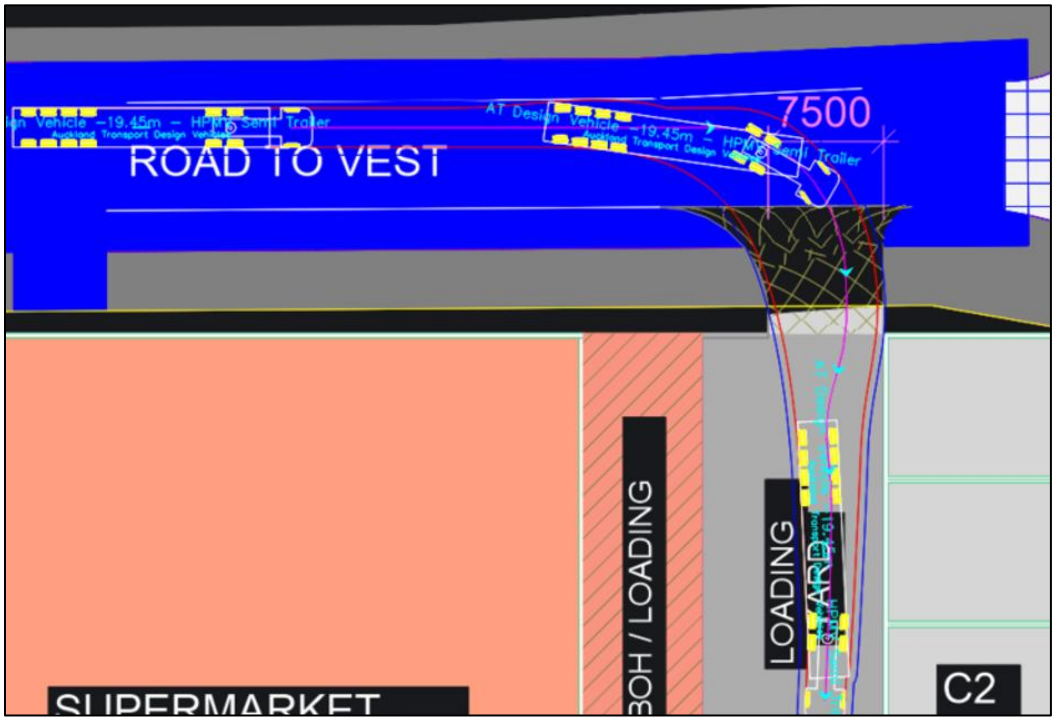

Figure 7-52: VC1 - Northern vehicle crossing width

As discussed above, despite some of the proposed vehicle crossings not complying with the specific design constraints outlined in the operative AUP, they have been designed as such to provide safe and efficient vehicle movements in and out of the accessways, loading

zones and car parks. Additionally, these non-compliances are unlikely to have any adverse effects on the safe and efficient operation of the road corridor.

Apart from the proposed JOALs and vehicle crossings outlined in **Table 7-6** above, individual formalised assessment of the proposed vehicle crossings serving individual vacant lots cannot be completed at this stage as the exact locations and sizes of these vehicle crossings is yet to be confirmed. As such, assessment of these vehicle crossings serving individual lots are not currently shown on the masterplan as they will be addressed in future resource consents for dwellings within those lots. However, it is expected that vehicle crossings serving most lots will comply with width requirements as outlined in the AUP.

Vehicle Crossing Separation

Table E27.6.4.2.1 of the Auckland Unitary Plan (AUP) states that all sites are permitted to have one vehicle crossing per 25m of road frontage or part thereof. Additional vehicle crossings serving the same site must provide minimum separation of 6m, and vehicle crossings serving adjacent sites must either be combined (with a maximum width of 6m), or achieve a minimum separation of 2m. Each of the apartment buildings within the Marina and Coastal Precinct, and the superlots within the Village Centre (VC1 - VC5) and the Community precinct (CM1 – CM5) have been treated as an individual site. Some of these sites provide multiple vehicle crossings as they provide access into multi-level carparks. **Table** below assesses the permitted number of vehicle crossings and separation requirements for each site.

Table 7-7: Permitted number of vehicle crossings and separation requirements

Lot / Apartment Number	Approximate Road Frontage (m)	Permitted no. of vehicle crossings	No. of vehicle crossings provided	Minimum separation (m)
MP1-A	9	1	1	-
MP3-A	88	4	1	-
MP3-B	56	3	2	38
MP8-A/B/C	233	10	2	144
MP13-A/B	45	2	1	-
MP15-A	44	2	1	-
MP16-A	41	2	1	-
MP16-B	27	2	1	-
MP24-A	42	2	1	-
MP25-A/B	52	3	1	-
MP26-A	95	4	2	55
C1-A	64	3	1	-
C5-A	109	5	1	-

C5-B	61	3	1	-
C5-C	60	3	1	-
C7-A	105	5	1	-
C9-A/B	310	13	1	-
E1	317	13	3	14
E3	178	8	2	25
E4	127	5	4	11
JOAL 4001	75	3	2	6.5
JOAL 4002	96	4	1	-
JOAL 4003	67	3	1	-
JOAL 4004	75	3	1	-
JOAL 4005	70	2	1	-
JOAL 4006	171	8	2	34
JOAL 1103	50	2	1	-
JOAL 4010	65	3	1	-
JOAL 4013	50	2	1	-
JOAL 4014	35	2	1	-
VC1	460	19	4	41.5
VC2	21	1	1	-
VC3	117	5	1	-
VC4	365	15	2	112
VC5	182	8	2	34
CM1	225	10	3	64
CM2	210	9	1	-
CM3	350	14	3	72
CM4	480	20	5	87
CM5	340	14	1	-

As shown, all proposed vehicle crossings comply with the minimum separation and maximum number of vehicle crossing requirements.

The JOALs serving the individual residential lots located within the Central East precinct (super lots CE1 – CE5, and JL1) have also been assessed to determine compliance with separation and number of vehicle crossing requirements. All proposed JOALs achieve minimum 2m separation from adjacent JOALs, hence complying with the requirements outlined in the AUP.

As stated above, exact vehicle crossing locations for individual vacant lots have not yet been determined, however it is expected that most vehicle crossings will be designed to comply with minimum separation requirements wherever possible. There may be some

vehicle crossings where it is not possible to achieve compliant separation due to geometric or road constraints. Such vehicle crossings and any potential adverse effects of this non-compliance will be assessed individually at a subsequent or separate resource consent to enable dwellings within the lots.

Intersection Separation

Figure E27.6.4.1.1 of the AUP requires vehicle crossings to have at least 10m separation from the nearest intersections. **Table** below summarises the minimum separation between a vehicle crossing and the nearest intersection for each individual lot within the Site.

Table 7-8: Intersection Separation requirements

Lot / Apartment Number	Separation from nearest intersection (m)
MP1-A	140
MP3-A	9
MP3-B (Loading Space)	23
MP8-A/B/C	28
MP13-A/B	105
MP15-A	71
MP16-A	0
MP16-B	26
MP24-A	115
MP25-A/B	110
MP26-A	30
C1-A	119
C5-A	15
C5-B	90
C5-C	30
C7-A	125
C9-A/B	60
E1 (western)	100
E1 (central)	53
E1 (eastern)	32
E3 (northern boundary)	34
E3 (eastern boundary)	106
E4	140
JOAL 4001	34
JOAL 4002	21
JOAL 4003	30
JOAL 4004	70
JOAL 4005	36

JOAL 4006	30
JOAL 1103	170
JOAL 4010	170
JOAL 4013	190
JOAL 4014	190
CE1	80
CE2	28
CE3	160
CE4	27
CE5	25
JL1	10
VC1	15 (ground level- northern boundary)
VC2	20
VC3	15
VC4	28 (ground floor, two-way access)
VC5	30
CM1	28
CM2	57
CM3	25
CM4	32
CM5	1.5

As shown above, three of the proposed vehicle crossings do not comply with the minimum intersection separation requirements. The vehicle crossing serving Apartment buildings MP3-A, MP16-A and super lot CM5 are located in close proximity to nearby T-intersections. However, given that all these road corridors are categorised as Local Roads, and provide good visibility in all directions, this non-compliance is unlikely to have a material effect on the safe and efficient movement of vehicles along the road corridor.

Provision for Passing Bays

Table E27.6.4.3.1 of the AUP states that passing bays must be provided at 50m intervals where the length of the accessway exceeds 50m, and the width of the accessway is less than 5.5m. This passing bay must have a formed width of access to 5.5m over 7m with 45 degree tapers. The proposed development site does not provide any two-way accessway with a width less than 5.5m, and length greater than 50m, hence no passing bays are required or proposed within the site.

7.9 Parking

Vehicle Parking

The AUP does not specify minimum or maximum vehicle parking requirements for the proposed residential, retail, and visitor accommodation activities. However, tables E27.6.2.3 and E27.6.2.4 outline the maximum parking rate for the office and education facilities activities. Office activities across all zones are permitted to provide a maximum of one parking space per 30sqm GFA. Educational facilities located within the *Business – Metropolitan Centre, Town Centre, Local Centre and Mixed Use Zones* and *Residential – Terrace Housing and Apartment Buildings Zone* are permitted to provide a maximum of 0.5 parking spaces per full-time equivalent (FTE) employee + 1 visitor space per classroom for primary and secondary schools, and 0.5 parking spaces per FTE employee + 0.25 per equivalent full time (EFT) student for tertiary school. However, the proposed educational facilities within the Site will not exist within these zones (the schools are proposed within the Residential – Mixed Housing Zone), hence there are no specific parking requirements. The only other activities which have restricted parking rates are Medical facilities – Hospital (none of which are proposed as part of this consent application).

VC1 proposes 2,854sqm of commercial GFA which has been conservatively assumed to be entirely allocated for the office activity. As such, a maximum of 95 parking spaces (2854/30) within the VC1 superlot can be allocated to the office activity. The basement within the VC1 super lot provides 195 parking spaces of which 73 are allocated to residential, and 122 are allocated for customers of the retail activities. Additionally, the VC1 superlot provides 62 parking spaces on the ground floor, which are understood to be largely allocated to the supermarket and some for the commercial activity located in the north-western corner of the Site. In the unlikely event that all 62 parking spaces on the ground floor are allocated to the commercial (office activity), the number of parking spaces provided is still less than the maximum number permitted. As such, the level of parking provided for the commercial/office activities proposed within super lot VC1 comply with the requirements outlined in the AUP.

All other proposed activities do not have a minimum or maximum parking requirement.

Accessible Parking

Rule E27.6.3.2A of the AUP outlines the specific requirements for accessible parking spaces in both residential and non-residential developments. The rule states that for residential developments of more than 10 dwellings, which provide car parking on-site accessible parking spaces must be provided and for all non-residential developments,

accessible parking must be provided whenever parking is provided on-site. Specific activities such as Community facilities, and organised sport and recreation facilities must provide accessible parking spaces even when no car parking is provided on-site.

Non-residential land uses

For non-residential land uses, the appropriate number of accessible parking spaces can be calculated based on either the theoretical demand as outlined in Appendix 23, or the number of proposed parking spaces within the Site (whichever is higher). Non-residential activities are provided within super lots VC1, VC2, CM2, CM5, school super lot and the employment precincts (E1-E4). The demand for accessible parking spaces calculated using both methods outlined above is provided in **Table** below.

Table 7-9: Accessible parking spaces requirement – Non-residential land use

Super lot	Activity	GFA/ units/ capacity	Theoretical Demand (Appendix 23)	Theoretical parking demand	Parking spaces proposed	Accessible parking spaces required and provided
VC1	Commercial	2854	1 per 100sqm GFA	28	186 (basement + ground floor)	5 (based on proposed parking spaces as higher) 7 provided (3 on GF, 4 in the basement)
	Innovation Hub (Commercial)	1340	1 per 100sqm GFA	13		
	Retail	1564	1 per 50sqm GFA	32		
	Supermarket	2620	1 per 50sqm GFA	53		
VC2	Community	654 sqm	0.2 per person	30 (assuming maximum capacity of 150 visitors)	43	3 (based on theoretical parking demand). 3 provided
	Food and Beverage	1271	1 per 25sqm GFA	51		
	Retail	496	1 per 50sqm GFA	10		
CM2	Land used for organised sport and recreation	5,627sqm	12.5 spaces per hectare	7	20	1 (based on proposed parking spaces). 1 provided.
CM5	Visitor Accommodation	153	0.3 per bedroom	46	174	5 required (based on proposed parking spaces). 5 provided.
School	Primary and Secondary School	2,100 students, 105 teachers, and a total of 84 classrooms	0.5 per FTE employee, plus 1 visitor space per classroom	137	103	4 required (based on theoretical parking demand). 4 provided.

		across the schools.				
E2	Light Industrial	16,323 sqm	1 per 100sqm GFA for warehousing, storage and lockup facilities. 1 per 50sqm for all other industrial activities Assuming 50% GFA for warehousing, storage and lockup facilities.	244	Expected to be less than the theoretical demand. *	6 (based on theoretical parking demand). 6 will be provided **
E3	Light Industrial	5,488 sqm		82	28	3 required (based on theoretical parking demand). 3 will be provided.
E4	Light Industrial	4,740 sqm		71	12	3 required (based on theoretical parking demand). 3 will be provided.

* The layout of super lot E2 will be confirmed as part of subsequent design stages. As such, the total number of proposed parking spaces is currently undetermined however it will be designed to comply with the parking requirements outlined in the AUP.

**Once the layout of super lot E2 is confirmed, an appropriate number of parking spaces (including accessible parking spaces) will be provided within super lot E2.

As shown above, the provision for accessible parking spaces in all super lots containing non-residential activities will comply with the requirements outlined in Rule E27.6.3.2.A of the AUP.

Residential Land Uses

The AUP outlines that for residential developments between 10-20 dwellings, a minimum of one accessible parking space is required. Where between 21-50 dwellings are provided, a minimum of two accessible parking spaces are required. For every additional 50 dwellings, one additional accessible parking space is required.

Precincts E1, E3, CE1-CE5, JL1, CM1, CM4, and VC5, and all other single residential lots all propose individual dwellings within individual lots, hence no accessible parking spaces are required within these lots. **Table 7-10** below outlines the number of dwellings proposed within the varying apartment buildings/super lots.

Table 7-10: Accessible parking spaces requirement – Residential land use

Super lot /Apartment	Dwellings	Accessible spaces reqd.	Accessible spaces provided
MP1-A	24	2	Yes – 4

MP3-A	24	2	Yes – 4
MP3-B	24	2	Yes - 4
MP8-A	18	1	Yes - 2
MP8-B	18	1	Yes – 2
MP8-C	18	1	Yes – 2
MP13-A	24	2	Yes – 4
MP13-B	24	2	Yes – 4
MP15-A	36	2	Yes – 2
MP16-A	24	2	Yes – 4
MP16-B	24	2	Yes – 4
MP24-A	36	2	Yes - 2
MP25-A	24	2	Yes - 4
MP25-B	24	2	Yes - 4
MP26-A	19	1	Yes - 1
C1-A	21	2	Yes - 2
C5-A	24	2	Yes - 4
C5-B	24	2	Yes - 4
C5-C	24	2	Yes - 4
C7-A	36	2	Yes - 2
C9-A	36	2	Yes - 1
C9-B	36	2	Yes - 1
E4	12	1	Yes - 1
CM3	114	4	Yes - 4
VC1	54	3	Yes – 3
VC3	82	3	Yes - 3
VC4	150	4	Yes – 3

As shown in **Table 7-10** above, the provision for accessible parking spaces in all super lots containing residential activities comply with the requirements outlined in Rule E27.6.3.2.A of the AUP. The proposed location of some of these accessible parking spaces is also shown in **Figures 7-54** to **7-58** below.

Parking Dimensions

Table E27.6.3.1.1 of the AUP outlines the minimum car parking space and manoeuvring dimensions for both regular and casual users. An extract of Table E27.6.3.2.1 is provided in **Figure 7-53** below. The AUP defines regular users as employees, residents, or long-term parking users, whereas casual users are typically short-term visitors who are not entirely familiar with the parking layout.

Car parking angle		Width of parking space	Depth of parking space		Manoeuvring space[3]	Total
			From wall[1]	From kerb[2]		
(T117)	90 degrees (regular users)[4]	2.4	5.0	4.0	7.1	12.1
(T118)		2.5			6.7	11.7
(T119)		2.6			6.3	11.3
(T120)		2.7			5.9	10.9
(T121)	90 degrees	2.5	5.0	4.0	7.7	12.7
(T122)	(casual users)[4]	2.6			7.0	12.0
(T123)		2.7			6.7	11.7

Figure 7-53: AUP Minimum car parking space and manoeuvring dimensions

Marina and Coastal Precincts

19 of the proposed 22 apartment buildings provide five different parking layouts on the ground floor or basement level of each building. These five parking layouts are shown in **Figures 7-54 to 7-58** below. Each of these five layouts provide 90-degree parking space with a stall width of 2.5m, stall depth of 5m, and minimum aisle width of 6.7m, hence complying with the requirements in the AUP (outlined in red in **Figure 7-53** above). Rule E27.6.3.3(3) also outlines that "*where a dwelling provides more than one parking space, these may be stacked*". As shown below, each of the parking layouts provides several stacked parking spaces which will be allocated appropriately to comply with AUP requirements.

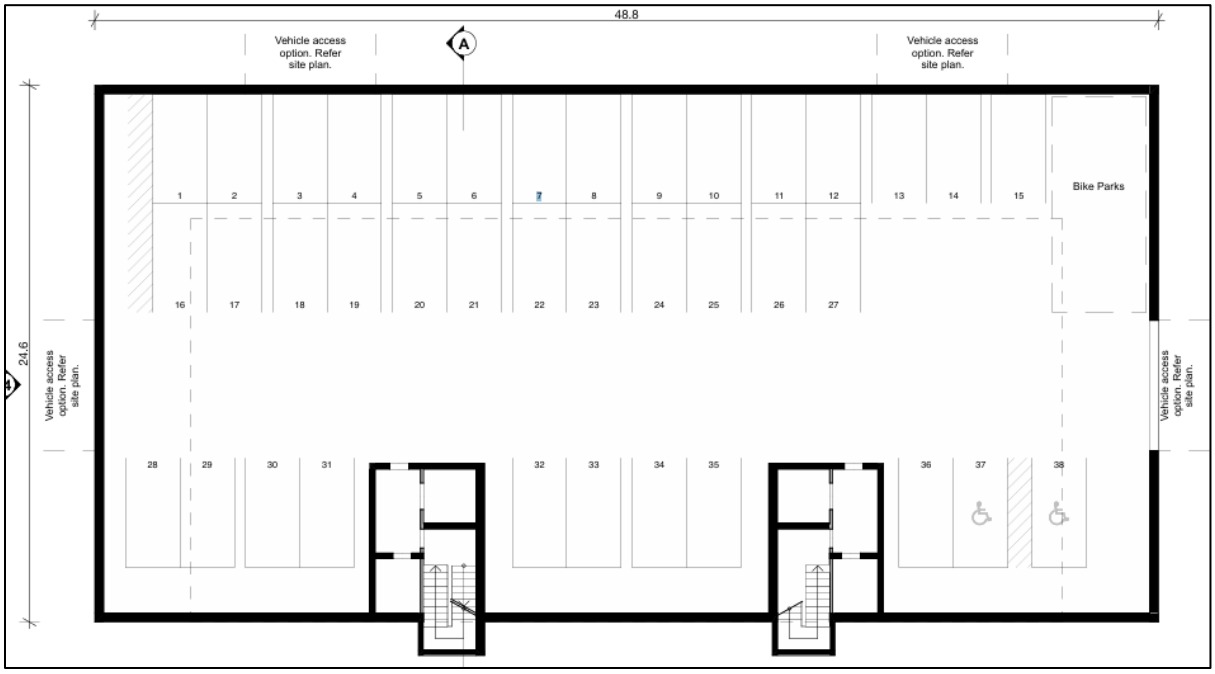

Figure 7-54: Type 1 Parking Layout

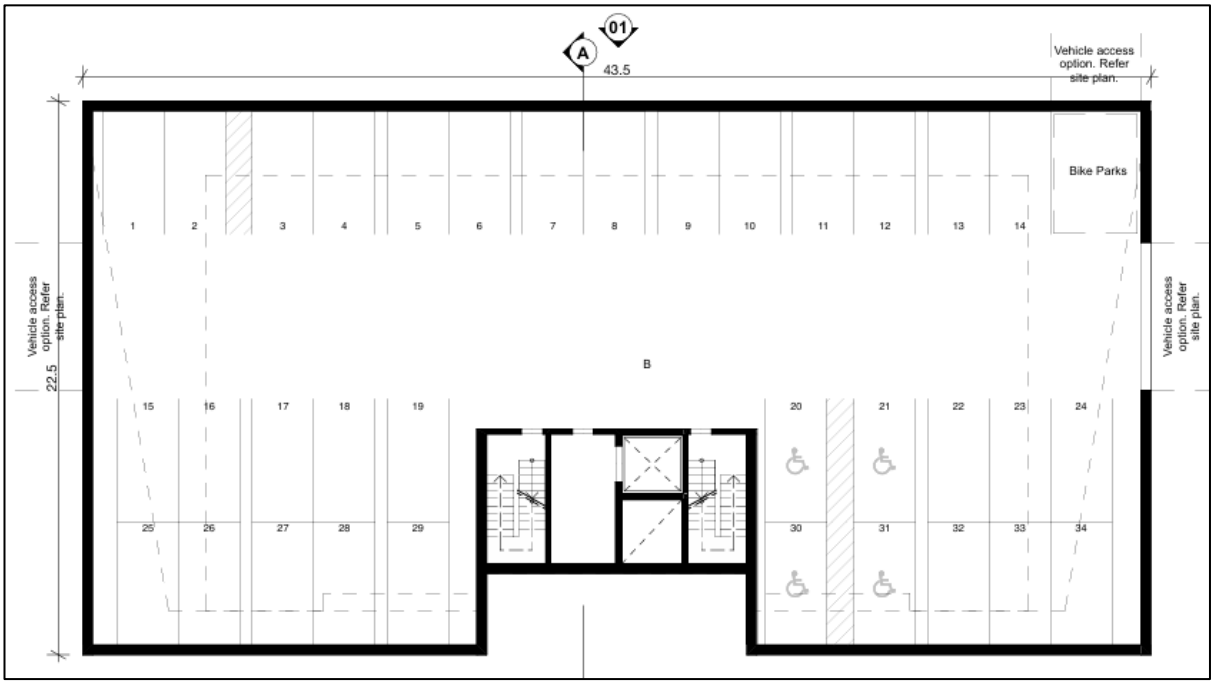

Figure 7-55: Type 2 Parking Layout

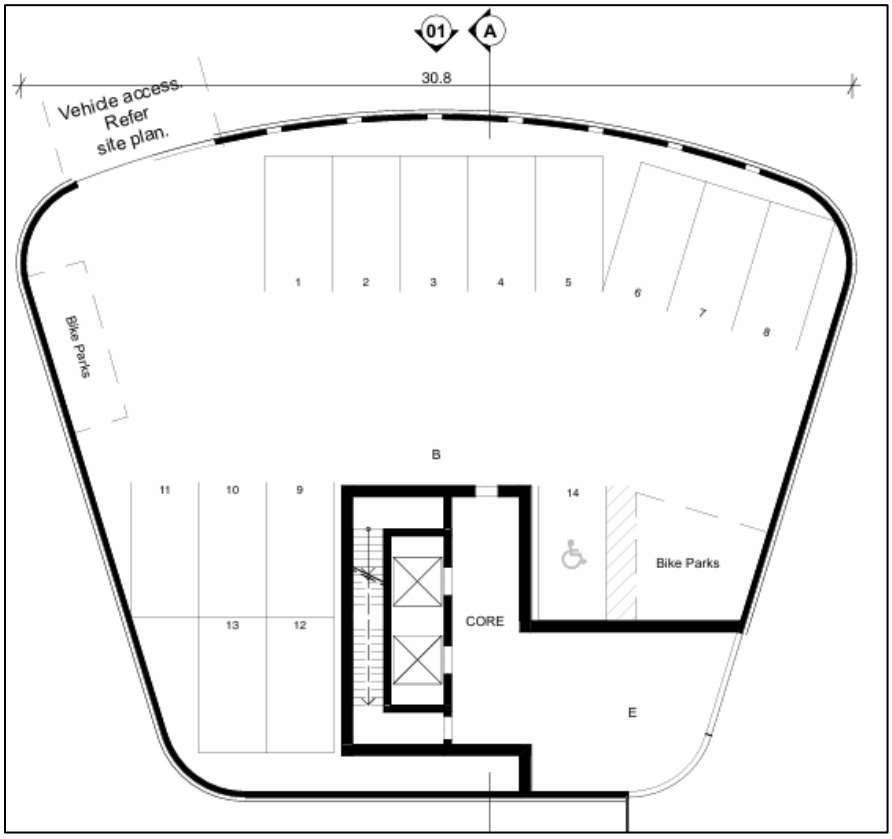

Figure 7-56: Type 3 Parking Layout

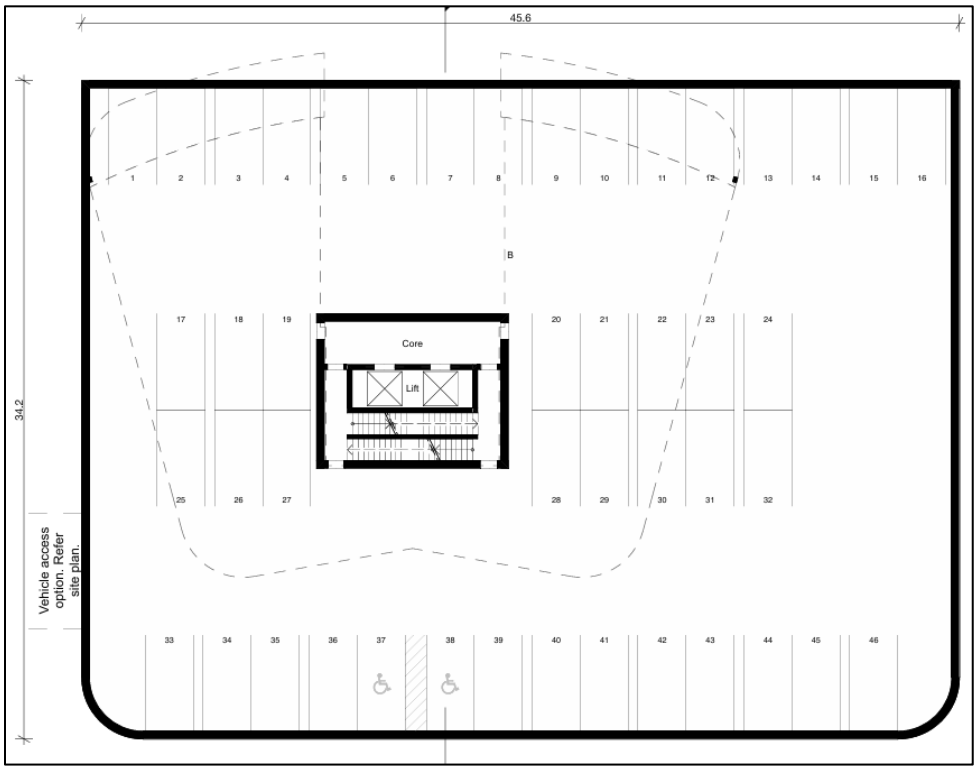

Figure 7-57: Type 4 Parking Layout

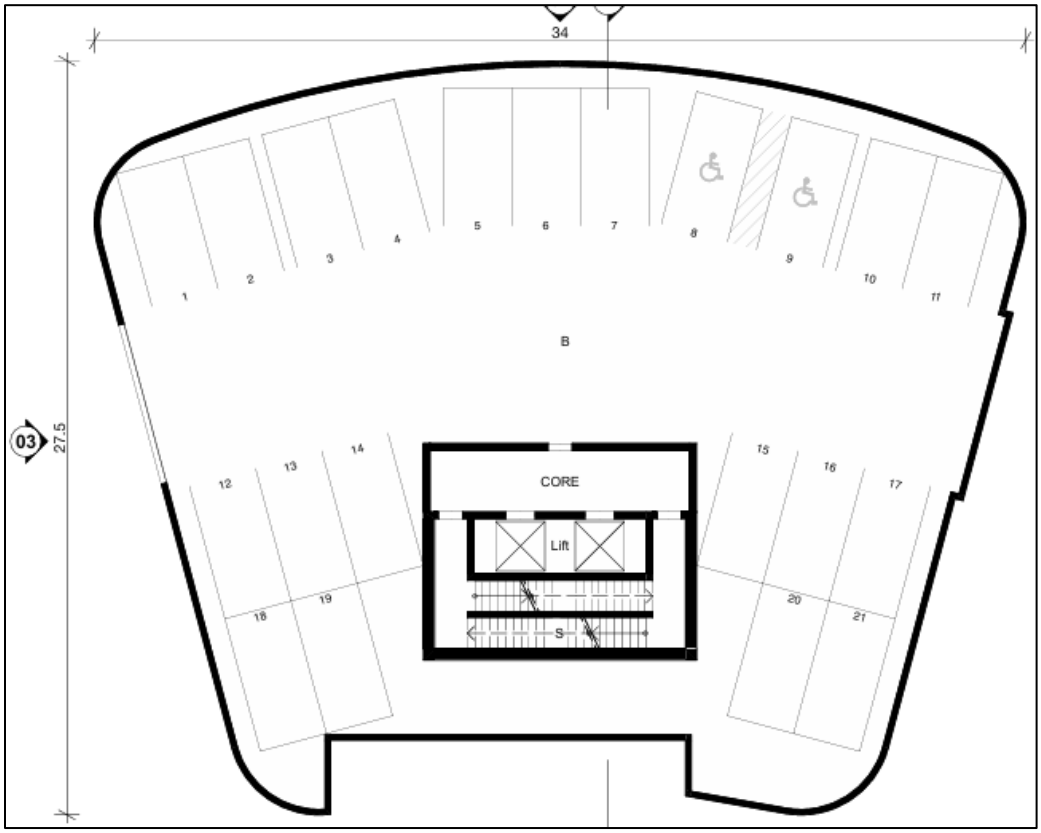

Figure 7-58: Type 5 Parking Layout

In addition to these dedicated carparks on the basement or ground floor of each building, some apartment buildings also provide external parking spaces along the JOAL or in a central carpark. This includes apartment buildings: MP-8A/B/C, MP13-A/B, MP15-A, MP24-A, MP16-A, MP16-B, MP25-A/B, MP26-A, and C1-A. The central carpark serving apartment buildings MP-8A/B/C provide a stall depth of 5m, width of 2.5m, and minimum aisle width of 7m. The MP13 – MP26 apartment buildings outlined above provide parking space with a width of 2.5m, depth of 5.5m, and more than 7m manoeuvring space. The C1 apartment building parking spaces provides a stall width of 2.8m, depth of 5m and more than 6m manoeuvring space. As such, all proposed parking spaces comply with the requirements outlined in the AUP.

Employment, Central East, Village Centre and Community Precincts

Each of the super lots within the Employment precinct, Central East (CE1 – CE5, JL1), Community (CM1, CM4) and Village Centre (VC5) provide terraced or standalone dwellings within individual lots either with a garage or a dedicated off-street parking space. While the exact dimensions and location of these parking spaces/garages will be finalised in subsequent consent applications, it is expected these parking space dimensions will comply with AUP requirements.

Remaining Village Centre and Community Precincts

CM2

CM2 provides a dedicated carpark with provision for 20 parking spaces, and two blocks of on-street perpendicular parking with a total of 18 parking spaces (these are not specifically dedicated to the CM2 super lot). The carpark provides parking spaces with a depth of 5m on both sides (an additional 1m allowance for kerb overhang on the eastern side), and a manoeuvring width of 7m, and stall widths of 2.5m. The on-street parking spaces have a stall depth of 5m, width of 2.7m, and 8.7m manoeuvring space. As such, all parking spaces within CM2 comply with the requirements outlined in the AUP.

CM3

CM3 provides a basement and ground floor carpark. Both carparks provide parking spaces allocated to the dwellings within the CM3 super lot, hence will only be accessible by regular users. The basement provides parking spaces with a depth of 5m, stall width of 2.5m, and minimum manoeuvring width of 7.6m at most locations. At three locations, the manoeuvring width reduces to a minimum of 6.6m, however the stall width has been increased for these parking spaces to ensure compliance with the AUP. The ground floor provides parking spaces with a depth of 5.1m, width of 2.5m, and minimum manoeuvring width of 6.7m. As such, all proposed parking spaces comply with the requirements outlined in the AUP.

CM5

CM5 also provides a basement carpark and ground floor carpark to serve the proposed golf course and hotel facility. The basement provides 27 parking spaces with a depth of 5.1m, stall width of 2.7m, and minimum manoeuvring width of 6.9m. An additional four parking spaces are provided with width of 2.4m, depth of 5.1m, and 9.8m manoeuvring width. It is understood these parking spaces will be allocated for employees or regular users of the golf club or hotel activities. Most parking spaces within the ground floor carpark have a stall width of 2.5m, depth of 5m, and 7.7m manoeuvring space, however some parking spaces along the eastern and western boundary provide parking spaces with a width of 2.6m, depth of 5m, and 7m manoeuvring space. As such, all parking spaces comply with the requirements outlined in the AUP.

VC1

As outlined above, VC1 provides three separate carparks. The basement level provides a northern carpark serving the retail stores (will be assessed against casual user requirements) and the southern carpark serves the residential dwellings located within

VC1, hence will be assessed against regular user requirements. The ground floor carpark serves the retail and commercial activities within the super lot, hence will be assessed against casual user requirements.

The northern basement carpark provides parking spaces with a minimum width of 2.5m, parking depth of 5.1m, and manoeuvring width of 7.7m. The southern basement carpark provides parking spaces with a minimum width of 2.5m, parking depth of 5.1m, and manoeuvring width of 6.7m. The ground floor carpark within VC1 will be utilised by customers of the retail stores, hence provides 64 parking spaces with stall widths of 2.7m, depth of 5m, and minimum manoeuvring space of 6.7m. As such, the proposed parking spaces comply with the requirements outlined in the AUP.

VC2

VC2 provides 45 parking spaces serving the retail, restaurant and community activities. All proposed parking spaces have a stall width of 2.6m, depth of 5.1m, and minimum manoeuvring space of 7.3m hence complying with the requirements outlined in the AUP.

VC3

The VC3 super lot provides one carpark at the basement level of the apartment building. Each of the proposed parking spaces provide a stall width of 2.5m, a stall depth of 5m, and a minimum manoeuvring space of 7.1m hence complying with the requirements outlined in the AUP.

VC4

The VC4 super lot provides two carparks within the basement and the ground levels. Most of the parking spaces across both carparks provide a stall width of 2.5m, stall depth of 5m, and a minimum manoeuvring space of 7.1m, hence complying with the AUP requirements.

Bicycle Parking

Table E27.6.2.5 of the AUP outlines the required bicycle parking rates for the proposed residential, commercial, retail, hotel, and community activities within the Beachlands South development. These are summarised below.

- Residential developments of 20 or more dwellings require one secure parking space per dwelling without a dedicated garage or basement parking space, and one visitor parking space per 20 dwellings.
- Visitor accommodation requires one secure parking space per 10 FTE employees, and one visitor space per 20 rooms/beds.

- Commercial activities (offices) greater than 200sqm up to 10,000sqm require one secure space per 300sqm of office, and one visitor space per 1000sqm.
- Food and beverage activities require one secure space per 300sqm GFA, and one visitor space per 350sqm GFA for developments greater than 350sqm.
- Other retail activities between 500sqm and 5000sqm GFA require one visitor space per 500sqm GFA, and one secure space per 300sqm GFA of office space.
- Community facilities require one visitor space per 200sqm GFA, and one secure space per 500sqm GFA.
- Organised sport and recreational facilities require three visitor spaces per hectare distributed in groups of 3-5 racks, and one secure space per hectare.
- Industrial activities including storage and lockup facilities require minimum one visitor space plus one space per 750sqm of office space, and one secure space per 300sqm of office space. The final GFA of the industrial activity buildings will be determined as part of subsequent design stages, hence it has been assumed that 10% of the total GFA will be allocated as office space
- Educational facilities (requirements outlined in **Figure 7-59** below):

Figure 7-59: Bicycle Parking Requirements for Educational facilities

Activity			Visitor (short-stay) Minimum rate	Secure (long-stay) Minimum rate
(T92)	Industrial activities and storage and lockup facilities		1 space plus 1 space per 750m² GFA of office space	1 per 300m² GFA of office
(T93)	Care centres		1 space plus 1 space per 50 people to be accommodated	1 space per 10 FTE employees
(T94)	Educational facilities	Primary and intermediate schools	1 space plus 1 space per 400 students and FTE employees	1 per 30 students in Year 1 to 5 plus 1 per 15 students in Year 6 to 8 plus 1 per 20 employees
(T95)		Secondary schools	1 space plus 1 space per 400 students and FTE employees	1 per 15 students in Year 9 to 13 plus 1 per 20 FTE employees
(T96)		Tertiary education facilities	1 per 800 m² GFA office	1 per 20 EFT students and FTE employees on site at the peak times

Table 7-11 below provides a breakdown of the proposed activities, bicycle parking requirements, and provision within each lot. It should be noted that the provided architectural plans do not contain specific layouts of the retail stores, hence it has been assumed that 5% of the total retail activity area consists of office space for employees. Using typical hotel employment assumptions, it has also been assumed that the proposed visitor accommodation (hotel activity) requires 0.5 employees per hotel room, so a 153-room hotel would have approximately 77 employees.

Table 7-11: Bicycle Parking Requirements

Super lot / Apartment Number	Proposed Activity	GFA / Units	Bicycle parking requirement (per activity)	Total Bicycle paring Requirement per super lot (if applicable)	Appropriate provision
MP1-A	Residential	24	1 visitor	-	Yes
MP3-A	Residential	24	1 visitor	-	Yes
MP3-B	Residential	24	1 visitor	-	Yes
MP8-A	Residential	18	18 secure	-	Yes
MP8-B	Residential	18	18 secure	-	Yes
MP8-C	Residential	18	18 secure	-	Yes
MP13-A	Residential	24	1 visitor	-	Yes
MP13-B	Residential	24	1 visitor	-	Yes
MP15-A	Residential	36	1 visitor	-	Yes
MP24-A	Residential	36	1 visitor	-	Yes
MP16-A	Residential	24	1 visitor	-	Yes
MP16-B	Residential	24	1 visitor	-	Yes
MP25-A	Residential	24	1 visitor	-	Yes
MP25-B	Residential	24	1 visitor	-	Yes
MP26-A	Residential	19	5 secure	-	Yes
C1-A	Residential	21	1 visitor	-	Yes
C5-A	Residential	24	1 visitor	-	Yes
C5-B	Residential	24	1 visitor	-	Yes
C5-C	Residential	24	1 visitor	-	Yes
C7-A	Residential	36	1 visitor	-	Yes
C9-A	Residential	36	1 visitor	-	Yes
C9-B	Residential	36	1 visitor	-	Yes
E1	Residential	2	1 visitor, 13 secure	-	Yes
E2	Industrial	16,323 sqm	3 visitor, 5 secure	-	Yes
E3	Industrial	5,488 sqm	1 visitor, 2 secure	-	Yes
E4	Industrial	4,740 sqm	1 visitor, 1 secure	-	Yes
CM2	Organised sport and recreational	5,700sqm	2 visitor, and 1 secure per hectare,	--	Yes
CM3	Residential	114	1 secure for every dwelling without basement parking space. 5 visitor spaces	-	Yes
CM5	Visitor Accommodation	153 rooms	7 secure, 8 visitor	-	Yes
VC1	Commercial	2854	2 visitor, 9 secure	16 visitor, and 11 secure parking spaces	Yes
	Community (Innovation hub)	1340	6 visitor, 2 secure		
	Retail (incl. supermarket)	4184	8 visitor, no office		
VC2	Community	653	3 visitor, 1 secure		Yes

	Food and Beverage	1271	3 visitor, 4 secure	6 visitor, and 5 secure parking spaces	
	Retail	496	0 visitor, 0 secure		
VC3	Residential	82	0 secure, 4 visitor	-	Yes
VC4	Residential	150	1 secure for every dwelling without basement parking space. 7 visitor spaces.	-	Yes
Primary School	Educational Facility	600 students, and 26 teachers across 24 classrooms	1 visitor space plus 1 space per 400 students and FTE employees. 1 secure space per 30 students in year 1 to 5 (500) + 1 secure space per 15 students in year 6 to 8 + 1 space per 20 employees.	1 visitor space, 25 secure parking spaces	Yes
Secondary School	Educational Facility	1,500 students, and 79 teachers across 60 classrooms	1 visitor space plus 1 space per 400 students and FTE employees. 1 secure space per 15 students in year 7 to 13 + 1 space per 20 employees.	3 visitor spaces, 103 secure parking spaces	Yes

The table outlines the minimum bicycle parking requirements and the bicycle parking provision provided within each of the proposed super lots. As shown, most of the apartment buildings within the Marina and Coastal Precincts provide vehicular parking within the basement, and an additional secure bicycle parking facility on the ground floor. As outlined above, the exact layout of the industrial buildings within super lots E1-E4 will be confirmed as part of subsequent design stages. For these calculations, it has been conservatively assumed that 10% of the total proposed 29,099sqm industrial GFA will be allocated for office space. Each of the super lots within the Employment, Community and Village Centre precincts also provide secure bicycle parking facilities which are spread across the several buildings and the basement/ground levels to make it more user-friendly, and meet minimum requirement levels. As such, all super lots will provide a compliant level of bicycle parking.

7.10 Servicing

Table E27.6.2.7 and E27.6.2.7A of the AUP outlines the minimum loading space requirements for activities based on their respective GFAs. The AUP requires retail activities with a GFA between 300sqm and 5,000sqm to provide one loading space. The requirement increases to two loading spaces for a floor area between 5,000sqm and 10,000sqm. All other activities (not within the rural zone) with a GFA of up to 5,000sqm are not required to provide a loading space, and activities with a GFA between 5,000sqm and

20,000sqm are required to provide a minimum of one loading space. Where loading spaces are provided, they must have a minimum length of 8m, and width of 3.5m.

Table E27.6.2.2.7A outlines the minimum small loading space requirements where residential activities only have vehicular access from an arterial road. It is noted that no dwellings have access from an arterial road. Accordingly, no small loading spaces are required or proposed.

Table 7-12 below outlines the minimum loading space requirements and provisions for each of the proposed super lots. It is noted that each of the 22 proposed apartment buildings within the Marina and Coastal Precincts provide one loading space each irrespective of whether the proposed GFA of the apartment building exceeds 5,000sqm or not, hence complying with the requirements outlined in the AUP. Additionally, loading zones have not been provided within the CM1, CM4, and VC5 super lots as these super lots provide terraced or standalone dwellings within individual lots each with a GFA of less than 5,000sqm.

Table 7-12: Loading space assessment

Super lot / Apartment number	Proposed Activity	GFA (sqm)	Loading space requirement	Provision and Compliance
E1	Residential / Light Industrial	5,150	1	1
E2	Light Industrial	16,323	3	3*
E3	Light Industrial	5,488	2	2
E4	Light Industrial	4,740	1	2
CM2	Organised sport and recreational	5,671	1	0
CM3	Residential	15,269	1	1
CM5	Visitor Accommodation	<20,000	1	2 (1 regular, and 1 small loading space)
VC1	Commercial	2,854	Total commercial/residential area = 11,567sqm. 1 required	2 (1 on ground floor, one in basement).
	Residential	7,373		
	Innovation hub (commercial)	1,340		
	Retail (incl. supermarket)	4,436	1 required.	
VC2	Community	653	1	1
	Food and Beverage	1,271		
	Retail	496		
VC3	Residential	11,164	1	1
VC4	Residential	20,953	2	3
School super lot	Education facility	~23,000	2	2*

**The final layout for super lot E2 within the Employment precinct, and the school super lot will be confirmed at subsequent design stages. It is expected these layouts will be in compliance with AUP loading space requirements.*

As outlined in Table above (*), super lot CM2, does not comply with the requirements for minimum number of loading spaces as stated within the AUP. Super lot CM2 provides a community park facility with a multi-use court, lawn area, skate bowl, community playground, a pergola and BBQ area. Once constructed, these facilities do not need to be regularly accessed by loading vehicles as maintenance requirement for such activities is reasonably infrequent. Occasionally, when a loading vehicle needs to access the CM2 super lot, it can temporarily park in the carpark within the super lot, or the on-street parking spaces along the western boundary. As such, this non-compliance is unlikely to have a significant adverse impact on the safe and efficient operation of vehicle movements within the Site.

All other super lots comply with the loading space requirements outlined in the AUP. **Figure 7-60** to **7-75** below outline vehicle tracking for each of these loading spaces.

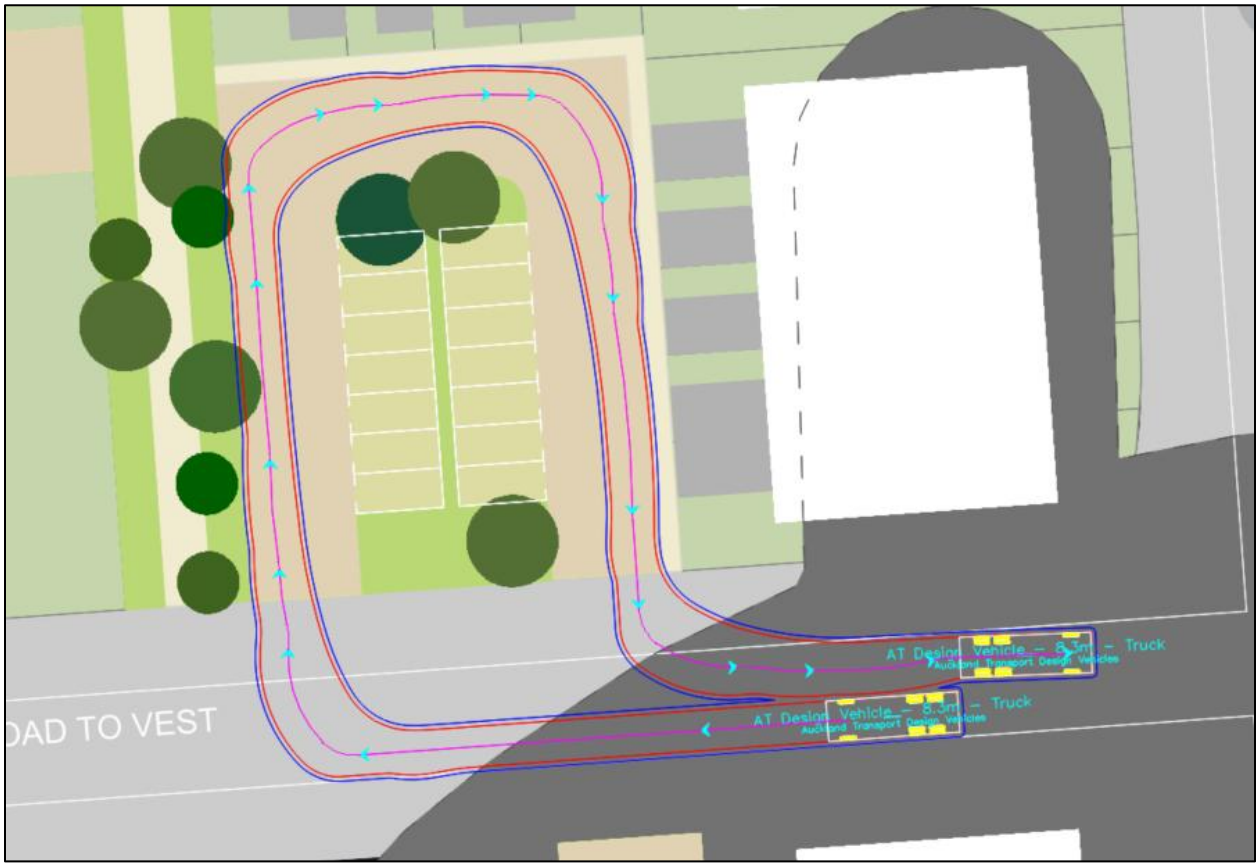

Figure 7-60: Super lot E1 - loading space tracking

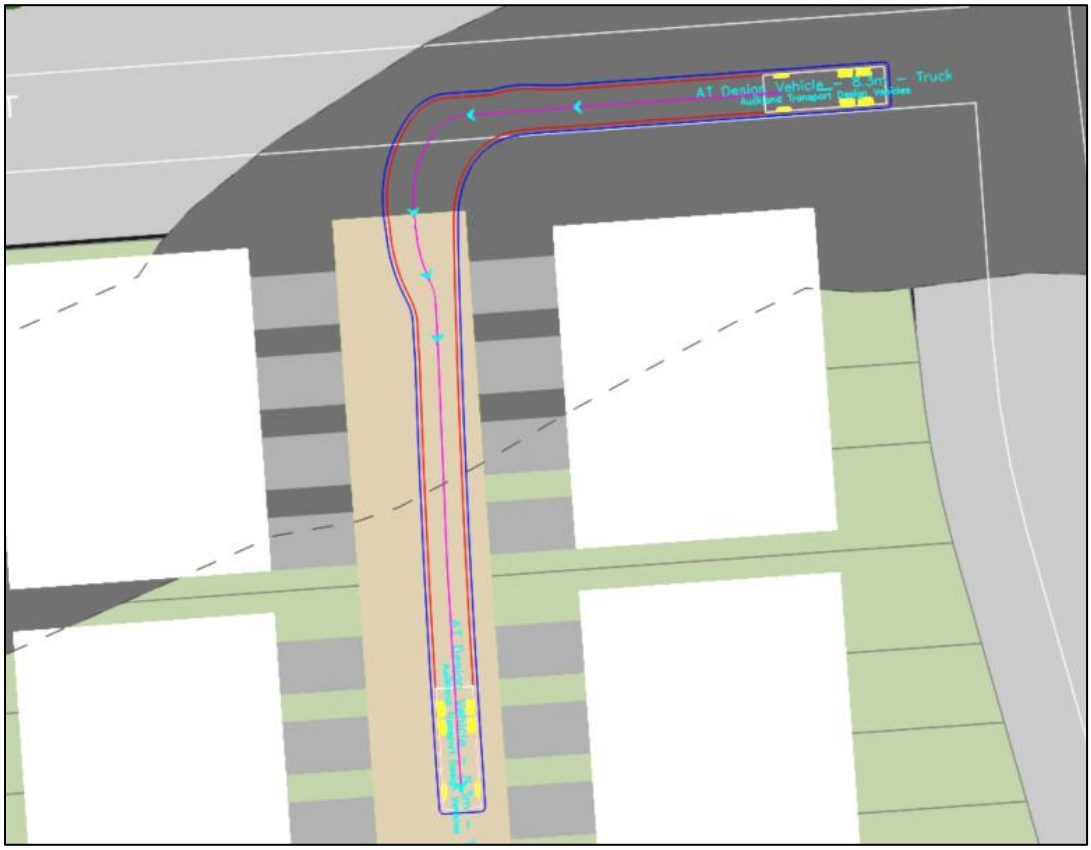

Figure 7-61: Super lot E3 - loading space tracking (inbound)

Figure 7-62: Super lot E3 - loading space tracking (outbound)

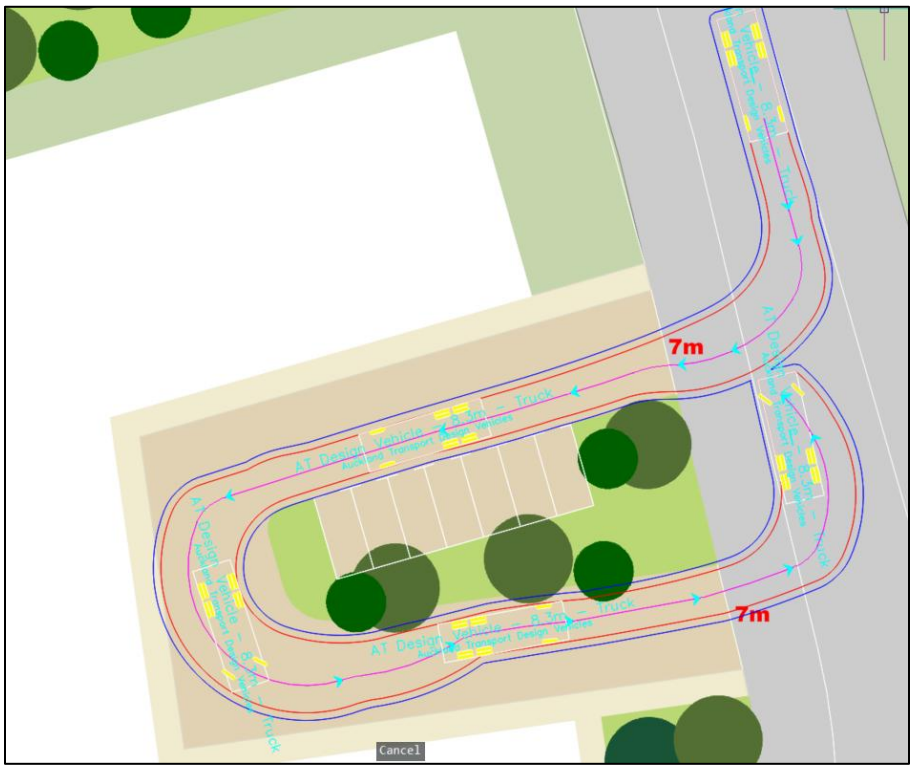

Figure 7-63: Super lot E4 - loading space tracking #1

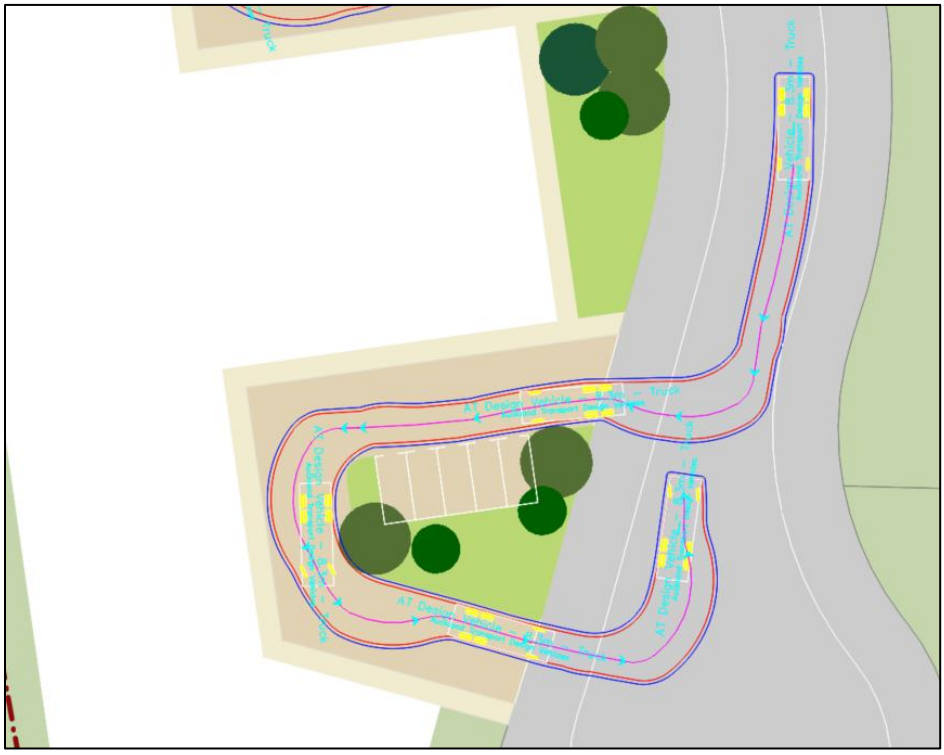

Figure 7-64: Super lot E4 - loading space tracking #2

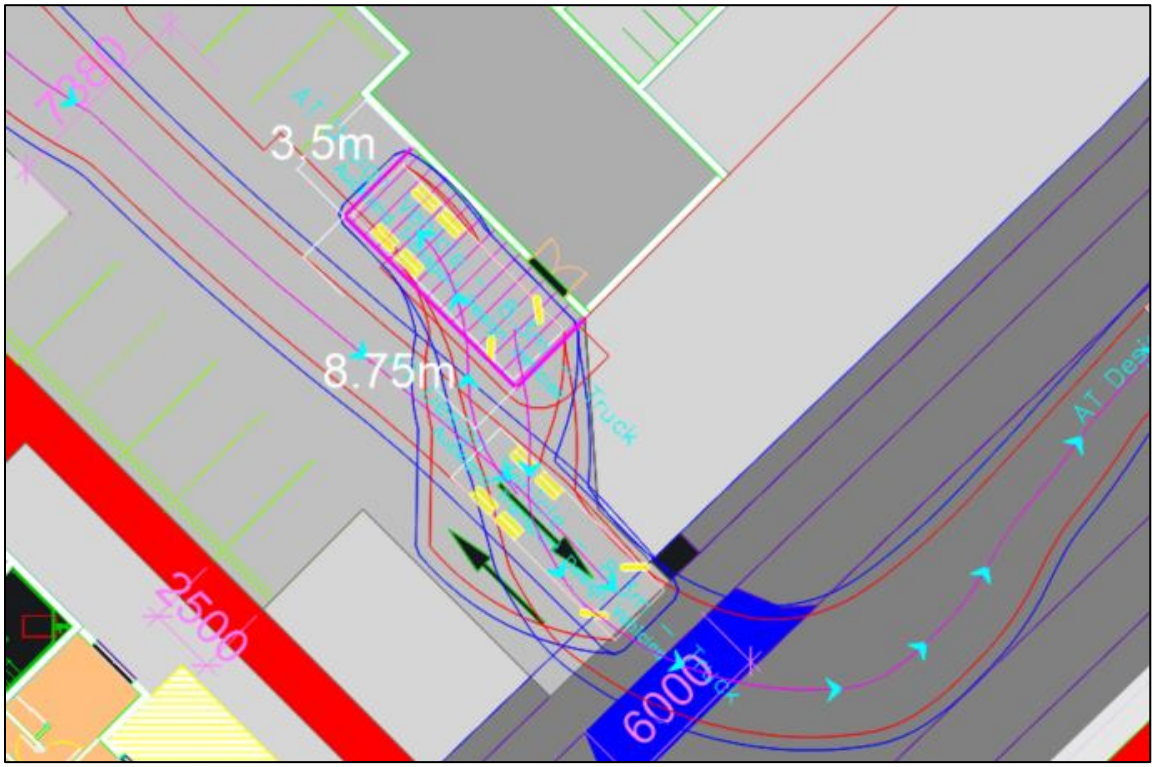

Figure 7-65: Super lot CM3 - loading space tracking

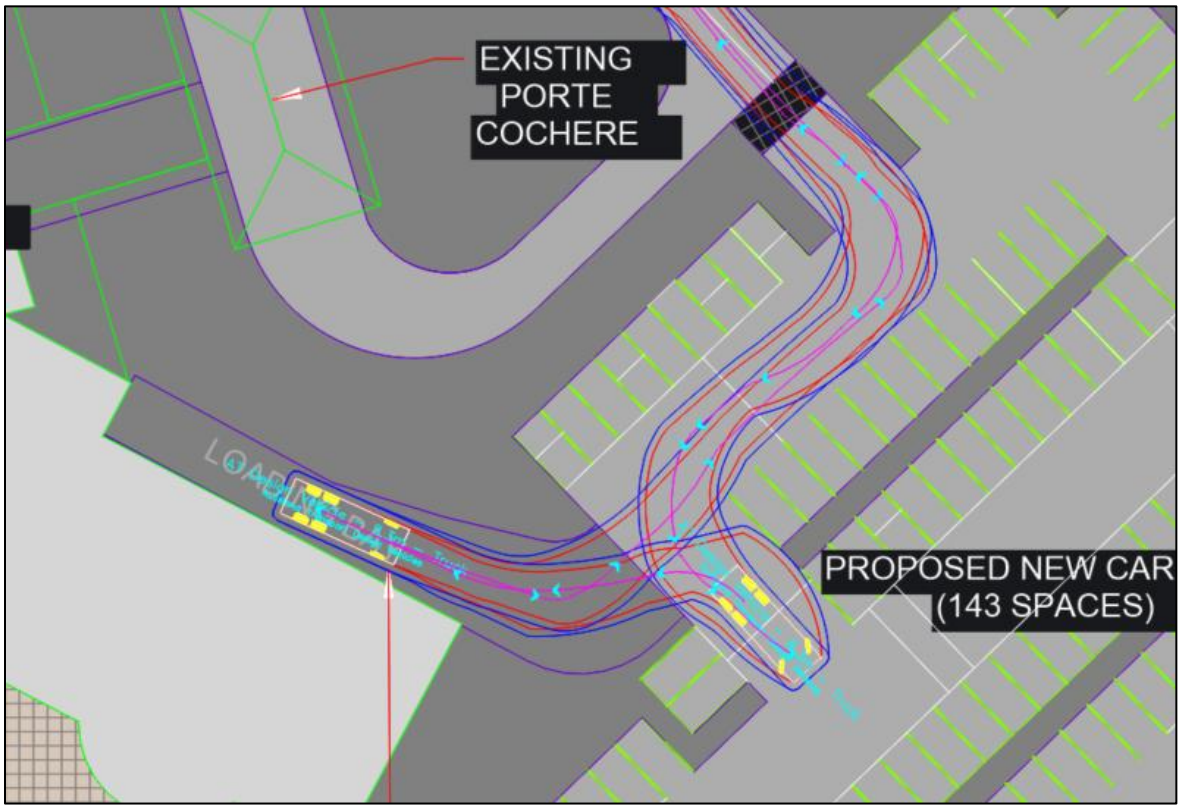

Figure 7-66: Super lot CM5 – loading space tracking (ground floor)

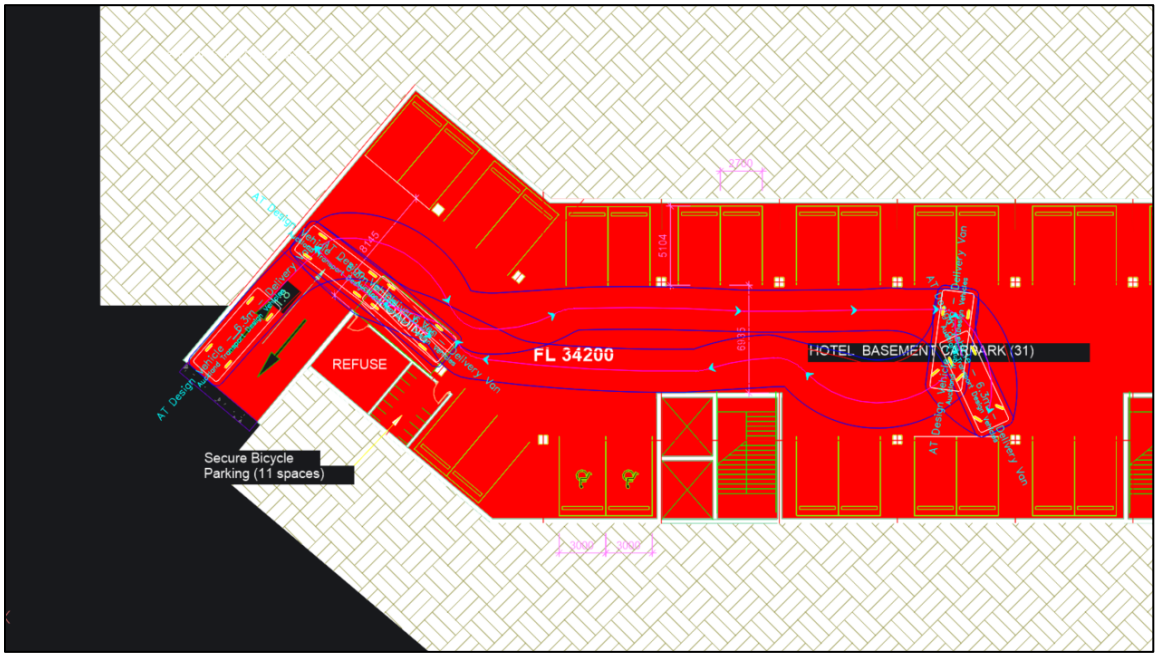

Figure 7-67: Super lot CM5 - loading space tracking (basement)

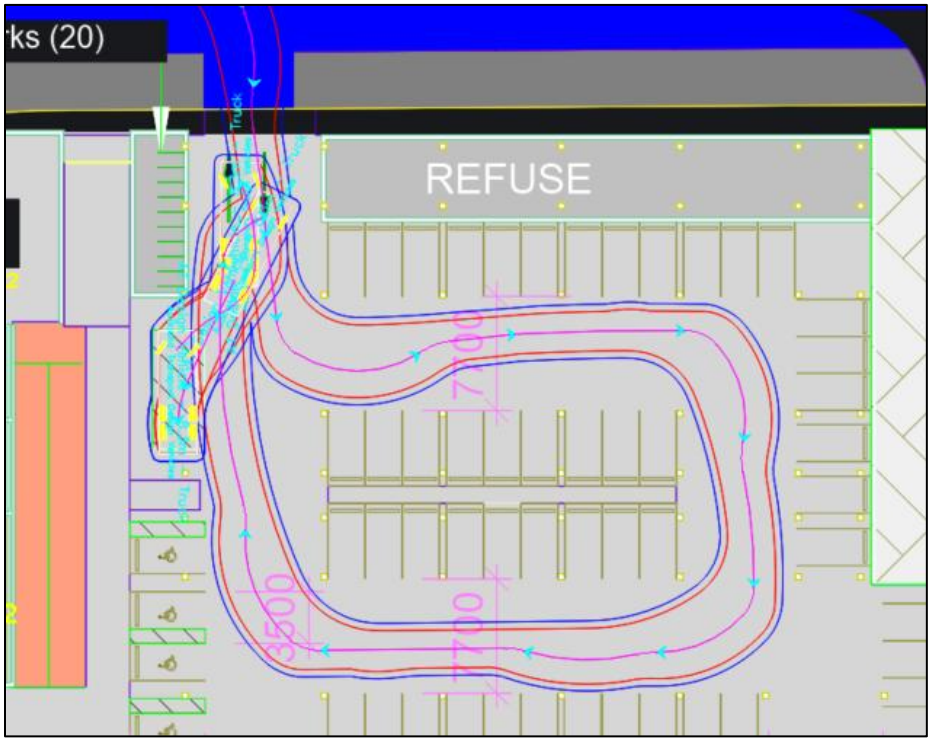

Figure 7-68: Super lot VC1 – loading space tracking (basement)

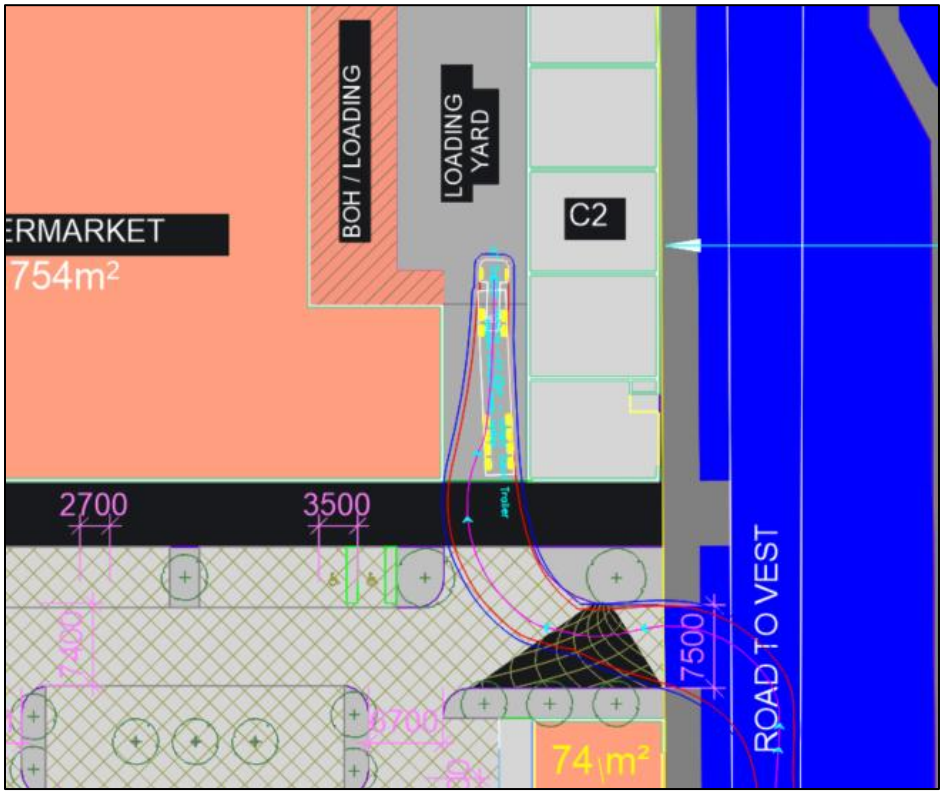

Figure 7-69: Super lot VC1 – loading space tracking (ground floor)

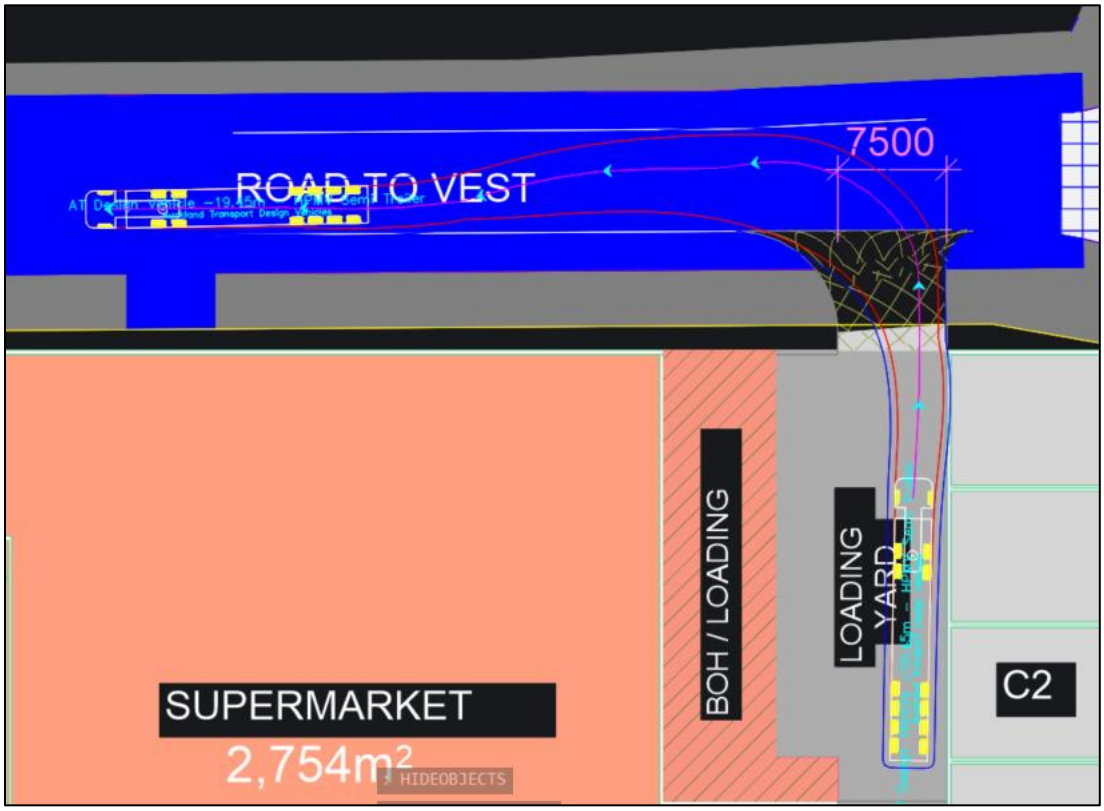

Figure 7-70: Super lot VC1 – loading space tracking (ground floor)

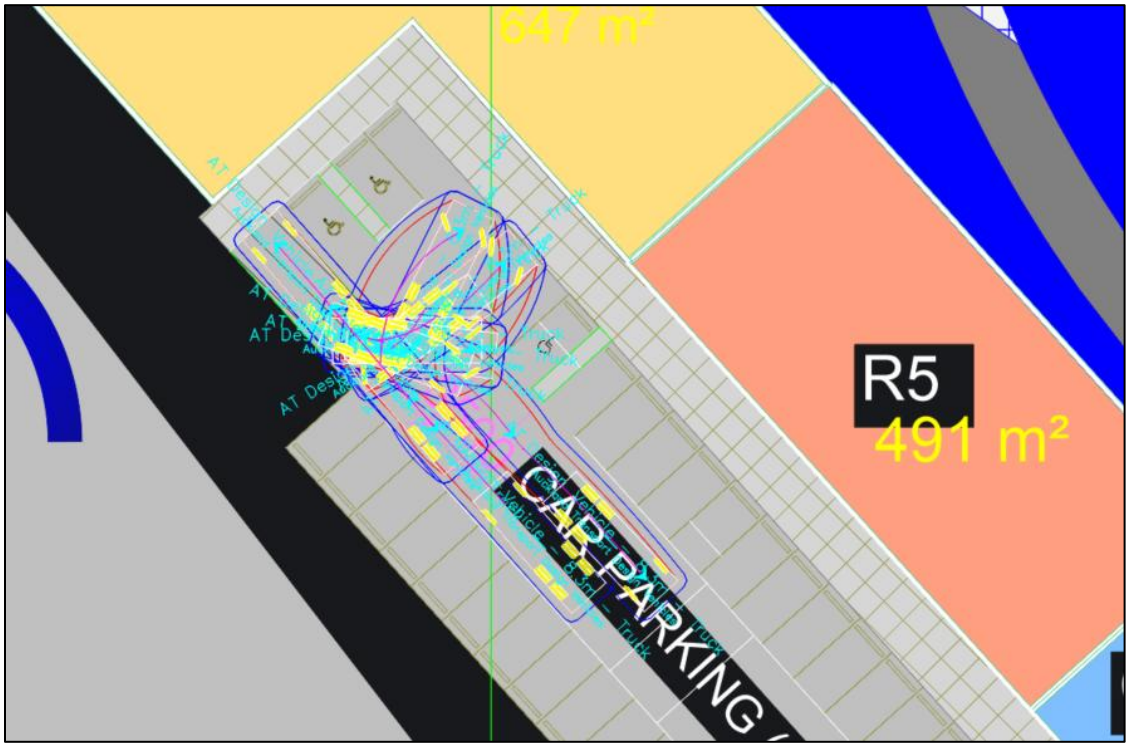

Figure 7-71: Super lot VC2 – loading space tracking

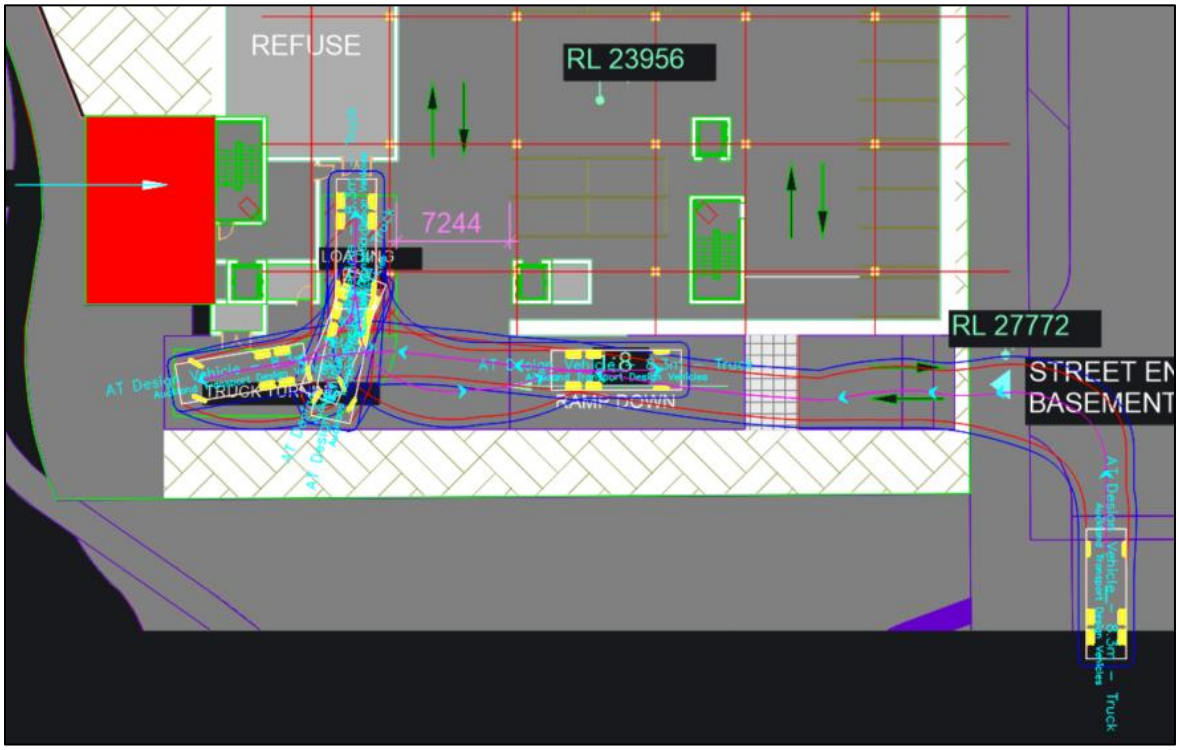

Figure 7-72: Super lot VC3 - loading space tracking

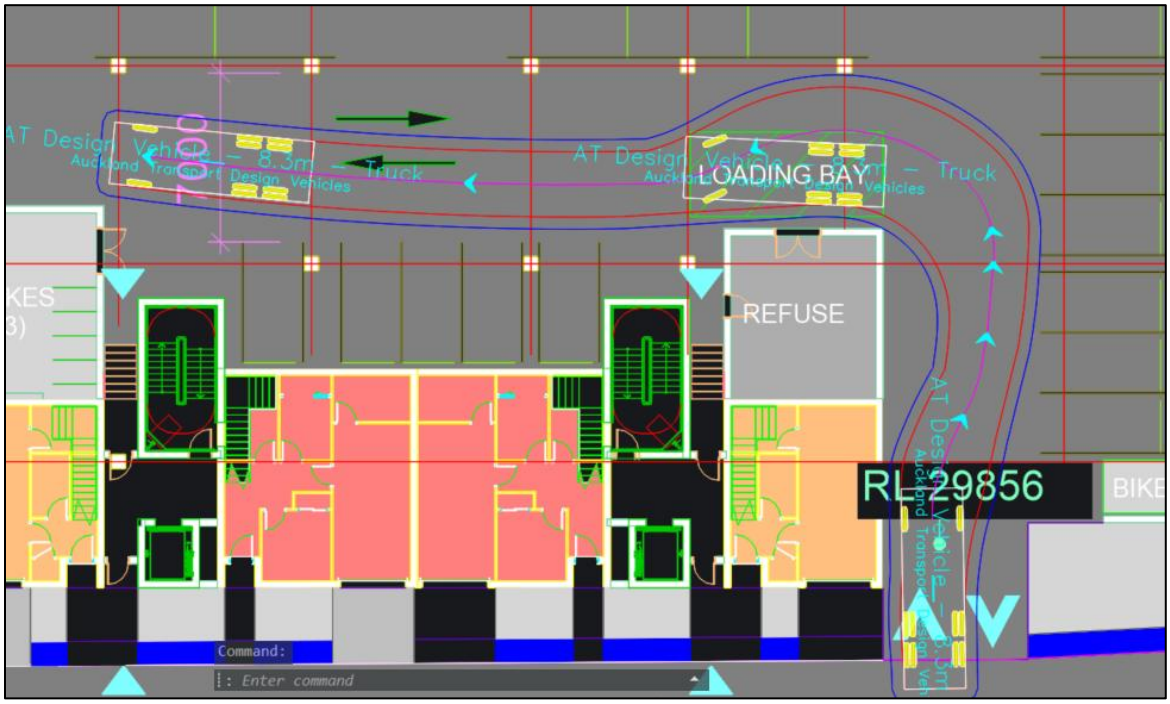

Figure 7-73: Super lot VC4 - loading space #1 tracking

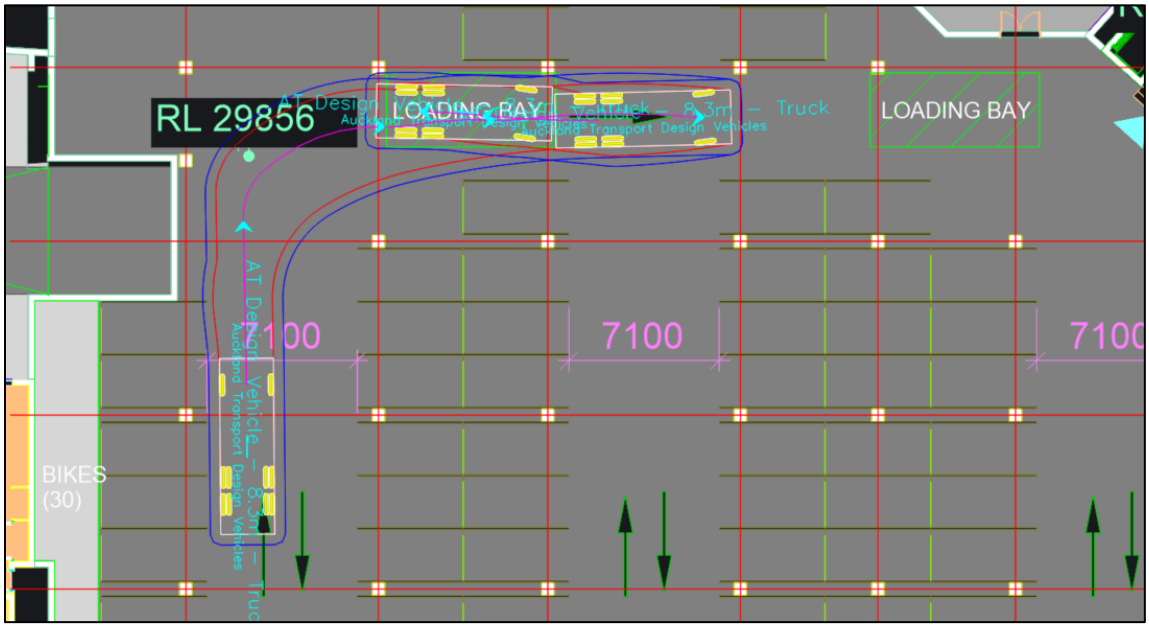

Figure 7-74: Super lot VC4 - loading space #2 tracking

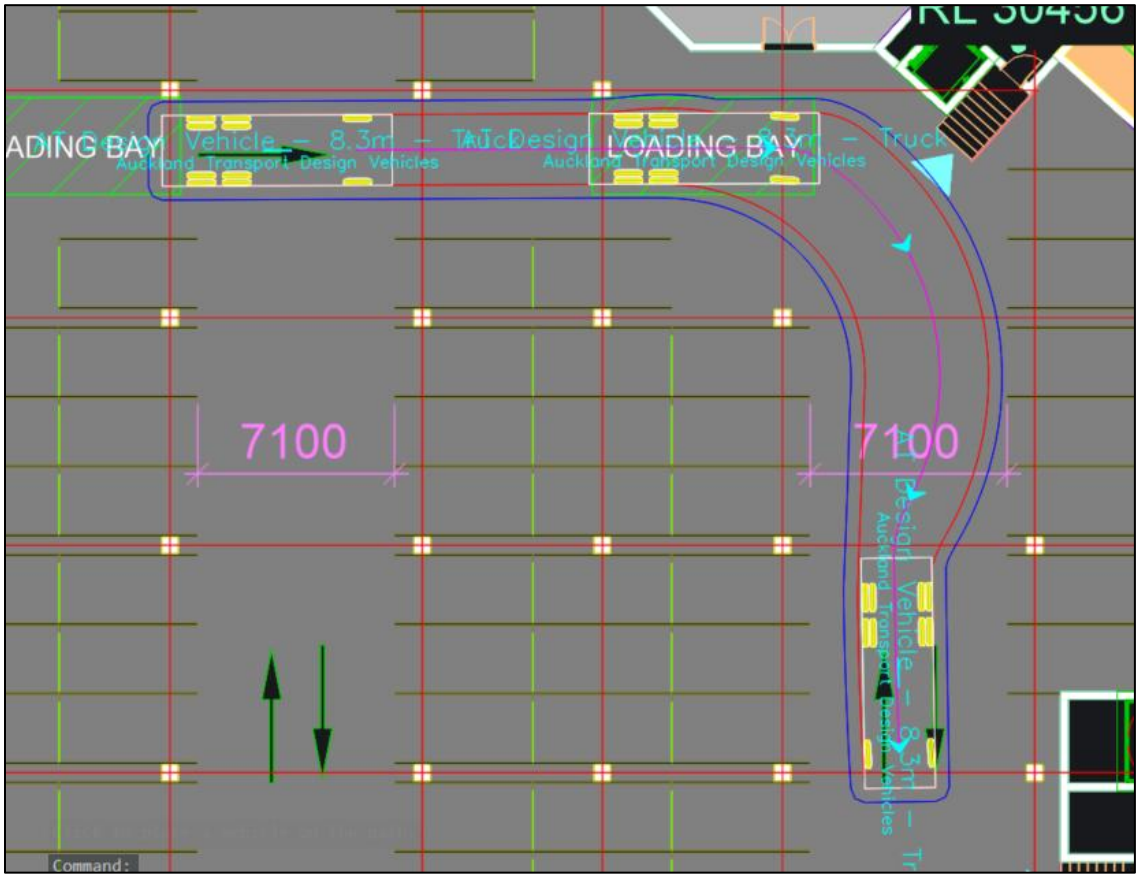

Figure 7-75: Super lot VC4 - loading space #3 tracking

7.11 End-Of-Trip Facilities

Table E27.6.2.6 of the AUP requires end-of-trip facilities to be provided for offices, education facilities and hospitals, but does not state any requirements for retail, community or commercial activities. As outlined above, there are no hospitals proposed within the Site and the precise details of the primary and secondary schools (including GFAs) are unconfirmed at this time. As such, a conservative assessment has been undertaken for the educational facilities assuming that each of the two schools have a GFA of 20,000sqm. Additionally, the VC1 super lot also contains 2,854sqm of GFA for the Office activity. The AUP requires offices, and educational facilities with a GFA between 2,500sqm to 7,500sqm to provide two showers and changing areas, and an additional two showers and changing areas for every additional 7,500sqm GFA. As such, both the primary and secondary schools will provide a minimum of six showers and changing areas, and the office building will provide two showers and changing areas, hence complying with AUP requirements.

7.12 Pedestrian Access Requirements

Rule E27.6.6 and Table E27.6.6.1 of the AUP outlines the pedestrian access requirements for dwellings within residential zones. These requirements where the primary pedestrian access is adjacent to the vehicle access and parking areas are summarised below:

- Vehicles accesses serving between 2-5 dwellings (excluding dwellings with direct pedestrian access from a road) do not require a primary pedestrian access.
- Accesses serving between 6-19 dwellings with a primary pedestrian access adjacent to the vehicle access and parking area must provide a 1.4m wide, physically separate primary pedestrian access which is free of permanent obstructions with minimum vertical clearance of 2.1m, gradient complying with maximum gradient outlined in Table E27.6.4.4.1 and a surface treatment which is firm, stable and slip resistant in any weather condition.
- Where accesses serve 20 or more dwellings, the primary pedestrian access must provide a minimum width of 1.8m, however all other requirements remain the same.

Where the primary pedestrian path is not adjacent to vehicle accesses or parking areas, the minimum width of the primary pedestrian access must be 1.8m, free of permanent obstruction with minimum vertical clearance of 2.1m, gradient no steeper than 1 in 12, and a surface treatment which is firm, stable and slip resistant in any weather condition.

Table 7-13 outlines the number of dwellings, requirements, and the provisions for pedestrian paths across the super lots.

Table 7-13: Assessment of pedestrian path requirements

Super lot / Apartment Number	Activity	# of dwellings (without direct frontage to road)	Pedestrian path adjacent?	Minimum required	Provision
MP1-A	Residential	24	Yes	1.8m, physically separated	1.8m physically separated.
MP3-A	Residential	24	No	1.8m	3m
MP3-B	Residential	24	No	1.8m	3m
MP8-A	Residential	18	No	1.8m	1.8m
MP8-B	Residential	18	No	1.8m	1.8m
MP8-C	Residential	18	No	1.8m	1.8m
MP13-A	Residential	24	Yes	1.8m, physically separated	1.8m physically separated.
MP13-B	Residential	24	Yes	1.8m, physically separated	1.8m physically separated.
MP15-A	Residential	36	Yes	1.8m, physically separated	1.8m physically separated.

MP24-A	Residential	36	Yes	1.8m, physically separated	1.8m physically separated.
MP16-A	Residential	24	No	1.8m	2m
MP16-B	Residential	24	No	1.8m	2m
MP25-A	Business – Mixed Use	N/A			
MP25-B	Business – Mixed Use	N/A			
MP26-A	Business – Mixed Use	N/A			
C1-A	Residential	21	No	1.8m	5m+
C5-A	Residential	24	No	1.8m	2m
C5-B	Residential	24	No	1.8m	2m
C5-C	Residential	24	No	1.8m	2m
C7-A	Residential	36	No	1.8m	2.5m
C9-A	Residential	36	No	1.8m	2.5m
C9-B	Residential	36	No	1.8m	2.5m
CE1	Residential	11	Yes	1.4m	1.5m
CE2	Residential	9	Yes	1.4m	1.5m
CE3	Residential	6	Yes	1.4m	1.5m
CE4	Residential	0	Yes	N/A	1.5m
CE5	Residential	1	Yes	N/A	1.5m
Jl1 (Short JOALs)	Residential	2	Yes	N/A	1.5m
JL1 (Long JOAL)	Residential	12	Yes	1.4m	1.5m
VC1	Business - Local Centre	N/A			
VC2	Business - Local Centre	N/A			
VC3	Business – Mixed Use	N/A			
VC4	Business - Local Centre	N/A			
VC5	Business – Mixed Use	N/A			
CM1	Residential	19	Yes	1.4m	1.5m
CM2	Business – Mixed Use	N/A			
CM3	Business – Mixed Use	N/A			
CM4	Business – Mixed Use	N/A			
CM5	Business – Mixed Use	N/A			

As shown above, all proposed superlots comply with the pedestrian access requirements outlined in the AUP.

7.13 Speed Management Requirements

Table E27.6.4.3.3 of the AUP outlines that vehicle accesses serving four or more dwellings within the residential zones where the length of the vehicle access exceeds 30m, must

provide speed management measures within 10m of the site boundary, and at 30m spacings thereafter.

It is noted that speed management measures will be required and provided on the following superlots: MP1-A, MP8-A/B/C, MP13-A/B, MP15-A, MP24-A, MP16-A/B, C1-A, C7-A, C9-A, CE1-CE5, JL-1, and CM1.

These will be designed as part of a future Engineering Approval stage. A condition has been prepared to ensure these are provided.

7.14 Lighting Requirements

Rule E27.6.3.7 of the AUP outlines that lighting is required for any carpark where there are 10 or more parking spaces which are likely to be used during the hours of darkness. Lighting is also required in residential zones to primary pedestrian accesses, vehicle accesses, parking and manoeuvring areas where there are four to nine dwellings accessed from a primary pedestrian path not adjacent to a vehicle access, 10 or more parking spaces or dwellings.

Lighting solutions compliant with Section E24 of the AUP will be provided for all basement and ground floor carparks within the Village Centre (VC1-VC4), Community precincts (CM2, 3, 5), and Central East Precincts (CE1, CM1, and JL1) as these provide primary pedestrian accesses serving more than 10 dwellings. The lighting design will be designed as part of a future Engineering Approval stage. A condition has been prepared to ensure these are provided.

7.15 Visibility Splays

The AUP does not outline specific visibility requirements from vehicle crossings, however each of the proposed vehicle crossings within the Village Centre, Jack Lachlan, Marina, Coastal, Central East, Community and Employment precincts have been assessed against minimum visibility requirements for vehicles, pedestrians and cyclists as outlined in several design documents.

Vehicular Visibility

Visibility of approaching vehicles has been assessed against the requirements outlined within the Guidelines for visibility at driveways: RTS 6 document. Measurements have been taken in accordance with RTS 6 figures 1 and 2, and assessed against the requirements outlined in RTS 6 Table 1.

Operating speed of the road corridors has largely been calculated as the posted speed limit + 10km/h. Exceptions have been made for those vehicle crossings which exist in proximity of intersections, or road curves where vehicular operating speed is expected to be lower than the posted speed limit due to design factors. Based on this assessment, all proposed vehicle crossings provide a compliant level of vehicular visibility as outlined in the RTS 6 document.

Pedestrian and Cyclist Visibility

Pedestrian and Cyclist visibility has been assessed against Auckland Transport's Practice Note 07 – Vehicle Crossings Design Standards document. This document supplements the Engineering Design Code - Urban and Rural Roadway Design and the AT Vehicle Crossing application design standards documents. Using these documents, the minimum required entry and exit visibility for footpaths, active mode paths and cycleways is shown in **Figure 7-76** below).

Driveway type	Through route	Path user speed (km/h)	X (m)	Y (m)
Residential single dwelling with driveway <7 m	Footpath (secondary)	5	3 From edge of footpath	5
	Footpath (primary) and near schools, shops and other high-use activities	10	3 From edge of footpath	7
	Shared path	15	3 From edge of path	10
	Cycleway	25	3 From edge of cycleway	24
	Traffic lane	V	3 From kerbline	SSD
All other accesses	Footpath (secondary)	5	10 From edge of footpath	5
	Footpath (primary) and near schools, shops and other high-use activities	10	10 From edge of footpath	7
	Shared path	15	10 From edge of path	10
	Cycleway	25	10 From edge of cycleway	24
	Traffic lane	V	10 From kerbline	SSD

Figure 7-76: Extract from AT Practice Note 07

All the proposed vehicle crossings within the Marina, Coastal and Employment precincts will comply with pedestrian and cyclist visibility requirements, if permeable adjacent lot corners can be provided. Accordingly, where these visibility splays slightly intrude into the proposed lot boundaries, visually permeable fencing will be provided along the road frontage of such lots. This is in compliance with AT's requirements which outlines that "visibility envelopes should not be obstructed by fixed or moveable street furniture larger than 200mm width". An example of this is shown in **Figure 7-77** below.

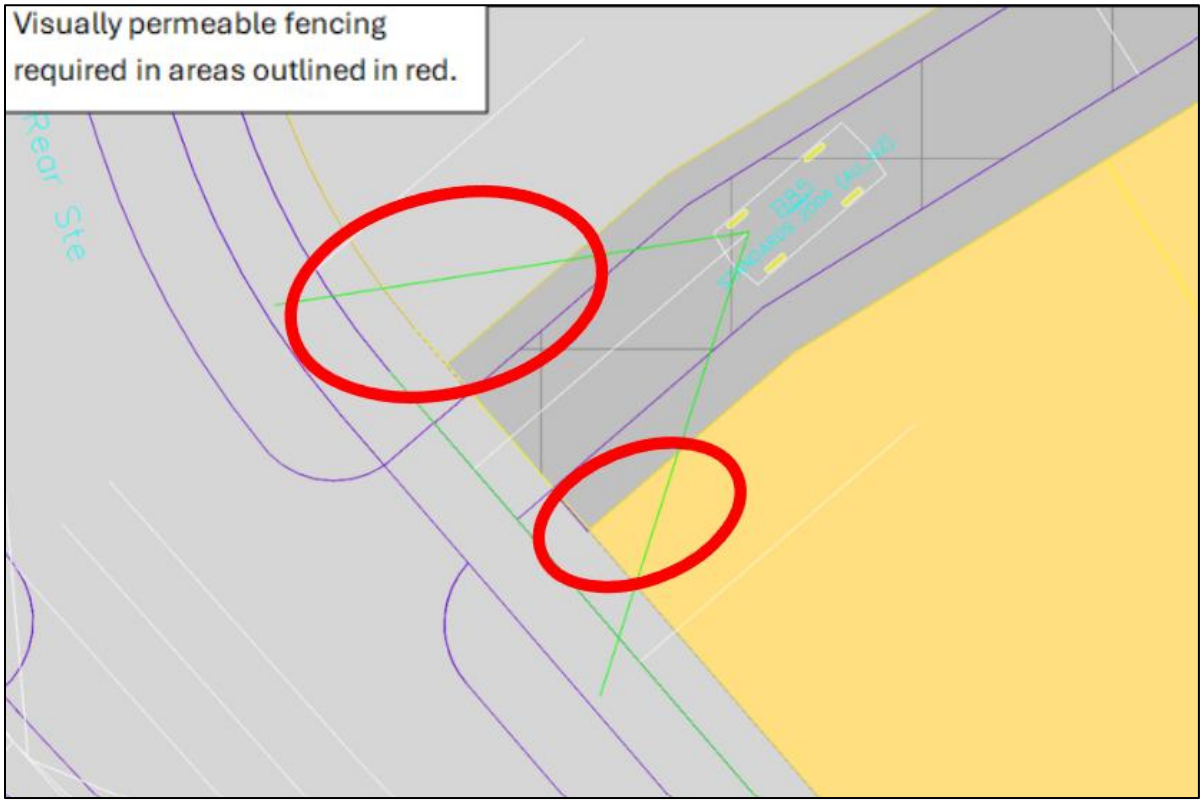

Figure 7-77: Example of permeable fencing extent along residential JOALs

Some proposed vehicle crossings do not currently achieve compliance with the pedestrian and cyclist visibility splay requirements. This includes the vehicle crossings serving:

- CM3 – Basement, VC1 – basement (residential),
- VC1 – Basement retail, and residential
- VC3 - Basement
- VC4 – Basement and Ground access.

Each of these are shown in **Figure 7-78** to **7-83** below, with the extent of the infringing splay identified in the image. It is understood that these infringements will be resolved through subsequent design stages.

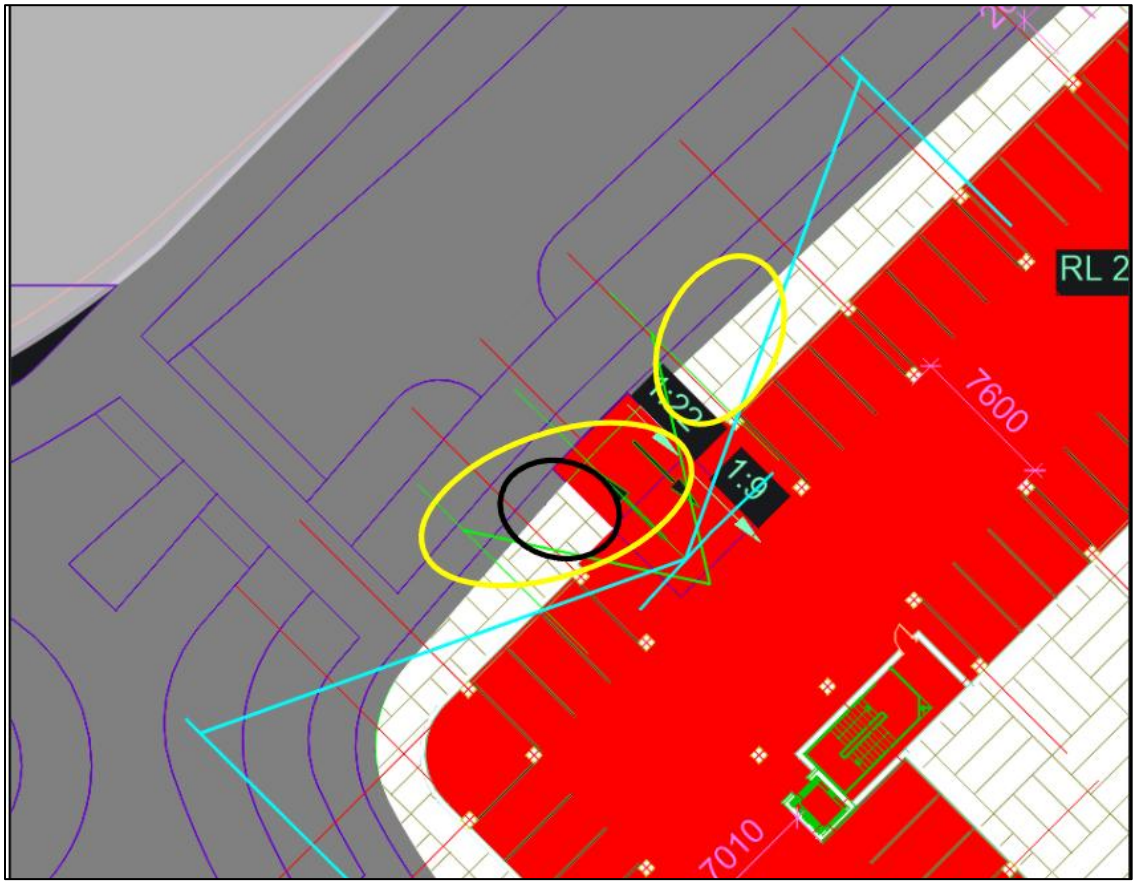

Figure: 7-78: CM3 – Basement (Black and yellow shows the infringing pedestrian and cyclist splays respectively).

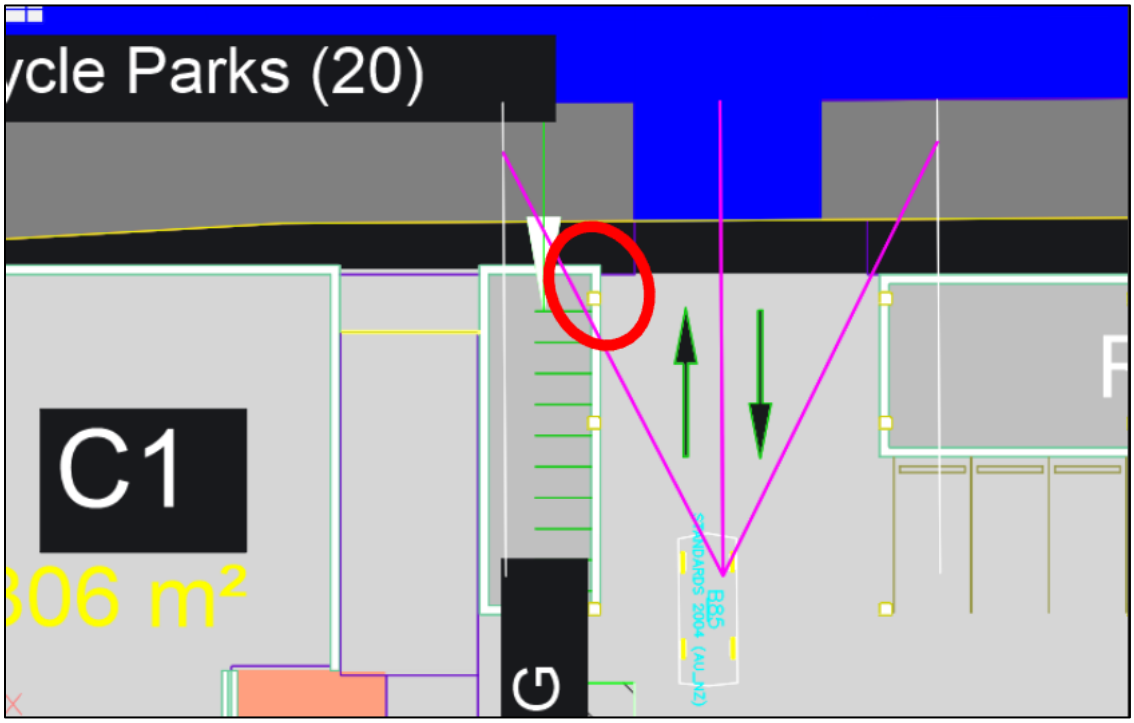

Figure 7-79: VC1 Basement - northern (retail) carpark

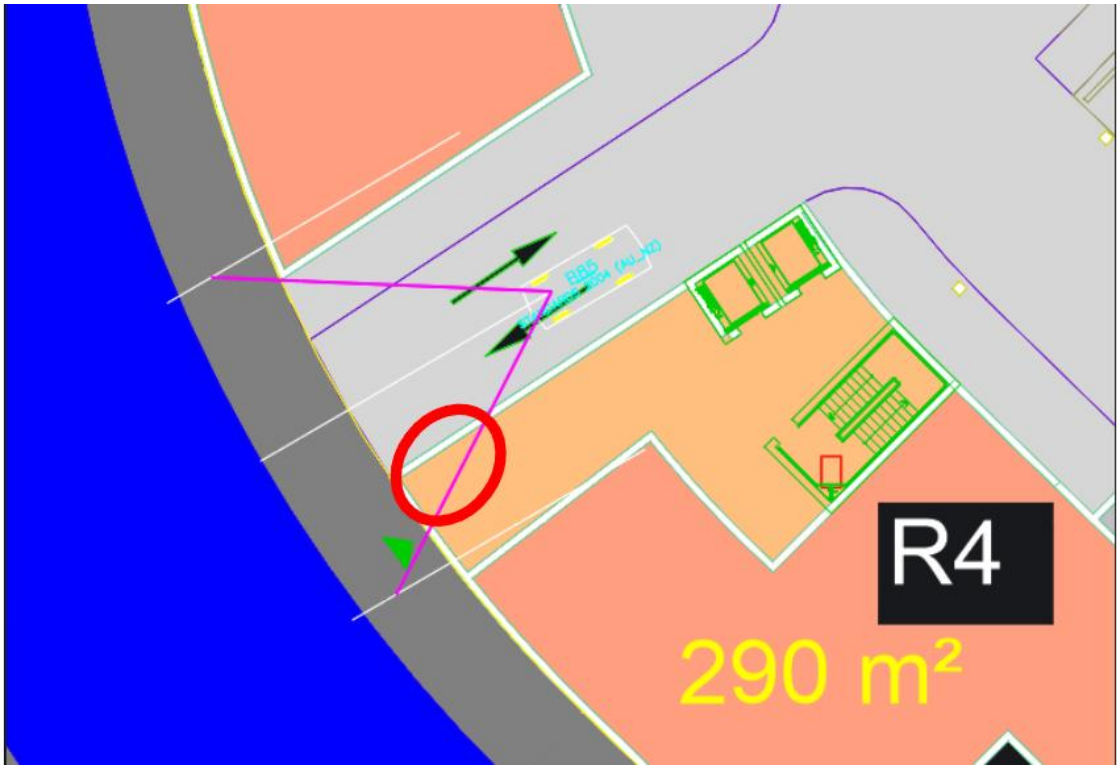

Figure 7-80: VC1 Basement - southern (residential) carpark

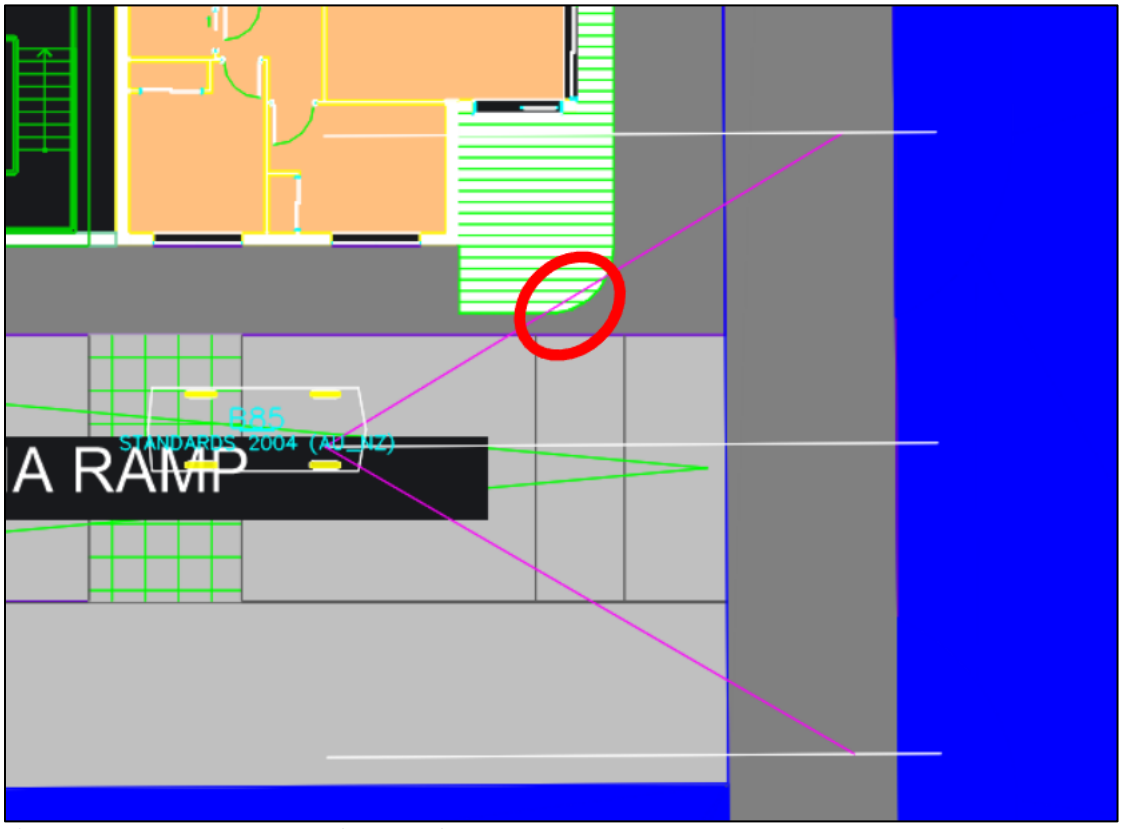

Figure 7-81: VC3 - Basement vehicle crossing

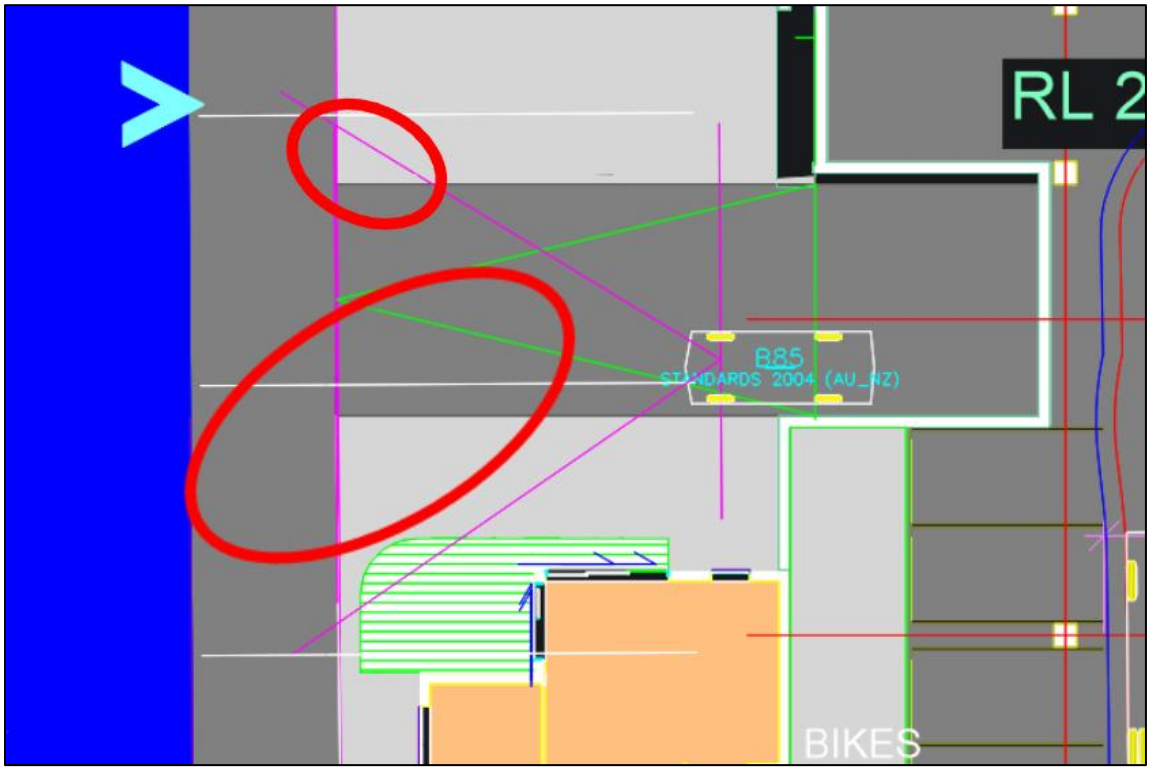

Figure 7-82: VC4 - Basement vehicle crossing

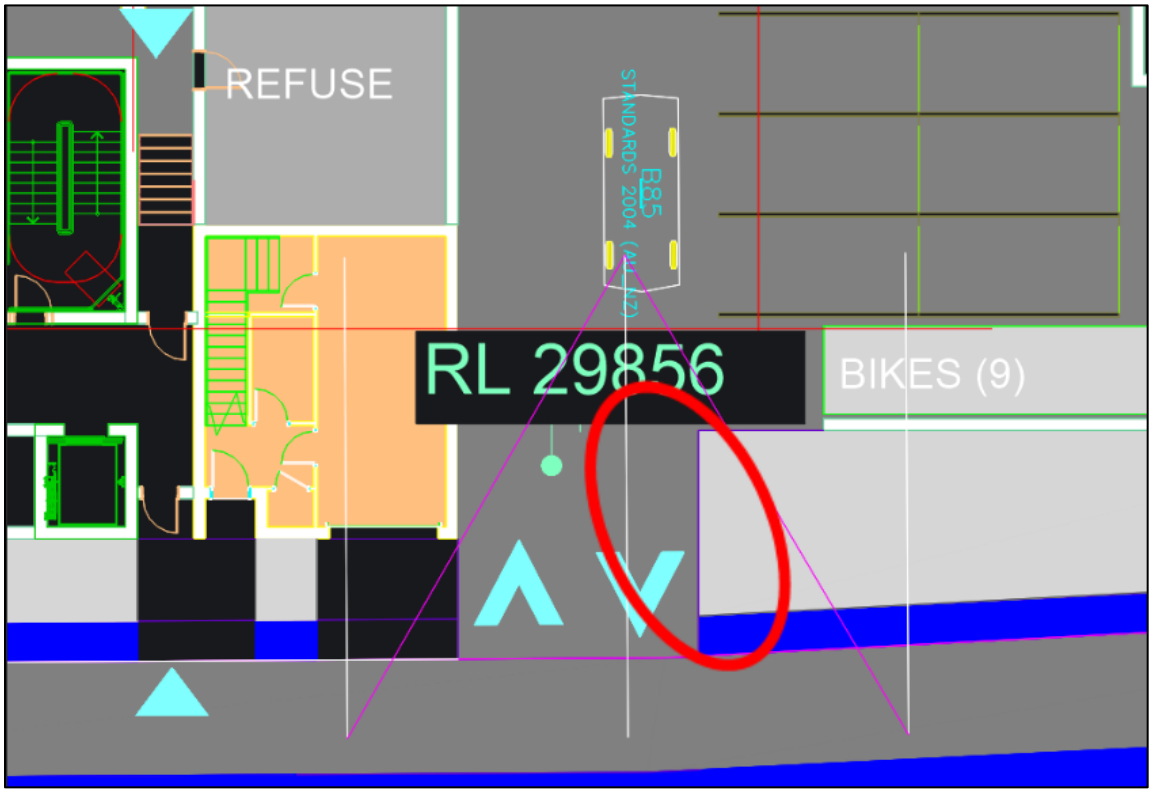

Figure 7-83: VC4 - Ground level vehicle crossing

8. Traffic Effects

8.1 Assessment Framework

The assessment of traffic effects has been undertaken within the transport framework established through the I458 Beachlands South Precinct, with updated development yields, updated activity timing, contemporary evidence on work-from-home travel behaviour, and the now proposed development mix. The assessment focuses on the critical external network effect that underpinned the PC88 staging framework, being the AM peak southbound flow on Whitford-Maraetai Road through Whitford.

The PC88 ITA identified Whitford-Maraetai Road as the key external corridor constraint for Beachlands South. The precinct trigger framework was informed by modelled southbound AM peak flows in the order of 1,600 vehicles per hour (vph) as the point at which the Whitford Bypass became required; with approximately 1,700vph representing the upper range of the full development scenario tested through the plan change process. Those flow references remain the most appropriate basis for assessing whether the updated proposed yield materially changes the traffic effects that were previously assessed.

This assessment applies the PC88 traffic model/transport planning framework and methodology to the updated development mix and timing, and then tests whether the resulting flows remain within the range of effects previously assessed. This is considered the most robust and proportionate approach, given that the operative precinct provisions, road upgrade triggers and transport mitigation framework were all derived from the PC88 modelling.

8.2 Development Yield and Staging

The proposed development yield differs from the yield tested through PC88. In particular, the amount of light industrial activity has increased from approximately 16,000 sqm GFA in the plan change assessment to approximately 29,000sqm GFA in the proposed development mix. The updated development mix also includes retail, food and beverage, commercial, education, hotel, recreational and residential activities, with the activities becoming operational progressively between 2028 and 2041.

The development yield adopted for the Project traffic assessment is summarised in **Table 8-1** below.

Table 8-1: Development Yield Summary

Activity	Proposed Yield
Low-density residential	114 dwellings
Medium-density residential	976 dwellings
High-density residential / apartments	875 dwellings
Total residential	**1,965 dwellings**
Food and beverage / cafes	1,271 sqm GFA
Small-scale retail	2,060 sqm GFA
Supermarket	2,872 sqm GFA
Commercial / office	4,847 sqm GFA
Hotel	153 rooms proposed (100 net additional rooms modelled as ~50 on existing site)
Education	2,100 pupils
Light industrial	29,099 sqm GFA
Golf course	9 holes
Retirement village	Not proposed but sensitivity test with retirement yield discussed later

As noted within the table, the proposed hotel yield includes 153 rooms, but 52 rooms already exist on the Site. Those existing rooms generate traffic that is already reflected in the existing base traffic environment, which were not previously subtracted from the base traffic flows before development traffic was added. For this reason, the traffic assessment has modelled only 100 net additional hotel rooms. This is not a trip-generation discount – it is a correction to avoid double-counting traffic associated with the existing hotel activity.

Table 8-2 below shows the staging of when each activity of the development becomes operational. This has been created using project staging and indicative construction timeframes for each activity.

Table 8-2: Development Staging by Activity (Green Depicts Initial Operation)

Parameters	Residential - Standalone (dwellings)	Residential - Medium Density (dwellings)	Residential - High Density (dwellings)	Retail - Cafes/F&B (sqm)	Retail - smaller scale shops (sqm)	Retail - supermarket (sqm)	Commercial (sqm)	Hotel (rooms)	Educational (pupils)	Light Industrial (sqm)	Recreational (golf coure holes)	Total Resi
Years												
2028	0	0	0	0	0	0	0	0	0	0	9	0
2029	0	0	0	0	0	0	0	0	0	0	9	0
2030	7	61	0	0	0	0	0	0	0	0	9	68
2031	7	148	0	0	0	0	0	0	158	0	9	155
2032	7	275	0	0	0	0	0	0	189	10000	9	282
2033	24	372	289	0	0	0	0	0	287	20000	9	685
2034	35	428	498	1271	2060	2872	4847	0	1330	29099	9	961
2035	73	459	594	1271	2060	2872	4847	0	1456	29099	9	1126
2036	83	638	709	1271	2060	2872	4847	0	1690	29099	9	1430
2037	94	738	709	1271	2060	2872	4847	0	1775	29099	9	1541
2038	109	833	761	1271	2060	2872	4847	0	1899	29099	9	1703
2039	109	910	811	1271	2060	2872	4847	0	1996	29099	9	1830
2040	114	976	869	1271	2060	2872	4847	0	2095	29099	9	1959
2041	114	976	875	1271	2060	2872	4847	150	2100	29099	9	1965

Although it does not form part of this Proposal, a retirement village option has also been assessed as a sensitivity. That hypothetical alternative would replace part of the residential yield with 250 retirement village dwellings, while retaining the same non-residential development assumptions. This option would result in a higher total dwelling count, but a broadly similar traffic effects because retirement village dwellings generate fewer peak hour vehicle trips than conventional dwellings or apartments. The changes to dwelling yield to make way for the 250-unit retirement village would be:

- Medium density housing reduces from 976 to 878 dwellings (-98).
- High density housing reduces from 875 to 823 dwellings (-52).

With the addition of 250 retirement village units, this would bring the total yield of the proposed development to 2,065 dwellings (+100). The results of this sensitivity test are presented later in this section.

8.3 Trip Generation

Base trip generation rates

The starting point for the trip generation assessment remains the PC88 trip generation framework. The plan change modelling used residential trip rates of:

- 0.80 trips per dwelling in the AM peak; and 0.83 trips per dwelling in the PM peak for low-density residential dwellings,
- 0.65 trips per dwelling in both peaks for medium-density residential dwellings, and

- a high-density / apartment rate that was subsequently confirmed through rebuttal evidence at 0.40 trips per apartment.

Non-residential rates were also established, including rates for food & beverage, smaller retail, supermarket, commercial, education, light industrial, hotel and golf.

The high-density apartment rate is supported by site-specific survey evidence undertaken during the PC88 process. Surveys were undertaken at the 41-unit Marina View Apartments at Gulf Harbour. That apartment block was considered an appropriate proxy because it relied on a single heavily trafficked road route, was close to local amenities and schools, and was within active mode distance of a ferry service. The survey recorded an AM peak rate of 0.34 vehicle trips per apartment, which was adjusted to an equivalent pre-COVID rate of 0.37 trips per apartment. This confirmed that the adopted 0.40 trips per apartment rate was conservative. A nearby 188-household medium-density residential catchment (Melons Bay, Howick) was also surveyed and recorded an AM peak rate of 0.54 trips per dwelling, adjusted to 0.59 trips per dwelling on a pre-COVID basis, which supported the adopted 0.65 medium-density residential rate as conservative.

These surveys are not relied upon to reduce the PC88 base trip rates further, but they provide a useful reasonableness check that contemporary medium-density, high-density and ferry-influenced residential environments are generally producing lower peak hour vehicle trip rates than older pre-COVID suburban trip-rate references would suggest.

The current Transport for NSW Guide to Transport Impact Assessment also provides a useful independent benchmark. The TfNSW 2022 low-density residential survey data records Sydney weekday vehicle trip rates of 0.68 trips per dwelling in the AM peak and 0.77 trips per dwelling in the PM peak, with regional NSW rates of 0.83 and 0.84 trips per dwelling respectively. The medium-density residential data records Sydney vehicle trip rates of 0.39 AM and 0.37 PM, and regional rates of 0.41 AM and 0.60 PM. The TfNSW guide also notes that residential subdivision trip rates reflect external trips to and from the subdivision, and that adjustment may be necessary depending on the location of shops, schools and recreation facilities.

Table 8-3 below summarises the base trip rates used in this assessment:

Table 8-3: Base Activity Trip Rates

Activity	Rate Basis	AM Peak	PM Peak
Residential			

Low-density residential	Per dwelling / unit	0.80	0.83
Medium-density residential	Per dwelling / unit	0.65	0.65
High-density residential / apartments	Per dwelling / unit	0.4	0.4
Retirement village sensitivity	Per dwelling / unit	0.33	0.31
Non Residential			
Food and beverage	per 100 sqm GFA	3.15	15.60
Small-scale retail	per 100 sqm GFA	2.84	9.93
Supermarket	per 100 sqm GFA	2.26	14.48
Commercial / office	per 100 sqm GFA	1.87	1.87
Education	per pupil	0.38	0.22
Light industrial	per 100 sqm GFA	0.75	0.68
Hotel	per room	1.20	1.20
Golf course	per hole	0.50	0.40
Food and beverage	per 100 sqm GFA	3.15	15.60
Small-scale retail	per 100 sqm GFA	2.84	9.93
Supermarket	per 100 sqm GFA	2.26	14.48
Commercial / office	per 100 sqm GFA	1.87	1.87
Education	per pupil	0.38	0.22

Work From Home Adjustment

Requirement

The residential trip rates used in the Beachlands South modelling are based on established industry and PC88 trip generation evidence, which was derived from pre-COVID travel behaviour. Since that time, weekday commuter travel patterns have materially changed, particularly through increased working from home (WFH) and hybrid working. If those pre-COVID trip rates were applied without adjustment, they would assume that future residents travel to work in the same way, and with the same weekday frequency, as was typical before COVID. That would not reflect current observed travel behaviour and would likely overstate weekday peak hour residential vehicle generation.

A WFH adjustment is therefore required to align the trip generation assessment with contemporary travel conditions. The adjustment is not intended to create an optimistic or aspirational mode shift assumption, rather, it recognises an observed structural change in how people now work and travel, using 2018 and 2023 Census journey-to-work data as the primary evidence base. This is particularly relevant to residential trip generation because the weekday AM and PM peak periods are strongly influenced by work-related travel. Where fewer residents commute on a given weekday, either because they usually work from home or because they work from home on some days each week, the residential peak hour vehicle trip rate is lower than would be expected from the historic pre-COVID survey data listed above.

For the Project, this adjustment is also important because the modelling is being used to assess long-term development effects and infrastructure triggers. It would be inappropriate to assess future transport effects using historic trip rates that pre-date a material and now well-established change in work travel behaviour. The assessment has therefore applied a WFH adjustment to the residential trip rates before assigning development traffic to the network. A smaller adjustment has also been applied to retail trip rates to recognise the secondary effect of reduced commuter-based retail activity, while no broader WFH adjustment has been applied to other non-residential activities. This provides a balanced assessment that updates the residential and retail trip rates where the post-COVID effect is most directly relevant, while retaining conservatism across the remainder of the trip generation assessment.

Project Assumptions

For this assessment, the relevant Beachlands, Pine Harbour and Maraetai census results have been reviewed to understand how local travel behaviour changed between 2018 and 2023. Those results show an approximately 10% reduction in workers who usually drive, from 77.9% in 2018 to 67.9% in 2023. Over the same period, the proportion of workers who usually WFH increased from 10.8% to 21.2%, an increase of 10.4%.

That local evidence demonstrates a clear post-COVID change in travel behaviour within the Beachlands catchment. The reduction in usual driving and corresponding increase in WFH are directly relevant to the AM and PM peak residential trip generation assessment, because work-related trips are a major component of residential peak hour travel demand. Applying the historic pre-COVID residential trip rates (the base rates listed above) without any adjustment would therefore not reflect the actual observed change in travel behaviour in the local area.

The assessment therefore uses a WFH adjustment from the observed Beachlands Census change, while also allowing for the effect of hybrid workers who still report that they usually travel to work but WFH on some days each week. The hybrid working rationale and methodology is outlined below:

Statistically, hybrid workers sometimes drive to work and sometimes WFH, so when the census question asked how they usually travelled, they answered that they usually drive, which does not recognise the occasions that they WFH. Likewise, those hybrid workers that answered that they usually WFH, also sometimes drive to work. To replicate this survey outcome, statistical probability calculations found that:

- people who usually drive may sometimes WFH approximately 8.48% of the time;
- while people who usually WFH may sometimes drive approximately 2.32% of the time; and
- the net additional effect was therefore approximately 6.16% (8.48% - 2.32%), rounded down to 6%.

On that basis, applying the hybrid-worker probability approach described below to the observed 10% permanent shift would produce a total adjustment of 16.16%, which was further rounded to 15% for conservatism.

Drury Centre Precedent

The approach adopted for Beachlands South is consistent with the methodology used in the recent Drury Centre Stage 2 Fast Track substantive consent process. That comparison is useful because Drury Centre also involved the use of established trip generation rates that were derived from pre-COVID travel behaviour, and therefore also required consideration of whether a contemporary WFH adjustment was appropriate.

In combination, the Drury Centre analysis produced an 8% residential WFH reduction, comprising the 5% usual-mode shift and the additional 3% hybrid-working effect. That adjustment was then applied to the residential trip rates for that project.

At Drury Centre, a smaller WFH-related adjustment was also applied to the retail trip rates, where a minor 1.5% reduction was applied to retail trip generation to recognise the reduction in weekday commuter-based retail activity associated with increased working from home and hybrid working. The adjustment was deliberately modest because retail activity is not affected by working from home in the same direct way as residential commuter trip generation. However, some reduction in retail vehicle activity is expected because a proportion of retail trips that would historically have occurred near workplaces,

during commuter journeys, or as part of office-based working days are now either not made, made locally, or shifted outside the commuter peak.

The Beachlands South assessment has followed the same methodology, but applies it to local Beachlands, Pine Harbour and Maraetai Census data rather than the broader Auckland-wide data used for Drury Centre. This provides a Site-specific basis for the adjustment, while retaining consistency with the previously applied and accepted Drury Centre approach. Table 8-4 summarises the assessed approach.

Table 8-4 summarises the assessed approach for the Project, as outlined above:

Table 8-4: WFH Adjusted Residential (15%) and Retail (1.5%) Trip Rates

Activity	Rate Basis	AM Peak (base)	PM Peak (base)	AM Peak (WFH adjusted)	PM Peak (WFH adjusted)
Residential					
Low-density residential	Per dwelling / unit	0.80	0.83	0.680	0.71
Medium-density residential	Per dwelling / unit	0.65	0.65	0.553	0.55
High-density residential / apartments	Per dwelling / unit	0.4	0.4	0.340	0.34
Retirement village sensitivity	Per dwelling / unit	0.33	0.31	0.280	0.26
Non Residential					
Food and beverage	per 100 sqm GFA	3.15	15.60	3.10	15.37
Small-scale retail	per 100 sqm GFA	2.84	9.93	2.80	9.78
Supermarket	per 100 sqm GFA	2.26	14.48	2.23	14.26

Trip Rates Summary

When compared against the updated TfNSW residential survey data and the project-specific survey evidence, the 15% WFH discounted residential trip rates remain appropriate.

The resulting low-density residential rates of 0.68 trips per dwelling in the AM peak and 0.71 trips per dwelling in the PM peak are broadly consistent with the TfNSW low-density residential survey range. The resulting medium-density rate of 0.55 trips per dwelling in both the AM and PM peaks is also consistent with the project survey evidence, including the surveyed medium-density residential rate of approximately 0.54 trips per dwelling. The adopted high-density / apartment rate of 0.34 trips per apartment aligns directly with the surveyed Marina View Apartments rate of 0.34 trips per apartment. Overall, the 15% WFH discounted rates compare well with the contemporary survey evidence and remain consistent with the direction of the updated TfNSW residential trip-rate data.

8.4 Internalisation, Externalisation and Directional Assumptions

The PC88 transport case was not based only on trip rates. It was also based on the land use and transport environment created by Beachlands South, including local employment, education, retail, recreational activities, a higher-density residential community near Pine Harbour, a connected walking and cycling network, improved ferry access and improved bus access. Those factors reduce the proportion of trips that need to travel externally via Whitford-Maraetai Road.

The original PC88 modelling assumed that the residential externalisation rate would reduce from the 67% currently seen at Beachlands township to 50% at full development. That assumption remains appropriate as a starting point, but the proposed updated development mix now includes a materially larger employment component than the plan change assessment. In particular, the light industrial GFA has increased from approximately 16,000 sqm to approximately 29,100 sqm. That increase nearly doubles the employment-generating light industrial component and will increase the opportunity for residents to work locally, for business trips to be internal to the Beachlands South / Beachlands / Maraetai area, and for some trips that would otherwise leave the catchment to be retained locally.

For this reason, this assessment adopts a residential externalisation rate of 45% at full development, rather than the 50% rate adopted at PC88. This is a modest adjustment and is consistent with the logic already accepted through the plan change process, namely that residential external trips reduce as the diversity and scale of local employment, education and services increase. It is also consistent with the updated land use mix, which now provides a greater employment base than was previously modelled.

The same land use logic is also relevant to the future externalisation of existing Beachlands / Maraetai trips. The PC88 modelling assumed that only 6% of existing external trips made by Beachlands and Maraetai residents would become internalised over time as Beachlands South provides additional employment, education, retail, community and recreation destinations. For the Proposal's full-development assessment, an existing Beachlands / Maraetai background internalisation assumption of 7.5% has been adopted. This is only marginally above the 7% longer-term FUZ assumption adopted in PC88 and remains a modest assumption in the context of the current proposal, which includes two schools, a local centre, supermarket, commercial / office activity, approximately 29,099sqm of light industrial activity, recreation activity and substantially improved walking, cycling and public transport access. The change represents only an additional 1.5% of internalisation, or around one to two trips in every 100 existing external trips. That level of change is considered realistic and conservative given the stronger local destination base now proposed within Beachlands South.

The adopted externalisation assumptions are summarised in **Table 8-5** below. The principal change from the PC88 full-development residential assumption is the reduction in residential externalisation from 50% to 45%. The non-residential assumptions reflect the current modelling framework and the local-serving role of the proposed activity mix.

Table 8-5: Adopted Trip Externalisation Assumptions

Activity	External Proportion	Comment
Residential	45%	Reduced from the PC88 full-development assumption of 50% to reflect the materially increased employment yield, particularly light industrial GFA
Food and beverage	5%	Predominantly local and substituted trips
Small-scale retail	5%	Predominantly local and substituted trips
Supermarket	5%	Predominantly local and substituted trips
Commercial / office	15%	Reflects local employment role and some external business trips
Education	20%	Allows for a mix of local and wider catchment school trips
Light industrial	20%	Reflects employment capture and some external business trips
Hotel	70%	Visitor accommodation has a wider catchment
Golf course	50%	Recreation catchment split
Retirement village sensitivity	40%	Consistent with the lower external travel demand expected from retirement village activities

Residential trips are directional in nature. The AM peak is expected to be dominated by outbound movements from the residential areas, while the PM peak is expected to be dominated by inbound return movements. Consistent with the PC88 modelling, the residential AM peak is assumed to comprise approximately 75% outbound and 25% inbound movements for low- and medium-density dwellings, and approximately 77% outbound and 23% inbound movements for high-density dwellings. The residential PM peak is assumed to comprise approximately 63% inbound and 37% outbound movements.

Non-residential activities have different directional profiles. Education, commercial and light industrial activities generally attract inbound trips in the AM peak and generate outbound trips in the PM peak. Retail and food and beverage activities have a more balanced profile and, in the case of retail and supermarket activity, a significant proportion of trips will be internal, pass-by or local substituted trips. The mixed-use nature of the development therefore assists in balancing directional flows across the internal network and reducing the intensity of external peak direction movements. Overall, the non-residential directionality used for PC88 was retained in this assessment.

8.5 Other Assumptions

The modelling approach adopted for this assessment generally retains the PC88 transport modelling framework, with targeted updates where more current or site-specific information is now available. This is important because the operative Beachlands South Precinct transport triggers were derived from the PC88 modelling framework. The Fast Track assessment therefore does not adopt a new modelling philosophy, but instead applies the PC88 assumptions as the foundation and updates them only where justified by the current Project yield, staging, work-from-home evidence, land use mix and hotel-room treatment.

The principal modelling assumptions adopted in this assessment are summarised in Table 8-6 below.

Table 8-6: Summary of Other Modelling Assumptions

Parameter	Adopted Assumption
Base modelling framework	The PC88 modelling framework has been retained as the foundation for the assessment, with the Project yield and revised development staging inserted into that framework.
Background traffic growth basis	Background traffic growth is retained from PC88. The PC88 assessment did not rely on historic traffic count growth because recent observed growth in Beachlands was materially influenced by earlier plan change development and was not considered a reliable basis for forecasting future background growth. Instead, the PC88 assessment used the MSM i11.5

	land use forecasts for zones 445, 448, 449, 450 and 451, with a blanket background traffic growth rate applied across the area and updated by model year.
Background traffic growth rate	The adopted background traffic growth rates were 1.08% per annum for 2020–2024 (not used for this assessment as 2025 traffic counts were used), 0.67% per annum for 2024–2031, and 0.52% per annum for the 2031–2038.
Background development included within growth	The adopted background traffic growth rates are 1.08% per annum for 2020–2024, 0.67% per annum for 2024–2031, 0.52% per annum for 2031–2038, and 0.30% per annum from 2038 to 2041 for the Fast Track full-development assessment. The 2025 survey year growth index is 1.0509 and the 2041 model year growth index is 1.1445, giving a 2025–2041 growth factor of 1.089.
Active mode allowance in modelling	Retained from PC88. The existing 2% active mode share was excluded from the traffic modelling assessment for conservatism.
Public transport mode share – development traffic	Retained from PC88. The full PC88 future public transport mode share assumption is retained as the reference point, being 17% at full development, comprising 4% bus and 13% ferry. However, for the modelling, the adjustment is applied on an incremental basis because the base vehicle trip rates already reflect existing travel conditions. The existing Beachlands / Maraetai public transport mode share is approximately 7%, comprising 1% bus and 6% ferry. The model therefore applies only the incremental uplift of 10%, comprising 3% bus and 7% ferry.
Existing Beachlands / Maraetai public transport mode share	Retained from PC88. The future public transport uplift was applied to PPC88 development traffic, while the existing Beachlands / Maraetai area was conservatively assumed to remain at its current public transport mode share of 7%.
Combined Beachlands public transport mode share	Retained from PC88. The combined Beachlands public transport mode share was assessed as 7% in 2018, 7.5% in 2024, 10% in 2031, and 12% in 2038.
Residential AM directional split – low- and medium-density	75% outbound / 25% inbound.
Residential AM directional split – high-density / apartments	77% outbound / 23% inbound.
Residential PM directional split	37% outbound / 63% inbound.
Non-residential directional split	Retained from PC88. Education, commercial / office and light industrial activities are generally inbound-dominant in the AM peak and outbound-dominant in the PM peak. Retail, supermarket and food and beverage activities have a more balanced profile, reflecting local, internal, pass-by and substituted trips.
North / south external split	Retained from PC88. 87% south; 13% north

The assessment continues to recognise that Beachlands South will change the transport function of the wider Beachlands / Maraetai area by providing local employment, schools, retail, community facilities and improved active mode connections. Those assumptions were central to the PC88 modelling approach and remain appropriate for this assessment because the Project continues to deliver the same core transport outcome: a more complete and self-sufficient coastal town with a greater proportion of trips able to be retained locally, made by public transport, or undertaken by walking and cycling.

The key changes from the PC88 modelling assumptions are limited to the updated development yield / activity breakdown and staging, revised residential externalisation rate to recognise the significant increase in employment proposed, residential WFH adjustment, minor retail WFH adjustment and net treatment of hotel rooms to avoid double-counting existing hotel activity already reflected in the base traffic environment. All other key assumptions remain consistent with the plan change methodology. This provides a consistent basis for comparing the Proposal with the PC88 effects and the operative precinct triggers.

8.6 Results: Whitford-Maraetai Road Flow Assessment

The updated modelling results focus on the AM peak southbound flow on Whitford-Maraetai Road at Whitford. This remains the most relevant traffic effects indicator because it was the key external corridor constraint used to inform the I458 Beachlands South Precinct trigger framework. The results for the primary scenario and sensitivity tests are provided in **Table 8-7** below. All of the scenarios include the adjusted 45% externalisation and 1.5% retail WFH adjustments:

Table 8-7: Whitford-Maraetai Road Southbound AM Flow per Scenario

Scenario	WFH Adjustment	2039 (1,830hh)	2040 (1,959hh)	2041 (1,965hh)
Primary Assessment (15% WFH)	**15%**	**1,561vph**	**1,575vph**	**1,589vph**
Retirement Village Sensitivity (WFH 15%)	15%	1,560vph	1,574vph	1,589vph
WFH 10% sensitivity	10%	1,574vph	1,589vph	1,604vph
WFH 10% sensitivity (with retirement)	10%	1,574vph	1,589vph	1,603vph

The updated results show that, with the primary assessment of 15% WFH residential trip rate adjustment and 45% residential externalisation assumption, the full proposed 2041 yield produces a modelled southbound AM peak flow of approximately 1,590vph, still below the 1,600vph threshold that requires the Whitford Bypass. For this reason, the Whitford Bypass is not required to support the full development proposal even though more than 1,900 dwellings/residential lots are proposed. The resulting non-compliance with the Beachlands South Precinct provisions – namely Standard I458.6.3 and Table I458.6.3.1 Road Upgrades – is assessed in Section 10 (Statutory Effects).

The retirement village sensitivity test (using the same modelling assumptions) produces almost identical results, despite the total number of residential dwellings increasing from 1,965 to 2,065 dwellings, due to the comparatively lower trip rates for retirement units.

The sensitivity test using only a 10% WFH residential factor sees an increase in external southbound AM trips to 1,604vph, some 15vph higher than the primary 15% WFH reduction assumption. This increase of 15vph is considered negligible, representing an increase on the full southbound traffic flow of less than 1%. Therefore even using the 10% WFH sensitivity assumption, the total AM southbound flow remains at 1,604vph, which is broadly at the 1,600vph reference point.

It also remains significantly below the approximately 1,700vph upper reference point associated with the maximum development scale previously tested through the PC88 process.

One additional sensitivity test was undertaken to understand the number of dwellings that the primary assessment outlined above (including 15% WFH) could support without exceeding the 1,600vph threshold. This was carried out by adding medium density residential houses until the threshold was reached. The result was that up to 2,037 dwellings could be supported without exceeding the 1,600vph threshold.

8.7 Complete Modelling Derivation

As outlined in Table 8-7 above, the full-development AM peak assessment for the primary 1,965 dwelling scenario in 2041 produces a total southbound flow on Whitford-Maraetai Road through Whitford of 1,590vph. To provide methodology transparency, this section sets out the calculations that produced that result. The 1,590vph consists of background traffic and development traffic.

Background Traffic Derivation

The 2025 survey established that the current southbound traffic flow through Whitford in the AM peak is 1,246vph. The following background growth factors are then applied:

- The background growth factor between 2025 and 2041 of 1.089; and
- The reduction factor to the existing traffic leaving the existing Beachlands Township of 0.925 (to conservatively assume that only 7.5% of the existing catchment will choose to stay in Beachlands once schools and employment is in place).

This results in a background traffic flow of 1,255vph.

Development Traffic Derivation

The development traffic component is derived from the Project land use yield. As set out in Table 8-2, for residential activity, the full-development scenario includes 114 low density dwellings, 976 medium density dwellings, and 875 high density / apartment dwellings, giving a total of 1,965 dwellings. Applying the adopted WFH AM peak base trip rates gives (provided in Table 8-4) as 0.68 trips/dwelling; 0.553 and 0.340 respectively, gives:

- Low density 78vph;
- Medium Density 540vph; and
- High density 298vph.
- Total 914vph.

The public transport adjustment is then applied on an incremental basis. The existing Beachlands / Maraetai area already recorded an approximately 7% public transport mode share, comprising approximately 1% bus and 6% ferry. The full-development public transport assumption is 17%, comprising 4% bus and 13% ferry. Accordingly, the model applies only the incremental public transport uplift above the existing mode share, being 3% bus and 7% ferry, or 10% in total.

The residential vehicle trip generation after applying the incremental public transport uplift is therefore 915 × 0.9 = 823vph.

Of these residential vehicle trips, 45% are treated as external trips, therefore the external residential vehicle component is 823 × 45% = 370vph.

In the AM peak, the residential directional split is 75% outbound / 25% inbound. The residential external departures contributing to the outbound external movement are therefore: 370 × 75% = 278vph.

The non-residential land uses are then added. The model includes the food and beverage, small-scale retail, supermarket, commercial / office, education, light industrial, hotel and golf course activities proposed as part of the full-development scenario. Retail-related activities include the adopted 1.5% retail WFH adjustment, while no broader WFH adjustment has been applied to the other non-residential activities. The resulting external AM peak departures are summarised in **Table 8-8** below.

Table 8-8: Non-Residential External AM Peak Departures

Activity	Yield	Adjusted AM Trips	External Trip %	AM Departure Proportion	External Departures
Food and beverage	1,271sqm	39vph	5%	59%	1vph
Small-scale retail	2,060sqm	58vph	5%	46%	1vph
Supermarket	2,872sqm	64vph	5%	50%	2vph
Commercial / office	4,847sqm	91vph	15%	14%	2vph
Education	2,100 pupils	791vph	20%	45%	71vph
Light industrial	29,099sqm	219vph	20%	17%	7vph
Hotel	100 net additional rooms	70vph	70%	44%	22vph
Golf course	9 holes	5vph	50%	10%	0vph
Total	—	—	—	—	106vph

The total external development departures in the AM peak are therefore:

- 278vph residential external departures; plus
- 106vph non-residential external departures;
- Equals 384vph

Not all of those external departures travel southbound through Whitford. The adopted outbound external distribution assigns 87% of external departures to the southbound Whitford-Maraetai Road movement through Whitford. The remaining 13% of external departures are assigned to other external movements (north to Maraetai and Clevedon) and therefore do not contribute to the critical southbound flow through Whitford.

The total development traffic component on the critical southbound Whitford-Maraetai Road movement is therefore 384 x 87% = 334vph.

Combining the background and development components gives a total 2041 AM peak southbound flow of 1,255vph + 334vph = 1,589vph.

This demonstrates that, under the full-development 1,965-dwelling scenario, the majority of the assessed southbound flow is existing and background traffic. The Beachlands South development contributes approximately 334vph, or around 21% of the total assessed 2041 AM southbound flow through Whitford. The resulting total flow of 1,589vph, or

approximately 1,590vph, remains broadly consistent with the 1,600vph PC88 bypass reference flow and materially below the approximately 1,700vph upper reference scenario tested through the PC88 process

8.8 Whitford-Maraetai Road / Trig Road Intersection Testing (Site C)

As mentioned earlier, the Project does not include the Whitford-Maraetai Road / Trig Road intersection upgrade identified in Table I458.6.3.1 Row (c) of the provisions. The statutory implications of not providing that upgrade are addressed separately in Section 10. This section addresses the traffic engineering basis for the approach.

As part of the analysis informing this ITA, further validation testing was undertaken to review the package of external intersection upgrades that had been embedded in the Beachlands South precinct framework. That review specifically considered whether the Trig Road South / Whitford-Maraetai Road upgrade remained necessary having regard to the updated development mix, revised trip generation assumptions, revised externalisation assumptions, and the updated traffic surveys identifying a low turning demand at the existing priority-controlled intersection. As part of that process, the need for the Trig Road upgrade was questioned and the full signalisation upgrade was ultimately ruled out.

The existing give-way intersection layout with existing traffic flows was compared and the same layout with Project traffic flows. The results of the Sidra analysis are summarised in **Table 8-9** below, with full SIDRA results provided in Attachment 1:

Table 8-9: Whitford-Maraetai Road / Trig Road intersection performance before and after development

Scenario	Peak Hour	DoS	Trig Road LOS	Max Trig Road Q (m)	Average Trig Rd Delay (s)
Existing give way layout and traffic flows	AM	0.606	LOS F	8.6m	55s
	PM	0.518	LOS E	0.7m	39s
Existing give way and full development flows.	AM	0.796	LOS F	6.1m	72s
	PM	0.667	LOS F	0.2m	43s

The results show that the Trig Road approach records delays and poor LOS, in the existing scenario, which as expected are worsened in the full development scenario given the higher traffic flows on the through movements. However, that result needs to be interpreted in the context of the very low traffic volume undertaking the critical movement. The delay is concentrated on the right turn out of Trig Road onto Whitford-Maraetai Road, which has a modelled demand of approximately one vehicle per hour (based on the 2025 traffic surveys that captured the same). The left-turn movement out of Trig Road is much

easier to accommodate, and the modelled 95th percentile queues on Trig Road remain very short in both the AM and PM peak periods.

In practical terms, the SIDRA result identifies that the very occasional right-turning vehicle may need to wait for a suitable gap in Whitford-Maraetai Road traffic. That does not, in itself, justify signalising the full intersection. Signalisation would provide priority to a movement of approximately one vehicle per hour, but would do so by interrupting the substantially higher through movement on Whitford-Maraetai Road, leading to delays to that traffic. That would be a disproportionate intervention and would likely create greater overall network disbenefit than the very limited delay benefit provided to the occasional Trig Road right-turning vehicle.

The modelled delay is also conservative in the sense that SIDRA assesses the movement on a conventional gap-acceptance basis. In practice, where Whitford-Maraetai Road traffic is platooned or queued during parts of the peak period, occasional gaps are likely to be created and drivers may also be informally allowed to enter the traffic stream. No reliance is placed on that behaviour for capacity purposes, but it reinforces that the modelled delay for a one vehicle per hour movement should not be treated as a network wide operational deficiency.

The intersection also sits within a 60kph speed environment, rather than a higher-speed rural arterial environment to the northeast. With good visibility available, the occasional right-turning driver is not required to identify gaps in an 80kph or 100kph traffic stream. The delay outcome is therefore primarily an operational inconvenience for a very low volume movement, rather than evidence of an unsafe or inefficient intersection form requiring full signalisation. In that respect, not signalising the intersection is not simply an omission of an upgrade, it is the more proportionate transport response because it avoids imposing delay on the dominant Whitford-Maraetai Road movement for the benefit of an extremely low volume side-road movement.

8.9 Traffic Effects Conclusions

The traffic effects assessment demonstrates that the Project can be accommodated within the transport effects envelope established through PC88 and set out in I458 Beachlands South Precinct provisions, subject to the infrastructure, staging and monitoring framework described in this ITA and precinct provisions. The assessment has retained the PC88 modelling approach as the foundation for the analysis, with targeted updates to reflect the

Project development yield, the increased employment-generating land use, contemporary work from home travel behaviour, and the current ferry and public transport context.

The critical external network measure remains the AM peak southbound flow on Whitford-Maraetai Road through Whitford. The transport trigger framework in the precinct provisions was informed by the transport model of PC88 which established a southbound flow of approximately 1,600vph before the Whitford Bypass became relevant, with approximately 1,700vph representing the upper range of the full development scenario tested through the plan change process. The updated modelling indicates that the full development scenario remains broadly at the 1,600vph reference point and materially below the 1,700vph upper reference point. On that basis, the proposed yield results in the same external traffic effect as the development yields assessed through PC88 and does not require the specified transport infrastructure upgrades at Sites C or F in the precinct provisions.

The assessment is considered robust because it retains the key PC88 assumptions where appropriate, including the general modelling structure, public transport uptake assumptions, background growth treatment and the trip distribution assumptions. The principal changes from the PC88 modelling are limited and justified. These include the updated development mix, a modest reduction in residential externalisation to recognise the larger employment base, the anticipated change in existing Beachlands travel patterns as more local employment, education, retail and community activities become available, a WFH adjustment based on actual post-COVID travel behaviour, a minor retail work-from-home adjustment consistent with the Drury Centre methodology, and the net treatment of hotel rooms to avoid double-counting existing hotel activity already reflected in base traffic conditions.

The decision not to provide the Trig Road South / Whitford-Maraetai Road signalised upgrade has also been reviewed from a traffic engineering perspective. The SIDRA validation testing indicates that the existing priority-controlled arrangement remains appropriate for the very low turning demand at that intersection. While the right-turn movement out of Trig Road experiences higher modelled delay, the volume of that movement is negligible and does not justify signalising the wider intersection, particularly where doing so would introduce delay to the dominant Whitford-Maraetai Road through movement. The omission of that signalisation upgrade is therefore considered appropriate from an operational perspective, notwithstanding the associated statutory non-compliance assessed in Section 10.

Overall, the traffic effects and impacts of the Project are considered acceptable and as anticipated through the PC88 process. The development will be supported by a staged

package of road upgrades, ferry capacity improvements, internal active mode and public transport-supportive infrastructure, and ongoing monitoring. The Project will also improve local self-sufficiency in Beachlands by providing employment, education, retail and community destinations that reduce the need for some existing and future residents to travel externally during peak periods. On that basis, the Project is expected to result in acceptable effects on the function, capacity and safety of the surrounding transport network.

9. Policy Framework Assessment

This section assesses the Project against the principal transport-related statutory and policy documents, focusing on broader policy alignment.

9.1 Auckland Unitary Plan (Operative in Part)

The Auckland Unitary Plan (AUP) provides the operative planning framework for transport effects, access, parking, loading, cycle parking and the Beachlands South Precinct. Chapter E27 seeks to ensure that land use and all modes of transport are integrated, that adverse transport effects are managed, and that parking, loading and access are designed and managed safely and efficiently. The Beachlands South Precinct provisions provide the site-specific framework for transport staging, movement network design, monitoring and travel planning.

The Project is consistent with the AUP transport framework because it implements the movement network and staging approach established through PC88 and set out in I458 Beachlands South Precinct provisions, provides high-quality walking and cycling facilities, improves access to public transport, and delivers transport upgrades in step with development. The Project does not rely on unmanaged private vehicle growth. It is supported by a package of access, active mode, public transport, ferry, road safety, monitoring and travel planning measures.

9.2 National Policy Statement on Urban Development

The National Policy Statement on Urban Development (NPS-UD) directs planning decisions to enable well-functioning urban environments, provide housing and business development capacity, and support urban form that provides good accessibility by a range of modes. The Project delivers a substantial mixed-use urban development adjacent to an existing coastal settlement and ferry terminal, with local employment, education, retail

and recreation opportunities. It therefore improves local accessibility and supports a more self-contained urban form for Beachlands and Maraetai which overall achieves a well-functioning urban environment.

9.3 Auckland Plan 2050

The Auckland Plan 2050 seeks a transport system that provides safe, reliable and sustainable access to opportunities. It also supports a quality compact urban form and improved access to employment, education and services. The Project is consistent with those outcomes because it concentrates growth in a comprehensively planned precinct, provides new local services and employment, and improves active mode and public transport access rather than extending low-density rural-residential development patterns.

9.4 Government Policy Statement on Land Transport and National Land Transport Programme

The current Government Policy Statement on Land Transport emphasises economic growth and productivity, value for money, maintenance and resilience, safety, and effective transport connections. The Project aligns with those themes by providing local employment and services, improving the efficiency of the existing transport network through targeted intersection and active mode upgrades, and supporting resilience through multiple access points and improved ferry connectivity. No reliance is placed on an uncommitted National Land Transport Programme roading project to support the core conclusions of this ITA.

9.5 Auckland Regional Land Transport Plan 2024–2034

The Auckland Regional Land Transport Plan 2024–2034 sets out the region's proposed land transport investment programme. It includes investment in low-emission ferries, electric buses, network optimisation, safety, renewals and resilience. The Project is consistent with the RLTP direction by supporting increased ferry use, integrating with bus-ferry improvements, and delivering local infrastructure improvements through the development framework rather than assuming that wider public funding will deliver all local upgrades.

9.6 Regional Public Transport Plan 2023–2031

The Regional Public Transport Plan 2023–2031 and its 2025 variation provide the public transport service framework for Auckland. The RPTP includes ferry improvements and bus

service changes, including improvements relevant to Pine Harbour. The relatively new Route 738 and associated Pine Harbour bus stop works provide a stronger basis for bus-ferry integration than existed at the time of the original PC88 ITA. The Project supports this policy direction by creating a larger walk-up and cycle-up catchment for Pine Harbour and by providing active mode connections that make public transport more accessible.

9.7 Transport Emissions Reduction Pathway

The Transport Emissions Reduction Pathway (TERP) seeks to reduce transport emissions by supporting compact urban form, mode shift to public transport, walking and cycling, and reductions in vehicle kilometres travelled. Beachlands South is not an inner-city or rapid-transit-adjacent development, however, the Project materially improves the transport-emissions profile of future growth in this part of Auckland compared with dispersed rural-residential development. It provides local employment, education and retail, supports ferry and bus use, creates a comprehensive active mode network, and increases self-containment within Beachlands and Maraetai.

9.8 Auckland Transport Design Manual, Roads and Streets Framework and Future Connect

The Auckland Transport Design Manual (ATDM), Roads and Streets Framework and Future Connect provide design and network guidance for streets, intersections, active modes and public transport. The Project is aligned with these frameworks because it uses a clear road hierarchy, signalised intersections where pedestrian and cycle crossings are required, protected cycle facilities on collector roads, raised crossings across side streets, low-speed local roads, and direct links to key destinations. The detailed design will confirm compliance with the ATDM and relevant engineering standards, but the masterplan structure is consistent with the intended multimodal street design response for a greenfield urban neighbourhood.

10. Statutory Assessment

This section provides a preliminary assessment of the Project against the key transport standards and information requirements. The assessment follows the sequence of requirement, trigger, Project response and compliance outcome. Some matters will require confirmation through detailed design, transport design reports and engineering plan approval. Those matters are identified explicitly.

10.1 Beachlands South Precinct Provisions (I458)

The first step in the precinct assessment is to identify the relevant transport-related activity status under the Beachlands South Precinct activity table. The assessment presented in **Table 10-1** below is limited to those activity rows that are directly relevant to transport, access, road design, staging, ferry capacity and active mode connectivity. Non-transport matters, including ecology, wastewater, water supply, built form and other non-transport precinct requirements, are addressed by others.

Table 10-1: Beachlands South Precinct Transport Activity Status (I458.4.1 Activity Table – All Sub-Precincts)

<table>
<tr><th>Criteria</th><th>Activity Status</th><th>Comment</th></tr>
<tr><td>I458.4.1(A8) Development that does not comply with Standard I458.6.3 and Table I458.6.3.1 Road Upgrades Rows (a) to (d):
<table>
<tr><th colspan="2">Column 1
Development and/or subdivision enabled within the area identified on Precinct Plan 6 by transport infrastructure in column 2,</th><th>Column 2
Transport infrastructure required to enable development and/or or subdivision in column 1</th></tr>
<tr><td>(a)</td><td>Up to a maximum of 500 dwellings and/or residential lots</td><td>Upgrade of Jack Lachlan Drive to provide two-way cycling facilities along the full length of one side of the road; and a footpath on the northern side of the road as shown in Appendix 2; and

Site (A) on Precinct Plan 6: Upgrade of Whitford-Maraetai Road / Jack Lachlan Drive intersection as shown in Appendix 2 and

Site (B) on Precinct Plan 6: Upgrade of Whitford Park Road / Whitford Road / Whitford-Maraetai Road roundabout to provide an additional traffic lane on the Whitford Road (western) approach and traffic signal metering of the same approach with queue detectors on the Whitford-Maraetai Road (eastern) approach as shown in
Appendix 2 **; and

Site (E) on Precinct Plan 6: Upgrade of Somerville Road / Whitford Road / Point View Drive roundabout to</td></tr>
</table></td><td>Non-complying Activity consent required</td><td>This is triggered because the development does not comply with all of the road upgrade requirement in Rows (a) to (d), namely: the initial full upgrade of Jack Lachlan Drive; and the upgrade of Trig Road South / WMR intersection.

The Jack Lachlan Drive non-compliance is due to construction staging that will see 68 residential properties occupied prior to the full JLD upgrade being completed.

The reasons for this Trig Road / WMR non-compliance is set out in Section 8 (Transport Effects). In summary, the Trig Road (south) / WMR intersection is not required as its performance remains adequate through to the full development sought in this consent, and implementing the upgrade would likely lead to excessive queueing on the WMR through Road.</td></tr>
</table>

		provide a double north-west bound through-lane for additional capacity as shown in Appendix 2.
(b)	A provision of: i. More than 500 and up to 850 dwellings or residential lots	Upgrades in (a) above; and Site (D) on Precinct Plan 6: Provision of an additional left-turn approach lane on the northbound approach to the Whitford Park Road / Saleyard Road / Sandstone Road roundabout as shown in Appendix 2*.
(c)	A provision of: i. More than 850 and up to 1,200 dwellings or residential lots	Upgrades in (a) – (b) above; and Site (C) on Precinct Plan 6: Upgrade to Trig Road (south) / Whitford-Maraetai Road intersection as shown in Appendix 2.*
(d)	A provision of: i. More than 1,200 and up to 1,900 dwellings or residential lots	Upgrades in (a) – (c) above; and Site (B) on Precinct Plan 6: Further upgrade of Whitford Park Road / Whitford Road / Whitford-Maraetai Road roundabout to provide an additional lane on the Whitford-Maraetai Road (eastern) approach, and the removal of the traffic signal metering equipment as shown in Appendix 2. *

I458.4.1(A9) Development that does not comply with Standard I458.6.3 and Table I458.6.3.1 Road Upgrades Row (e). (e) A provision of: i. More than 1,900 and up to 2,700 dwellings or residential lots — Upgrades in (a) – (d) above; and Site (F) on Precinct Plan 6: Whitford Bypass providing a two- way single lane each way between the Trig Road (south) / Whitford- Maraetai Road intersection and the Saleyard Road / Whitford Park Road / Sandstone Road intersection, including upgrades to the intersections at both ends.	Discretionary Activity consent required	This is triggered because the development exceeds 1,900 dwellings / lots and does not provide the Whitford Bypass required by Row (e). The reason for this non-compliance is set out in Section 8 (Transport Effects). In summary, the Whitford Bypass is not required as the development activity mix now proposed ensures the AM southbound traffic flow on WMR remains below the 1,600vph (background plus development) threshold used to determine the trigger point at Plan Change.
I458.4.1(A10) Development that does not comply with Standard I458.6.3 and Table I458.6.3.2 Ferry Capacity.	Discretionary Activity consent required	This is triggered because the development does not comply with the required Pine Harbour ferry capacity thresholds, because the ferry upgrades proposed by Auckland Transport see the two-hour AM peak provision increase to 969pax, which satisfies rows (a) through to (d) (950pax), but not Row (e) (1,150pax). This is best dealt with through a condition of consent that requires the adequacy of the ferry provision beyond 1,900hh to be assessed, and potential options for further increasing capacity to be discussed with Auckland Transport at that time. Further, it is expected that the difference in ferry demand

<table><tr><th>Column 1 Development and/or subdivision enabled within the area identified on Precinct Plan 6 by transport infrastructure in column 2</th><th>Column 2 Transport infrastructure required to enable development and/or subdivision in column 1</th></tr><tr><td>(a) A provision of more than 250 up to 500 dwellings or residential lots</td><td>Provision for a total capacity of at least 600 ferry passengers from Pine Harbour during the two-hour peak period between 0620 – 0820 on weekdays.</td></tr><tr><td>(b) A provision of more than 500 up to 850 dwellings or residential lots</td><td>Provision for a total capacity of at least 700 ferry passengers from Pine Harbour during the two-hour peak period between 0620 – 0820 on weekdays.</td></tr><tr><td>(c) A provision of more than 850 up to 1500 dwellings or residential lots</td><td>Provision for a total capacity of at least 825 ferry passengers from Pine Harbour during the two-hour peak period between 0620-0820 on weekdays; and</td></tr><tr><td>(d) A provision of more than 1500 up to 1900 dwellings or residential lots</td><td>Provision for a total capacity of at least 950 ferry passengers from Pine Harbour during the two-hour peak period between 0620 – 0820 on weekdays.</td></tr><tr><td>(e) A provision of more than 1900 and up to 2700 dwellings or residential lots</td><td>Provision for a total capacity of at least 1150 ferry passengers from Pine Harbour during the two-hour peak period between 0620 – 0820 on weekdays</td></tr></table>		between the 1,900 dwelling trigger and the now anticipated yield over 1,900 dwellings but under 2,000 dwellings will make little difference to actual ferry demands.
I458.4.1(A11) Development of more than 2,700 dwellings.	Not applicable	Not triggered as the Project remains below 2,700 dwellings.
I458.4.1(A23) Subdivision that does not comply with Standard I458.6.3 and Table I458.6.3.1 Road Upgrades Rows (a) to (d).	Non-complying Activity consent required.	This is the subdivision equivalent of A8. It is triggered because the proposed subdivision does not comply with the road upgrade requirements in Rows (a) to (d), namely row (a) Jack Lachlan Drive upgrade; and row (c), the Trig Road (south) / WMR upgrade. The Jack Lachlan Drive non-compliance is due to construction staging that will see 68 residential properties occupied prior to the full JLD upgrade being completed. The reason for the Trig Road non-compliance is set out in Section 8 (Transport Effects). In summary, the Trig Road / WMR intersection is not required as its performance remains adequate through to the full development sought in this consent, and implementing the upgrade would likely lead to excessive queueing on the WMR through Road.
I458.4.1(A24) Subdivision that does not comply with Standard I458.6.3 and Table I458.6.3.1 Road Upgrades Row (e).	Discretionary Activity consent required	This is the subdivision equivalent of A9. It is triggered because subdivision exceeds 1,900 residential lots without providing the Whitford Bypass upgrade in this trigger. The reason for this non-compliance is set out in Section 8 (Transport Effects). In summary, the Whitford Bypass is not required as the development activity mix now proposed ensures the AM southbound traffic flow on WMR remains below the 1,600vph

		(background plus development) threshold used to determine the trigger point at Plan Change.
I458.4.1(A25) Subdivision that does not comply with Standard I458.6.3 and Table I458.6.3.2 Ferry Capacity.	Discretionary Activity consent required	This is triggered if subdivision does not comply with all of the ferry capacity thresholds. The ferry upgrades proposed by Auckland Transport see the two-hour AM peak provision increase to 969pax, which satisfies road (a) through to (d) (950pax), but not Row (e) (1,150pax). This is best dealt with through a condition of consent that requires the adequacy of the ferry provision beyond 1,900hh to be assessed, and potential options for further increasing capacity to be discussed with Auckland Transport at that time. Further, it is expected that the difference in ferry demand between the 1,900 dwelling trigger and the now anticipated yield over 1,900 dwellings but under 2,000 dwellings will make little difference to actual ferry demands.
I458.4.1(A26) Subdivision of more than 2,700 residential lots.	Not applicable	Not triggered as the Project remains below 2,700 residential lots.
I458.4.1(A29) Subdivision and/or development that does not comply with Standard I458.6.14 Road Design.	Restricted Discretionary Activity consent required	Triggered because the road design does not comply with Appendix 1: Beachlands South Precinct Road Function and Design Details Table, in that the Jack Lachlan Drive road reserve width is generally proposed at 20.7m, but the requirement is 23m. This is considered a reasonable practicable width that provides all the required design features set out in the table. Also, on the northern side of Jack Lachlan Drive, no footpath is provided due to topography constraints and the fact that no pedestrian permeability is available to the site to the north. This also leads to a further reduction in road reserve width resulting in two non-compliances against Appendix 1. As discussed above, these two non-compliances are unlikely to have any adverse effect on the safe and efficient operation of the corridor. Auckland Transport has

		reviewed this Project and accepted it in principle, pending confirmation of design details. In general, note 1 of the table specifies that the typical minimum road reserve width "may need to be varied in specific locations where required to accommodate network utilities, batters, structures, stormwater treatment, intersection design, significant constraints or other localised design requirements". And that "width of roads where they continuously adjoin open space may be modified and Road width on Collector roads may be reduced if a two-way cycleway is provided on one side of the road." Further, an active mode path is provided on the southern side of the western-most extent of Jack Lachlan Drive as it passes the constrained "boat-houses" frontage. Auckland Transport has reviewed this proposal and accepted it in principle, pending confirmation of design details. The other non-compliance against Appendix 1 is the Primary Collector (Village Centre), which has collector road status and therefore requires a 23m corridor and a cycle facility, but only provides 20m. This is a deliberate intervention to ensure that this section of road provides a tight corridor with slow moving vehicles through the key village centre. A cycleway diversion around the village centre is provided to ensure consistency with the cycling route. The non-compliance is intentional to provide an urban design treatment for this important street and is therefore considered acceptable.

As shown in the table above, the Project triggers a restricted discretionary activity component for road design infringements associated with Standard I458.6.14. However, the overall transport-related activity status is driven by the non-compliance with Standard I458.6.3. In particular, the Project does not provide the Trig Road South / Whitford-Maraetai Road upgrade required by Table I458.6.3.1 Row (c), exceeds 1,900 dwellings without providing the Whitford Bypass required by Row (e), and for a period of time the Jack Lachlan Drive upgrade will not be in place when the first 68 houses are occupied due to

construction staging. The Row (c) road upgrade non-compliance triggers non-complying activity status for both development and subdivision under I458.4.1(A8) and I458.4.1(A23). Accordingly, the overall transport-related activity status is non-complying.

Table I458.6.3.1 and Table I458.6.3.2 establish the precinct's transport staging framework. These provisions coordinate subdivision and development with the delivery of road upgrades and ferry capacity upgrades, so that development does not outpace the infrastructure required to manage its transport effects. Table 10-2 below assesses the Project against each relevant road and ferry threshold.

Table 10-2: Beachlands South Precinct Standards and Transport Triggers (I458.6.3)

<table>
<tr><th>Criteria</th><th>Compliance</th><th>Comment</th></tr>
<tr>
<td>I458.6.3 Staging of Subdivision and Development with Transport Upgrades.

<table>
<tr><th colspan="2">Column 1
Development and/or subdivision enabled within the area identified on Precinct Plan 6 by transport infrastructure in column 2,</th><th>Column 2
Transport infrastructure required to enable development and/or or subdivision in column 1</th></tr>
<tr><td>(a)</td><td>Up to a maximum of 500 dwellings and/or residential lots</td><td>Upgrade of Jack Lachlan Drive to provide two-way cycling facilities along the full length of one side of the road; and a footpath on the northern side of the road as shown in Appendix 2; and

Site (A) on Precinct Plan 6: Upgrade of Whitford-Maraetai Road / Jack Lachlan Drive intersection as shown in Appendix 2 and

Site (B) on Precinct Plan 6: Upgrade of Whitford Park Road / Whitford Road / Whitford-Maraetai Road roundabout to provide an additional traffic lane on the Whitford Road (western) approach and traffic signal metering of the same approach with queue detectors on the Whitford-Maraetai Road (eastern) approach as shown in
Appendix 2 **; and

Site (E) on Precinct Plan 6: Upgrade of Somerville Road / Whitford Road / Point View Drive roundabout to</td></tr>
</table>
</td>
<td>Non-compliant</td>
<td>The Project does not comply with the operative transport staging standard because it does not provide the Trig Road (south) / Whitford-Maraetai Road upgrade required under Table I458.6.3.1 Row (c), exceeds 1,900 dwellings without providing the Whitford Bypass required under Row (e), and does not provide the full Jack Lachlan Drive upgrade for the first 68 dwellings and/or residential lots.

The Jack Lachlan Drive non-compliance is due to construction staging that will see 68 residential properties occupied prior to the full JLD upgrade being completed.

The reasons for the Trig Road non-compliance are set out in Section 8 (Transport Effects). In summary, the signalisation of Trig Road (south) / WMR intersection is not required as its performance remains adequate through to the full development sought in this consent, and implementing the upgrade would likely lead to excessive queueing on the WMR through Road.

The Whitford Bypass is not required as the development activity mix now proposed ensures the AM southbound traffic flow on WMR remains below the 1,600vph (background plus development) threshold used to determine the trigger point at Plan Change.</td>
</tr>
</table>

		provide a double north-west bound through-lane for additional capacity as shown in Appendix 2.		
(b)	A provision of: i. More than 500 and up to 850 dwellings or residential lots	Upgrades in (a) above; and Site (D) on Precinct Plan 6: Provision of an additional left-turn approach lane on the northbound approach to the Whitford Park Road / Saleyard Road / Sandstone Road roundabout as shown in Appendix 2*.		
(c)	A provision of: i. More than 850 and up to 1,200 dwellings or residential lots	Upgrades in (a) – (b) above; and Site (C) on Precinct Plan 6: Upgrade to Trig Road (south) / Whitford-Maraetai Road intersection as shown in Appendix 2.*		
(d)	A provision of: i. More than 1,200 and up to 1,900 dwellings or residential lots	Upgrades in (a) – (c) above; and Site (B) on Precinct Plan 6: Further upgrade of Whitford Park Road / Whitford Road / Whitford-Maraetai Road roundabout to provide an additional lane on the Whitford-Maraetai Road (eastern) approach, and the removal of the traffic signal metering equipment as shown in Appendix 2. *		
(e)	A provision of: i. More than 1,900 and up to 2,700 dwellings or residential lots	Upgrades in (a) – (d) above; and Site (F) on Precinct Plan 6: Whitford Bypass providing a two- way single lane each way between the Trig Road (south) / Whitford- Maraetai Road intersection and the Saleyard Road / Whitford Park Road / Sandstone Road intersection, including upgrades to the intersections at both ends.		
I458.6.3.1(a) Up to a maximum of 500 dwellings and / or residential lots.			Non-compliant	This threshold requires the Jack Lachlan Drive upgrade, including two-way cycling facilities along one side of the road and a footpath on the northern side, the WMR / Jack Lachlan Drive intersection upgrade, the Whitford Park Road / Whitford Road / WMR roundabout upgrade, and the Somerville Road / Whitford Road / Point View Drive roundabout upgrade. Most of these upgrades are proposed to be delivered through proposed consent conditions before the relevant occupation / subdivision release threshold is exceeded, but there will be 68 dwellings occupied prior to the Jack Lachlan Drive upgrade due to construction staging.
I458.6.3.1(b) More than 500 and up to 850 dwellings or residential lots.			Complies	This threshold requires the upgrades in Row (a), plus the additional left-turn approach lane on the northbound approach to the Whitford Park Road / Saleyard Road / Sandstone Road roundabout. This upgrade is proposed to be delivered through the Project condition framework before the

		relevant occupation / subdivision release threshold is exceeded.
I458.6.3.1(c) More than 850 and up to 1,200 dwellings or residential lots.	Non-compliant	This threshold requires the upgrades in Rows (a) and (b), plus the Trig Road South / Whitford-Maraetai Road intersection upgrade. The Project does not provide this upgrade for the reasons outlined above, and therefore does not comply with Row (c).
I458.6.3.1(d) More than 1,200 and up to 1,900 dwellings or residential lots.	Non-Compliant	This threshold requires the upgrades in Rows (a) to (c), plus the further Whitford Park Road / Whitford Road / WMR roundabout upgrade to provide an additional lane on the WMR eastern approach and remove the traffic signal metering equipment. As explained in Section 8, it is proposed to fully upgrade the Whitford Roundabout, including both Stages 1 and 2, all at once prior to any dwellings being constructed. As a result, this further Stage 2 upgrade will already have been carried out, thus complying with this step. However, this row remains non-compliant because it also requires upgrades (a) to (c), which as discussed above are not all being provided.
I458.6.3.1(e) More than 1,900 and up to 2,700 dwellings or residential lots.	Non-compliant	This threshold requires the upgrades in Rows (a) to (d), plus the Whitford Bypass between the Trig Road South / WMR intersection and the Saleyard Road / Whitford Park Road / Sandstone Road intersection, including upgrades at both ends. The Project exceeds 1,900 dwellings but does not provide the Whitford Bypass for the reasons described above.
I458.6.3.2(a) More than 250 and up to 500 dwellings or residential lots.	Complies	This threshold requires total Pine Harbour ferry capacity of at least 600 passengers during the weekday 0620–0820 peak period, which will be provided as part of the Auckland Transport service upgrade in 2027.
I458.6.3.2(b) More than 500 and up to 850 dwellings or residential lots.	Complies	This threshold requires total Pine Harbour ferry capacity of at least 700 passengers during the weekday 0620–0820 peak period, which will be provided as part of the Auckland Transport service upgrade in 2027.
I458.6.3.2(c) More than 850 and up to 1,500 dwellings or residential lots.	Complies	This threshold requires total Pine Harbour ferry capacity of at least 825 passengers during the weekday 0620–0820 peak period,

		which will be provided as part of the Auckland Transport service upgrade in 2027.
I458.6.3.2(d) More than 1,500 and up to 1,900 dwellings or residential lots.	Complies	This threshold requires total Pine Harbour ferry capacity of at least 950 passengers during the weekday 0620–0820 peak period, which will be provided as part of the Auckland Transport service upgrade in 2027.
I458.6.3.2(e) More than 1,900 and up to 2,700 dwellings or residential lots.	Non compliant	This threshold requires total Pine Harbour ferry capacity of at least 1,150 passengers during the weekday 0620–0820 peak period. The Project exceeds 1,900 dwellings, so this ferry threshold is triggered but the ferry upgrades proposed by Auckland Transport see the two-hour AM peak provision increase to 969pax, which satisfies road (a) through to (d) (950pax), but not Row (e). This is proposed to be dealt with through a condition of consent that requires the adequacy of the ferry provision beyond 1,900hh to be assessed, and potential options for further increasing capacity to be discussed with Auckland Transport at that time.

The Project complies with the majority of the road and ferry staging framework, subject to the delivery of the relevant upgrades through the proposed Project consent conditions. However, the Project does not comply with the Jack Lachlan Drive upgrade requirement in Table I458.6.3.1 Row (a), Trig Road South / Whitford-Maraetai Road upgrade requirement in Table I458.6.3.1 Row (c), the Whitford Bypass requirement in Row (e), or the full 1,150 passenger ferry capacity requirement in Table I458.6.3.2 Row (e). The technical basis for not providing the Trig Road upgrade and Whitford Bypass is addressed in the Traffic Effects section of this report. In summary, the updated modelling demonstrates that the alternative development mix and proposed infrastructure package can appropriately manage the transport effects of the Project without those specific upgrades being delivered at the operative precinct trigger points.

Because the Project infringes relevant transport-related precinct standards, the applicable assessment criteria in I458.8.2 are addressed in **Table 10-3** below. The assessment focuses on whether the Project implements appropriate mitigation, provides a connected and multimodal movement network, integrates with Pine Harbour ferry services and the existing Beachlands township, supports walking, cycling and public transport use, and

provides a road network that is safe, efficient and consistent with the precinct's movement network policies.

Table 10-3: Beachlands South Precinct Assessment Criteria (I458.8.2)

Criteria	Compliance	Comment
I458.8.2(3)(a) Implementation of mitigation measures to address adverse effects, including travel planning, alternatives to private vehicle trips, public transport accessibility, staging, local transport network improvements and ferry service improvements.	Complies	The Project includes a Travel Management Plan framework, public transport and ferry integration, internal active mode connections, Jack Lachlan Drive active mode upgrades, staged road upgrades and ongoing transport monitoring.
I458.8.2(3)(b)(i) Quality public transport, walking and cycle connections within the subdivision or development.	Complies	The masterplan includes footpaths on all roads, protected cycle facilities on collector roads, raised side-road crossings, low-speed local streets, and off-road green / coastal active mode links.
I458.8.2(3)(b)(ii) Quality public transport, walking and cycle connections between the subdivision or development and the ferry berth.	Complies	The Project provides improved active mode access to Pine Harbour Ferry, including the Jack Lachlan Drive active mode corridor and a direct western accessible path connection (and secondary staircase) down to the marina / ferry area.
I458.8.2(3)(b)(iii) Quality public transport, walking and cycle connections between the subdivision or development and the existing Beachlands township.	Complies	Jack Lachlan Drive will be upgraded with continuous active mode facilities, including a two-way cycle facility located to serve both the existing Beachlands township catchment, the Beachlands South catchment and connections between the two.
I458.8.2(3)(c) Whether the Project is of a scale or type that promotes increased walking, cycling and public transport use.	Complies	The development scale, density, mixed-use structure, local employment, education activities, Village Centre, ferry access and internal active mode network support a materially higher walking, cycling and public transport mode share than the existing rural environment.
I458.8.2(3)(d) Extent of subdivision and development previously approved under the standard.	Not applicable	There have been no previously consented developments.
I458.8.2(3)(e) Whether intersections are designed to provide safe and efficient movement for pedestrians and cyclists.	Complies	The Project includes signalised intersections on Jack Lachlan Drive, pedestrian and cycle crossing facilities, and internal raised crossings across local road side streets. Detailed signal layouts and crossing design

		are provided in Section 9 (Transport Design Report).
I458.8.2(3)(f) Extent to which funding options are available to provide the required transport infrastructure upgrades.	Complies	As required, the external upgrades will all be funded by the applicant, and a financial contribution will be made to the ferry upgrades. The funding is confirmed, thereby providing funding certainty for the upgrades.
I458.8.2(3)(g) Monitoring of forecast mode share splits, assumed trip generation and development mix, and mitigation if outcomes are not achieved.	Not applicable	There have been no previously consented developments, therefore monitoring not yet available, but conditions are provided to ensure the 500-dwelling monitoring framework is carried out at the appropriate times.
I458.8.2(8)(a) Collector and local roads provided generally in accordance with Precinct Plan 5 to achieve a highly connected street layout, including one of the two alternative Indicative Primary Collector Spine Road connections from Jack Lachlan Drive to WMR.	Complies	The masterplan provides a connected collector and local road network generally consistent with Precinct Plan 5, and includes one of the two connections to Whitford-Maraetai Road (albeit as a local rather than collector form).
I458.8.2(8)(b) If an alternative alignment is proposed, whether it provides an equal or better degree of connectivity and amenity within and beyond the precinct.	Not applicable	No alternatives are proposed.
I458.8.2(8)(b)(i) Presence of natural features, natural hazards or contours and how these affect road placement.	Complies	The roading layout responds to the coastal edge, ecological areas, topography and development structure.
I458.8.2(8)(b)(ii) Need to achieve an efficient block structure and layout suitable to the proposed activities.	Complies	The internal collector and local road structure supports residential blocks, the Village Centre, employment areas, schools and active mode connections.
I458.8.2(8)(b)(iii) Constructability of roads and ability for roads to be delivered by a single landowner.	Complies	The proposed transport network is capable of being delivered comprehensively through the Project consent and BSLP as the majority landowner of the project area
I458.8.2(8)(c) Whether a high-quality and integrated local road network is provided, with good accessibility and a walkable street network.	Complies	The Project provides a connected local street network with walkable blocks, local footpaths, collector road cycleways and connections to the Village Centre and ferry access routes.
I458.8.2(8)(d) Whether road design prioritises active mode facilities, including walking and cycling.	Complies	The Project includes protected cycleways on collector roads, footpaths on local streets, raised crossings and a continuous Jack Lachlan Drive active mode corridor.

I458.8.2(8)(e) Whether primary collector, secondary collector and local roads are designed generally in accordance with Appendix 1 road design and cross-section details.	Generally complies	The proposed internal hierarchy follows the Appendix 1 framework. Some minor non-compliances to external / Jack Lachlan Drive cross sections are proposed, and are discussed in an earlier table.
I458.8.2(8)(f) Enhanced pedestrian facilities through Whitford Village associated with the Whitford Village roundabout upgrade.	Complies	The Whitford Village roundabout upgrade is part of the precinct trigger framework and includes enhanced pedestrian facilities.
I458.8.2(8)(g) Provision of Precinct Plan 3 structuring elements, including open space linkages, green links, coastal pathways and connections between them and existing connections.	Complies	The masterplan includes internal active mode links, coastal / open space connections and direct links to Jack Lachlan Drive and Pine Harbour.
I458.8.2(8)(h) Subdivision within the Golf Course Special Area in sub-precinct E Golf maintains connectivity.	Complies	The Project replaces some of the existing golf course environment with a connected street and active mode network. Any retained or staged golf-related area will maintain connectivity.
I458.8.2(14)(a) For road design infringements, whether constraints or other factors make compliance impractical.	Addressed	The Jack Lachlan Drive road reserve width is generally proposed at 20.7m, but the requirement is 23m. This is considered a reasonable and practicable width that provides all the required design features set out in the table. Also, on the northern side of Jack Lachlan Drive, no footpath is provided due to topography constraints and the fact that no pedestrian permeability is available to the site to the north. This also leads to a further reduction in road reserve width. Appendix 1 requires Jack Lachlan Drive to have a minimum road reserve width of 23m, however due to the existing boundary of the stormwater reserve to the north, the road reserve width varies between 20.7m and 23m resulting in a non-compliance. Auckland Transport has reviewed this Project and accepted it in principle, pending confirmation of design details. In general, note 1 of the table specifies that the typical minimum road reserve width "may need to be varied in specific locations where required to accommodate network utilities, batters, structures, stormwater treatment, intersection design, significant constraints or other localised design requirements". And that "width of roads

		where they continuously adjoin open space may be modified and Road width on Collector roads may be reduced if a two-way cycleway is provided on one side of the road." Further, an active mode path is provided on the southern side of the western-most extent of Jack Lachlan Drive as it passes the constrained "boat-houses" frontage. Auckland Transport has reviewed this Project and accepted it in principle, pending confirmation of design details.
I458.8.2(14)(b) For road design infringements, whether the design achieves the following I458.3 precinct policies: (17) – as per Precinct Plan 5. (18) – general accordance with Appendix 1. (19) – highly connected street network. (20) – attractive / multi-modal design	Addressed	Internally, the proposed road network supports safe, connected and multimodal movement, with a clear hierarchy, active mode priority and staged integration with the external network, with general compliance to Appendix 1 and Precinct Plan 5.
I458.8.2(14)(c)(i) For road design infringements, whether the proposed design and road reserve incorporate measures to achieve required design speeds.	Addressed	Local roads will be low-speed, traffic-calmed environments, with collector road design, intersection control and crossing treatments used to manage operating speeds.
I458.8.2(14)(c)(ii) For road design infringements, whether the design can safely accommodate required vehicle movements.	Addressed	The network includes collector roads, signalised access points, a WMR LILO access and road widths intended to accommodate residential, service, emergency and bus movements. Swept path assessments are provided for all within the civil design package.
I458.8.2(14)(c)(iii) For road design infringements, whether the design can accommodate all proposed infrastructure and roading elements, including utilities and stormwater treatment.	Addressed in civil design	The civil design package confirms integration of transport, stormwater, utilities, planting, lighting and active mode facilities within the road reserves.
I458.8.2(14)(c)(iv) For road design infringements, whether feasibility of upgrading any interim design or road reserve to the ultimate required standard has been assessed.	Addressed	No interim layouts are proposed.
I458.8.2(14)(d) For road design infringements, whether there is appropriate interface design treatment at property boundaries, particularly for pedestrians and cyclists.	Addressed	Frontage and access design will maintain footpath / cycleway continuity, particularly along Jack Lachlan Drive and at collector / local side-road intersections.

I458.8.2(15)(a) For infringements to I458.6.16 Site Access, E27 access assessment criteria apply.	Addressed	This has been assessed in the Transport Design Report section.
I458.8.2(15)(b) For infringements to I458.6.16 Site Access, whether the driveway achieves a safe street environment where cyclists have priority.	Addressed	Accesses and driveways crossing cycle facilities maintain cyclist priority and visibility.

The assessment demonstrates that the Project is generally consistent with the transport outcomes sought by the Beachlands South Precinct. The Project provides a connected collector and local road network, upgrades to Jack Lachlan Drive with active mode facilities, provides direct walking and cycling connections to Pine Harbour Ferry, supports public transport integration, and includes a monitoring and staging framework to manage transport effects over time. The principal departures relate to the timing or necessity of specific external transport upgrades, rather than to the internal transport structure or the quality of the active mode and public transport outcomes proposed.

The Beachlands South Precinct also includes transport-related special information requirements. These requirements ensure that applications which infringe the transport staging framework are supported by an ITA, transport monitoring information, travel management measures, transport design reporting, and ongoing monitoring of dwelling and lot numbers against the precinct thresholds. Table 10-4 below identifies how the Project responds to each relevant transport information requirement.

Table 10-4: Beachlands South Precinct Special Information Requirements (I458.9)

Criteria	Compliance	Comment
I458.9(4) Integrated Transport Assessment	Complies	This ITA is required because the Project infringes Standard I458.6.3. It addresses trip generation, staging, access, public transport, active modes, road safety and precinct trigger effects.
I458.9(4)(a) Whether the proposal demonstrates methods that promote increased use of public transport, including implementation, monitoring and review	Complies	The Project promotes ferry and bus use through intensification close to the ferry berths, active mode links to Pine Harbour, Route 738 / 739 integration, internal collector roads capable of bus penetration, and staff travel planning. A condition requiring monitoring at 500-dwelling intervals is proposed.
I458.9(4)(b) Whether WMR can operate safely and with reasonable efficiency during the inter-peak period, generally no worse than LOS D for the overall route and intersections.	Complies,	The Traffic Effects section of this report provides modelling results for each key intersection, which all operate better than LOS D during peak hours. Although inter-

<table>
<tr><td></td><td></td><td>peaks are not modelled, these will perform better than the peak periods.</td></tr>
<tr><td>I458.9(4)(c) Effect of timing and development of any other transport upgrades or transport innovations not anticipated by the precinct provisions.</td><td>Complies</td><td>The ITA addresses imminent ferry service upgrades by AT.</td></tr>
<tr><td>I458.9(4)(d) Whether the ITA documents the outcome of engagement with the road controlling authority.</td><td>Complies</td><td>Section 13 of this ITA (and the Consultation Summary Report prepared by Unio Environmental) includes a record of engagement with Auckland Transport.</td></tr>
<tr><td>I458.9(4)(e) For applications that infringe Table I458.6.3.2 ferry capacity thresholds only, assessment of ferry two-hour weekday peak passenger numbers, available remaining capacity and anticipated ferry demand.</td><td>Complies</td><td>This has been assessed. An infringement is proposed, but a consent condition is proposed to assess the ferry service requirements once the 1,900hh threshold has passed.</td></tr>
<tr><td>I458.9(4)(f) Information and findings from transport monitoring material supplied under I458.9(5).</td><td>Not applicable</td><td>For this initial substantive application there are no prior monitoring reports. Conditions are proposed to ensure the necessary monitoring occurs.</td></tr>
<tr><td>I458.9(5) Transport Development and Subdivision Monitoring Report. A Transport Monitoring Report shall be prepared for every 500 dwellings or residential lots cumulatively within the precinct (e.g., 500, 1,000, 1,500, and so on). At each of these thresholds, a Transport Monitoring Report must be submitted to Council. The Transport Monitoring Report is to include:
(a) An assessment demonstrating whether the following public transport mode share for residential trips to employment and education activities
have been achieved:

Table I458.9.1: Residential Mode Share
<table><tr><th>Dwellings</th><th>Public Transport</th></tr><tr><td>Base Scenario</td><td>7%</td></tr><tr><td>Up to 1200 Dwellings</td><td>13%</td></tr><tr><td>Up to 2700 Dwellings</td><td>17%</td></tr></table>
If the assessment demonstrates that mode share splits are less than shown in the above table, the report shall identify any of the required transport infrastructure upgrades that need to be brought forward for managing adverse effects on the environment, or alternative mitigation measures that are required to manage adverse effects on the environment. This may include consideration of the percentage of people working from home if different to the 11% recorded in the 2018 census.
(b) An assessment demonstrating whether vehicle trips rates per apartment are 0.4 trips or fewer. If the monitoring demonstrates that the trips rates are greater than 0.4, the report shall identify any of the required transport</td><td>Not Applicable</td><td>This monitoring is proposed as a consent condition. The consent conditions will require monitoring at 500, 1,000, 1,500 and subsequent 500-dwelling thresholds, using the criteria listed under I458.9(5).

It is noted that the proposed development activity and staging will adhere to Table I458.9.2 Development Mix (comparing residential to light industrial yields).</td></tr>
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<table>
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<td>infrastructure upgrades that need to be brought forward for managing adverse effects on the environment, or alternative mitigation measures that are required to manage adverse effects on the environment.
(c) Information on the mix of consented or constructed development within the Precinct, including:
(i) Whether it differs from that assumed and specified in Table I458.9.2: Development Mix; and
(ii) If there is a difference:
- An assessment of the associated trip generation arising from this difference;
- An evaluation of any effects on the surrounding transport network;
- Whether any transport infrastructure upgrades in Table I458.6.3.1 are still appropriate or any alternatives that are proposed

Table I458.9.2 Development Mix
<table><tr><th>Residential</th><th>Non-Residential</th></tr><tr><td>More than 500 dwellings and up to 850 dwellings or residential lots</td><td>a) Minimum of 900m² light industrial GFA;</td></tr><tr><td>More than 850 dwellings and up to 1,900 dwellings or residential lots</td><td>a) Minimum of 1,500m² light industrial GFA;
b) Minimum of 1,100m² commercial GFA;
c) Education facilities with capacity for 750 pupils.</td></tr><tr><td>More than 1,900 dwellings and up to 2,700 dwellings or residential lots</td><td>a) Minimum of 8,000m² light industrial GFA;
b) Minimum of 3,300m² commercial GFA;
c) Education facilities with capacity for 1,600 pupils.</td></tr></table>
(d) A safety assessment for Whitford-Maraetai Road between Jack Lachlan Drive and Whitford Village. This assessment shall:
(i) Include an updated crash history for this section of Whitford-Maraetai
Road;
(ii) Identify any new patterns of deaths or serious injuries that have emerged on this section of Whitford-Maraetai Road from the date of the first occupied dwelling within the Precinct or issue of first s224(c) certificate for a dwelling within the Precinct;
(iii) Analyse the nature and causes of these crashes;
(iv) If any new patterns are identified, the report should recommend specific safety improvements to be implemented to reduce the risk of further deaths or serious injuries.
Note: The purpose of the safety assessment specified in clause I458.9(5)(d) above is to guide future Auckland Transport safety upgrade investments. Any outcomes of the safety assessment shall not be considered or used as the basis for a condition of resource consent for any application for subdivision or development that complies with Standard I458.6.3 Staging of Subdivision and Development with Transport Upgrades.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I458.9(7) Travel Management Plan, required for commercial activities greater than 500sqm within this precinct.</td>
<td>Complies</td>
<td>The Project includes commercial activities above 500sqm, and a Travel Management Plan framework is included in this ITA.</td>
</tr>
</table>

I458.9(9) Transport Design Report, required for all new or upgraded road intersections.	Complies	A Transport Design Report is included in this ITA.
I458.9(10) Monitoring of Standard I458.6.3 Staging of Subdivision and Development with Transport Upgrades	Complies	The consent conditions include a precinct-wide dwelling / lot register.

The Project satisfies the relevant transport-related special information requirements at this stage of design. This ITA provides the required assessment of staging, trip generation, public transport, ferry capacity, active modes, road safety and transport effects. It also provides a Transport Design Report section and a Travel Management Plan framework. Ongoing monitoring will be secured through consent conditions, including dwelling and lot tracking, transport monitoring at 500-dwelling intervals, and further review of ferry capacity and travel behaviour as development proceeds.

The transport trigger departures identified above do not represent a departure from the overall transport outcome sought by the Beachlands South Precinct. The intent of the trigger framework is to ensure that subdivision and development are coordinated with transport infrastructure and ferry capacity so that the effects of growth are appropriately managed. That outcome is still achieved through the proposed staging, monitoring and infrastructure package. The departures relate to the timing or necessity of specific upgrades, rather than to the absence of a transport response. In particular, the Jack Lachlan Drive upgrade will be completed before the school opens and before substantial pedestrian and cycle demands arise; the Trig Road signalisation has been reviewed and is not considered proportionate to the very low right-turn demand; and the Whitford Bypass is not required to manage the Fast Track traffic effects because the updated development mix and trip generation assumptions keep the critical Whitford-Maraetai Road southbound flow within the PC88 effects envelope.

10.2 Auckland Unitary Plan E27 Transport

As discussed earlier in this report, the proposed development includes provision for a combination of retail, commercial, residential, community and visitor accommodation activities across the site. Section 7 (Transport Design Report) of this ITA assessed the lot and street designs against section E27 of the AUP (PC79 – Fully Operative version). A summary of all assessments is provided below:

Table 10-5: AUP E27 preliminary standards assessment

Criteria	Compliance	Comment
E27.6.1 Trip Generation		

(1) Where a proposal (except where excluded in Standard E27.6.1(2)) exceeds one of the following thresholds a. A new development or subdivision in Table E27.6.1.1; b. 100v/hr (any hour) for activities not specified in Table E27.6.1.1 requiring a controlled or restricted discretionary land use activity consent in the applicable zone where there are no requirements for an assessment of transport or trip generation effects. This standard does not apply to development activities provided for as permitted in the applicable zone. resource consent for a restricted activity is required. **(2)** Standard E27.6.1(1) does not apply where: c. a proposal is located in the Business – City Centre Zone, Business – Metropolitan Centre Zone, Business – Town Centre Zone, or Residential – Terrace Housing and Apartment Building Zone or Centre Fringe Office Control as shown on the planning maps; d. the activity is permitted in the H7 Open space zones; or e. there are requirements to assess trip-generation effects for the activity in any applicable zone rules or precinct rules for any controlled or restricted discretionary land use activities	Does not comply	As per I458.6.3, standard E27.6.1 does not apply to the Beachlands South Centre Precinct as the required transport infrastructure upgrades are outlined in Table I458.6.3.1 and Table I458.6.3.2. Table E27.6.1.1 of the AUP requires a resource consent application for the project as the proposed development exceeds the development threshold for education facilities, retail and industrial activities. Traffic modelling has been completed to assess trip generation effects for the proposed activities as discussed in Section 8.
E27.6.2. Number of Parking and Loading Spaces		
(1) The number of parking spaces: a. must not exceed the maximum rates specified which apply to the zone or location specified in Table E27.6.2.1, Table E27.6.2.2, Table E27.6.2.3 and Table E27.6.2.4	Complies	As per Table E27.6.2 from the AUP, parking rates for the office activity must not exceed the maximum rate of 1 per 30sqm GFA. Parking spaces allocated for the office activity will be below this maximum rate. No minimum or maximum rates apply for the other proposed activities
(3) For the purposes of meeting the requirements for vehicle parking rules, a parking space includes those provided for in a garage or car port or any paved area provided for the sole purpose of parking a motor vehicle. **(3A)** Within the Centre Fringe Office Control area, the parking rates contained in Table E27.6.2.2 apply instead of those contained in Table E27.6.2.3 and Table E27.6.2.4.	Complies	Each car park has the sole purpose of catering for a vehicle.
(6) Bicycle parking: a) the activities specified in Table E27.6.2.5 must provide the minimum number of bicycle parking spaces specified; aa) for residential developments, the required secure long-stay bicycle parking must be located and designed in a manner that (is): i.Not part of any required outdoor living space ii.Sheltered from the weather iii.Lockable and secure bb) To avoid doubt, the required secure long-stay bicycle parking may be located within a dwelling. b) The following bicycle parking requirements (Table E27.6.2.5) apply to new buildings and developments.	Complies	The proposed bicycle parking spaces for the Beachlands South development comply with the minimum requirements. See section 7.9 for more detail.
(7) End-of-trip facilities: (a) The activities specified in Table E27.6.2.6 must provide end-of-trip facilities as listed below; (b) the following end-of-trip facilities requirements apply to new buildings and developments (Table E27.6.2.6)	Complies	Proposed end of trip facilities comply with the minimum required for the office activity. Two EOT facilities required, and provided. See section 7.11 for more detail.
(8) Number of loading spaces: (a) All activities must provide loading spaces as specified in Table E27.6.2.7	Does not comply	Loading space provision for super lot CM2 does not meet the minimum requirements outlined in the AUP. See section 7.10 for more detail.

(b) in addition, where the only vehicle access for residential activities is from an arterial road as identified on the planning maps, a small loading space must be provided in accordance with Table E27.6.2.7A.		
(9) Fractional Spaces: (a) Where the calculation of the permitted parking results in a fractional space, any fraction that is less than one-half will be disregarded and any fraction of one-half or more will be counted as one space. If there are different activities within a development, the parking permitted for each activity must be added together prior to rounding.	Complies	Rounding has been undertaken accordingly
E27.6.3.Design of Parking and Loading Spaces		
E27.6.3.1 Size and location of parking spaces **(1)** Every parking space must: a. comply with the minimum dimensions given in Table E27.6.3.1.1 and Figure E27.6.3.1.1; except accessible parking dimensions and accessible route requirements must be designed in accordance with the New Zealand Standard for Design for Access and Mobility – Buildings and Associated Facilities (NZS: 4121- 2001); and b. be located on the same site as the activity to which it relates unless one of the following criteria is met: c. be kept clear and available at all times the activity is in operation, except where stacked parking is permitted by Standard E27.6.3.3(3); and d. be located outside any area designated for road widening; and e. parking located in part of any yard on the site (where it is permitted in the zone) must not: i.impede vehicular access and movement on the site and ii.infringe any open space and landscape requirements for the relevant zone; and f. not to be sold or leased separately from the activity for which it provides parking as an accessory activity unless a resource consent is granted to an alternative arrangement such as shared parking or off-site parking	Complies	All proposed parking spaces including within the carparks and on-street will comply with minimum dimensions outlined in the AUP. All proposed parking spaces are located on the same site as the activity to which it relates, will be kept clear and available (except stacked parking), and will be located outside any area designated for road widening,
E27.6.3.2 Size and location of loading spaces **(1)** Every loading space must: a. comply with the minimum dimensions given in Table E27.6.3.2.1; and b. be located on the same site as the activity to which it relates and be available at all times while the activity is in operation; and c. be located outside any area designated for road widening; and d. comply with the following when any yard of a site is used to provide the loading space (where it is permitted within the zone): i.ensure that the footpath or access to the rear of the site or access to an adjacent property is not blocked at any time; and ii.the use of the loading space does not create a traffic hazard on the road at any time. e. have a maximum crossfall of 1:50 (2%) in all directions.	Complies	Most proposed loading spaces only serve the residential, retail or commercial activities, hence comply with the minimum required dimensions of 8m x 3.5m. The proposed loading space within the supermarket is designed to accommodate an articulated vehicle, hence has minimum dimensions of 18m x 3.5m. All proposed loading spaces are provided on the same site as the activity to which it relates, and outside any area designated for road widening. The unmarked/informal loading spaces provided in Lot CM2, VC1, and VC2 are provided within the carpark, away from the road corridor, and therefore do not create any adverse effects for vehicles travelling along the road corridor. See section 7.10 for more detail.
E27.6.3.2A Number and Design of Accessible Parking 1. Accessible parking must be provided for all new buildings, extension to existing buildings and changes of activity from non-residential to residential land uses, in accordance with E27.6.3.2A (2) to (5) below; 2. For residential developments where car parking is provided on site, accessible parking spaces must be provided for developments of 10 or more dwellings.	Complies	Appropriate number of accessible parking spaces provided within each super lot to comply with AUP requirements. Refer to section 7.9 for more details.

3. For all non-residential developments, accessible parking must be provided when car parking is provided on-site.
4. Accessible parking is not required to be provided where no car parking is provided on site, except for the following activities in the following zones where accessible parking must be provided even when there is no car parking on-site:

Column A Zones where activities listed in column B must provide accessible car parks	**Column B** Activities that must provide accessible car parks where located in any of the zones listed in column A
Business - General Business Business - Business Park Business - Heavy Industry Business - Light Industry Zone Future Urban Zone Residential - Large Lot Residential - Rural and Coastal Settlement Residential – Mixed Housing Urban Residential – Mixed Housing Suburban Residential – Single House Zone All Special Purpose Zones	Care centres Cemeteries Community facilities Educational facilities including: Tertiary, Educational facilities, Hospital and Healthcare facilities Organised sport and recreation Recreation facilities

5. Where accessible parking is required to be provided on-site in accordance with E27.6.3.2A (1) to (4) above, the required number of accessible parking spaces must be calculated as set out in E27.6.3.2A (6) and (7).
6. For non-residential land uses, the required number of accessible parking spaces is to be determined using Steps 1 to 3 below:

   Step 1 – For non-residential land uses in the following Business Zones:

   i. Business – City Centre Zone
   ii. Business – Metropolitan Centre Zone
   iii. Business – Town Centre Zone
   iv. Business – Local Centre Zone
   v. Business – Mixed Use Zone
   vi. Business – Neighbourhood Centre Zone

   Use Table E27.6.2.1 (maximum parking rates for the Business – City Centre), Table E27.6.2.2 (maximum parking rates for the Centre Fringe Office Control area) or Table E27.6.2.3 (maximum parking rates area 1) to determine theoretical demand where a maximum parking rate is stipulated that results in a lesser parking requirement to that based on the Parking Demand Guidelines in Appendix 23.

   For other non-residential land uses in the above Business zones and in all other Zones - use the Parking Demand Guidelines in Appendix 23 to determine the theoretical parking demand.

   Step 2 - Use Table 1 – Number of accessible parking spaces – Non Residential, below to determine the required number of accessible car park spaces for non-residential land uses based on either the number of parking spaces that are existing or proposed to be

provided or the theoretical parking demand for non-residential land uses calculated in step 1, whichever is the higher. **Step 3** – Provided that the number of accessible car parks calculated using Table 1 shall not be less than presently exist on the site. 7. For dwellings in all zones (including dwellings in the residential component of mixed use developments) which provide car parking, the required number of accessible parking spaces provided must be in accordance with Table 2 below 8. For retirement villages, supported residential care, visitor accommodation and boarding houses The same method for calculating the required number of onsite accessible parking spaces for non-residential uses in (6) applies. 9. Accessible car parks must be marked as accessible and connected by an accessible route to the building, unit(s) or facility they serve, except that: a. for residential developments where an accessible car park is located within a garage, carport or parking pad that directly adjoins the dwelling it serves, the space may be, but is not required to be, marked as accessible; and b. for accessible parking spaces in grouped or communal areas of residential developments that do not directly adjoin the dwellings they serve, such spaces must be marked as accessible, and may include additional signage indicating private allocation to specific dwellings. The marking for these residential parking spaces may be supplemented beyond standard accessible parking markings to clearly indicate their residential and private/allocated nature. For all non-residential developments, or non-residential components of mixed-use developments, standard accessible parking markings must be used. 10. The requirements of this standard E27.6.3.2A do not apply to activities within I208 Port Precinct.		
E27.6.3.3 Access and manoeuvring 1. Every parking space must have driveways and aisles for entry and exit of vehicles to and from the road, and for vehicle manoeuvring within the site. Access and manoeuvring areas must accommodate the 85 percentile car tracking curves in Figure E27.6.3.3.1 2. For every loading space accommodating heavy vehicles the access and manoeuvring areas associated with that loading space must comply with the tracking curves set out in the NZTA guidelines: RTS 18: NZ on-road tracking curves (2007). (2a) For every small loading space required by Table E27.6.3.2.1.(T137A) the access and manoeuvring areas associated with that loading space must accommodate the 6.4m van tracking curves set out in Figure E27.6.3.3.3 3. Where a dwelling provides more than one parking space, these may be stacked. Stacked parking means access is required through another parking space.	Complies	All accessways and aisles have been designed appropriately to accommodate the B85 design vehicle, and servicing vehicles as required for each site. No small loading spaces required as all loading spaces required and provided are regular sized. Several dwellings provide stacked parking spaces. Dimensions of these stacked parking spaces comply with AUP requirements.
E27.6.3.4. Reverse Manoeuvring 1. Sufficient space must be provided on the site so vehicles do not need to reverse off the site or onto or off the road from any site where any of the following apply: a) four or more parking spaces are served by a single access; b) there is more than 30m between the parking space and the road boundary of the site; or	Does not comply	Apartment MP3-B provides an accessway serving more than four parking spaces, however, a separate vehicle crossing is provided for the loading space. Which requires the loading vehicle to reverse onto the local road corridor in order to exit the loading space. See assessment below for more detail.

c) access would be from an arterial road or otherwise within a Vehicle Access Restriction covered in Standard E27.6.4.1. 2. Where E27.6.3.4.(1)(a), (b) or (c) requires a heavy vehicle to turn around within a site in a residential zone, to avoid reversing off the site or onto or off the road, sufficient space must be provided on the site so an 8m heavy vehicle can turn around with a maximum reverse manoeuvring distance of 12m. 3. Heavy vehicle access and manoeuvring areas associated with access required by E27.6.3.4.(2) above must comply with the tracking curves set out in the Land Transport New Zealand Road and traffic guidelines: RTS 18: New Zealand on-road tracking curves for heavy motor vehicles (2007).		All other loading spaces have been designed to allow a loading vehicle to turn around within the site and enter/exit the site in a forwards direction.
E27.6.3.5 Vertical Clearance (1) To ensure vehicles can pass safely under overhead structures to access any parking and loading spaces, the minimum clearance between the formed surface and the structure must be: a) 2.1m where access and/or parking for cars is provided for residential activities; b) 2.3m where access and/or parking for cars is provided for all other activities; c) 2.5m where access and/or accessible parking for people with disabilities is provided; or ca) 2.8m where loading is required for residential activities denoted with an asterisk (*) in Table E27.6.2.7A; cb) 3.8m where heavy vehicle access in Standards E27.6.3.4.(2) and E27.6.3.4.(3) is provided; or d) 3.8m where loading is required in Table E27.6.2.7.	Complies	A minimum clearance of 2.1m will be provided for all garages serving the proposed dwellings. A minimum clearance of 2.3m will be provided for all other activities. A minimum clearance of 2.5m will be provided for all carparks containing accessible spaces. All loading spaces proposed within basement carparks will provide a minimum vertical clearance of 3.8m, hence complying with the minimum requirements.
E27.6.3.6. Formation and gradient 1. Except for Standard E27.6.3.6(2) below, the whole area of parking and loading spaces, and manoeuvring areas and aisles must be formed, drained, provided with an all-weather surface to prevent dust and nuisance, and be marked out or delineated. This must be done before the activity to which those parking and loading spaces relate commences, and maintained for as long as that activity is continued. 2. Parking and loading spaces and manoeuvring areas and aisles do not need to be provided with an all-weather surface in the following zones: a) Rural – Rural Conservation Zone; b) Rural – Rural Coastal Zone; c) Rural – Mixed Rural Zone; and d) Rural – Rural Production Zone. 3. The gradient for the surface of any parking space must not exceed: a) 1 in 25 in any direction for accessible spaces for people with disabilities; or b) 1 in 20 (five percent) in any direction for other spaces 4. The gradient for the manoeuvring area must not exceed 1 in 8.	Complies	All parking and loading areas will be suitably formed with an all-weather surface. Maximum gradient of any parking space does not exceed 1 in 25 for accessible parking spaces, or 1 in 20 for regular parking spaces Gradients for manoeuvring areas will not exceed 1 in 8.
E27.6.3.7. Lighting 1. Lighting is required where there are 10 or more parking spaces which are likely to be used during the hours of darkness. The parking and manoeuvring areas and associated pedestrian routes must be adequately lit during use in a manner that complies with the rules in Section E24 Lighting. 2. Lighting is required, in residential zones to primary pedestrian access, vehicle access, parking and manoeuvring areas, where any of the following apply: a) There are four to nine dwellings accessible from a primary pedestrian access which is not adjacent to a vehicle access; b) There are 10 or more parking spaces; or	Complies	All proposed carparks providing 10 or more parking spaces will be adequately lit to comply with the requirements outlined in Section E24 Lighting. Where a primary pedestrian access is provided serving 10 or more parking spaces, or dwellings, lighting will be provided to comply with requirements outlined in section 7.14.

c) There are 10 or more dwellings. Lighting must be provided during the hours of darkness in a manner that complies with the rules in Section E24 Lighting		
E27.6.4 Access		
1 Vehicle Access Restrictions (1) Vehicle Access Restrictions apply and new vehicle crossings must not be constructed to provide vehicle access across that part of a site boundary which is subject to: a) a Vehicle Access Restriction – General Control as shown on the planning maps in the Business – City Centre Zone; or b) a Key Retail Frontage Control as shown on the planning maps infringing this standard is a non-complying activity unless the application involves: i. the use of an existing vehicle crossing to service the establishment of a new activity, a change of activity type, the expansion or intensification of an existing activity or where a building(s) is constructed, or additions to buildings that are not permitted activities in: ii. the construction of a new vehicle crossing and the establishment of the vehicle crossing is to relocate and/or amalgamate an existing vehicle crossing or crossings serving the site, that will reduce or otherwise not increase either the number of crossings or width of crossings serving a site; or there is no other means of accessing a site where Standards E27.6.4.1(1)(b)(i) and E27.6.4.1(1)(b)(ii) apply the activities require a restricted discretionary activity consent.	N/A	No vehicle access restrictions apply.
(2) Standard E27.6.4.1(3) below applies in any of the following circumstances: a) a new vehicle crossing is proposed; b) a new activity is established on a site; c) there is a change of type of activity; or d) a building(s) is constructed, or additions to buildings that are not permitted activities in Table H8.4.1, Table H9.4.1, Table H10.4.1, Table H11.4.1, Table H12.4.1, Table H13.4.1, Table H14.4.1, or Table H15.4.1 except that this does not apply in the case of a dwelling where the reconstruction, alteration or addition does not increase the number of dwellings on a site.	Applies	Several new vehicle crossings and new activities are proposed to be established on-site. Therefore, standard E27.6.4.1(3) applies and is assessed below.
E27.6.4.1.(3) Vehicle Access Restrictions apply and vehicle crossings must not be constructed or used to provide vehicle access across that part of a site boundary which: a) is located within 10m of any intersection as measured from the property boundary, illustrated in Figure E27.6.4.1.1; b) is subject to the following types of Vehicle Access Restriction as identified on the planning maps in the zones listed in Table E27.6.4.1.1; c) has frontage to an arterial road as identified on the planning maps; or d) is located closer than 30m from a railway level crossing limit line	Does not Comply	The vehicle crossing serving apartment building MP3-A, MP16-A and the CM5 super lot do not comply with the minimum requirements for separation from an adjacent intersection as they achieve less than 10m separation from the nearest intersections. See section 7.8 for more detail.
E27.6.4.2 Width and number of vehicle crossings 1. The maximum number of vehicle crossings permitted for any site and separation distance between crossings is specified in Table E27.6.4.2.1	Complies	All proposed vehicle crossings comply with the minimum separation requirements between adjacent crossings serving the same or adjacent sites.
2. The width of a vehicle crossing(s) must meet the minimum width and not exceed the maximum width as specified in Table E27.6.4.3.2	Non-compliance	The vehicle crossings serving the MP3-B (loading zone), MP26-A (eastern carpark), CM1, and VC1 do not comply with the width requirements. All other

		vehicle crossings comply with the vehicle crossing width requirements. See section 7.8 for more detail.
3. With the exception of vehicle crossings on unsealed roads, all vehicle crossings must be designed and constructed to maintain the level, colour, and materials of the footpath to clearly identify to vehicles that pedestrians have priority	Complies	Vehicle crossings will be designed and constructed to compliant standards.
4. Vehicle crossings on unsealed roads: a) where the vehicle crossing is served by an access steeper than 1 in 8, the vehicle crossing must be sealed for 6m between the site boundary and the unsealed road. b) vehicle crossings not covered by Standard E27.6.4.2.(3)(a) above must be formed using materials similar to the existing road surface or better	N/A	All roads within the site will be sealed.
5. Where a vehicle crossing is altered or no longer required, the crossing, or redundant section of crossing, must be reinstated as berm and/or footpath and the kerbs replaced. The cost of such work will be borne by the owner of the site previously accessed by the vehicle crossing	N/A	There are no existing or redundant vehicle crossings within the site.
E27.6.4.3 Width of vehicle access, queueing and speed management requirements 1. Every on-site parking and loading space must have vehicle access from a road, with the vehicle access complying with the following standards: a) passing bays are provided in accordance with Table E27.6.4.3.1; and b) meeting the minimum formed access width specified in Table E27.6.4.3.2; and c) meeting the minimum speed management measure spacing specified in Table E27.6.4.3.3. 2. Access must be designed so that vehicles using or waiting to use fuel dispensers, ticket vending machines, remote ordering facilities and devices, entrance control mechanisms, or other drive-through facilities do not queue into the adjoining road reserve or obstruct entry to or exit from the site.	Complies	No passing bays required as all two—way accessways with a length greater than 50m have a minimum width of 5.5m, hence allowing simultaneous two-way vehicular movements. Some carparks will likely have an entrance control mechanism (VC1 – residential parking), however the entrance device will be located accordingly to ensure vehicles do not queue or obstruct the road reserve.
E27.6.4.3 Speed Management Requirements **Activity** / **Length of vehicle access** / **Location of minimum speed management measures** Vehicle access serving four or more dwellings in Residential zones / Exceeds 30m / Within10m of the site's boundary with the legal road; and Thereafter, not more than 30m spacing between speed management measures.	Complies	Speed management treatments will be provided on all accessways serving four or more dwellings in residential zones where the length of the vehicle access exceeds 30m.
E27.6.4.4 Gradient of Vehicle access 1. The gradient of the access must not be steeper than specified in Table E27.6.4.4.1	Complies	Gradients are not expected to exceed maximum requirements.
2. To avoid the underside of the car striking the ground, as illustrated in Figure E27.6.4.4.2, access with a change in gradient exceeding 1 in 8	Complies	It is expected that transition sections will be provided where required.

(greater than 12.5 percent change) at the summit or a 1 in 6.7 (15 percent change) at a sag must include transition sections to achieve adequate ground clearance, refer to Figure E27.6.4.3.3. Typically, a transition section requires a minimum length of 2m		
3. All vehicle accesses must be designed so that where the access adjoins the road there is sufficient space onsite for a platform so that vehicles can stop safely and check for pedestrians and other vehicles prior to exiting. This is illustrated in Figure E27.6.4.4.4. The platform must have a maximum gradient no steeper than 1 in 20 (5 percent) and a minimum length of 4m for residential activities and 6m for all other activities	Complies	Platform gradients are not expected to exceed 1 in 20 for a length of 4m and 6m for sites serving residential and other activities respectively.
E27.6.4.5.Sightlines for road/rail level crossings 1. Sites subject to sightlines for level crossings are identified on the planning maps by the Level Crossings with Sightline Control. If alarms and/or barrier arms are subsequently installed at a level crossing with Stop or Give Way signs, the Approach sight triangle in Figure E27.6.4.5.1 below ceases to apply 2. Approach sight triangles (refer to Figure E27.6.4.5.1) a) on sites adjacent to Level Crossings with Sightline Control buildings and other visual obstructions, cannot be located within the approach sight triangles identified on the planning maps. b) the approach sight triangles are calculated by reference to Figure E27.6.4.5.1. For a single set of railway tracks, the sight triangles are defined by a triangle taken 30m from the outside rail and 320m along the railway track. For each additional set of tracks, 25m is added to the 320m along the railway track. 3. Restart sight triangles (see Figure E27.6.4.5.2) a) on sites adjacent to the Level Crossings with Sightline Control, buildings and other visual obstructions, cannot be located within the restart sight triangles identified on the planning maps. The restart triangle applies to all level crossings. b) the restart sight triangles are calculated by reference to Figure E27.6.4.5.2. For a single set of tracks, the sight triangles are defined by a triangle taken 5m from the outside rail and 677m along the railway track. For each additional set of tracks, 50m is added to the 677m along the railway track	N/A	No level crossings proposed in vicinity of site.
E27.6.5 Design and Location of Off-road Pedestrian and Cycling Facilities		
1. The design and location of the proposed facility shall provide connections to existing pedestrian and cycling routes and facilities. 2. The width of the path is designed to accommodate the anticipated number and type of users. 3. The surface of the path is designed to safely provide for the anticipated number and type of users.	Complies	The proposed cycle lanes and footpaths align with the Beachlands South Precinct.
E27.6.6. Design and location of pedestrian access in residential zones		
Purpose: to provide for on-site pedestrian safety and convenience. 1. This standard applies to development of two or more dwellings in residential zones. 2. For the purposes of this standard and standard E38.8.1.2. (Access to rear sites), and the associated provisions and related assessment criteria, “physically separated” means separation of primary pedestrian access from vehicle access, parking and manoeuvring areas by way of: a) 150mm high, non-mountable vertical kerbs to primary pedestrian access;	Complies	Where primary pedestrian accesses are provided adjacent to an accessway, these footpaths will be physically separated to comply with AUP requirements.

b) Minimum 1 m wide landscape buffer between primary pedestrian access and vehicle access, manoeuvring or parking areas; or c) wheel stops or similar barriers positioned to avoid vehicle access onto or over an adjacent primary pedestrian access.		
3. Primary pedestrian access must be provided to each dwelling. The primary pedestrian access requirements specified in Table E27.6.6.1 apply for the full length of the pedestrian access:	Complies	All proposed dwellings will have a primary pedestrian access in compliance with Table E27.6.6.1.
4. Clear Width / Height Requirements for emergency responders Purpose: to provide access for emergency responders. a) Where primary pedestrian access is adjacent to a vehicle access on the same site, no additional clear width/height requirement applies beyond the primary pedestrian access requirements in E27.6.6.(3). b) Where primary pedestrian access is not adjacent to a vehicle access as described in E27.6.6.(4)(a), the following further requirements apply in addition to those in E27.6.6.(3): i. Minimum clear width of 3m ii. Minimum clear height of 2.1m iii. The clear width may include the minimum formed primary pedestrian access width of 1.8m required in E27.6.6.(3), but shall be free of permanent obstructions and spaces within which vehicles may park with the exception of: Soft/frangible landscape treatment with a maximum mature height of 600mm; Wall-mounted, fence-mounted or building-mounted lighting infrastructure.	Complies	Several proposed lots/apartment buildings provide a primary pedestrian access adjacent to the vehicle access. Where the primary pedestrian access is not adjacent to the vehicle access, this is provided directly onto the road corridor, hence providing easy and compliant access for emergency responders.
E27.6.7 Provision for Electric Vehicle Charging		
Purpose: to ensure that any undercover car parks for new dwellings (except new detached dwellings) are provided with the capability to install Electric Vehicle Supply Equipment. 1. Any new dwellings with undercover car parking (with the exception of new detached dwellings) must provide each undercover car park with the capability to install Electric Vehicle Supply Equipment with sufficient space for the necessary conduit, circuit and metering between the car park and an electrical distribution board on the same building storey, or ground level if the undercover car park is at ground level. 2. For developments requiring resource consent, compliance with this standard may be through one of the following: a) Resource consent drawings showing schematically the space identified for future Electric Vehicle Supply Equipment as required by E27.6.6.7.(1); or b) An appropriate condition of resource consent (offered by the applicant and agreed by the Council) requiring that a detailed plan or plans be provided and certified by Council prior to the lodgement of any building consent application, showing the space identified for future Electric Vehicle Supply Equipment as required by E27.6.6.7.(1). 3. For developments not requiring resource consent, compliance with this standard must be demonstrated at building consent stage through building consent drawings showing the space identified for future Electric Vehicle Supply Equipment as required by E27.6.6.7. (1).		All proposed dwellings within the apartment buildings with allocated undercover parking spaces will include provision for EV charging. This is proposed as a condition of consent.
E27.6.8. Electric vehicle charging stations		

1.	Any building or structure for EV charging must: a) Not exceed a maximum height above ground level of 3m (excluding charging cables and cable support systems); and b) If there are more than two EV charging structures or EV charging buildings, comply with the front yard and landscape buffer standards of the underlying Zone.	Complies	EV charging stations not expected to exceed a maximum height of 3m.

The assessment has identified five non-compliances with the transportation rules of the Unitary Plan. These non-compliances relate to the trip generation rates, provision for loading spaces, reversing manoeuvres onto the road corridor, separation distances between vehicle crossings and intersections, and width of some of the proposed vehicle crossings.

The first non-compliance relates to the trip generation from the education, retail and industrial activities exceeding the development threshold outlined in Table E27.6.1.1. It is noted Table I458.6.3.2 of the I458 Beachlands South Precinct Plan Change outlines the residential development thresholds and the infrastructure upgrades, hence the residential activity is exempt from the assessment. As discussed in Section 8, the traffic modelling includes trips associated with the retail, industrial, and educational facilities, hence their impacts have been considered and evaluated as part of the modelling exercise. As such, the potential for any adverse effects caused by this non-compliance have already been addressed.

The second non-compliance relates to the provision for the number of loading spaces within super lot CM2. Superlot CM2 requires provision of one loading space, however none have been provided. As discussed above, this super lot contains a community park with facilities such as a sports field, multi-use court and a skate bowl, all of which are unlikely to require frequent maintenance or servicing. On the odd occasion when a loading vehicle needs to access the Site, the driver can park in one or two of the parking spaces provided within the carpark. Also, this activity is likely to have a reasonably low level of usage during typical business hours which is when loading vehicles are most likely to visit. As such, the non-compliance of not providing the one loading space is unlikely to have a noticeable impact on the safe and efficient movement of vehicles within the Site.

The third non-compliance relates to a loading vehicle servicing apartment MP3-B reversing onto a local road corridor. The AUP states that sufficient space must be provided within the Site so vehicles do not need to reverse off the Site where four or more parking spaces are served by a single access. Vehicle tracking checks were completed to determine whether a loading space can be provided along the accessway serving the basement carpark, however this was not practical as it would require multiple manoeuvres from the driver,

which could adversely impact residents attempting to enter or exit the building. As such, a separate loading bay accessed directly from the local road corridor was determined as a practical alternative. Despite the non-compliance with the AUP, the loading bay provides access onto a local road corridor with a straight alignment, and good visibility in all directions, hence the potential of any adverse impacts is likely to be relatively low.

The fourth non-compliance relates to the separation distance between a vehicle crossing and the nearest intersection. The AUP requires vehicle crossings to have a minimum separation of 10m from the nearest intersection. It is not possible for the vehicle crossing into apartments MP3-A, MP16-A, and super lot CM5 to comply with this requirement. Apartment building MP3-A exists on the corner of two local roads, and also opposite a T-intersection between two local roads, hence alternative vehicle crossing locations were restricted. The accessway for apartment building MP16-A exists directly opposite a T-intersection between two local roads. This is typical for local roads. The vehicle crossing for superlot CM5 is provided in close proximity of a T-intersection between two local roads. As outlined in the report, each of these proposed vehicle crossings provide excellent visibility across all road corridors and in all directions. As such, this non-compliance is unlikely to have any significant adverse effect on the safe and efficient operation of the road corridor or the vehicle crossing.

The last non-compliance relates to the width of the proposed vehicle crossings not complying with the maximum width requirements as stipulated within the AUP. Each of these non-compliances are extensively discussed in the Vehicle Crossing Widths section. It is expected that these non-compliances are unlikely to have any material adverse effect on the safe and efficient operation of the road corridor.

11. Construction Effects

The construction of the Beachlands South Project will generate temporary transport effects associated with earthworks, civil infrastructure construction, building construction, material deliveries, contractor parking, temporary traffic management and localised disruption to road users. These effects are typical of a large greenfield urbanisation project and will vary over the construction programme.

The highest heavy vehicle demands are expected during bulk earthworks, civil works, road construction and major building construction stages. Construction traffic will include truck-and-trailer units, concrete trucks, delivery vehicles, light commercial vehicles and

contractor private vehicles. The volume and direction of construction traffic will change as different parts of the Site are developed.

Construction access should be staged to use the most appropriate access points as they become available. Early works may require temporary access from Jack Lachlan Drive and/or Whitford-Maraetai Road, subject to temporary traffic management approval. Once the internal collector network and permanent intersections are constructed, construction traffic should be directed to those routes wherever practicable to minimise effects on the existing local road network and the established Beachlands township.

An Earthworks Consent TA has already been provided for the Stage 1 earthworks application, which has now been granted. A Construction Traffic Management Plan (CTMP) is provided for the Stage 1 development, and is attached as Attachment 2. Further CTMPs will be provided for subsequent stages. The Stage 1 CTMP identifies the anticipated construction vehicle volumes, vehicle types, access points, haul routes, work hours, contractor parking areas, temporary traffic management measures, wheel washing, road cleaning, road safety measures, and communication protocols with Auckland Transport, Auckland Council, emergency services, schools and the local community.

Construction traffic generally avoid peak commuter and school travel periods where practicable, particularly for high-volume truck movements. Temporary traffic management should be designed and implemented in accordance with Auckland Transport requirements and the applicable New Zealand temporary traffic management guidance at the time of works.

The construction programme will need to maintain safe and legible access to existing properties, Pine Harbour Marina, local businesses, ferry services and public roads. Where temporary disruption to footpaths, cycle routes or bus stops is required, safe alternative routes and clear signage should be provided. With these measures in place, construction traffic effects can be appropriately managed and will be temporary in nature.

12. Travel Management Plan

12.1 Travel Management Plan Purpose

As required in I458.9 (Special Information Requirements), this Travel Management Plan has been prepared as a framework for employment-generating activities within Beachlands South, including food and beverage, retail, supermarket, commercial, education, hotel,

recreation and light industrial activities. It is intended to support the mode share, trip generation and peak spreading outcomes relied upon in this ITA, and to respond to the Beachlands South Precinct requirement for a Travel Management Plan for commercial development greater than 500 sqm.

The Travel Management Plan is an operational management tool. It does not replace the physical transport infrastructure required by the precinct provisions or by the conditions of consent. Rather, it complements that infrastructure by ensuring that staff, tenants and operators are provided with practical information, incentives and management measures that reduce reliance on single-occupancy vehicle travel, particularly during the weekday commuter peak periods.

The Travel Management Plan will be progressively implemented as employment-generating activities are established. This is appropriate because Beachlands South will be delivered in stages, and the availability of walking, cycling, bus, ferry and internal street connections will improve over time as the local centre, employment areas, road network and active mode network are completed.

12.2 Travel Management Plan Objectives

The objectives of the Travel Management Plan are presented in **Table 12-1** below:

Table 12-1: Travel Management Plan Objectives

Objective	Description
Reduce single-occupancy vehicle travel	Encourage staff to travel by walking, cycling, ferry, bus, car sharing and other non-single-occupancy vehicle modes where practicable.
Reduce peak period traffic effects	Encourage flexible start and finish times, staggered shifts and work-from-home arrangements for office and administrative staff where operationally practicable.
Support ferry and bus use	Provide staff with clear information on Pine Harbour ferry services, bus connections, AT HOP use, real-time information and walking/cycling routes to stops and ferry facilities.
Manage staff parking demand	Avoid uncontrolled all-day staff parking in high-demand visitor, customer or short-stay parking areas.
Support active travel	Provide secure cycle parking, end-of-trip facilities, walking and cycling maps, wayfinding and safety information.
Support lower emissions	Contribute to reduced vehicle kilometres travelled and lower transport emissions by supporting local employment, internal trips and non-car travel.

Monitor and adapt	Establish baseline travel data, monitor staff travel behaviour and update actions in response to observed travel patterns.

12.3 Travel Management Plan Scope

The Travel Management Plan applies to staff employed in commercial activities greater than 500sqm within the Project. This includes, but is not limited to, staff associated with the items listed in **Table 12-2**:

Table 12-2: Travel Management Plan Scope

Activity	Travel Management Plan Relevance
Food and beverage	Staff shift times, local travel, cycle parking, late evening travel and parking management.
Retail and supermarket	Shift scheduling, staff parking management, customer parking protection and public transport information.
Commercial / office	Work-from-home, flexible start and finish times, ferry and bus use, carpooling and active mode uptake.
Recreation / golf	Staff travel, visitor information and parking management.

The Travel Management Plan is primarily directed at staff travel. However, a number of measures will also benefit visitors and customers, including travel information on websites, maps showing ferry, bus, walking and cycling access, and clear wayfinding to cycle parking and public transport connections.

12.4 Travel Management Plan Management

A Travel Management Plan Coordinator shall be appointed prior to occupation of the first substantial employment-generating activity within Beachlands South. The role may be held by a precinct management entity, centre manager, body corporate manager, facilities manager, school travel coordinator, hotel manager, major employer representative, or other suitably authorised person. The organisation of which entities or management bodies will be responsible for this will be decided through the tenancy agreements.

The Travel Management Plan Coordinator will be responsible for the day-to-day implementation and review of the Travel Plan. The role will include the items listed in **Table 12-3** below:

Table 12-3: Travel Management Plan Management

Responsibility	Description
Overall responsibility	Maintain the Travel Management Plan and coordinate implementation across relevant tenants and employers.
Liaison	Liaise with Auckland Transport, ferry operators, bus operators, Auckland Council and the precinct management entity as required.
Staff engagement	Promote travel choices to staff and encourage participation in surveys, car sharing, walking, cycling and public transport initiatives.
Travel information	Ensure current information is available on walking routes, cycling routes, bus services, ferry services, AT HOP, real-time information, cycle parking and end-of-trip facilities.
Induction	Ensure new staff receive travel information as part of their induction material.
Monitoring	Arrange baseline and follow-up staff travel surveys, collate results and identify issues or barriers to mode shift.
Action plan	Maintain and update the Travel Management Plan action plan, including targets and measures following each monitoring review.
Reporting	Prepare monitoring summaries and provide them to the relevant consent authority or Auckland Transport if required by conditions.

Where Auckland Transport allocates a Travel Demand Planner or equivalent staff member, the Travel Management Plan Coordinator should liaise with that person to obtain available resources, survey templates, promotional material and advice on behaviour-change initiatives.

12.5 Baseline Data and Staff Travel Survey

Because the final tenant mix, staff numbers, shift patterns and public transport service levels will evolve over time, mode share targets should be confirmed after baseline survey data has been collected. A baseline staff travel survey shall be undertaken within three to six months of occupation of each major employment stage. Follow-up surveys shall be undertaken annually for at least the first three years after each major employment stage, and thereafter as required by the monitoring framework or Travel Management Plan Coordinator.

The staff travel survey should record the items listed in **Table 12-4** below:

Table 12-4: Travel Management Plan Baseline Data

Survey Matter	Information to be Collected
Staff home location	General suburb or postcode-level location, not personal address.
Usual travel mode	Drive alone, car share, passenger, walk, cycle, e-bike, bus, ferry, work from home, other.
Travel frequency	Number of days worked on site each week and number of days worked from home.
Arrival and departure times	Typical work start and finish times, including shift patterns.
Parking use	Whether staff park on site, on street, off site, or do not use parking.
Barriers	Reasons for not using walking, cycling, bus, ferry or car sharing.
Willingness to change	Interest in carpooling, flexible work, cycling, public transport, ferry use or other measures.
End-of-trip needs	Demand for lockers, showers, secure cycle parking, e-bike charging or other facilities.
Safety issues	Any perceived safety issues on walking, cycling or public transport routes.

The survey results should be summarised and used to update the Travel Management Plan action plan. Where the survey identifies barriers that can be addressed through management measures, information, minor infrastructure, parking management or liaison with Auckland Transport, those actions should be added to the following year's implementation programme.

12.6 Targets

Initial targets should be set after the baseline travel survey for each stage. This approach is preferred because the final tenant mix and staff travel needs will not be known until occupation. The targets should nevertheless support the broader transport outcomes relied upon in the ITA, including reduced private vehicle mode share, increased ferry and bus use, higher walking and cycling uptake for local staff, and reduced peak period single-occupancy vehicle travel.

The interim target framework listed in **Table 12-5** should be applied until baseline survey data is available:

Table 12-5: Travel Management Plan Targets

Target Area	Interim Target Approach

Single-occupancy vehicle travel	Reduce the proportion of staff driving alone over time, relative to the baseline survey.
Ferry and bus use	Increase staff awareness and use of Pine Harbour ferry and connecting bus services.
Walking and cycling	Increase local staff walking, cycling and e-bike use where staff live within practical travel distance.
Parking management	Avoid staff parking displacing customer, visitor or short-stay parking in high-demand areas.
Peak spreading	Encourage flexible starts, staggered shifts and work-from-home arrangements where practicable.
Monitoring	Achieve good staff survey participation and update the action plan annually.

If monitoring indicates that staff vehicle mode share or peak period staff parking demand is materially higher than anticipated, the Travel Management Plan Coordinator should review the action plan and consider additional measures, including stronger parking management, targeted staff communications, increased carpool promotion, revised shift start times, or further liaison with Auckland Transport regarding public transport information and service integration.

12.7 Travel Management Plan Actions and Measures

The Travel Management Plan shall include the actions in **Table 12-6** below. The measures are intended to be practical and capable of being implemented by the Travel Management Plan Coordinator, tenants, employers and the precinct management entity.

Table 12-6: Travel Management Plan Actions

Theme	Measure
Walking	• Provide staff with walking maps showing direct routes between employment areas, local residential areas, the local centre, bus stops, Pine Harbour ferry connections and key internal streets. Walking maps should identify approximate walking times and safe crossing locations • Provide wayfinding signage within the precinct to support safe and legible pedestrian movement between parking areas, employment areas, the local centre, bus stops, ferry connections and active mode routes. • Ensure pedestrian routes within employment areas are well lit, direct, overlooked and maintained to a suitable standard. • Promote walking events or challenges where appropriate, including Auckland Transport or national walking initiatives.
Cycling and micromobility	• Provide secure staff cycle parking in convenient and visible locations close to employment entrances. • Provide visitor cycle parking at key destinations, including retail, food and beverage, commercial, hotel, recreation and education activities.

	• Provide end-of-trip facilities for larger employment activities where practicable, including lockers, showers and changing facilities. • Provide e-bike charging opportunities where practicable and where they can be safely managed. • Provide staff with maps showing safe cycling routes within Beachlands South, routes to Pine Harbour, and connections to the wider Beachlands and Maraetai area.
Public transport and ferry	• Provide current ferry timetable information, bus route information, AT HOP information, real-time service links and walking/cycling routes to ferry and bus stops. • Include public transport and ferry information in staff induction packs and tenant onboarding material. • Display travel information in staff areas, back-of-house areas or digital staff portals. • Liaise with Auckland Transport and ferry operators where staff surveys identify recurring barriers to public transport or ferry use.
Flexible work and peak spreading	• Encourage office, administrative and management staff to work from home where operationally practicable. • Encourage flexible start and finish times for office and administrative staff to reduce travel during the most congested commuter peak periods. • Encourage staggered shift times for retail, hotel, light industrial and food and beverage staff where this can be achieved without compromising operations.
Car sharing	• Establish a staff carpool register or digital matching process for staff who are willing to share vehicle trips. • Consider priority carpool spaces where parking is managed or allocated. • Promote an emergency ride-home arrangement for staff who walk, cycle, use public transport or car share, so that staff are not discouraged from using non-car modes due to occasional unforeseen needs.
Parking management	• Manage staff parking to avoid long-stay staff parking occupying the most convenient customer, visitor or short-stay spaces. • Where appropriate, allocate staff parking areas away from the highest-demand visitor parking areas. • Review staff parking demand through annual staff surveys and occupancy observations. • Avoid informal or unmanaged staff parking on streets where it would adversely affect safety, visibility, access or residential amenity.
Visitors and customers	• Provide website and tenant information showing how to access Beachlands South by ferry, bus, walking and cycling, including cycle parking locations. • Encourage hotel, recreation, retail and food and beverage operators to provide non-car travel information to visitors and customers.
Freight and servicing	• Coordinate servicing and deliveries to avoid peak commuter periods where practicable. • Manage loading and servicing activity to minimise conflicts with pedestrians, cyclists and staff walking routes.
Marketing and awareness	• Provide travel information packs to new staff and tenants. • Promote travel choices during the first months of occupation and after major public transport, ferry or active mode changes. • Participate in relevant walking, cycling, public transport or low-emission travel campaigns where appropriate.
Review and reporting	• Review survey results annually, identify barriers to mode shift, update the action plan and report outcomes through the relevant monitoring process.

12.8 Parking Management

Parking management is an important component of the Travel Management Plan because unmanaged staff parking can reduce the effectiveness of visitor, customer and short-stay parking areas, and can encourage single-occupancy vehicle commuting. The Travel Management Plan Coordinator should work with employers and tenants to identify appropriate staff parking locations and to discourage all-day staff parking in the most convenient customer or visitor spaces.

The parking management approach should be proportionate to the scale and stage of development. In early stages, informal management and staff information may be sufficient. As the local centre and employment areas develop, more formal measures may be required, including staff parking allocation, permits, time restrictions, carpool priority spaces, or monitoring of high-demand parking areas.

Parking management should be reviewed following each staff travel survey. If staff parking demand is higher than anticipated, the Travel Management Plan Coordinator should consider additional measures to promote carpooling, walking, cycling, ferry use, bus use, flexible work and staggered start times.

12.9 Flexible Working and Shift Patterns

The Travel Management Plan recognises that not all employment activities can operate in the same way. Office and administrative staff are more likely to be able to work from home or vary their start and finish times. Retail, food and beverage, hotel, education and light industrial activities are more likely to require on-site staff, but may still be able to manage shift start and finish times to avoid the most congested network periods where operationally practicable.

Employers should therefore be encouraged to consider the measures set out in **Table 12-7** below:

Table 12-7: Flexible Working Strategies

Employment Type	Relevant Measures
Office and administrative	Work from home, flexible start and finish times, ferry use, carpooling and reduced peak travel.

Retail and supermarket	Staggered shifts, staff parking management, carpooling, cycling and public transport information.
Food and beverage	Shift coordination, safe late-evening travel information, cycling and carpooling.

12.10 Monitoring and Review

The Travel Management Plan shall be reviewed after each annual staff travel survey. The review should compare observed travel behaviour against the baseline survey and any targets set by the Travel Management Plan Coordinator. The review should identify the items in **Table 12-8** below:

Table 12-8: Travel Management Plan Monitoring

Survey Matter	Information to be Collected
Mode share	Understand how staff are travelling and whether single-occupancy vehicle travel is reducing.
Peak spreading	Identify whether staff are arriving and departing during the most congested periods.
Parking demand	Confirm whether staff parking is affecting visitor, customer or street parking.
Barriers	Identify practical barriers to walking, cycling, ferry, bus or car sharing.
Actions	Confirm which measures have been implemented and whether further measures are required.
Infrastructure changes	Update the Travel Management Plan to reflect new roads, paths, bus stops, ferry changes or active mode connections.
Reporting	Provide monitoring summaries to Auckland Transport, Auckland Council or the consent authority if required.

The Travel Management Plan should remain a live document. It should be updated as Beachlands South develops, as new employment activities open, as ferry and bus services change, and as the active mode network is completed. This adaptive approach is appropriate for a staged development and ensures that travel management measures remain relevant to the actual transport environment experienced by staff.

12.11 Management Support

The effectiveness of the Travel Management Plan depends on active support from the developer, precinct management entity (if applicable), employers and tenants. Travel planning measures are most effective when they are embedded into normal operational

systems, including staff induction, tenant onboarding, parking management, health and safety processes, facilities management and staff communications.

Employers and tenants should therefore be required, where practicable, to cooperate with the Travel Management Plan Coordinator, distribute travel information to staff, participate in staff travel surveys, and implement relevant actions. The precinct management entity should maintain oversight of the Travel Management Plan and ensure that it is updated as development proceeds.

With these measures in place, the Travel Management Plan will support the transport assumptions relied upon in the ITA, assist in reducing single-occupancy vehicle travel, manage staff parking demand, support ferry, bus, walking and cycling use, and contribute to lower peak period traffic effects on Whitford-Maraetai Road

13. Authority Consultation

Several meetings have been held with Authorities through the preparation of the consent documentation. There are summarised below:

- **3 December 2025**: Meeting with AT to discuss emerging design issues, with particular focus on the proposed Jack Lachlan Drive upgrade. Key issues discussed were:
    - Difficultly in providing a footpath on the northern, undeveloped side of the road between opposite the three collector road accesses due to difficult topography. Given the land to the north is considered undevelopable, it is proposed to not provide a footpath along that stretch of road, while ensuring a footpath and bi-directional cycleway were provided on the southern side.
    - Difficultly providing footpaths on both sides and a bi-directional cycleway through the westernmost section of the road as it passes the “boat-houses”, due to very narrow road reserve and overlapping of property lines. An alternative to enable active mode connections on this section with an active mode path was suggested as the only viable alternative
    - An update on the preferred intersection treatment at Jack Lachlan Drive / Whitford-Maraetai Road, that being a standard double lane roundabout. The potential signalisation was set aside as it would be somewhat out of character as an entry treatment to Beachlands, reflecting Auckland Transport’s earlier preference for a roundabout. The dedicated southbound through lane was removed to avoid property access issues on the eastern

side. A fourth arm into the Site's employment megalot was considered but rejected due to topography constraints.

- **10 February 2026 – 3 March 2026**: Email correspondence with Auckland Transport, providing more detailed design plans of the above three proposals. General agreement in principle received from Auckland Transport, pending further design confirmation to be prepared through the consent process.
- **1 April 2026**: Whole of Council family initial pre-app meeting to introduce the Council teams to the development.
- **17 April 2026**: Urban design focussed pre-app meeting with Auckland Council and Auckland Transport, with some focus on transport related urban design elements.
- **21 April 2026:** Transport focussed pre-app meeting with Auckland Council and Auckland Transport (including consultant specialists for both). A transport presentation was issued prior to the meeting. The meeting summarised the key transport elements of the proposed development.

14. Conclusion

This Integrated Transport Assessment has assessed the transport effects of the Beachlands South Fast Track substantive application. The Project will enable the development of the live-zoned land in the Beachlands South precinct to a comprehensively planned, public transport-focused community comprising residential dwellings, commercial and employment activities, education facilities, hotel and recreation activities, open space, ecological restoration areas, walking and cycling networks, and supporting transport infrastructure.

The transport assessment has been prepared within the framework established through PC88 and as set out in the Beachlands South Precinct provisions. That process included detailed transport modelling, expert conferencing, peer review and an Independent Hearings Panel decision, which resulted in the operative Beachlands South Precinct transport staging provisions. This ITA has used that framework as the starting point, while updating the assessment to reflect the proposed yield in this Project, development staging, post-COVID travel behaviour, ferry capacity changes, the revised employment land use mix, and the detailed transport design now proposed.

The proposed movement network will provide a substantial improvement over the existing transport environment. The Site is currently served by a limited rural and local road network, with poor active mode provision and limited public transport integration. The Project will deliver a connected internal road network, multiple access points to Jack

Lachlan Drive, a left-in / left-out connection to Whitford-Maraetai Road, upgraded external intersections, a continuous active mode corridor along Jack Lachlan Drive, internal walking and cycling links, and direct active mode connections to Pine Harbour. The internal street network has been designed to support low-speed local streets, protected cycle facilities on collector roads, convenient pedestrian movement, and the ability for future bus services to penetrate the development as demand increases.

Public transport accessibility will be supported by the existing Pine Harbour ferry service, the committed ferry berth and vessel capacity improvements by Auckland Transport, the recently introduced Route 738 bus service between Maraetai, Beachlands and Pine Harbour, and the opportunity for Route 739 or future bus services to be extended or diverted through the development. The Project will also provide the scale, density and mix of activities needed to support a more self-sufficient Beachlands community and to make walking, cycling, ferry and bus travel more realistic options for everyday trips.

The traffic assessment demonstrates that the Project can be accommodated within the traffic effects envelope established through PC88 and as set out in the Beachlands South Precinct provisions. The updated modelling indicates that the full development scenario remains broadly at the 1,600vph AM southbound Whitford-Maraetai Road reference flow, and materially below the 1,700vph upper reference point tested through the plan change process. The retirement village sensitivity produces a similar outcome. The assessment is considered conservative and robust because it retains the core PC88 modelling assumptions, with limited and justified updates to reflect contemporary travel behaviour and the revised land use mix.

The Project does not fully comply with the operative Beachlands South Precinct transport trigger framework. In particular, the Trig Road South / Whitford-Maraetai Road upgrade is not proposed, the development exceeds the 1,900-dwelling threshold without providing the Whitford Bypass, and a small number of early dwellings may be occupied while the Jack Lachlan Drive upgrade is still under construction. Those matters are assessed in Section 10. From a transport effects perspective, the departures are considered acceptable. The Trig Road upgrade has been ruled out following validation testing because the relevant right-turn demand is negligible and signalisation would impose unnecessary delay on the dominant Whitford-Maraetai Road through movement. The Whitford Bypass is not required to manage the Project's traffic effects because the updated development mix and trip generation assumptions keep the critical southbound flow within the PC88 effects envelope. The temporary Jack Lachlan Drive staging matter is limited in scale and duration,

and the full Jack Lachlan Drive upgrade will be completed before the school opens and before the larger pedestrian, cycle and school-related demands arise.

The Project also includes a Travel Management Plan framework for employment-generating activities. That framework will support public transport use, walking, cycling, car sharing, flexible working, peak spreading and staff parking management. It will operate alongside the precinct's broader monitoring requirements, including tracking of dwelling and lot numbers, mode share, trip generation, ferry demand, road safety and development mix as the project proceeds.

Overall, the Project is consistent with the transport outcomes sought for Beachlands South. It will deliver a connected, multimodal and staged transport network that supports compact urban form, local employment, active mode uptake, ferry and bus use, reduced vehicle kilometres travelled, and improved access between Beachlands South, the existing Beachlands township and Pine Harbour. Subject to the proposed staging, design, monitoring and travel planning conditions, the transport effects of the Project are considered acceptable.

Hughes Traffic & Transportation Limited

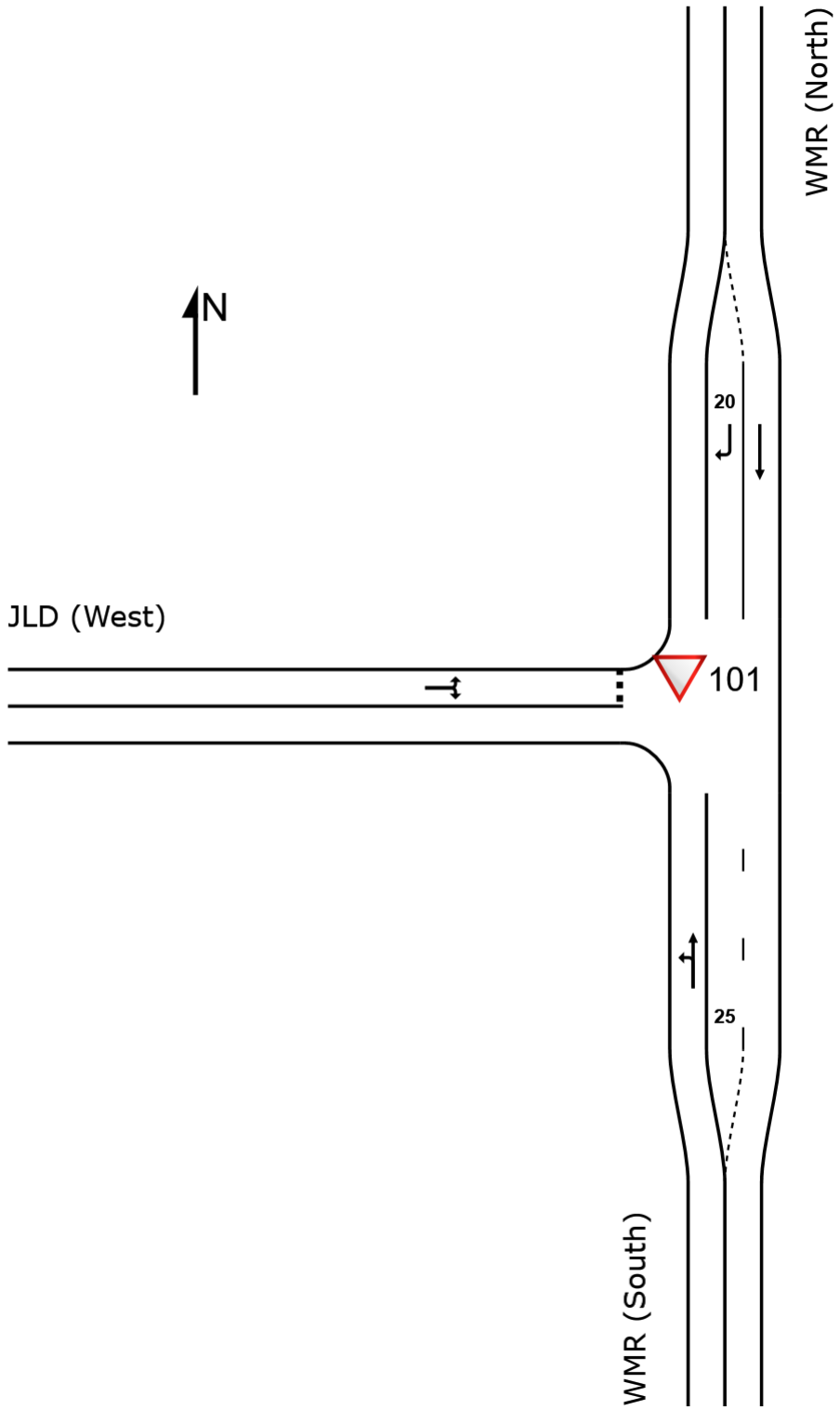
Attachment 1: SIDRA Results

SITE LAYOUT

Site: 101 [2025 Base JLD_WMR_AM (Site Folder: JLD / WMR Existing - 2025 Base)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: 101 [2025 Base JLD_WMR_AM (Site Folder: JLD / WMR Existing - 2025 Base)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: WMR (South)															
1	L2	All MCs	91	14.0	91	14.0	0.172	4.7	LOS A	0.0	0.0	0.00	0.16	0.00	47.6
2	T1	All MCs	212	13.4	212	13.4	0.172	0.1	LOS A	0.0	0.0	0.00	0.16	0.00	49.0
Approach			302	13.6	302	13.6	0.172	1.5	NA	0.0	0.0	0.00	0.16	0.00	48.6
North: WMR (North)															
8	T1	All MCs	1000	2.4	1000	2.4	0.521	0.3	LOS A	0.0	0.0	0.00	0.00	0.00	49.6
9	R2	All MCs	53	0.0	53	0.0	0.051	6.0	LOS A	0.2	1.4	0.40	0.61	0.40	44.9
Approach			1053	2.3	1053	2.3	0.521	0.6	NA	0.2	1.4	0.02	0.03	0.02	49.4
West: JLD (West)															
10	L2	All MCs	23	0.0	23	0.0	0.971	63.7	LOS F	9.1	64.4	0.99	1.84	3.82	22.3
12	R2	All MCs	140	1.5	140	1.5	0.971	93.3	LOS F	9.1	64.4	0.99	1.84	3.82	22.3
Approach			163	1.3	163	1.3	0.971	89.1	LOS F	9.1	64.4	0.99	1.84	3.82	22.3
All Vehicles			1518	4.4	1518	4.4	0.971	10.3	NA	9.1	64.4	0.12	0.25	0.42	43.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [2025 Base JLD_WMR_PM (Site Folder: JLD / WMR Existing - 2025 Base)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: WMR (South)															
1	L2	All MCs	242	0.9	242	0.9	0.524	4.8	LOS A	0.0	0.0	0.00	0.13	0.00	47.7
2	T1	All MCs	763	0.4	763	0.4	0.524	0.3	LOS A	0.0	0.0	0.00	0.13	0.00	48.9
Approach			1005	0.5	1005	0.5	0.524	1.4	NA	0.0	0.0	0.00	0.13	0.00	48.6
North: WMR (North)															
8	T1	All MCs	312	2.7	312	2.7	0.163	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
9	R2	All MCs	23	0.0	23	0.0	0.073	14.8	LOS B	0.2	1.6	0.79	0.91	0.79	40.5
Approach			335	2.5	335	2.5	0.163	1.1	NA	0.2	1.6	0.05	0.06	0.05	49.1
West: JLD (West)															
10	L2	All MCs	26	0.0	26	0.0	0.951	64.4	LOS F	6.0	43.4	0.99	1.62	3.22	22.8
12	R2	All MCs	98	5.4	98	5.4	0.951	90.9	LOS F	6.0	43.4	0.99	1.62	3.22	22.7
Approach			124	4.2	124	4.2	0.951	85.3	LOS F	6.0	43.4	0.99	1.62	3.22	22.7
All Vehicles			1464	1.3	1464	1.3	0.951	8.4	NA	6.0	43.4	0.10	0.24	0.29	44.4

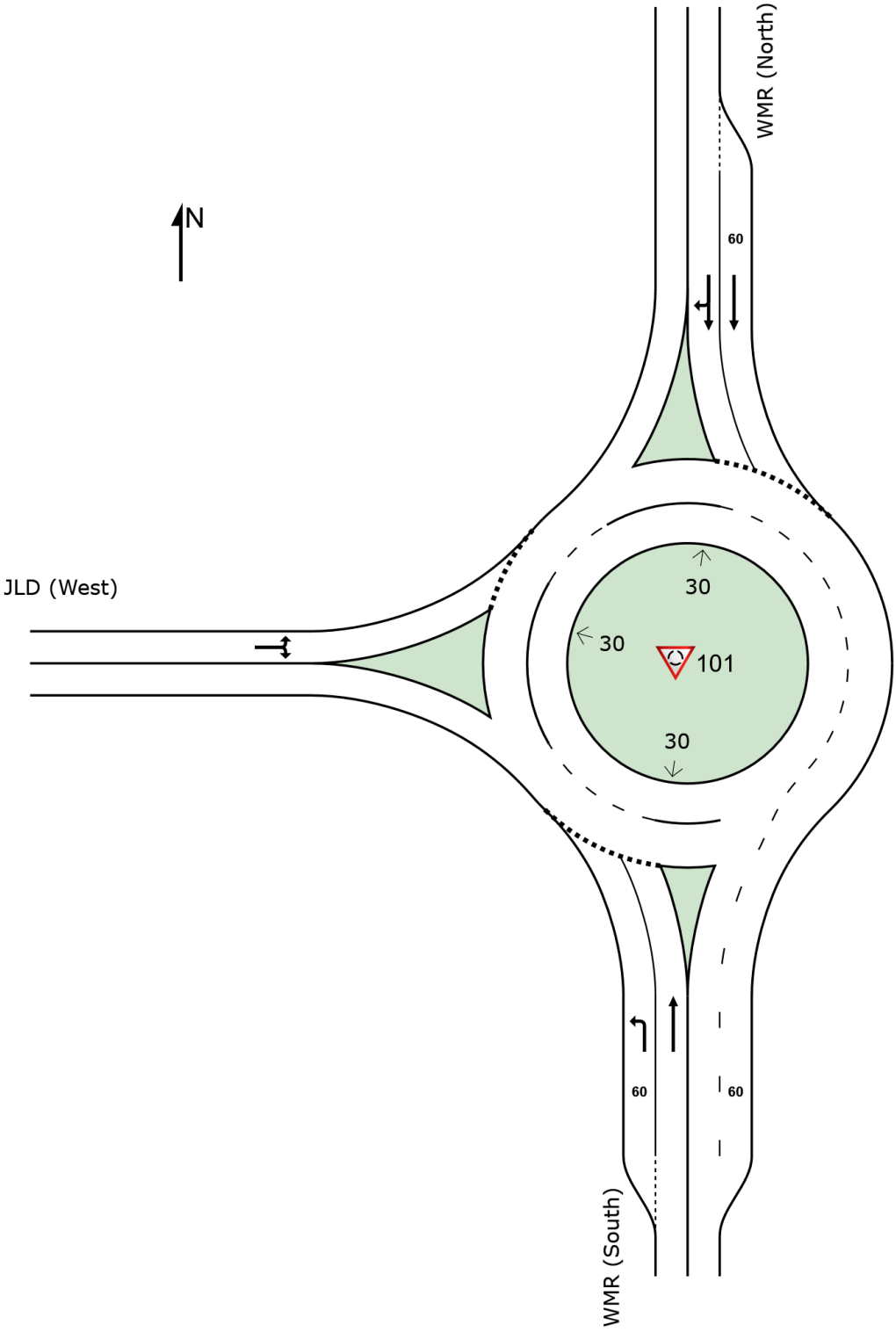
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SITE LAYOUT

Site: 101 [Standard - JLD / WMR RB Peak AM (Site Folder: JLD / WMR R/B 2038 Options)]

New Site
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: 101 [Standard - JLD / WMR RB Peak AM (Site Folder: JLD / WMR R/B 2038 Options)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: WMR (South)															
1	L2	All MCs	87	13.8	87	13.8	0.080	2.8	LOS A	0.4	3.0	0.19	0.35	0.19	47.3
2	T1	All MCs	203	13.3	203	13.3	0.143	2.2	LOS A	0.8	5.9	0.19	0.25	0.19	47.7
Approach			290	13.4	290	13.4	0.143	2.4	LOS A	0.8	5.9	0.19	0.28	0.19	47.6
North: WMR (North)															
8	T1	All MCs	962	2.4	962	2.4	0.642	5.8	LOS A	6.1	43.6	0.69	0.62	0.76	45.7
9	R2	All MCs	57	0.0	57	0.0	0.642	10.9	LOS B	6.1	43.6	0.74	0.66	0.83	45.0
Approach			1019	2.3	1019	2.3	0.642	6.1	LOS A	6.1	43.6	0.69	0.62	0.77	45.7
West: JLD (West)															
10	L2	All MCs	81	0.0	81	0.0	0.426	3.5	LOS A	2.5	17.5	0.44	0.58	0.44	44.7
12	R2	All MCs	416	0.5	416	0.5	0.426	8.8	LOS A	2.5	17.5	0.44	0.58	0.44	44.3
Approach			497	0.4	497	0.4	0.426	7.9	LOS A	2.5	17.5	0.44	0.58	0.44	44.4
All Vehicles			1806	3.5	1806	3.5	0.642	6.0	LOS A	6.1	43.6	0.54	0.56	0.58	45.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Standard - JLD / WMR RB Peak PM (Site Folder: JLD / WMR R/B 2038 Options)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: WMR (South)															
1	L2	All MCs	233	0.9	233	0.9	0.269	4.4	LOS A	1.3	9.4	0.48	0.51	0.48	46.5
2	T1	All MCs	734	0.4	734	0.4	0.572	3.6	LOS A	4.2	29.7	0.59	0.42	0.59	46.2
Approach			967	0.5	967	0.5	0.572	3.8	LOS A	4.2	29.7	0.56	0.44	0.56	46.3
North: WMR (North)															
8	T1	All MCs	36	0.0	36	0.0	0.042	2.9	LOS A	0.2	1.3	0.34	0.34	0.34	47.2
9	R2	All MCs	298	2.7	298	2.7	0.222	8.0	LOS A	1.3	9.2	0.35	0.57	0.35	44.0
Approach			334	2.4	334	2.4	0.222	7.5	LOS A	1.3	9.2	0.35	0.54	0.35	44.3
West: JLD (West)															
10	L2	All MCs	130	0.0	130	0.0	0.414	7.2	LOS A	2.8	20.0	0.81	0.77	0.85	43.8
12	R2	All MCs	156	3.2	156	3.2	0.414	12.6	LOS B	2.8	20.0	0.81	0.77	0.85	43.4
Approach			286	1.7	286	1.7	0.414	10.2	LOS B	2.8	20.0	0.81	0.77	0.85	43.6
All Vehicles			1587	1.1	1587	1.1	0.572	5.7	LOS A	4.2	29.7	0.56	0.52	0.57	45.4

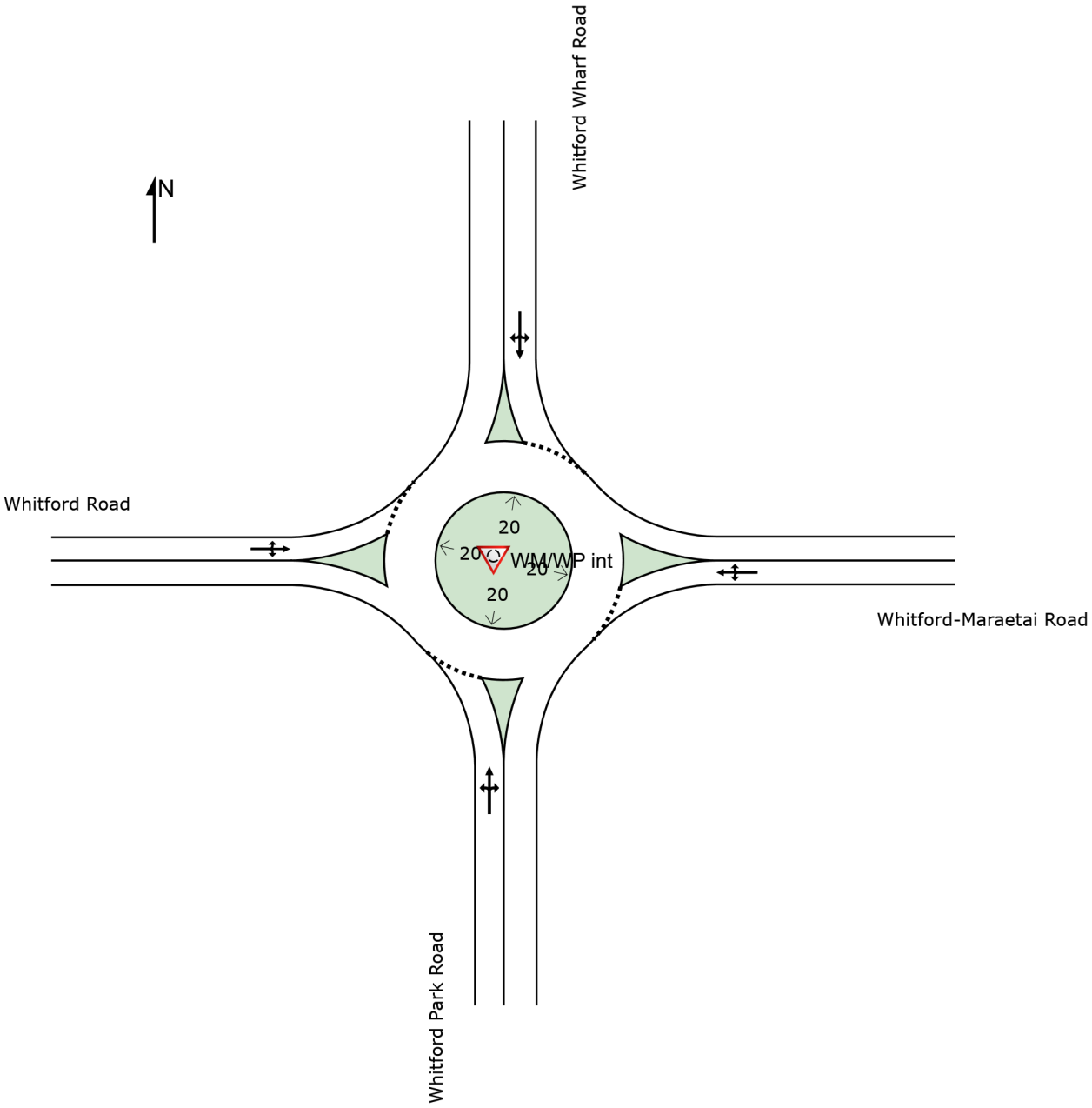
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SITE LAYOUT

Site: WM/WP int [2025 Baseline AM (Site Folder: Whitford Roundabout 2025 Base)]

New Site
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: WM/WP int [2025 Baseline AM (Site Folder: Whitford Roundabout 2025 Base)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Whitford Park Road															
1	L2	All MCs	336	6.0	336	6.0	0.760	12.4	LOS B	9.9	74.6	1.00	0.97	1.37	41.4
2	T1	All MCs	11	0.0	11	0.0	0.760	12.0	LOS B	9.9	74.6	1.00	0.97	1.37	38.0
3	R2	All MCs	240	12.1	240	12.1	0.760	17.1	LOS B	9.9	74.6	1.00	0.97	1.37	41.1
Approach			587	8.3	587	8.3	0.760	14.3	LOS B	9.9	74.6	1.00	0.97	1.37	41.2
East: Whitford-Maraetai Road															
4	L2	All MCs	656	2.9	656	2.9	1.167	163.3	LOS F	139.8	1002.1	1.00	4.08	5.63	15.5
5	T1	All MCs	579	2.8	579	2.8	1.167	163.2	LOS F	139.8	1002.1	1.00	4.08	5.63	15.5
6	R2	All MCs	8	0.0	8	0.0	1.167	167.5	LOS F	139.8	1002.1	1.00	4.08	5.63	11.0
Approach			1243	2.8	1243	2.8	1.167	163.3	LOS F	139.8	1002.1	1.00	4.08	5.63	15.5
North: Whitford Wharf Road															
7	L2	All MCs	2	0.0	2	0.0	0.014	5.5	LOS A	0.1	0.5	0.61	0.58	0.61	42.4
8	T1	All MCs	6	16.7	6	16.7	0.014	5.9	LOS A	0.1	0.5	0.61	0.58	0.61	42.6
9	R2	All MCs	3	0.0	3	0.0	0.014	9.9	LOS A	0.1	0.5	0.61	0.58	0.61	42.0
Approach			11	9.1	11	9.1	0.014	6.9	LOS A	0.1	0.5	0.61	0.58	0.61	42.4
West: Whitford Road															
10	L2	All MCs	4	0.0	4	0.0	0.465	5.6	LOS A	3.8	27.9	0.73	0.62	0.73	41.6
11	T1	All MCs	200	9.5	200	9.5	0.465	5.9	LOS A	3.8	27.9	0.73	0.62	0.73	44.5
12	R2	All MCs	177	4.0	177	4.0	0.465	10.2	LOS B	3.8	27.9	0.73	0.62	0.73	44.0
Approach			381	6.8	381	6.8	0.465	7.9	LOS A	3.8	27.9	0.73	0.62	0.73	44.2
All Vehicles			2222	5.0	2222	5.0	1.167	96.5	LOS F	139.8	1002.1	0.95	2.65	3.64	21.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: WM/WP int [2025 Baseline PM (Site Folder: Whitford Roundabout 2025 Base)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Whitford Park Road															
1	L2	All MCs	330	2.4	330	2.4	0.808	8.2	LOS A	12.8	90.9	0.91	0.76	1.08	43.1
2	T1	All MCs	13	0.0	13	0.0	0.808	8.0	LOS A	12.8	90.9	0.91	0.76	1.08	40.2
3	R2	All MCs	579	1.6	579	1.6	0.808	12.6	LOS B	12.8	90.9	0.91	0.76	1.08	42.8
Approach			922	1.8	922	1.8	0.808	11.0	LOS B	12.8	90.9	0.91	0.76	1.08	42.8
East: Whitford-Maraetai Road															
4	L2	All MCs	222	8.1	222	8.1	0.508	5.2	LOS A	4.4	32.6	0.68	0.53	0.68	45.5
5	T1	All MCs	248	4.0	248	4.0	0.508	5.0	LOS A	4.4	32.6	0.68	0.53	0.68	45.7
6	R2	All MCs	1	0.0	1	0.0	0.508	9.4	LOS A	4.4	32.6	0.68	0.53	0.68	42.8
Approach			471	5.9	471	5.9	0.508	5.1	LOS A	4.4	32.6	0.68	0.53	0.68	45.6
North: Whitford Wharf Road															
7	L2	All MCs	11	0.0	11	0.0	0.055	11.6	LOS B	0.4	2.5	0.88	0.78	0.88	38.7
8	T1	All MCs	9	0.0	9	0.0	0.055	11.4	LOS B	0.4	2.5	0.88	0.78	0.88	39.0
9	R2	All MCs	6	0.0	6	0.0	0.055	16.0	LOS B	0.4	2.5	0.88	0.78	0.88	38.4
Approach			26	0.0	26	0.0	0.055	12.5	LOS B	0.4	2.5	0.88	0.78	0.88	38.7
West: Whitford Road															
10	L2	All MCs	12	0.0	12	0.0	1.175	184.3	LOS F	78.3	553.5	1.00	4.01	7.60	10.1
11	T1	All MCs	422	0.9	422	0.9	1.175	184.3	LOS F	78.3	553.5	1.00	4.01	7.60	14.3
12	R2	All MCs	223	1.8	223	1.8	1.175	188.9	LOS F	78.3	553.5	1.00	4.01	7.60	14.2
Approach			657	1.2	657	1.2	1.175	185.9	LOS F	78.3	553.5	1.00	4.01	7.60	14.2
All Vehicles			2076	2.6	2076	2.6	1.175	65.0	LOS E	78.3	553.5	0.89	1.74	3.05	26.3

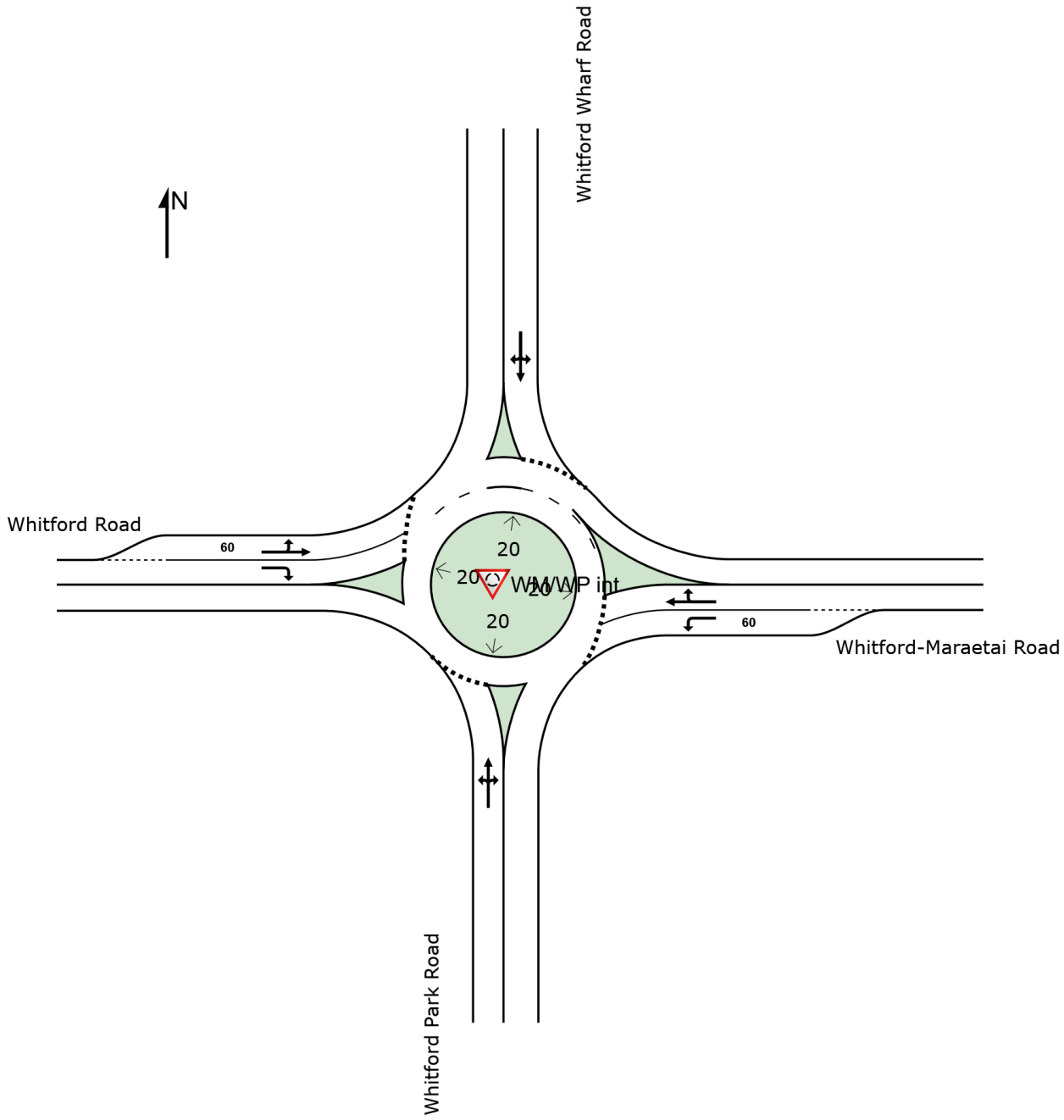
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SITE LAYOUT

Site: WM/WP int [Whitford RB 1900 HH AM (Site Folder: Whitford Roundabout Upgraded 1900 HH)]

New Site
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: WM/WP int [Whitford RB 1900 HH AM (Site Folder: Whitford Roundabout Upgraded 1900 HH)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Whitford Park Road															
1	L2	All MCs	344	5.8	344	5.8	1.096	119.4	LOS F	59.0	438.5	1.00	3.39	6.14	18.9
2	T1	All MCs	11	0.0	11	0.0	1.096	118.9	LOS F	59.0	438.5	1.00	3.39	6.14	13.9
3	R2	All MCs	339	8.8	339	8.8	1.096	124.0	LOS F	59.0	438.5	1.00	3.39	6.14	18.8
Approach			694	7.2	694	7.2	1.096	121.6	LOS F	59.0	438.5	1.00	3.39	6.14	18.8
East: Whitford-Maraetai Road															
4	L2	All MCs	852	2.2	852	2.2	0.705	5.4	LOS A	8.4	60.2	0.77	0.57	0.78	45.4
5	T1	All MCs	724	2.2	724	2.2	0.667	5.2	LOS A	7.3	52.0	0.75	0.54	0.76	45.2
6	R2	All MCs	8	0.0	8	0.0	0.667	9.6	LOS A	7.3	52.0	0.75	0.54	0.76	42.1
Approach			1584	2.2	1584	2.2	0.705	5.3	LOS A	8.4	60.2	0.76	0.55	0.77	45.3
North: Whitford Wharf Road															
7	L2	All MCs	2	0.0	2	0.0	0.015	5.0	LOS A	0.1	0.4	0.51	0.60	0.51	42.9
8	T1	All MCs	6	16.7	6	16.7	0.015	5.3	LOS A	0.1	0.4	0.51	0.60	0.51	43.1
9	R2	All MCs	3	0.0	3	0.0	0.015	9.3	LOS A	0.1	0.4	0.51	0.60	0.51	42.4
Approach			11	9.1	11	9.1	0.015	6.3	LOS A	0.1	0.4	0.51	0.60	0.51	42.9
West: Whitford Road															
10	L2	All MCs	4	0.0	4	0.0	0.314	5.4	LOS A	2.3	17.0	0.68	0.56	0.68	42.8
11	T1	All MCs	279	6.8	279	6.8	0.314	5.3	LOS A	2.3	17.0	0.68	0.56	0.68	45.5
12	R2	All MCs	181	3.9	181	3.9	0.230	10.1	LOS B	1.5	11.1	0.66	0.66	0.66	43.2
Approach			464	5.6	464	5.6	0.314	7.2	LOS A	2.3	17.0	0.67	0.60	0.67	44.5
All Vehicles			2753	4.1	2753	4.1	1.096	35.0	LOS C	59.0	438.5	0.81	1.28	2.11	33.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: WM/WP int [Whitford RB 1900 HH PM (Site Folder: Whitford Roundabout Upgraded 1900 HH)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Whitford Park Road															
1	L2	All MCs	338	2.4	338	2.4	0.990	31.9	LOS C	41.0	290.8	1.00	1.74	2.38	33.8
2	T1	All MCs	13	0.0	13	0.0	0.990	31.7	LOS C	41.0	290.8	1.00	1.74	2.38	28.6
3	R2	All MCs	739	1.2	739	1.2	0.990	36.3	LOS D	41.0	290.8	1.00	1.74	2.38	33.6
Approach			1090	1.6	1090	1.6	0.990	34.9	LOS C	41.0	290.8	1.00	1.74	2.38	33.6
East: Whitford-Maraetai Road															
4	L2	All MCs	284	6.3	284	6.3	0.293	5.0	LOS A	2.1	15.4	0.59	0.54	0.59	45.8
5	T1	All MCs	297	3.4	297	3.4	0.287	4.5	LOS A	2.1	15.0	0.58	0.48	0.58	45.8
6	R2	All MCs	1	0.0	1	0.0	0.287	8.9	LOS A	2.1	15.0	0.58	0.48	0.58	42.9
Approach			582	4.8	582	4.8	0.293	4.7	LOS A	2.1	15.4	0.58	0.51	0.58	45.8
North: Whitford Wharf Road															
7	L2	All MCs	1	0.0	1	0.0	0.055	10.4	LOS B	0.3	2.0	0.79	0.85	0.79	38.7
8	T1	All MCs	10	10.0	10	10.0	0.055	10.8	LOS B	0.3	2.0	0.79	0.85	0.79	38.9
9	R2	All MCs	11	0.0	11	0.0	0.055	14.8	LOS B	0.3	2.0	0.79	0.85	0.79	38.3
Approach			22	4.5	22	4.5	0.055	12.8	LOS B	0.3	2.0	0.79	0.85	0.79	38.6
West: Whitford Road															
10	L2	All MCs	12	0.0	12	0.0	1.004	69.6	LOS E	32.9	231.7	1.00	2.20	3.60	20.0
11	T1	All MCs	553	0.9	553	0.9	1.004	69.4	LOS E	32.9	231.7	1.00	2.20	3.60	25.7
12	R2	All MCs	228	1.8	228	1.8	0.587	22.2	LOS C	5.2	36.7	0.99	0.98	1.29	38.0
Approach			793	1.1	793	1.1	1.004	55.8	LOS E	32.9	231.7	1.00	1.85	2.93	28.3
All Vehicles			2487	2.2	2487	2.2	1.004	34.3	LOS C	41.0	290.8	0.90	1.48	2.12	33.7

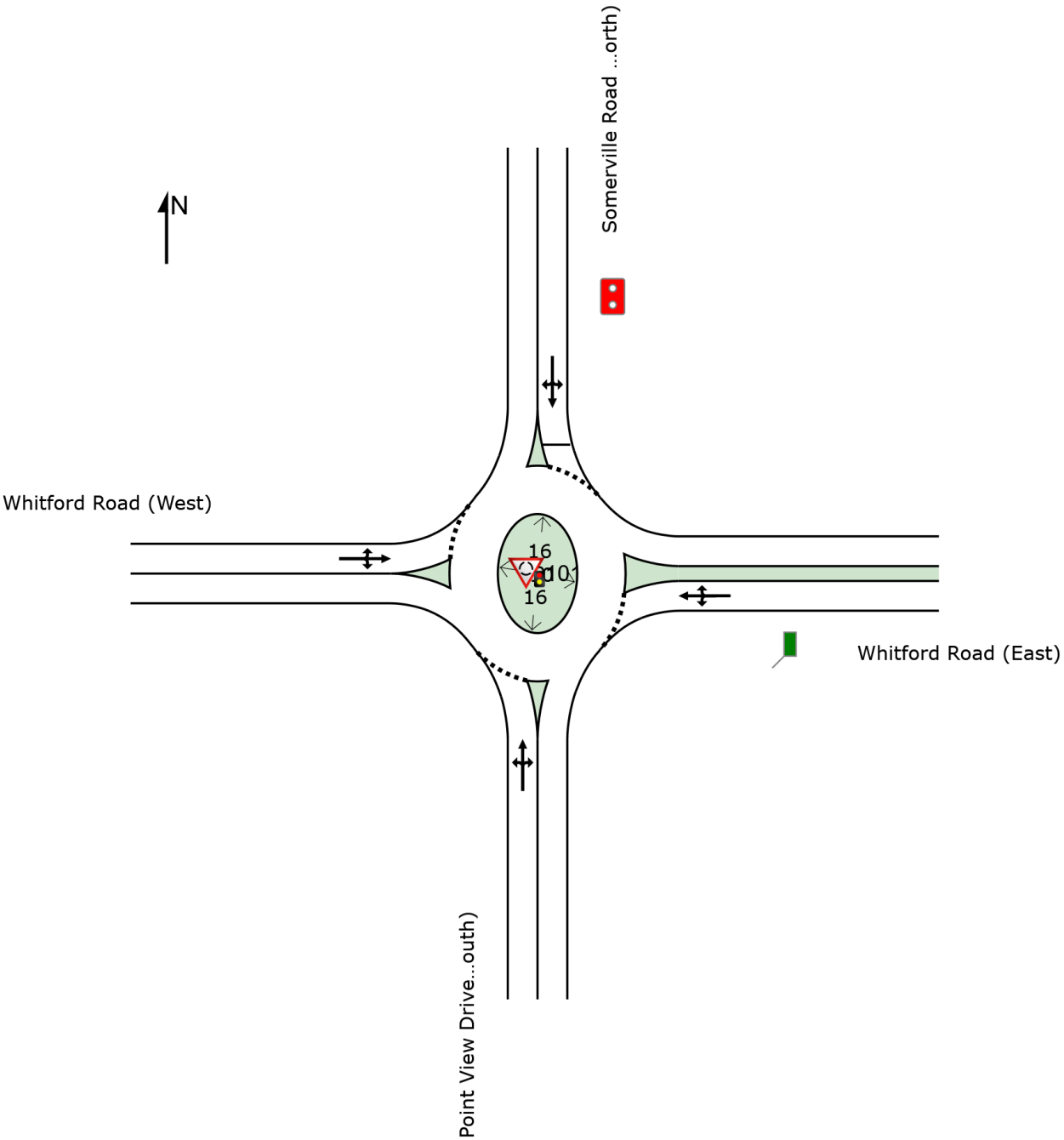
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SITE LAYOUT

Site: 101 [2025 Base Somerville Roundabout AM (Site Folder: Somerville Roundabout Existing - 2025 Base)]

New Site
Site Category: (None)
Roundabout Metering

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: 101 [2025 Base Somerville Roundabout AM (Site Folder: Somerville Roundabout Existing - 2025 Base)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

New Site
Site Category: (None)
Roundabout Metering

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Point View Drive (South)															
1	L2	All MCs	67	1.5	67	1.5	0.346	17.0	LOS B	1.8	12.5	0.99	0.89	1.09	39.9
2	T1	All MCs	12	0.0	12	0.0	0.346	17.1	LOS B	1.8	12.5	0.99	0.89	1.09	40.1
3	R2	All MCs	2	0.0	2	0.0	0.346	20.8	LOS C	1.8	12.5	0.99	0.89	1.09	39.7
Approach			81	1.2	81	1.2	0.346	17.1	LOS B	1.8	12.5	0.99	0.89	1.09	39.9
East: Whitford Road (East)															
4	L2	All MCs	1	0.0	1	0.0	1.218	210.8	LOS F	145.6	1046.4	1.00	5.26	8.65	12.9
5	T1	All MCs	926	2.5	926	2.5	1.218	210.6	LOS F	145.6	1046.4	1.00	5.26	8.65	12.9
6	R2	All MCs	193	6.2	193	6.2	1.218	214.4	LOS F	145.6	1046.4	1.00	5.26	8.65	12.8
Approach			1120	3.1	1120	3.1	1.218	211.2	LOS F	145.6	1046.4	1.00	5.26	8.65	12.9
North: Somerville Road (North)															
7	L2	All MCs	65	3.1	65	3.1	0.512	13.1	LOS B	17.5	124.2	0.34	NaN	0.37	40.5
8	T1	All MCs	5	0.0	5	0.0	0.512	12.9	LOS B	17.5	124.2	0.34	NaN	0.37	40.7
9	R2	All MCs	306	1.0	306	1.0	0.512	16.8	LOS B	17.5	124.2	0.34	NaN	0.37	40.3
Approach			376	1.3	376	1.3	0.512	16.1	LOS B	17.5	124.2	0.34	NaN	0.37	40.3
West: Whitford Road (West)															
10	L2	All MCs	325	0.0	325	0.0	0.543	4.6	LOS A	5.1	36.6	0.60	0.52	0.60	45.1
11	T1	All MCs	268	6.7	268	6.7	0.543	4.4	LOS A	5.1	36.6	0.60	0.52	0.60	45.5
12	R2	All MCs	23	21.7	23	21.7	0.543	8.3	LOS A	5.1	36.6	0.60	0.52	0.60	44.6
Approach			616	3.7	616	3.7	0.543	4.7	LOS A	5.1	36.6	0.60	0.52	0.60	45.3
All Vehicles			2193	2.9	2193	2.9	1.218	112.6	LOS F	145.6	1046.4	0.77	NaN	4.69	19.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [2025 Base Somerville Roundabout PM (Site Folder: Somerville Roundabout Existing - 2025 Base)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

New Site
Site Category: (None)
Roundabout Metering

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Point View Drive (South)															
1	L2	All MCs	29	6.9	29	6.9	0.048	7.5	LOS A	0.3	2.0	0.69	0.65	0.69	44.4
2	T1	All MCs	1	0.0	1	0.0	0.048	7.4	LOS A	0.3	2.0	0.69	0.65	0.69	44.6
3	R2	All MCs	3	0.0	3	0.0	0.048	11.1	LOS B	0.3	2.0	0.69	0.65	0.69	44.1
Approach			33	6.1	33	6.1	0.048	7.8	LOS A	0.3	2.0	0.69	0.65	0.69	44.4
East: Whitford Road (East)															
4	L2	All MCs	3	0.0	3	0.0	0.535	5.9	LOS A	3.8	28.3	0.62	0.57	0.62	44.8
5	T1	All MCs	425	6.8	425	6.8	0.535	5.8	LOS A	3.8	28.3	0.62	0.57	0.62	45.1
6	R2	All MCs	59	1.7	59	1.7	0.535	9.2	LOS A	3.8	28.3	0.62	0.57	0.62	44.6
Approach			487	6.2	487	6.2	0.535	6.2	LOS A	3.8	28.3	0.62	0.57	0.62	45.1
North: Somerville Road (North)															
7	L2	All MCs	168	9.5	168	9.5	0.702	25.5	LOS C	21.1	155.3	0.38	NaN	0.80	36.1
8	T1	All MCs	8	0.0	8	0.0	0.702	24.3	LOS C	21.1	155.3	0.38	NaN	0.80	36.3
9	R2	All MCs	166	3.0	166	3.0	0.702	28.4	LOS C	21.1	155.3	0.38	NaN	0.80	35.9
Approach			342	6.1	342	6.1	0.702	26.9	LOS C	21.1	155.3	0.38	NaN	0.80	36.0
West: Whitford Road (West)															
10	L2	All MCs	214	0.9	214	0.9	0.655	4.2	LOS A	5.9	43.1	0.39	0.45	0.39	45.5
11	T1	All MCs	635	5.7	635	5.7	0.655	3.9	LOS A	5.9	43.1	0.39	0.45	0.39	45.9
12	R2	All MCs	57	0.0	57	0.0	0.655	7.4	LOS A	5.9	43.1	0.39	0.45	0.39	45.4
Approach			906	4.2	906	4.2	0.655	4.2	LOS A	5.9	43.1	0.39	0.45	0.39	45.8
All Vehicles			1768	5.1	1768	5.1	0.702	9.2	LOS A	21.1	155.3	0.46	NaN	0.54	43.3

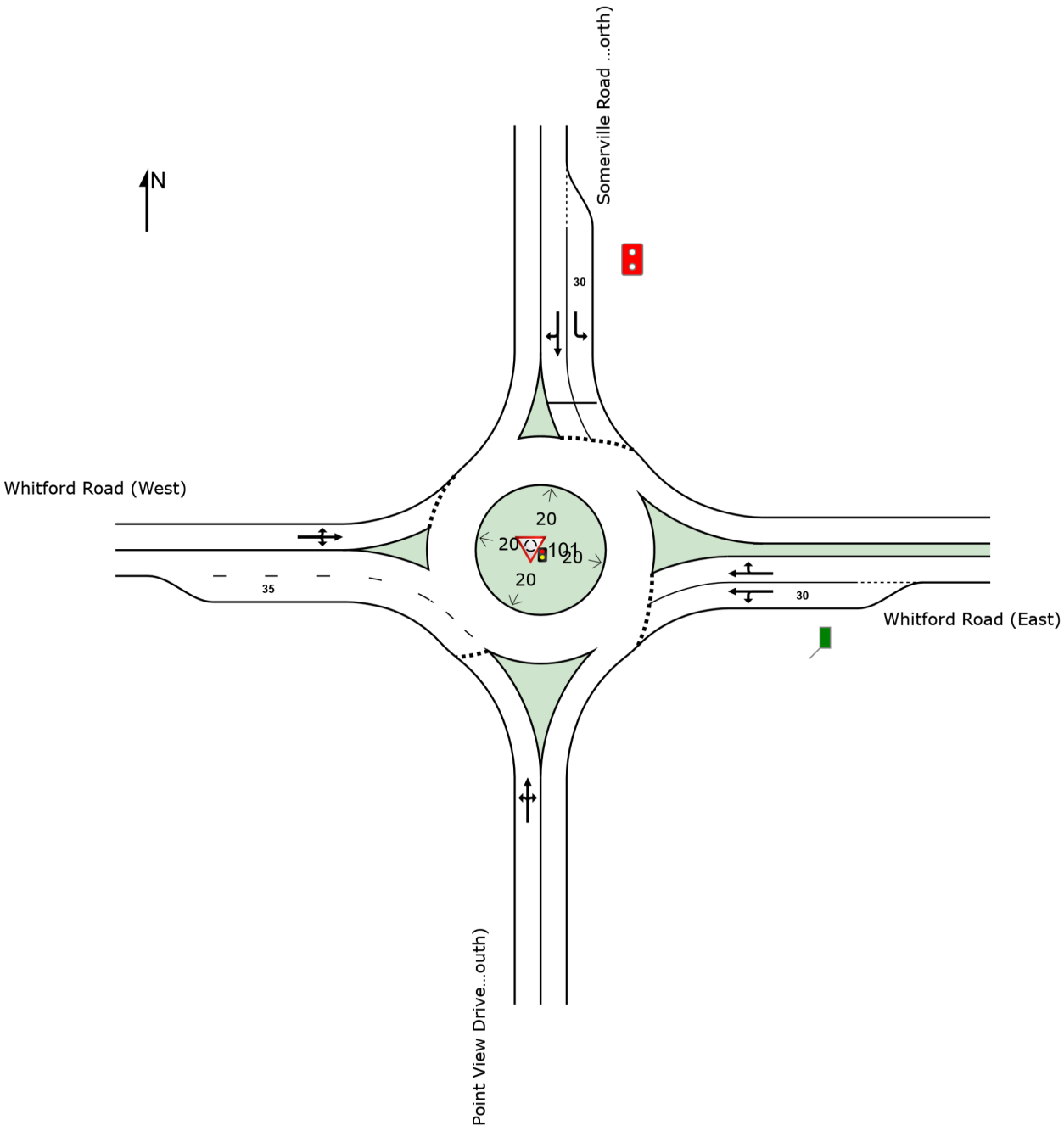
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SITE LAYOUT

Site: 101 [1900HH Somerville Roundabout AM (Site Folder: Somerville Roundabout Upgraded 1900 HH)]

New Site
Site Category: (None)
Roundabout Metering

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: 101 [1900HH Somerville Roundabout AM (Site Folder: Somerville Roundabout Upgraded 1900 HH)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

New Site
Site Category: (None)
Roundabout Metering

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Point View Drive (South)															
1	L2	All MCs	69	1.4	69	1.4	0.293	24.7	LOS C	2.2	15.5	1.00	0.87	1.00	37.3
2	T1	All MCs	12	0.0	12	0.0	0.293	23.5	LOS C	2.2	15.5	1.00	0.87	1.00	37.4
3	R2	All MCs	5	0.0	5	0.0	0.293	28.0	LOS C	2.2	15.5	1.00	0.87	1.00	37.1
Approach			86	1.2	86	1.2	0.293	24.7	LOS C	2.2	15.5	1.00	0.87	1.00	37.3
East: Whitford Road (East)															
4	L2	All MCs	1	0.0	1	0.0	0.246	6.8	LOS A	1.3	9.4	0.57	0.55	0.57	45.4
5	T1	All MCs	801	3.0	801	3.0	0.749	8.3	LOS A	10.4	74.8	0.80	0.72	0.94	44.3
6	R2	All MCs	212	5.7	212	5.7	0.749	13.1	LOS B	10.4	74.8	0.85	0.77	1.04	43.4
Approach			1014	3.6	1014	3.6	0.749	9.3	LOS A	10.4	74.8	0.81	0.73	0.96	44.1
North: Somerville Road (North)															
7	L2	All MCs	105	1.9	105	1.9	0.031	8.9	LOS A	0.0	0.0	-2.29	NaN	-2.29	66.5
8	T1	All MCs	5	0.0	5	0.0	0.366	10.4	LOS B	12.6	88.8	0.37	NaN	0.37	41.5
9	R2	All MCs	313	1.0	313	1.0	0.366	15.1	LOS B	12.6	88.8	0.37	NaN	0.37	41.0
Approach			423	1.2	423	1.2	0.366	13.5	LOS B	12.6	88.8	-0.29	NaN	-0.29	45.2
West: Whitford Road (West)															
10	L2	All MCs	338	1.5	338	1.5	0.610	4.1	LOS A	5.8	41.5	0.71	0.52	0.71	45.4
11	T1	All MCs	328	5.5	328	5.5	0.610	4.1	LOS A	5.8	41.5	0.71	0.52	0.71	45.6
12	R2	All MCs	19	5.3	19	5.3	0.610	8.6	LOS A	5.8	41.5	0.71	0.52	0.71	45.0
Approach			685	3.5	685	3.5	0.610	4.2	LOS A	5.8	41.5	0.71	0.52	0.71	45.5
All Vehicles			2208	3.0	2208	3.0	0.749	9.1	LOS A	12.6	88.8	0.57	NaN	0.64	44.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [1900HH Somerville Roundabout PM (Site Folder: Somerville Roundabout Upgraded 1900 HH)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

New Site
Site Category: (None)
Roundabout Metering

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Point View Drive (South)															
1	L2	All MCs	30	6.7	30	6.7	0.054	7.9	LOS A	0.3	2.4	0.71	0.66	0.71	44.2
2	T1	All MCs	2	50.0	2	50.0	0.054	9.6	LOS A	0.3	2.4	0.71	0.66	0.71	44.3
3	R2	All MCs	6	0.0	6	0.0	0.054	11.8	LOS B	0.3	2.4	0.71	0.66	0.71	44.0
Approach			38	7.9	38	7.9	0.054	8.6	LOS A	0.3	2.4	0.71	0.66	0.71	44.2
East: Whitford Road (East)															
4	L2	All MCs	3	0.0	3	0.0	0.132	5.8	LOS A	0.6	4.3	0.45	0.49	0.45	45.9
5	T1	All MCs	478	6.3	478	6.3	0.402	4.6	LOS A	2.7	19.7	0.51	0.50	0.51	45.8
6	R2	All MCs	71	1.4	71	1.4	0.402	8.8	LOS A	2.7	19.7	0.52	0.50	0.52	45.2
Approach			552	5.6	552	5.6	0.402	5.2	LOS A	2.7	19.7	0.51	0.50	0.51	45.7
North: Somerville Road (North)															
7	L2	All MCs	192	8.3	192	8.3	0.058	4.5	LOS A	0.0	0.0	-1.13	NaN	-1.13	51.2
8	T1	All MCs	8	0.0	8	0.0	0.387	16.0	LOS B	7.4	52.8	0.52	NaN	0.60	39.0
9	R2	All MCs	170	2.9	170	2.9	0.387	20.9	LOS C	7.4	52.8	0.52	NaN	0.60	38.6
Approach			370	5.7	370	5.7	0.387	12.3	LOS B	7.4	52.8	-0.33	NaN	-0.29	44.2
West: Whitford Road (West)															
10	L2	All MCs	219	0.9	219	0.9	0.717	3.5	LOS A	7.7	55.4	0.49	0.42	0.49	45.9
11	T1	All MCs	747	5.0	747	5.0	0.717	3.5	LOS A	7.7	55.4	0.49	0.42	0.49	46.1
12	R2	All MCs	58	0.0	58	0.0	0.717	7.9	LOS A	7.7	55.4	0.49	0.42	0.49	45.6
Approach			1024	3.8	1024	3.8	0.717	3.7	LOS A	7.7	55.4	0.49	0.42	0.49	46.0
All Vehicles			1984	4.7	1984	4.7	0.717	5.8	LOS A	7.7	55.4	0.34	NaN	0.35	45.5

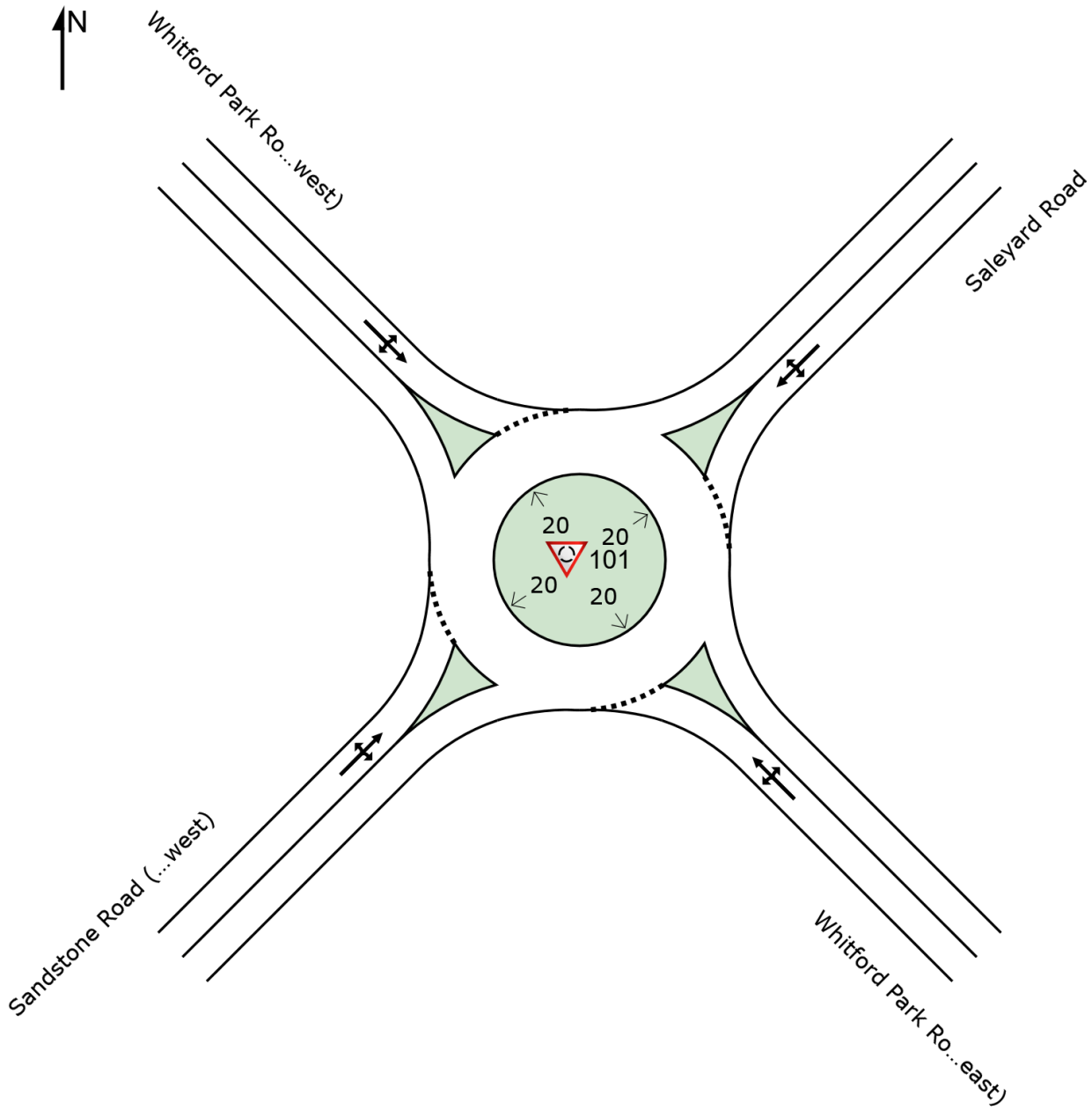
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SITE LAYOUT

Site: 101 [2025 Base Sandstone Roundabout AM (Site Folder: Sandstone Roundabout Existing 2025 Base)]

New Site
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: 101 [2025 Base Sandstone Roundabout AM (Site Folder: Sandstone Roundabout Existing 2025 Base)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
SouthEast: Whitford Park Road (south east)															
4	L2	All MCs	239	5.9	239	5.9	0.807	17.3	LOS B	12.3	90.9	1.00	1.14	1.66	40.0
5	T1	All MCs	392	6.6	392	6.6	0.807	17.3	LOS B	12.3	90.9	1.00	1.14	1.66	40.2
6	R2	All MCs	1	0.0	1	0.0	0.807	21.4	LOS C	12.3	90.9	1.00	1.14	1.66	39.8
Approach			632	6.3	632	6.3	0.807	17.3	LOS B	12.3	90.9	1.00	1.14	1.66	40.1
NorthEast: Saleyard Road															
7	L2	All MCs	2	50.0	2	50.0	0.015	11.6	LOS B	0.1	0.8	0.78	0.68	0.78	41.9
8	T1	All MCs	3	66.7	3	66.7	0.015	12.3	LOS B	0.1	0.8	0.78	0.68	0.78	42.1
9	R2	All MCs	1	0.0	1	0.0	0.015	13.3	LOS B	0.1	0.8	0.78	0.68	0.78	41.9
Approach			6	50.0	6	50.0	0.015	12.2	LOS B	0.1	0.8	0.78	0.68	0.78	42.0
NorthWest: Whitford Park Road (north west)															
10	L2	All MCs	1	0.0	1	0.0	0.593	3.4	LOS A	6.3	45.9	0.41	0.50	0.41	44.8
11	T1	All MCs	254	6.7	254	6.7	0.593	3.4	LOS A	6.3	45.9	0.41	0.50	0.41	45.0
12	R2	All MCs	592	2.9	592	2.9	0.593	7.9	LOS A	6.3	45.9	0.41	0.50	0.41	44.5
Approach			847	4.0	847	4.0	0.593	6.5	LOS A	6.3	45.9	0.41	0.50	0.41	44.6
SouthWest: Sandstone Road (south west)															
1	L2	All MCs	169	13.6	169	13.6	0.283	5.6	LOS A	1.9	14.7	0.68	0.63	0.68	45.1
2	T1	All MCs	2	100.0	2	100.0	0.283	8.1	LOS A	1.9	14.7	0.68	0.63	0.68	44.9
3	R2	All MCs	63	12.7	63	12.7	0.283	10.0	LOS B	1.9	14.7	0.68	0.63	0.68	44.7
Approach			234	14.1	234	14.1	0.283	6.8	LOS A	1.9	14.7	0.68	0.63	0.68	45.0
All Vehicles			1719	6.4	1719	6.4	0.807	10.6	LOS B	12.3	90.9	0.67	0.75	0.91	42.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [2025 Base Sandstone Roundabout PM (Site Folder: Sandstone Roundabout Existing 2025 Base)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
SouthEast: Whitford Park Road (south east)															
4	L2	All MCs	50	6.0	50	6.0	0.310	3.9	LOS A	2.1	14.7	0.44	0.42	0.44	46.1
5	T1	All MCs	319	2.2	319	2.2	0.310	3.8	LOS A	2.1	14.7	0.44	0.42	0.44	46.3
6	R2	All MCs	1	0.0	1	0.0	0.310	8.3	LOS A	2.1	14.7	0.44	0.42	0.44	45.8
Approach			370	2.7	370	2.7	0.310	3.8	LOS A	2.1	14.7	0.44	0.42	0.44	46.3
NorthEast: Saleyard Road															
7	L2	All MCs	2	0.0	2	0.0	0.007	6.4	LOS A	0.0	0.3	0.67	0.58	0.67	44.5
8	T1	All MCs	1	0.0	1	0.0	0.007	6.3	LOS A	0.0	0.3	0.67	0.58	0.67	44.7
9	R2	All MCs	2	0.0	2	0.0	0.007	10.9	LOS B	0.0	0.3	0.67	0.58	0.67	44.1
Approach			5	0.0	5	0.0	0.007	8.2	LOS A	0.0	0.3	0.67	0.58	0.67	44.4
NorthWest: Whitford Park Road (north west)															
10	L2	All MCs	6	16.7	6	16.7	0.431	4.4	LOS A	3.4	24.5	0.54	0.51	0.54	45.1
11	T1	All MCs	328	3.0	328	3.0	0.431	4.1	LOS A	3.4	24.5	0.54	0.51	0.54	45.4
12	R2	All MCs	167	5.4	167	5.4	0.431	8.6	LOS A	3.4	24.5	0.54	0.51	0.54	44.8
Approach			501	4.0	501	4.0	0.431	5.6	LOS A	3.4	24.5	0.54	0.51	0.54	45.2
SouthWest: Sandstone Road (south west)															
1	L2	All MCs	562	0.9	562	0.9	0.702	7.5	LOS A	8.3	58.7	0.82	0.73	0.95	44.2
2	T1	All MCs	1	0.0	1	0.0	0.702	7.4	LOS A	8.3	58.7	0.82	0.73	0.95	44.4
3	R2	All MCs	189	1.6	189	1.6	0.702	12.0	LOS B	8.3	58.7	0.82	0.73	0.95	43.9
Approach			752	1.1	752	1.1	0.702	8.6	LOS A	8.3	58.7	0.82	0.73	0.95	44.1
All Vehicles			1628	2.3	1628	2.3	0.702	6.6	LOS A	8.3	58.7	0.65	0.59	0.71	44.9

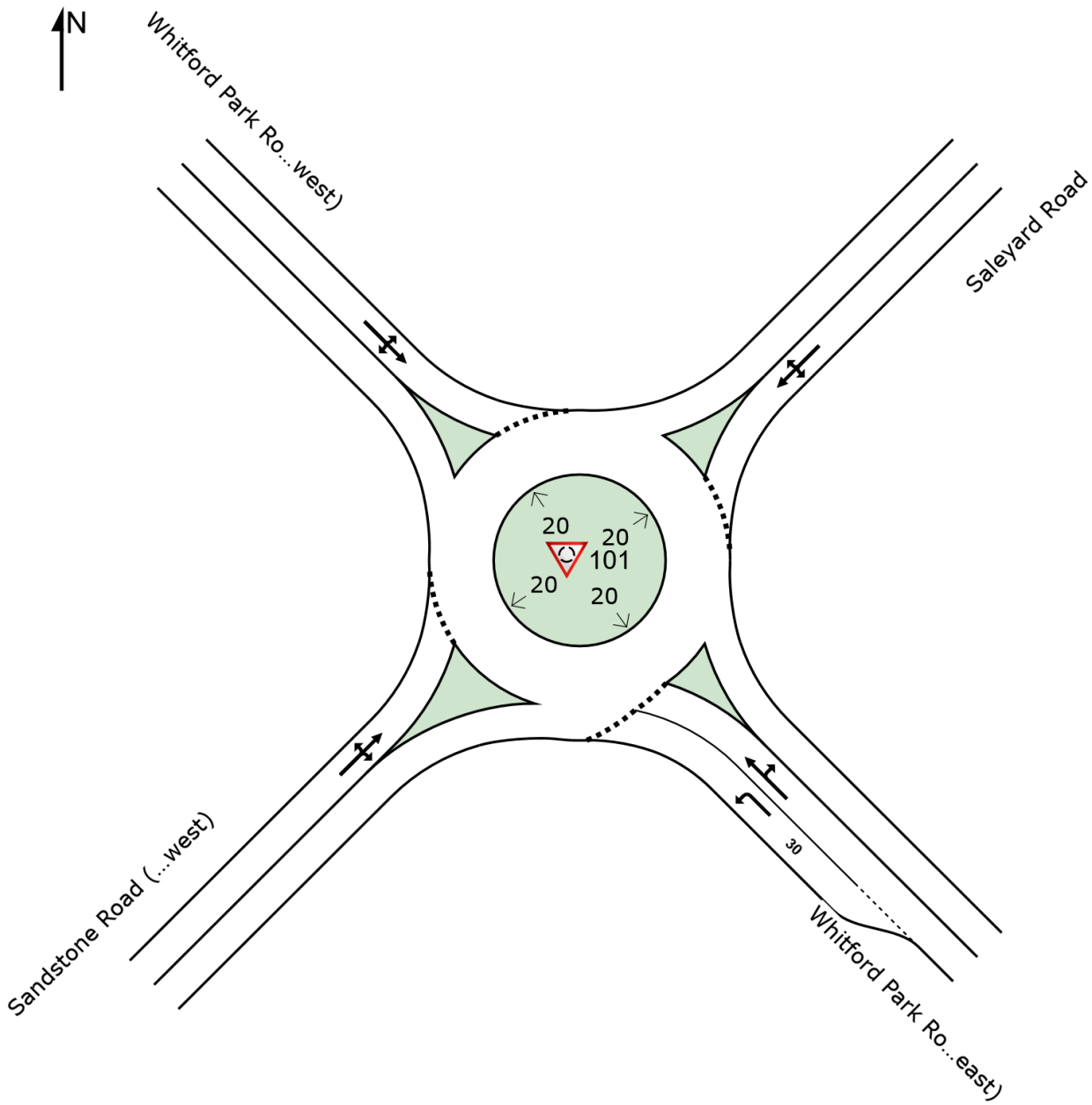
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SITE LAYOUT

Site: 101 [1900 HH Sandstone Roundabout AM (Site Folder: Sandstone Roundabout Upgraded 1900 HH)]

New Site
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: 101 [1900 HH Sandstone Roundabout AM (Site Folder: Sandstone Roundabout Upgraded 1900 HH)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
SouthEast: Whitford Park Road (south east)															
4	L2	All MCs	244	5.7	244	5.7	0.383	9.1	LOS A	2.6	19.3	0.85	0.75	0.86	43.8
5	T1	All MCs	430	6.3	430	6.3	0.515	9.0	LOS A	4.7	34.9	0.91	0.79	1.04	44.2
6	R2	All MCs	1	0.0	1	0.0	0.515	13.3	LOS B	4.7	34.9	0.91	0.79	1.04	43.7
Approach			675	6.1	675	6.1	0.515	9.1	LOS A	4.7	34.9	0.89	0.78	0.97	44.1
NorthEast: Saleyard Road															
7	L2	All MCs	1	0.0	1	0.0	0.016	12.4	LOS B	0.1	0.9	0.88	0.74	0.88	40.5
8	T1	All MCs	1	0.0	1	0.0	0.016	12.4	LOS B	0.1	0.9	0.88	0.74	0.88	40.7
9	R2	All MCs	3	66.7	3	66.7	0.016	21.7	LOS C	0.1	0.9	0.88	0.74	0.88	39.6
Approach			5	40.0	5	40.0	0.016	18.0	LOS B	0.1	0.9	0.88	0.74	0.88	40.0
NorthWest: Whitford Park Road (north west)															
10	L2	All MCs	1	0.0	1	0.0	0.725	3.6	LOS A	10.2	73.7	0.54	0.50	0.54	44.5
11	T1	All MCs	309	5.5	309	5.5	0.725	3.6	LOS A	10.2	73.7	0.54	0.50	0.54	44.7
12	R2	All MCs	738	2.3	738	2.3	0.725	8.1	LOS A	10.2	73.7	0.54	0.50	0.54	44.2
Approach			1048	3.2	1048	3.2	0.725	6.8	LOS A	10.2	73.7	0.54	0.50	0.54	44.3
SouthWest: Sandstone Road (south west)															
1	L2	All MCs	238	10.1	238	10.1	0.373	6.0	LOS A	2.6	20.0	0.73	0.65	0.73	45.1
2	T1	All MCs	2	100.0	2	100.0	0.373	9.0	LOS A	2.6	20.0	0.73	0.65	0.73	44.9
3	R2	All MCs	64	12.5	64	12.5	0.373	10.6	LOS B	2.6	20.0	0.73	0.65	0.73	44.6
Approach			304	11.2	304	11.2	0.373	7.0	LOS A	2.6	20.0	0.73	0.65	0.73	45.0
All Vehicles			2032	5.5	2032	5.5	0.725	7.6	LOS A	10.2	73.7	0.68	0.62	0.71	44.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [1900 HH Sandstone Roundabout PM (Site Folder: Sandstone Roundabout Upgraded 1900 HH)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
SouthEast: Whitford Park Road (south east)															
4	L2	All MCs	51	5.9	51	5.9	0.059	4.6	LOS A	0.3	2.2	0.42	0.50	0.42	46.1
5	T1	All MCs	379	1.8	379	1.8	0.276	3.6	LOS A	1.9	13.2	0.44	0.41	0.44	46.3
6	R2	All MCs	1	0.0	1	0.0	0.276	8.1	LOS A	1.9	13.2	0.44	0.41	0.44	45.7
Approach			431	2.3	431	2.3	0.276	3.8	LOS A	1.9	13.2	0.44	0.42	0.44	46.3
NorthEast: Saleyard Road															
7	L2	All MCs	2	0.0	2	0.0	0.007	7.1	LOS A	0.0	0.3	0.72	0.60	0.72	44.2
8	T1	All MCs	1	0.0	1	0.0	0.007	7.0	LOS A	0.0	0.3	0.72	0.60	0.72	44.4
9	R2	All MCs	2	0.0	2	0.0	0.007	11.5	LOS B	0.0	0.3	0.72	0.60	0.72	43.8
Approach			5	0.0	5	0.0	0.007	8.8	LOS A	0.0	0.3	0.72	0.60	0.72	44.1
NorthWest: Whitford Park Road (north west)															
10	L2	All MCs	6	16.7	6	16.7	0.494	4.6	LOS A	4.3	31.0	0.60	0.53	0.60	44.9
11	T1	All MCs	370	2.7	370	2.7	0.494	4.2	LOS A	4.3	31.0	0.60	0.53	0.60	45.3
12	R2	All MCs	194	4.6	194	4.6	0.494	8.7	LOS A	4.3	31.0	0.60	0.53	0.60	44.7
Approach			570	3.5	570	3.5	0.494	5.7	LOS A	4.3	31.0	0.60	0.53	0.60	45.0
SouthWest: Sandstone Road (south west)															
1	L2	All MCs	668	0.7	668	0.7	0.848	13.3	LOS B	15.6	110.2	1.00	1.01	1.47	41.4
2	T1	All MCs	1	0.0	1	0.0	0.848	13.2	LOS B	15.6	110.2	1.00	1.01	1.47	41.6
3	R2	All MCs	193	1.6	193	1.6	0.848	17.8	LOS B	15.6	110.2	1.00	1.01	1.47	41.1
Approach			862	0.9	862	0.9	0.848	14.3	LOS B	15.6	110.2	1.00	1.01	1.47	41.3
All Vehicles			1868	2.0	1868	2.0	0.848	9.2	LOS A	15.6	110.2	0.75	0.73	0.96	43.5

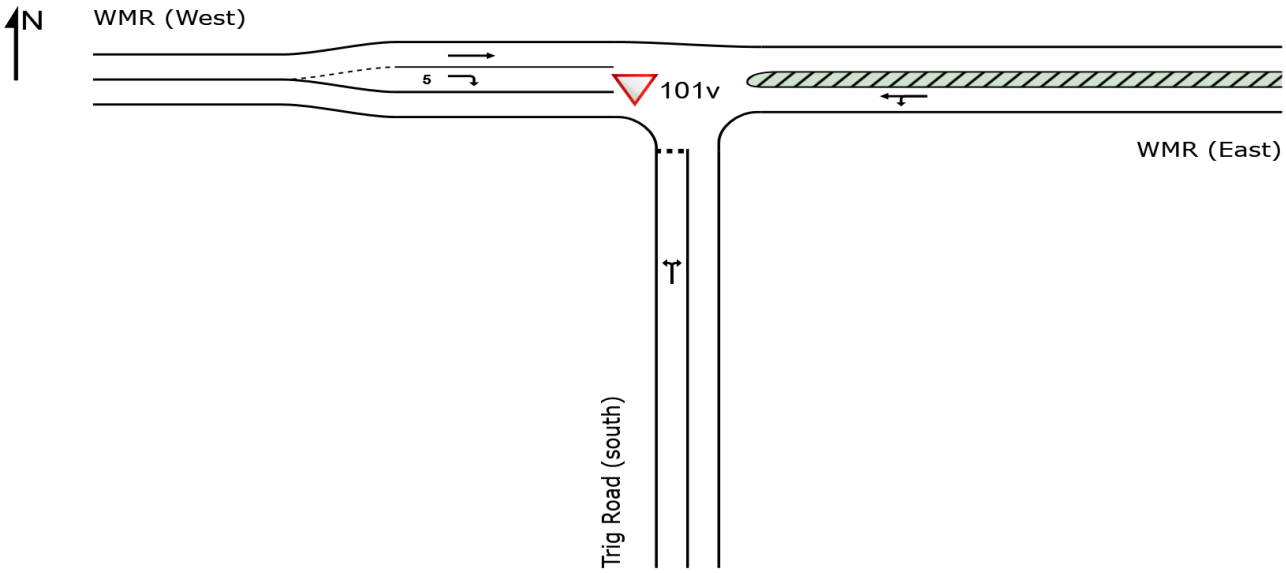
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SITE LAYOUT

Site: 101v [2025 Base HH Trig Road AM (Site Folder: Trig Road / WMR Give Way Existing - 2025 Base)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: 101v [2025 Base HH Trig Road AM (Site Folder: Trig Road / WMR Give Way Existing - 2025 Base)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Trig Road (south)															
1	L2	All MCs	39	10.3	39	10.3	0.438	51.7	LOS F	1.1	8.6	0.94	1.03	1.17	31.6
3	R2	All MCs	1	0.0	1	0.0	0.438	55.1	LOS F	1.1	8.6	0.94	1.03	1.17	31.7
Approach			40	10.0	40	10.0	0.438	51.8	LOS F	1.1	8.6	0.94	1.03	1.17	31.6
East: WMR (East)															
4	L2	All MCs	4	25.0	4	25.0	0.606	6.1	LOS A	0.0	0.0	0.00	0.00	0.00	55.8
5	T1	All MCs	1153	3.1	1153	3.1	0.606	0.3	LOS A	0.0	0.0	0.00	0.00	0.00	59.4
Approach			1157	3.2	1157	3.2	0.606	0.3	NA	0.0	0.0	0.00	0.00	0.00	59.3
West: WMR (West)															
11	T1	All MCs	348	14.9	348	14.9	0.196	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
12	R2	All MCs	17	11.8	17	11.8	0.076	21.6	LOS C	0.2	1.6	0.86	0.94	0.86	42.4
Approach			365	14.8	365	14.8	0.196	1.1	NA	0.2	1.6	0.04	0.04	0.04	58.8
All Vehicles			1562	6.1	1562	6.1	0.606	1.8	NA	1.1	8.6	0.03	0.04	0.04	57.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101v [2025 Base Trig Road PM (Site Folder: Trig Road / WMR Give Way Existing - 2025 Base)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Trig Road (south)															
1	L2	All MCs	12	8.3	12	8.3	0.031	8.6	LOS A	0.1	0.7	0.59	0.73	0.59	42.5
3	R2	All MCs	1	0.0	1	0.0	0.031	38.7	LOS E	0.1	0.7	0.59	0.73	0.59	42.5
Approach			13	7.7	13	7.7	0.031	10.9	LOS B	0.1	0.7	0.59	0.73	0.59	42.5
East: WMR (East)															
4	L2	All MCs	2	50.0	2	50.0	0.278	5.1	LOS A	0.0	0.0	0.00	0.00	0.00	47.9
5	T1	All MCs	512	8.2	512	8.2	0.278	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
Approach			514	8.4	514	8.4	0.278	0.1	NA	0.0	0.0	0.00	0.00	0.00	49.9
West: WMR (West)															
11	T1	All MCs	1004	1.0	1004	1.0	0.518	0.3	LOS A	0.0	0.0	0.00	0.00	0.00	49.6
12	R2	All MCs	21	0.0	21	0.0	0.020	6.6	LOS A	0.1	0.6	0.51	0.63	0.51	44.6
Approach			1025	1.0	1025	1.0	0.518	0.4	NA	0.1	0.6	0.01	0.01	0.01	49.5
All Vehicles			1552	3.5	1552	3.5	0.518	0.4	NA	0.1	0.7	0.01	0.02	0.01	49.6

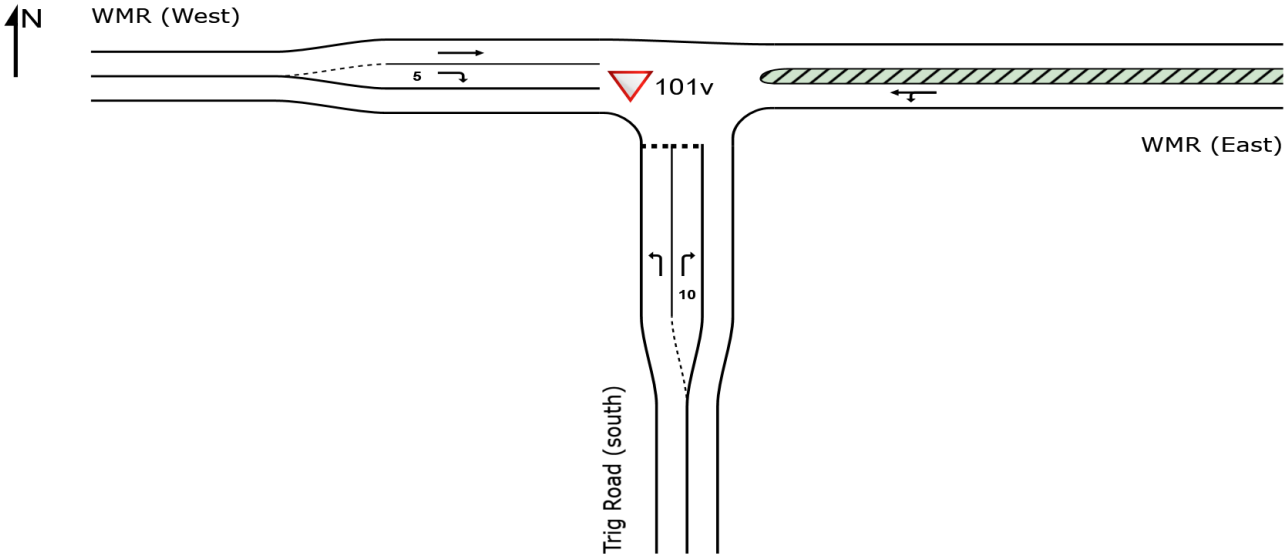
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SITE LAYOUT

Site: 101v [1900 HH Trig Road AM_High_LevelofReduction (Site Folder: Trig Road / WMR Give Way + Acceleration Lane - 1900 HH)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: 101v [1900 HH Trig Road AM_High_LevelofReduction (Site Folder: Trig Road / WMR Give Way + Acceleration Lane - 1900 HH)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Trig Road (south)															
1	L2	All MCs	40	10.0	40	10.0	0.366	41.3	LOS E	0.8	6.1	0.95	1.01	1.10	34.7
3	R2	All MCs	1	0.0	1	0.0	0.021	72.3	LOS F	0.1	0.4	0.97	0.99	0.97	26.8
Approach			41	9.8	41	9.8	0.366	42.0	LOS E	0.8	6.1	0.95	1.01	1.10	34.5
East: WMR (East)															
4	L2	All MCs	4	25.0	4	25.0	0.796	6.5	LOS A	0.0	0.0	0.00	0.00	0.00	55.1
5	T1	All MCs	1524	2.4	1524	2.4	0.796	0.8	LOS A	0.0	0.0	0.00	0.00	0.00	58.4
Approach			1528	2.5	1528	2.5	0.796	0.8	NA	0.0	0.0	0.00	0.00	0.00	58.4
West: WMR (West)															
11	T1	All MCs	524	10.1	524	10.1	0.286	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
12	R2	All MCs	17	11.8	17	11.8	0.163	39.2	LOS E	0.3	2.6	0.94	0.98	0.97	35.3
Approach			541	10.2	541	10.2	0.286	1.3	NA	0.3	2.6	0.03	0.03	0.03	58.5
All Vehicles			2110	4.6	2110	4.6	0.796	1.8	NA	0.8	6.1	0.03	0.03	0.03	57.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
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Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101v [1900 HH Trig Road PM_High_LevelofReduction (Site Folder: Trig Road / WMR Give Way + Acceleration Lane - 1900 HH)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Trig Road (south)															
1	L2	All MCs	12	8.3	12	8.3	0.007	4.6	LOS A	0.0	0.0	0.00	0.53	0.00	45.8
3	R2	All MCs	1	0.0	1	0.0	0.012	43.2	LOS E	0.0	0.2	0.95	0.98	0.95	30.8
Approach			13	7.7	13	7.7	0.012	7.6	LOS A	0.0	0.2	0.07	0.56	0.07	44.2
East: WMR (East)															
4	L2	All MCs	2	50.0	2	50.0	0.321	5.1	LOS A	0.0	0.0	0.00	0.00	0.00	47.8
5	T1	All MCs	615	2.0	615	2.0	0.321	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	49.8
Approach			617	2.1	617	2.1	0.321	0.1	NA	0.0	0.0	0.00	0.00	0.00	49.8
West: WMR (West)															
11	T1	All MCs	1294	0.8	1294	0.8	0.667	0.5	LOS A	0.0	0.0	0.00	0.00	0.00	49.4
12	R2	All MCs	21	0.0	21	0.0	0.020	6.7	LOS A	0.1	0.6	0.53	0.64	0.53	44.7
Approach			1315	0.8	1315	0.8	0.667	0.6	NA	0.1	0.6	0.01	0.01	0.01	49.3
All Vehicles			1945	1.2	1945	1.2	0.667	0.5	NA	0.1	0.6	0.01	0.01	0.01	49.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
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Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Attachment 2: CTMP

HUGHES
TRAFFIC &
TRANSPORTATION

Beachlands South Stage 1

Draft Construction Traffic Management Plan

20 June 2026

Control Page

Hughes Traffic Reference	25010
File name:	25010 Beachlands South Draft Construction Traffic Management Plan (CTMP)
Site Location:	Jack Lachlan Drive, Beachlands
Author:	Paarth Rajpal Transportation Engineer Subconsultant to Hughes Traffic & Transportation Daryl Hughes Director, Hughes Traffic & Transportation 
Reviewed By:	Daryl Hughes Director, Hughes Traffic & Transportation 
Authorised By:	Daryl Hughes Director, Hughes Traffic & Transportation 
Revision No.	1
Document Status:	Final
Date:	24 June 2026

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Contents

1. Introduction

This Framework Construction Traffic Management Plan has been prepared for the Beachlands South Stage 1 development within the 159.58ha of live zoned land located at 110 Jack Lachlan Drive, and 620, 712, 758 and 770 Whitford-Maraetai Road, Beachlands. The Project name is "Beachlands South" and is located approximately 1.5 kilometres south of the existing Beachlands town centre. The Stage 1 area is located within the western half of the existing Formosa Golf Course site, with the remaining eastern portion of the golf course expected to continue operating during the early works period.

The purpose of this CTMP is to describe the expected construction traffic activity associated with the Stage 1 civil works, subdivision servicing, road construction, earthworks completion, and subsequent building activity. The CTMP sets out how construction traffic will access the site, how truck and staff movements will be managed, and what measures will be implemented to minimise adverse traffic effects on Jack Lachlan Drive, Whitford-Maraetai Road, nearby residents, existing golf course users, and the wider Beachlands transport network.

The Beachlands South Precinct provisions require transport effects to be managed in an integrated manner as the precinct develops. In particular, the provisions require consideration of staging, mitigation measures, safe and efficient movement, walking and cycling outcomes, public transport connections, development monitoring, and the operation of Whitford-Maraetai Road. They also require ongoing monitoring at cumulative 500-dwelling thresholds and a safety assessment for Whitford-Maraetai Road between Jack Lachlan Drive and Whitford Village. This CTMP therefore sits within the wider consent implementation framework for the precinct and provides the construction-specific traffic management measures required to manage the temporary effects of the Stage 1 works.

This CTMP has been prepared as a framework document based on the information available at this stage. A contractor-specific detailed CTMP, Site Specific Traffic Management Plan, and any required Corridor Access Request documentation will be prepared prior to construction commencing. These subsequent documents will confirm the final construction programme, daily operating hours, temporary traffic management layouts, site establishment arrangements, signage, contact details, and any short-duration traffic control measures required within the public road corridor.

2. Purpose and Scope

The purpose of this CTMP is to ensure that construction traffic associated with Beachlands South Stage 1 is managed in a way that maintains the safe and efficient operation of the surrounding road network, protects vulnerable road users, and avoids unnecessary disruption to residents, golf course users, and the wider Beachlands community.

The scope of this CTMP includes the Stage 1 civil works and associated building construction activity. The civil works are expected to include site establishment, completion of bulk earthworks-related activities, erosion and sediment control, drainage installation, utility servicing, road formation, pavement construction, landscaping, and associated subdivision infrastructure. The subsequent building phase will involve vertical construction activity within released housing tranches. The civil engineer has advised that building activity will be released in tranches of approximately 50 to 80 houses at any one time, with some overlap between civil works and building activity.

The earlier Earthworks Consent Transportation Assessment confirmed that the Stage 1 earthworks were designed to be cut/fill balanced, with material retained on-site and no bulk off-site disposal of earthworks material anticipated. That is important for this CTMP because it means the project is not expected to generate the high truck volumes normally associated with mass haulage of cut or fill material. The construction traffic effects are therefore primarily associated with staff travelling to/from the site, and deliveries of construction materials and equipment such as concrete, building supplies, and civil infrastructure materials rather than continuous bulk haulage.

This CTMP does not replace the detailed temporary traffic management documentation required before works occur within or adjacent to the public road corridor. All temporary traffic management measures will be designed and implemented by suitably qualified personnel in accordance with the New Zealand Guide to Temporary Traffic Management (NZGTTM) requirements, Auckland Transport requirements, and any project-specific consent conditions.

3. Site Location and Existing Transport Environment

3.1 Existing Road Network

The subject site is located at 110 Jack Lachlan Drive, Beachlands, within the existing Formosa Golf Club landholding. The Stage 1 area is located within the western portion of the wider golf course and has direct access to Jack Lachlan Drive as shown in **Figure 1**. The site is currently largely undeveloped apart from the existing golf course buildings, internal accessways, maintenance areas, and golf course infrastructure.

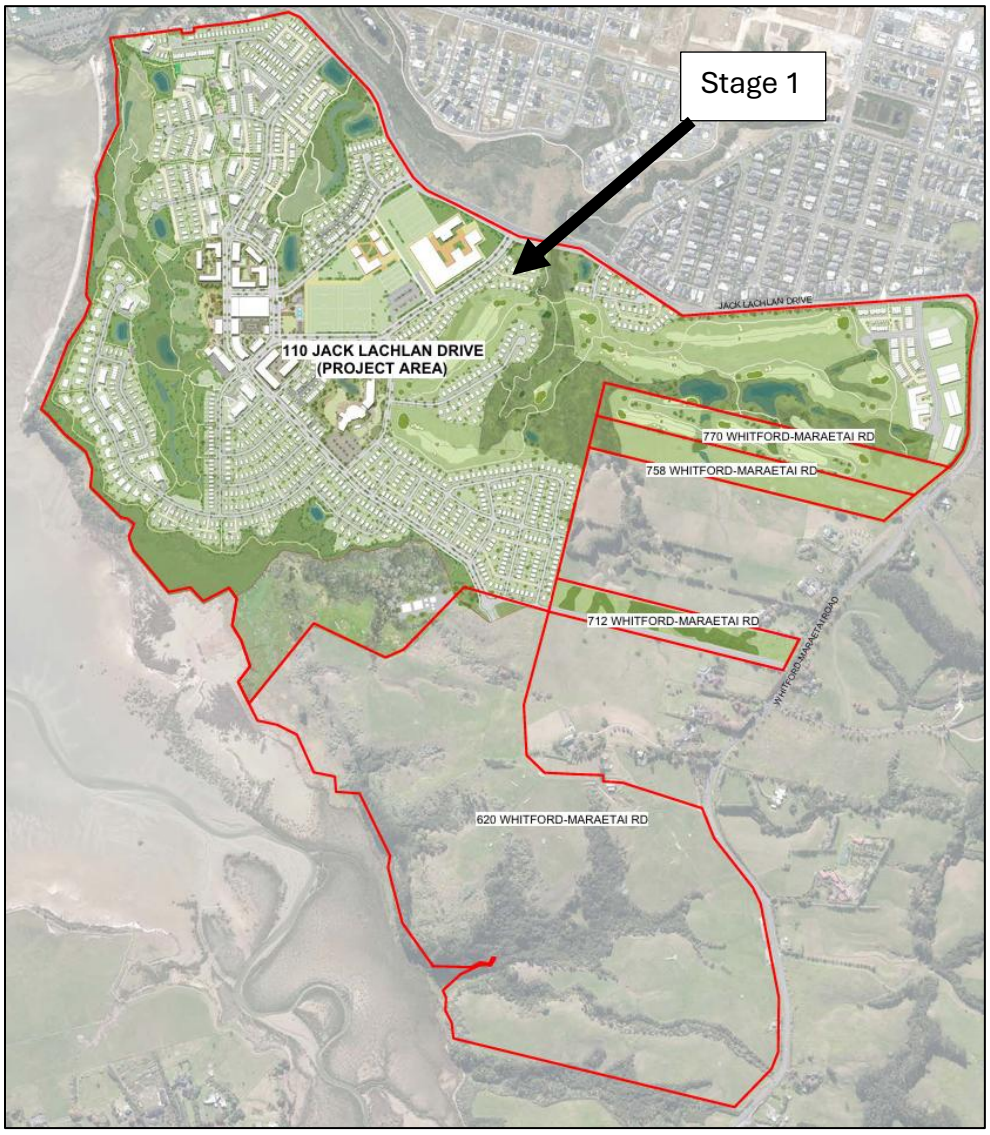

Figure 1: Site Location

The Site is surrounded by Jack Lachlan Drive along its northern boundary, and Whitford – Maraetai Road along its eastern boundary. **Figure 2** below shows the full Site, however this

CTMP only considers traffic effects for construction activities within Stage 1 as identified in Figure 1 above.

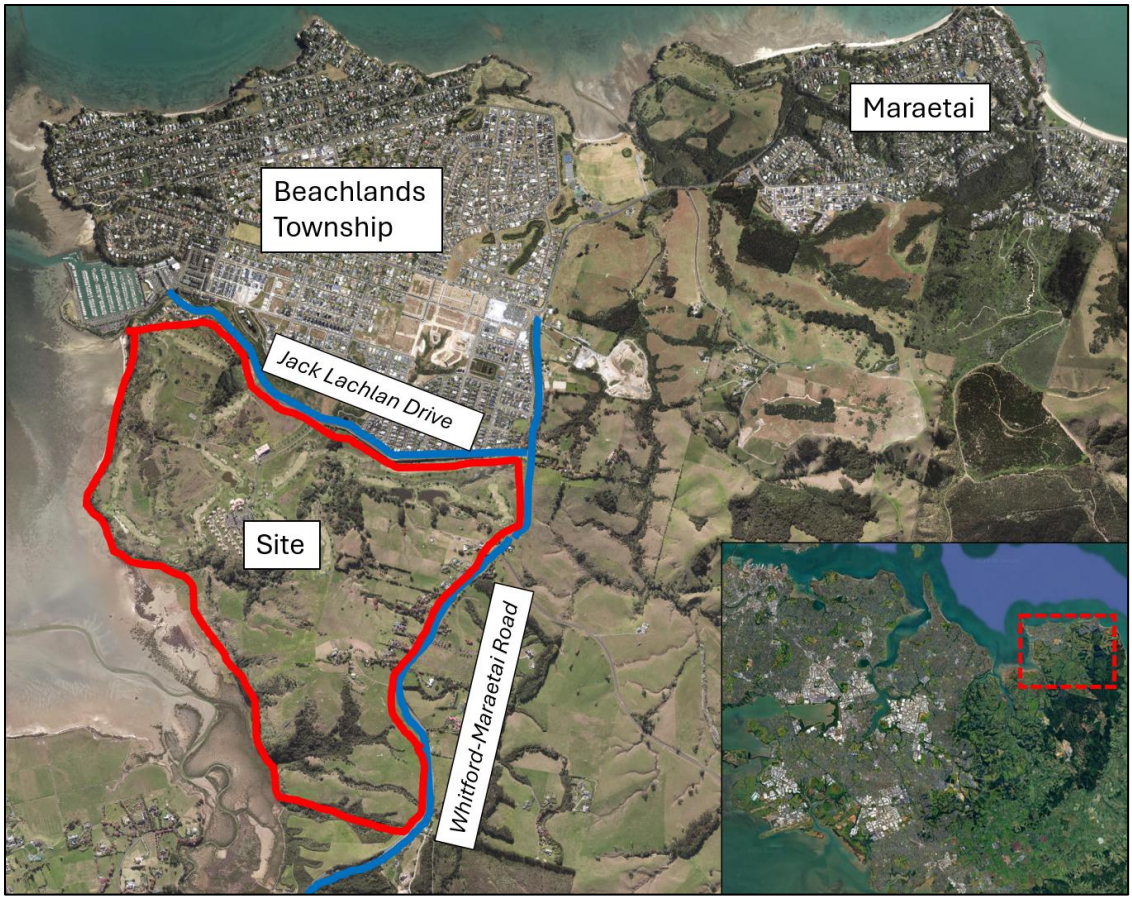

Figure 2: Roading network surrounding the Site

Jack Lachlan Drive is a sealed two-way, two-lane east-west road with a posted speed limit of 60 km/h. Jack Lachlan Drive provides the direct road connection between the Formosa Golf Club site and Whitford-Maraetai Road. Its existing road reserve and carriageway width vary, with some constrained sections at the western end near existing buildings and boat-related activities. The carriageway is generally 6.0 to 6.5 metres wide, with grassed berms and swales along much of its length. It has a semi-rural road character and currently lacks formal pedestrian footpaths and cycle facilities along most of the corridor as shown in **Figure 3** below.

The Earthworks Consent Transportation Assessment identified that Jack Lachlan Drive carries approximately 1,474 vehicles per day (vpd), with an assumed peak hour volume of approximately 150 vehicles per hour (vph). More recent data reports an approximate traffic volume of 2,070vpd resulting in an assumed peak hour volume of 207vph.

Figure 3: Jack Lachlan Drive typical existing cross-section

Whitford-Maraetai Road provides the wider arterial connection between Beachlands, Whitford, Maraetai, and the broader Auckland transport network. It is generally a two-lane, two-way rural arterial road with a winding alignment and limited active mode provision as shown in **Figure 4** below. The road passes through a sequence of constrained rural and village environments, including Whitford Village, before connecting to the more urbanised parts of east Auckland (Botany and Flatbush) via Whitford Road or Whitford Park Road and Sandstone Road. Whitford-Maraetai Road between Jack Lachlan Drive and the Beachlands Road roundabout was recorded as carrying approximately 12,594vpd with a peak hour volume of approximately 1,645vph.

Figure 4: Whitford-Maraetai Road typical existing cross-section

3.2 Active mode facilities

The local road network currently has limited active mode provision. Jack Lachlan Drive only provides a gravel footpath on the northern side of the road corridor between Kahawairahi Drive and Whitford-Maraetai Road, and no cycle facilities along the corridor. Whitford-Maraetai Road provides a short footpath on the northern/western ride of the corridor between the BP Petrol Station and Pohutukawa Park.

Pedestrian and cyclist movements are constrained along both corridors due to the rural-style road formation and informal shoulders along the road corridor. Active mode connectivity is expected to improve along Jack Lachlan Drive over time as the Beachlands South Precinct is urbanised. A sealed footpath, and grade separated bi-directional cycleway will be provided on the southern side of Jack Lachlan Drive. However, during the early Stage 1 construction period, construction traffic management will need to recognise that pedestrians and cyclists may still be present within the corridor in an informal manner.

3.3 Public Transport

Public transport services do not currently operate along Jack Lachlan Drive (except for the short section between Mahutonga Avenue and Whitford-Maraetai Road). The nearest public transport services are located within the Beachlands town centre, with bus routes connecting Pine Harbour to Maraetai via bus route #738, and Maraetai to Botany via bus route #739. A ferry service also operates between Pine Harbour and Auckland CBD Ferry

terminal. Despite the available public transport facilities, given the location of the Site, and the need for construction workers to carry their own tools, construction staff travel is expected to be predominantly by private vehicle, although carpooling will be encouraged where practicable.

4. Construction Access Arrangements

The Stage 1 works will utilise the access arrangements identified in the Earthworks Consent Transportation Assessment. For ease of reference, these access locations are also provided in **Figure 5** below.

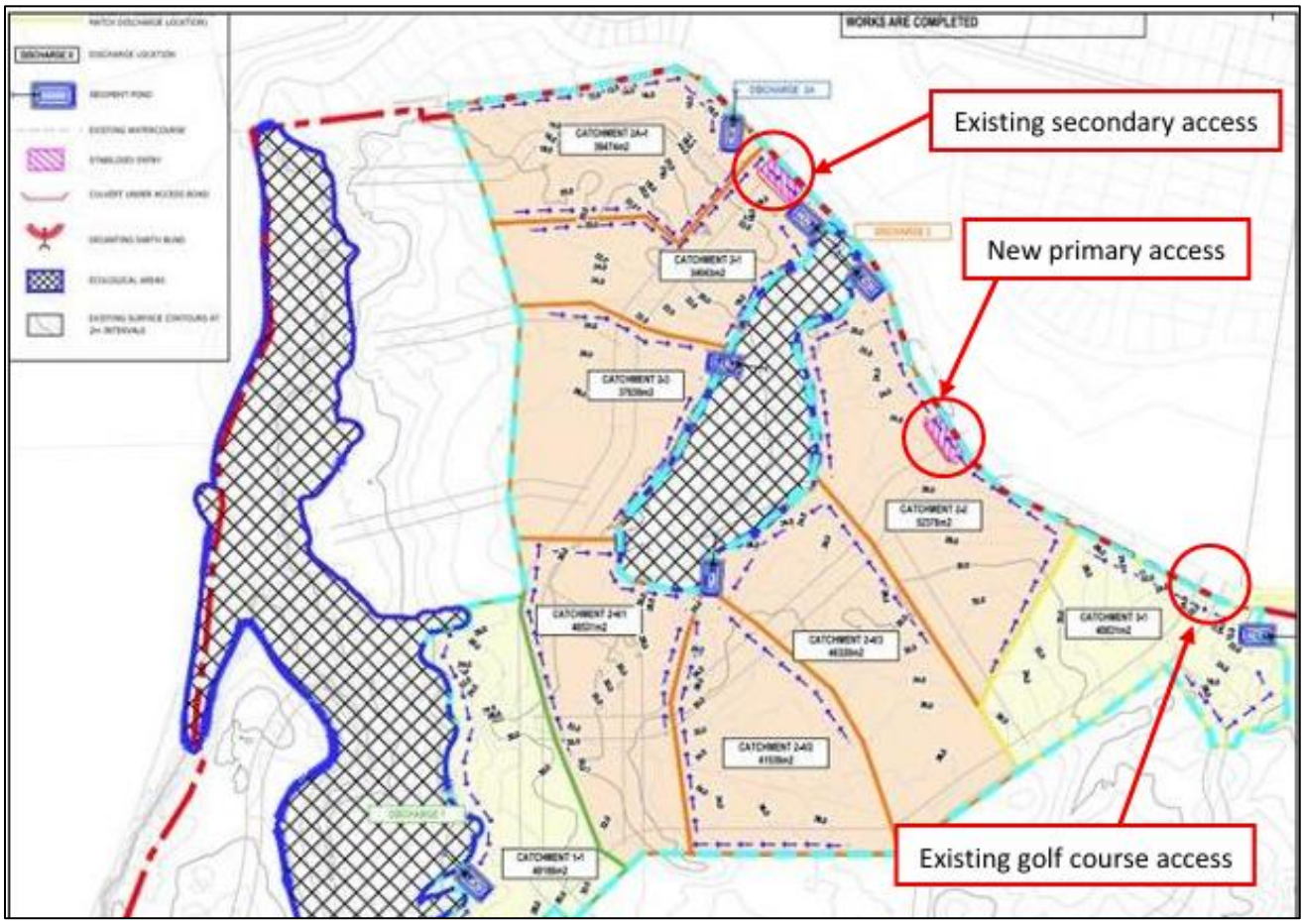

Figure 5: Proposed Construction Access Locations

As shown, primary construction vehicular access will be provided from Jack Lachlan Drive near the existing vehicle crossing and accessway currently serving the Formosa Golf Club resort. This location has been selected as it minimises conflicts with existing traffic and is located on the outside bend of Jack Lachlan Drive, therefore maximising sight distances for vehicles entering/exiting the construction site. It should be noted the existing golf course

access will remain separate from the primary construction access. This separation is important because it allows golf course patrons, staff and service vehicles to be managed independently from construction traffic. Construction vehicles will not use the existing golf course patron access unless specifically authorised by the site manager for exceptional circumstances.

A secondary access is available at the northern portion of the site, adjacent to the existing maintenance shed entrance, and is intended for low-volume use by light vehicles and occasional deliveries of construction materials.

The primary construction access will be formed to accommodate heavy commercial vehicles, including truck-and-trailer combinations where required. The access will be designed and maintained to provide sufficient width, pavement strength, and turning space so that trucks do not track over the berm, cross the centreline unnecessarily, or queue on Jack Lachlan Drive while waiting to enter the site. The Earthworks Consent Transportation Assessment confirmed that the primary access will be subject to final detailed design and vehicle tracking to accommodate HCV movements, with the treatment to be confirmed through the CTMP process.

All construction vehicles will enter and exit the site in a forward direction. Internal turning and manoeuvring areas will be provided within the site so that reversing movements do not occur on Jack Lachlan Drive from either of the two accesses. A laydown and loading area will be provided within the site, and larger vehicles will be directed to the appropriate internal work area by the site manager or traffic controller where required. The earlier assessment noted that laydown areas are expected to include sufficient space for HCV manoeuvring, loading, temporary equipment storage, and a wheel wash facility.

The primary access sight distance assessment undertaken for the earthworks consent confirmed that the access achieved more than 200 metres visibility to the south and approximately 149 metres to the north, satisfying the relevant Austroads Safe Intersection Sight Distance requirements for the 60 km/h environment. The secondary access was also assessed as achieving appropriate visibility subject to tree trimming and maintenance. The contractor will be required to maintain vegetation and sight lines at all active construction accesses throughout the construction period.

5. Truck Routing Plan

As shown in Figure 6 below, construction truck and workers travelling to site will generally travel via Whitford-Maraetai Road and Jack Lachlan Drive. All construction related traffic travelling to the site from the wider Auckland network will be directed to use Whitford-

Maraetai Road and then turn into Jack Lachlan Drive before entering the site via the designated primary construction access (shown in orange). The same route will be used in reverse for outbound truck movements (shown in purple), unless a specific alternative route is approved by the project manager and Auckland Transport. It is possible that a small percentage of construction workers residing within Beachlands or Maraetai townships will travel to the site using either the internal residential streets or Maraetai Drive.

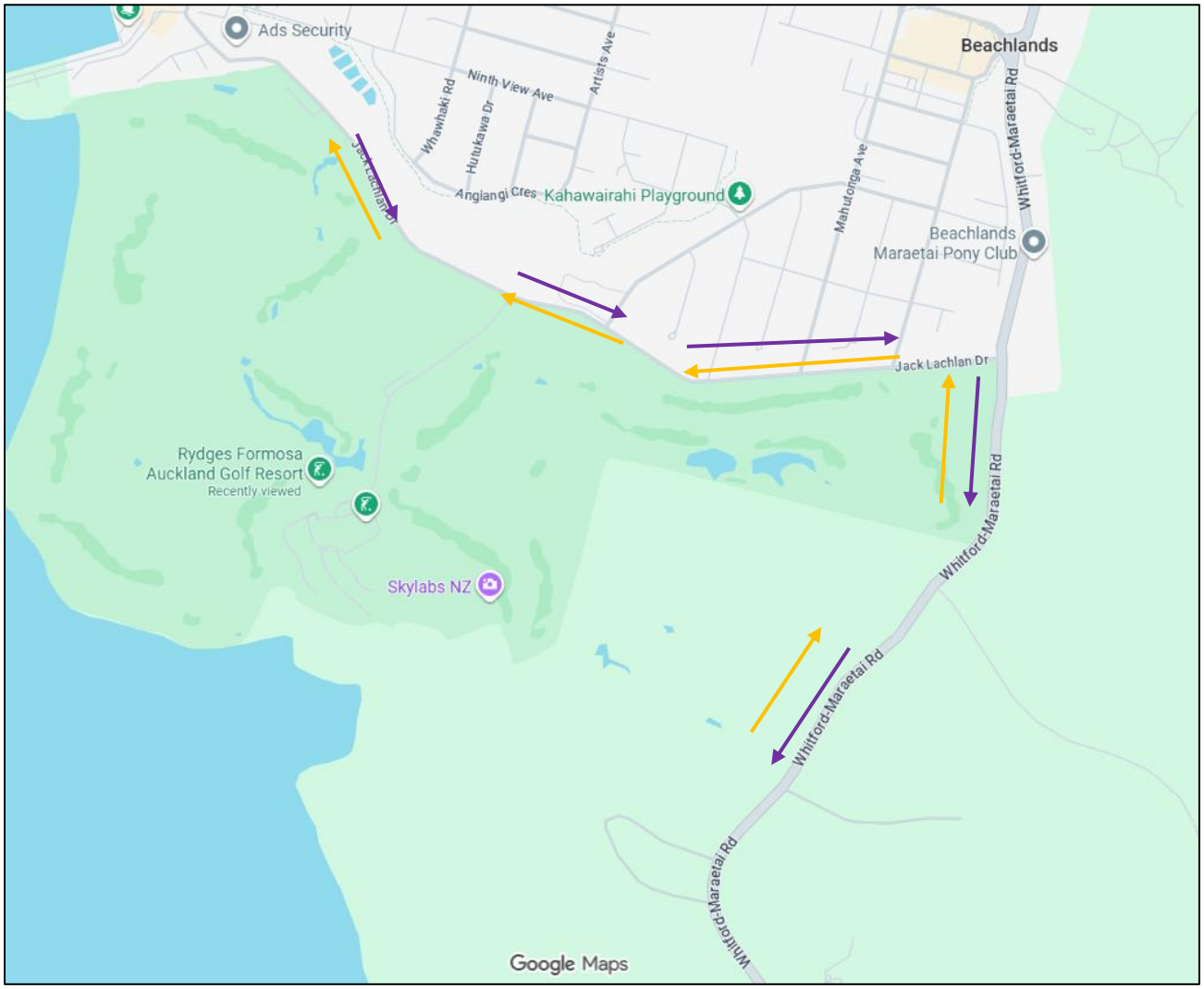

Figure 6: Truck Routing Plan

The use of Jack Lachlan Drive and Whitford-Maraetai Road is appropriate given these roads provide the most direct practical connection between the site and the wider Auckland Transport network. It is expected that most of the deliveries and construction workers will travel to the site from the south or west, making Whitford-Maraetai Road and Jack Lachlan Drive the direct, and only feasible route to travel to the site. The Earthworks Consent

Transportation Assessment similarly identified that Jack Lachlan Drive connects with Whitford-Maraetai Road to join the wider road network and that the use of Whitford-Maraetai Road is appropriate given the lack of other viable routes to the site.

Truck drivers will be instructed not to use local residential streets within Beachlands as informal shortcuts. In particular, construction trucks will be required to remain on the nominated route (being Jack Lachlan Drive and Whitford-Maraetai Road) and avoid circulating through the local Beachlands residential street network unless required for a specific delivery destination unrelated to the Stage 1 works. The procured contractor will be responsible for briefing all delivery drivers and suppliers on the approved route before they travel to/from the site.

Truck movements will be distributed across the working day as far as practicable. The project will not involve continuous bulk earthworks haulage because the landform has been designed to be cut/fill neutral and the earlier earthworks assessment confirmed that all material will be retained on-site. Truck activity will therefore be intermittent and associated mainly with deliveries of construction materials, plant, civil infrastructure, and other building supplies.

Where possible, heavy vehicle deliveries will be scheduled outside the busiest commuter periods on Whitford-Maraetai Road. This is particularly relevant because the key commuter traffic pressure on the external network is understood to be outbound from Beachlands in the weekday morning peaks and inbound towards Beachlands township in the weekday afternoon peak. Civil construction staff will generally travel in the opposite direction to these dominant flows, arriving at the Beachlands South site in the morning and departing in the afternoon. Accordingly, although staff movements will add vehicles to the network, they will not generally coincide with the dominant commuter direction.

6. Construction Traffic Generation

Traffic generation associated with the Stage 1 construction activities has been estimated using information provided by the civil engineers. It is expected a maximum of 100 construction employees will be working per day during the busiest construction times of the Stage 1 development. The expected peak truck demand is approximately 40 trucks travelling to/from the site per day, resulting in a total of 80 heavy vehicle movements per day.

For the residential building phase, the engineer has advised that for each 10 houses under construction, approximately 20 staff per day and 2 trucks per day are expected. On the basis that “2 trucks per day” is interpreted consistently with the civil advice as 2 trucks

entering and 2 trucks exiting, each 10-house package would generate approximately 20 staff arrivals and 20 staff departures per day, plus 2 truck arrivals and 2 truck departures per day.

The civil engineer has advised that building works will be released in tranches of approximately 50 to 80 houses at any one time, with some overlap. On that basis, one active building tranche would generate approximately 100 to 160 staff per day and approximately 10 to 16 trucks travelling to/from the site per day. When combined with the peak civil works activity, a concurrent civil works and one-tranche building period would generate approximately 200 to 260 staff on-site per day and approximately 50 to 56 trucks entering and 50 to 56 trucks exiting per day.

Where two building tranches overlap, the total number of employees working on the site would increase to approximately 200 to 320 staff per day and approximately 20 to 32 trucks travelling to/from the site per day. In the highly unlikely scenario, where civil works, and two tranches of 80 houses each are under construction at the same time, the combined peak would be approximately 300 to 420 staff per day and approximately 60 to 72 trucks travelling to/from the site per day. This is considered a conservative upper-range scenario and is unlikely to occur for extended periods, as the most intensive civil works and most intensive building works are generally expected to be managed through staged release of work areas.

For clarity, the estimated daily construction traffic generation is summarised below with the most conservative scenario reported in the last row and highlighted in green.

Construction activity	Staff on-site per day	Truck arrivals per day	Truck departures per day	Total truck movements per day
Civil works peak	100	40	40	80
Building works, 50-house tranche	100	10	10	20
Building works, 80-house tranche	160	16	16	32
Civil works plus one 50-house tranche	200	50	50	100
Civil works plus one 80-house tranche	260	56	56	112
Civil works plus two overlapping 50-house tranches	300	60	60	120
Civil works plus two overlapping 80-house tranches	420	72	72	144

The above staff figures should be treated as attendance number rather than necessarily individual vehicle arrivals, because some staff are expected to carpool in private vehicles

or travel to/from the site using trade vehicles or company vans. For traffic assessment purposes, it is conservative to assume that staff attendance may generally correspond to staff vehicle arrivals and departures, although carpooling will be encouraged wherever possible.

Construction staff in New Zealand typically travel outside of general commuting peak hours, arriving to site between 7:00 to 7:30AM, and departing site between 3:30 to 4:00PM. This means staff traffic will tend to arrive before the peak of school and commuter activity and depart before the busiest inbound commuter period to Beachlands. Additionally, as stated above, the dominant commuter pattern on Whitford-Maraetai Road is understood to be outbound from Beachlands during the AM peak and inbound towards Beachlands township during the PM peak. Construction staff will generally travel in the reverse direction, reducing the potential for direct conflict with the most constrained peak-direction traffic movements.

Truck movements will generally occur throughout the working day and will not be concentrated into a single peak hour. Even under the conservative 72-truck-arrival upper scenario, spreading truck activity across an assumed 9-hour construction day would result in an average of approximately eight trucks travelling to and from the site each hour. This level of heavy vehicle activity is not expected to materially affect the capacity of Jack Lachlan Drive or Whitford-Maraetai Road, particularly given the absence of mass earthworks haulage and the ability to manage deliveries efficiently within the site.

7. Staff Parking and Site Logistics

Vehicle parking for construction employees will be accommodated within the existing golf club car park which provides approximately 200 parking spaces. This is the most appropriate arrangement because it eliminates the need for employees to park their vehicles on Jack Lachlan Drive or surrounding residential streets which would adversely affect residents in proximity of the site. The prohibition of on-street staff parking will be included in site induction material and subcontractor briefings. The site manager will monitor compliance and will require any incorrectly parked vehicles to be moved immediately.

Given the golf club will remain partially open for the duration of the Stage 1 construction works, the car park will be actively managed by the contractor so that employee parking remains clear of active golf course patron areas. Given the carpark provides approximately 200 parking spaces which significantly exceeds employee numbers even during peak construction periods, the contractor will identify specific parts of the golf club car park for

construction employees usage. Usage of the on-site carpark will also allow the contractor to manage staff arrivals, inductions, and internal site access from within the site boundary rather than relying on the public road corridor.

Additionally, the contractor will identify a walking route between the staff parking area, site office, induction area, and active work zones. Where staff are required to walk through or near areas used by golf course patrons, the contractor will provide appropriate separation, signage, or supervision to limit any adverse effects on visitors/users of the golf course. A construction compound will be established within the site. The compound will include, as required, site offices, staff amenities, storage, laydown areas, first aid facilities, waste management areas, internal vehicle circulation, and any wheel wash or stabilised access treatment required to prevent debris tracking onto Jack Lachlan Drive. Loading and unloading will occur within the site and not on the public road.

8. Traffic Management Measures

The contractor will prepare detailed temporary traffic management documentation before works commence. The detailed traffic management documentation will identify the final construction access layouts, temporary warning signage, advance notice requirements, traffic control measures, and any temporary restrictions required during specific activities.

The CTMP measures will be based on maintaining two-way traffic on Jack Lachlan Drive wherever practicable. Given the nature of the works and the availability of internal space within the site, routine construction activity is expected to be managed without lane closures on Jack Lachlan Drive. Temporary traffic control may be required for discrete activities such as access construction, service connections, oversized plant delivery, pavement tie-ins, or works in close proximity of the road corridor. Any such works will be subject to an Activity Specific Traffic Management Plan and Auckland Transport approvals where required.

Construction access points will be clearly signed and delineated. Advance warning signage will be provided where required to alert drivers to construction vehicles entering and exiting the site. Access gates will be set back from Jack Lachlan Drive so that trucks can stand clear of the live traffic lane while gates are being opened or while drivers are being checked in. Gate operations will be managed so that trucks do not queue back onto Jack Lachlan Drive.

The contractor will be responsible to maintain the road surface in a clean and safe condition. Stabilised access surfacing, wheel wash facilities, street sweeping, or other sediment control measures will be provided as required to prevent mud, aggregate, or

construction debris being tracked onto Jack Lachlan Drive. Any material deposited on the public road will be removed promptly.

Pedestrian and cyclist safety will be actively managed, even though formal footpaths and cycle facilities are not currently provided along Jack Lachlan Drive. Drivers will be briefed to expect occasional pedestrians, cyclists, golf course users, and recreational users in the vicinity of the site. Truck drivers will be required to enter and exit slowly, give way to vulnerable road users, and comply with any temporary traffic controller instructions.

9. Safety Assessment and Mitigation

The road safety assessment section in the Earthworks Consent Transportation Assessment identified two reported non-injury crashes within the Jack Lachlan Drive study area over the five-year period reviewed (between 2020-2025). The assessment concluded that the crashes were due to driver error rather than a specific road safety deficiency associated with the site. It also identified low collective and low personal risk ratings for Jack Lachlan Drive and Whitford-Maraetai Road south of Jack Lachlan Drive.

The principal construction traffic safety risks are not therefore related to an existing crash pattern, but to the temporary introduction of construction vehicles into a semi-rural road environment with limited active mode facilities. The key risks are vehicles slowing or turning into the site, trucks exiting onto Jack Lachlan Drive, interaction between trucks and cyclists or pedestrians, mud tracking onto the road, and driver unfamiliarity with the access locations.

These risks will be mitigated through a combination of access design, route control, driver induction, signage, site supervision, and monitoring. The primary access has been selected and assessed on the basis of suitable and compliant visibility. As stated above, vegetation and sight lines will be maintained throughout the period of works. Construction vehicles will enter and exit the site in a forward direction, and internal laydown areas will ensure that loading, unloading, and all vehicle manoeuvring occurs within the site, and there is no queuing, or reversing onto the public road corridor.

The contractor will prepare and maintain a driver induction procedure for all regular truck drivers and suppliers. The induction will identify the approved route, site access protocol, speed expectations, parking restrictions, delivery booking requirements, and the requirement to avoid residential shortcuts. Drivers will be reminded that Jack Lachlan Drive has a semi-rural character, narrow shoulders, no formal footpaths, and potential vulnerable road users.

The wider Beachlands South precinct provisions require future monitoring of Whitford-Maraetai Road safety between Jack Lachlan Drive and Whitford Village as development progresses. While that monitoring is a precinct-level requirement rather than a construction-only measure, this CTMP supports the same safety objective by ensuring that construction traffic is routed, managed and monitored in a manner that does not create additional risk on Whitford-Maraetai Road.

10. Communication and Signage Plan

The contractor will establish a communication process before construction begins. This will include identifying a site contact person responsible for receiving and responding to construction traffic queries or complaints. The contact details will be displayed at the site entrance and provided to Auckland Council, Auckland Transport, and other relevant stakeholders as required.

Advance notices will be provided to nearby residents, golf course operators, and other affected parties before construction commences. The notice will identify the expected construction start date, general working hours, access arrangements, truck route, expected types of construction vehicles, and the contact person for enquiries. Further notices will be provided before any activities that are likely to create short-duration disruption, such as oversized deliveries, temporary traffic control, access works, or service connections.

Construction access signage will be installed at the primary site entrance. Signs will be clear, professional and maintained in good condition. The signage will identify the construction access, direct visitors and deliveries to report to the site office, and discourage unauthorised entry. Where required, temporary warning signs will be installed on Jack Lachlan Drive in accordance with the approved temporary traffic management plan.

Communication with Auckland Transport will be maintained for any works affecting the public road corridor. Corridor Access Requests will be lodged where required, and the contractor will comply with all conditions attached to approvals. Any incidents affecting the public road, including mud tracking, damage, queuing, or near misses, will be recorded and addressed through the contractor's site management procedures.

11. Monitoring and Compliance

The contractor will be responsible for monitoring compliance with this CTMP and the detailed CTMP once prepared. The site manager will undertake regular checks of the construction access, signage, staff parking, truck routing, and the cleanliness of Jack Lachlan Drive. Any non-compliance will be recorded and corrective action will be implemented promptly.

Daily monitoring will include checking that trucks are using the approved route, that staff are parking within the golf club car park or other approved on-site parking area, that no vehicles are queuing on Jack Lachlan Drive, and that the road surface remains clean and safe at all times. The site manager will also monitor whether truck arrivals are becoming concentrated at particular times and will accordingly adjust delivery scheduling where required.

A complaints register will be maintained for traffic-related matters. The register will record the date, time, nature of complaint, person responsible for investigating it, outcome, and any corrective action taken. Where a complaint relates to public road safety or the operation of the road corridor, Auckland Transport will be notified where required.

The CTMP will be reviewed if construction methodology changes materially, if truck volumes exceed the assessed levels for a sustained period, if an access location changes, or if a road safety issue is identified,. The CTMP will remain a live document throughout the duration of the Stage 1 works.

12. Construction Programme and Logistics

The Earthworks Consent Transportation Assessment assumed that the Stage 1 earthworks would occur within a single earthworks season from approximately 1 October 2025 to 30 April 2026, subject to weather and ground conditions. Subsequent civil works and building construction will occur progressively as development areas are released.

The Stage 1 works are expected to proceed through site establishment, completion of earthworks-related activities, civil infrastructure works, road construction, utility installation, landscaping, subdivision release, and residential building works. The detailed programme will be confirmed by the contractor and civil engineer before construction commences.

The exact hours of work are to be confirmed. The Earthworks Consent Transportation Assessment identified earthworks hours of 7:30am to 6:00pm Monday to Saturday, with no

works on Sundays or public holidays. For this CTMP, those hours should be treated as the starting assumption unless amended by consent conditions or contractor methodology.

Construction deliveries will be managed through the site manager. Regular suppliers will be advised of the approved route and delivery protocol. Deliveries will be scheduled to avoid unnecessary clustering and to ensure that the site has sufficient capacity to receive trucks without queuing on Jack Lachlan Drive. Oversized or unusual deliveries will be planned separately and, where necessary, will be subject to temporary traffic control.

The staging and logistics approach will be coordinated with the ongoing use of the eastern portion of the golf course where relevant. Separation will be maintained between construction operations and golf course operations. The contractor will manage internal haul roads, staff parking, pedestrian routes, and delivery areas so that construction activity does not create avoidable conflict with golf course users.

13. Mitigation Summary

The construction traffic effects of Beachlands South Stage 1 will be managed through the following measures:

- Construction trucks will use the nominated route via Whitford-Maraetai Road and Jack Lachlan Drive.
- Trucks will not use local Beachlands residential streets as shortcuts.
- The primary construction access will be formed to accommodate HCV movements and will be maintained with suitable sight lines for the duration of the Stage 1 construction works.
- All construction vehicles will enter and exit the site in a forward direction.
- Staff parking will be accommodated within the large existing golf club car park.
- No staff parking will be permitted on Jack Lachlan Drive.
- Truck arrivals will be scheduled and distributed across the working day where practicable.
- Deliveries will be managed so that trucks do not queue on Jack Lachlan Drive.
- Wheel wash, stabilised access, sweeping, or equivalent measures will be used to prevent mud and debris tracking onto Jack Lachlan Drive.
- Temporary traffic management will be designed and implemented by suitably qualified personnel.
- Advance communication will be provided to nearby residents, golf course operators, and relevant stakeholders prior to commencement of construction.

- A complaints register and monitoring process will be maintained throughout construction.

14. Conclusion

This Framework CTMP has been prepared to manage the construction traffic effects associated with Beachlands South Stage 1 site at 110 Jack Lachlan Drive, Beachlands. The Stage 1 works will use the same construction access strategy identified in the Earthworks Consent Transportation Assessment, with the primary construction access from Jack Lachlan Drive and a secondary low-volume access near the existing maintenance shed entrance also on Jack Lachlan Drive. The existing golf course access will remain separate from the construction accesses.

The project is not expected to generate mass earthworks haulage because the Stage 1 landform has been designed to be neutral, with cut and fill balanced on-site. Heavy vehicle movements will therefore largely be associated with civil works, and deliveries of plant, materials, services, and building materials rather than continuous bulk haulage. The expected peak truck activity ranges from approximately 80 heavy vehicle movements per day for civil works alone to approximately 100 to 112 heavy vehicle movements per day where civil works overlap with one active residential building tranche. A higher short-duration scenario of approximately 120 to 144 heavy vehicle movements per day could occur if two building tranches overlap with peak civil works, although this is considered highly conservative and would be managed through delivery scheduling.

Staff parking will be accommodated within the existing golf club car park and will not require parking on Jack Lachlan Drive. Staff arrival and departure patterns are expected to occur early in the morning and mid-afternoon, which will generally avoid the most constrained commuter periods. Staff movements will also generally be in the reverse direction to the dominant Beachlands commuter flows on Whitford-Maraetai Road.

With the implementation of the measures set out in this CTMP, including defined truck routing, on-site staff parking, managed access, internal loading and turning, driver induction, temporary traffic management, monitoring, and communication with affected parties, the Stage 1 construction works can be undertaken without creating significant adverse effects on the safety or efficiency of Jack Lachlan Drive, Whitford-Maraetai Road, or the wider Beachlands transport network.

Hughes Traffic & Transportation Limited