INTEGRATED TRANSPORT ASSESSMENT
BEACHLANDS SOUTH

PREPARED FOR BEACHLANDS SOUTH LIMITED PARTNERSHIP | MARCH 2022

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Revision Schedule

Rev No	Date	Description	Signature of Typed Name (documentation on file)			
A	15/06/2021	Draft	H Papps	D Hughes	D Hughes	D Hughes
B	01/11/2021	Final	H Papps	D Hughes	D Hughes	B Harries
C	16/12/2021	Final V2	H Papps	D Hughes	D Hughes	B Harries
D	23/12/2021	Final V3	H Papps	D Hughes	D Hughes	B Harries
E	23/03/2022	Final V4	D Hughes	D Hughes	D Hughes	B Harries

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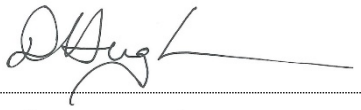
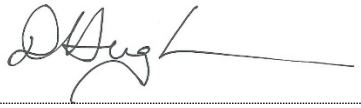
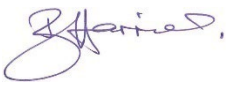
CHECKED BY Daryl Hughes		23 / 12 / 2021
REVIEWED BY Daryl Hughes		23 / 03 / 2022
APPROVED FOR ISSUE BY Brett Harries		23 / 03 / 2021

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Executive Summary

Stantec has been commissioned by Beachlands South Limited Partnership (**The Partnership**) to prepare an Integrated Transport Assessment (**ITA**) as part of the Private Plan Change request. The Plan Change will allow developments to occur on The Partnership land to the timing and scale that The Partnership envisages in order to fulfil the full target development, that is sustainable and appropriate to the existing infrastructure and future infrastructure already committed. This ITA assesses the traffic effects of the proposed development enabled by the live zoning proposed by the Private Plan Change in the next few decades. It also assesses the ability of the surrounding existing and future road network to accommodate the development and identifies further required transportation infrastructure to support the development potential of the Plan Change area.

The wider Beachlands area, located approximately 35km east of Auckland's City Centre, accommodates countryside living properties which are serviced by small coastal town centres, such as the existing Beachlands settlement and Maraetai. Beachlands South comprises approximately 307ha of predominantly rural land and is located immediately south of the existing Beachlands settlement.

Whitford-Maraetai Road, an arterial road, provides the main vehicular route to / from the Beachlands area and limited bus services are provided. Road safety issues have been identified along Whitford-Maraetai Road and reduced speed limitations have recently been enforced. A ferry route from the Beachlands Pine Harbour terminal to the Auckland City Centre is already well established as part of the wider Auckland ferry network.

The Beachlands area is currently heavily reliant on private vehicles with approximately 80% of trips for work and education being completed by private vehicle. Only 1% of trips are completed by bus but 6% of trips are completed by ferry. This is a higher than average vehicular and ferry mode share compared to the rest of Auckland but a much lower bus and train mode share.

According to census data, the majority of people leaving Beachlands for work travel to/from East Tāmaki, Auckland Airport and Penrose (a combined 30%), whilst only 8% travel to the Auckland City Centre. However, 86% of those work trips to the city centre are completed by ferry. As 25% of Auckland's jobs are located in the Wāitematā Local Board area, the number of commuters to the Auckland city centre (and city centre fringes) are anticipated to increase. Therefore, the ferry patronage and demand is only likely to increase in the future.

The Partnership are proposing to rezone the land in Beachlands South through a Plan Change to enable development to occur. The Plan Change area includes provision for a Village Centre (with general retail), a commercial area / innovation hub, a light industrial area, a school for years 7-13, a retirement village, a golf course, residential development of between 2,900 – 3,900 households and community facilities. Other supporting developments such as a hotel/conference centre, parks and plazas, and parking are also being proposed.

The proximity and accessibility to the Pine Harbour Ferry terminal as well as the magnitude and density of development enables Beachlands South to be realised as a Transit Oriented Community (TOC) – a form of high-density development which capitalises on public transport availability and achieves the optimum levels of land use-transportation integration.

As part of the development strategy, a live zoned area is proposed for the northern section of the Plan Change area, with the remaining southern area is proposed to be rezoned as Future Urban Zone (FUZ).

This staged approach balances the existing surrounding rural characteristics with the roading infrastructure required to enable the proposed development and considers alignment with the wider Auckland Plan. This strategy aims to deliver good land use and transport outcomes, by creating densities that are supportive of public transport in coordination with other roading infrastructure upgrades.

The proposed Plan Change would likely double the existing amount of traffic demand on the existing network and major growth in both population and employment are expected. This is likely to lead to an increased demand in trips into and out of the city centre from Pine Harbour, as supported by the Hobsonville Point case study, and thus an increase in ferry trips.

However, the existing network (roading and ferry) is under capacity and does not sufficiently meet demands. The existing ferry terminal location and marine conditions place constraints on vessel size and capacity, meaning that passengers are currently getting left behind. With this level of development, and the anticipated increase in trips to the city centre, Beachlands South has the unique opportunity to invest in an already established ferry network to meet future growth demands, reduce the reliance on cars and adhere to government strategy.

In general, the Plan Change is highly supportive of mode shifts, primarily through its proximity to the Pine Harbour Ferry Terminal. Further, in terms of the provision of local transport infrastructure upgrades, the Plan Change has taken a conscientious approach in ensuring that the upgrades are provided in a sustainable manner, that does not take away from the opportunity for the network operational performance to create circumstances conducive to public transport uptake.

It is proposed to expand and improve on the existing ferry network to enable increased capacity, increased frequency, and improved customer Level of Service (**LoS**). These interventions encourage a mode shift from private vehicles to public transport by offering a viable and attractive alternative. The interventions proposed help support the future ferry patronage forecasted based on the census data. This means that no passenger should be left behind.

Comprehensive and conservative traffic modelling has been undertaken for the next three decades (up to 2051) which focused on determining how Beachlands South can be accommodated on the surrounding network in the future. The modelling provides indication of when and what specific upgrades are required based on the anticipated future network and development, as outlined in the table below. Based on the modelling, it is considered that the Plan Change can be supported from a traffic perspective and is unlikely to have a significant adverse effect on the traffic network, provided that the transport infrastructure required to support the live zoning is implemented in accordance with the timeframes/triggers identified in this report.

This ITA report concludes that the Plan Change will enable a development form and scale that appropriately responds to its coastal location and mutually supportive of land use and transport infrastructure integration. The table below sets out the proposed development staging alongside infrastructure upgrade progression.

Column 1 **Land use enabled within the area identified on Precinct Plan 6 by transport infrastructure in column 2,**		**Column 2** **Transport infrastructure required to enable activities or subdivision in column 1**
(a)	Up to a maximum of 250 dwellings or residential lots	Site (A) on Figure 35: Upgrade of Whitford Maraetai Road / Jack Lachlan Drive intersection to traffic signals; and Site (D) on Figure 35: Upgrade of Whitford Park Road / Whitford Road / Whitford Maraetai Road roundabout to a double roundabout
(b)	A provision of: i. More than 250 and up to 550 dwellings or residential lots; ii. Up to 3,500m^2 light industrial GFA;	Provision for an additional capacity of 100 ferry passengers (total capacity of 600 passengers) from Pine Harbour during the two-hour peak period between 0645 -0845 on weekdays; and
(c)	A provision of: i. More than 550 and up to 820 dwellings or residential lots; ii. More than 3,500m^2 and up to 5,700m^2 light industrial GFA; iii. Up to 400m^2 retail GFA; and iv. Up to 1,100m^2 commercial GFA.	Provision for an additional capacity of 200 ferry passengers (total capacity of 700 passengers) from Pine Harbour Ferry Terminal during the two-hour peak period between 0645 -0845 on weekdays; and Site (B) on Figure 35: Provision of an additional 30m left-turn approach lane on the northbound approach to the Whitford Park Road / Saleyard Road / Sandstone Road roundabout.
(d)	A provision of: i. More than 820 and up to 1,900 dwellings or residential lots; ii. More than 5,700m^2 and up to 12,300m^2 light industrial GFA; iii. More than 400m^2 and up to 2,100m^2 retail GFA; and	Provision for an additional capacity of 400 ferry passengers (total capacity of 900 passengers) from Pine Harbour during the two-hour peak period between 0645 -0845 on weekdays; and

Column 1 Land use enabled within the area identified on Precinct Plan 6 by transport infrastructure in column 2,		Column 2 Transport infrastructure required to enable activities or subdivision in column 1
	iv. More than 1,100m^2 and up 3,300m^2 commercial GFA.	Site (C) on Figure 35: Upgrade to Trig Road (south) intersection.
(e)	A provision of: i. More than 1,900 and up to 2,918 dwellings or residential lots; ii. More than 12,300m^2 and up to 18,000m^2 light industrial GFA; iii. More than 2,100m^2 and up to 5,700m^2 retail GFA; and iv. More than 3,300m^2 and up to 5,100m^2 commercial GFA.	Provision for an additional capacity of 650 passengers (total capacity of 1150 passengers) from Pine Harbour during the two-hour peak period between 0645 -0845 on weekdays.

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1 Introduction

Stantec has been commissioned by Beachlands South Limited Partnership (**Partnership**) to prepare an Integrated Transport Assessment (**ITA**) as part of a Private Plan Change. The Plan Change will allow developments to occur to the timing and scale that the Partnership envisages in order to fulfil the full target development, that is sustainable and appropriate to the existing infrastructure and future infrastructure already committed.

The Partnership are proposing to rezone the land in Beachlands South through a Plan Change to enable development to occur. The Plan Change area includes provision for a Village Centre (with general retail), a commercial area / innovation hub, a light industrial area, a school for years 7-13, a retirement village, a golf course, residential development of between 2,900 – 3,900 households and community facilities. Other supporting developments such as a hotel/conference centre, parks and plazas, and parking are also being proposed.

As part of the development strategy, The Partnership proposes a live zoned area in the northern section of the Plan Change Area, with the remaining southern area is proposed to be rezoned as Future Urban Zone (FUZ). The Live Zoned area is anticipated to be completed by 2038, whilst the long term fully developed FUZ is targeted for completion in 2051. A further plan change will be required to rezone the FUZ and the traffic implications of that rezoning will be fully assessed at that time.

This ITA assesses the traffic effects of the proposed development within the Plan Change area focusing on the effects of the development that will be enabled by the live zoning. It also assesses the ability of the surrounding existing and future road network to accommodate the development and identifies further required transportation infrastructure to support the development potential of the Plan Change area as a whole.

2 Existing Environment

2.1 Plan Change Area Location

The wider Beachlands area, located approximately 35km east of Auckland's Central Business District (**CBD**), currently accommodates countryside living properties which are serviced by small coastal town centres, such as Beachlands and Maraetai. Beachlands South comprises approximately 307ha of predominantly rural land and is located immediately south of the existing Beachlands settlement.

Figure 1 shows the Plan Change area in relation to the surrounding area. The extent of land that Beachlands South Limited Partnership owns is outlined in red (110 Jack Lachlan Drive, 620 and 712 Whitford Maraetai Road), whilst the third-party properties are shown in blue (722-770 Whitford-Maraetai Road) and green (680-702 Whitford-Maraetai Road).

The Plan Change area is bounded by Jack Lachlan Drive to the north, Whitford-Maraetai Road to the east and south and the coast to the west. Pine Harbour Marina is located approximately 350m northwest of the Plan Change area, at the entrance to Hauraki Gulf, and provides services to/from Pine Harbour and the Auckland CBD.

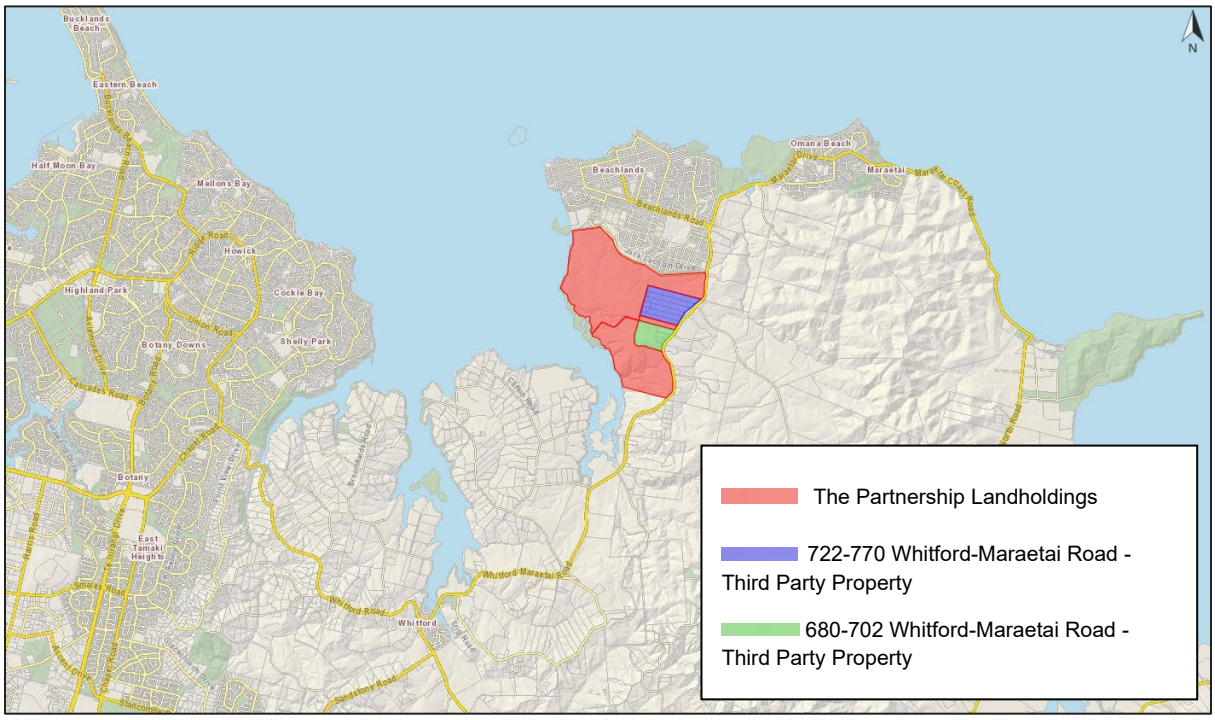


Figure 1: Plan Change Area Location (as highlighted in context with the local Road Network). (Source: Auckland GeoMaps)

2.2 Existing Planning Context

The Plan Change Area is currently zoned Countryside Living Zone (**CLZ**), under the Auckland Unitary Plan – Operative in Part (**Unitary Plan**) as shown in **Figure 2**. The majority of the surrounding land is also zoned CLZ, with the existing Beachlands settlement primarily zoned Residential – Single House Zone, under the Unitary Plan.

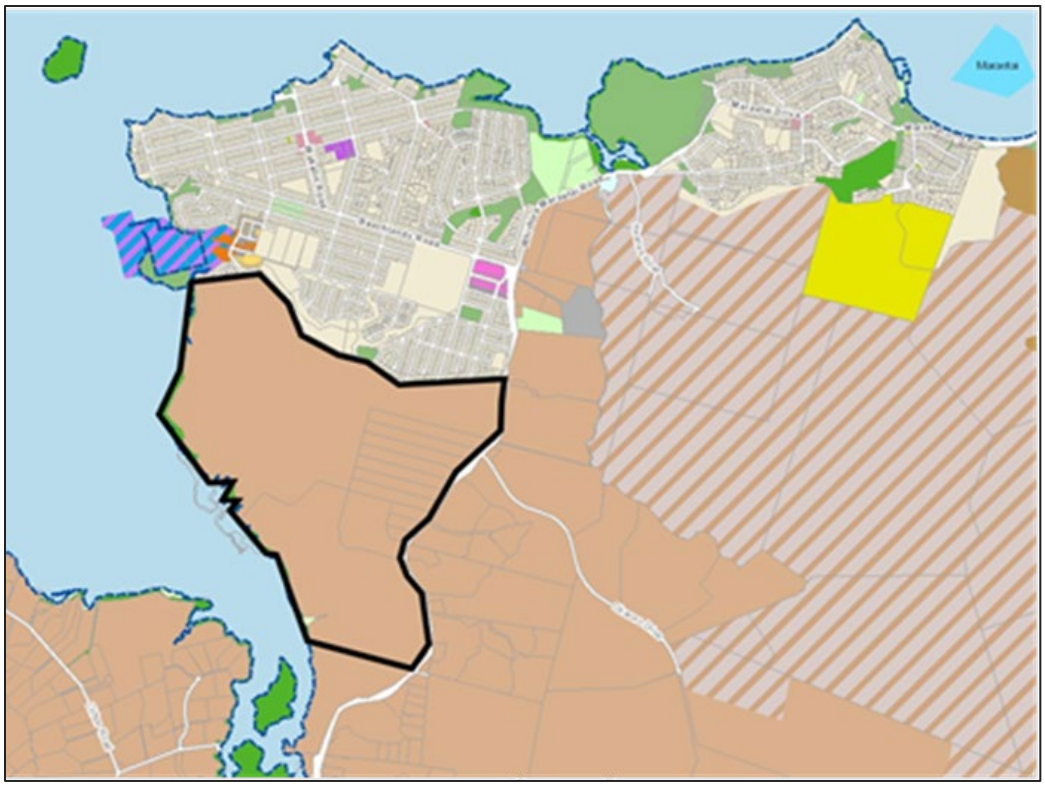


Figure 2: Plan Change Area currently zoned Countryside Living Zone. (Source: Auckland Unitary Plan.)

2.3 Existing Land Use

2.3.1 Demographics

The predominant existing land use, within the proposed Plan Change area consists of an existing 18-hole golf course (Rydges Formosa Golf Resort) and a scattering of countryside living properties. Beachlands (located north of Jack Lachlan Drive) includes low density dwellings, small scale retail (including a supermarket) and a primary school (Beachlands School). Maraetai also contains a primary school (Maraetai Beach School), however, no secondary or tertiary education facilities are located within the area.

To understand the existing land use and transport environment, data from the 2018 New Zealand Census (**Census**) was assessed. The areas relevant to the proposed Plan Change were summarised into three groups: (1) Sunkist Bay, (2) Te Puru and (3) Maraetai. These three areas are shown in **Figure 3** below and are referred to as the "Beachlands area" in the sub-sections follow.

Figure 3: Existing Land Use in the Area (source: Google Maps)

The existing land use composition in Beachlands area is summarised in **Table 1** according to the Census data.

Table 1: Land Use – Existing in Beachlands Area

Land Use	Sunkist Bay	Te Puru	Maraetai	Total
Population (2018 Census Usual Residents)	3,207	3,054	2,346	**8,607**
Employment (2018 Employment by Workplace Address)	525	573	366	**1,464**
Dwellings (2018 Census occupied and unoccupied)	1167	1149	954	**3,270**

Although there are no secondary schools located within the Beachlands area, there are two secondary schools within Beachlands school zone[1]: Howick College and Sancta Maria College. A summary of the schools within zone, their type and number of students are summarised in Table 2 below.

Table 2: Schools within the Beachlands area school zone

School Name	Type	No. Students
Howick College	Secondary (Year 9-15)	2099
Sancta Maria College	Secondary (Year 7-15)	1053
Beachlands School (primarily Sunkist Bay and Te Puru)	Full Primary	663
Maraetai Beach School (primarily Maraetai)	Full Primary	436
Our Lady Star of the Sea School	Contributing	432

As indicated by the large discrepancy between population and employment count, the majority of residents work outside of these three areas. This means that residents would have to travel to other suburbs during commute peaks. Moreover, while there are two schools in the area, they are both primary schools and the nearest high school is in Sommerville (Howick College). Ormiston College is not included as it is not located within the Beachlands school zone

The median age for Beachlands is between 30 and 64 years old, which indicates an older adult demographic in the area. A breakdown of ages, per area, is shown in **Figure 4**.

[1] According to the Ministry of Education source: https://www.educationcounts.govt.nz/find-school

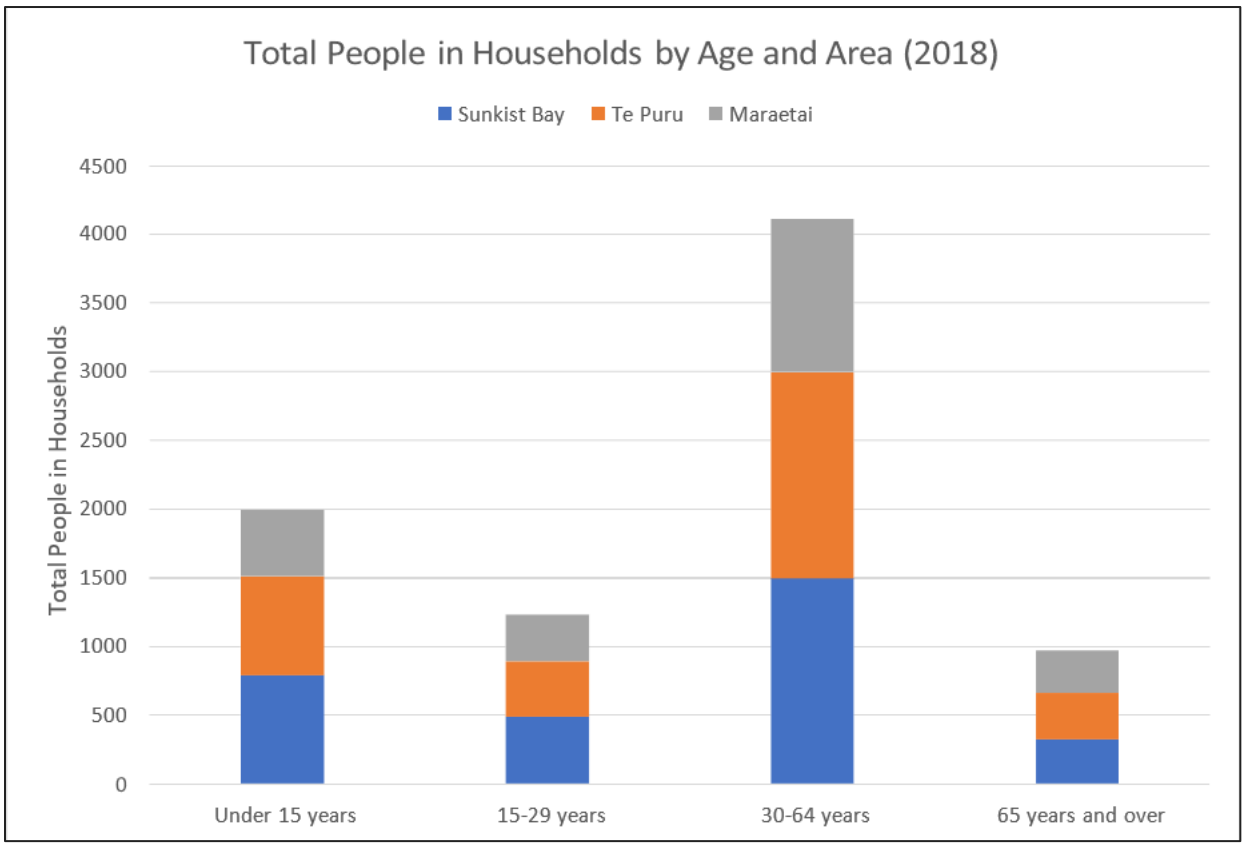


Figure 4: Total households by age and area (source: Stats NZ)

2.3.2 Mode Share and Traffic Distribution

To further understand existing travel patterns, the Census data and Commuter Waka app were used to determine the mode share and where the trips were going to and coming from in relation to the Beachlands area.

The table below compares the mode share for the Beachlands area against the Auckland regional average.

Table 3: Mode Share – Existing in Beachlands Area vs. Auckland Regional Average

Main means of mode for travel to work (2018 Census)	Beachlands Area	Auckland Region
Car, truck, or van (private or company, driver, or passenger)	80%	74%
Public bus	1%	7%
Train	0%	3%
Ferry	6%	1%
Active modes (walking, jogging or cycling)	2%	5%
Other (including working from home)	11%	10%

As indicated in the table, Beachlands area has a higher than average vehicular and ferry mode share, but a much lower bus and train mode share. This reflects the low level of bus service – with a single hourly bus service to Botany, and the long distance (26 km) to the nearest railway station at Panmure.

The figures below are extracted from the Commuter Waka app, where the darker the red, the more people were observed travelling from the Beachlands area (highlighted in green) to the area for either work or education purpose.

Journey to Work

Journey to Education

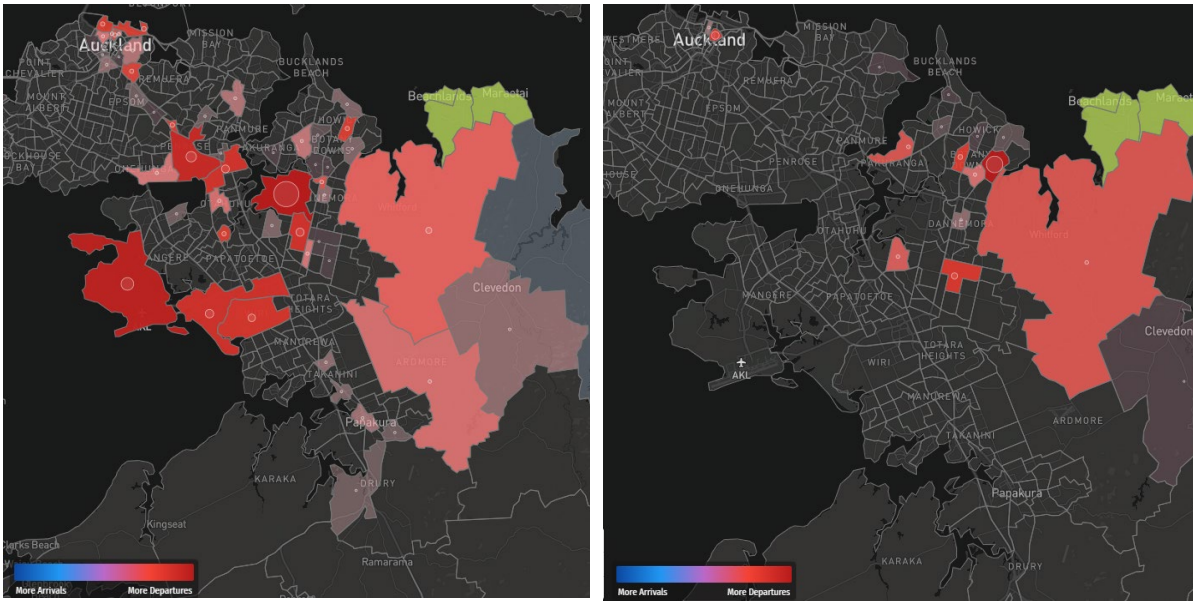


Figure 5: Journey to Work and Journey to Education - from Sunkist Bay, Te Puru and Maraetai areas (source: Stats NZ)

When compared against the total number of usual residents in the area, 72% of people were recorded making work trips and 15% of people recorded journey to school trips leaving Beachlands area in the 2018 census.

The top three destinations for people leaving Beachlands area for work purposes are:

1. East Tāmaki (14%)
2. Auckland Airport (9%)
3. Penrose (7%)

A number of people also travelled to Wiri West (5%) and Manukau Central (6%), which are both adjacent to each other and within close proximity of the Auckland Airport area. All of these destinations are generally located within light and heavy industrial areas, indicating a predominantly industrial workforce. Of the 72% of people leaving the Beachlands area, only 5-8% travelled to Auckland City Centre.

While the proportion of people travelling to Auckland City Centre is low, compared to East Tāmaki or Auckland Airport, analysis of 2018 Census data shows that 75% of the wider Beachlands area[2] residents already travelling to the City Centre for work or study do so by ferry with that figure rising to close to 86% for journey to work. The percentage of existing commuter trips to the city centre by public transport is summarised in **Figure 6** below. It is noted that, currently, all public transport commuter trips made to the city centre from the Beachlands wider area are by ferry. No commuter trips to the city centre are made by bus. This is understandable given that the current bus journey time to the city centre would require multiple transfers and a travel time of approximately 2 hours.

[2] Including Sunkist Bay, Te Puru and Maraetai

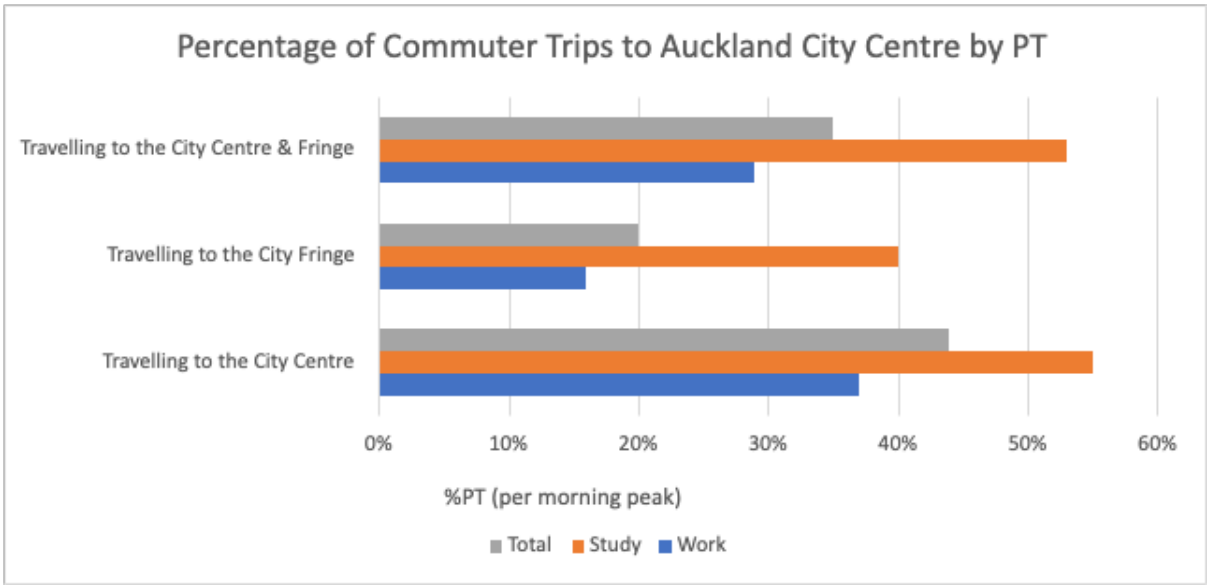


Figure 6: Percentage of Commuter Trips to Auckland City Centre by PT (source: NZ Stats)

Currently 120,285 people commute into the city centre daily from the Auckland region, a figure that rises to 172,700 when the city centre fringe is included, and 25% of Auckland's jobs are in the Waitematā Local Board area. 2018 Census data shows that there is a 37% PT mode share for commuting to the city centre (from across Auckland) for work and 55% for journey to study. By comparison, PT mode share to Auckland Airport (from across Auckland) is 2% and 1% for East Tāmaki. This indicates both a very high disposition to use ferry to commute to the city centre and the very high number of jobs in or close to the city centre (from across Auckland). Therefore, the ferry patronage and demand is only likely to increase in the future.

In addition, the attractiveness of Beachlands South and its easy access to the city centre by ferry will lead to strong self-selection by city centre workers looking for the lifestyle that Beachlands South offers.

The top destinations for people leaving the Beachlands area to travel for school, are:

1. Somerville (37%)
2. Botany Downs (8%)
3. Ormiston North (11%)

15% of the people leaving the Beachlands area to travel for school are going to the University of Auckland. The introduction of a school within the Beachlands South area will likely reduce the need for external trips to these locations.

Beachlands and Maraetai attract only 3% of external trips, the remaining 97% of trips are internal. Most arrivals are coming from Kawakawa Bay. No people travel to these three areas (from outside of those three areas) for school.

This shows that the Beachlands area is not a main destination attractor for the wider area and most of the arrival trips will occur between those three areas.

There is still considerable uncertainty about the long-term impacts of the Covid-19 pandemic on travel patterns but analysis by Auckland Transport shows that the patronage impact on ferries has been much lower than for PT as a whole. In June 2021, ferry patronage was down by 0.2% on June 2020, with Auckland being in alert level 1 for both of those months. While there is clearly an increased disposition to work from home as a result of the pandemic, the impact has been much more muted for ferry. It is therefore expected that any patronage impacts will be short term and will be quickly overtaken by growth in demand from both existing Beachlands and Beachlands South.

3 Existing Accessibility

3.1 Walking and Cycling

The existing Plan Change area currently does not have any formal walking or cycling facilities, given the countryside living land use. A footpath is provided along the northern edge of Jack Lachlan Drive only, between Whitford-Maraetai Road and Kahawairahi Drive, and at the western end of Jack Lachlan Drive on approach to the marina. These footpaths are a result of recent development and were established to provide a direct connection to the marina from residential properties, however, other than the sections described above, there are no other footpaths along Jack Lachlan Drive.

No pedestrian or cycling facilities are provided along Whitford-Maraetai Road and there are no pedestrian crossing points between the Plan Change Area and the existing Beachlands settlement. This is reflective of the rural nature of the area.

3.2 Bus Network

Figure 7 shows that bus services are very limited in the Beachlands area. The entire Beachlands / Maraetai area is served by the 739-bus route which travels between Botany Town Centre and Beachlands / Maraetai (via Ormiston and Whitford).

The service runs once every hour between 6am and 6pm during weekdays and 7am to 8pm on weekends. Independent of traffic conditions, the journey from Beachlands to Botany Town Centre takes about 40 minutes.

In general, the bus services are very limited in this area and the infrequent service (once hourly) is likely to discourage new users.

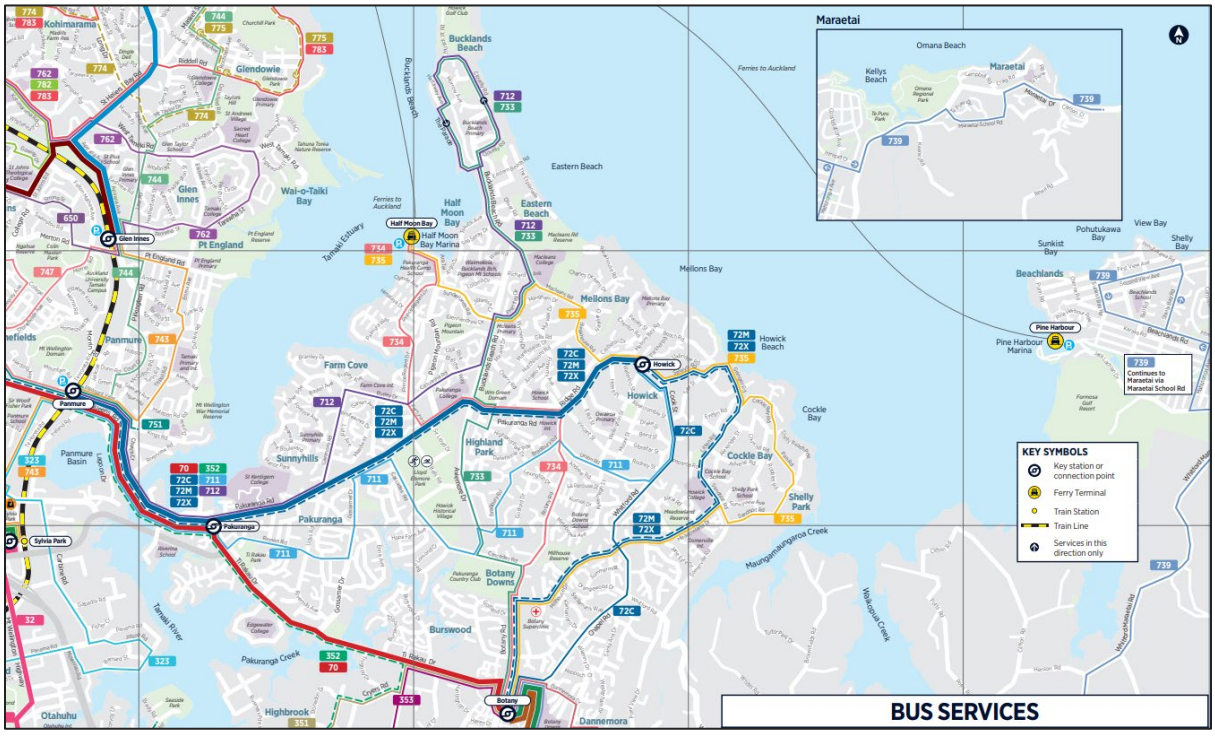


Figure 7: Public Transport Network (source: Auckland Transport)

3.3 Ferry Network

The current ferry service in the Beachlands area, which was first established in 2003, departs from the Pine Harbour Marina.

3.3.1 Ferry Terminal

The ferry terminal is located inside the Pine Harbour Marina at the entrance to the Hauraki Gulf. In addition to hosting the ferry services to and from the Auckland city centre, the privately owned marina also provides full on-site services with boat park facility of up to 555 berths. It is largely self-contained and operates 24 hours a day 365 days a year.

Free Park and ride facilities are available at most ferry departure points. Pine Harbour Marina has ample free parking, and a 24-hour security service is in place, including regular patrols by security staff. There is no dedicated infrastructure on site to allow for bicycle or scooter parking at the terminal, while cars have access to ample free parking.

There are no connected and safe active mode network in Beachlands and as such the active mode infrastructure and connectivity to ferry terminal is poor.

The existing ferry terminal sits inside the privately owned marina, which results in extra time spent for the vessels to navigate through the crowded boat parking facility at a very low speed (approx. 5 knots).

Figure 8 depicts the terminal inside the marina and the ferry route.

Figure 8: Pine Harbour Ferry Terminal (red star) and Route (blue dotted line) (source: Auckland GeoMaps)

3.3.2 Ferry Fleet

The ferry service is contracted to a private operator SeaLink, who has increased the fleet on the Pine Harbour route from one to four in 2014. The table below lists the properties and conditions for each of the four vessels currently in use.

Micro mobility parking (e.g., bicycle and scooter parking) is provided on the back deck of the ferry vessels. Passengers can take their bikes on board on a first come, first serve basis. However, available space for bikes on-board Pine Harbour vessels is very limited.

The marine conditions currently present within the Hauraki Gulf varies, with very shallow water surrounding the marina. Any relocation of the ferry terminal would require dredging of channels, which is an expensive and complex process. Therefore, the type of vessels that can operate within the current area is restricted to 200 seat vessels.

Table 4: Existing Vessels on Pine Harbour Route (source: Auckland Transport)

Vessel Name		**Vessels Currently in Use**			
Vessel Name		**Clipper 2**	**Clipper 3**	**Clipper 4**	**Clipper 5**
Operator		**SeaLink**	**SeaLink**	**SeaLink**	**SeaLink**
Age		Unknown	Unknown	2011	2016
Speed	**Maximum (knots)**	40	40	31	31
	Cruise (knots)	27	27	28	28
Cruise speed fuel consumption (L/hr)		180	180	160	160
Length (m)		15	15	17	17
Total capacity	**Inshore waters**	50	50	99	99
	Enclosed waters	50	50	99	99
Occupiable decks		1	1	1	1
Total seats		51	51	99	99
Retained/Retired		Retired within 3 years of new contract (~2023)	Retired within 3 years of new contract (~2023)	Retained	Retained

3.3.3 Ferry Services

The existing Pine Harbour ferry services run on a route between the Downtown Ferry Terminal and Pine Harbour Terminal, with an on-route travel time of 35 minutes one-way with 5 minutes dwell time at either end.

Despite the maximum vessel speeds listed in Table 4, a voluntary speed reduction protocol was implemented in 2013, which required large vessel speeds to be at or below 10 knots when close to the coast or ferry terminals. In addition, Pine Harbour terminal is located inside the private marina so vessels have to further reduce their speed to be at or below 5 knots getting into the terminal. These lower speeds mean that a noticeable proportion of the 35-minute travel time is likely to occur when arriving / departing the terminal.

The services only run on weekdays, with a 20-minute headway during the commuter peaks (two hours in the morning[3] and another two in the afternoon). Outside of the commuter peaks the ferry services run on inconsistent intervals, at roughly a 90-minute frequency[4]. However, the existing wharf infrastructure can support a 15-minute ferry headway with the appropriate vessel size.

The first service starts at 6:20am departing from Pine Harbour, with the last one leaving Downtown Ferry Terminal at 7:40pm on Mondays to Thursdays. Two additional services per direction are provided on Fridays, which extend the span of ferry operation until 11:10pm at night. There is currently no weekend service.

The existing weekday ferry capacity is currently approximately 500 passengers during the peak two-hour period (6:45-8:45am).

The waters and islands of the Hauraki Gulf include many species of seabirds, mammals, fish, and a great diversity of invertebrates. Historically, marine mammals were at risk of being struck by vessels and, whilst this has been improved through the reduction in vessel speeds, the impact on marine life should be considered when exploring increased vessel frequency.

3.3.4 Ferry Patronage

The annual patronage for the services in 2019 was around 195,500 trips[5].

There have been instances of passengers being left behind at the terminal due to the limited capacity of vessels, generally entailing a 20-minute wait until the next ferry service in peak periods. The graphic below shows the monthly reported passengers left behind over the last three years on the Pine Harbour and West Harbour services.

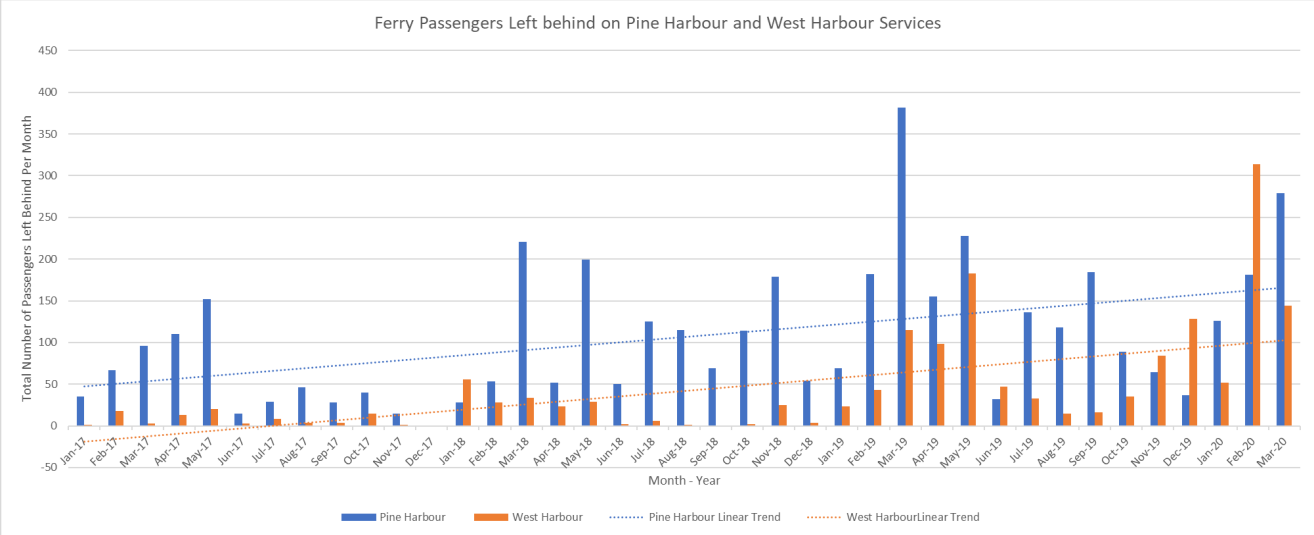


Figure 9: Pine Harbour Passengers Being Left Behind (source: AT Hop Data)

As indicated in the chart, there is an increasing trend in the number of passengers left behind on Pine Harbour. Whilst no information is available on the time of day at which these incidents were recorded, it is expected this would be an occurrence during peak periods due to the high number of commuters.

[3] 6:45am to 8:45am

[4] A clock-face timetable is a system under which PT services run at consistent intervals

[5] Determined from AT Hop data

3.3.5 Ferry Network Summary

In summary, the existing ferry terminal location and marine conditions places constraints on vessel size and capacity, meaning that people are currently getting left behind. The main issues with the ferry network are summarised as follows:

- **Issue 1 – Lack of Capacity and Customer Level of Service (Los):** The ferry fleet does not meet existing demand due to limited vessel size with the consequence that passengers are sometimes being left behind and that there is no capacity to provide for future growth at peak periods.
- **Issue 2 – Limited Terminal Capacity :** Speed and environmental constraints due to the location of the ferry terminal means that the service is slower than it could be with the consequence of it being a less attractive travel choice.
- **Issue 3 – Limited Modal Integration:** Poor integration with other non-car transport modes (such as walking, cycling and bus facilities) means that car access is the very dominant access mode. This means that the capacity of terminal parking is a relevant factor with regard to the capacity of the ferry.
- **Issue 4 – Limited Service Span** the limited span of service, heavily focused on peak trips to the city centre, with no late evening service (except on Friday) and no weekend service means that the ferry does not fully provide for travel needs for many purposes, reducing its attractiveness and utility for customers.

The above problems result in a reliance on private vehicles, lower ferry mode share and increase in congestion. If these problems are not addressed then the existing network will not be able to accommodate the proposed development and would not align with developer, Auckland and central government direction and strategies.

3.4 Train Network

There is no train station within walking or cycling distance of the terminal. The closest is Panmure train station, which is 26 km away.

3.5 Existing Road Network

The existing key transport links within and surrounding the Plan Change area are described in the following sections of this report.

3.5.1 Whitford-Maraetai Road

Whitford-Maraetai Road is approximately 10km and runs north from Whitford Road / Whitford Park Road intersection and terminates just north of Beachlands at the Maraetai Drive / Keanes Road intersection. It forms the main arterial route from Whitford to Beachlands.

Whitford-Maraetai Road is a two lane, undivided two-way arterial road. It is recognised as currently operating at over-capacity[6], with safety issues related to the road environment (as discussed further in this report). The posted speed limits on Whitford-Maraetai Road have been recently reduced under the October 2019 bylaw (implemented June 2020)[7]. The speed limits are listed in Table 5 below.

[6] Lane capacity is understood to be around 1,700 vehicles per hour per lane.

[7] https://at.govt.nz/media/1984176/speed-limits-bylaw-2019-as-at-oct-2020-compressed.pdf and recent amendments https://at.govt.nz/media/1985671/speed-limits-amendment-bylaw-2021-final_daniel-mccabe.pdf

Table 5: Updated speed limits as per the 2019 Bylaw

Location	Speed Limit (as per the bylaw)
Between eastern end of Trig Road and 100m north of Jack Lachlan Drive	80km/h
Between 470m northeast of Whitford Park Road and 160m west of the eastern end of Trig Road	60km/h

3.5.2 Jack Lachlan Drive

Jack Lachlan Drive forms a key east-west road to the north of the proposed development and is also the northern boundary of the Plan Change area. It provides direct connection from Whitford-Maraetai Road, and the proposed Plan Change Area, to the Pine Harbour Marina.

Jack Lachlan Drive is a two lane, undivided two-way road. It is classified as "unknown" between Whitford-Maraetai Road and Kibblewhite Avenue, according to the one road network classification (ONRC). The remainder of the road is classified as a primary collector. This aligns with the function of the road.

The cross section of Jack Lachlan Drive includes one lane in each direction with no kerb lines and a solid line separating the two directions. The road widens to include a right turning bay at certain intersections with local roads and currently has a posted speed limit of 60km/h.

The plan change will likely upgrade the classification of Jack Lachlan Road to a primary collector along the entire length over time as development occurs.

The Plan Change area currently has limited vehicle access to the external road network. Private vehicles must currently access the proposed site via Whitford-Maraetai Road.

With the exception of Whitford-Maraetai Road, the other roads are either local or collector roads. Accordingly, private vehicles have limited options to reach a variety of destinations within the local and wider road network with Whitford-Maraetai Road being the most direct connecting route to the Auckland City Centre.

3.5.3 Existing Traffic Volumes

Table 6 below displays the 5-day and 7-day ADT and morning (**AM**) and evening (**PM**) peak hour traffic volumes at different locations along Whitford-Maraetai Road and Jack Lachlan Drive, as obtained from the AT website.

Table 6: Road Traffic Volumes (source: https://at.govt.nz/about-us/reports-publications/traffic-counts/ as of May 2021)

Location	AADT		Peak Hour Traffic Volumes		Date Surveyed
	5-day	7 day	AM	PM	
Whitford-Maraetai Rd HC-WK1 (between Trig Road and Turanga Road)	10,129	10,129	729	1,041	Dec 2018
Whitford-Maraetai Rd HC-WK2 (between Trig Road and Turanga Road)	9,807	10,227	686	1,132	Dec 2018
Whitford-Maraetai Road (between Trig Road and Turanga Road)	14,454	13,633	1,594	1,439	Nov 2018
Whitford-Maraetai Road (end of RAB to sportsground entrance)	14,472	14,422	0	0	Nov 2018
Whitford-Maraetai (between Waikopua Road and the start of passing lane (end rail RHS)	13,182	12,544	1,471	1,321	Nov 2018

Location	AADT		Peak Hour Traffic Volumes		Date Surveyed
	5-day	7 day	AM	PM	
Whitford-Maraetai (between Whitford Park RAB and Whitford Bridge)	14,915	14,080	1,584	1,499	Nov 2018
Jack Lachlan Drive (between Whitford-Maraetai and Karo Road)	2358	2237	222	264	Apr 2019
Jack Lachlan Dr Hc-Wk1 (between road narrows and Kibblewhite Ave)	1327	1355	125	159	Dec 2018

As shown in the table above, Whitford-Maraetai Road experiences high daily and peak hour traffic volumes.

In addition to the above, peak hour traffic volumes and turning movements were also obtained for the following roundabouts and intersections on behalf of Stantec:

- Site 1: Whitford-Maraetai Road / Beachlands Road / Kouka Road roundabout;
- Site 2: Jack Lachlan Drive / Kahawairahi Drive intersection;
- Site 3: Whitford-Maraetai Road / Jack Lachlan Drive intersection;
- Site 4: Whitford-Maraetai Road / Trig Road (western end) intersection;
- Site 5: Whitford Road / Whitford Park Road / Whitford Wharf Road roundabout;
- Site 6: Whitford Park Road / Sandstone Road / Saleyard Road roundabout; and
- Site 7: Whitford Road / Somerville Road / Point View Drive intersection;

The surveys occurred simultaneously across seven days from Monday 2nd November 2020 and captured the morning traffic between 6:30am and 9:30am and evening traffic between 3:30pm and 6:30pm.

For the purposes of understanding the traffic impacts on the network, data from Tuesday 3rd November was assessed. Data collected from this date was considered to be consistent, reliable and generally representative of the existing traffic volumes along these roads.

The survey data was then assessed in two main areas; the Beachlands area with sites 1,2 and 3 and the Whitford area with sites 4, 5, 6 and 7. The areas are shown in Figure 10 to Figure 12, with the traffic volumes for each approach summarised per direction across morning and evening survey periods.

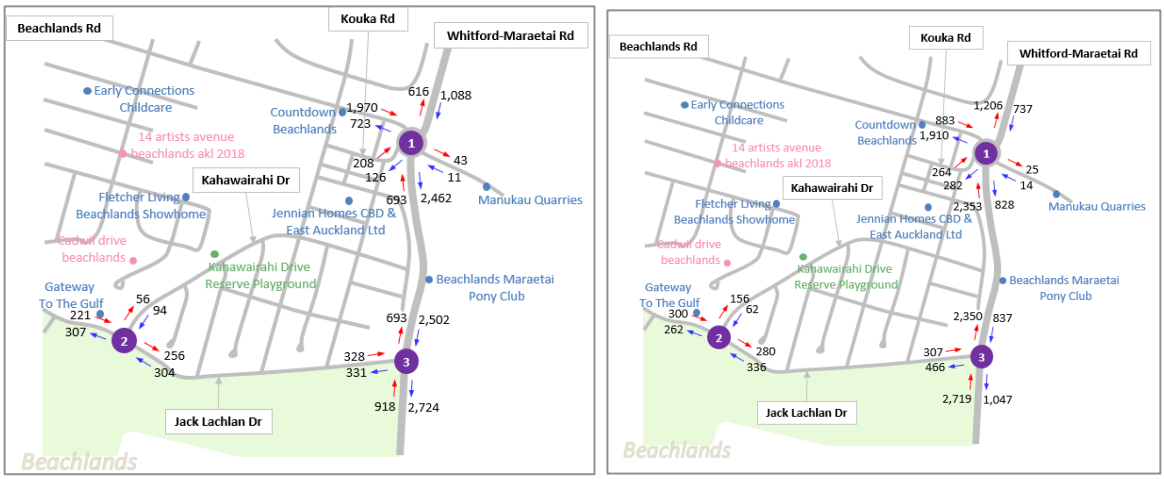


Figure 10: Whitford Area with Sites 1, 2 and 3: Sum of approach volumes, per direction for the AM (left) and PM (right)

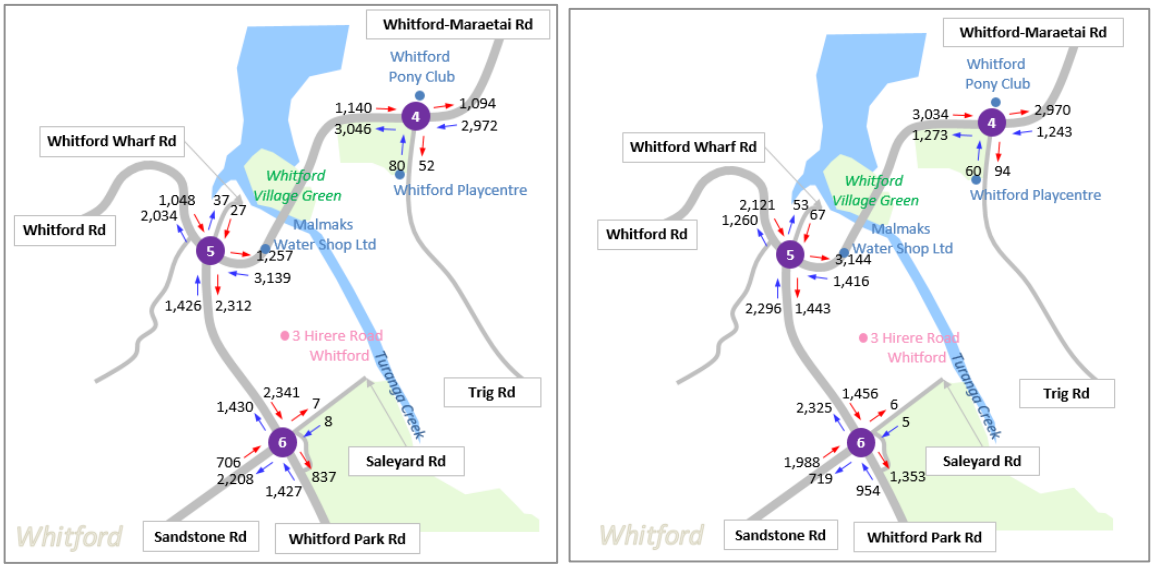


Figure 11: Whitford Area with Sites 4, 5 and 6: Sum of approach volumes, per direction for the AM (left) and PM (right

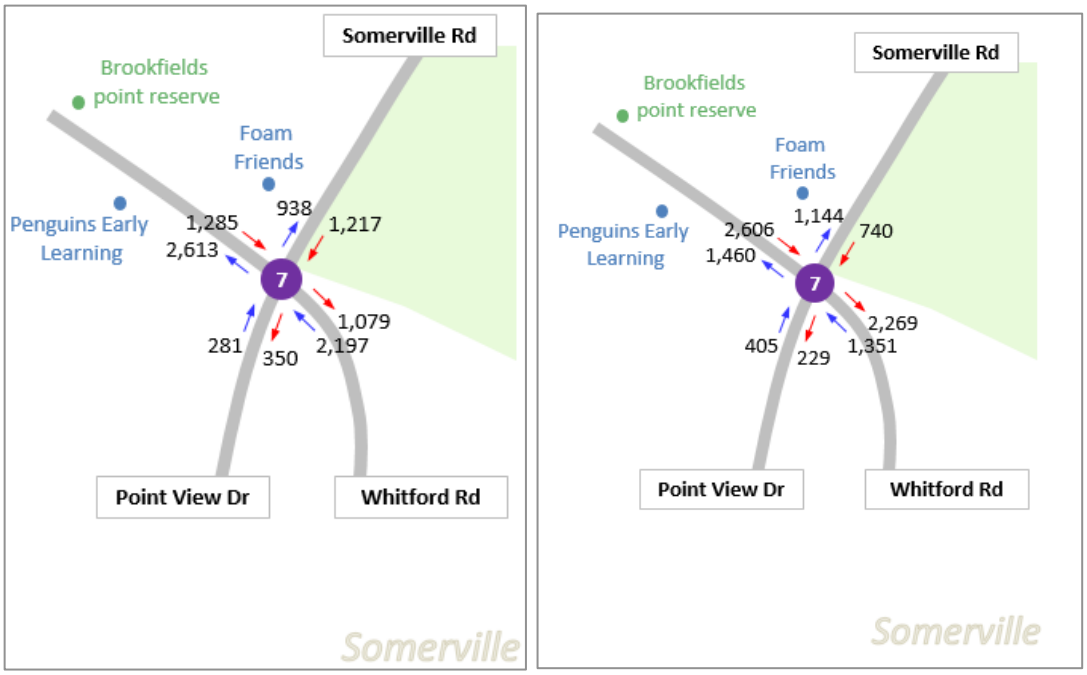
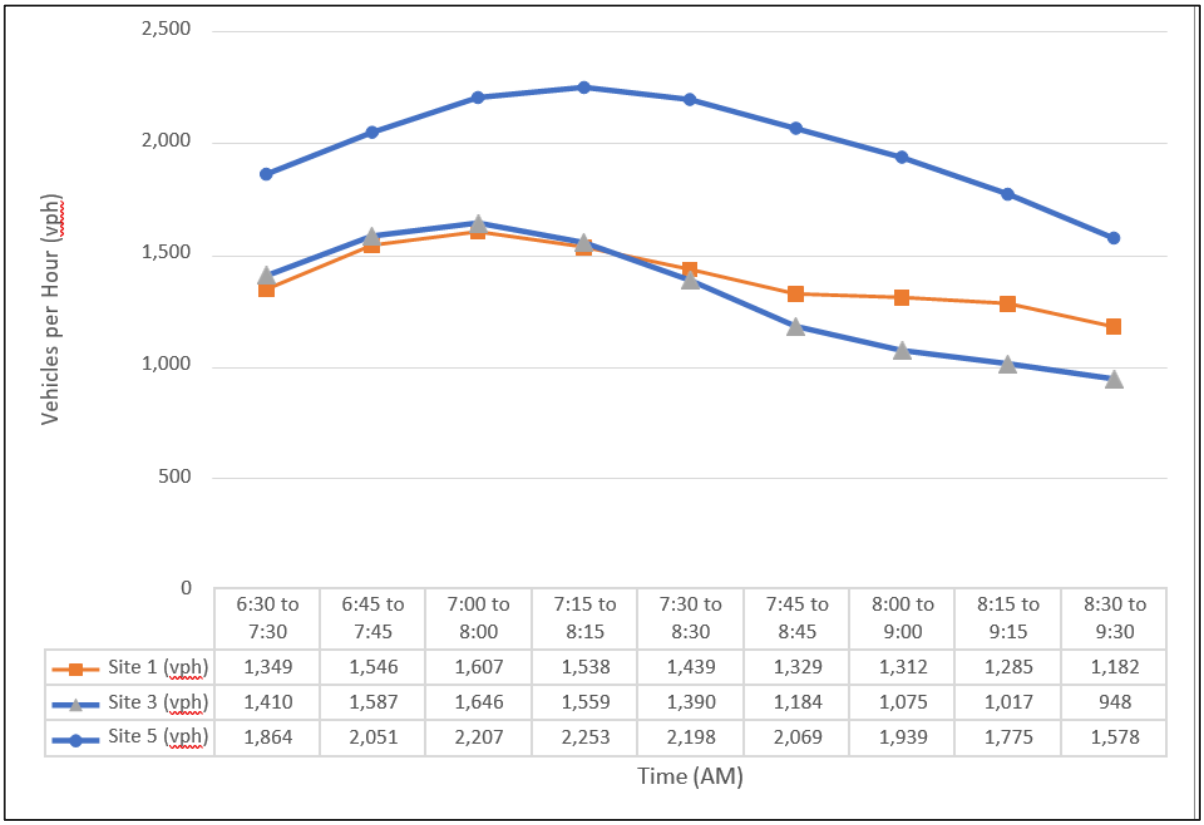


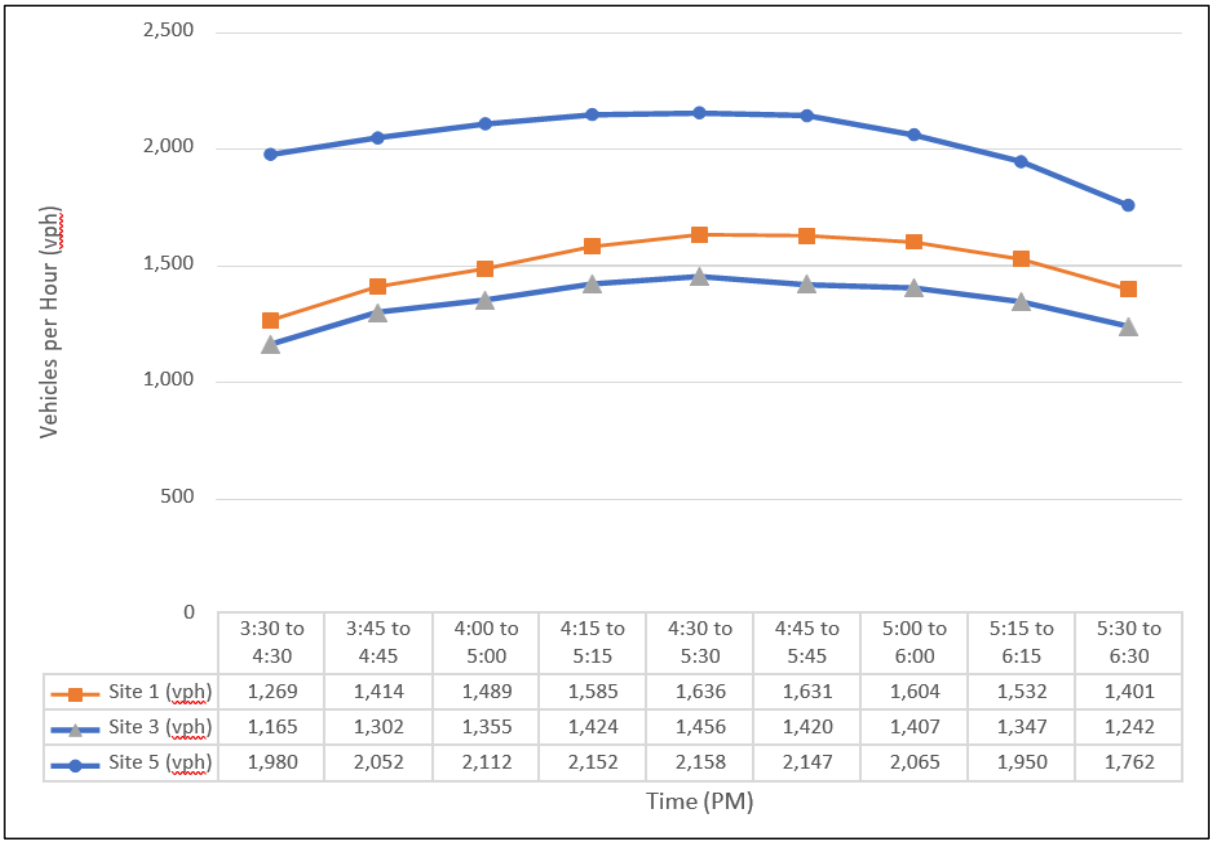
Figure 12: Whitford Area with Site 7: Sum of approach volumes, per direction for the AM (left) and PM (right

Traffic volumes were recorded in 15-minute periods and were summarised and presented in hourly blocks (i.e. starting at 6:30am to 7:30am) per intersection. The surveyed volume hourly profiles for sites 1, 3, and 5) are shown in Figure 13 and Figure 14 below for the morning and evening periods respectively. These sites are shown as they show key locations along the Whitford-Maraetai route and thus reflect the general nature of the road.



	6:30 to 7:30	6:45 to 7:45	7:00 to 8:00	7:15 to 8:15	7:30 to 8:30	7:45 to 8:45	8:00 to 9:00	8:15 to 9:15	8:30 to 9:30
Site 1 (vph)	1,349	1,546	1,607	1,538	1,439	1,329	1,312	1,285	1,182
Site 3 (vph)	1,410	1,587	1,646	1,559	1,390	1,184	1,075	1,017	948
Site 5 (vph)	1,864	2,051	2,207	2,253	2,198	2,069	1,939	1,775	1,578

Figure 13: Site 1,3 and 5 Surveyed Traffic Volumes – AM (source: Matrix survey data)



	3:30 to 4:30	3:45 to 4:45	4:00 to 5:00	4:15 to 5:15	4:30 to 5:30	4:45 to 5:45	5:00 to 6:00	5:15 to 6:15	5:30 to 6:30
Site 1 (vph)	1,269	1,414	1,489	1,585	1,636	1,631	1,604	1,532	1,401
Site 3 (vph)	1,165	1,302	1,355	1,424	1,456	1,420	1,407	1,347	1,242
Site 5 (vph)	1,980	2,052	2,112	2,152	2,158	2,147	2,065	1,950	1,762

Figure 14: Site 1,2 and 3 Surveyed Traffic Volumes – PM (source: Matrix survey data)

The data indicates that Site 5 has a higher amount of traffic in both the morning and evening periods. This is consistent with the nature of the network as the intersection provides connection to both Somerville to the northwest (via Whitford

Road), Flat Bush to the southwest (via Sandstone Road) and Brookby to the south (via Whitford Park Road). Given the additional route choice at this intersection, it is understandable that traffic volumes would be noticeably higher than at intersections 1 and 3.

The data shows that the traffic distribution was fairly consistent for all three sites during the surveyed hours. For sites 1 and 3, the morning peak hour occurred between 7 and 8am, whereas for site 5, the morning peak hour occurred between 7:15am to 8:15am. The evening peak hour occurred at 4pm for all three sites.

The peak hour factor (PHF) was also assessed for each approach for each site. A peak hour factor compares the traffic volume during the busiest 15 minutes of the peak hour with the total volume during that peak hour. It indicates how consistent and distributed traffic volume is during the peak hour. A PHF of 1 indicates that the traffic volume in every 15-minute interval is the same and therefore the traffic flow is consistent throughout the hour. Lower PHF values indicate more variable traffic flows and that the traffic volumes have a 15-minute spike within the peak hour itself (i.e., most of the volume within the peak hour occurs within one 15-minute interval). This assessment has been summarised in Figure 15 below.

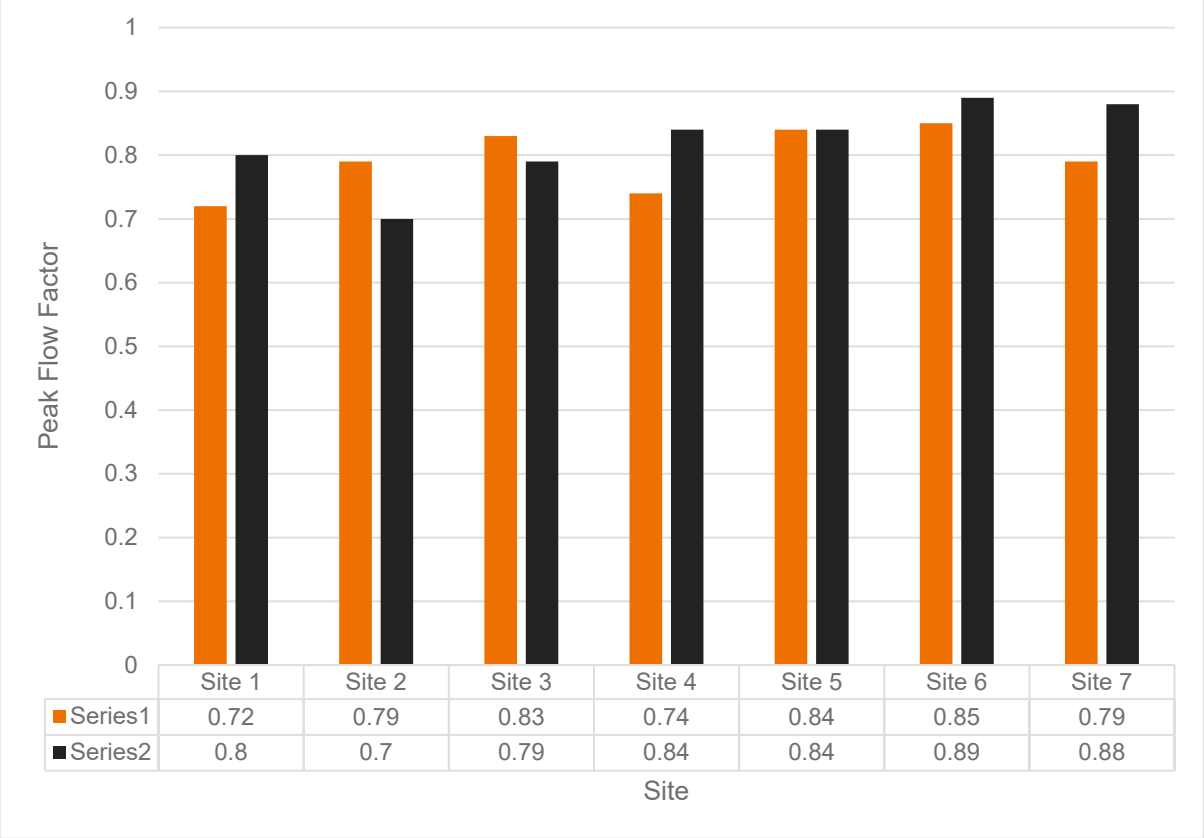


Figure 15: PHF per site (source: Matrix survey data)

As anticipated, the higher PHF tended to occur along Whitford-Maraetai Road, Whitford Park Road and Whitford Road approaches. On average, the PHF for each intersection ranged from 0.72 to 0.85 in the morning peak period and 0.70 to 0.89 in the evening peak period. This indicates that the traffic volumes were fairly well distributed throughout the peak hour.

3.6 Summary

Beachlands is serviced predominantly by private vehicles due to limited attractive alternative modes of transport. There is negligible active transportation within the Plan Change area due to the lack of walking and cycling provisions. However, given the intent for rezoning and urbanisation, significant walking and cycling infrastructure are required and are proposed to be provided.

The Plan Change area is currently serviced by one infrequent bus route and the Pine Harbour ferry terminal. Despite the level of rural land use, the Beachlands area has experienced recent growth and this level of public transport is considered inadequate to serve the existing Beachlands area. An hourly bus service and infrequent ferry services, in which demand exceeds capacity during peak periods, does not encourage a mode shift from private vehicles.

As development occurs further public transport is required to provide any substantial mode shift from the private vehicle. There is great potential for the ferry service to be utilised, given its proximity to the Plan Change area.

4 Road Safety

The road safety scope includes Whitford-Maraetai Road from Beachlands Road to Whitford Road, as four laning along this road has been previously investigated (refer to Section 5), and the section of Whitford Park Road from Whitford Road to Sandstone Road due to the short distance between the two intersections. The full length of Jack Lachlan Drive has also been included due to the direct access to the site.

The following eight intersections have also been included:

- Beachlands Rd/Whitford-Maraetai Rd
- Jack Lachlan Dr/Whitford-Maraetai Rd
- Henson Rd/Whitford-Maraetai Rd
- Trig Rd/Clifton Rd/Whitford-Maraetai Rd
- Trig Rd/Whitford-Maraetai Rd
- Whitford Rd/Whitford-Maraetai Rd/Whitford Park Rd
- Sandstone Rd/ Whitford Park Road/Saleyard Rd
- Whitford Rd/Point View Dr/Somerville Rd

The extent of the safety assessment area has been shown in Figure 16 below. The crash history has been analysed and summarised by both the entire route and the individual eight intersections. The data has also been categorized by crash type and crash severity to identify any crash patterns.

Figure 16: Extent of safety area

4.1.1 Entire Route

4.1.1.1 Crash Severity

The Waka Kotahi New Zealand Transport Agency (**WKNZTA**) Crash Analysis System (**CAS**) database has been examined to ascertain the ten-year road safety record during the period 2011 to 2020, plus all available data for 2021[8]. It is acknowledged that irregular traffic patterns can be expected from late February 2020 to June 2020, due to the 2020 COVID -19 pandemic.

A total of 275 crashes have been recorded in the area, 69 minor injuries, 22 serious and one fatal injury crashes were recorded. The remaining crashes were non-injury crashes.

The fatal crash occurred in 2015 along Whitford-Maraetai Rd between Henson Road and Waikopua Road. It was a fine day, and road conditions were good. While travelling along the slight bend a vehicle had crossed the centreline, causing a head-on collision. Additional crash factors are unknown at this stage.

The majority of the crashes (73%) occurred within mid-blocks and not at intersections.

There is a cluster of crashes at a set of curves between Okaroro Drive and Waikopua Road along Whitford - Maraetai Road. At the curve closest to Okaroro Road three serious, two minor, and seven non -injury crashes have occurred. Four out of the five injury crashes were of the lost control type and only one occurred during wet conditions. This is a high-speed environment, and a single curve sign warns vehicles of the bend but there are no chevron signs or an advisory speed limit. It is likely that the existing speed limit at the time of the crashes (100km/h) was inappropriate for the road conditions. The lack of signage may also have contributed to vehicles underestimating the nature of the road alignment.

Another cluster exists along the midblock between the Whitford-Maraetai Road/Trig Road intersection and the Whitford Road/Whitford-Maraetai Road roundabout. Three serious, two minor, and seven non-injury crashes have occurred at the curve since 2011. All five injury crashes are of the lost control type, and four of these have occurred during wet conditions. This curve is in a high-speed zone, although chevron signs warn vehicles of the curve, there is no advisory speed limit.

The pattern of loss of control crashes at these sets of curves indicates a safety concern with the current road design and warning signage. The speed limit along Whitford-Maraetai Road has been recently reduced (since June 2020) and this is likely to reduce the frequency and severity of the crashes along this section of road, as the recent trial of lower speed limits on Whitford Road has seen. However, additional safety measures, such as signage and delineation should be considered in addition to any road infrastructure upgrades.

A summary of the crashes in terms of severity and location are summarised in Table 7.

Table 7: Summary of crash severity and Location (source: WKNZTA)

Location	Crash Type				Total
	Fatal	Serious	Minor	Non-injury	
Mid-block	1	16	52	132	201
Intersections	0	6	17	51	74
Total	1	22	69	183	275

[8] CAS data obtained July 2021

4.1.1.2 Crash Types

The majority of the crash types (76%) were loss of control, along both the straight sections of road and the curves. The second most common crash type were rear end / obstruction crashes at 16%. A summary of the crash types for the entire study area are summarised in Table 8 below.

Table 8: Summary of crash type and Location (source: WKNZTA)

Location	Crash type							Total
	Overtaking crashes	Straight road/lost control	Bend - lost control/ head on	Rear end/ Obstruction	Crossing/ turning	Pedestrian crashes	Misc. crashes	
Mid- block	6	24	135	30	5	1	0	201
Intersections	2	6	41	15	10	0	0	74
Total	8	30	176	45	15	1	0	275
% All crashes[9]	**3%**	**11%**	**65%**	**16%**	**5%**	**0%**	**0%**	**100%**

4.1.2 Vulnerable Road Users

- Of the 275 crashes, one crash involved a pedestrian, one crash involved a cyclist and ten motorcycle/moped crashes.
- The pedestrian crash resulted in a serious injury and occurred along Whitford-Maraetai Road between Henson Road and Waikopua Road. A person ran out onto the road to wave down a vehicle for help with a crash that happened moments prior. The vehicle was unable to avoid the person.
- The collision involving a cyclist occurred on Whitford-Maraetai Road between Henson Road and Clifton Road, resulting in a minor injury. The driver of the vehicle did not see the cyclist travelling along the left of the lane due to sunstrike, consequently rear-ending the cyclist.
- Of the ten motorcycle crashes, three were serious injury and six were minor injury crashes. Therefore, 30% of the motorcycle crashes were serious injury crashes. Three crashes occurred at the Whitford Rd/Point View Dr/Somerville Rd roundabout when a vehicle did not notice the motorcyclist at the intersection and failed to give way. The remaining seven crashes occurred along the entire route, three of which were rear end crashes and four of which were loss of control. These type of crashes align with the crash types for the entire route, as discussed above.

[9] Percentages have been rounded

4.1.3 Intersections

The following eight intersections along the entire route have been analysed and summarised in the following sections:

- Beachlands Rd/Whitford-Maraetai Rd
- Jack Lachlan Dr/Whitford-Maraetai Rd
- Henson Rd/Whitford-Maraetai Rd
- Clifton Rd/Whitford-Maraetai Rd
- Trig Rd/Whitford-Maraetai Rd
- Whitford Rd/Whitford-Maraetai Rd
- Sandstone Rd/ Whitford Park Road
- Whitford Rd/Point View Dr/Somerville Rd

4.1.3.1 Crash Severity

A total of 74 crashes have been recorded at intersections, 17 resulting in minor injuries, 6 serious and no fatal injury crashes were recorded. The remaining crashes were non-injury crashes. Serious injury crashes account for less than ten percent of the total crashes, this figure is more than doubled for minor injury crashes.

A summary of the crashes in terms of severity and location are summarised in Table 9 below

Table 9: Number of crashes by severity per intersection

Intersections	Number of Crashes by Severity				Total
	Fatal	Serious	Minor	Non-injury	
Beachlands Rd/Whitford-Maraetai Rd	0	0	2	4	6
Jack Lachlan Dr/Whitford-Maraetai Rd	0	0	1	1	2
Henson Rd/Whitford-Maraetai Rd	0	2	4	9	15
Clifton Rd/Whitford-Maraetai Rd	0	1	1	7	9
Trig Rd/Whitford-Maraetai Rd	0	1	0	2	3
Whitford Rd/Whitford-Maraetai Rd	0	1	2	10	13
Sandstone Rd/Whitford-Maraetai Rd	0	0	3	11	14
Whitford Rd/Point View Dr/Somerville Rd	0	1	4	7	12
Total	0	6	17	51	74

4.1.3.2 Crash Types

The majority of the intersection crash types (63%%) were loss of control, along both the straight sections of road and the curves. The second common crash type were rear end / obstruction crashes at 20%. This aligns with the crash types for the entire route.

A summary of the crash types for the entire study area are summarised in Table 10 below and the crashes at each intersection are outlined in further detail below.

Table 10: Summary of crash type and Intersection

Location	Crash TYPE							Total
	Overtaking crashes	Straight road/lost control	Bend - lost control/ head on	Rear end/ obstruction	Crossing/ turning	Pedestrian crashes	Misc. crashes	
Beachlands Rd/Whitford-Maraetai Rd	0	1	2	2	1	0	0	6
Jack Lachlan Dr/Whitford-Maraetai Rd	0	0	2	0	0	0	0	2
Henson Rd/Whitford-Maraetai Rd	0	0	15	0	0	0	0	15
Clifton Rd/Whitford-Maraetai Rd	1	0	5	1	2	0	0	9
Trig Rd/Whitford- Maraetai Rd	0	0	3	0	0	0	0	3
Whitford Rd/Whitford-Maraetai Rd	0	1	9	3	0	0	0	13
Sandstone Rd/Whitford-Maraetai Rd	1	2	4	5	2	0	0	14
Whitford Rd/Point View Dr/Somerville Rd	0	2	1	4	5	0	0	12
Total	**2**	**6**	**41**	**15**	**10**	**0**	**0**	**74**
% All crashes	**3%**	**8%**	**55%**	**20%**	**14%**	**0%**	**0%**	**100%**

4.1.4 Beachlands Rd/Whitford-Maraetai Rd Roundabout

Two minor crashes and four non-injury crashes have occurred at the Beachlands Rd/Whitford-Maraetai Rd roundabout. The minor injury crashes included:

- One was of the loss-of-control type, involving a motorcycle. The motorcyclist entered the cycle lane and failed to brake safely when approaching a raised traffic island.
- The second crash was caused by a vehicle failing to give way before travelling through the roundabout, resulting in a collision.

These crashes are considered a result of unawareness and/or illegal driving, rather than specifically relating to elements of road design.

4.1.5 Jack Lachlan Dr/Whitford-Maraetai Rd

One minor crash and one non-injury crash occurred at the Jack Lachlan Dr/Whitford-Maraetai Rd T intersection. The minor injury crash was of the loss of control type. The driver is believed to have passed out, crossed the centreline and struck a power pole. Although the power pole contributed to the severity of the crash, a medical event was the cause.

4.1.6 Henson Rd/Whitford-Maraetai Rd

Two serious, four minor and nine non-injury crashes have occurred at the Henson Rd/Whitford-Maraetai Rd T-intersection. All crashes at this location are of the loss of control type.

Both serious injury crashes involved vehicles losing control around the bend on Whitford-Maraetai Rd, causing head-on collisions with oncoming traffic. Both crashes occurred during light-rain and over-cast conditions. Of the two crashes, at least one vehicle was travelling in excess of the 65km/hr advisory speed limit.

Of the four minor injury crashes, three vehicles lost control while travelling around the bend on Whitford-Maraetai Road in light-rain and overcast conditions. One minor injury crash occurred as a vehicle turned left onto Henson Road and lost control while the road was wet.

Five of the injury crashes occurred at the bend along Whitford-Maraetai Road, and all six happened while the road was wet. The advisory speed limit around this curve may not be appropriate for its geometry, during wet conditions.

4.1.7 Clifton Rd/Whitford-Maraetai Rd

One serious, one minor injury and seven non-injury crash has occurred at the Clifton Rd/Whitford-Maraetai Rd intersection.

The serious injury crash was of the loss of control type. A vehicle entered the gravel verge, then attempted to correct itself but lost control and collided with oncoming traffic.

The minor crash involved a vehicle stopping suddenly on Whitford-Maraetai Rd. One of the vehicles behind did not maintain a safe following distance, causing rear -end collisions between three vehicles.

It is considered that the complex traffic environment in this location is one of the catalysts for these crash factors. The horizontal bend change in gradient, limited visibility and the relatively high -speed environment means that this section of Whitford-Maraetai Road is unforgiving of human error.

4.1.8 Trig Rd/Whitford-Maraetai Rd

One serious injury crash and two non-injury crashes have occurred at this location. The vehicle involved in the serious injury crash drove straight through the T-intersection from Trig Road, crashing into two fences before coming to a stop in a ditch full of trees. Poor weather conditions or lighting were not factoring in this crash. Although the obstacles hit by the vehicle amplified the severity of the crash, a medical event was likely the cause.

4.1.9 Whitford Rd/Whitford-Maraetai Rd

One serious injury, two minor injury and ten non-injury crashes occurred at this roundabout. The serious injury crash was of the loss of control type. While travelling along Whitford Park Rd the driver fell asleep. As they approached the intersection the vehicle continued straight rather than follow the bend, colliding with a concrete power pole.

Both minor injury crashes were of the loss of control type and caused by driver error. Following a gear change while travelling through the intersection, a vehicle lost traction of its back wheels and landed in a bank on the other side of the road. The other minor injury crash was possibly caused by excessive speed. The vehicle went straight through the roundabout at around 40km/hr, then veered to the left and landed down a bank.

Approaches to the roundabout (excluding Whitford Wharf Road) are curved, there is also vegetation lining the Whitford Road and Whitford Park Road approaches. Speed appears to be a factor in the minor injury crashes. It is noted that the speed limit was reduced in June 2020

4.1.10 Sandstone Rd/Whitford Park Rd

Three minor injury and 11 non-injury crashes occurred at this intersection, however all of the injury crashes occurred before the roundabout was installed in 2014/2015. Initially this intersection was controlled by stop signs and therefore the previous crash factors have been mitigated.

4.1.11 Whitford Road/Point View Dr/Somerville Rd

One serious, four minor injury and seven non-injury crashes occurred at this intersection. There were no recorded crashes after 2019 when the serious crash occurred. Three of the 12 crashes (25%) involve a motorcyclist injury when a vehicle did not notice the motorcyclist and failed to give way. This is considered a significant proportion of the crashes.

4.1.12 Summary

Based on the above, the following can be concluded:

- A total of 275 crashes have been recorded in the area, 69 minor injuries, 22 serious and one fatal injury crashes were recorded. The remaining crashes were non-injury crashes.
- 27% of the crashes along the site route occurred at or near the intersections. The remaining 76% occurred along the midblock.
- One fatality has been recorded in the last ten years and occurred along Whitford-Maraetai Rd between Henson Road and Waikopua Road. However, 22 serious injury crashes have been recorded, 27% of which occurred at the intersections.

- Only one pedestrian and one cyclist crash has been recorded and this is likely a reflection of the rural nature of the area. However, ten motorcycle crashes have been recorded, 30% of which occurred at Whitford Rd/Point View Dr/Somerville Rd intersection.
- In both the midblock and at the intersections, the most common crash type is loss of control (76%). The second most common crash type is rear end / obstruction crashes (16%).
- All injury crashes at the Henson Rd/Whitford-Maraetai Rd intersection since 2011 have occurred during wet conditions. Most vehicles have lost control at the bend on Whitford-Maraetai Road, so the geometry of this curve and the high-speed environment are of particular concern at this intersection. However, it is noted that the speed limit has been reduced recently.

As mentioned, the majority of the crashes are loss of control crashes and occur at midblock locations. The recent (June 2020) reduction in the speed limits along Whitford-Maraetai Road will have helped to minimise the frequency and severity of these types of crashes. Upgrading intersections along Whitford-Maraetai Road, as discussed further in this report, will also help address the 27% of crashes that occurred at intersections. However, there are some midblock locations which may require additional curve advisory signage and delineation, such as the set of curves near Okaroro Drive.

5 Future Land Development

As previously discussed, the Plan Change area is currently zoned as CLZ, with the existing Beachlands settlement predominantly residential – single house zoning. This zoning indicates low density and minimal future development planned within and around the Plan Change area in the future. This assumption is supported by the lack of specific reference to the Beachlands area in Auckland's land planning strategies and documentation (discussed in detail in Section 9).

However, recent developments in Beachlands and in neighbouring areas has seen significant growth within the area and population projections show an increasing upwards trend in the Beachlands area[10].

It is understood that the only known additional development within the area includes an 89ha FUZ in Maraetai (approximately 200 households within the next 15 years) and a proposal for a 235 household development being considered under the Covid-19 Recovery (Fast Track consenting) Act 2020 in Beachlands prior to 2024.

[10] As per Figure 3 of the Property Economics draft report (June 2021)

6 Future Strategic Transport Network

The future transport context has been assessed to understand and allow for any future, potential changes in the network relevant to Beachlands South. Future Connect is the long-term network plan for Auckland's transport system and identifies the most important parts of the transport network and any critical issues or opportunities for active modes, public and private transport. It incorporates information from the 10-year Regional Land Transport Plan (**RLTP**).

A screenshot of the site area in the first decade[11] is shown in Figure 17.

This provides a high-level summary of the different transport modes proposed to be in place within the area in the next ten years. Major cycling network links are proposed within the Beachlands and Maraetai area but no roading infrastructure upgrades are proposed.

Figure 17: Future Connect - First Decade

A Draft Scheme Assessment was undertaken by WSP (formerly Opus International Consultants Limited) in 2010 which provided capital costings for a staged upgrade of Whitford-Maraetai Road to a four-lane road. The corridor has subsequently been designated for four lanes.

A bypass (Whitford Bypass) that connects the existing Whitford Park Road/Sandstone Road roundabout from Saleyard Road through to Trig Road (north) via the greenfield site was also investigated. The new Whitford Bypass would cross Turanga Creek.

As the speed limits in this area were confirmed to be reduced in June 2020, a revised due diligence design has been undertaken by WSP for both the Whitford-Maraetai Road and Whitford Bypass.

[11] Future Connect image obtained 3/11/2021

There is currently no allocated funding for the upgrade of either Whitford-Maraetai Road to four lanes or the construction of the new Whitford Road bypass. However, it is anticipated that in three decades (2051) government funding would have been allocated for these improvements.

No other roading or public transport investment has been programmed for the Beachlands and/or Whitford area in the next ten years.

To understand what the PT mode share may be like within the Beachlands area in the future, case studies within Auckland were assessed, using a combination of the Stats NZ 2018 census data, the Commuting Journey Survey 2013, AT ferry patronage data and Waka Kotahi Traffic Monitoring System (TMS) data.

Hobsonville Point, located in north-west Auckland, is considered to have geographical similarities with Beachlands including access to a ferry terminal, coastal amenities and is a new development. Therefore, Hobsonville Point has been used as the main case study to understand the potential future ferry patronage for Beachlands South.

Hobsonville Point has an overall PT mode share of 14%. This consists of ferry and bus services only (no rail services). In comparison, several urban areas in Auckland (i.e., New Lynn, Kingsland, Newmarket, and Mt Albert) range between 14% and 22%.

Based on TMS data, traffic growth on key routes to/from Hobsonville, reduced from around 10% to 2% between 2016 to 2019. As the population within Hobsonville doubled between 2015 to 2019, the ferry patronage tripled. Refer to Figure 18 below.

This indicates that as the Hobsonville population increases (through development), people in that area shifted from private vehicles to alternative transport modes, such as ferries. As a result, the travel behaviour of those in the Hobsonville area changed as more people travelled to / from the city centre for work or education. An increase in people who lived in Hobsonville but travelled to the city centre increased from 7% to 18% between 2013 to 2018.

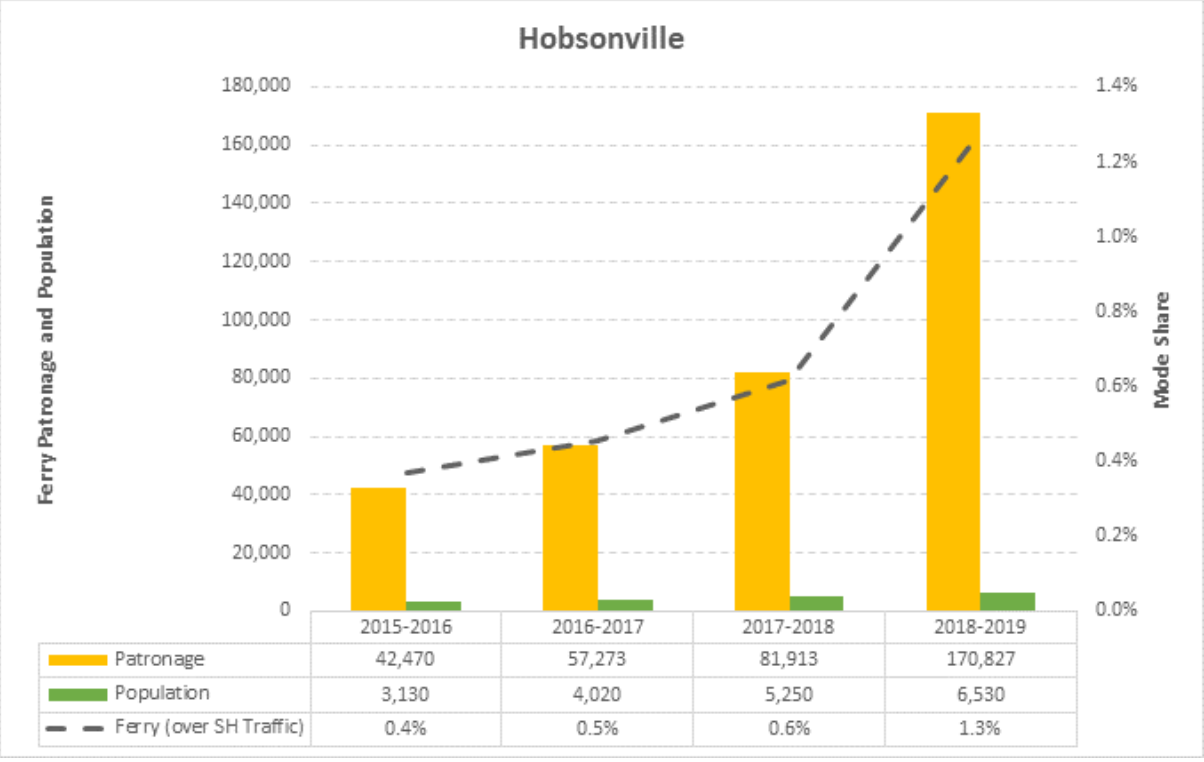


Figure 18: Hobsonville Ferry Patronage and Population

The assumed Beachlands South future PT mode share within the lower edge of this urban range and compares well against the existing Hobsonville Point PT mode share. Given that there will be appropriate land use and density around the ferry terminal and good feeder services, it is realistic to assume that as the population within Beachlands is anticipated to at least double, the ferry patronage is likely to triple.

It is also noted that, given changing technologies and carbon emission reduction initiatives, it is difficult to ascertain exactly how people will travel in thirty years.

7 Proposed Plan Change

7.1 The Development Concept

Beachlands South is located immediately south of the existing Beachlands settlement. Beachlands South comprises 307ha of predominantly rural land and encompasses Partnership landholdings (110 Jack Lachlan Drive, 620 and 712 Whitford-Maraetai Road) and third-party owned properties, 680-702 and 722-770 Whitford-Maraetai Road. The Partnership is proposing to rezone the land in Beachlands South through a Plan Change to enable development to occur.

The overall vision for the Beachlands South Plan Change Area is to provide a world class masterplan that supports and enhances the growth of Beachlands. The three main objectives for the development are to create:

1. A place defined by its symbiotic relationship with the natural environment
2. An innovative, low-impact development that is sustainable, restorative, and regenerative
3. A thriving, resilient and self-sufficient 21st century coastal community with diverse housing, amenities, and employment opportunities.

When creating the masterplan for the Plan Change area, the design principles outlined in Figure 19 were considered.

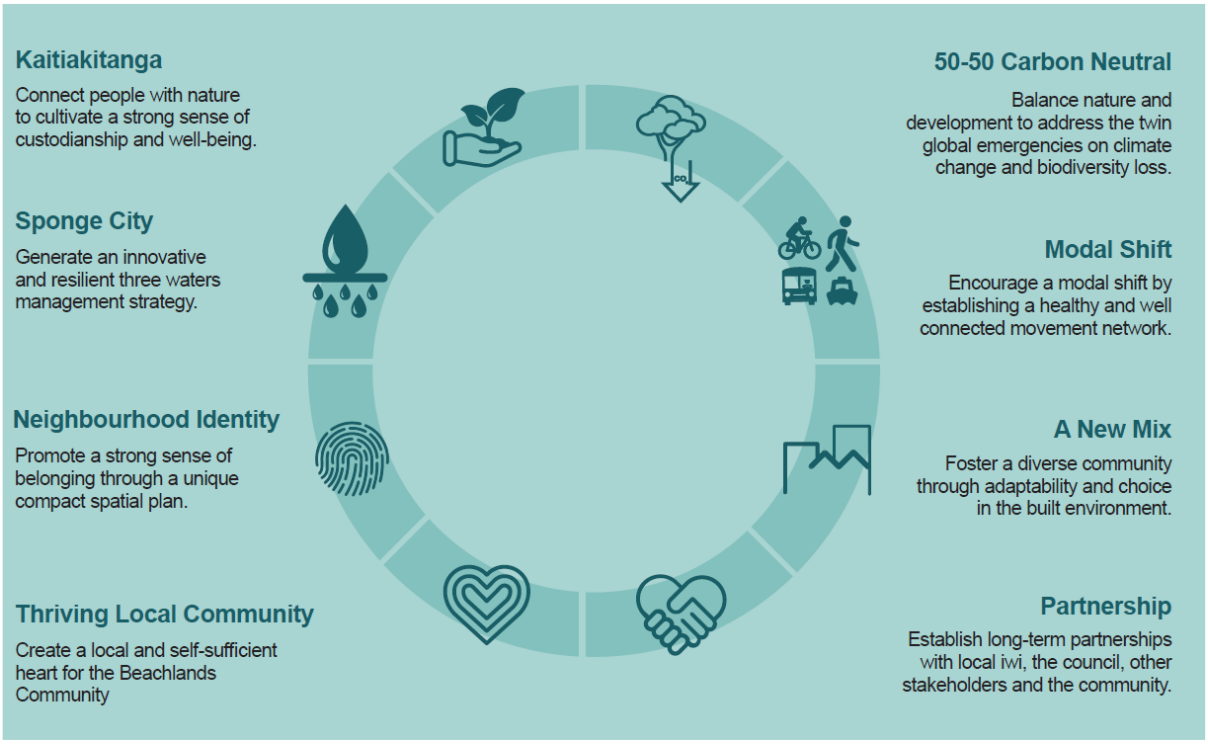


Figure 19: Beachlands Plan Change Design Principles (source: Beachlands South Structure Plan Draft)

As part of the development strategy, a live zoned area is proposed for the northern section of the Plan Change area, with the remaining southern area zoned as Future Urban Zone (FUZ).

This staged approach balances the existing surrounding rural characteristics with the roading infrastructure required to enable the proposed development and considers alignment with the wider Auckland Plan. This strategy aims to deliver good land use and transport outcomes, by creating densities that are supportive of public transport and other roading infrastructure upgrades.

7.1.1 Live Zoned

The live zoned area will include a mixture of land uses currently provided for under the AUP with specific precinct provisions applied over the land to control and manage effects of future development. The proposed zoning plan for the Plan Change, is shown in Figure 20 below.

Development of the live zoned area is anticipated to commence in 2024 and be completed by 2038. A mid-point year of 2031 has been included in the analysis. A summary of the main proposed land uses, for the purpose of this ITA and in accordance with those threshold years, are outlined in **Table 11** below.

The overall Plan Change include provision for a Village Centre (with general retail), a commercial area / innovation hub, a light industrial area, a school for years 7-13, a retirement village, a golf course, residential development of up to 2,918 households and community facilities. Other supporting developments such as a hotel/conference centre, parks and plazas, and parking are also being proposed. The following land use assumptions, regarding general staging of the live zone, include:

- The residential yield consists of a mixture of standalone, medium density and high-density dwellings. It is assumed that a portion of the residential dwellings will be constructed and occupied from 2024. The residential dwellings will then grow linearly between each threshold year, as outlined in Table 11.
- Retail comprises a mixture of cafes, smaller scale shops (i.e., local centre retail) and metro supermarkets. It is assumed that a portion of the retail will be constructed and occupied from 2028 and all of the retail land use will be completed in 2038.
- The commercial land use comprises an innovation hub and supplementary offices. An innovation hub can be described as a social community or workspace used to serve like-minded individuals interested in innovation. It is a flexible working space that be adjusted to cater for different needs. It is assumed that a portion of the commercial land use will be constructed from 2028 and all of the commercial land use will be fully completed by 2038.
- The education facilities will cater a total of 2,200 students between year 7 to year 13. It is assumed that the school will be constructed and will be initially occupied in 2027, with full student roll occupancy in 2038.
- Light industrial land use is assumed to be initially constructed and occupied from 2025 to enable immediate employment opportunity for the development. It is assumed that the full light industrial will be completed in 2038.
- A nine-hole golf course is proposed to be retained within the Plan Change area, which is a reduction of the existing 18-hole golf course.
- A portion of the retirement living units are proposed to be completed in 2025 and fully completed in 2038.
- For simplicity, and given the long-time horizon, the projected build out rates are assumed to occur linearly based on the anticipated yields and timeframes.

A summary of the main proposed land uses, for the purpose of this ITA and in accordance with those threshold years, are outlined in **Table 11** below.

Table 11: Land Use - Assumption for Beachlands South Plan Change Live Zone

Land Use	2024	2031	2038[12]
Residential – Low Density	29 dwellings	150 dwellings	268 dwellings
Residential – Medium Density	44 dwellings	450 dwellings	885 dwellings
Residential – High Density	34 dwellings	400 dwellings	1,571 dwellings
Retail – Café & Restaurants (GFA)	0 sqm	250 sqm	1,625 sqm

[12] Internally referred to as Live Zoned (Scenario 1)

Land Use	2024	2031	2038[12]
Retail – Small stores (GFA)	0 sqm	500 sqm	2,270 sqm
Retail – Metromarket (GFA)	0 sqm	0 sqm	1,800 sqm
Commercial (GFA)	0 sqm	2,000 sqm	5,100 sqm
Education	0 pupils	1,210 pupils	2,200 pupils
Light Industrial (GFA)	0 sqm	8,000 sqm	18,000 sqm
Golf Course	0 holes	9 holes	9 holes
Retirement Units	0 sqm	100 units	194 sqm

The proposed rezoning in the live zoned area of the plan change for Beachlands South takes into account the recent Resource Management (Enabling Housing Supply and Other Matters) Amendment Bill to enable greater medium density housing development in New Zealand. This is reflected in application of the Residential – Terrace Housing and Apartment Buildings and Residential – Mixed Housing Urban zones across the live zoned area which are the highest density residential zones in the Auckland region and incorporating of the Medium Density Residential Standards (MDRS) in the precinct provisions to the extent that residential development in these zones within the precinct will need to be in accordance with the MDRS's.

These changes have been considered as part of the traffic modelling completed to date for Beachlands South. In particular, it is noted that the traffic modelling is based on a specific number of dwellings relative to the identified transport infrastructure upgrades required to enable and support that level of urban development. Therefore, while the residential zonings and MDRS proposed in the plan change will enable greater medium density housing developments within the precinct, the triggers (discussed latter in this report) contain a restriction on the number of dwellings that can be developed alongside transport infrastructure upgrades based on the traffic modelling completed.

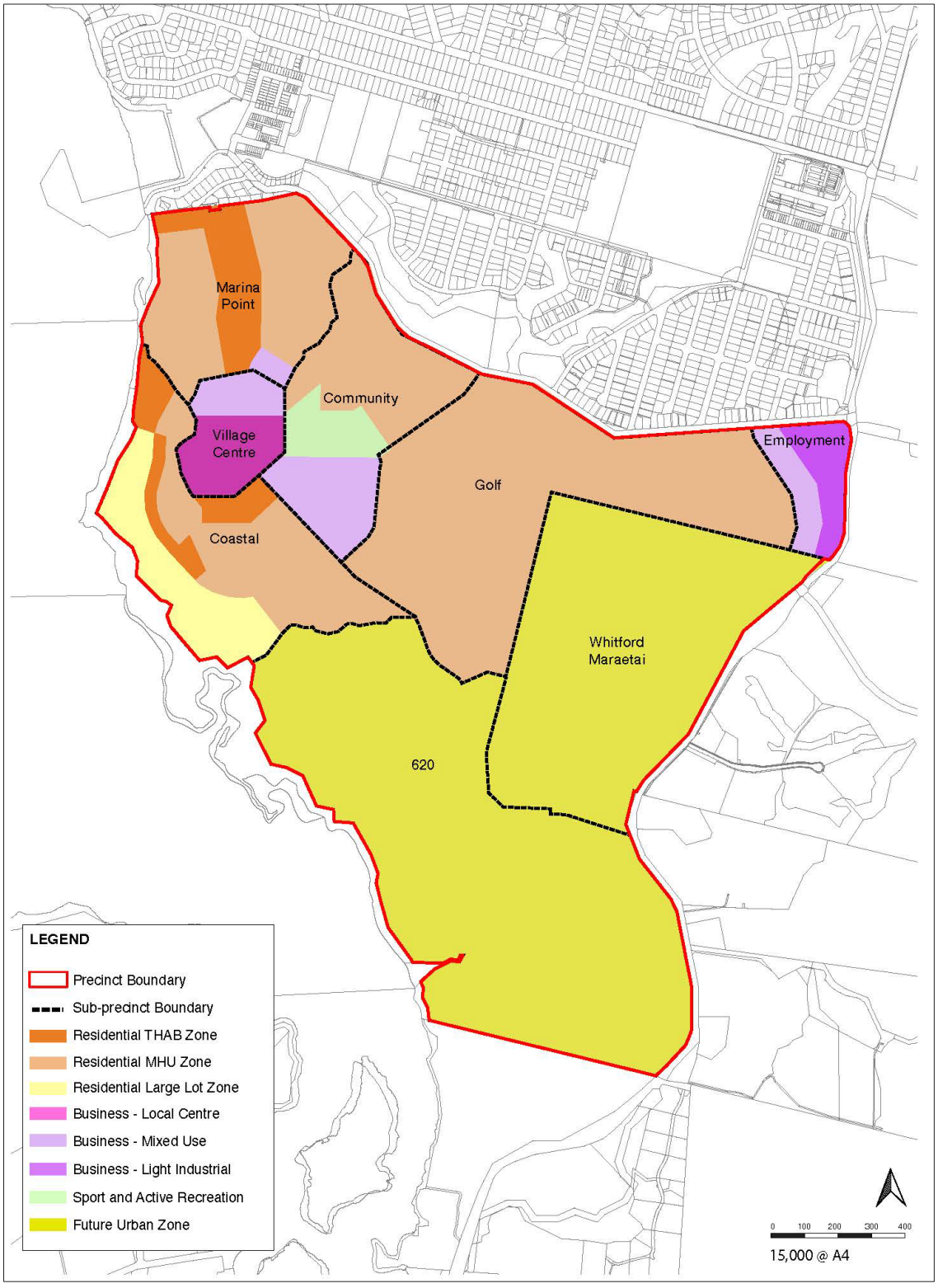


Figure 20: Illustrative Plan Change Live Zone Plan (with golf course). (Source: Russell Property Group 21.12.2021)

7.1.2 Future Urban Zone

The northern section of Beachlands South is proposed as live zone (as mentioned above), whilst the southern section of Beachlands South is proposed to be zoned as FUZ. FUZ is defined as "a transitional zone in which land may be used for a range of general rural activities but cannot be used for urban activities until the site is rezoned for urban purposes."[13].

This strategy is a long-term and proactive approach that identifies and earmarks land that is suitable for urbanisation. As this land is predominantly rural and has not previously been identified for urbanisation, bulk infrastructure (such as roading) must be investigated for the future potential development that could be enabled by the FUZ.

A potential long term fully developed FUZ is targeted for completion in 2051 and is outlined in Table 12.

Table 12: Land Use - Assumption for Beachlands South Plan Change

Land Use	FUZ[14]
Residential – Low Density	828 dwellings
Residential – Medium Density	1,197 dwellings
Residential – High Density	1,591 dwellings
Retail – Café & Restaurants (GFA)	1,625 sqm
Retail – Small stores (GFA)	2,700 sqm
Retail – Supermarket (GFA)	1,800 sqm
Commercial (GFA)	5,100 sqm
Education	2,200 pupils
Light Industrial (GFA)	18,000 sqm
Golf Course	9 holes
Retirement Units	194 sqm

[13] Auckland Unitary Plan Section H18

[14] Internally referred to as Scenario 2a

Figure 21: Illustrative Plan Change Full Development Plan (with golf course). (Source: Russell Property Group 4.10.2021)

7.2 Transit Oriented Communities

A Transit Oriented Communities (**TOC**) is a type of compact community development which focuses on planning mixed-use and high-density development near a significant public transport station or corridor.

A TOC ultimately aims to create places where people can live, work and play, within a walkable neighbourhood; where non-car transportation modes to, within and from the site are easily accessible and positively encouraged; and where PT infrastructural investments can be supported by a large, localised ridership base. Integration of transport and land-use planning is crucial for TOC and the focus should be on accessibility for pedestrians, cyclists and public transport.

The TOC is the lesser-known sibling of the Transit Oriented Development (**TOD**), which is defined as "a compact development, with moderate to higher densities, located within an easy walk of a transit station, generally with a mix of residential, employment, and shopping opportunities design for pedestrians [and cyclists] without excluding the auto."[15] The difference is that TOCs are not considered to have the same level of density and established urban centre as TODs.

Whitford-Maraetai Road, an arterial road, provides the main vehicular route to / from the Beachlands area and limited bus services are provided. A ferry route from the Beachlands Pine Harbour terminal to the Auckland City Centre is already well established as part of the wider Auckland ferry network.

The Beachlands area is currently heavily reliant on private vehicles with approximately 80% of trips for work and education being completed by private vehicle. Only 1% of trips are completed by bus but 6% of trips are completed by ferry (refer to Section 3). This is a higher than average vehicular and ferry mode share compared to the rest of Auckland but a much lower bus and train mode share.

According to census data, the majority of people leaving the Beachlands area for work travel to/from East Tāmaki, Auckland Airport and Penrose (a combined 30%), whilst only 8% travel to the Auckland City Centre. However, 86% of those work trips to the city centre are completed by ferry. As 25% of Auckland's jobs are located in the Wāitematā Local Board area, the number of commuters to the Auckland city centre (and city centre fringes) are anticipated to increase. Therefore, the ferry patronage and demand is only likely to increase in the future.

As indicated in Section 7 above, with the proposed Plan Change, the total number of dwellings in the area could double the existing level in the Sunkist Bay area alone with almost 100% increase in dwellings and a new high school. While the growth in land use would see the traffic demand increase, a significant amount of internalisation of existing and new trips is expected with the inclusion of a new high school, town centre and employment activities. Detailed estimation of the traffic demand can be found in Section 9 of this ITA.

While the Plan Change would introduce additional employment and a high school for the Beachlands area, the level of internalisation of traffic is likely to be insignificant compared to the expected growth in traffic should the current public transport provision be retained. Without improvements in the current PT system, the increase in demand may lead to significant increase in on road traffic volume, which would add pressure onto the already congested road network and contribute to further increase in transportation related emissions.

The relatively large mode share for ferry indicates that ferry is a competitive mode for commuter trips especially for city bound trips. Therefore, the level of development proposed, established ferry network and coastal location, offer a unique opportunity for a focus away from private vehicles and towards more sustainable modes of transport under the TOC principles.

This design increases both accessibility, mobility and minimises the required investment on roading infrastructure. This helps in reducing the overall dependency and reliance on private vehicles while also providing wider transportation benefits and enabling urban growth.

To support the TOC approach, address the existing network issues (refer to Section 3.3.5) and enable the development, significant upgrades to the existing PT (buses and ferries) network are required. This has been investigated in more detail below.

[15] GB Arrington, 2007. Transit Orientated Development: Understanding the Fundamentals of TOD

8 Proposed Transportation Network

The proposed movement network for the various travel modes within the Plan Change area is discussed in the following sections. The proposed movement network is illustrated in Figure 22.

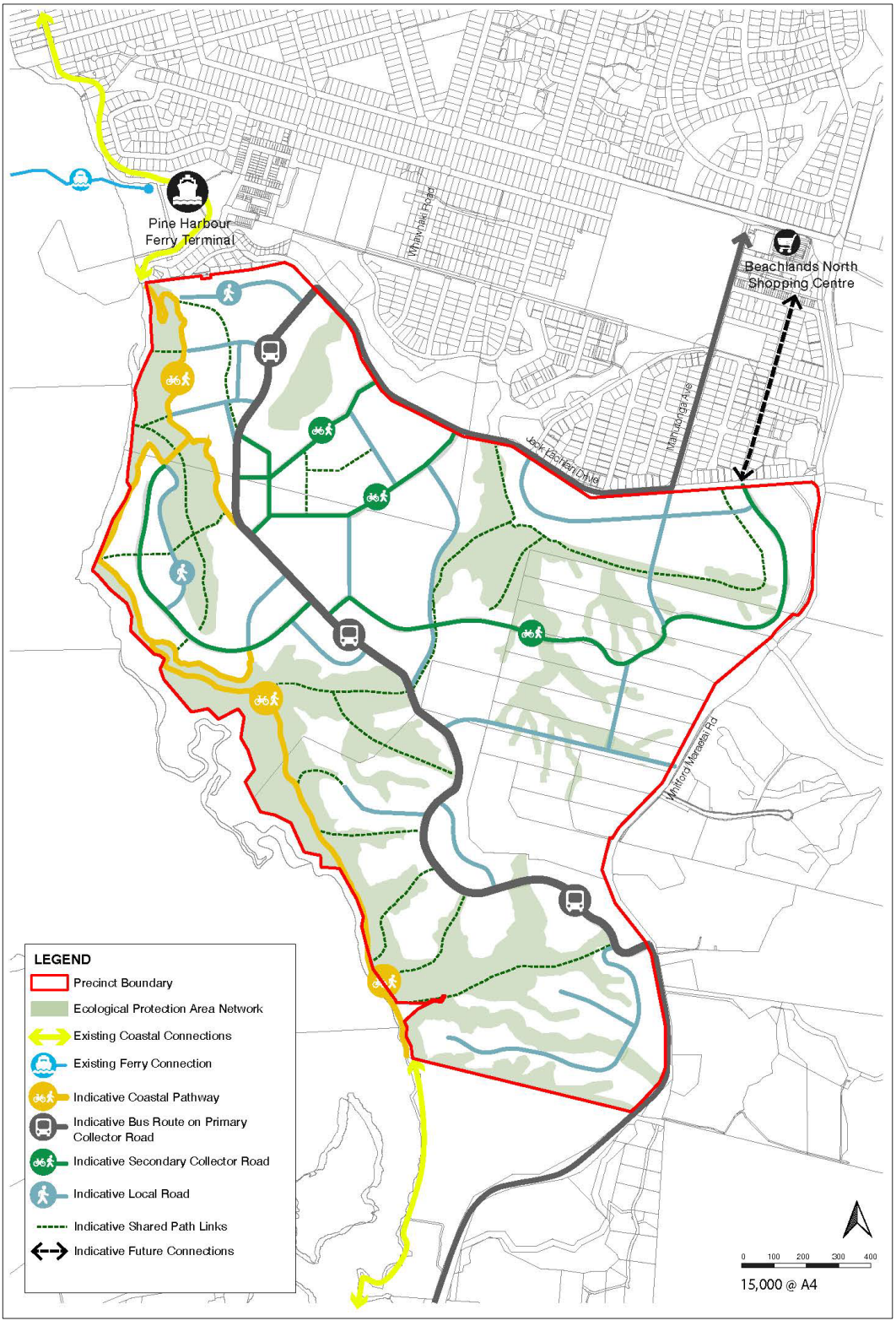


Figure 22: Proposed Plan Change Area Movement Plan (source: Russell Property Group)

8.1 Walking and Cycling

The proposed Plan Change provides an extensive and diverse walking and cycling network, as outlined in the sections below. The intention is to provide safe and convenient options to accommodate both travel to work/education and for recreational purposes.

Fully separated cycle lanes and footpaths are proposed on all Collector Roads within Beachlands South, as provided for within the proposed precinct provisions. The Collector Roads provide connection from the southern Whitford-Maraetai Road access to the existing Beachlands settlement and the Pine Harbour Ferry Terminal. These facilities provide a direct and safe option for pedestrians and cyclists to commute locally without the reliance on private vehicles. It also provides connection to the proposed commercial/retail centre, school and bus route.

Local Roads provide connection between residential properties and the Collector Roads. Where no dedicated cycle lanes are provided on local roads, cycling activity will be supported by slow-speed environments (i.e. 30km/h speed limits) and passive traffic calming (i.e. narrow lanes). Pedestrian footpaths are provided on all roads.

Beachlands South maximises the western coastline by proposing an off-road two way separated cycle path and walkway from the southern boundary to the Pine Harbour Ferry Terminal. This route is proposed along the coastline thus creating an enjoyable walking/cycling experience for those wishing to travel for leisure rather than purely a destination. This helps reinforce a sense of place within Beachlands South.

- Other walking and cycling facilities includes:
- Off-road shared paths which provide connection through open space and green areas.
- Department of Conservation (**DoC**) walkways
- A pedestrian and cyclist connection between Beachlands South and the existing Beachlands settlement
- Upgrades to the Jack Lachlan Drive cross section as necessary to connect development stages

More detailed information on the cross sections proposed are outlined in Section 8.6 of this ITA.

8.2 Bus Network

Integrated bus routes are able to be provided to serve and connect Beachlands South to the existing Beachlands settlement and the wider Auckland City. In response to greater residential catchment, it is appropriate to assume that AT will increase the bus frequency during both peak and off-peak periods to/from Auckland City.

Local bus services will be able to be accommodated on arterial and collector road within the wider area, as illustrated in Figure 23 Bus stops can be distributed at an appropriate walking distance (approximately a maximum of 400m walk) on these roads, with accesses from local roads.

In summary, the Plan Change area's public transport network will be significantly better connected to the wider Beachlands area and to Auckland City Centre than it is at present.

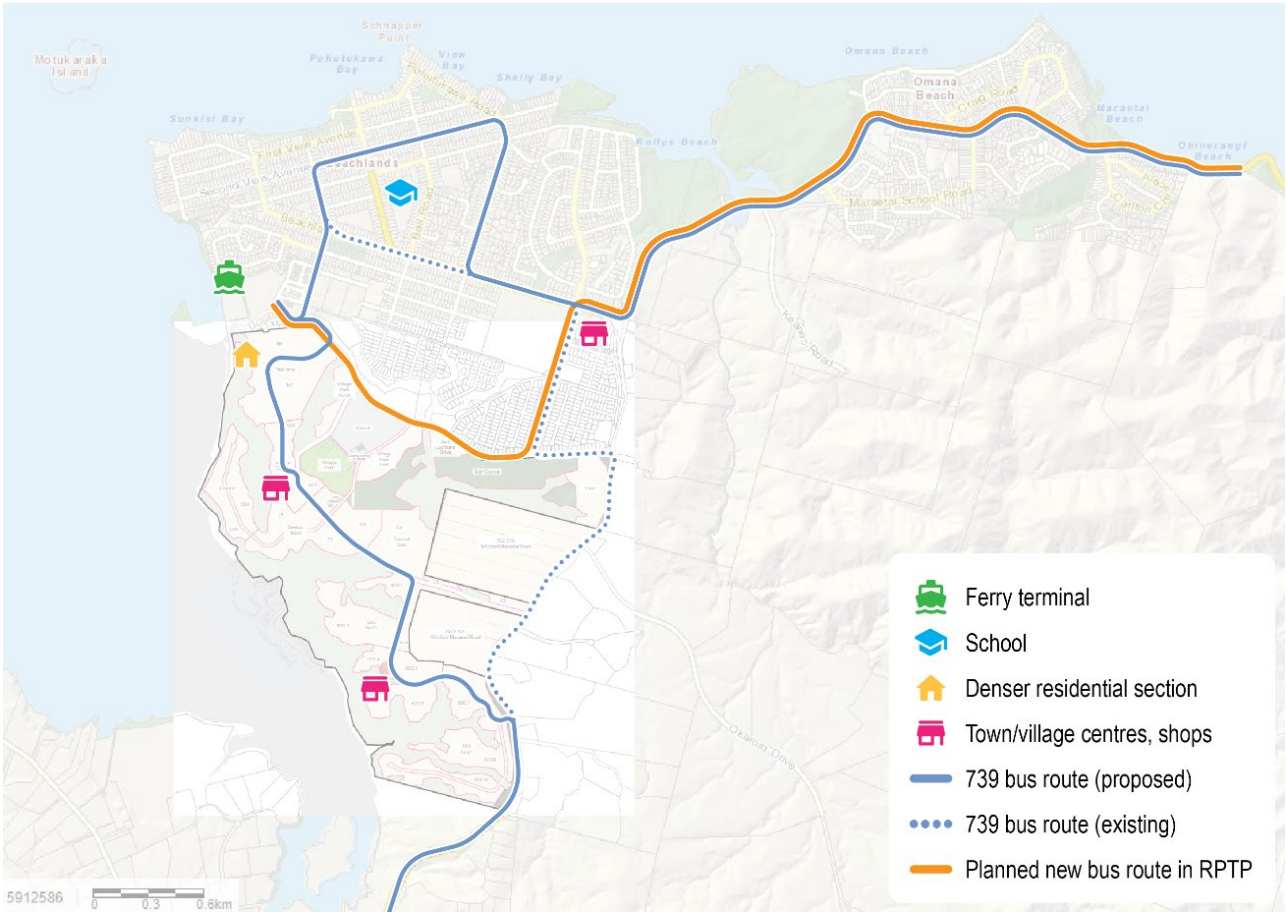


Figure 23: Proposed Public Transport Network

8.3 Ferry Network

The existing ferry terminal location and marine conditions places constraints on vessel size and capacity, meaning that people are currently getting left behind. The main issues with the ferry network are addressed in greater detail earlier in this report and are summarised as follows:

- Issue 1 – Lack of Capacity and Customer Level of Service (Los)
- Issue 2 – Limited Terminal Capacity
- Issue 3 – Limited Modal Integration
- Issue 4 – Limited Service Span

With this level of development, and the anticipated increase in trips to the city centre, Beachlands South has the unique opportunity to invest in an already established ferry network to meet future growth demands, reduce the reliance on cars and adhere to government strategy.

The ferry patronage was forecasted annually from 2023 to 2038 to establish an estimated future ferry demand, on top of existing demand and growth from the Beachlands area. The estimated future ferry patronage was determined by assessing the number of dwellings proposed by the Plan Change and in the Beachlands area, the number of people in work and education travelling to Auckland City Centre for work/education and the ferry mode share of people from the wider area that travel to the central city for work or education. The ferry patronage is given over a two-hour morning peak period (6:45am to 8:45am) and is summarised per year below.

Table 13: Future Peak Pine Harbour ferry patronage

Year	From Beachlands South	From Beachlands Area	Total
2023	0	413	413
2024	14	444	458
2025	33	459	492
2026	54	478	532
2027	76	502	577
2028	99	525	624
2029	122	539	661
2030	147	552	699
2031	172	566	737
2032	215	579	794
2033	258	592	851
2034	303	593	896
2035	348	607	955
2036	394	609	1,002
2037	440	620	1,060
2038	487	630	1,117

Table 13 demonstrates that the ferry demand for the threshold years 2024, 2031 and 2038 are 458 people, 737 people and 1117 people, respectively.

It is proposed to expand and improve on the existing ferry network to enable increased capacity, increased frequency, and improved customer Level of Service (**LoS**). A number of interventions are recommended to achieve this, including:

- Fleet improvement for Pine Harbour service.
- Additional interpeak and evening sailings for Pine Harbour
- An introduction of Pine Harbour weekend service

Figure 24 below illustrates a sequenced series of the ferry service improvements during the peak period.

To understand whether the future ferry demand would be met, the ferry capacity was determined by summing the total number of ferry seats travelling from Pine Harbour to Downtown between 06:45 and 08:45. For simplicity and to be conservative, standing space on the vessels was not included.

Figure 25 shows the vessel size, configuration and investment over the two hour peak period, per year.

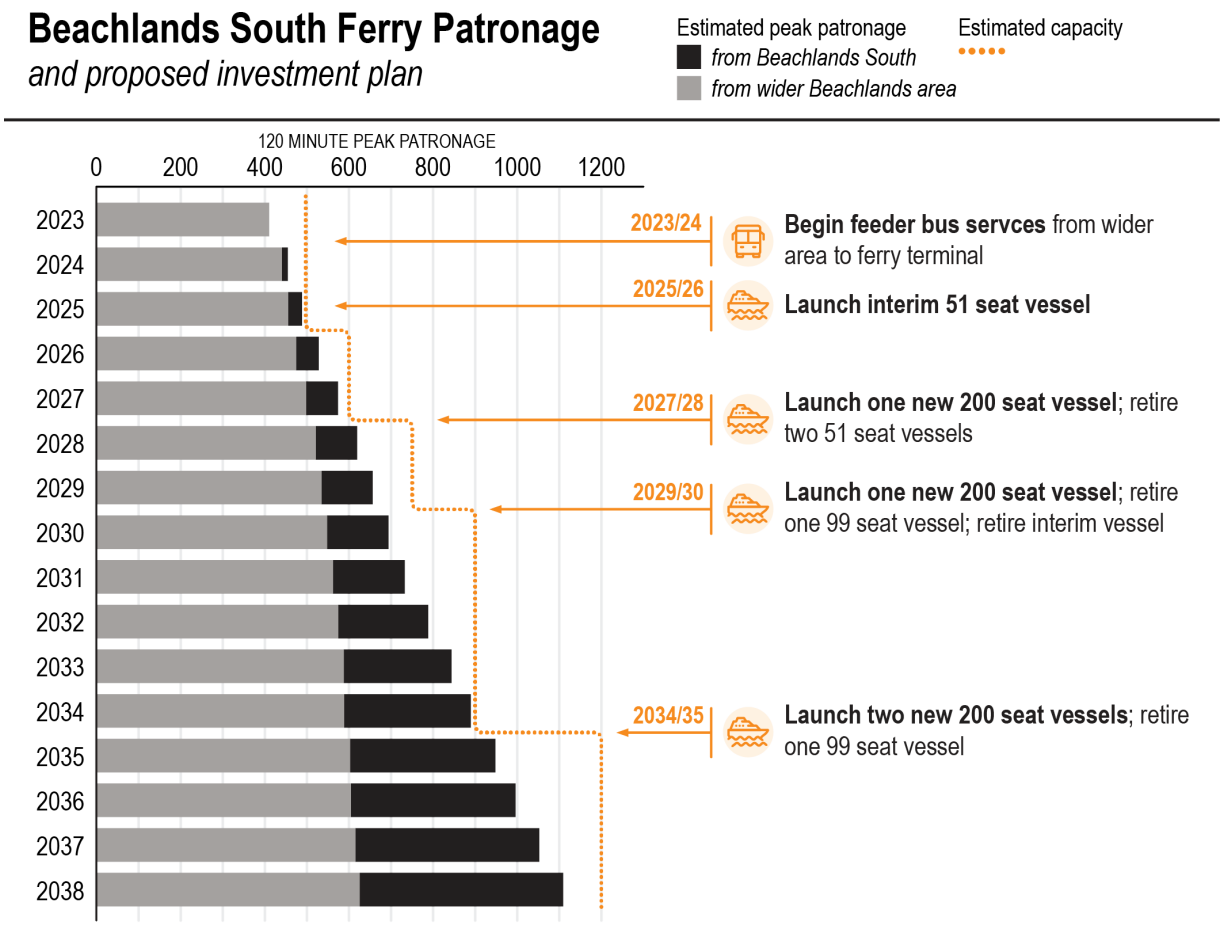


Figure 24: Sequenced Ferry Strategy

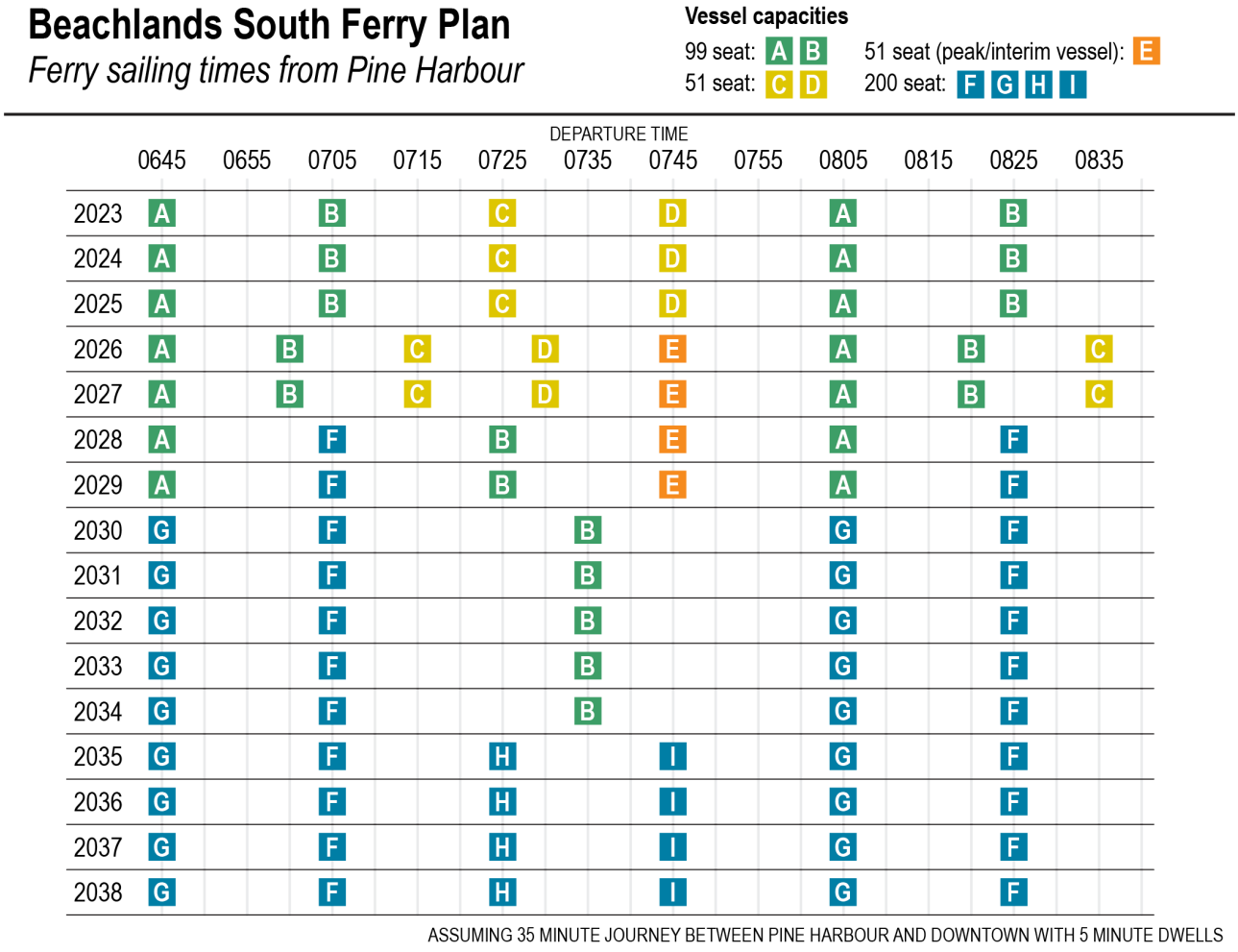


Figure 25: Ferry Sailing Times from Pine Harbour

To provide a full span of PT service to Pine Harbour the following must also be considered:

- **Weekdays** - additional 3.5 operating hours Monday to Thursday (i.e., 200 x per year) to match current Friday evening services (last boat from Downtown at 11:15pm)
- **Weekends** - new 15 hour a day single boat operation on weekends and public holidays

It is recommended that there should be a focus on supporting the new ferry terminal and supporting late evening and weekend ferry services. This would be complemented by a shuttle service to take customers to and from the ferry terminal, which in turn would mitigate the need to provide significant additional park and ride facilities.

Ferry investment beyond completion of the live zoned development (2038+) has not been assessed at this stage as the ability to accurately predict ferry travel behaviour decreases as the timeframe increases. It is instead recommended to reassess the ferry network performance and operation at the completion of the live zoned development (~2038) prior to proceeding with any further development and the plan change to rezone the FUZ land.

The introduction of larger vessels targets Issue 1 and Issue 2 as identified. The network operation gaps are addressed through the additional interpeak and weekend services.

These interventions encourage a mode shift from private vehicles to PT by offering a viable and attractive alternative. The interventions proposed help support the future ferry patronage forecasted based on the census data. This means that no passenger should be left behind.

It is this combination of measures that will provide both the capacity to meet demand to travel to the city centre from Pine Harbour and a level of seven-day-a-week ferry service that would make the service attractive for residents and the development as a destination for visitors from Auckland city centre.

8.4 Beachlands South Road Network

Within the Plan Change area, the internal road network is proposed to be arranged to provide direct multi - modal access to the Village Centres to reinforce the commercial viability.

Collector Roads will serve to collect traffic from local roads and provide connection to the Whitford-Maraetai Road and Jack Lachlan Drive. Local Roads will then serve access to adjacent property and connect to the Collector Roads to provide a comprehensive internal road network.

A high-level assessment of the internal intersections has been completed to understand the intersection types within the Plan Change Area. Roundabouts are recommended at Collector / Collector intersections, whilst a mixture of mini roundabouts and priority-controlled intersections are recommended on lower hierarchy roads.

Figure 26 shows an indicative internal network and indicates the internal road hierarchy, in accordance with the Auckland Transport Roads and Streets Framework.

The internal road network includes consideration of public transport routes and active transportation (such as cycling and walking amenities), as discussed in the sections above.

Provision of parking is abundant in the early stages of the development, with on-street spaces provided on the internal local roads, as well as under croft parking areas throughout the Plan Change area.

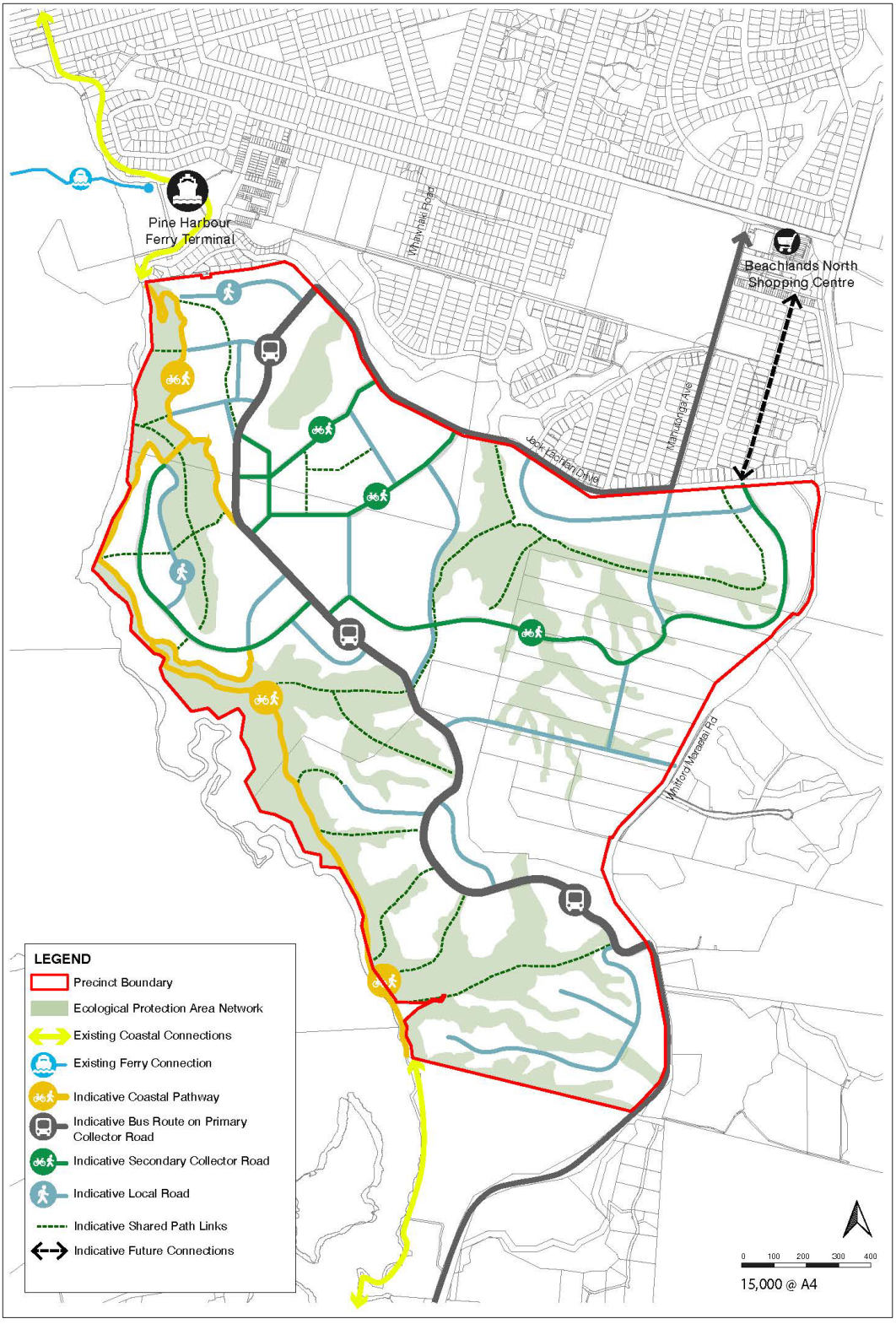


Figure 26: Indicative Beachlands South Road Hierarchy Network

The proposed street network and hierarchy is considered appropriate to enable safe and efficient movement of all modes within the development and connecting to the existing Beachlands settlement. A Primary Collector Road will intersect the site to carry buses and through traffic to and from the town centre and residential areas, as well as being the primary active mode spine. Secondary collectors are provided to further distribute all trip types, then a low-speed network of local roads will provide access to residential developments. All collectors will provide protected cycleways, and all local roads will be traffic clamed, to ensure a premium active mode experience. There will also be a network of recreational coastal shared paths, and a direct shared path to the ferry terminal.

8.5 External Road Network and Access to the Plan Change Area

In general, initially the Plan Change area will be accessible primarily via the Jack Lachlan Drive / Whitford- Maraetai Road intersection at the north. In the long term, it is anticipated that there will be multiple other access options to the Plan Change area, including the 722-770 Access / Whitford-Maraetai Road intersection, 620 Access / Whitford-Maraetai Road intersection and the Jack Lachlan Drive / Whitford- Maraetai Road intersection.

It is proposed to provide staged accesses to the Plan Change area in response to the level and rate of development and required roading infrastructure. Upgrades to the existing adjacent roads that may be required to support the proposed development can also be provided in stages, corresponding to the actual development, future market changes and funding availability.

The external access options and proposed infrastructure upgrades for the Plan Change area and have been investigated through traffic modelling as discussed in Section 10. High level concept designs are shown in Appendix A to show indicative land take.

Minor safety improvements, such as additional signage and markings, along Whitford-Maraetai should be considered in conjunction with the upgrade of the identified intersections.

8.6 Road Cross Sections

The proposed indicative cross sections within Plan Change area are outlined in Table 14. These sections have been developed in accordance with the AT Roads and Streets Framework. They are subject to further design development in the subsequent planning and design stages of the project.

Table 14: Indicative Cross Sections for the Road Network

Road type	Corridor width	Carriageway (incl. channel)	Median	Cycle Paths	Street trees/ Rain Garden/ Parking	Footpath
Jack Lachlan Drive	20m	6.4m	Not required	3.2m (two-way cycle path). Allowance for a 200mm Copenhagen kerb is required between the cyclepath and footpath	2.5m landscaping strip, ideally between the two-waycycle path and carriageway.	1.8m along the same side as the cycleway as minimum.
Primary Collector Road (with Public Transport)	23.8m	6.8m	Not required	3.2m (two-waycycle path). Allowance for a 200mm Copenhagen kerb is required between the cycle path and footpath	Multi-functional space[16]= 4m minimum each side, ideally between the two-waycycle path and carriageway. On-street parking may be provided (interspersed betweentrees) minimum 2.2m. Minimum 800mm back berms on both sides.	2m each side minimum

[16] A multi-functional space can change function throughout the long section and can include stormwater treatment (such as swales), landscaping, bus stops and/or parking.

Road type	Corridor width	Carriageway (incl. channel)	Median	Cycle Paths	Street trees/ Rain Garden/ Parking	Footpath
Primary Collector Road (Village Centre)	23.8m	6.8m[17]	Not required	3.2m (two-way cycle path). Allowance for a 200mm Copenhagen kerb is required between the cycle path and footpath	Multi-functional space= 2.8m minimum each side, ideally between the two-way cycle path and carriageway. On-street parking may be provided (interspersed between trees) minimum 2.2m.	2.5m each side. A minimum occupation zone of 1.5m should also be considered
Secondary Collector	19.1	6.4m	Not required	3.2m (two-way cycle path). Allowance for a 200mm Copenhagen kerb is required between the cycle path and footpath	2.4m parking / trees	2.5m each side minimum
Local Road	15m	5.4m	Not required	Not required	2.5m minimum parking / planting one side and 1.5m planting on other side..	2m each side minimum

Local roads, as well as other residential streets, will suitably cater for safe pedestrian and cyclist movements; with the latter to be accommodated on street safely through a reduced speed limit of 30km/h.

As previously discussed, within the Plan Change area, parking will be provided in accordance with the Auckland-wide parking provisions. Parking requirements will adapt overtime as the development and public transport network within the Plan Change area progresses, with the view that it will gradually reduce overtime. This approach will ensure the provision of carparking is appropriate for the scale and intensity of the Metropolitan Centre and will enable the market to provide the amount of carparking necessary to support development, while limiting carparking to an appropriate level to ensure that land is used efficiently.

[17] Assuming buses are required to go through the Village Centre. Can be reduced to 6.4m without buses.

9 Traffic Effects

Traffic modelling has been undertaken to assess the traffic effect of the proposed developments within the Beachlands South Plan Change Area, including identifying any roading infrastructure required to enable the proposed plan change and subsequent development for both the live zone and FUZ.

9.1 Modelling Methodology

A macro strategic model (MSM) [11] and ADTA[12] for the Beachlands area were available. Both models were reviewed and considered to be too coarse within the Beachlands, Whitford and Maraetai areas to provide even a high-level understanding of the network effects in these areas. Therefore, traffic modelling has been undertaken using a two-tiered approach with a network wide spreadsheet model (using excel) and a localised intersection operational model (Sidra Intersection).

The extents of the network wide spreadsheet model include:

- Whitford-Maraetai Road;
- Jack Lachlan Drive;
- Whitford Park Road from Whitford Road to Sandstone Road;
- Whitford Road from Whitford-Maraetai Road to Point View Drive;
- Site 1: Whitford-Maraetai Road / Beachlands Road / Kouka Road roundabout;
- Site 2: Jack Lachlan Drive / Kahawairahi Drive intersection;
- Site 3: Whitford-Maraetai Road / Jack Lachlan Drive intersection;
- Site 4: Whitford-Maraetai Road / Trig Road (western end) intersection;
- Site 5: Whitford Road / Whitford Park Road / Whitford Wharf Road roundabout;
- Site 6: Whitford Park Road / Sandstone Road / Saleyard Road roundabout;
- Site 7: Whitford Road / Somerville Road / Point View Drive intersection;
- Site 8: Proposed 712 Access/Whitford-Maraetai Road intersection; and
- Site 9: Proposed 620 Access/Whitford-Maraetai Road intersection.

The modelling assesses four forecast years: the beginning of the development in 2024, the midpoint of development in 2031, the live zoned development completion 2038 and FUZ. The traffic has been analysed for the morning and evening peak periods of these modelling years. Ultimately resulting in five main model scenarios as follows:

- 2020 Existing Traffic Scenario[18]
- 2024 Baseline[19] Scenario[20]
- 2024 Development Scenario[21]

[18] Internal Reference: N0D0

[19] Without the proposed development

[20] Internal Reference: N0D1a

[21] Internal Reference: N1D2a

- 2031 Development Scenario[22]
- 2038 Development Scenario[23]
- FUZ Proposed Scenario[24]

Each scenario is modelled by applying the background traffic (including any internalisation of background traffic), updated PT mode share and any updated network assumptions. The proposed development land use and trip generation rates are then used to determine the trips generated. Externalisation, inbound/outbound and distribution percentages are then applied to understand how the trips are distributed throughout the network and existing survey data was assessed to understand the trip distribution at the intersections.

Those traffic volumes are then imported into the Sidra Intersection model for each individual intersection to determine the infrastructure upgrades required to accommodate the proposed development.

Through the master planning process, the land use is refined and updated, resulting in an iterative modelling process. However, these latest land use scenarios refer to the Masterplan being lodged as part of this Plan Change application. These scenarios and the required assumptions are discussed in more detail below.

9.2 Background Traffic

An existing traffic growth rate could not be determined using historical traffic count data along Whitford - Maraetai Road as traffic volumes have increased substantially per year due to developments being constructed in the Beachlands area. AT traffic counts show a range of traffic growth from 1% - 113% between 2015-2018. The variability means that this data cannot be reliably used to predict the future background traffic growth.

Whilst the MSM model is quite coarse for this area, given the lack of reliability in the traffic counts, the population growth for zones 445,448,449,450 and 451 using the i11.5 land use forecasts, as shown in Figure 27 below, has been used to extrapolate an understanding on the future traffic growth in the area (without development of the Plan Change area development).

[22] Internal Reference: N8D16

[23] Internal Reference: N9D17f

[24] Internal Reference: N10D18a

Figure 27: I11.5 Land Use Zones

Applying a different growth rate on different roads, based on the MSM population growth zones, was considered. However, this approach was not considered appropriate for this higher level of assessment as the MSM zones are very broad and no information on trip distribution between the zones were available. Therefore, a blanket traffic growth rate was applied across the area but updated per model year.

The i11.5 land use forecast indicates that the growth rate will not be linear but will slow down in the future as the area develops. A summary of the background traffic growth, per annum, has been outlined in Table 15 below for each model year.

Table 15: Background Traffic Growth Rate

Model Year	Background Traffic Growth Rate (%) per annum
2020 - 2024	1.08%
2024 - 2031	0.67%
2031 - 2038	0.52%
2038 – 2051 (FUZ)	0.00%

It is understood that the only known additional development within the area includes an 89ha FUZ in Maraetai (approximately 200 households within the next 15 years) and 235 household developments in the existing Beachlands settlement prior to 2024. These developments are incorporated into the traffic growth rates, as reflected in the i11.5 population growth and Future Urban Land Supply Strategy (**FULSS**).

It is assumed that FUZ development would be completed in 2051 and it was assumed that the Plan Change development has already been allowed for in the i11.5 land use forecast and therefore any significant additional traffic growth compared to 2038 would be a direct result of the completed Plan Change area and therefore, to avoid double counting, no background traffic growth has been applied in the 2051 model scenarios.

The development will also provide some positive travel demand effects by internalising some existing daily trips in/out of Beachlands' current and proposed population. The provision of schools, employment and further amenities will be

particularly effective in that regard. Therefore, as the development progresses, the percentage of internalised background traffic on the network will increase.

The assumed percentage of background traffic internalisation is summarised in Table 16. These percentages are based on the assumed relationship between the increase in additional land uses within the area and the existing land uses. For example, in 2038, new/increased retail, educational and commercial facilities are proposed, which will result in people who live within the region and previously worked, studied, or played in Auckland City Centre to now travel internally to/from Beachlands South instead.

Table 16: Percentage of Background Internalisation per scenario year

Beachlands (i.e. Sunkist Bay + Te Puru) + Maraetai	
Year	% Internalisation of Background External Travel (i.e. along Whitford-Maraetai Road)
2018 Census	0%
2024	0%
2031	3%
2038	5%
2051 (FUZ)	7%

9.3 Public Transport

The existing public transport mode share was determined using the Stats NZ 2018 census data. To be conservative, the active mode share of 2% was excluded from the traffic modelling assessment.

Assumptions around the change in public transport mode share, for each model year, were required to be included due to the TOC nature of the proposed development. The public transport mode share is directly influenced by the existing and proposed infrastructure for the area.

As previously stated there is currently no government funding for the Beachlands area within the next decade. However, we understand that investment options for the Pine Harbour Ferry terminal and associated operations have been investigated by Auckland Transport.

The bus and ferry upgrades, discussed in Section 7, enable the PT mode share to increase as outlined in Table 17 below. These assumptions are in accordance with the forecasted ferry capacity and case studies discussed previously in this ITA.

Table 17: Public Mode Share Assumptions

Model Year	% Public bus	% Ferry	%Combined	Public Transport Network
2020	1%	6%	**7%**	• One hourly bus route (739) which runs between 6am and 6pm during the weekdays and 7am to 8pm on weekends. • Weekday ferry services only every 20 minutes during peak periods. • There is currently no permanent weekend service.
2024	2%	6%	**8%**	• 1x additional interim 51-seat vessel • Shuttle Service connecting the existing 739 bus route to the ferry terminal • Additional 3.5 operating hours Monday to Thursday
2031	2%	11%	**13%**	• 2x new 200-seat vessels (retired 2x 51-seat vessels, 1x 99-seat vessel and the interim 99-seat vessel)
2038	4%	13%	**17%**	• 2x new 200-seat vessels (retired 1x 99-seat vessel)
2051	4%	13%	**17%**	No additional upgrades proposed at this stage. Reassessment recommended at 2051.

9.4 Road Network

To assess the impact of the development traffic on the network and identify any potential infrastructure upgrades that will be required, the 2024 Baseline scenario was determined by using the existing 2020 traffic survey data and applying the aforementioned traffic growth. As there are no significant developments consented for between 2020 and 2024 within the Beachlands area, no changes to infrastructure, public transport or internalisation were assumed.

As discussed earlier, four laning of Whitford-Maraetai Road and the Whitford bypass have been historically assessed as part of potential infrastructure upgrades within the Whitford area. However, no funding has been formally allocated for these upgrades. Therefore, the need for these upgrades would be determined by the outcome of the Plan Change area traffic effects only.

This scenario was then used to assess the capacity of the future network prior to the proposed Beachlands South staged development. It has been used as a baseline to compare the other scenarios, as it can be assumed that as the general background traffic increases and there are no upgrades to the infrastructure due to no government funding allocated, the performance of the network would only worsen with time.

It is noted that if an upgrade is required in 2024 than it is assumed that upgrade will be in place from 2024 onwards unless another model year triggers an additional upgrade. Sometimes if an upgrade is required at the same intersection every model year than the final intersection may be adopted as the initial design to accommodate that future demand. This minimises the need for future rework.

9.5 Trip Generation

A high-level feasibility assessment was undertaken to determine the estimated trip generation of the activities of the proposed Plan Change Area.

A research of the available trip generation data for the relevant activities from the following sources: RMS Guide to Traffic Generating Developments (**RMS**), NZ Transport Agency Research Report 453: Trips and Parking related to land use (**RR453**), Institute of Transportation Engineers Trip Generation Manual (**ITE**), and trip generation data collected internally by Stantec was completed. To determine an appropriate trip generation rate for the land use activities the following was assumed:

- Commercial activities were classified as offices under the ITE and RMS and therefore an average trip generation rate was taken.

- For educational facilities, a middle school/junior high school was assumed for the ITE. The Waka Kotahi Research Report 467 (**RR467**) was also referred to as an additional source. An average trip generation rate of the ITE, RR453 and RR467 was adopted.
- For the residential, low density dwellings, an average trip generation rate of the ITE, RMS and internally collected data[25] was adopted. Survey data was included in the trip generation rate for the low-density dwellings as the existing residential activity in the Beachlands area is already predominantly low-density housing and therefore could be accurately captured within the recently completed surveyed traffic volumes.
- For the residential, medium density and high-density dwellings, the RMS trip generation rate was adopted. This was deemed to represent the New Zealand trip generations most accurately.
- For the retail and café, the PM trip generation rate from RR453 was adopted for the PM trip generation rate. For the smaller shops and metro supermarket an average of internal surveys and the RR453 report were adopted. For sources that did not provide an AM trip generation rate for retail, a factor of 20%[26] of the PM trip rate was applied.
- The ITE trip generation rate was adopted for the golf course. However, the peak generator for golf courses will be more likely to occur during the weekend or off-peak times during the weekday. Therefore, the trip generation for the golf course was not included within the peak periods of the network as it was considered to be negligible.
- The ITE trip generation was adopted for the retirement living dwellings/units and light industrial land use.

Using the abovementioned trip rates and areas, the total trip generation in vehicles per hour (**vph**) were calculated.

A summary of the trip generation based on activity is outlined in Table 18 below.

Table 18: Trip Generation Summary Based on Activity

Land Use	Trip Gen Rate		2024 – Trip Generation (vph)		2031 – Trip Generation (vph)		2038 – Trip Generation (vph)		FUZ – Trip Generation (vph)	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
Residential – Low Density	0.80	0.83	23	24	120	124	214	222	663	686
Residential - Medium Density	0.65	0.65	29	29	293	293	575	575	778	778
Residential - High Density	0.29	0.29	10	10	116	116	456	456	461	461
Retail -cafes	3.15	15.60	0	0	8	39	51	254	51	254
Retail – smaller scale shops	2.84	9.93	0	0	14	50	71	248	71	248
Retail – metro supermarkets	2.26	14.48	0	0	0	0	45	290	45	290
Commercial	1.87	1.87	0	0	37	37	96	95	96	95

[25] Beachlands survey data (2020 and 2012)

[26] Based on internal survey data

Land Use	Trip Gen Rate		2024 – Trip Generation (vph)		2031 – Trip Generation (vph)		2038 – Trip Generation (vph)		FUZ – Trip Generation (vph)	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
Education	0.38	0.22	0	0	456	262	829	477	829	477
Light Industrial	0.75	0.68	0	0	15	14	121	109	121	109
Retirement	0.33	0.31	0	0	33	31	64	60	64	60
Total	-	-	**62**	**62**	**1,059**	**935**	**2,458**	**2,725**	**3,114**	**3,397**

9.6 Trip Distribution

The total trips per peak hour period were then further analysed and the directional distribution (inbound / outbound movements) was determined using the averaged survey data for Beachlands Road / Whitford - Maraetai Road intersection and Jack Lachlan Drive / Whitford-Maraetai Road intersection. These directional distributions were applied across all the land use activities and are summarised in Table 19 below.

Future trip distributions and trip generation rates are based off historical trends and data. Adjustments have been made to account for the changes in land use where reasonable, as discussed below. This is a conservative approach as the traditional way of work has been disrupted due to COVID-19 and it is likely that a number of people may have more flexible working arrangements in the future, including work from home. In addition, political pressure on carbon emission reductions could likely impact how and when people travel on the network.

Table 19: Inbound / Outbound Directional Distribution

Direction	AM		PM	
	Outbound	Inbound	Outbound	Inbound
North	13%	35%	60%	18%
South	87%	65%	40%	82%

The percentage of inbound / outbound trips for each land use, was determined using the ITE.

A percentage of the trips generated by the development will only travel internally. For the purposes of this assessment, internal trips are defined as trips that stay within The existing Beachlands settlement and Beachlands South (the Plan Change Area) without using Whitford-Maraetai Road. External trips are defined as any trips required to travel on Whitford-Maraetai Road.

To understand the percentage of internal and external trips, per land use, the NZ Stats 2018 census data, existing and proposed land use activities were assessed.

Due to the location of Beachlands, the predominantly surrounding rural nature and the common opening hours for stores (9am-5pm) compared with the peak period times, it is unlikely that external trips would be made into Beachlands for retail purposes during the peak period of the network. It is more likely that retail trips would occur during off peak network times and/or the weekend.

As new offices, commercial spaces and light industrial activities are proposed in conjunction with residential dwellings, it is assumed that a high proportion of the people taking up new employment would also reside within the area.

Currently, 24% of students leave Beachlands to go to an in-zone secondary school area, 49% stay in the Beachlands area and 27% go to out-of-zone schools. In the future, it is assumed that the percentage that previously went to in-zone schools would opt for a closer school. However, the percentage that are currently already going to an out of zone school would continue to choose those more established schools.

As the development progresses, the diversity of land use increases, and it is assumed that the number of residential external trips made will decrease as more land use activities are developed in closer proximity.

Based on the above, the inbound / outbound split and percentage of external and internal trips per land use are summarised in Table 20 below. These assumptions were then applied to the trips generated. Existing survey data was used to distribute those trips at each model intersection and across the wider model network.

Table 20: Trip Distribution Assumptions

Land Use Description	AM Trip Distribution		PM Trip Distribution		% of External Trips	% of Internal Trips
	Inbound	Outbound	Inbound	Outbound		
Residential – Low Density	0.25	0.75	0.63	0.37	65% (2024) 55% (2031) 50% (2038 & FUZ)	35% (2024) 45% (2031) 50% (2038 & FUZ)
Residential - Medium Density	0.25	0.75	0.63	0.37	65% (2024) 55% (2031) 50% (2038 & FUZ)	35% (2024) 45% (2031) 50% (2038 & FUZ)
Residential - High Density	0.23	0.77	0.63	0.37	65% (2024) 55% (2031) 50% (2038 & FUZ)	35% (2024) 45% (2031) 50% (2038 & FUZ)
Retail -cafes	0.41	0.59	0.5	0.5	10%	90%
Retail – smaller scale shops	0.54	0.46	0.46	0.54	10%	90%
Retail – metro supermarkets	0.5	0.5	0.51	0.49+	5%	95%
Commercial	0.86	0.14	0.16	0.84	40%	60%
Education	0.55	0.45	0.45	0.55	27%	73%
Light Industrial	0.83	0.17	0.22	0.78	55%	45%
Retirement	0.47	0.53	0.53	0.47	40%	60%

9.7 Intersection Modelling

Once the model traffic data outputs were extracted from the network model, the development of the intersection models were assessed. SIDRA models were coded for each model scenario to assess the following intersections (morning and evening peak hours):

- Site 1: Whitford-Maraetai Road / Beachlands Road / Kouka Road roundabout;
- Site 2: Jack Lachlan Drive / Kahawairahi Drive intersection;
- Site 3: Whitford-Maraetai Road / Jack Lachlan Drive intersection;

- Site 4: Whitford-Maraetai Road / Trig Road (western end) intersection;
- Site 5: Whitford Road / Whitford Park Road / Whitford Wharf Road roundabout;
- Site 6: Whitford Park Road / Sandstone Road / Saleyard Road roundabout;
- Site 7: Whitford Road / Somerville Road / Point View Drive intersection;
- Site 8: Proposed 712 Access/Whitford-Maraetai Road intersection; and
- Site 9: Proposed 620 Access/Whitford-Maraetai Road intersection.

Each intersection was tested during each base and development scenario. Where an intersection clearly failed from a capacity perspective, an upgrade was proposed. Failure results are not provided for brevity of reporting The modelling results and resulting upgrade requirements are discussed below and the full SIDRA results are provided in Appendix B.

9.7.1 2020 Existing

The SIDRA intersection layouts used for the 2020 Existing scenario are shown in Appendix C.

The modelled 2020 Baseline, peak-hour results are summarised in Table 21 and Table 22 below. The performance parameters include the average delay (in seconds), the level of service (LOS) and the 95% queue (in vehicles) for each approach.

The results show that the existing 2020 traffic volume data results in a LOS E and F at the Whitford Road/Whitford-Maraetai Road roundabout in the AM and PM peak respectively. Long delays and queues are evident on the Whitford Maraetai Road approach of 87 seconds and 630m in the AM peak and on the Whitford Road approach of 87 seconds and 617m in the PM peak.

At Whitford Maraetai Road / Jack Lachlan Drive intersection, the overall performance is LOS E and D in the AM and PM peaks respectively. However, the Jack Lachlan Drive approach operates at LOS F in both peaks, with average delays over 500 seconds and queues over 200m in the AM peak and 232 seconds and 178m in the PM peak.

As such it is considered that both the Whitford Road and Jack Lachlan Drive intersections with Whitford Maraetai Road are currently over-capacity during peak hour conditions, with long queues and delays at those times.

Table 21: 2020 Existing SIDRA Results - AM

Intersection - AM	DOS	Intersection LOS	Max Q (m)	Max Delay (s)
1_Beachlands / Whitford Maraetai Road RAB	0.92	LOS B	126	54
2_Jack Lachlan / Kahawairahi Drive	0.06	LOS A	1	9
3_Jack Lachlan / Whitford Maraetai Road	1.99	LOS E	201	507
4_Trig Road / Whitford Maraetai Road	0.70	LOS A	5	132
5_Whitford Road / Whitford Maraetai Road RAB	1.15	LOS E	631	83
6_Sandstone Road / Whitford Park Road RAB	0.95	LOS B	173	37
7_Somerville Road / Whitford Road	0.89	LOS C	158	46

Table 22: 2020 Existing SIDRA Results - PM

Intersection - PM	DOS	Intersection LOS	Max Q (m)	Max Delay (s)
1_Beachlands / Whitford Maraetai Road RAB	0.75	LOS A	70	17

Intersection - PM	DOS	Intersection LOS	Max Q (m)	Max Delay (s)
2_Jack Lachlan / Kahawairahi Drive	0.12	LOS A	1	9
3_Jack Lachlan / Whitford Maraetai Road	1.51	LOS D	177	286
4_Trig Road / Whitford Maraetai Road	0.58	LOS A	4	65
5_Whitford Road / Whitford Maraetai Road RAB	1.37	LOS F	617	191
6_Sandstone Road / Whitford Park Road RAB	0.80	LOS A	89	16
7_Somerville Road / Whitford Road	0.86	LOS B	116	17

9.7.2 2024 Baseline

The SIDRA intersection layouts used for the 2024 Baseline scenario are shown in Appendix D. The intersection layouts reflect the current layouts in this scenario, prior to any development traffic or upgrades being proposed.

The results show that even without the Beachlands South development, traffic volumes for the 2024 baseline scenario result in a LOS E and F for the Whitford Road/Whitford-Maraetai Road intersection in the AM and PM peaks respectively. The delays at the Whitford Maraetai Road approach during the AM peak increase to 105 seconds and 780 metres, and on the Whitford Road approach in the PM peak to 241 seconds and 748 metres. The Jack Lachlan Drive / Whitford-Maraetai Road priority intersection performs at LOS F and E in the AM and PM peak hours respectively. On the Jack Lachlan Drive approach, delays and queues are 2,473 seconds and 394 metres in the AM and 424 seconds and 232 metres in the PM. Both intersections are therefore well over capacity by 2024 without any Beachlands South development added.

Table 23: 2024 Baseline SIDRA Results - AM

Intersection	DOS	Intersection LOS	Max Q (m)	Max Delay (s)
1_Beachlands / Whitford Maraetai Road RAB	1.07	LOS C	208	94
2_Jack Lachlan / Kahawairahi Drive	0.07	LOS A	1	9
3_Jack Lachlan / Whitford Maraetai Road	6.33	LOS F	394	2,473
4_Trig Road / Whitford Maraetai Road	0.73	LOS A	5	96
5_Whitford Road / Whitford Maraetai Road RAB	1.21	LOS E	776	108
6_Sandstone Road / Whitford Park Road RAB	1.03	LOS C	251	56
7_Somerville Road / Whitford Road	1.01	LOS C	289	78

Table 24: 2024 Baseline SIDRA Results - PM

Intersection	DOS	Intersection LOS	Max Q (m)	Max Delay (s)
1_Beachlands / Whitford Maraetai Road RAB	0.79	LOS A	83	18
2_Jack Lachlan / Kahawairahi Drive	0.12	LOS A	1	9

Intersection	DOS	Intersection LOS	Max Q (m)	Max Delay (s)
3_Jack Lachlan / Whitford Maraetai Road	1.83	LOS E	232	424
4_Trig Road / Whitford Maraetai Road	0.60	LOS A	3	50
5_Whitford Road / Whitford Maraetai Road RAB	1.50	LOS F	748	245
6_Sandstone Road / Whitford Park Road RAB	0.85	LOS A	110	18
7_Somerville Road / Whitford Road	0.90	LOS B	150	19

9.7.3 2024 Development

Due to their very poor performances in the 2024 baseline scenario, the following upgrades are proposed prior to any occupation occurring at Beachlands South:

- Jack Lachlan Dr/Whitford-Maraetai Rd give-way priority intersection upgraded to a signalised intersection
- Whitford Rd/Whitford-Maraetai Rd intersection single lane roundabout upgraded to a two-lane roundabout

These upgrades are included in the proposed precinct provisions and are required to be implemented prior to any subdivision and development of land.

It should be noted that the existing poor performances are a result of the current expansion of the existing Beachlands settlement (and other growth in the area), and therefore should be upgraded by Auckland Transport to prevent a safety issue from occurring. However, these intersections are currently not identified for improvements within Auckland Transport's funding streams, and therefore the applicants propose to construct the upgrades to support the plan change.

A concept design for the proposed upgrade of the Whitford Maraetai Road / Jack Lachlan Drive intersection is shown in **Figure 28** below, with the full drawing provided in Appendix B.

The upgrade entails the signalisation of the intersection to include two through lanes on Whitford Maraetai Road and double right turning lanes from Jack Lachlan Drive. It is proposed that the speed limit on Whitford Maraetai Road be reduced to 50kph at this location to enhance safety and reflect the urban environment that the Beachlands South plan change will introduce. This speed limit change will be undertaken in coordination with Auckland Transport. It is noted that a smaller intersection could accommodate the traffic envisaged in the 2024 development scenario, but it is considered prudent to future proof for subsequent development stages rather than increase disruption by constructing an interim layout first, then a larger upgrade later. The improvement can be made within the existing widening designation, meaning that some small land purchase will be required.

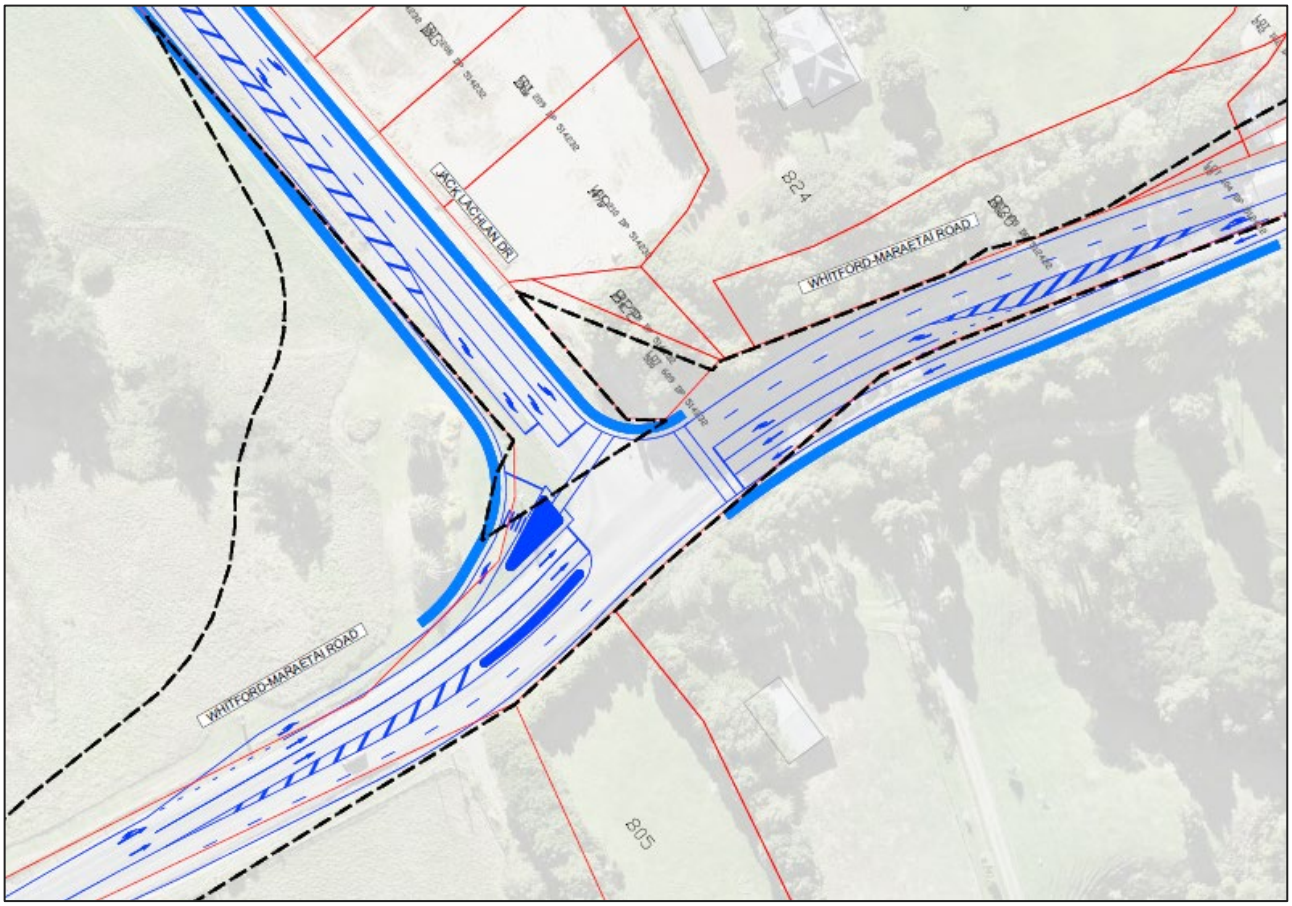


Figure 28: Proposed Upgrade to Whitford Maraetai Road / Jack Lachlan Drive intersection

A concept design for the proposed upgrade of the Whitford Maraetai Road / Whitford Road roundabout is shown in **Figure 29** below, with the full drawing provided in Appendix B.

The design provides for two approach lanes from the northwest and northeast, and three lanes from the south. It also incorporates raised speed humps on all approaches, including a raised zebra crossing on the northeastern arm to accommodate the pedestrian movements. This upgrade can be made within the existing road reserve, but structural works will be required along the southwestern frontage adjacent to the creek. Again, the intersection has been future-proofed to accommodate the full development enabled by both the live zone (and FUZ), rather than providing an interim design that would need to be subsequently upgraded.

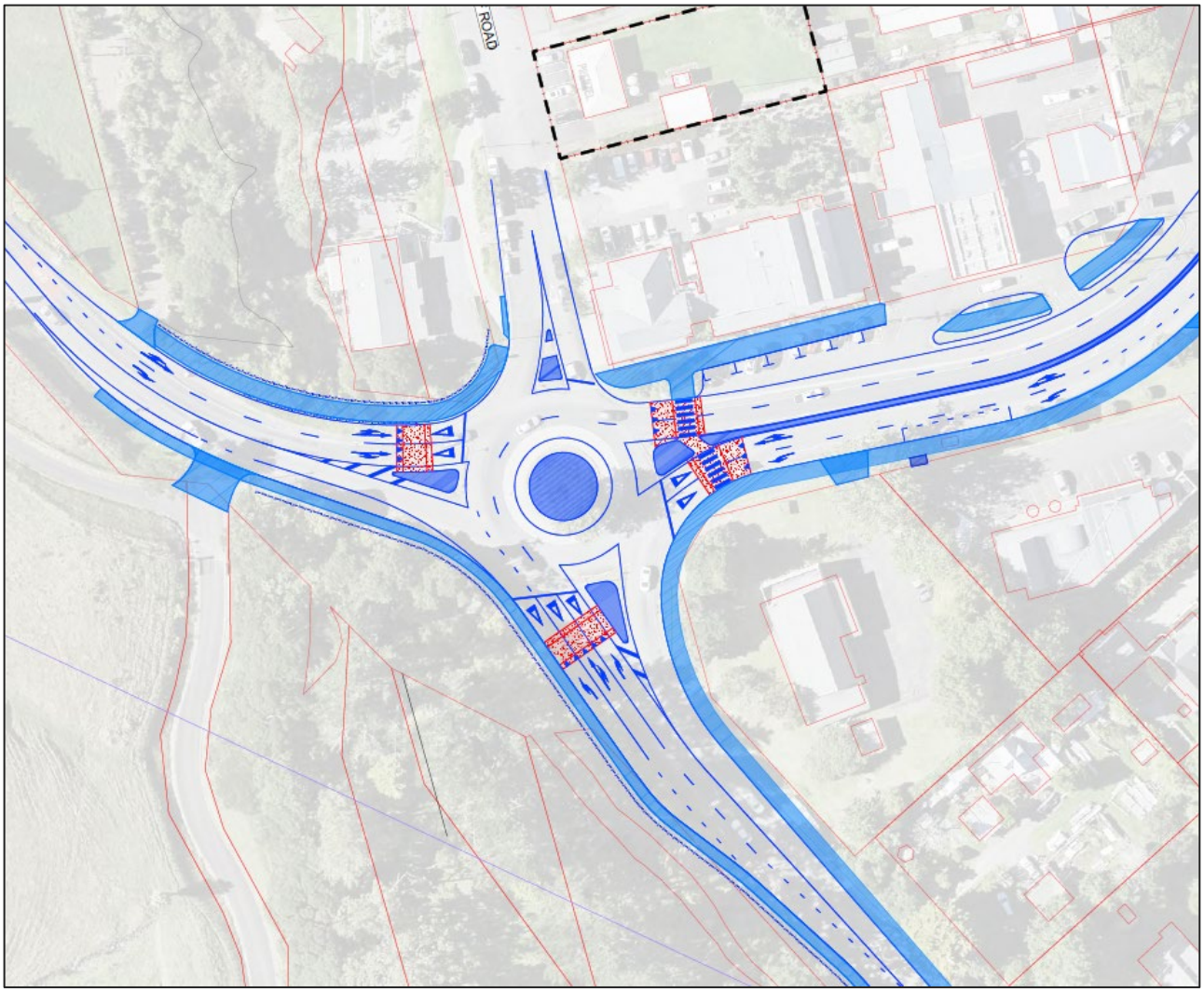


Figure 29: Proposed Upgrade to Whitford Maraetai Road / Whitford Road roundabout

The SIDRA intersection layouts used for the 2024 Development scenario, including the upgraded intersections, are shown in Appendix E.

With these upgrades are in place, the results of the 2024 Development scenarios are provided in Appendix B and summarised in Table 25 and Table 26 below. The results show that the proposed intersection upgrades can accommodate the development traffic, with LOS at the Whitford Maraetai Road / Whitford Road roundabout reducing to LOS A in both peaks, and the Jack Lachlan Drive / Whitford Maraetai Road performance reducing to LOS B in both peak periods. Some further delays and queues are evident at both the Beachlands Road / Whitford Maraetai Road roundabout and the Whitford Park Road / Saleyard Road / Sandstone Road roundabout, but these are within normal peak hour levels.

Table 25: 2024 Development SIDRA Results - AM

Intersection	DOS	Intersection LOS	Max Q (m)	Max Delay (s)
1_Beachlands / Whitford Maraetai Road RAB	1.08	LOS C	215	97
2_Jack Lachlan / Kahawairahi Drive	0.07	LOS A	1	9
3_Jack Lachlan / Whitford Maraetai Road	0.67	LOS B	124	46
4_Trig Road / Whitford Maraetai Road	0.75	LOS A	5	107

Intersection	DOS	Intersection LOS	Max Q (m)	Max Delay (s)
5_Whitford Road / Whitford Maraetai Road RAB	0.85	LOS A	99	13
6_Sandstone Road / Whitford Park Road RAB	1.10	LOS C	339	83
7_Somerville Road / Whitford Road	1.01	LOS C	293	80

Table 26: 2024 Development SIDRA Results - PM

Intersection	DOS	Intersection LOS	Max Q (m)	Max Delay (s)
1_Beachlands / Whitford Maraetai Road RAB	0.80	LOS A	86	18
2_Jack Lachlan / Kahawairahi Drive	0.14	LOS A	1	10
3_Jack Lachlan / Whitford Maraetai Road	0.51	LOS B	94	47
4_Trig Road / Whitford Maraetai Road	0.62	LOS A	3	54
5_Whitford Road / Whitford Maraetai Road RAB	0.93	LOS A	89	20
6_Sandstone Road / Whitford Park Road RAB	0.86	LOS A	116	19
7_Somerville Road / Whitford Road	0.91	LOS B	156	20

9.7.4 2031 Development

Due to their poor performances in the 2031 development scenario, it is proposed that before the development that is anticipated by the 2031 development scenario can proceed, there will be a requirement in the plan change provisions to upgrade the Whitford Park Road / Saleyard Road / Sandstone Road roundabout to provide an additional approach lane on the northbound approach, and to upgrade the Trig Road / Whitford-Maraetai Road to signals. For the purposes of this assessment, it was assumed that the Trig Road intersection upgrade would be in the form of a signalised intersection, however, it is recommended that the exact form of the intersection be assessed closer to the time, based on updated traffic counts and travel patterns.

It should be noted that the poor performance is a result of existing traffic volumes and general background growth alongside the growth enabled in Beachlands South. However, these intersections are currently not identified for improvements within Auckland Transport's funding streams, and therefore the applicants propose to construct the upgrades to support the plan change.

Concept designs for the proposed upgrades of the Whitford Road / Saleyard Road / Sandstone Road and Whitford Maraetai Road / Trig Road intersections are shown in **Figure 30** and **Figure 31** below, with the full drawings provided in Appendix B.

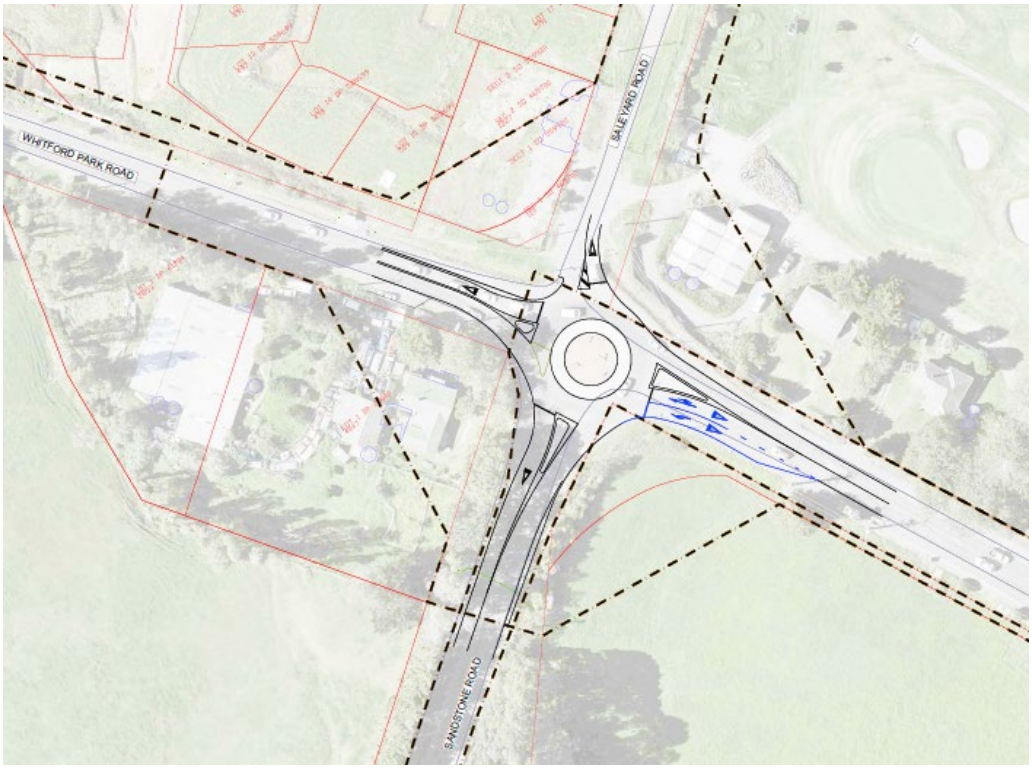


Figure 30: Proposed Upgrade to Whitford Park Road / Sandstone Road / Saleyard Road roundabout

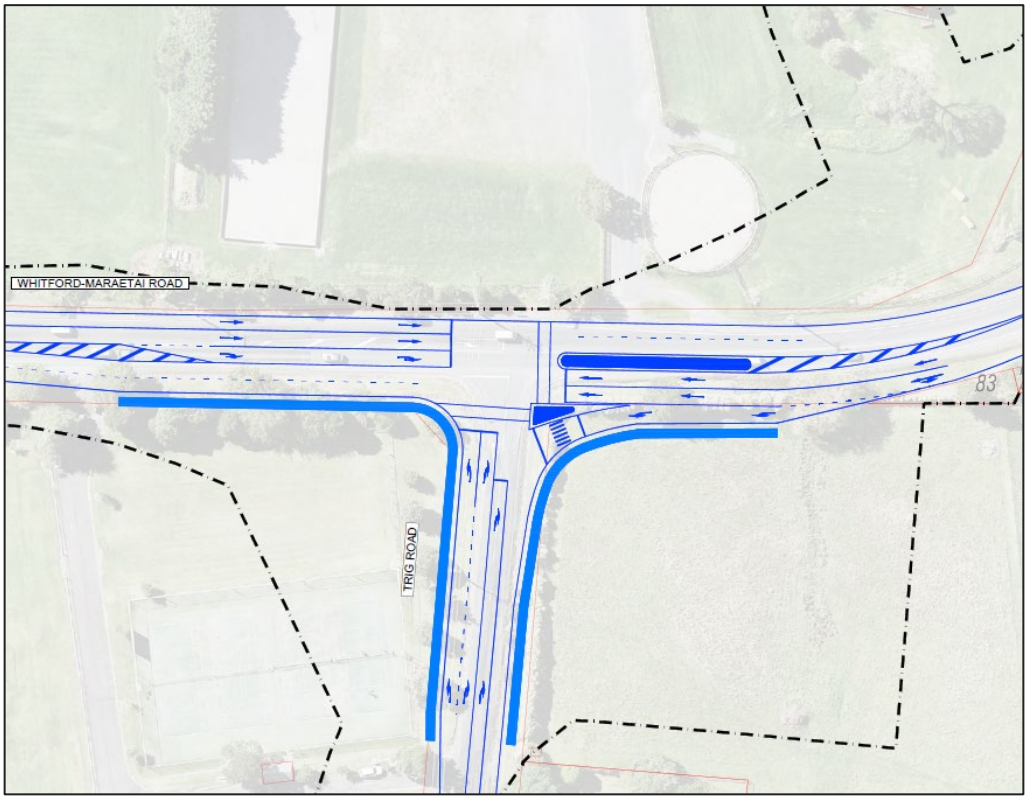


Figure 31: Proposed Upgrade to Whitford Maraetai Road / Trig Road (south) intersection

The SIDRA intersection layouts used for the 2031 Development scenario, including the above upgrades are shown in Appendix F.

The modelled 2031 Development, peak-hour results are provided in Appendix B and summarised in Table 27 and Table 28 below. The results show that with the proposed upgrades now perform at LOS A or B in both peak periods. The other intersections continue to perform well.

Table 27: 2031 Development SIDRA Results - AM

Intersection	DOS	Intersection LOS	Max Q (m)	Max Delay (s)
1_Beachlands / Whitford Maraetai Road RAB	1.14	LOS D	282	118
2_Jack Lachlan / Kahawairahi Drive	0.27	LOS A	2	18
3_Jack Lachlan / Whitford Maraetai Road	0.86	LOS C	225	40
4_Trig Road / Whitford Maraetai Road	0.85	LOS B	250	45
5_Whitford Road / Whitford Maraetai Road RAB	1.07	LOS B	349	47
6_Sandstone Road / Whitford Park Road RAB	0.93	LOS B	174	40
7_Somerville Road / Whitford Road	1.08	LOS D	398	129

Table 28: 2031 Development SIDRA Results - PM

Intersection	DOS	Intersection LOS	Max Q (m)	Max Delay (s)
1_Beachlands / Whitford Maraetai Road RAB	0.86	LOS A	120	24
2_Jack Lachlan / Kahawairahi Drive	0.32	LOS A	1	21
3_Jack Lachlan / Whitford Maraetai Road	0.57	LOS B	105	49
4_Trig Road / Whitford Maraetai Road	0.88	LOS A	326	62
5_Whitford Road / Whitford Maraetai Road RAB	1.13	LOS C	241	75
6_Sandstone Road / Whitford Park Road RAB	0.96	LOS B	191	30
7_Somerville Road / Whitford Road	0.97	LOS B	221	27

9.7.5 2038 (Live Zone) Development

It is likely that by 2038, an additional access point will be provided from the Beachlands South area onto Whitford Maraetai Road. This was designed as a left-in / left-out arrangement only and is situated in the approximate location of 712 Whitford Maraetai Road. It should be noted that this intersection is not required to mitigate the effects of the development, rather for convenience of Beachlands South trips. A concept drawing of the intersection is provided in **Figure 32** below with the full drawing provided in Appendix B.

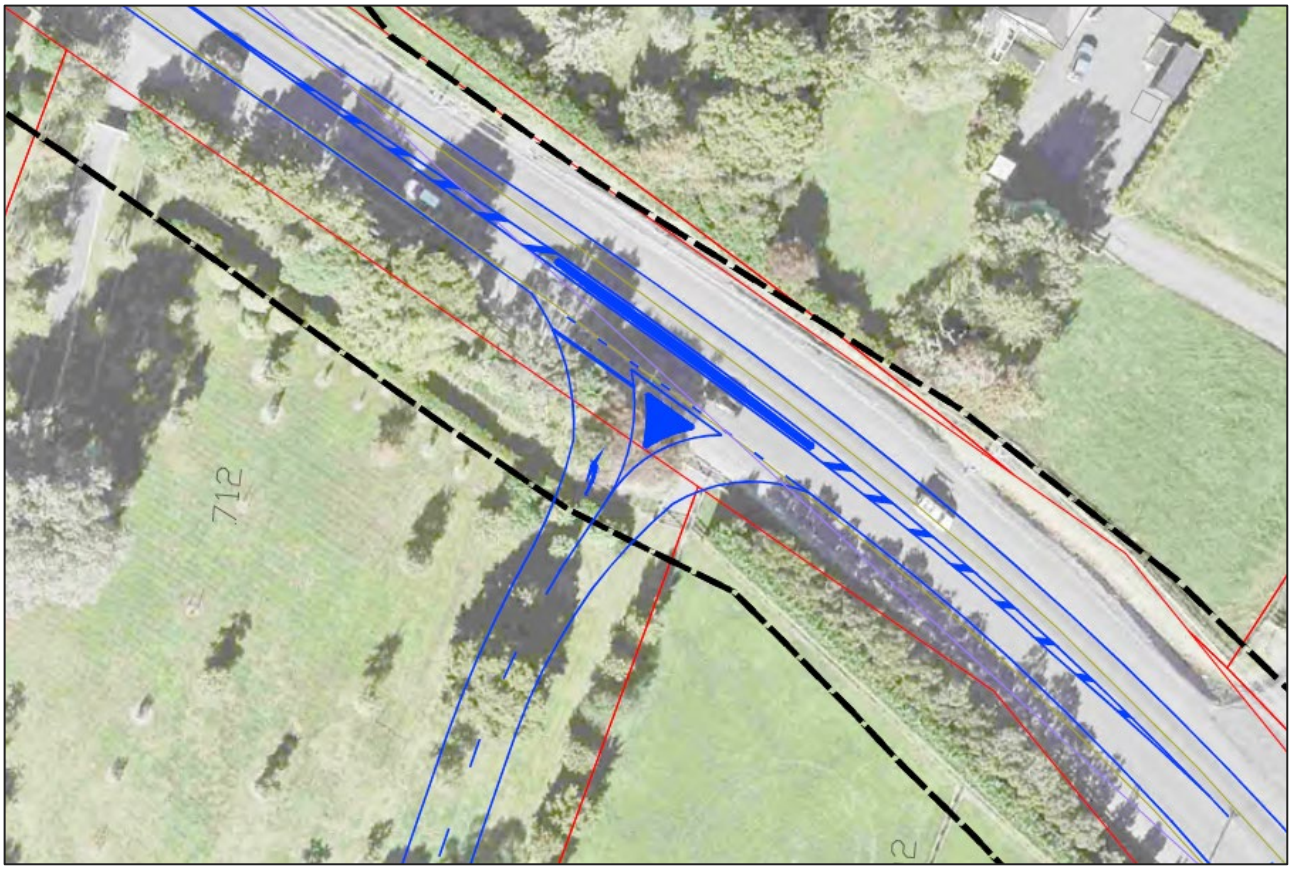


Figure 32: Proposed New Site Access Intersection at 712 Whitford Maraetai Road

The SIDRA intersection layout used for the 2038 Development scenarios are provided in **Appendix G**.

The modelled 2038 Development, peak-hour results are provided in Appendix B and summarised in Table 29 and Table 30 below. The results show that the proposed intersection upgrades can accommodate the development traffic, as can the other intersections. It can be seen that all intersections operate satisfactorily. Long queues are evident at the Whitford Maraetai Road / Whitford Road roundabout, but these are less than observed in the 2020 baseline scenario, and the intersection remains at a satisfactory LOS C during both peaks.

Table 29: 2038 Development SIDRA Results - AM

Intersection	DOS	Intersection LOS	Max Q (m)	Max Delay (s)
1_Beachlands / Whitford Maraetai Road RAB	1.11	LOS C	283	100
2_Jack Lachlan / Kahawairahi Drive	0.34	LOS A	2	23
3_Jack Lachlan / Whitford Maraetai Road	0.91	LOS C	250	44
4_Trig Road / Whitford Maraetai Road	0.85	LOS B	254	63
5_Whitford Road / Whitford Maraetai Road RAB	1.14	LOS C	498	73
6_Sandstone Road / Whitford Park Road RAB	0.84	LOS B	133	27
7_Somerville Road / Whitford Road	1.02	LOS C	279	84
8_ 712 Access/Whitford-Maraetai Road intersection	1.00	LOS A	0	11

Table 30: 2038 Development SIDRA Results - PM

Intersection	DOS	Intersection LOS	Max Q (m)	Max Delay (s)
1_Beachlands / Whitford Maraetai Road RAB	0.94	LOS B	197	28
2_Jack Lachlan / Kahawairahi Drive	0.25	LOS A	1	18
3_Jack Lachlan / Whitford Maraetai Road	0.64	LOS B	114	49
4_Trig Road / Whitford Maraetai Road	0.94	LOS B	524	80
5_Whitford Road / Whitford Maraetai Road RAB	1.25	LOS C	368	129
6_Sandstone Road / Whitford Park Road RAB	0.99	LOS B	217	38
7_Somerville Road / Whitford Road	1.00	LOS C	282	34
8_ 712 Access/Whitford-Maraetai Road intersection	0.76	LOS A	0	7

9.7.6 FUZ Development

As the full development enabled by the proposed FUZ land will require a plan change to apply a live zone, a new ITA will be required that will assess the need for upgrades at that time based upon recent traffic counts and travel information. However, to understand the implications of the full development that would be enabled by the FUZ, high level modelling has been undertaken.

It is considered that to enable the FUZ, that the following upgrades will likely be required:

- Four-laning of Whitford Maraetai Road between Whitford and Beachlands (using the existing NOR along that corridor);
- Introduction of the Whitford Bypass, including the upgrade of the intersections at both ends (using the existing NOR);
- Addition of a new signalised access intersection at the Whitford-Maraetai Road/Beachlands South access, likely in the vicinity of 620 Whitford Maraetai Road (as shown as a concept design in Figure 33 below); and
- An additional southbound approach lane at the Beachlands Road/Whitford-Maraetai Road intersection (as shown as a concept design in Figure 34 below).

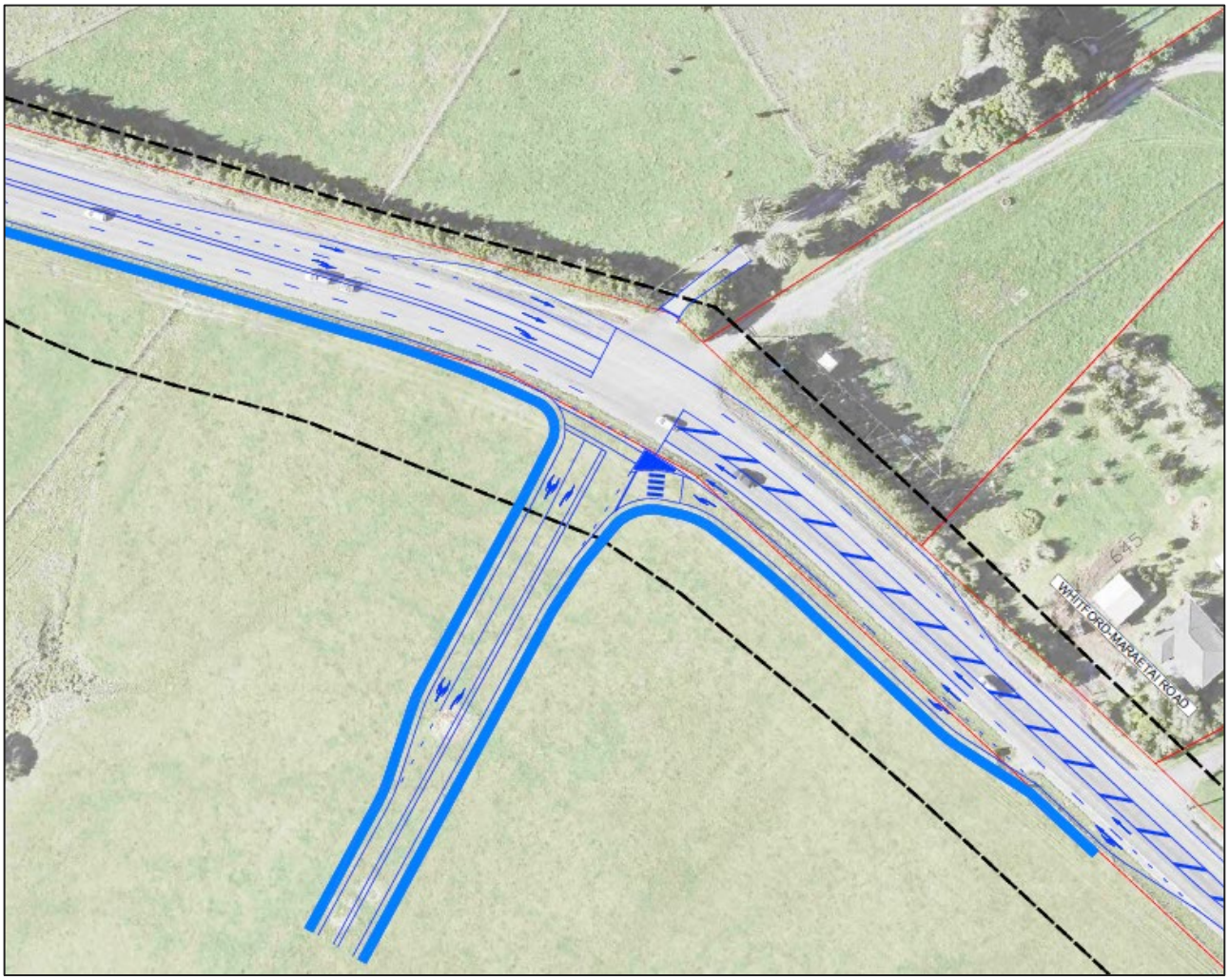


Figure 33: Proposed New Site Access Intersection at 620 Whitford Maraetai Road

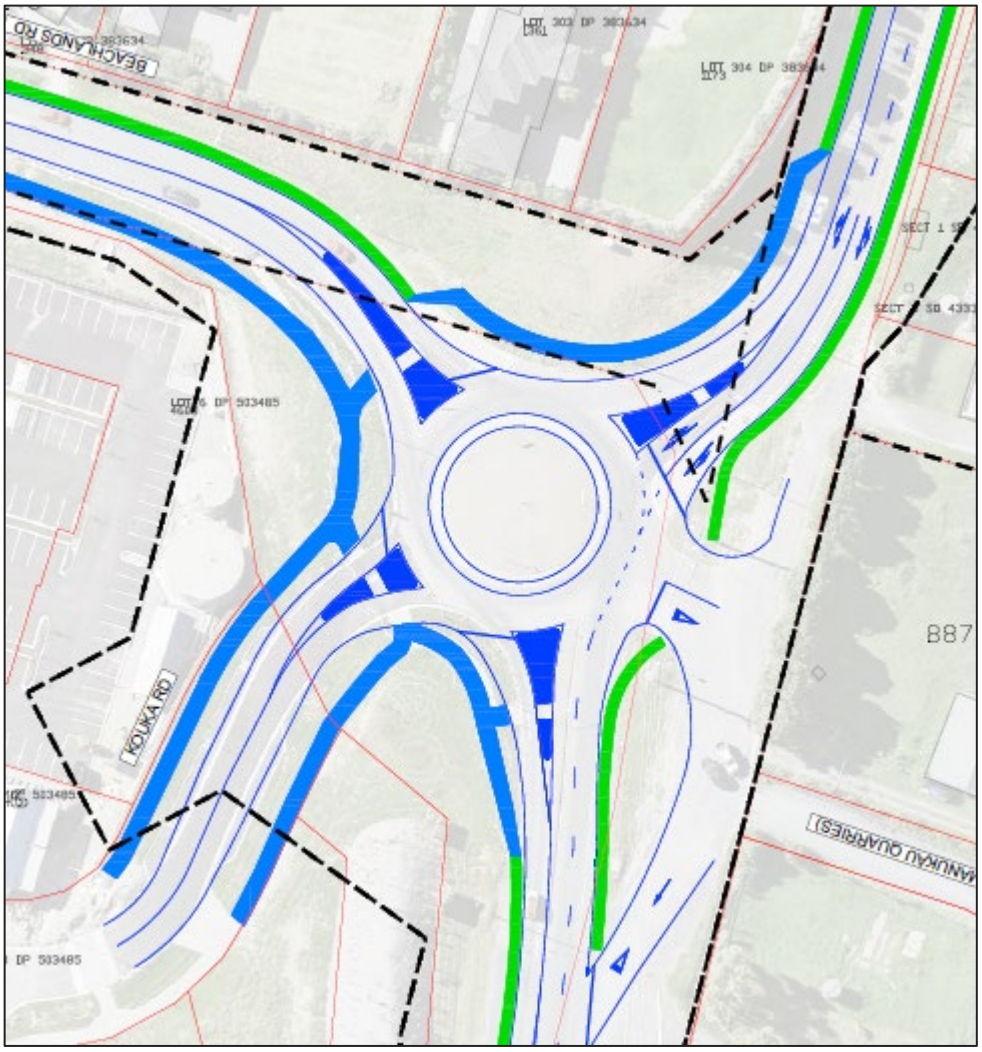


Figure 34: Proposed additional southbound approach lane at Whitford Maraetai Road / Beachlands Road roundabout

The SIDRA intersection layouts used for the 2051 Development scenario – including the above two new / amended intersections, the four laning and Whitford Bypass – are shown in Appendix H. The results show that the proposed intersection upgrades can accommodate the development traffic, as can all of the other intersections.

Table 31: 2051 Development SIDRA Results - AM

Intersection	DOS	Intersection LOS	Max Q (m)	Max Delay (s)
1_Beachlands / Whitford Maraetai Road RAB	0.74	LOS A	66	18
2_Jack Lachlan / Kahawairahi Drive	0.25	LOS A	1	13
3_Jack Lachlan / Whitford Maraetai Road	0.61	LOS B	122	38
4_Trig Road / Whitford Maraetai Road	0.90	LOS B	353	46
5_Whitford Road / Whitford Maraetai Road RAB	1.02	LOS B	264	29
6_Sandstone Road / Whitford Park Road RAB	0.88	LOS B	103	29
7_Somerville Road / Whitford Road	1.10	LOS D	386	137

Intersection	DOS	Intersection LOS	Max Q (m)	Max Delay (s)
8_ 712 Access/Whitford-Maraetai Road intersection	0.47	LOS A	0	5
9_ 620 Access/Whitford-Maraetai Road intersection	0.73	LOS B	97	26

Table 32: 2051 Development SIDRA Results - PM

Intersection	DOS	Intersection LOS	Max Q (m)	Max Delay (s)
1_Beachlands / Whitford Maraetai Road RAB	0.89	LOS A	45	19
2_Jack Lachlan / Kahawairahi Drive	0.18	LOS A	1	11
3_Jack Lachlan / Whitford Maraetai Road	0.61	LOS B	121	48
4_Trig Road / Whitford Maraetai Road	0.87	LOS B	154	24
5_Whitford Road / Whitford Maraetai Road RAB	0.70	LOS A	48	16
6_Sandstone Road / Whitford Park Road RAB	0.96	LOS B	177	41
7_Somerville Road / Whitford Road	1.03	LOS C	331	42
8_ 712 Access/Whitford-Maraetai Road intersection	0.39	LOS A	0	5
9_ 620 Access/Whitford-Maraetai Road intersection	0.77	LOS B	173	46

9.7.7 Summary

For comparison, a summary of the intersection level of service and maximum queuing (m) for each threshold year is summarised in Table 33 and Table 34 below for the AM and PM peak periods.

Table 33: SIDRA Performance Summary - AM

Site / Intersection AM	2020		2024 Base		2024 Development		2031 Development		2038 Development		Future FUZ Development	
	LOS	Max Q (m)	LOS	Max Q (m)	LOS	Max Q (m)	LOS	Max Q (m)	LOS	Max Q (m)	LOS	Max Q (m)
1_Beachlands / Whitford Maraetai Road RAB	B	126	LOS C	208	LOS C	215	LOS D	282	LOS C	283	LOS A	66
2_Jack Lachlan / Kahawairahi Drive	A	1	LOS A	1	LOS A	1	LOS A	2	LOS A	2	LOS A	1
3_Jack Lachlan / Whitford Maraetai Road	E	201	LOS F	394	LOS B	124	LOS C	225	LOS C	250	LOS B	122
4_Trig Road / Whitford Maraetai Road	A	5	LOS A	5	LOS A	5	LOS B	250	LOS B	254	LOS B	353
5_Whitford Road / Whitford Maraetai Road RAB	E	631	LOS E	776	LOS A	99	LOS B	349	LOS C	498	LOS B	264
6_Sandstone Road / Whitford Park Road RAB	B	173	LOS C	251	LOS C	339	LOS B	174	LOS B	133	LOS B	103
7_Somerville Road / Whitford Road	C	158	LOS C	289	LOS C	293	LOS D	398	LOS C	279	LOS D	386
8_712 Access	-	-	-	-	-	-	-	-	LOS A	0	LOS A	0
9_620 Access	-	-	-	-	-	-	-	-	-	-	LOS B	97

Table 34: SIDRA Performance Summary - PM

Site / Intersection PM	2020		2024 Base		2024 Development		2031 Development		2038 Development		Future FUZ Development	
	LOS	Max Q (m)	LOS	Max Q (m)	LOS	Max Q (m)	LOS	Max Q (m)	LOS	Max Q (m)	LOS	Max Q (m)
1_Beachlands / Whitford Maraetai Road RAB	LOS A	70	LOS A	83	LOS A	86	LOS A	120	LOS B	197	LOS A	45
2_Jack Lachlan / Kahawairahi Drive	LOS A	1	LOS A	1	LOS A	1	LOS A	1	LOS A	1	LOS A	1
3_Jack Lachlan / Whitford Maraetai Road	LOS D	177	LOS NA	232	LOS B	94	LOS B	105	LOS B	114	LOS B	121
4_Trig Road / Whitford Maraetai Road	LOS A	4	LOS A	3	LOS A	3	LOS A	326	LOS B	524	LOS B	154
5_Whitford Road / Whitford Maraetai Road RAB	LOS F	617	LOS F	748	LOS A	89	LOS C	241	LOS C	368	LOS A	48
6_Sandstone Road / Whitford Park Road RAB	LOS A	89	LOS A	110	LOS A	116	LOS B	191	LOS B	217	LOS B	177
7_Somerville Road / Whitford Road	LOS B	116	LOS B	150	LOS B	156	LOS B	221	LOS C	282	LOS C	331
8_712 Access	-	-	-	-	-	-	-	-	LOS A	0	LOS A	0
9_620 Access	-	-	-	-	-	-	-	-	-	-	LOS B	173

9.8 Modelling Outcomes

The modelling outcomes above – along with the ferry upgrade programme – have formed the basis for creating the thresholds for development within the Beachlands South plan change. The modelling has demonstrated that the Beachlands South development can be accommodated by the surrounding transportation network, with several targeted local upgrades within the next two decades as summarised in Table 35 below, and Figure 35 summarises the location of each road improvement.

It is noted that all road upgrades that have been identified through the modelling can be delivered in stages in response to the actual development, future changes in the market and availability of required funding

Based on the modelling, the proposed Plan Changes can be supported from a traffic capacity and performance perspective. Given that the infrastructure required to support the developments is implemented, the developments are unlikely to have a significant adverse effect on the traffic network.

Table 35: Development Threshold for Infrastructure Upgrades

Column 1 **Land use enabled within the area identified on Precent Plan 6 by transport infrastructure in column 2,**		**Column 2** **Transport infrastructure required to enable activities or subdivision in column 1**
(a)	Up to a maximum of 250 dwellings or residential lots	Site (A) on Figure 35: Upgrade of Whitford Maraetai Road / Jack Lachlan Drive intersection to traffic signals; and Site (D) on Figure 35: Upgrade of Whitford Park Road / Whitford Road / Whitford Maraetai Road roundabout to a double roundabout
(b)	A provision of: iii. More than 250 and up to 550 dwellings or residential lots; iv. Up to 3,500m^2 light industrial GFA;	Provision for an additional capacity of 100 ferry passengers (total capacity of 600 passengers) from Pine Harbour during the two-hour peak period between 0645 -0845 on weekdays; and
(c)	A provision of: v. More than 550 and up to 820 dwellings or residential lots; vi. More than 3,500m^2 and up to 5,700m^2 light industrial GFA; vii. Up to 400m^2 retail GFA; and viii. Up to 1,100m^2 commercial GFA.	Provision for an additional capacity of 200 ferry passengers (total capacity of 700 passengers) from Pine Harbour Ferry Terminal during the two-hour peak period between 0645 -0845 on weekdays; and Site (B) on Figure 35: Provision of an additional 30m left-turn approach lane on the northbound approach to the Whitford Park Road / Saleyard Road / Sandstone Road roundabout.
(d)	A provision of: v. More than 820 and up to 1,900 dwellings or residential lots; vi. More than 5,700m^2 and up to 12,300m^2 light industrial GFA; vii. More than 400m^2 and up to 2,100m^2 retail GFA; and viii. More than 1,100m^2 and up 3,300m^2 commercial GFA.	Provision for an additional capacity of 400 ferry passengers (total capacity of 900 passengers) from Pine Harbour during the two-hour peak period between 0645 -0845 on weekdays; and Site (C) on Figure 35: Upgrade to Trig Road (south) intersection.
(e)	A provision of: v. More than 1,900 and up to 2,918 dwellings or residential lots; vi. More than 12,300m^2 and up to 18,000m^2 light industrial GFA; vii. More than 2,100m^2 and up to 5,700m^2 retail GFA; and viii. More than 3,300m^2 and up to 5,100m^2 commercial GFA.	Provision for an additional capacity of 650 passengers (total capacity of 1150 passengers) from Pine Harbour during the two-hour peak period between 0645 -0845 on weekdays.

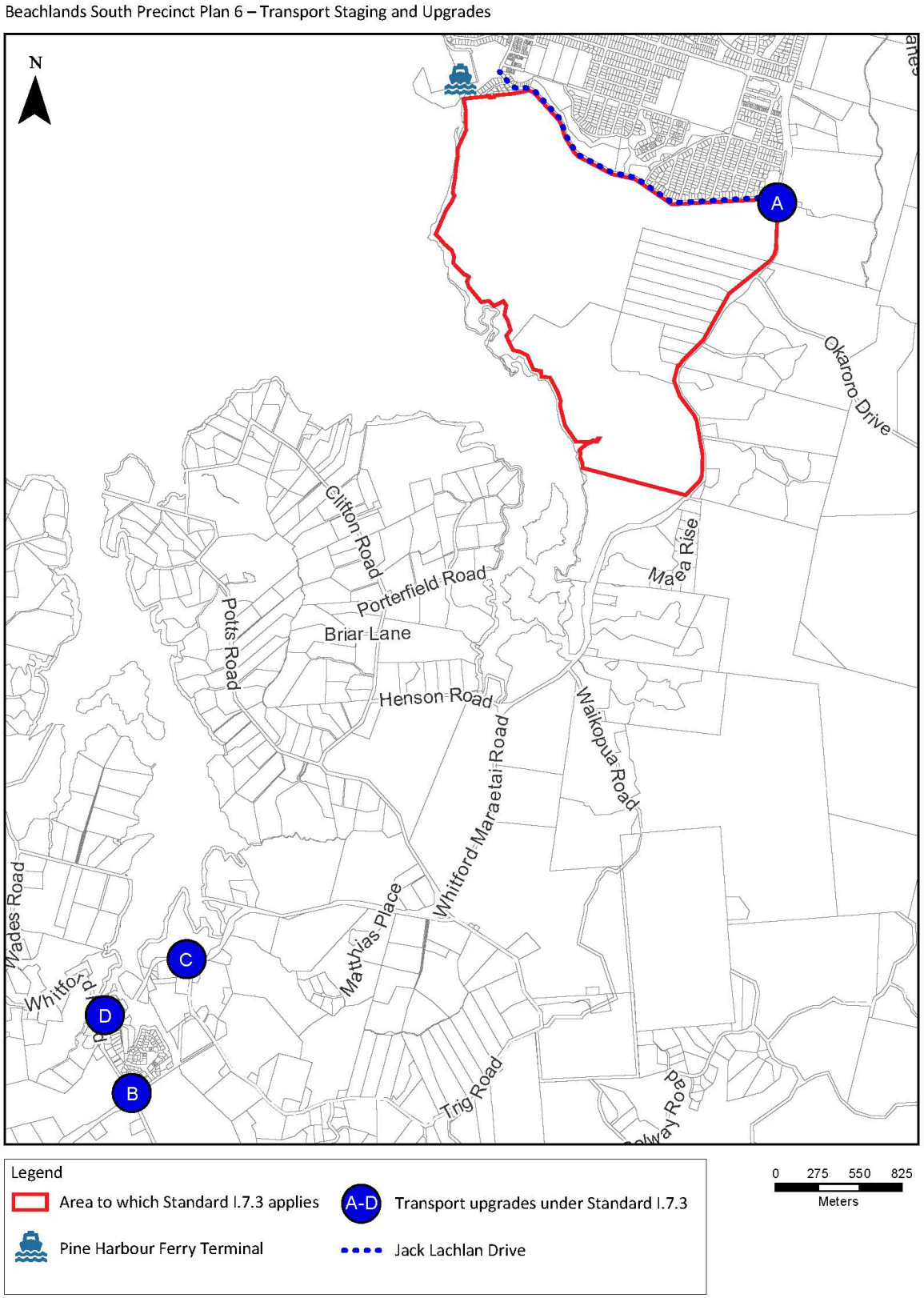


Figure 35: Road Upgrade Site Locations referred to in Table 35

The trigger table and figure will be included within the Precinct Provisions. Given the rigorous analyses undertaken, it is considered that the trigger table will ensure that the currently constrained transportation network can be improved gradually to respond to the demands of multi-modal trips to and from the development enabled by the plan change.

10 Integration with Transport Policy

10.1 Background

The following section provides a review of established policy and plans in relation to the proposed developments. The documents reviewed comprise:

- Government Policy Statement on Land Transport (**GPS**);
- Auckland Plan 2050;
- Auckland Unitary Plan (AUP-OIP);
- Auckland Transport Alignment Project (**ATAP**);
- Regional Land Transport Programme (**RLTP**); and
- Regional Public Transport Programme (**RPTP**)

10.2 Government Policy Statement on Land Transport (GPS)

The Government Policy Statement (**GPS**) on Land Transport sets out the Government's desired outcomes and priorities for the land transport sector. It describes what the Government expects to achieve through the National Land Transport Fund and the manner in which funding is allocated to upgrade and maintain the land transport network.

The GPS was released in September 2020 and took effect from 1 July 2021. The GPS provides strategic direction for a 10-year period until 2030/2031 to improve the performance of the land transport system.

The GPS has five transport outcomes to achieve, and summarises the objectives of these outcomes as follows:

(i) Inclusive access – enabling all people to participate in society through access to social and economic opportunities;

(ii) Healthy and safe people – protecting people from transport-related injuries and harmful pollution, and making active travel an attractive option;

(iii) Environmental sustainability – transitioning to net zero carbon emissions, and maintaining or improving biodiversity, water quality, and air quality;

(iv) Resilience and security – minimising and managing the risks from natural and human-made hazards, anticipating and adapting to emerging threats, and recovering effectively from disruptive events; and

(v) Economic prosperity – supporting economic activity via local, regional, and international connections, with efficient movements of people and products.

The GPS outlines four strategic priorities for land transport investment to best contribute to improving our communities' wellbeing and liveability, which are described below:

(i) Safety – developing a transport system where no-one is killed or seriously injured;

(ii) Better travel options – providing people with better transport options to access social and economic opportunities;

(iii) Climate change – developing a low carbon transport system that supports emissions reductions, while improving safety and inclusive access; and

(iv) Improving freight connections – for economic development.

The proposed development involves changing zoning from CLZ into a mixture of commercial and residential land uses providing opportunities for a mixture of commercial properties, a golf course, schools, and other community facilities, in close proximity to new residential areas. This allows integrated land use both within the development and within the context of supplementary activities in the local Beachlands area. Associated shopping is therefore easily accessible by active modes for the new residents as well as being adjacent to an arterial route where existing drivers can readily divert to the development on their way to another destination. This has positive health and environmental benefits and enables improved accessibility for all age groups (young and old).

The location of the proposed village and commercial development reduces the need for commuters to make specific trips to other commercial centres or travel to destinations further away. This encourages economic prosperity and aligns with the GPS as the development of a local village centre, parks, schools, an innovation hub, etc., will provide opportunities for efficient movement of people and products.

The development proposes to optimise the natural coastal topography by improving ferry services and providing larger and more frequent connections to Auckland City. This is seen as a resilient approach as it places an emphasis on public transport rather than relying solely on the roading network.

The proposed project aligns with the strategic priorities of the GPS by the promotion of inclusive access by providing educational, retail and community opportunities for residents. The development also acts to reduce the impact on the environment by reducing the number and length of vehicular trips on the road network. It is therefore demonstrated that the proposed project in Beachlands integrates very well with the strategic priorities and the themes outlined in the GPS.

10.3 Auckland Plan 2050

The Auckland Plan is Auckland Council's 30-year strategy to ensure Auckland grows in a way that will meet the opportunities and challenges of the future. Initially produced in 2012, a new plan was released in June 2018. Since the original Plan was released, the Auckland Unitary Plan has been introduced and several significant infrastructure developments have been completed. The new Auckland Plan shows how Auckland will prepare for an expected population increase of 39% by 2043, and the key challenges Auckland faces in dealing with this population growth. Other key challenges identified are sharing prosperity with all Aucklanders and reducing environmental degradation.

The Auckland Plan is comprised of six outcomes where significant progress is targeted, one of which addresses transport and access. The Auckland Plan summarises this outcome as "Aucklanders will be able to get to where they want to go more easily, safely and sustainably."

The transport and access outcomes outline three directions:

(i) Better connect people, places, goods and services;

(ii) Increase genuine travel choices for a healthy, vibrant and equitable Auckland; and

(iii) Maximise safety and environmental protection.

The Auckland Plan also includes seven focus areas for the transport and access outcome:

(i) Make better use of existing transport networks;

(ii) Target new transport investment to the most significant challenges;

(iii) Maximise the benefits from transport technology;

(iv) Make walking, cycling and public transport preferred choices for many more Aucklanders;

(v) Better integrate land use and transport decisions;

(vi) Move to a safe transport network, free from death and serious injury; and

(vii) Develop a sustainable and resilient transport system.

Providing a village centre in the Beachlands area provides an opportunity for the public transport network to be expanded and further developed, to effectively serve the proposed urbanisation. The proposed development allows an integrated transport system to be created with the ferry and bus networks, which will enable people to be connected with places, goods and services. The close proximity of the complementary activities will improve the attractiveness of the active transport modes, in alignment with TOC principles and thus reducing reliance upon private vehicle trips.

Employees and residents within Beachlands will also have more travel options beyond private vehicles, such as walking, cycling, and public transport, due to the proposed infrastructure upgrades, TOC design principles and the expected connectivity of the Plan Change area to the external network. The new bus routes, alongside the provision of better-connected ferry services, will create an improved basis for public transport provision throughout the future precinct. This demonstrates that the proposed project integrates well with the transport and access outcomes of the Auckland Plan.

10.4 Auckland Unitary Plan (AUP-OIP)

The Auckland Unitary Plan, which has been operative in part since November 2016, has the following objectives with regards to transport infrastructure:

(i) Land use and all modes of transport are integrated in a manner that enables:

  a) The benefits of an integrated transport network to be realised; and

  b) The adverse effects of traffic generation on the transport network to be managed;

(ii) An integrated public transport, walking and cycling network is provided for;

(iii) Parking and loading support urban growth and the quality compact urban form;

(iv) The provision of safe and efficient parking, loading and access is commensurate with the character, scale and intensity of the zone;

(v) Pedestrian safety and amenity along public footpaths is priorities; and

(vi) Road / rail crossings operate safely with neighbouring land use and development.

The proposed Plan Change area will promote integration between residential and commercial activities. The subsequent employment opportunities in the area will reduce the effects on the road network by reducing the number and length of trips generated on the wider road network, thus acting as a TOC. In addition to the improved public transport, further infrastructure upgrades are anticipated as a result of this project, which will enhance the Plan Change area's integration with various transport modes. This will ultimately provide the benefits of an integrated network by providing residents and employees with transportation choices, thereby reducing the effects of generated traffic by reducing the relative demand for private vehicle travel.

The construction of network upgrades enables the adverse effects of the traffic generated by the developments to be mitigated. The new road network and upgrades to existing roads (including new dedicated footpaths and cycle lanes) will provide for safe travel for all transport modes.

In summary, the Plan Change area is well located to a variety of transportation modes which means that the proposed developments integrate well with both the objectives of the Unitary Plan and the existing and future transportation network.

10.5 Auckland Transport Alignment Project (ATAP)

Given the growth challenges that Auckland is facing, and the need for some big transport decisions to deal with this, the Government and Auckland Council have agreed on the need for a collaborative approach to improving alignment on a long-term strategic approach to transport in Auckland. A new edition of the Auckland Transport Alignment Project (ATAP) was released in March 2021 to provide a package to develop Auckland's transport system over the next 10 years. An important part of this work is to agree an indicative investment package that guides statutory funding plans like Auckland's Region al Land Transport Plan and the National Land Transport Programme. Over the past five years, ATAP has enabled significant progress on improving transport in Auckland. The ATAP focuses on three main investment areas; operational costs (including maintenance), asset renewals, and new infrastructure. Within new infrastructure, a great emphasis has been placed on rapid transit, road network, safety, walking and cycling, bus and ferry improvements, and more.

Ultimately, ATAP aims to provide Auckland with a transport system that provides safe, reliable and sustainable access. It contains investment to be made in projects to assist growth over the next decade (2021 – 2031), while identifying future priorities beyond 2031. It recommends investment be made in short and medium-term projects to assist growth over the next decade, while working to protect routes for longer term projects.

There are no specific projects planned for delivery, within proximity of the Beachlands area, between 2021 and 2031. However, there is mention of funding towards decarbonising the existing ferry fleet and investing in walking/cycling and Local Board initiatives. An emphasis on decarbonising Auckland's transport system and reducing the impacts on the climate are key objectives within the ATAP.

The Plan Change prioritises a mode shift from private vehicles to active modes and public transport. This is evident in the integration with the ferry network and consideration for the ferry fleet investments to meet existing and future demands.

The Plan Change adopts a carbon neutral approach to mitigate the impacts of the development on the climate. This is reflected throughout the development approach and the transport design by providing a diverse and connected cycling and walking network.

Enabling and supporting Auckland's growth and increased housing supply is also a key focus of the ATAP package. Investment in transport infrastructure as outlined above, enables growth and intensification of housing.

Therefore, the overall philosophy of the Beachlands South Plan Change aligns with the ATAP principles

10.6 Regional Land Transport Plan (RLTP)

The Regional Land Transport Plan (**RLTP**), prepared by Auckland Transport with Waka Kotahi and Kiwi rail, identifies the priority of several key region-wide transport projects over a ten-year period. The current RLTP was adopted in 2021 and covers the period 2021-2031. Projects outlined in the existing RLTP are outlined in ATAP.

The key transport challenges the RLTP attempts to address are climate change and the environment, safety, access to employment and social opportunities, and travel choices. The proposed development integrates well with the RLTP by aligning well these strategic challenges the RLTP addresses. The integration of different land uses allows active modes and public transport to be prioritised as a transport mode. Furthermore, the variety of feasible modes in addition to the expected infrastructure upgrades in Beachlands will allow network optimising by providing a variety of alternative routes. This will enhance the relative resilience of the area.

10.7 Regional Public Transport Plan (RPTP)

The Auckland Regional Public Transport Plan (**RPTP**) seeks to deliver " *a [public transport] system with seamless end-to-end customer journeys that are safe, accessible and reliable".* To achieve this vision, Auckland's public transport system needs to deliver:

- Services that align with future land use patterns;
- Services that meet customer needs;
- Increased passenger numbers;
- Increased public transport mode share; and
- Improved value for money.

The main aspects within the RPTP outline what changes will be made to each specific public transport service and policies and actions that will be used to drive public transport planning, design, implementation and operation.

Whilst there is no specific reference to funding for the Beachlands area, general objectives within the RPTP include:

- Increasing the bus network operation through increased frequencies, safe and attractive services.
- Growing the ferry network with off-peak and weekend services.
- Enhancing customer experience, particularly for the first and last legs of the journey.

Funding priorities also included an improved bus network across Auckland, improved ferry network and general improved network capacity and performance (refer to Figure 2 of the RPTP). There are also additional service improvements that AT acknowledge are required but which are not yet funded, including further ferry service improvements and terminal upgrades and further improvements to bus service frequency and capacity in other locations in Auckland. It is stated that "*should funding become available, AT regards these items as being high priorities for investment*".

The RPTP also discusses the roles that walking/cycling and placemaking play in the success of a public transport network. Walking and cycling are commonly used for the first and last leg of multimodal journeys and thus provide a crucial connection for any public transport network.

Well-designed placemaking, using strategies such as TOC, influence the viability and success of neighbourhoods. High quality public transport, such as buses, ferries and rail, play an important part in the design of public space. This also unlocks a certain level of development intensification, which is important in supporting housing growth under the RLTP Greenfield transport infrastructure projects.

Overarching all of the actions and objectives is the focus on a moving to a lower carbon emissions public transport network.

The existing Beachlands area is not currently well served by the public transport network. However, future increased activity within Beachlands enabled by this plan change will improve the economic viability of providing additional bus routes and frequencies to serve the Beachlands area. This provides an opportunity to improve an existing service, increase demand and customer service.

The investment and focus on improving the existing ferry network, as part of the proposed Plan Change, helps to achieve the RPTP vision for a more accessible and reliable public transport network whilst also providing a funding opportunity to meet future demand.

Overall, the proposed Plan Change aligns with the wider objectives and policies outlined in the RPTP, even providing investment strategies to improve the network that may have otherwise not been available.

10.8 Summary

It has been demonstrated that the future development that would be enabled by the Plan Change has relatively good alignment with the various transport-related policy documents relevant to this proposal. Given the close proximity of new residential and commercial developments proposed, the project aligns with many of the larger policy documents by providing high-density development, increasing the integration of ferry and bus services to the development area, and providing quality walking and cycling facilities in order to promote a mode shift away from private vehicles.

The ATAP does not identify any Council led investment within the Beachlands area within the next ten years, however, growth in this area is anticipated and the existing roading network and ferry services are already at capacity. Therefore, this area will soon become underserviced.

The improved public network and roading infrastructure upgrades proposed to enable the Plan Change area creates a more integrated transport system and a financially feasible way.

Further, the nature and scale of the development potential will positively influence the viability of and confidence in the public and active transport infrastructure investments that are planned in the area.

11 Conclusion

This ITA has been prepared to support the Plan Change to rezone approximately 307 hectares of Countryside Living zoned land in Beachlands South to a variety of urban zones for residential, commercial, light industrial and recreational development. This ITA has considered the future transport networks and land uses within the Beachlands South plan change area and the surrounding areas. A particular focus area of the ITA is land within the Plan Change area to be live zoned and identifying the necessary transport infrastructure upgrades in coordination with urban development

Descriptions, analyses and assessments provided in the ITA has shown that the Beachlands South Precinct will enhance accessibility of the Plan Change area by various transport modes: public transport, walking and cycling, and private vehicles. The extent of development enabled by the plan change can be accommodated on the surrounding road network while maintaining acceptable levels of safety and efficiency through the next three decades, based on the proposed public transport investments and additional roading infrastructure upgrades mentioned. The upgrades proposed provide funding opportunities that may have otherwise been unavailable. The plan change precinct provisions set out the basis for these triggers.

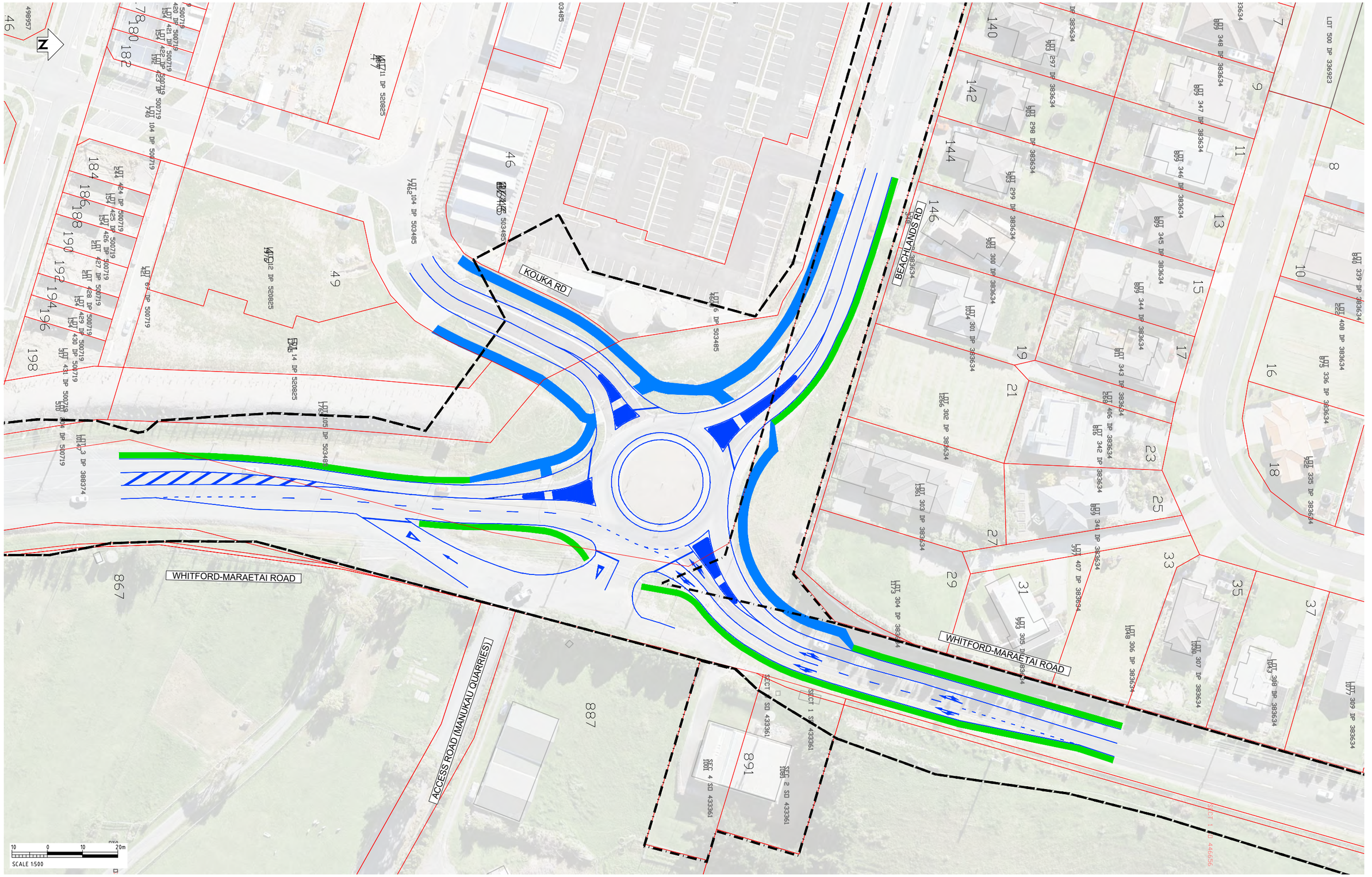
The development enabled by the Plan Change is consistent with current government transport policies.

In summary, there is no traffic engineering and transport planning reason to preclude acceptance of the proposal. The full extent of live zoning proposed that would be enabled by the Plan Change will be appropriately supported by the future wider and local network upgrades, as identified in the ITA.

Appendices

We design with community in mind

Appendix A High Level Intersection Designs



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DRAWN	Mark Luo	05.2021
CAD REVIEW	Tegwen Atkinson	05.2021
DESIGN CHECK		
DESIGN REVIEW		
APPROVED	NOT APPROVED	
PROF REGISTRATION:		

Stantec

BEACHLANDS SOUTH PRIVATE PLAN CHANGE
WHITFORD-MARAETAI ROAD / BEACHLANDS ROAD ROUNDABOUT (SITE 1)

GENERAL LAYOUT PLAN

Status Stamp: CONCEPT SKETCH
Date Stamp: 12.05.2021
Scales: 1:500@A1; 1:1000@A3
Drawing No.: 310204447-01-001_SK002
Rev.: A

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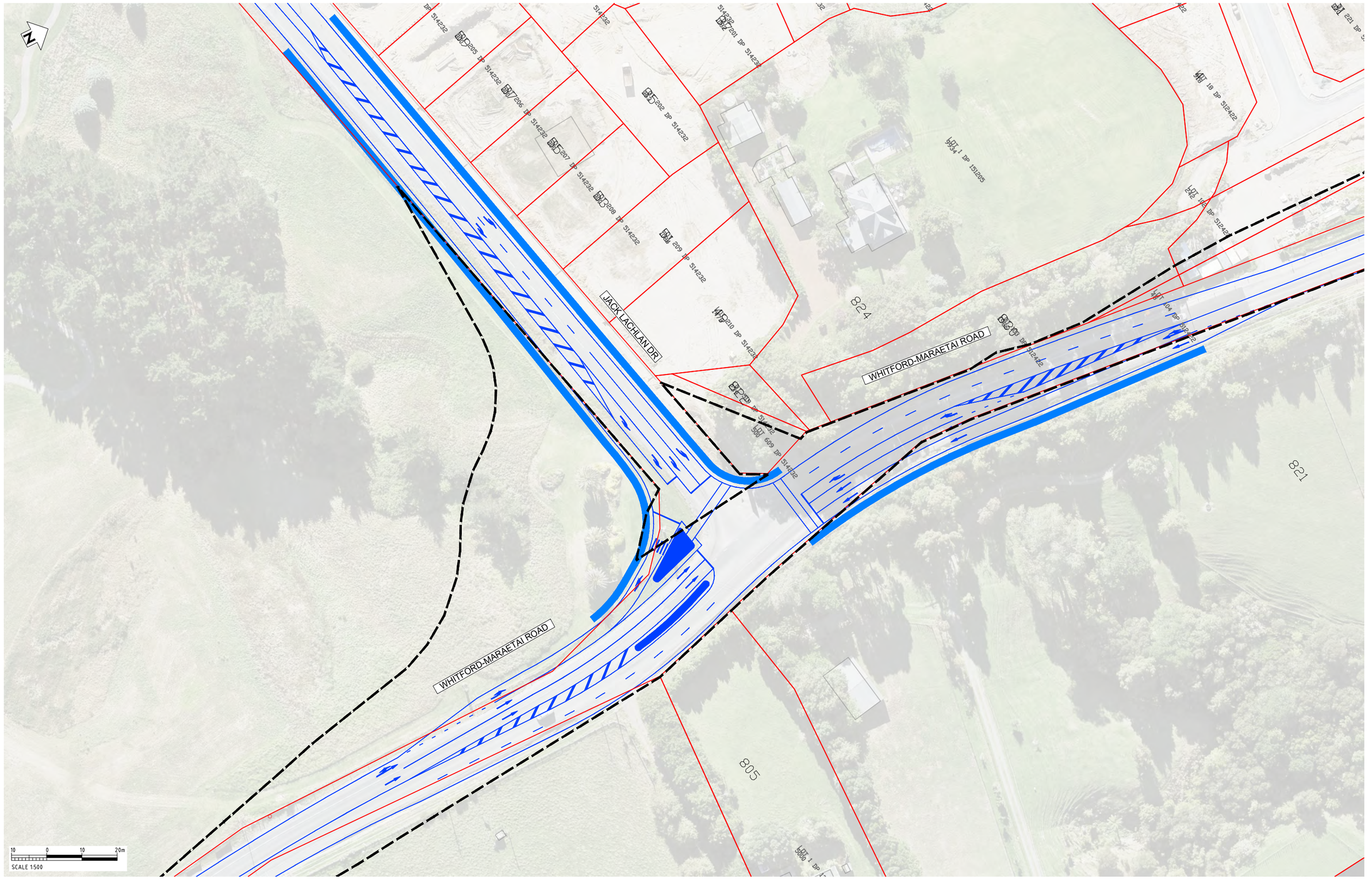

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DRAWN	Mark Luo	05.2021
CAD REVIEW	Tegwen Atkinson	05.2021
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APPROVED		
PROF REGISTRATION:		

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BEACHLANDS SOUTH PRIVATE PLAN CHANGE
WHITFORD-MARAETAI ROAD / JACK LACHLAN ROAD (SITE 3)

GENERAL LAYOUT PLAN

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WHITFORD-MARAETAI ROAD

WHITFORD-MARAETAI ROAD

TRIG ROAD

53R

53R

83

85

12

10 0 10 20m

SCALE 1:500

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CAD REVIEW	Mark Moslin-Thomas	05.2021
DESIGN CHECK		
DESIGN REVIEW		
APPROVED	NOT APPROVED	
PROF REGISTRATION:		

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BEACHLANDS SOUTH PRIVATE PLAN CHANGE
WHITFORD-MARAETAI ROAD / TRIG ROAD INTERSECTION (SITE 4)

GENERAL LAYOUT PLAN

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WHITFORD ROAD

WHITFORD WHARF ROAD

WHITFORD-MARAETAI ROAD

WHITFORD PARK ROAD

10 0 10 20m

SCALE 1:500

LEGEND

- PROPERTY BOUNDARY
- NEW ROADMARKING / KERBLINE
- NEW TRAFFIC ISLAND
- NEW CONCRETE SHARED PATH / CYCLEWAY
- NEW CONCRETE SPEED TABLE

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DRAWN	Mark Luo	05.2021
CAD REVIEW	Tegwen Atkinson	05.2021
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DESIGN REVIEW		
APPROVED		
PROF REGISTRATION:		

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BEACHLANDS SOUTH PRIVATE PLAN CHANGE
WHITFORD ROAD / WHITFORD PARK ROAD (SITE 5)

GENERAL LAYOUT PLAN

Status Stamp: CONCEPT SKETCH

Date Stamp: 14.12.2021

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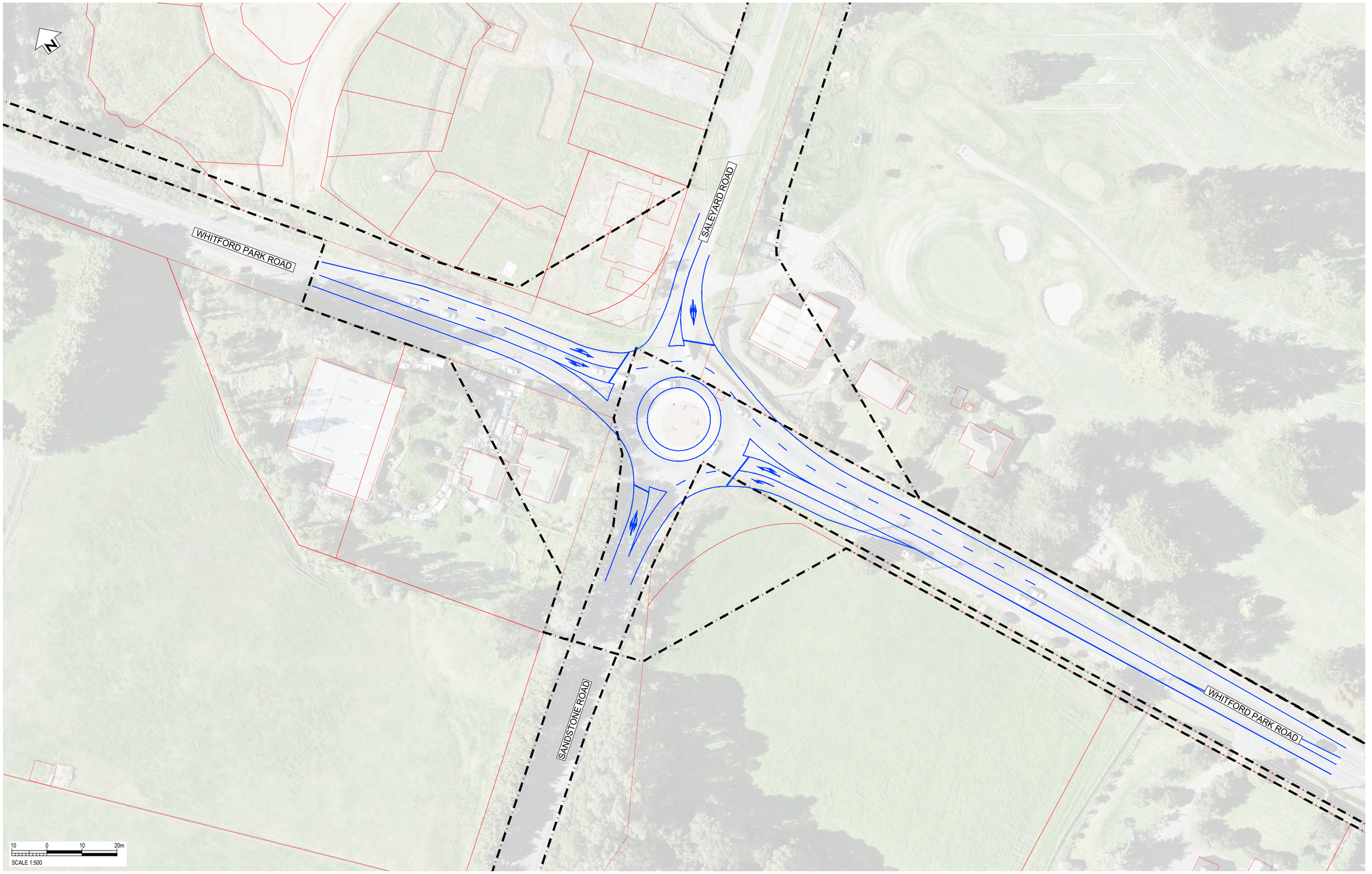

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APPROVED		
PROF REGISTRATION:		

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BEACHLANDS SOUTH PRIVATE PLAN CHANGE
SANDSTONE ROAD / WHITFORD PARK ROAD ROUNDABOUT (SITE 6)

GENERAL LAYOUT PLAN

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DRAWN	Mark Luo	05.2021
CAD REVIEW	Tegwen Atkinson	05.2021
DESIGN CHECK		
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APPROVED		
PROF REGISTRATION:		

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BEACHLANDS SOUTH PRIVATE PLAN CHANGE
WHITFORD-MARAETAI ROAD - 712 ACCESS (SITE 8)

GENERAL LAYOUT PLAN

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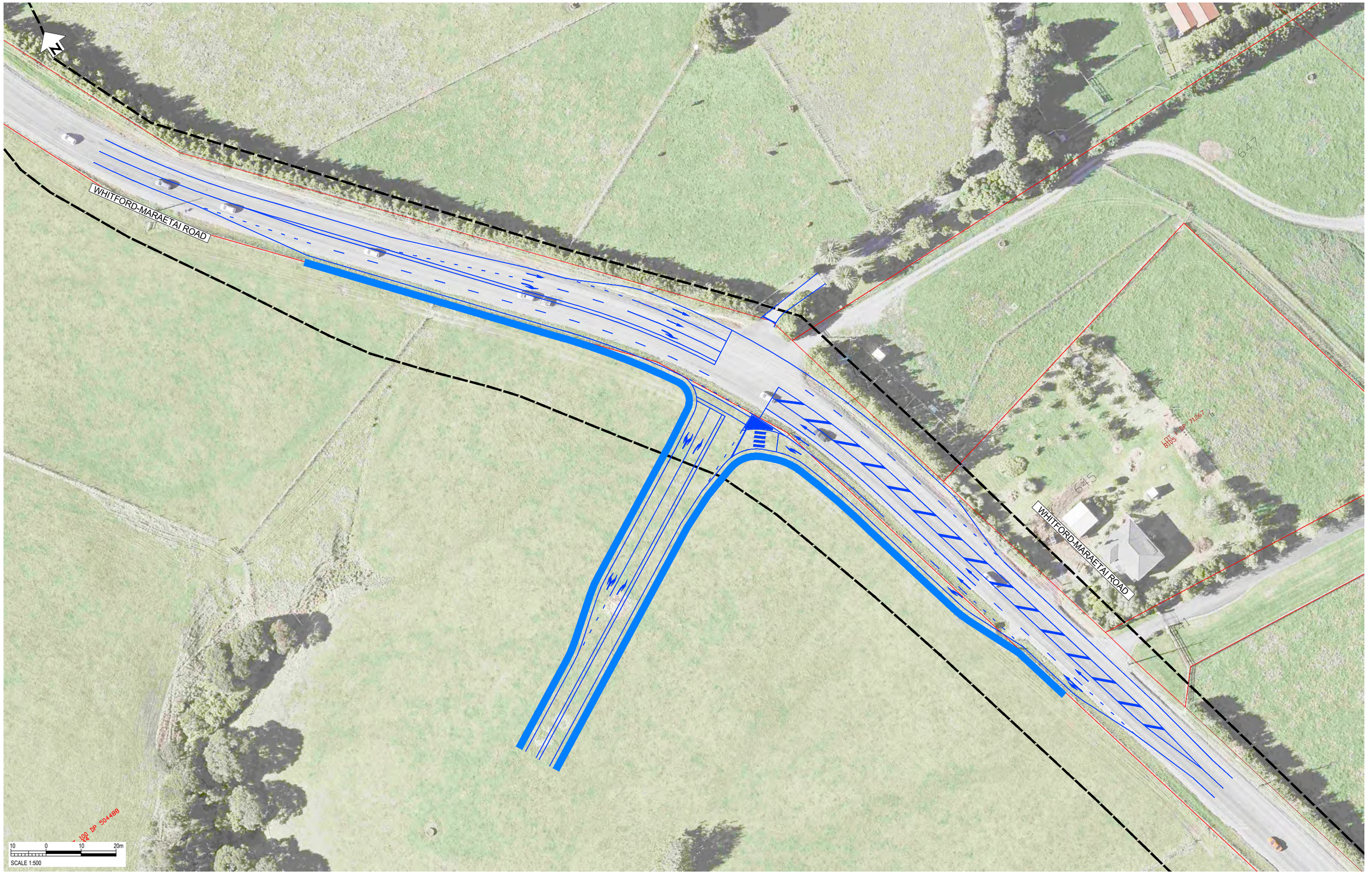

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CAD REVIEW	Tegwen Atkinson	05.2021
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PROF REGISTRATION:		

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BEACHLANDS SOUTH PRIVATE PLAN CHANGE
WHITFORD-MARAETAI ROAD - 650 ACCESS (SITE 9)

GENERAL LAYOUT PLAN

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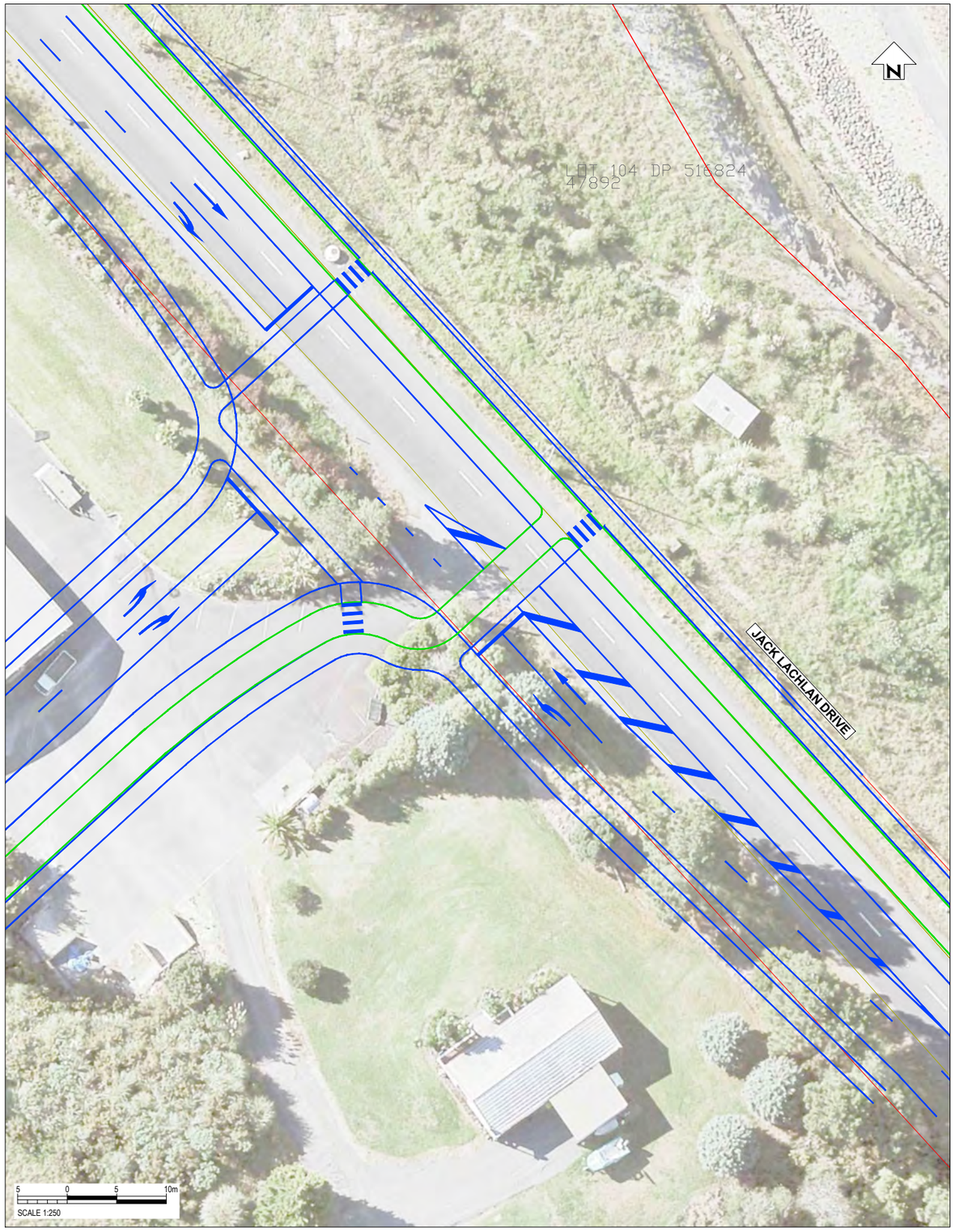

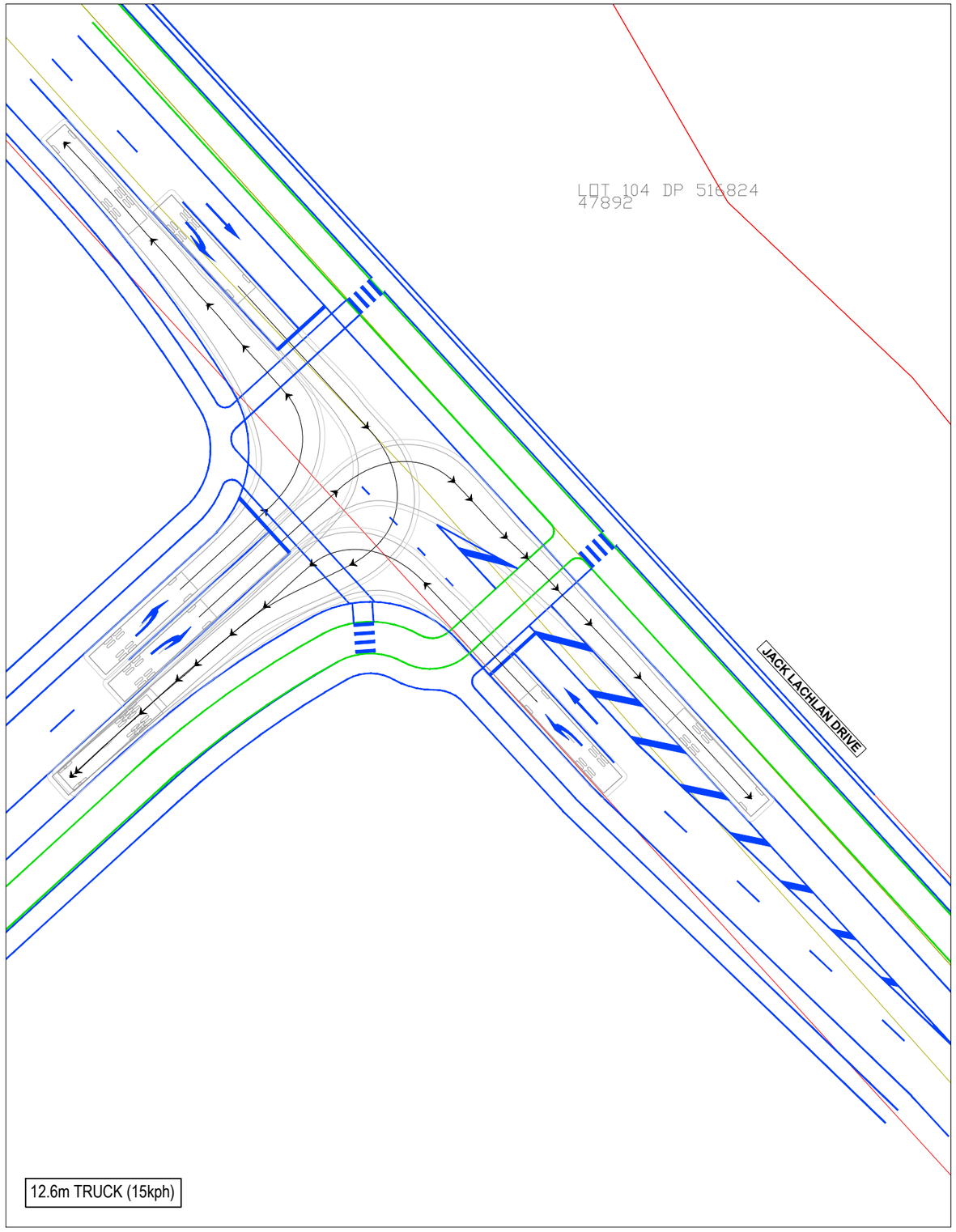

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Stantec

Client:

BEACHLANDS SOUTH PRIVATE PLAN CHANGE
#110A JACK LACHLAN DRIVE (SITE 10)

GENERAL LAYOUT PLAN

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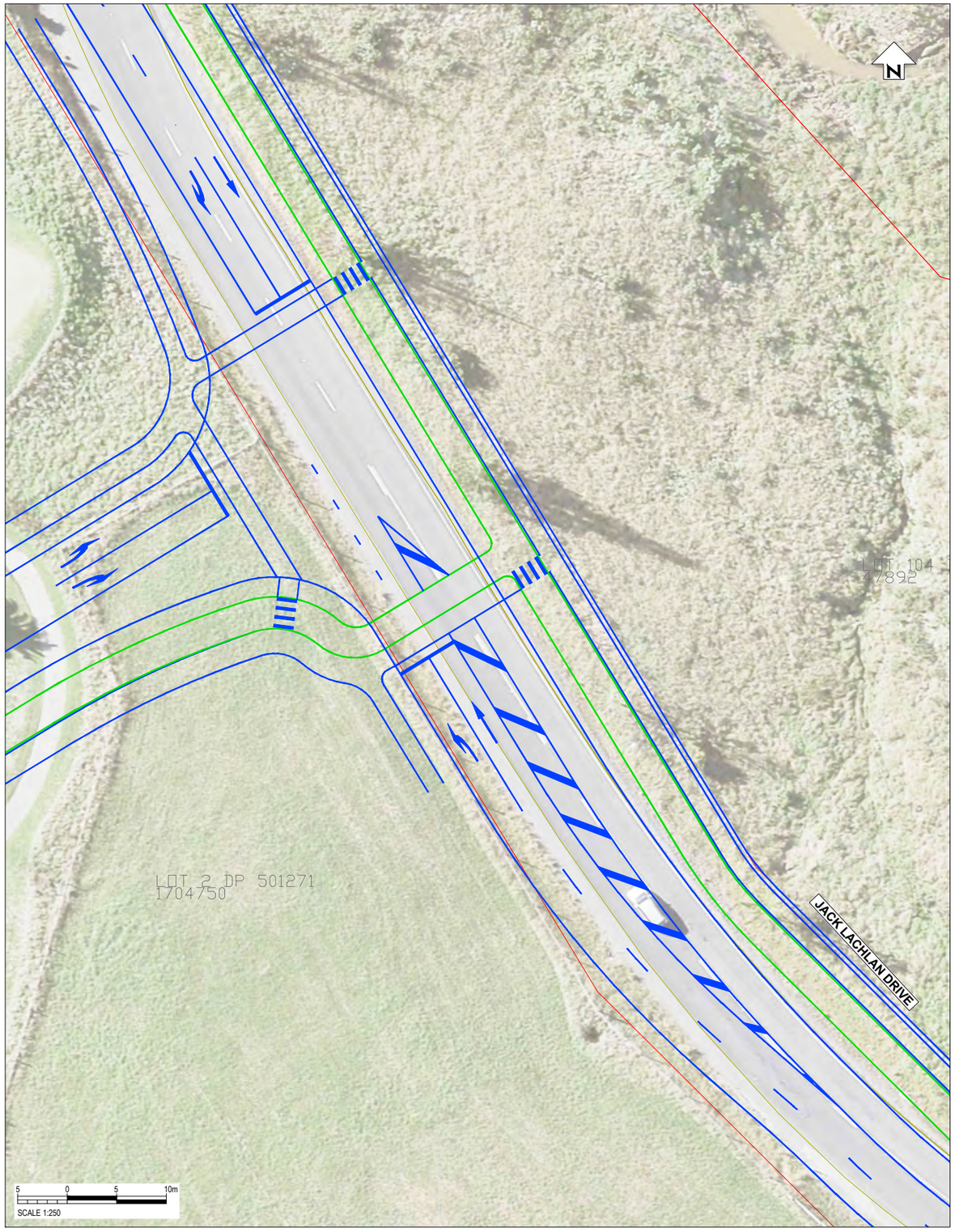

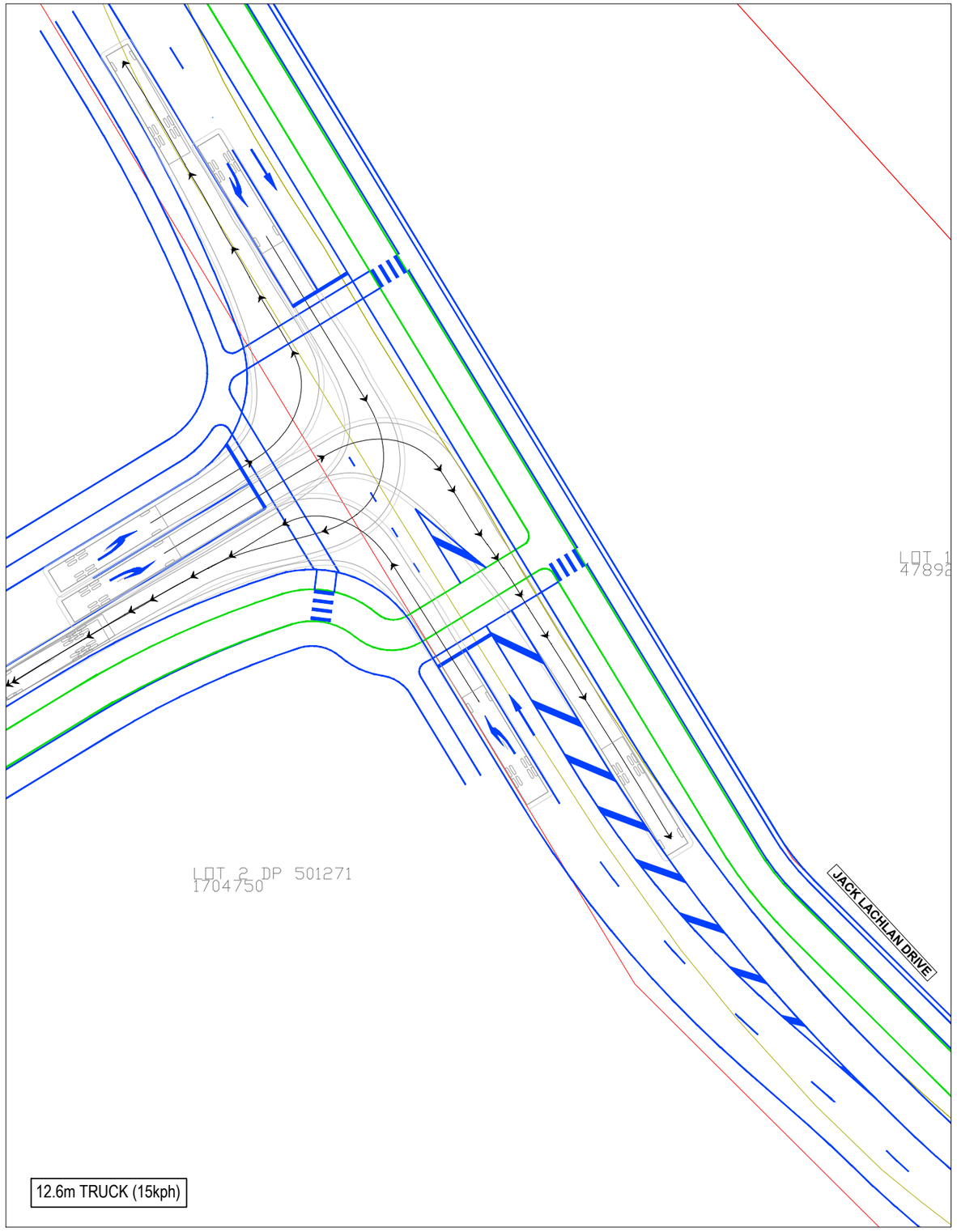

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APPROVED		
PROF REGISTRATION:		

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Client:

BEACHLANDS SOUTH PRIVATE PLAN CHANGE
#17 GREEN - JACK LACHLAN DRIVE (SITE 11)

GENERAL LAYOUT PLAN

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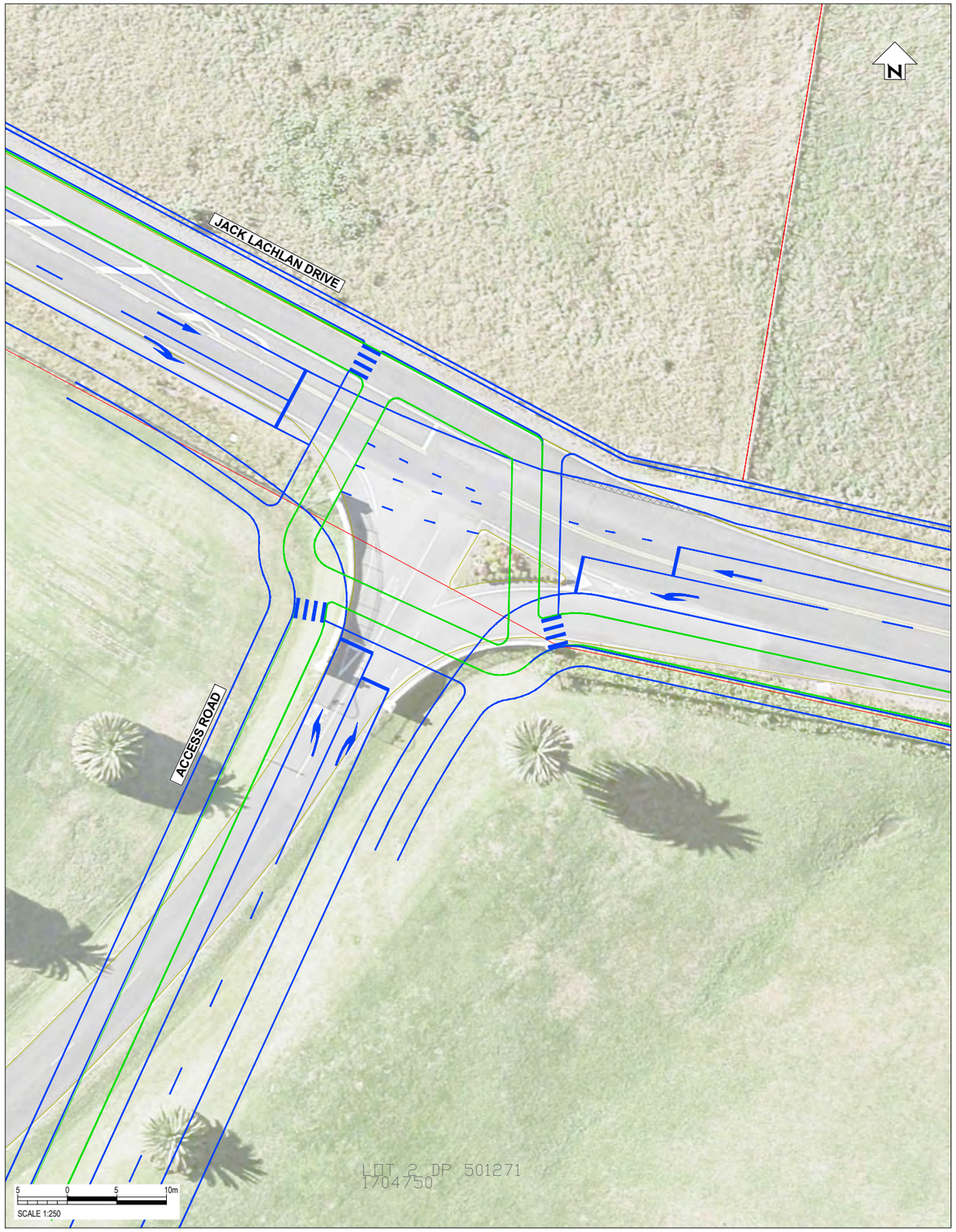

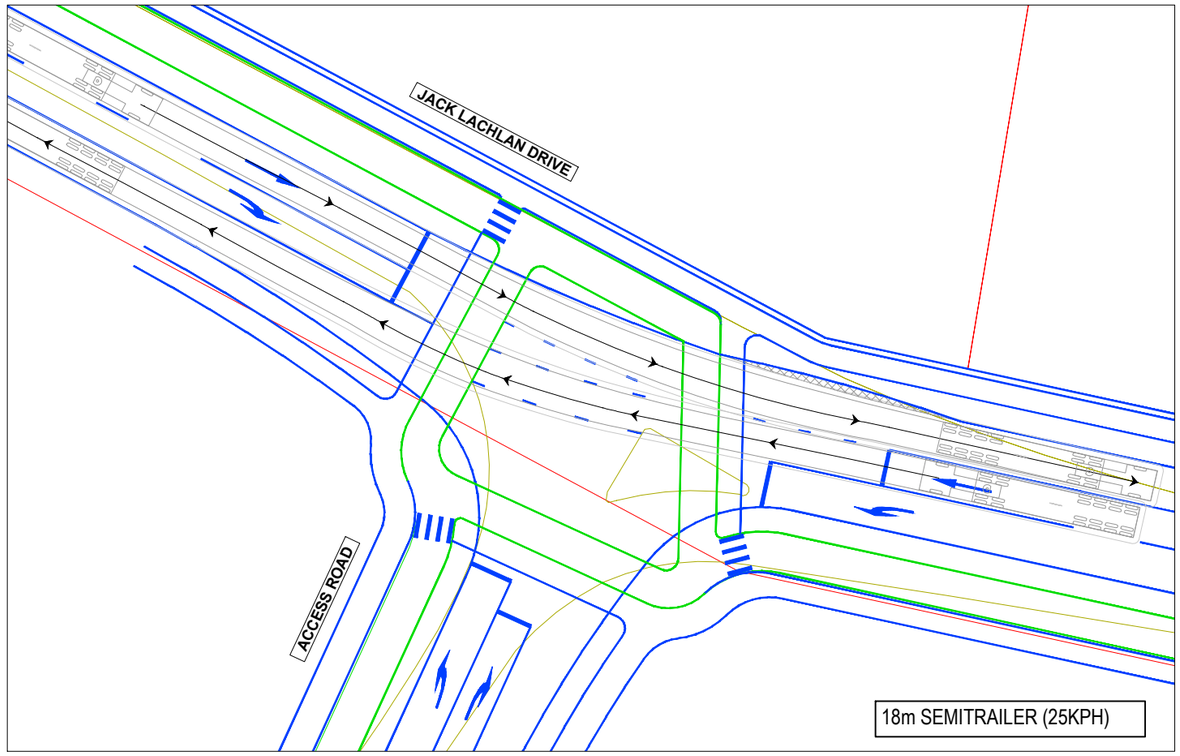

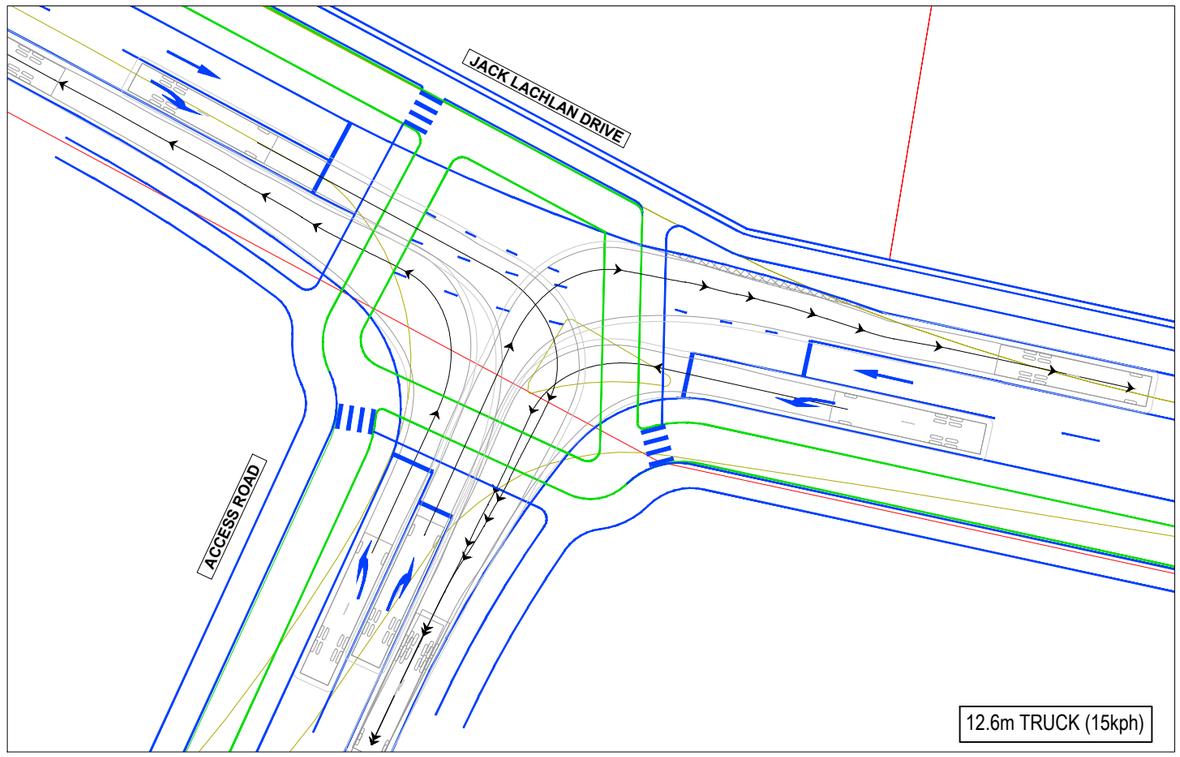

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APPROVED		
PROF REGISTRATION:		

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Client:

BEACHLANDS SOUTH PRIVATE PLAN CHANGE
ACCESS ROAD - JACK LACHLAN DRIVE (SITE 12)

GENERAL LAYOUT PLAN

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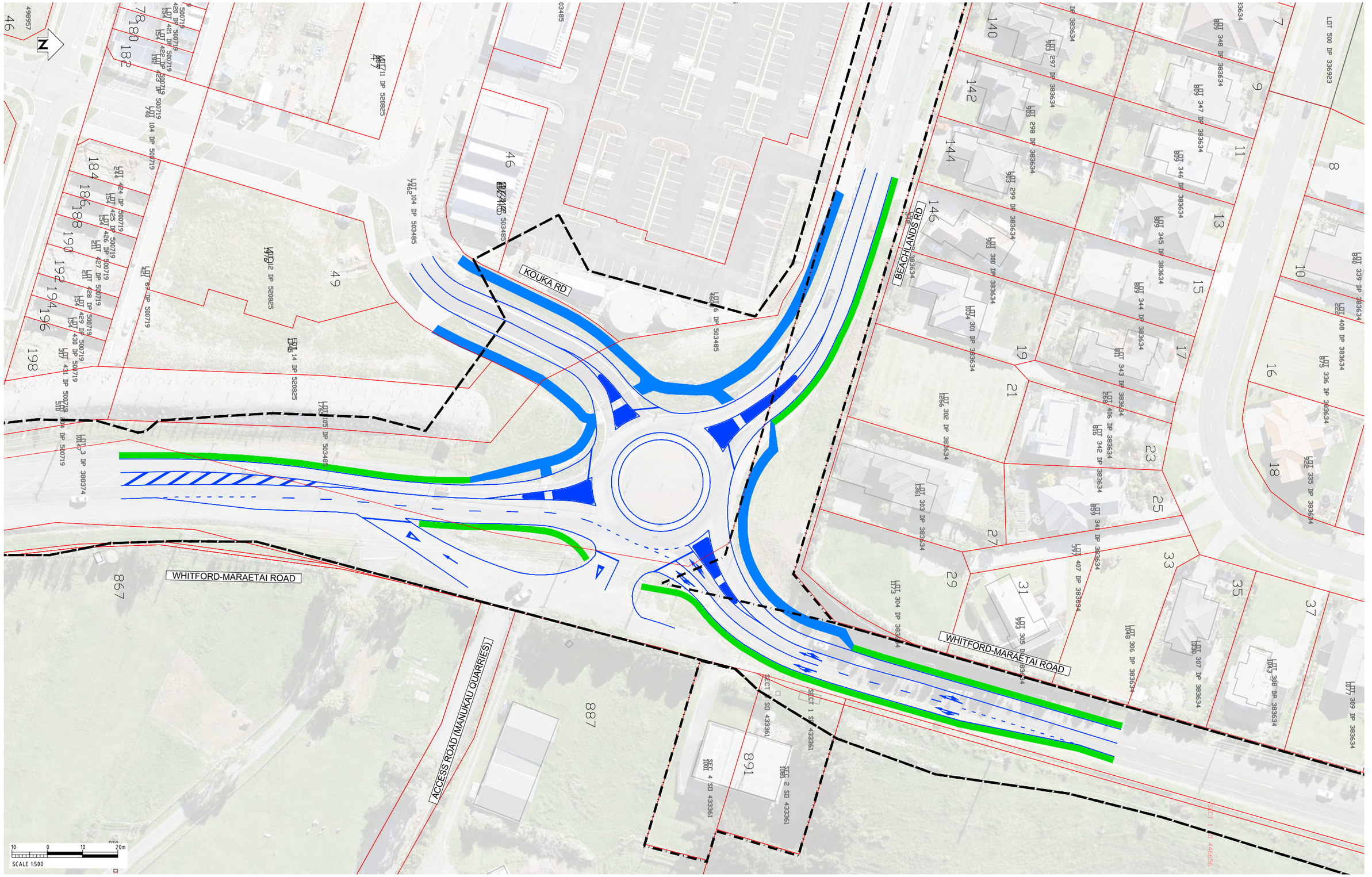

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CAD REVIEW	Tegwen Atkinson	05.2021
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DESIGN REVIEW		
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PROF REGISTRATION:		

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BEACHLANDS SOUTH PRIVATE PLAN CHANGE
WHITFORD-MARAETAI ROAD / BEACHLANDS ROAD ROUNDABOUT (SITE 1)

GENERAL LAYOUT PLAN

Status Stamp: CONCEPT SKETCH
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Drawing No.: 310204447-01-001_SK002
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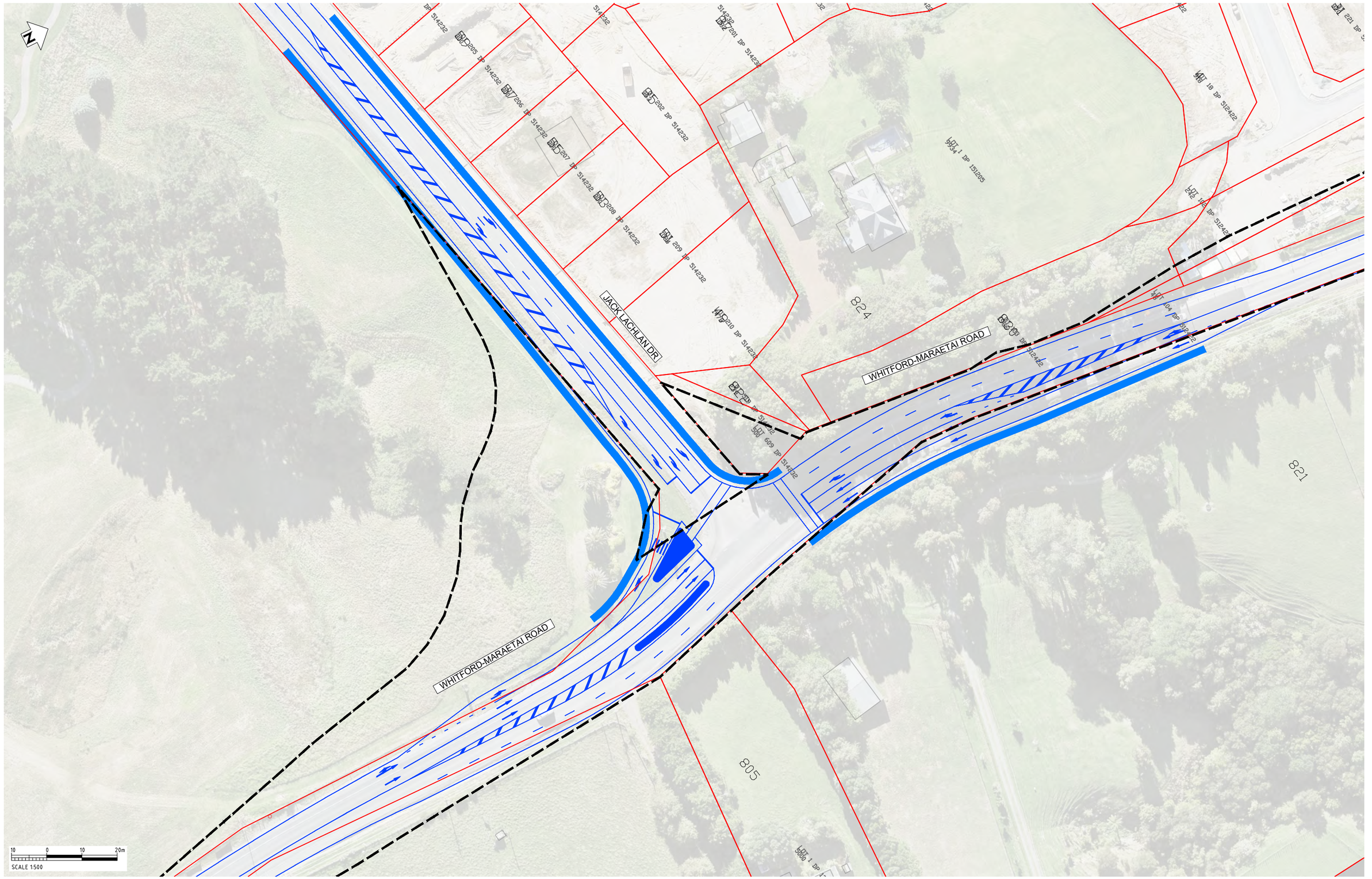

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BEACHLANDS SOUTH PRIVATE PLAN CHANGE
WHITFORD-MARAETAI ROAD / JACK LACHLAN ROAD (SITE 3)

GENERAL LAYOUT PLAN

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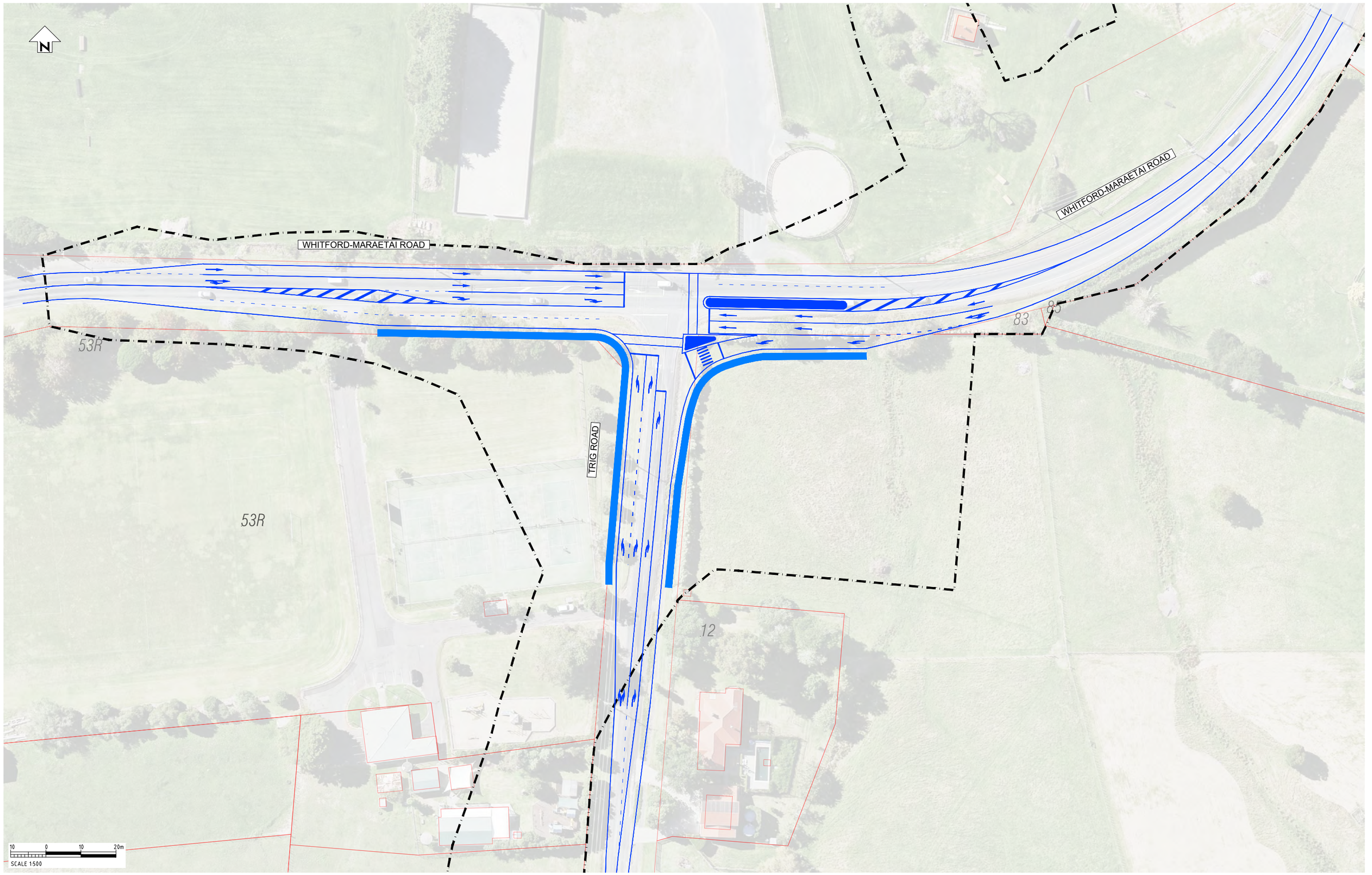

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CAD REVIEW	Mark Moslin-Thomas	05.2021
DESIGN CHECK		
DESIGN REVIEW	NOT APPROVED	
APPROVED		
PROF REGISTRATION:		

Stantec

BEACHLANDS SOUTH PRIVATE PLAN CHANGE
WHITFORD-MARAETAI ROAD / TRIG ROAD INTERSECTION (SITE 4)

GENERAL LAYOUT PLAN

Status Stamp: CONCEPT SKETCH
Date Stamp: 12.05.2021
Scales: 1:500@A1, 1:1000@A3
Drawing No.: 310204447-01-001_SK001
Rev.: A

\\Nz4105-ppfss01\shared_projects\310204447\beachlands_sth\CAD\310204447-01-001_SK001

DO NOT SCALE - IF IN DOUBT, ASK

ORIGINAL SIZE A1

WHITFORD ROAD

WHITFORD WHARF ROAD

WHITFORD-MARAETAI ROAD

WHITFORD PARK ROAD

730

1

14

8

29

9

1

13

15

17

19

10

14

LOT 1 DP 95227

LOT 1 DP 108526

LOT 2 DP 108526

LOT 3 DP 108526

LOT 4 DP 108526

LOT 2 DP 57035

LOT 3 DP 57035

10 0 10 20m

SCALE 1:500

LEGEND

- PROPERTY BOUNDARY
- NEW ROADMARKING / KERBLINE
- NEW TRAFFIC ISLAND
- NEW CONCRETE SHARED PATH / CYCLEWAY
- NEW CONCRETE SPEED TABLE

NOT FOR CONSTRUCTION

REV	REVISIONS	DRN	CHK	APP	DATE
E	AMEND SITE 6 LAYOUT	CTM	TA		22.12.21
D	MODIFIED DESIGN	LS	DD		15.01.21
C	MODIFIED DESIGN	CTM	DD		18.08.21
B	MODIFIED DESIGN - WHITFORD/MARAETAI/WHARF ROUNDABOUT	CTM	DD		12.08.21
A	CONCEPT SKETCH	ML	-	-	05.2021

SURVEYED	-	-
DESIGNED	Mannan Sahebi	04.2021
DRAWN	Mark Luo	05.2021
CAD REVIEW	Tegwen Atkinson	05.2021
DESIGN CHECK		
DESIGN REVIEW		
APPROVED		
PROF REGISTRATION:		

Stantec

BEACHLANDS SOUTH PRIVATE PLAN CHANGE
WHITFORD ROAD / WHITFORD PARK ROAD (SITE 5)

GENERAL LAYOUT PLAN

Status Stamp: CONCEPT SKETCH

Date Stamp: 22.12.2021

Scales: 1:500@A1, 1:1000@A3

Drawing No.: 310204447-01-001_SK003-5A

Rev.: E

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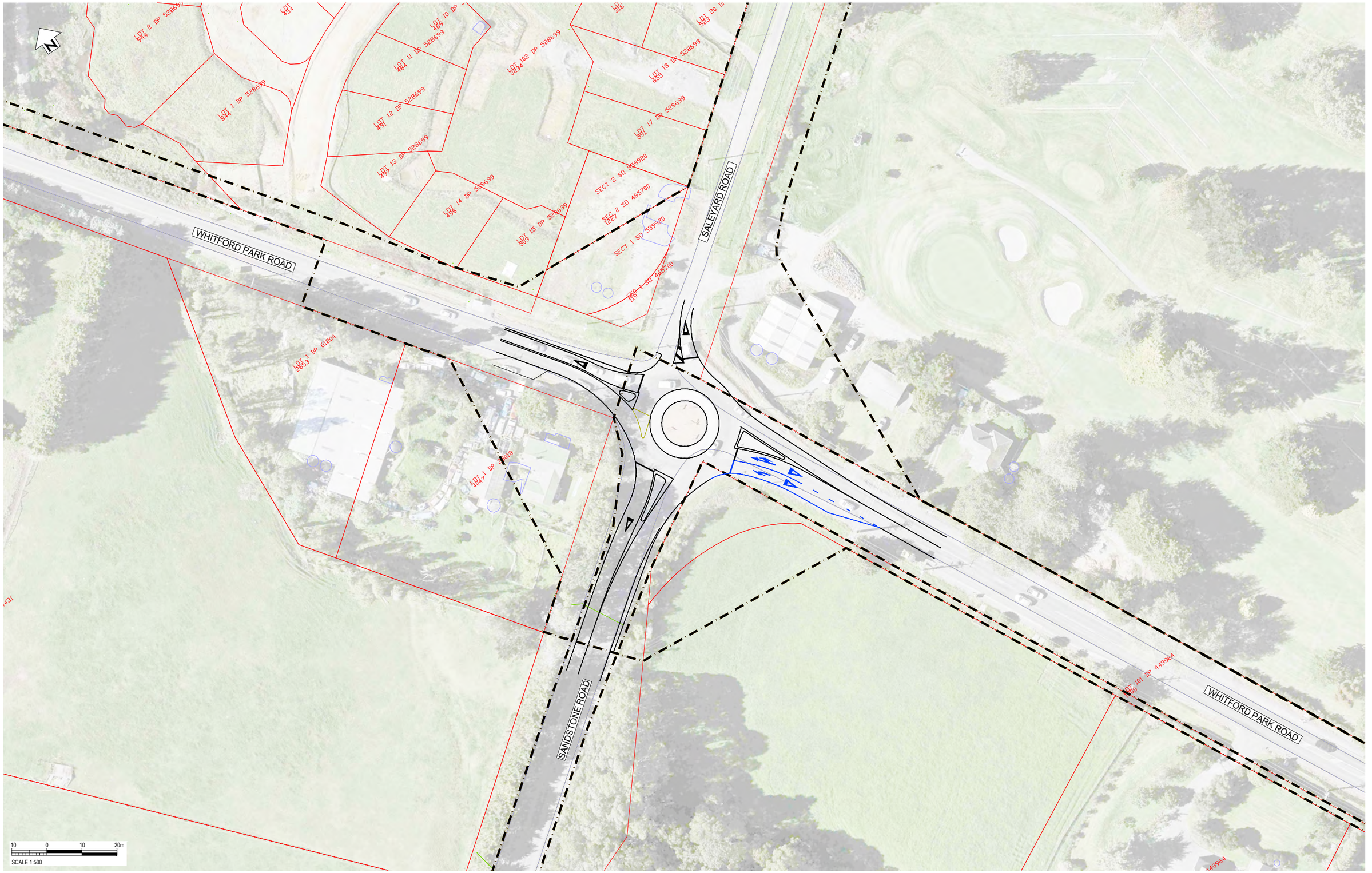
DO NOT SCALE - IF IN DOUBT, ASK

ORIGINAL SIZE A1



NOT FOR CONSTRUCTION

REV	REVISIONS	DRN	CHK	APP	DATE
E	AMEND SITE 6 LAYOUT	CTM	TA		22.12.21
D	MODIFIED DESIGN	LS	DD		15.01.21
C	MODIFIED DESIGN	CTM	DD		18.08.21
B	MODIFIED DESIGN - WHITFORD/MARAETAI/WHARF ROUNDABOUT	CTM	DD		12.08.21
A	CONCEPT SKETCH	ML	-	-	05.2021

SURVEYED	-	-
DESIGNED	Mannan Sahebi	04.2021
DRAWN	Mark Luo	05.2021
CAD REVIEW	Tegwen Atkinson	05.2021
DESIGN CHECK		
DESIGN REVIEW		
APPROVED		
PROF REGISTRATION:		

Stantec

BEACHLANDS SOUTH PRIVATE PLAN CHANGE
SANDSTONE ROAD / WHITFORD PARK ROAD ROUNDABOUT (SITE 6)

GENERAL LAYOUT PLAN

Status Stamp: CONCEPT SKETCH
Date Stamp: 22.12.2021
Scales: 1:500@A1, 1:1000@A3
Drawing No.: 310204447-01-001_SK003-6
Rev.: E

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DO NOT SCALE - IF IN DOUBT, ASK

ORIGINAL SIZE A1

NOT FOR CONSTRUCTION

REV	REVISIONS	DRN	CHK	APP	DATE
E	AMEND SITE 6 LAYOUT	CTM	TA		22.12.21
D	MODIFIED DESIGN	LS	DD		15.01.21
C	MODIFIED DESIGN -	CTM	DD		18.08.21
B	MODIFIED DESIGN - WHITFORD/MARAETAI/WHARF ROUNDABOUT	CTM	DD		12.08.21
A	CONCEPT SKETCH	ML	-	-	05.2021

SURVEYED	-	-
DESIGNED	Mannan Sahebi	04.2021
DRAWN	Mark Luo	05.2021
CAD REVIEW	Tegwen Atkinson	05.2021
DESIGN CHECK		
DESIGN REVIEW		
APPROVED		
PROF REGISTRATION:		

Stantec

BEACHLANDS SOUTH PRIVATE PLAN CHANGE
WHITFORD-MARAETAI ROAD - 712 ACCESS (SITE 8)

GENERAL LAYOUT PLAN

Status Stamp: CONCEPT SKETCH
Date Stamp: 22.12.2021
Scales: 1:500@A1, 1:1000@A3
Drawing No.: 310204447-01-001_SK003-8
Rev.: E

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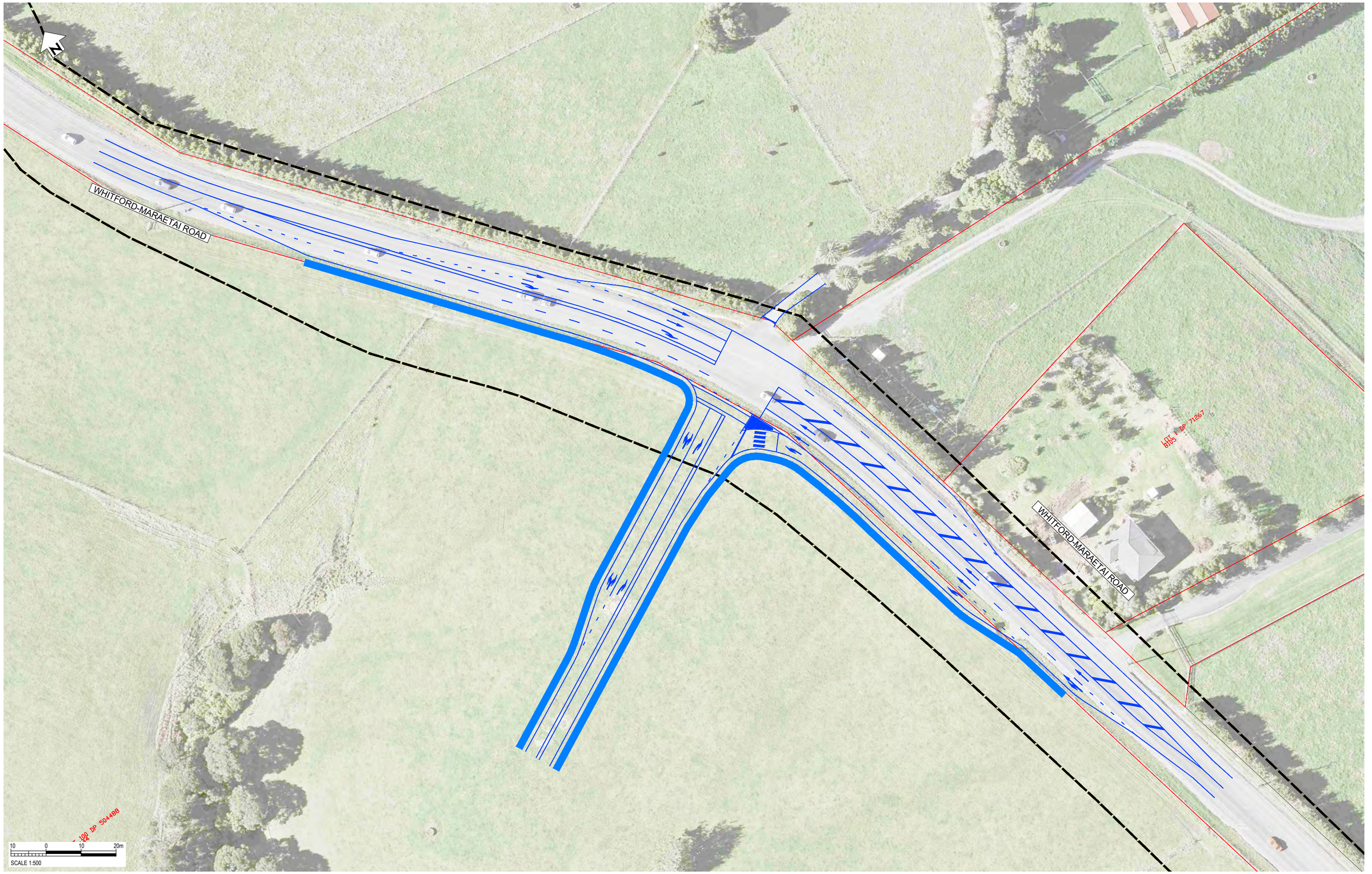
DO NOT SCALE - IF IN DOUBT, ASK

ORIGINAL SIZE A1



NOT FOR CONSTRUCTION

REV	REVISIONS	DRN	CHK	APP	DATE
E	AMEND SITE 6 LAYOUT	CTM	TA		22.12.21
D	MODIFIED DESIGN	LS	DD		15.01.21
C	MODIFIED DESIGN	CTM	DD		18.08.21
B	MODIFIED DESIGN - WHITFORD/MARAETAI/WHARF ROUNDABOUT	CTM	DD		12.08.21
A	CONCEPT SKETCH	ML	-	-	05.2021

SURVEYED	-	-
DESIGNED	Mannan Sahebi	04.2021
DRAWN	Mark Luo	05.2021
CAD REVIEW	Tegwen Atkinson	05.2021
DESIGN CHECK		
DESIGN REVIEW	NOT APPROVED	
APPROVED		
PROF REGISTRATION:		

Stantec

BEACHLANDS SOUTH PRIVATE PLAN CHANGE
WHITFORD-MARAETAI ROAD - 650 ACCESS (SITE 9)

GENERAL LAYOUT PLAN

Status Stamp: CONCEPT SKETCH
Date Stamp: 22.12.2021
Scales: 1:500@A1, 1:1000@A3
Drawing No.: 310204447-01-001_SK003-9
Rev.: E

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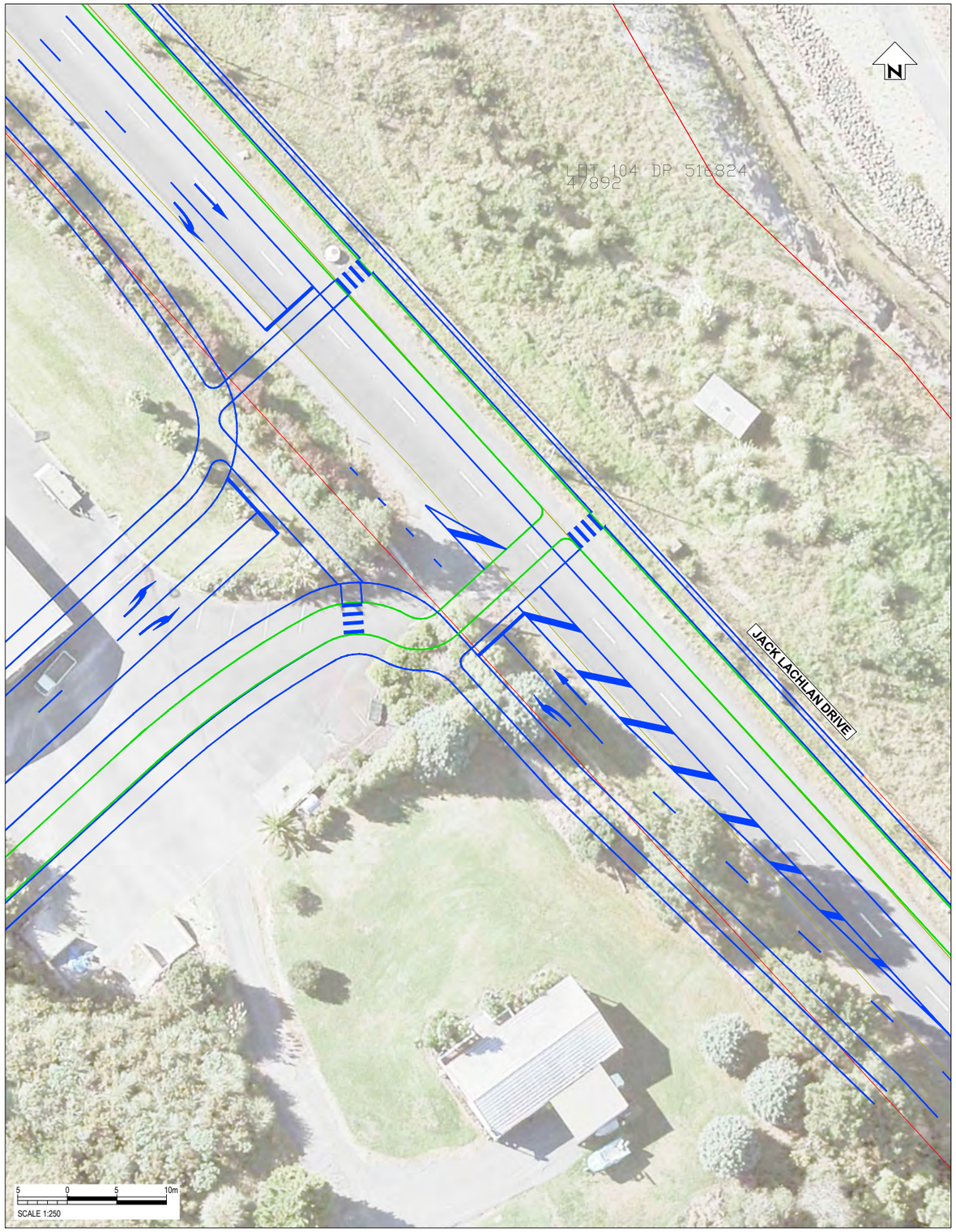
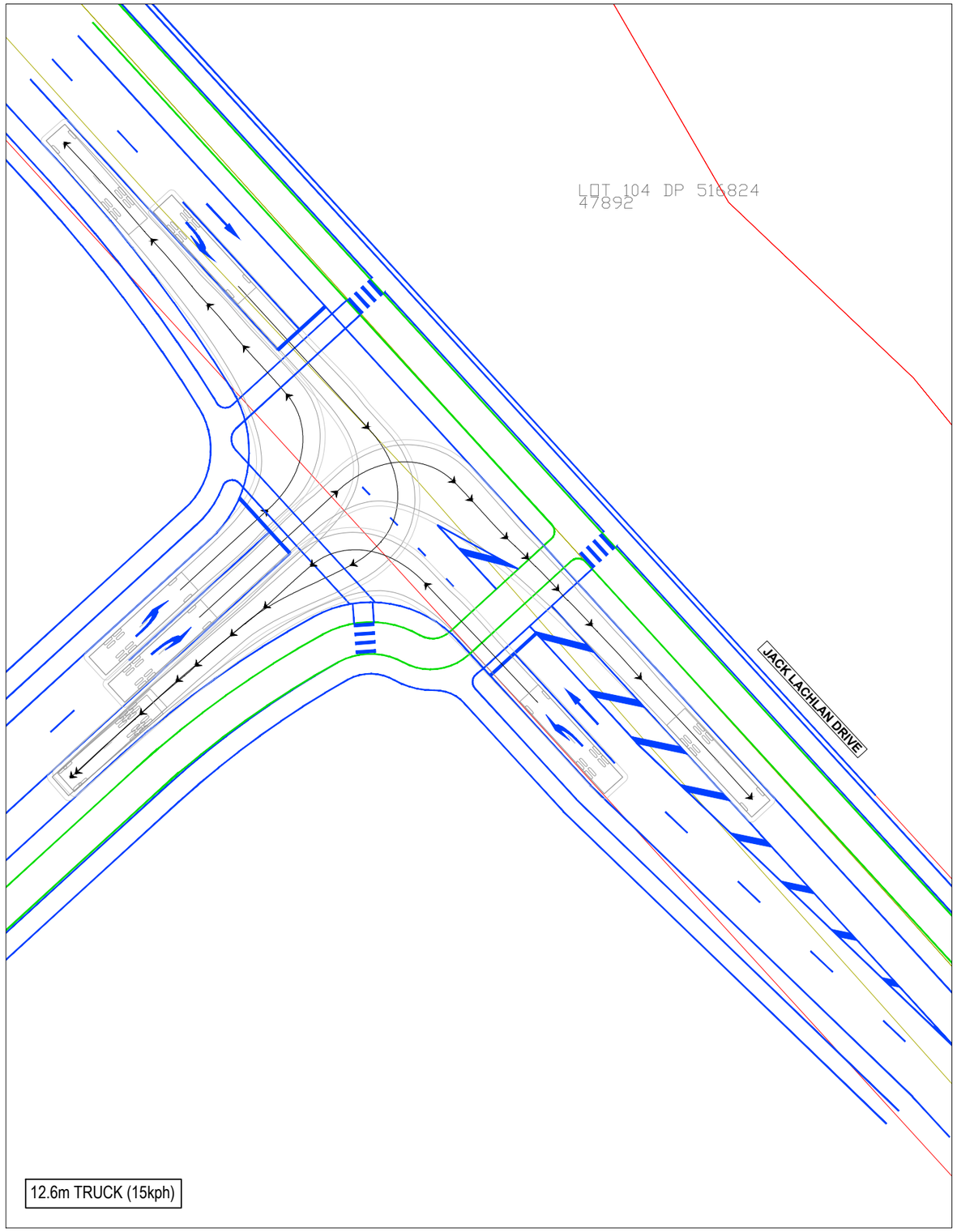
DO NOT SCALE - IF IN DOUBT, ASK

ORIGINAL SIZE A1





NOT FOR CONSTRUCTION

REV	REVISIONS	DRN	CHK	APP	DATE
A	MR DESIGN BASED ON AERIAL PHOTO	CTM	MR		

SURVEYED		
DESIGNED	M.ROBITZSCH	
DRAWN	C.MAAKA	08.07.21
CAD REVIEW	M.ROBITZSCH	
DESIGN CHECK		
DESIGN REVIEW		
APPROVED		
PROF REGISTRATION:		

Stantec

Client:

BEACHLANDS SOUTH PRIVATE PLAN CHANGE
#110A JACK LACHLAN DRIVE (SITE 10)

GENERAL LAYOUT PLAN

Status Stamp: **WORKING PLOT**

Date Stamp: **08.07.2021**

Scales: 1:250@A1 / 1:500@A3

Drawing No.: 310204447-01-001_SK010-1

Rev.: A

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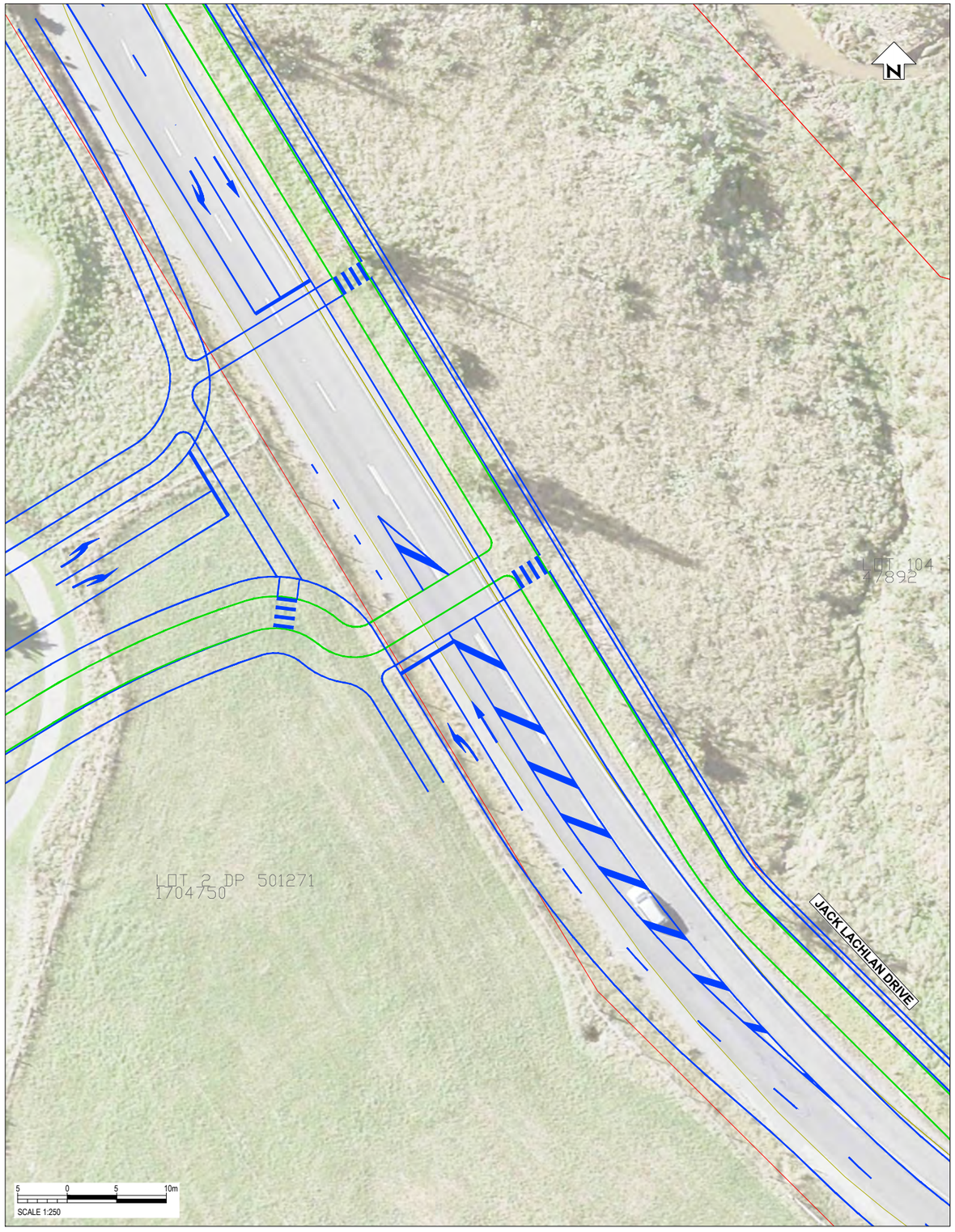
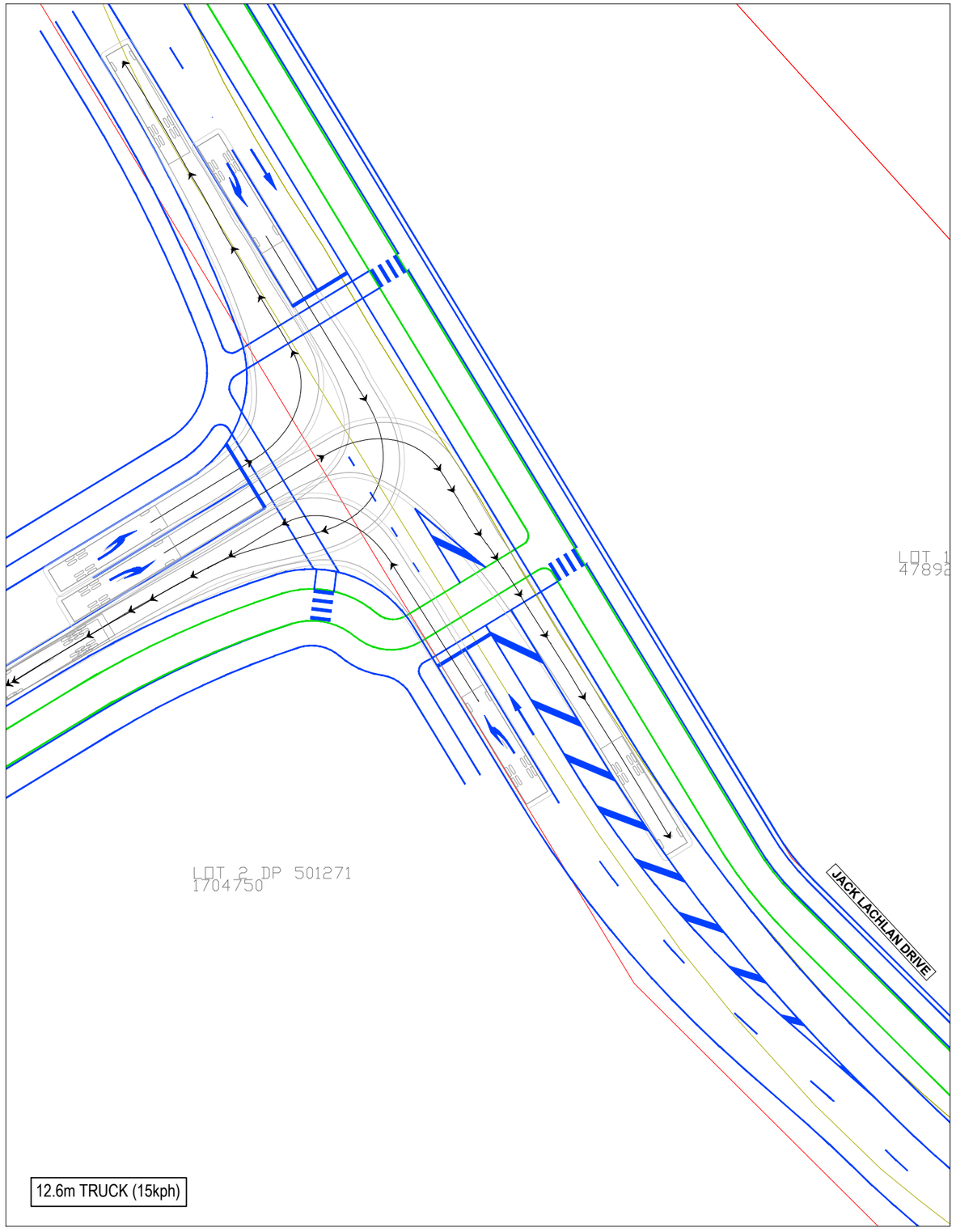
DO NOT SCALE - IF IN DOUBT, ASK

ORIGINAL SIZE A1





NOT FOR CONSTRUCTION

REV	REVISIONS	DRN	CHK	APP	DATE
A	MR DESIGN BASED ON AERIAL PHOTO	CTM	MR		

SURVEYED		
DESIGNED	M.ROBITZSCH	
DRAWN	C.MAAKA	08.07.21
CAD REVIEW	M.ROBITZSCH	
DESIGN CHECK		
DESIGN REVIEW		
APPROVED		
PROF REGISTRATION:		

Stantec

Client:

BEACHLANDS SOUTH PRIVATE PLAN CHANGE
#17 GREEN - JACK LACHLAN DRIVE (SITE 11)

GENERAL LAYOUT PLAN

Status Stamp: **WORKING PLOT**

Date Stamp: **08.07.2021**

Scales: 1:250@A1 / 1:500@A3

Drawing No.: 310204447-01-001_SK010-2

Rev.: A

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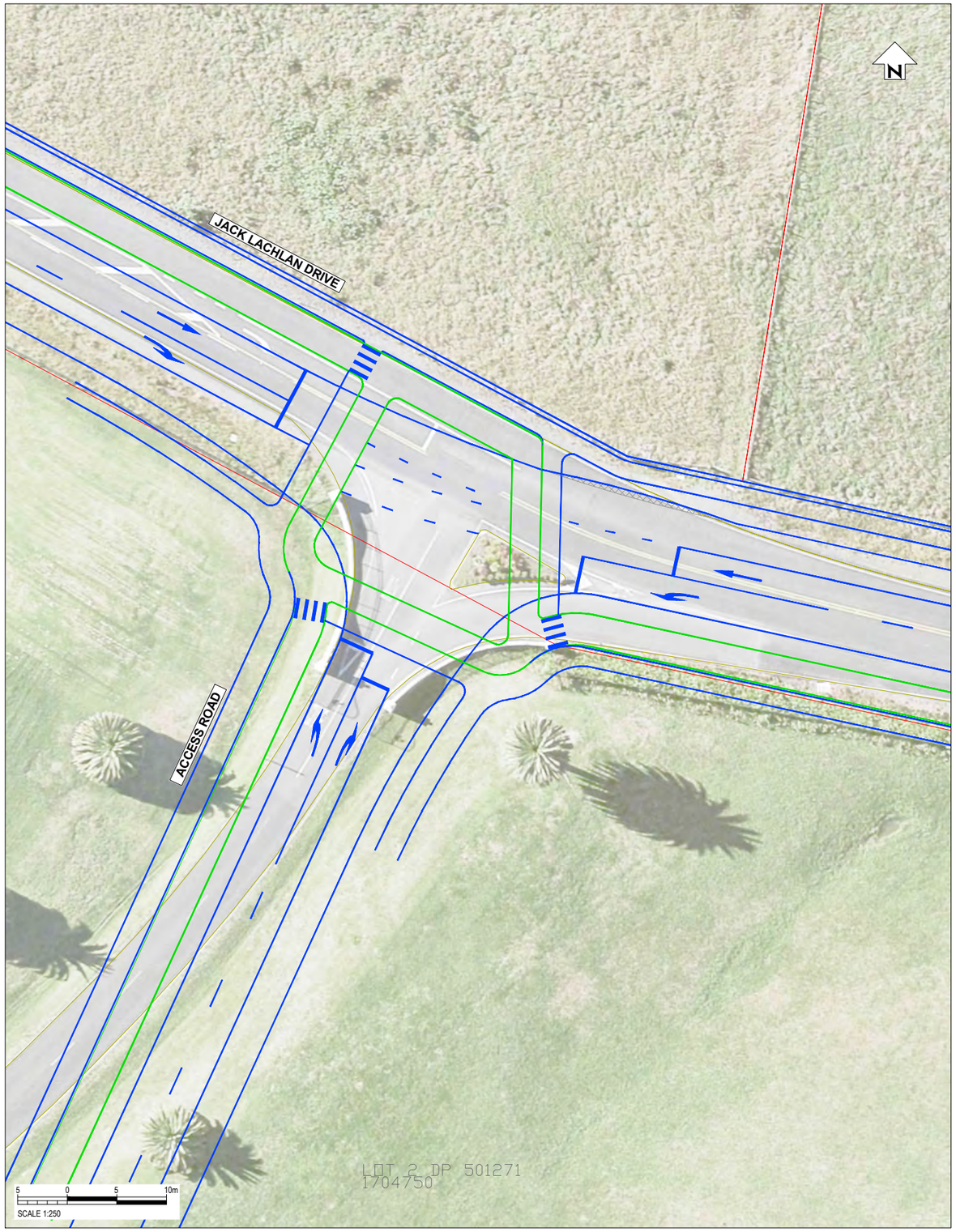
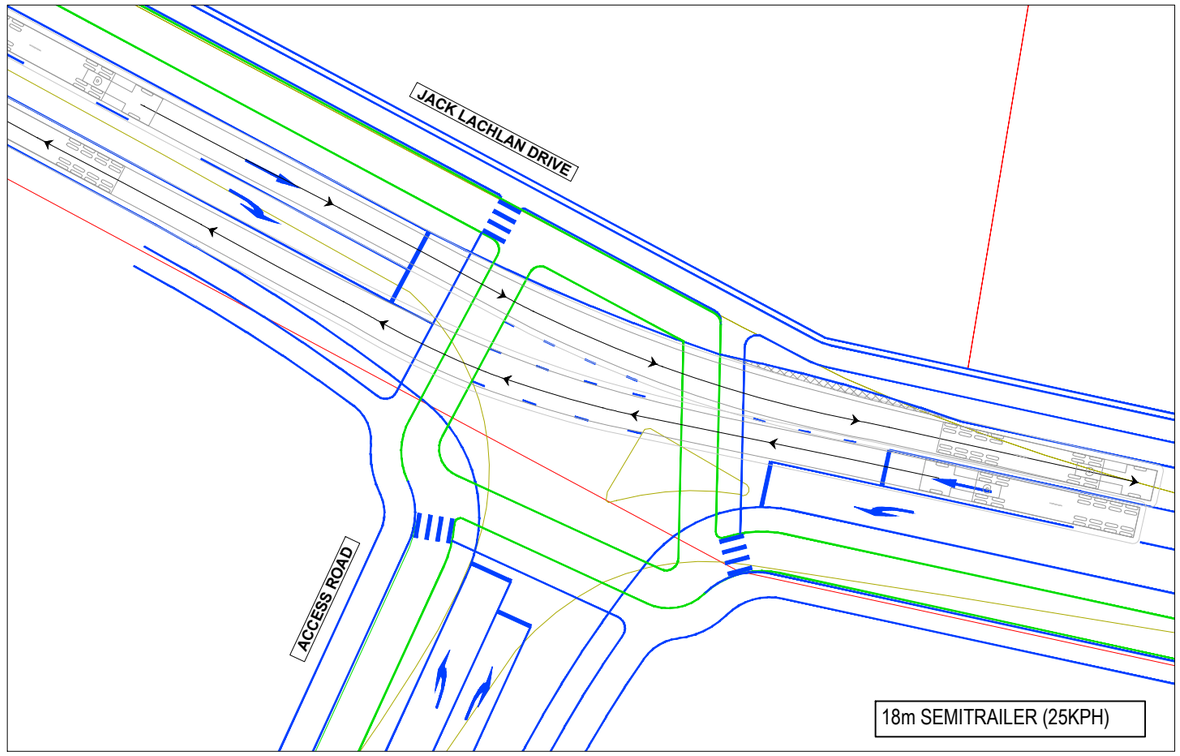
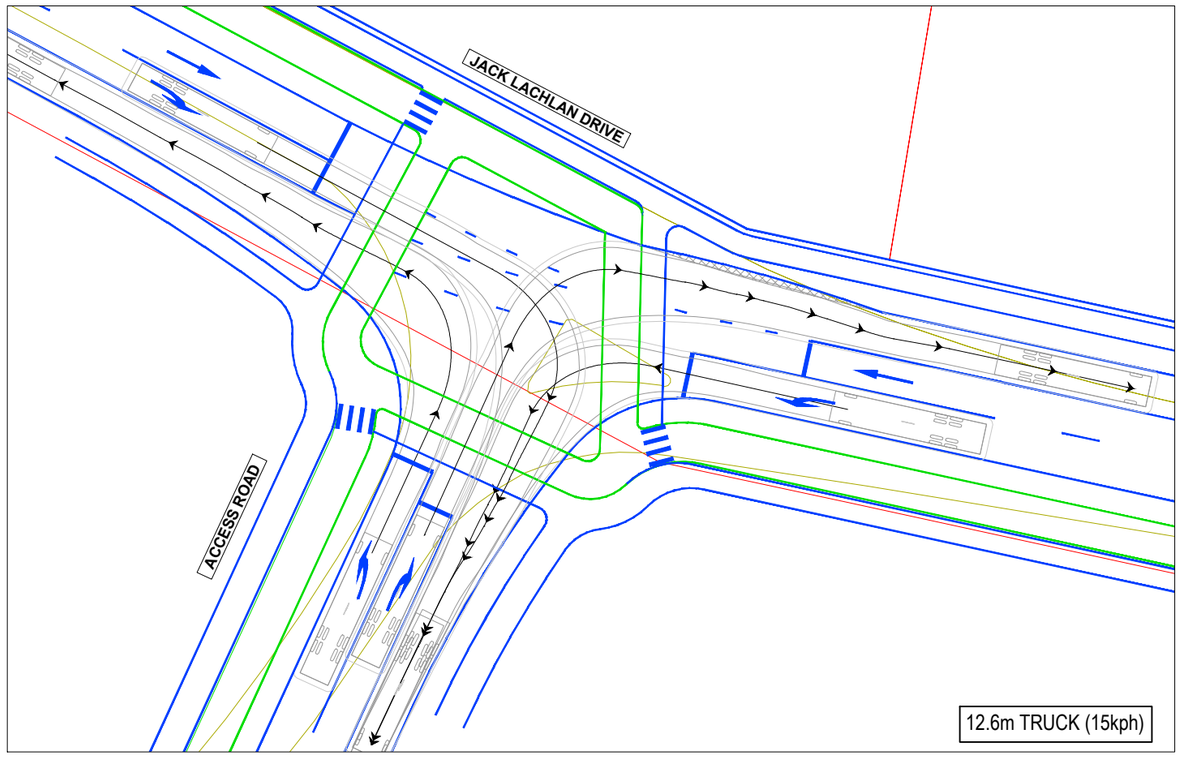
DO NOT SCALE - IF IN DOUBT, ASK

ORIGINAL SIZE A1







NOT FOR CONSTRUCTION

REV	REVISIONS	DRN	CHK	APP	DATE
A	MR DESIGN BASED ON AERIAL PHOTO	CTM	MR		

SURVEYED		
DESIGNED	M.ROBITZSCH	
DRAWN	C.MAAKA	08.07.21
CAD REVIEW	M.ROBITZSCH	
DESIGN CHECK		
DESIGN REVIEW		
APPROVED		
PROF REGISTRATION:		

Stantec

Client:

BEACHLANDS SOUTH PRIVATE PLAN CHANGE
ACCESS ROAD - JACK LACHLAN DRIVE (SITE 12)

GENERAL LAYOUT PLAN

Status Stamp: **WORKING PLOT**

Date Stamp: **08.07.2021**

Scales: 1:250@A1 / 1:500@A3

Drawing No.: 310204447-01-001_SK010-3

Rev.: A

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Appendix B SIDRA Modelling Results

[

MOVEMENT SUMMARY

Site: 1_N0D0am [1_2020_Base_AM (Site Folder: 2020 Base AM N0 D0)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Whitford-Maraetai Road														
1b	L3	10	0	13	0.0	0.240	3.2	LOS A	1.7	13.4	0.33	0.39	0.33	47.1
1	L2	153	18	194	11.8	0.240	3.1	LOS A	1.7	13.4	0.33	0.39	0.33	47.5
2	T1	64	10	81	15.6	0.240	2.9	LOS A	1.7	13.4	0.33	0.39	0.33	48.8
3	R2	12	11	15	91.7	0.240	9.0	LOS A	1.7	13.4	0.33	0.39	0.33	48.1
Approach		239	39	303	16.3	0.240	3.4	LOS A	1.7	13.4	0.33	0.39	0.33	47.8
East: Access														
4	L2	1	0	1	0.0	0.016	24.4	LOS C	0.1	0.9	1.00	0.74	1.00	37.4
4a	L1	1	0	1	0.0	0.016	24.0	LOS C	0.1	0.9	1.00	0.74	1.00	37.9
5	T1	1	0	1	0.0	0.016	24.2	LOS C	0.1	0.9	1.00	0.74	1.00	38.2
6	R2	1	0	1	0.0	0.016	29.3	LOS C	0.1	0.9	1.00	0.74	1.00	38.4
Approach		4	0	4	0.0	0.016	25.5	LOS C	0.1	0.9	1.00	0.74	1.00	38.0
North: Whitford-Maraetai Road														
7	L2	1	0	1	0.0	0.920	48.9	LOS D	17.6	125.8	1.00	1.65	2.47	30.1
8	T1	327	5	337	1.5	0.920	48.8	LOS D	17.6	125.8	1.00	1.65	2.47	30.6
9a	R1	13	0	13	0.0	0.920	52.8	LOS E	17.6	125.8	1.00	1.65	2.47	30.6
9	R2	70	4	72	5.7	0.920	54.1	LOS E	17.6	125.8	1.00	1.65	2.47	30.8
Approach		411	9	424	2.2	0.920	49.8	LOS D	17.6	125.8	1.00	1.65	2.47	30.7
West: Beachlands Road														
10	L2	84	3	97	3.6	0.801	7.2	LOS A	12.2	87.6	0.84	0.77	0.97	43.6
11	T1	2	1	2	50.0	0.801	8.4	LOS A	12.2	87.6	0.84	0.77	0.97	44.5
12	R2	776	20	892	2.6	0.801	12.0	LOS B	12.2	87.6	0.84	0.77	0.97	44.9
12b	R3	1	0	1	0.0	0.801	12.9	LOS B	12.2	87.6	0.84	0.77	0.97	45.5
Approach		863	24	992	2.8	0.801	11.5	LOS B	12.2	87.6	0.84	0.77	0.97	44.8
SouthWest: Kouka Road														
30b	L3	2	0	3	0.0	0.121	4.7	LOS A	0.7	4.7	0.52	0.66	0.52	44.3
30a	L1	13	1	18	7.7	0.121	4.1	LOS A	0.7	4.7	0.52	0.66	0.52	45.3
32a	R1	1	0	1	0.0	0.121	8.3	LOS A	0.7	4.7	0.52	0.66	0.52	45.6
32b	R3	73	1	103	1.4	0.121	10.2	LOS B	0.7	4.7	0.52	0.66	0.52	46.6
Approach		89	2	125	2.2	0.121	9.2	LOS A	0.7	4.7	0.52	0.66	0.52	46.3
All Vehicles		1606	74	1848	4.8	0.920	18.8	LOS B	17.6	125.8	0.77	0.91	1.18	41.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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 (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 2_N0D0am [2_2020_Base_AM (Site Folder: 2020 Base AM N0 D0)]

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

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Jack Lachlan Drive														
5	T1	104	1.0	124	1.0	0.064	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
6	R2	13	23.1	15	23.1	0.011	6.1	LOS A	0.0	0.4	0.22	0.53	0.22	48.8
Approach		117	3.4	139	3.4	0.064	0.7	NA	0.0	0.4	0.02	0.06	0.02	58.5
North: Kahawairahi Drive														
7	L2	23	4.3	32	4.3	0.025	8.0	LOS A	0.1	0.7	0.20	0.89	0.20	47.8
9	R2	17	0.0	24	0.0	0.030	8.5	LOS A	0.1	0.8	0.37	0.86	0.37	47.3
Approach		40	2.5	56	2.5	0.030	8.2	LOS A	0.1	0.8	0.27	0.87	0.27	47.6
West: Jack Lachlan Drive														
10	L2	4	0.0	5	0.0	0.054	5.6	LOS A	0.0	0.0	0.00	0.03	0.00	58.1
11	T1	80	1.3	99	1.3	0.054	0.0	LOS A	0.0	0.0	0.00	0.03	0.00	59.7
Approach		84	1.2	104	1.2	0.054	0.3	NA	0.0	0.0	0.00	0.03	0.00	59.6
All Vehicles		241	2.5	299	2.5	0.064	2.0	NA	0.1	0.8	0.06	0.20	0.06	56.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 3_N0D0am [3_2020_Base_AM (Site Folder: 2020 Base AM N0 D0)]

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

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Whitford-Maraetai Road														
1	L2	87	3.4	109	3.4	0.222	7.0	LOS A	0.0	0.0	0.00	0.18	0.00	70.0
2	T1	228	16.7	285	16.7	0.222	0.0	LOS A	0.0	0.0	0.00	0.18	0.00	76.8
Approach		315	13.0	394	13.0	0.222	2.0	NA	0.0	0.0	0.00	0.18	0.00	75.1
North: Whitford-Maraetai Road														
8	T1	1165	3.1	1355	3.1	0.715	0.5	LOS A	0.0	0.0	0.00	0.00	0.00	78.8
9	R2	42	0.0	49	0.0	0.039	8.2	LOS A	0.2	1.1	0.45	0.65	0.45	60.0
Approach		1207	3.0	1403	3.0	0.715	0.8	NA	0.2	1.1	0.02	0.02	0.02	77.9
West: Jack Lachlan Drive														
10	L2	7	0.0	9	0.0	0.007	6.4	LOS A	0.0	0.2	0.35	0.55	0.35	60.1
12	R2	117	1.7	143	1.7	1.991	507.4	LOS F	28.4	201.5	1.00	2.10	5.90	6.2
Approach		124	1.6	151	1.6	1.991	479.1	LOS F	28.4	201.5	0.96	2.01	5.59	6.5
All Vehicles		1646	4.8	1948	4.9	1.991	38.1	NA	28.4	201.5	0.09	0.21	0.44	44.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 4_N0D0am [4_2020_Base_AM (Site Folder: 2020 Base AM N0 D0)]

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

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Trig Road														
1	L2	29	6.9	31	6.9	0.218	32.2	LOS D	0.6	4.7	0.93	0.98	0.99	36.6
3	R2	2	0.0	2	0.0	0.083	132.1	LOS F	0.2	1.5	0.98	0.99	0.98	18.6
Approach		31	6.5	33	6.5	0.218	38.7	LOS E	0.6	4.7	0.93	0.98	0.99	34.4
East: Whitford-Maraetai Road														
4	L2	1	0.0	1	0.0	0.703	6.0	LOS A	0.0	0.0	0.00	0.19	0.00	56.6
5	T1	1233	3.4	1340	3.4	0.703	1.5	LOS A	0.0	0.0	0.00	0.19	0.00	58.7
Approach		1234	3.4	1341	3.4	0.703	1.5	NA	0.0	0.0	0.00	0.19	0.00	58.7
West: Whitford-Maraetai Road														
11	T1	367	17.2	459	17.2	0.264	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
12	R2	19	21.1	24	21.1	0.212	39.6	LOS E	0.6	5.3	0.95	0.99	0.99	33.3
Approach		386	17.4	483	17.4	0.264	2.0	NA	0.6	5.3	0.05	0.05	0.05	48.7
All Vehicles		1651	6.7	1856	7.1	0.703	2.3	NA	0.6	5.3	0.03	0.16	0.03	55.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 5_N0D0am [5_2020_Base_AM (Site Folder: 2020 Base AM N0 D0)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Whitford Park Road														
1	L2	324	6.8	360	6.8	0.877	20.7	LOS C	15.7	119.6	1.00	1.36	1.78	38.3
2	T1	1	0.0	1	0.0	0.877	20.3	LOS C	15.7	119.6	1.00	1.36	1.78	39.0
3	R2	234	15.0	260	15.0	0.877	25.6	LOS C	15.7	119.6	1.00	1.36	1.78	39.0
Approach		559	10.2	621	10.2	0.877	22.8	LOS C	15.7	119.6	1.00	1.36	1.78	38.6
East: Whitford Maraetai Road														
4	L2	711	3.8	756	3.8	1.147	78.2	LOS F	87.5	628.6	1.00	2.36	3.43	24.2
5	T1	558	2.2	594	2.2	1.147	78.1	LOS F	87.5	628.6	1.00	2.36	3.43	24.5
6	R2	1	0.0	1	0.0	1.147	82.5	LOS F	87.5	628.6	1.00	2.36	3.43	24.5
Approach		1270	3.1	1351	3.1	1.147	78.1	LOS F	87.5	628.6	1.00	2.36	3.43	24.3
North: Whitford Wharf Road														
7	L2	1	0.0	1	0.0	0.009	6.8	LOS A	0.1	0.4	0.69	0.61	0.69	44.6
8	T1	2	0.0	2	0.0	0.009	6.8	LOS A	0.1	0.4	0.69	0.61	0.69	45.6
9	R2	3	0.0	3	0.0	0.009	11.3	LOS B	0.1	0.4	0.69	0.61	0.69	45.8
Approach		6	0.0	6	0.0	0.009	9.0	LOS A	0.1	0.4	0.69	0.61	0.69	45.5
West: Whitford Road														
10	L2	6	0.0	7	0.0	0.445	4.8	LOS A	3.4	26.2	0.67	0.65	0.67	45.1
11	T1	190	15.8	213	15.8	0.445	5.2	LOS A	3.4	26.2	0.67	0.65	0.67	46.1
12	R2	176	5.7	198	5.7	0.445	9.4	LOS A	3.4	26.2	0.67	0.65	0.67	46.2
Approach		372	10.8	418	10.8	0.445	7.2	LOS A	3.4	26.2	0.67	0.65	0.67	46.1
All Vehicles		2207	6.2	2396	6.2	1.147	51.2	LOS E	87.5	628.6	0.94	1.80	2.51	29.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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 (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 6_N0D0am [6_2020_Base_AM (Site Folder: 2020 Base AM N0 D0)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Whitford Park Road														
1	L2	228	5.7	268	5.7	0.949	33.6	LOS C	23.5	174.1	1.00	1.75	2.56	34.3
2	T1	385	7.5	453	7.5	0.949	33.7	LOS C	23.5	174.1	1.00	1.75	2.56	34.9
3	R2	1	0.0	1	0.0	0.949	37.7	LOS D	23.5	174.1	1.00	1.75	2.56	35.1
Approach		614	6.8	722	6.8	0.949	33.6	LOS C	23.5	174.1	1.00	1.75	2.56	34.7
East: Saleyard Road														
4	L2	1	0.0	1	0.0	0.011	9.4	LOS A	0.1	0.5	0.81	0.66	0.81	43.0
5	T1	1	0.0	1	0.0	0.011	9.3	LOS A	0.1	0.5	0.81	0.66	0.81	43.9
6	R2	4	0.0	4	0.0	0.011	13.8	LOS B	0.1	0.5	0.81	0.66	0.81	44.0
Approach		6	0.0	6	0.0	0.011	12.3	LOS B	0.1	0.5	0.81	0.66	0.81	43.8
North: Whitford Park Road														
7	L2	2	0.0	2	0.0	0.606	3.2	LOS A	6.9	50.2	0.36	0.51	0.36	45.4
8	T1	246	5.7	251	5.7	0.606	3.2	LOS A	6.9	50.2	0.36	0.51	0.36	46.4
9	R2	639	3.8	652	3.8	0.606	7.7	LOS A	6.9	50.2	0.36	0.51	0.36	46.6
Approach		887	4.3	905	4.3	0.606	6.5	LOS A	6.9	50.2	0.36	0.51	0.36	46.5
West: Sandstone Road														
10	L2	184	16.3	198	16.3	0.316	6.1	LOS A	2.2	17.7	0.74	0.75	0.74	45.7
11	T1	1	0.0	1	0.0	0.316	5.6	LOS A	2.2	17.7	0.74	0.75	0.74	46.9
12	R2	39	35.9	42	35.9	0.316	11.3	LOS B	2.2	17.7	0.74	0.75	0.74	46.6
Approach		224	19.6	241	19.6	0.316	7.0	LOS A	2.2	17.7	0.74	0.75	0.74	45.8
All Vehicles		1731	7.2	1875	7.2	0.949	17.0	LOS B	23.5	174.1	0.66	1.02	1.26	41.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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 (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 7_N0D0am [7_2020_Base_AM (Site Folder: 2020 Base AM N0 D0)]

New Site
Site Category: (None)
Roundabout Metering

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Point View Drive														
1	L2	26	0.0	46	0.0	0.246	9.6	LOS A	1.3	9.1	0.84	0.92	0.84	43.6
2	T1	24	0.0	42	0.0	0.246	9.4	LOS A	1.3	9.1	0.84	0.92	0.84	44.5
3	R2	7	0.0	12	0.0	0.246	13.0	LOS B	1.3	9.1	0.84	0.92	0.84	44.4
Approach		57	0.0	100	0.0	0.246	9.9	LOS A	1.3	9.1	0.84	0.92	0.84	44.1
East: Whitford Road														
4	L2	2	0.0	2	0.0	0.857	17.1	LOS B	18.6	133.8	1.00	1.17	1.62	40.1
5	T1	732	3.3	796	3.3	0.857	17.5	LOS B	18.6	133.8	1.00	1.17	1.62	40.6
6	R2	90	3.3	98	3.3	0.857	21.2	LOS C	18.6	133.8	1.00	1.17	1.62	40.6
Approach		824	3.3	896	3.3	0.857	17.9	LOS B	18.6	133.8	1.00	1.17	1.62	40.6
North: Somerville														
7	L2	85	2.4	101	2.4	0.890	42.2	LOS D	22.4	158.1	1.00	1.52	2.30	31.1
8	T1	87	1.1	104	1.1	0.890	42.0	LOS D	22.4	158.1	1.00	1.52	2.30	31.6
9	R2	236	0.0	281	0.0	0.890	45.6	LOS D	22.4	158.1	1.00	1.52	2.30	31.5
Approach		408	0.7	486	0.7	0.890	44.1	LOS D	22.4	158.1	1.00	1.52	2.30	31.4
West: Whitford Road														
10	L2	91	2.2	112	2.2	0.403	3.5	LOS A	1.7	13.0	0.35	0.45	0.35	46.5
11	T1	287	12.5	354	12.5	0.403	3.8	LOS A	1.7	13.0	0.35	0.45	0.35	47.1
12	R2	14	0.0	17	0.0	0.403	7.4	LOS A	1.7	13.0	0.35	0.45	0.35	47.2
Approach		392	9.7	484	9.7	0.403	3.9	LOS A	1.7	13.0	0.35	0.45	0.35	47.0
All Vehicles		1681	4.0	1965	4.1	0.890	20.5	LOS C	22.4	158.1	0.83	1.06	1.44	39.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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 (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 1_N0D0pm [1_2020_Base_PM (Site Folder: 2020 Base PM N0 D0)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Whitford-Maraetai Road														
1b	L3	56	0.0	58	0.0	0.753	6.2	LOS A	10.0	70.1	0.80	0.69	0.87	45.8
1	L2	601	1.0	626	1.0	0.753	5.9	LOS A	10.0	70.1	0.80	0.69	0.87	46.2
2	T1	237	0.0	247	0.0	0.753	5.7	LOS A	10.0	70.1	0.80	0.69	0.87	47.4
3	R2	1	0.0	1	0.0	0.753	10.8	LOS B	10.0	70.1	0.80	0.69	0.87	47.8
Approach		895	0.7	932	0.7	0.753	5.9	LOS A	10.0	70.1	0.80	0.69	0.87	46.5
East: Access														
4	L2	1	0.0	1	0.0	0.012	5.2	LOS A	0.1	0.4	0.60	0.55	0.60	45.7
4a	L1	2	0.0	2	0.0	0.012	4.8	LOS A	0.1	0.4	0.60	0.55	0.60	46.4
5	T1	3	0.0	3	0.0	0.012	5.1	LOS A	0.1	0.4	0.60	0.55	0.60	46.8
6	R2	4	0.0	4	0.0	0.012	10.1	LOS B	0.1	0.4	0.60	0.55	0.60	47.2
Approach		10	0.0	11	0.0	0.012	7.0	LOS A	0.1	0.4	0.60	0.55	0.60	46.8
North: Whitford-Maraetai Road														
7	L2	1	0.0	1	0.0	0.298	3.9	LOS A	1.9	13.8	0.51	0.59	0.51	45.5
8	T1	96	4.2	122	4.2	0.298	3.8	LOS A	1.9	13.8	0.51	0.59	0.51	46.7
9a	R1	49	0.0	62	0.0	0.298	7.8	LOS A	1.9	13.8	0.51	0.59	0.51	46.5
9	R2	122	0.8	154	0.8	0.298	8.8	LOS A	1.9	13.8	0.51	0.59	0.51	47.0
Approach		268	1.9	339	1.9	0.298	6.8	LOS A	1.9	13.8	0.51	0.59	0.51	46.8
West: Beachlands Road														
10	L2	145	1.4	165	1.4	0.369	4.8	LOS A	2.5	18.3	0.63	0.69	0.63	45.5
11	T1	3	0.0	3	0.0	0.369	4.6	LOS A	2.5	18.3	0.63	0.69	0.63	46.7
12	R2	176	8.0	200	8.0	0.369	9.8	LOS A	2.5	18.3	0.63	0.69	0.63	46.9
12b	R3	4	0.0	5	0.0	0.369	10.6	LOS B	2.5	18.3	0.63	0.69	0.63	47.6
Approach		328	4.9	373	4.9	0.369	7.5	LOS A	2.5	18.3	0.63	0.69	0.63	46.3
SouthWest: Kouka Road														
30b	L3	3	0.0	4	0.0	0.255	11.3	LOS B	1.9	13.5	0.96	0.91	0.96	42.7
30a	L1	64	0.0	81	0.0	0.255	10.6	LOS B	1.9	13.5	0.96	0.91	0.96	43.7
32a	R1	1	0.0	1	0.0	0.255	14.9	LOS B	1.9	13.5	0.96	0.91	0.96	43.9
32b	R3	29	0.0	37	0.0	0.255	16.8	LOS B	1.9	13.5	0.96	0.91	0.96	44.8
Approach		97	0.0	123	0.0	0.255	12.5	LOS B	1.9	13.5	0.96	0.91	0.96	44.0
All Vehicles		1598	1.7	1778	1.7	0.753	6.9	LOS A	10.0	70.1	0.72	0.68	0.76	46.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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 (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 2_N0D0pm [2_2020_Base_PM (Site Folder: 2020 Base PM N0 D0)]

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

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Jack Lachlan Drive														
5	T1	80	1.3	88	1.3	0.046	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
6	R2	37	2.7	41	2.7	0.028	6.3	LOS A	0.1	0.9	0.33	0.56	0.33	48.8
Approach		117	1.7	129	1.7	0.046	2.0	NA	0.1	0.9	0.10	0.18	0.10	55.9
North: Kahawairahi Drive														
7	L2	19	10.5	30	10.5	0.027	8.6	LOS A	0.1	0.8	0.29	0.87	0.29	47.5
9	R2	6	0.0	10	0.0	0.013	9.2	LOS A	0.0	0.3	0.43	0.85	0.43	46.9
Approach		25	8.0	40	8.0	0.027	8.8	LOS A	0.1	0.8	0.33	0.87	0.33	47.3
West: Jack Lachlan Drive														
10	L2	25	0.0	44	0.0	0.120	5.6	LOS A	0.0	0.0	0.00	0.11	0.00	57.3
11	T1	105	2.9	184	2.9	0.120	0.0	LOS A	0.0	0.0	0.00	0.11	0.00	58.9
Approach		130	2.3	228	2.3	0.120	1.1	NA	0.0	0.0	0.00	0.11	0.00	58.6
All Vehicles		272	2.6	396	2.7	0.120	2.2	NA	0.1	0.9	0.07	0.21	0.07	56.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 3_N0D0pm [3_2020_Base_PM (Site Folder: 2020 Base PM N0 D0)]

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

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Whitford-Maraetai Road														
1	L2	153	0.7	156	0.7	0.541	7.1	LOS A	0.0	0.0	0.00	0.10	0.00	72.4
2	T1	867	0.8	885	0.8	0.541	0.2	LOS A	0.0	0.0	0.00	0.10	0.00	77.9
Approach		1020	0.8	1041	0.8	0.541	1.2	NA	0.0	0.0	0.00	0.10	0.00	77.2
North: Whitford-Maraetai Road														
8	T1	292	6.8	384	6.8	0.208	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	79.9
9	R2	10	0.0	13	0.0	0.031	14.5	LOS B	0.1	0.7	0.77	0.91	0.77	55.4
Approach		302	6.6	397	6.6	0.208	0.5	NA	0.1	0.7	0.03	0.03	0.03	78.7
West: Jack Lachlan Drive														
10	L2	26	0.0	41	0.0	0.074	10.9	LOS B	0.3	1.8	0.68	0.86	0.68	57.0
12	R2	108	5.6	171	5.6	1.510	285.6	LOS F	24.1	176.9	1.00	2.20	5.97	10.2
Approach		134	4.5	213	4.5	1.510	232.3	LOS F	24.1	176.9	0.94	1.94	4.94	12.5
All Vehicles		1456	2.3	1651	2.7	1.510	30.8	NA	24.1	176.9	0.13	0.32	0.64	48.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 4_N0D0pm [4_2020_Base_PM (Site Folder: 2020 Base PM N0 D0)]

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

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Trig Road														
1	L2	15	0.0	25	0.0	0.025	6.5	LOS A	0.1	0.6	0.47	0.62	0.47	45.5
3	R2	7	0.0	11	0.0	0.189	65.0	LOS F	0.5	3.7	0.96	0.99	0.99	27.1
Approach		22	0.0	36	0.0	0.189	25.1	LOS D	0.5	3.7	0.63	0.74	0.64	37.5
East: Whitford-Maraetai Road														
4	L2	6	16.7	6	16.7	0.268	5.8	LOS A	0.0	0.0	0.00	0.20	0.00	56.4
5	T1	462	9.1	486	9.1	0.268	1.2	LOS A	0.0	0.0	0.00	0.20	0.00	59.3
Approach		468	9.2	493	9.2	0.268	1.3	NA	0.0	0.0	0.00	0.20	0.00	59.2
West: Whitford-Maraetai Road														
11	T1	1080	0.9	1113	0.9	0.580	0.3	LOS A	0.0	0.0	0.00	0.00	0.00	49.5
12	R2	29	3.4	30	3.4	0.029	6.6	LOS A	0.1	0.8	0.51	0.63	0.51	48.1
Approach		1109	1.0	1143	1.0	0.580	0.5	NA	0.1	0.8	0.01	0.02	0.01	49.5
All Vehicles		1599	3.4	1672	3.4	0.580	1.3	NA	0.5	3.7	0.02	0.09	0.02	51.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 5_N0D0pm [5_2020_Base_PM (Site Folder: 2020 Base PM N0 D0)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Whitford Park Road														
1	L2	228	1.8	253	1.8	0.914	15.5	LOS B	22.2	157.1	1.00	1.10	1.52	40.0
2	T1	8	0.0	9	0.0	0.914	15.4	LOS B	22.2	157.1	1.00	1.10	1.52	40.8
3	R2	631	1.4	701	1.4	0.914	20.0	LOS B	22.2	157.1	1.00	1.10	1.52	40.9
Approach		867	1.5	963	1.5	0.914	18.8	LOS B	22.2	157.1	1.00	1.10	1.52	40.7
East: Whitford Maraetai Road														
4	L2	270	13.0	287	13.0	0.530	4.7	LOS A	4.6	34.7	0.64	0.56	0.64	46.1
5	T1	258	7.0	274	7.0	0.530	4.5	LOS A	4.6	34.7	0.64	0.56	0.64	47.3
6	R2	1	0.0	1	0.0	0.530	8.9	LOS A	4.6	34.7	0.64	0.56	0.64	47.5
Approach		529	10.0	563	10.0	0.530	4.6	LOS A	4.6	34.7	0.64	0.56	0.64	46.7
North: Whitford Wharf Road														
7	L2	10	0.0	17	0.0	0.147	19.1	LOS B	1.0	7.3	0.99	0.93	0.99	39.4
8	T1	11	0.0	19	0.0	0.147	19.0	LOS B	1.0	7.3	0.99	0.93	0.99	40.2
9	R2	5	0.0	8	0.0	0.147	23.5	LOS C	1.0	7.3	0.99	0.93	0.99	40.3
Approach		26	0.0	44	0.0	0.147	19.9	LOS B	1.0	7.3	0.99	0.93	0.99	39.9
West: Whitford Road														
10	L2	5	0.0	5	0.0	1.373	186.8	LOS F	86.9	617.2	1.00	3.77	7.06	14.1
11	T1	503	0.6	553	0.6	1.373	186.8	LOS F	86.9	617.2	1.00	3.77	7.06	14.2
12	R2	220	4.1	242	4.1	1.373	191.4	LOS F	86.9	617.2	1.00	3.77	7.06	14.2
Approach		728	1.6	800	1.6	1.373	188.2	LOS F	86.9	617.2	1.00	3.77	7.06	14.2
All Vehicles		2150	3.6	2370	3.5	1.373	72.6	LOS F	86.9	617.2	0.91	1.87	3.17	25.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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 (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 6_N0D0pm [6_2020_Base_PM (Site Folder: 2020 Base PM N0 D0)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Whitford Park Road														
1	L2	53	22.6	63	22.6	0.391	4.6	LOS A	2.8	20.6	0.53	0.49	0.53	46.2
2	T1	320	2.8	381	2.8	0.391	4.2	LOS A	2.8	20.6	0.53	0.49	0.53	47.4
3	R2	1	0.0	1	0.0	0.391	8.6	LOS A	2.8	20.6	0.53	0.49	0.53	47.6
Approach		374	5.6	445	5.6	0.391	4.2	LOS A	2.8	20.6	0.53	0.49	0.53	47.2
East: Saleyard Road														
4	L2	1	0.0	1	0.0	0.004	6.9	LOS A	0.0	0.2	0.72	0.56	0.72	44.9
5	T1	1	0.0	1	0.0	0.004	6.8	LOS A	0.0	0.2	0.72	0.56	0.72	45.9
6	R2	1	0.0	1	0.0	0.004	11.3	LOS B	0.0	0.2	0.72	0.56	0.72	46.1
Approach		3	0.0	3	0.0	0.004	8.3	LOS A	0.0	0.2	0.72	0.56	0.72	45.6
North: Whitford Park Road														
7	L2	1	0.0	1	0.0	0.477	4.2	LOS A	4.0	30.2	0.60	0.57	0.60	45.5
8	T1	303	9.6	326	9.6	0.477	4.4	LOS A	4.0	30.2	0.60	0.57	0.60	46.5
9	R2	190	9.5	204	9.5	0.477	8.9	LOS A	4.0	30.2	0.60	0.57	0.60	46.6
Approach		494	9.5	531	9.5	0.477	6.1	LOS A	4.0	30.2	0.60	0.57	0.60	46.5
West: Sandstone Road														
10	L2	551	1.3	605	1.3	0.801	11.1	LOS B	12.6	88.9	0.96	1.03	1.30	42.9
11	T1	2	0.0	2	0.0	0.801	11.0	LOS B	12.6	88.9	0.96	1.03	1.30	43.8
12	R2	186	1.1	204	1.1	0.801	15.5	LOS B	12.6	88.9	0.96	1.03	1.30	44.0
Approach		739	1.2	812	1.2	0.801	12.2	LOS B	12.6	88.9	0.96	1.03	1.30	43.2
All Vehicles		1610	4.8	1792	4.8	0.801	8.4	LOS A	12.6	88.9	0.75	0.76	0.90	45.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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 (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 7_N0D0pm [7_2020_Base_PM (Site Folder: 2020 Base PM N0 D0)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Point View Drive														
1	L2	42	2.4	52	2.4	0.319	8.7	LOS A	2.1	14.8	0.79	0.82	0.79	44.2
2	T1	122	0.0	151	0.0	0.319	8.4	LOS A	2.1	14.8	0.79	0.82	0.79	45.2
3	R2	14	0.0	17	0.0	0.319	12.0	LOS B	2.1	14.8	0.79	0.82	0.79	45.0
Approach		178	0.6	220	0.6	0.319	8.7	LOS A	2.1	14.8	0.79	0.82	0.79	45.0
East: Whitford Road														
4	L2	6	0.0	6	0.0	0.505	4.7	LOS A	4.2	30.8	0.60	0.60	0.60	45.4
5	T1	408	6.1	439	6.1	0.505	5.0	LOS A	4.2	30.8	0.60	0.60	0.60	46.1
6	R2	113	1.8	122	1.8	0.505	8.6	LOS A	4.2	30.8	0.60	0.60	0.60	46.1
Approach		527	5.1	567	5.1	0.505	5.8	LOS A	4.2	30.8	0.60	0.60	0.60	46.1
North: Somerville														
7	L2	137	0.0	169	0.0	0.591	13.4	LOS B	5.7	40.2	0.99	1.10	1.24	41.3
8	T1	34	0.0	42	0.0	0.591	13.2	LOS B	5.7	40.2	0.99	1.10	1.24	42.2
9	R2	97	1.0	120	1.0	0.591	16.9	LOS B	5.7	40.2	0.99	1.10	1.24	42.0
Approach		268	0.4	331	0.4	0.591	14.6	LOS B	5.7	40.2	0.99	1.10	1.24	41.7
West: Whitford Road														
10	L2	202	0.0	210	0.0	0.856	11.6	LOS B	16.4	116.5	1.00	0.99	1.32	42.8
11	T1	653	2.5	680	2.5	0.856	12.0	LOS B	16.4	116.5	1.00	0.99	1.32	43.4
12	R2	44	2.3	46	2.3	0.856	15.6	LOS B	16.4	116.5	1.00	0.99	1.32	43.4
Approach		899	1.9	936	1.9	0.856	12.1	LOS B	16.4	116.5	1.00	0.99	1.32	43.3
All Vehicles		1872	2.5	2054	2.4	0.856	10.4	LOS B	16.4	116.5	0.87	0.88	1.05	43.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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 (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 1_N0D1aam [1_2024_Base_AM (Site Folder: 2024 Base AM N0 D1a)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Whitford-Maraetai Road														
1b	L3	10	0	13	0.0	0.248	3.2	LOS A	1.7	13.9	0.33	0.39	0.33	47.1
1	L2	160	19	203	11.9	0.248	3.1	LOS A	1.7	13.9	0.33	0.39	0.33	47.5
2	T1	66	10	84	15.2	0.248	2.9	LOS A	1.7	13.9	0.33	0.39	0.33	48.8
3	R2	12	11	15	91.7	0.248	9.0	LOS A	1.7	13.9	0.33	0.39	0.33	48.1
Approach		248	40	314	16.1	0.248	3.3	LOS A	1.7	13.9	0.33	0.39	0.33	47.8
East: Access														
4	L2	1	0	1	0.0	0.019	26.0	LOS C	0.1	1.0	1.00	0.76	1.00	36.8
4a	L1	1	0	1	0.0	0.019	25.6	LOS C	0.1	1.0	1.00	0.76	1.00	37.3
5	T1	1	0	1	0.0	0.019	25.8	LOS C	0.1	1.0	1.00	0.76	1.00	37.6
6	R2	1	0	1	0.0	0.019	30.9	LOS C	0.1	1.0	1.00	0.76	1.00	37.8
Approach		4	0	4	0.0	0.019	27.1	LOS C	0.1	1.0	1.00	0.76	1.00	37.4
North: Whitford-Maraetai Road														
7	L2	1	0	1	0.0	1.066	89.2	LOS F	29.2	208.4	1.00	2.10	3.50	22.7
8	T1	338	5	348	1.5	1.066	89.1	LOS F	29.2	208.4	1.00	2.10	3.50	23.0
9a	R1	14	0	14	0.0	1.066	93.0	LOS F	29.2	208.4	1.00	2.10	3.50	22.9
9	R2	73	4	75	5.5	1.066	94.4	LOS F	29.2	208.4	1.00	2.10	3.50	23.0
Approach		426	9	439	2.1	1.066	90.1	LOS F	29.2	208.4	1.00	2.10	3.50	23.0
West: Beachlands Road														
10	L2	88	3	101	3.4	0.842	8.6	LOS A	15.0	107.7	0.92	0.83	1.11	42.9
11	T1	2	1	2	50.0	0.842	10.0	LOS A	15.0	107.7	0.92	0.83	1.11	43.8
12	R2	810	21	931	2.6	0.842	13.4	LOS B	15.0	107.7	0.92	0.83	1.11	44.2
12b	R3	1	0	1	0.0	0.842	14.3	LOS B	15.0	107.7	0.92	0.83	1.11	44.7
Approach		901	25	1036	2.8	0.842	12.9	LOS B	15.0	107.7	0.92	0.83	1.11	44.1
SouthWest: Kouka Road														
30b	L3	2	0	3	0.0	0.127	4.7	LOS A	0.7	5.0	0.53	0.67	0.53	44.3
30a	L1	14	1	20	7.1	0.127	4.2	LOS A	0.7	5.0	0.53	0.67	0.53	45.3
32a	R1	1	0	1	0.0	0.127	8.3	LOS A	0.7	5.0	0.53	0.67	0.53	45.6
32b	R3	76	1	107	1.3	0.127	10.3	LOS B	0.7	5.0	0.53	0.67	0.53	46.6
Approach		93	2	131	2.2	0.127	9.2	LOS A	0.7	5.0	0.53	0.67	0.53	46.3
All Vehicles		1672	76	1924	4.8	1.066	28.8	LOS C	29.2	208.4	0.81	1.04	1.49	36.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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 (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 2_N0D1aam [2_2024_Base_AM (Site Folder: 2024 Base AM N0 D1a)]

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

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Jack Lachlan Drive														
5	T1	107	0.9	127	0.9	0.066	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
6	R2	13	23.1	15	23.1	0.011	6.1	LOS A	0.0	0.4	0.22	0.53	0.22	48.8
Approach		120	3.3	143	3.3	0.066	0.7	NA	0.0	0.4	0.02	0.06	0.02	58.5
North: Kahawairahi Drive														
7	L2	24	4.2	34	4.2	0.026	8.0	LOS A	0.1	0.8	0.21	0.88	0.21	47.8
9	R2	18	0.0	25	0.0	0.032	8.6	LOS A	0.1	0.8	0.38	0.86	0.38	47.2
Approach		42	2.4	59	2.4	0.032	8.2	LOS A	0.1	0.8	0.28	0.87	0.28	47.6
West: Jack Lachlan Drive														
10	L2	4	0.0	5	0.0	0.056	5.6	LOS A	0.0	0.0	0.00	0.03	0.00	58.1
11	T1	83	1.2	102	1.2	0.056	0.0	LOS A	0.0	0.0	0.00	0.03	0.00	59.7
Approach		87	1.1	107	1.1	0.056	0.3	NA	0.0	0.0	0.00	0.03	0.00	59.6
All Vehicles		249	2.4	309	2.4	0.066	2.0	NA	0.1	0.8	0.06	0.20	0.06	56.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 3_N0D1aam [3_2024_Base_AM (Site Folder: 2024 Base AM N0 D1a)]

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

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Whitford-Maraetai Road														
1	L2	91	3	114	3.3	0.232	7.0	LOS A	0.0	0.0	0.00	0.18	0.00	70.1
2	T1	238	40	298	16.8	0.232	0.0	LOS A	0.0	0.0	0.00	0.18	0.00	76.8
Approach		329	43	411	13.1	0.232	2.0	NA	0.0	0.0	0.00	0.18	0.00	75.1
North: Whitford-Maraetai Road														
8	T1	1216	38	1414	3.1	0.747	0.6	LOS A	0.0	0.0	0.00	0.00	0.00	78.6
9	R2	43	0	50	0.0	0.043	8.4	LOS A	0.2	1.3	0.47	0.67	0.47	60.0
Approach		1259	38	1464	3.0	0.747	0.8	NA	0.2	1.3	0.02	0.02	0.02	77.7
West: Jack Lachlan Drive														
10	L2	7	0	9	0.0	0.007	6.5	LOS A	0.0	0.2	0.36	0.56	0.36	60.1
12	R2	122	2	149	1.6	6.335	2473.4	LOS F	55.5	393.7	1.00	1.63	3.94	1.4
Approach		129	2	157	1.6	6.335	2339.6	LOS F	55.5	393.7	0.97	1.57	3.74	1.5
All Vehicles		1717	83	2033	4.9	6.335	182.1	NA	55.5	393.7	0.09	0.17	0.30	17.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 4_N0D1aam [4_2024_Base_AM (Site Folder: 2024 Base AM N0 D1a)]

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

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Trig Road														
1	L2	30	6.7	32	6.7	0.199	28.4	LOS D	0.6	4.3	0.93	0.98	0.97	38.0
3	R2	2	0.0	2	0.0	0.059	95.7	LOS F	0.2	1.1	0.98	0.99	0.98	22.9
Approach		32	6.3	34	6.3	0.199	32.7	LOS D	0.6	4.3	0.93	0.98	0.97	36.5
East: Whitford-Maraetai Road														
4	L2	1	0.0	1	0.0	0.734	6.0	LOS A	0.0	0.0	0.00	0.18	0.00	56.5
5	T1	1287	3.4	1399	3.4	0.734	1.6	LOS A	0.0	0.0	0.00	0.18	0.00	58.5
Approach		1288	3.4	1400	3.4	0.734	1.6	NA	0.0	0.0	0.00	0.18	0.00	58.5
West: Whitford-Maraetai Road														
11	T1	383	17.2	479	17.2	0.275	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
12	R2	20	20.0	25	20.0	0.195	34.2	LOS D	0.6	4.8	0.94	0.98	0.98	35.0
Approach		403	17.4	504	17.4	0.275	1.8	NA	0.6	4.8	0.05	0.05	0.05	48.8
All Vehicles		1723	6.7	1937	7.1	0.734	2.2	NA	0.6	4.8	0.03	0.16	0.03	55.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 5_N0D1aam [5_2024_Base_AM (Site Folder: 2024 Base AM N0 D1a)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Whitford Park Road														
1	L2	338	6.8	376	6.8	0.918	25.0	LOS C	18.8	143.0	1.00	1.47	2.00	36.7
2	T1	1	0.0	1	0.0	0.918	24.6	LOS C	18.8	143.0	1.00	1.47	2.00	37.4
3	R2	245	15.1	272	15.1	0.918	29.9	LOS C	18.8	143.0	1.00	1.47	2.00	37.4
Approach		584	10.3	649	10.3	0.918	27.0	LOS C	18.8	143.0	1.00	1.47	2.00	37.0
East: Whitford Maraetai Road														
4	L2	742	3.8	789	3.8	1.209	104.8	LOS F	108.4	779.2	1.00	2.87	4.21	20.6
5	T1	583	2.2	620	2.2	1.209	104.7	LOS F	108.4	779.2	1.00	2.87	4.21	20.8
6	R2	1	0.0	1	0.0	1.209	109.1	LOS F	108.4	779.2	1.00	2.87	4.21	20.8
Approach		1326	3.1	1411	3.1	1.209	104.7	LOS F	108.4	779.2	1.00	2.87	4.21	20.6
North: Whitford Wharf Road														
7	L2	1	0.0	1	0.0	0.009	7.1	LOS A	0.1	0.4	0.71	0.61	0.71	44.5
8	T1	2	0.0	2	0.0	0.009	7.1	LOS A	0.1	0.4	0.71	0.61	0.71	45.4
9	R2	3	0.0	3	0.0	0.009	11.6	LOS B	0.1	0.4	0.71	0.61	0.71	45.6
Approach		6	0.0	6	0.0	0.009	9.3	LOS A	0.1	0.4	0.71	0.61	0.71	45.4
West: Whitford Road														
10	L2	6	0.0	7	0.0	0.471	5.0	LOS A	3.7	28.1	0.69	0.67	0.69	45.0
11	T1	198	15.7	222	15.7	0.471	5.3	LOS A	3.7	28.1	0.69	0.67	0.69	46.0
12	R2	183	5.5	206	5.5	0.471	9.6	LOS A	3.7	28.1	0.69	0.67	0.69	46.2
Approach		387	10.6	435	10.6	0.471	7.3	LOS A	3.7	28.1	0.69	0.67	0.69	46.0
All Vehicles		2303	6.2	2501	6.3	1.209	67.4	LOS E	108.4	779.2	0.95	2.12	3.01	26.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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 (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 6_N0D1aam [6_2024_Base_AM (Site Folder: 2024 Base AM N0 D1a)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Whitford Park Road														
1	L2	238	5.9	280	5.9	1.027	52.5	LOS E	33.9	251.6	1.00	2.17	3.47	29.2
2	T1	402	7.5	473	7.5	1.027	52.6	LOS E	33.9	251.6	1.00	2.17	3.47	29.6
3	R2	1	0.0	1	0.0	1.027	56.6	LOS E	33.9	251.6	1.00	2.17	3.47	29.7
Approach		641	6.9	754	6.9	1.027	52.6	LOS E	33.9	251.6	1.00	2.17	3.47	29.4
East: Saleyard Road														
4	L2	1	0.0	1	0.0	0.011	10.0	LOS B	0.1	0.5	0.83	0.67	0.83	42.6
5	T1	1	0.0	1	0.0	0.011	10.0	LOS A	0.1	0.5	0.83	0.67	0.83	43.5
6	R2	4	0.0	4	0.0	0.011	14.5	LOS B	0.1	0.5	0.83	0.67	0.83	43.7
Approach		6	0.0	6	0.0	0.011	13.0	LOS B	0.1	0.5	0.83	0.67	0.83	43.5
North: Whitford Park Road														
7	L2	2	0.0	2	0.0	0.635	3.3	LOS A	7.7	55.6	0.39	0.51	0.39	45.4
8	T1	257	5.8	262	5.8	0.635	3.3	LOS A	7.7	55.6	0.39	0.51	0.39	46.3
9	R2	667	3.7	681	3.7	0.635	7.8	LOS A	7.7	55.6	0.39	0.51	0.39	46.5
Approach		926	4.3	945	4.3	0.635	6.5	LOS A	7.7	55.6	0.39	0.51	0.39	46.4
West: Sandstone Road														
10	L2	192	16.1	206	16.1	0.337	6.2	LOS A	2.3	18.8	0.75	0.76	0.75	45.6
11	T1	1	0.0	1	0.0	0.337	5.7	LOS A	2.3	18.8	0.75	0.76	0.75	46.8
12	R2	41	36.6	44	36.6	0.337	11.4	LOS B	2.3	18.8	0.75	0.76	0.75	46.5
Approach		234	19.7	252	19.7	0.337	7.1	LOS A	2.3	18.8	0.75	0.76	0.75	45.8
All Vehicles		1807	7.2	1957	7.3	1.027	24.4	LOS C	33.9	251.6	0.67	1.18	1.63	38.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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 (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 7_N0D1aam [7_2024_Base_AM (Site Folder: 2024 Base AM N0 D1a)]

New Site
Site Category: (None)
Roundabout Metering

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Point View Drive														
1	L2	27	0.0	47	0.0	0.255	8.0	LOS A	1.0	7.1	0.79	0.89	0.79	44.5
2	T1	25	0.0	44	0.0	0.255	7.8	LOS A	1.0	7.1	0.79	0.89	0.79	45.4
3	R2	7	0.0	12	0.0	0.255	11.4	LOS B	1.0	7.1	0.79	0.89	0.79	45.3
Approach		59	0.0	104	0.0	0.255	8.3	LOS A	1.0	7.1	0.79	0.89	0.79	45.0
East: Whitford Road														
4	L2	2	0.0	2	0.0	0.890	10.6	LOS B	13.4	96.7	0.99	1.13	1.44	43.2
5	T1	764	3.3	830	3.3	0.890	10.8	LOS B	13.4	96.7	0.99	1.13	1.44	43.9
6	R2	94	3.2	102	3.2	0.890	14.5	LOS B	13.4	96.7	0.99	1.13	1.44	43.8
Approach		860	3.3	935	3.3	0.890	11.2	LOS B	13.4	96.7	0.99	1.13	1.44	43.9
North: Somerville														
7	L2	89	2.2	106	2.2	1.010	74.9	LOS F	41.0	288.9	0.99	2.40	4.00	24.4
8	T1	91	1.1	108	1.1	1.010	74.7	LOS F	41.0	288.9	0.99	2.40	4.00	24.7
9	R2	246	0.0	293	0.0	1.010	78.3	LOS F	41.0	288.9	0.99	2.40	4.00	24.6
Approach		426	0.7	507	0.7	1.010	76.8	LOS F	41.0	288.9	0.99	2.40	4.00	24.6
West: Whitford Road														
10	L2	95	2.1	117	2.1	0.421	3.4	LOS A	1.4	10.4	0.32	0.44	0.32	46.5
11	T1	300	12.7	370	12.7	0.421	3.7	LOS A	1.4	10.4	0.32	0.44	0.32	47.2
12	R2	15	0.0	19	0.0	0.421	7.3	LOS A	1.4	10.4	0.32	0.44	0.32	47.3
Approach		410	9.8	506	9.8	0.421	3.8	LOS A	1.4	10.4	0.32	0.44	0.32	47.1
All Vehicles		1755	4.0	2052	4.1	1.010	25.5	LOS C	41.0	288.9	0.81	1.26	1.76	37.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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 (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 1_N0D1apm [1_2024_Base_PM (Site Folder: 2024 Base PM N0 D1a)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Whitford-Maraetai Road														
1b	L3	58	0	60	0.0	0.790	7.1	LOS A	11.9	83.5	0.86	0.75	0.97	45.4
1	L2	627	6	653	1.0	0.790	6.9	LOS A	11.9	83.5	0.86	0.75	0.97	45.8
2	T1	245	0	255	0.0	0.790	6.7	LOS A	11.9	83.5	0.86	0.75	0.97	47.0
3	R2	1	0	1	0.0	0.790	11.7	LOS B	11.9	83.5	0.86	0.75	0.97	47.3
Approach		931	6	970	0.6	0.790	6.8	LOS A	11.9	83.5	0.86	0.75	0.97	46.1
East: Access														
4	L2	1	0	1	0.0	0.012	5.4	LOS A	0.1	0.5	0.62	0.56	0.62	45.6
4a	L1	2	0	2	0.0	0.012	5.0	LOS A	0.1	0.5	0.62	0.56	0.62	46.3
5	T1	3	0	3	0.0	0.012	5.2	LOS A	0.1	0.5	0.62	0.56	0.62	46.7
6	R2	4	0	4	0.0	0.012	10.2	LOS B	0.1	0.5	0.62	0.56	0.62	47.1
Approach		10	0	11	0.0	0.012	7.2	LOS A	0.1	0.5	0.62	0.56	0.62	46.7
North: Whitford-Maraetai Road														
7	L2	1	0	1	0.0	0.312	4.0	LOS A	2.1	14.6	0.53	0.60	0.53	45.5
8	T1	99	4	125	4.0	0.312	3.9	LOS A	2.1	14.6	0.53	0.60	0.53	46.6
9a	R1	51	0	65	0.0	0.312	7.9	LOS A	2.1	14.6	0.53	0.60	0.53	46.5
9	R2	127	1	161	0.8	0.312	8.9	LOS A	2.1	14.6	0.53	0.60	0.53	47.0
Approach		278	5	352	1.8	0.312	6.9	LOS A	2.1	14.6	0.53	0.60	0.53	46.7
West: Beachlands Road														
10	L2	151	2	172	1.3	0.391	4.9	LOS A	2.7	19.9	0.66	0.70	0.66	45.5
11	T1	3	0	3	0.0	0.391	4.7	LOS A	2.7	19.9	0.66	0.70	0.66	46.6
12	R2	184	15	209	8.2	0.391	9.9	LOS A	2.7	19.9	0.66	0.70	0.66	46.9
12b	R3	4	0	5	0.0	0.391	10.7	LOS B	2.7	19.9	0.66	0.70	0.66	47.5
Approach		342	17	389	5.0	0.391	7.7	LOS A	2.7	19.9	0.66	0.70	0.66	46.2
SouthWest: Kouka Road														
30b	L3	3	0	4	0.0	0.291	12.2	LOS B	2.2	15.7	0.99	0.95	0.99	42.2
30a	L1	67	0	85	0.0	0.291	11.5	LOS B	2.2	15.7	0.99	0.95	0.99	43.2
32a	R1	1	0	1	0.0	0.291	15.8	LOS B	2.2	15.7	0.99	0.95	0.99	43.5
32b	R3	30	0	38	0.0	0.291	17.7	LOS B	2.2	15.7	0.99	0.95	0.99	44.4
Approach		101	0	128	0.0	0.291	13.4	LOS B	2.2	15.7	0.99	0.95	0.99	43.5
All Vehicles		1662	28	1849	1.7	0.790	7.5	LOS A	11.9	83.5	0.76	0.72	0.82	46.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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 (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 2_N0D1apm [2_2024_Base_PM (Site Folder: 2024 Base PM N0 D1a)]

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

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Jack Lachlan Drive														
5	T1	83	1.2	91	1.2	0.047	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
6	R2	39	2.6	43	2.6	0.030	6.3	LOS A	0.1	0.9	0.33	0.57	0.33	48.8
Approach		122	1.6	134	1.6	0.047	2.0	NA	0.1	0.9	0.11	0.18	0.11	55.9
North: Kahawairahi Drive														
7	L2	20	10.0	32	10.0	0.028	8.6	LOS A	0.1	0.8	0.30	0.87	0.30	47.5
9	R2	6	0.0	10	0.0	0.014	9.4	LOS A	0.0	0.3	0.44	0.85	0.44	46.8
Approach		26	7.7	41	7.7	0.028	8.8	LOS A	0.1	0.8	0.33	0.87	0.33	47.3
West: Jack Lachlan Drive														
10	L2	26	0.0	46	0.0	0.123	5.6	LOS A	0.0	0.0	0.00	0.12	0.00	57.3
11	T1	108	2.8	189	2.8	0.123	0.0	LOS A	0.0	0.0	0.00	0.12	0.00	58.9
Approach		134	2.2	235	2.2	0.123	1.1	NA	0.0	0.0	0.00	0.12	0.00	58.6
All Vehicles		282	2.5	410	2.6	0.123	2.2	NA	0.1	0.9	0.07	0.21	0.07	56.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 3_N0D1apm [3_2024_Base_PM (Site Folder: 2024 Base PM N0 D1a)]

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

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Whitford-Maraetai Road														
1	L2	160	0.6	163	0.6	0.564	7.1	LOS A	0.0	0.0	0.00	0.10	0.00	72.4
2	T1	905	0.8	923	0.8	0.564	0.2	LOS A	0.0	0.0	0.00	0.10	0.00	77.9
Approach		1065	0.8	1087	0.8	0.564	1.2	NA	0.0	0.0	0.00	0.10	0.00	77.1
North: Whitford-Maraetai Road														
8	T1	305	6.9	401	6.9	0.217	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	79.9
9	R2	10	0.0	13	0.0	0.034	15.5	LOS C	0.1	0.8	0.79	0.92	0.79	54.7
Approach		315	6.7	414	6.7	0.217	0.5	NA	0.1	0.8	0.03	0.03	0.03	78.7
West: Jack Lachlan Drive														
10	L2	27	0.0	43	0.0	0.083	11.4	LOS B	0.3	1.9	0.70	0.87	0.70	56.6
12	R2	112	5.4	178	5.4	1.828	423.9	LOS F	31.7	231.9	1.00	2.33	6.60	7.3
Approach		139	4.3	221	4.3	1.828	343.8	LOS F	31.7	231.9	0.94	2.05	5.46	9.0
All Vehicles		1519	2.3	1722	2.6	1.828	45.0	NA	31.7	231.9	0.13	0.33	0.71	41.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 4_N0D1apm [4_2024_Base_PM (Site Folder: 2024 Base PM N0 D1a)]

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

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Trig Road														
1	L2	16	0	26	0.0	0.026	7.4	LOS A	0.1	0.7	0.47	0.65	0.47	48.7
3	R2	7	0	11	0.0	0.146	49.9	LOS E	0.4	2.9	0.95	0.98	0.95	32.2
Approach		23	0	38	0.0	0.146	20.4	LOS C	0.4	2.9	0.62	0.75	0.62	42.1
East: Whitford-Maraetai Road														
4	L2	6	1	6	16.7	0.279	5.8	LOS A	0.0	0.0	0.00	0.20	0.00	56.4
5	T1	482	44	507	9.1	0.279	1.2	LOS A	0.0	0.0	0.00	0.20	0.00	59.3
Approach		488	45	514	9.2	0.279	1.3	NA	0.0	0.0	0.00	0.20	0.00	59.2
West: Whitford-Maraetai Road														
11	T1	1127	10	1162	0.9	0.605	0.4	LOS A	0.0	0.0	0.00	0.00	0.00	49.5
12	R2	30	1	31	3.3	0.029	6.6	LOS A	0.1	0.9	0.51	0.64	0.51	48.2
Approach		1157	11	1193	1.0	0.605	0.5	NA	0.1	0.9	0.01	0.02	0.01	49.5
All Vehicles		1668	56	1744	3.4	0.605	1.2	NA	0.4	2.9	0.02	0.09	0.02	51.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 5_N0D1apm [5_2024_Base_PM (Site Folder: 2024 Base PM N0 D1a)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Whitford Park Road														
1	L2	238	1.7	264	1.7	0.963	22.3	LOS C	29.6	209.7	1.00	1.29	1.85	37.3
2	T1	8	0.0	9	0.0	0.963	22.1	LOS C	29.6	209.7	1.00	1.29	1.85	38.0
3	R2	658	1.4	731	1.4	0.963	26.7	LOS C	29.6	209.7	1.00	1.29	1.85	38.1
Approach		904	1.4	1004	1.4	0.963	25.5	LOS C	29.6	209.7	1.00	1.29	1.85	37.9
East: Whitford Maraetai Road														
4	L2	282	13.1	300	13.1	0.546	4.7	LOS A	4.8	36.7	0.64	0.55	0.64	46.1
5	T1	269	7.1	286	7.1	0.546	4.5	LOS A	4.8	36.7	0.64	0.55	0.64	47.2
6	R2	1	0.0	1	0.0	0.546	8.9	LOS A	4.8	36.7	0.64	0.55	0.64	47.5
Approach		552	10.1	587	10.1	0.546	4.6	LOS A	4.8	36.7	0.64	0.55	0.64	46.7
North: Whitford Wharf Road														
7	L2	10	0.0	17	0.0	0.151	19.3	LOS B	1.1	7.5	0.99	0.93	0.99	39.3
8	T1	11	0.0	19	0.0	0.151	19.2	LOS B	1.1	7.5	0.99	0.93	0.99	40.1
9	R2	5	0.0	8	0.0	0.151	23.7	LOS C	1.1	7.5	0.99	0.93	0.99	40.2
Approach		26	0.0	44	0.0	0.151	20.1	LOS C	1.1	7.5	0.99	0.93	0.99	39.8
West: Whitford Road														
10	L2	5	0.0	5	0.0	1.495	240.3	LOS F	105.5	748.4	1.00	4.19	8.03	11.7
11	T1	525	0.6	577	0.6	1.495	240.3	LOS F	105.5	748.4	1.00	4.19	8.03	11.8
12	R2	229	3.9	252	3.9	1.495	245.0	LOS F	105.5	748.4	1.00	4.19	8.03	11.8
Approach		759	1.6	834	1.6	1.495	241.7	LOS F	105.5	748.4	1.00	4.19	8.03	11.8
All Vehicles		2241	3.6	2470	3.5	1.495	93.4	LOS F	105.5	748.4	0.91	2.09	3.63	22.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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 (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 6_N0D1apm [6_2024_Base_PM (Site Folder: 2024 Base PM N0 D1a)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Whitford Park Road														
1	L2	56	23.2	67	23.2	0.413	4.7	LOS A	3.0	22.3	0.55	0.50	0.55	46.1
2	T1	334	2.7	398	2.7	0.413	4.3	LOS A	3.0	22.3	0.55	0.50	0.55	47.3
3	R2	1	0.0	1	0.0	0.413	8.7	LOS A	3.0	22.3	0.55	0.50	0.55	47.5
Approach		391	5.6	465	5.6	0.413	4.3	LOS A	3.0	22.3	0.55	0.50	0.55	47.2
East: Saleyard Road														
4	L2	1	0.0	1	0.0	0.005	7.2	LOS A	0.0	0.2	0.74	0.57	0.74	44.8
5	T1	1	0.0	1	0.0	0.005	7.1	LOS A	0.0	0.2	0.74	0.57	0.74	45.8
6	R2	1	0.0	1	0.0	0.005	11.6	LOS B	0.0	0.2	0.74	0.57	0.74	46.0
Approach		3	0.0	3	0.0	0.005	8.7	LOS A	0.0	0.2	0.74	0.57	0.74	45.5
North: Whitford Park Road														
7	L2	1	0.0	1	0.0	0.504	4.3	LOS A	4.4	32.9	0.64	0.58	0.64	45.4
8	T1	316	9.5	340	9.5	0.504	4.5	LOS A	4.4	32.9	0.64	0.58	0.64	46.4
9	R2	199	9.5	214	9.5	0.504	9.0	LOS A	4.4	32.9	0.64	0.58	0.64	46.5
Approach		516	9.5	555	9.5	0.504	6.2	LOS A	4.4	32.9	0.64	0.58	0.64	46.4
West: Sandstone Road														
10	L2	575	1.2	632	1.2	0.850	13.6	LOS B	15.6	110.1	1.00	1.13	1.48	41.7
11	T1	2	0.0	2	0.0	0.850	13.5	LOS B	15.6	110.1	1.00	1.13	1.48	42.6
12	R2	194	1.0	213	1.0	0.850	18.0	LOS B	15.6	110.1	1.00	1.13	1.48	42.7
Approach		771	1.2	847	1.2	0.850	14.7	LOS B	15.6	110.1	1.00	1.13	1.48	41.9
All Vehicles		1681	4.8	1871	4.7	0.850	9.6	LOS A	15.6	110.1	0.78	0.81	1.00	44.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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 (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 7_N0D1apm [7_2024_Base_PM (Site Folder: 2024 Base PM N0 D1a)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Point View Drive														
1	L2	44	2.3	54	2.3	0.344	9.0	LOS A	2.3	16.3	0.82	0.85	0.82	44.0
2	T1	127	0.0	157	0.0	0.344	8.8	LOS A	2.3	16.3	0.82	0.85	0.82	45.0
3	R2	15	0.0	19	0.0	0.344	12.4	LOS B	2.3	16.3	0.82	0.85	0.82	44.8
Approach		186	0.5	230	0.5	0.344	9.1	LOS A	2.3	16.3	0.82	0.85	0.82	44.7
East: Whitford Road														
4	L2	6	0.0	6	0.0	0.530	4.8	LOS A	4.6	33.3	0.63	0.61	0.63	45.3
5	T1	426	6.1	458	6.1	0.530	5.2	LOS A	4.6	33.3	0.63	0.61	0.63	46.0
6	R2	118	1.7	127	1.7	0.530	8.7	LOS A	4.6	33.3	0.63	0.61	0.63	46.0
Approach		550	5.1	591	5.1	0.530	5.9	LOS A	4.6	33.3	0.63	0.61	0.63	46.0
North: Somerville														
7	L2	143	0.0	177	0.0	0.651	15.9	LOS B	6.8	47.5	1.00	1.15	1.34	40.2
8	T1	35	0.0	43	0.0	0.651	15.8	LOS B	6.8	47.5	1.00	1.15	1.34	41.0
9	R2	101	1.0	125	1.0	0.651	19.4	LOS B	6.8	47.5	1.00	1.15	1.34	40.8
Approach		279	0.4	344	0.4	0.651	17.2	LOS B	6.8	47.5	1.00	1.15	1.34	40.5
West: Whitford Road														
10	L2	211	0.0	220	0.0	0.904	15.0	LOS B	21.1	150.0	1.00	1.11	1.50	41.2
11	T1	682	2.5	710	2.5	0.904	15.4	LOS B	21.1	150.0	1.00	1.11	1.50	41.8
12	R2	46	2.2	48	2.2	0.904	19.0	LOS B	21.1	150.0	1.00	1.11	1.50	41.7
Approach		939	1.9	978	1.9	0.904	15.5	LOS B	21.1	150.0	1.00	1.11	1.50	41.6
All Vehicles		1954	2.5	2144	2.4	0.904	12.4	LOS B	21.1	150.0	0.88	0.95	1.16	42.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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 (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 1_N1D2aam [1_2024_BuildOut_AM (Site Folder: 2024 Buildout AM N1 D2a)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Whitford-Maraetai Road														
1b	L3	11	0	14	0.0	0.252	3.2	LOS A	1.8	14.2	0.33	0.39	0.33	47.1
1	L2	163	19	206	11.7	0.252	3.1	LOS A	1.8	14.2	0.33	0.39	0.33	47.5
2	T1	67	10	85	14.9	0.252	2.9	LOS A	1.8	14.2	0.33	0.39	0.33	48.8
3	R2	12	11	15	91.7	0.252	9.0	LOS A	1.8	14.2	0.33	0.39	0.33	48.1
Approach		253	40	320	15.8	0.252	3.3	LOS A	1.8	14.2	0.33	0.39	0.33	47.8
East: Access														
4	L2	1	0	1	0.0	0.019	26.0	LOS C	0.1	1.0	1.00	0.76	1.00	36.8
4a	L1	1	0	1	0.0	0.019	25.6	LOS C	0.1	1.0	1.00	0.76	1.00	37.3
5	T1	1	0	1	0.0	0.019	25.8	LOS C	0.1	1.0	1.00	0.76	1.00	37.6
6	R2	1	0	1	0.0	0.019	30.8	LOS C	0.1	1.0	1.00	0.76	1.00	37.8
Approach		4	0	4	0.0	0.019	27.0	LOS C	0.1	1.0	1.00	0.76	1.00	37.4
North: Whitford-Maraetai Road														
7	L2	1	0	1	0.0	1.075	91.9	LOS F	30.1	214.8	1.00	2.13	3.57	22.3
8	T1	341	5	352	1.5	1.075	91.8	LOS F	30.1	214.8	1.00	2.13	3.57	22.6
9a	R1	14	0	14	0.0	1.075	95.7	LOS F	30.1	214.8	1.00	2.13	3.57	22.5
9	R2	73	4	75	5.5	1.075	97.1	LOS F	30.1	214.8	1.00	2.13	3.57	22.6
Approach		429	9	442	2.1	1.075	92.8	LOS F	30.1	214.8	1.00	2.13	3.57	22.6
West: Beachlands Road														
10	L2	88	3	101	3.4	0.843	8.6	LOS A	15.1	108.3	0.92	0.84	1.11	42.9
11	T1	2	1	2	50.0	0.843	10.0	LOS B	15.1	108.3	0.92	0.84	1.11	43.7
12	R2	810	21	931	2.6	0.843	13.5	LOS B	15.1	108.3	0.92	0.84	1.11	44.2
12b	R3	1	0	1	0.0	0.843	14.3	LOS B	15.1	108.3	0.92	0.84	1.11	44.7
Approach		901	25	1036	2.8	0.843	13.0	LOS B	15.1	108.3	0.92	0.84	1.11	44.0
SouthWest: Kouka Road														
30b	L3	2	0	3	0.0	0.128	4.7	LOS A	0.7	5.0	0.53	0.67	0.53	44.3
30a	L1	14	1	20	7.1	0.128	4.2	LOS A	0.7	5.0	0.53	0.67	0.53	45.3
32a	R1	1	0	1	0.0	0.128	8.4	LOS A	0.7	5.0	0.53	0.67	0.53	45.6
32b	R3	76	1	107	1.3	0.128	10.3	LOS B	0.7	5.0	0.53	0.67	0.53	46.6
Approach		93	2	131	2.2	0.128	9.3	LOS A	0.7	5.0	0.53	0.67	0.53	46.3
All Vehicles		1680	76	1933	4.7	1.075	29.4	LOS C	30.1	214.8	0.82	1.05	1.51	36.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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 (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 2_N1D2aam [2_2024_BuildOut_AM (Site Folder: 2024 Buildout AM N1 D2a)]

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

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Jack Lachlan Drive														
5	T1	117	0.9	139	0.9	0.073	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
6	R2	13	23.1	15	23.1	0.011	6.3	LOS A	0.0	0.4	0.26	0.54	0.26	48.7
Approach		130	3.1	155	3.1	0.073	0.6	NA	0.0	0.4	0.03	0.05	0.03	58.6
North: Kahawairahi Drive														
7	L2	24	4.2	34	4.2	0.027	8.1	LOS A	0.1	0.8	0.24	0.87	0.24	47.8
9	R2	18	0.0	25	0.0	0.034	9.0	LOS A	0.1	0.9	0.41	0.87	0.41	47.0
Approach		42	2.4	59	2.4	0.034	8.5	LOS A	0.1	0.9	0.32	0.87	0.32	47.5
West: Jack Lachlan Drive														
10	L2	4	0.0	5	0.0	0.074	5.6	LOS A	0.0	0.0	0.00	0.02	0.00	58.2
11	T1	112	0.9	138	0.9	0.074	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	59.8
Approach		116	0.9	143	0.9	0.074	0.2	NA	0.0	0.0	0.00	0.02	0.00	59.7
All Vehicles		288	2.1	357	2.1	0.074	1.8	NA	0.1	0.9	0.06	0.18	0.06	56.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 3_N1D2aam [3_2024_BuildOut_AM (Site Folder: 2024 Buildout AM N1 D2a)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Whitford-Maraetai Road														
1	L2	97	3	121	3.1	0.089	8.9	LOS A	0.7	5.4	0.28	0.67	0.28	58.1
2	T1	238	40	298	16.8	0.195	10.6	LOS B	3.7	29.5	0.55	0.46	0.55	66.9
Approach		335	43	419	12.8	0.195	10.1	LOS B	3.7	29.5	0.47	0.52	0.47	64.4
North: Whitford-Maraetai Road														
8	T1	1216	38	1414	3.1	* 0.675	5.4	LOS A	17.3	124.2	0.47	0.43	0.47	73.7
9	R2	47	0	55	0.0	0.196	40.2	LOS D	1.9	13.5	0.91	0.74	0.91	42.0
Approach		1263	38	1469	3.0	0.675	6.7	LOS A	17.3	124.2	0.49	0.44	0.49	71.7
West: Jack Lachlan Drive														
10	L2	11	0	13	0.0	0.029	30.0	LOS C	0.4	2.8	0.78	0.67	0.78	45.6
12	R2	148	2	180	1.4	* 0.651	46.1	LOS D	4.9	34.6	0.99	0.80	1.06	35.7
Approach		159	2	194	1.3	0.651	45.0	LOS D	4.9	34.6	0.97	0.79	1.04	36.4
All Vehicles		1757	83	2081	4.8	0.675	11.0	LOS B	17.3	124.2	0.53	0.49	0.53	65.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
North: Whitford-Maraetai Road												
P3	Full	25	26	34.3	LOS D	0.1	0.1	0.93	0.93	202.3	218.5	1.08
West: Jack Lachlan Drive												
P4	Full	25	26	34.3	LOS D	0.1	0.1	0.93	0.93	199.8	215.2	1.08
All Pedestrians		0	53	34.3	LOS D	0.1	0.1	0.93	0.93	201.1	216.9	1.08

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 4_N1D2aam [4_2024_BuildOut_AM (Site Folder: 2024 Buildout AM N1 D2a)]

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

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Trig Road														
1	L2	30	6.7	32	6.7	0.221	31.5	LOS D	0.6	4.7	0.93	0.99	0.99	36.8
3	R2	2	0.0	2	0.0	0.066	106.9	LOS F	0.2	1.2	0.98	0.99	0.98	21.4
Approach		32	6.3	34	6.3	0.221	36.2	LOS E	0.6	4.7	0.94	0.99	0.99	35.3
East: Whitford-Maraetai Road														
4	L2	1	0.0	1	0.0	0.748	6.1	LOS A	0.0	0.0	0.00	0.18	0.00	56.5
5	T1	1313	3.4	1427	3.4	0.748	1.6	LOS A	0.0	0.0	0.00	0.18	0.00	58.5
Approach		1314	3.3	1428	3.3	0.748	1.6	NA	0.0	0.0	0.00	0.18	0.00	58.5
West: Whitford-Maraetai Road														
11	T1	390	16.9	488	16.9	0.280	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
12	R2	20	20.0	25	20.0	0.219	38.6	LOS E	0.6	5.3	0.95	0.99	1.00	33.6
Approach		410	17.1	513	17.1	0.280	2.0	NA	0.6	5.3	0.05	0.05	0.05	48.7
All Vehicles		1756	6.6	1974	7.0	0.748	2.3	NA	0.6	5.3	0.03	0.16	0.03	55.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 5_N1D2aam [5_2024_BuildOut_AM (Site Folder: 2024 Buildout AM N1 D2a)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Whitford Park Road														
1	L2	338	23	376	6.8	0.544	6.2	LOS A	4.4	32.3	0.84	0.98	0.99	19.3
2	T1	1	0	1	0.0	0.263	6.6	LOS A	1.3	10.0	0.72	0.72	0.72	26.6
3	R2	248	37	276	14.9	0.357	6.4	LOS A	2.0	15.5	0.74	0.75	0.75	19.4
Approach		587	60	652	10.2	0.544	6.3	LOS A	4.4	32.3	0.79	0.88	0.89	19.4
East: Whitford Maraetai Road														
4	L2	756	28	804	3.7	0.845	6.8	LOS A	13.7	99.3	0.93	0.94	1.14	19.3
5	T1	594	13	632	2.2	0.674	3.1	LOS A	6.4	45.6	0.68	0.58	0.74	19.7
6	R2	1	0	1	0.0	0.674	3.0	LOS A	6.4	45.6	0.68	0.58	0.74	27.9
Approach		1351	41	1437	3.0	0.845	5.2	LOS A	13.7	99.3	0.82	0.78	0.96	19.5
North: Whitford Wharf Road														
7	L2	1	0	1	0.0	0.013	8.6	LOS A	0.0	0.3	0.56	0.73	0.56	26.7
8	T1	2	0	2	0.0	0.013	10.7	LOS B	0.0	0.3	0.56	0.73	0.56	26.7
9	R2	3	0	3	0.0	0.013	12.6	LOS B	0.0	0.3	0.56	0.73	0.56	26.7
Approach		6	0	6	0.0	0.013	11.3	LOS B	0.0	0.3	0.56	0.73	0.56	26.7
West: Whitford Road														
10	L2	6	0	7	0.0	0.236	2.1	LOS A	1.1	8.5	0.51	0.43	0.51	27.5
11	T1	201	31	226	15.4	0.367	2.5	LOS A	1.9	14.3	0.52	0.44	0.52	19.8
12	R2	183	10	206	5.5	0.367	2.1	LOS A	1.9	14.3	0.54	0.46	0.54	19.8
Approach		390	41	438	10.5	0.367	2.3	LOS A	1.9	14.3	0.53	0.45	0.53	19.8
All Vehicles		2334	142	2534	6.2	0.845	5.0	LOS A	13.7	99.3	0.76	0.75	0.87	19.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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 (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 6_N1D2aam [6_2024_BuildOut_AM (Site Folder: 2024 Buildout AM N1 D2a)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Whitford Park Road														
1	L2	238	5.9	283	5.9	1.103	78.8	LOS F	45.8	339.2	1.00	2.65	4.54	24.1
2	T1	404	7.4	481	7.4	1.103	78.9	LOS F	45.8	339.2	1.00	2.65	4.54	24.3
3	R2	1	0.0	1	0.0	1.103	82.9	LOS F	45.8	339.2	1.00	2.65	4.54	24.4
Approach		643	6.8	765	6.8	1.103	78.8	LOS F	45.8	339.2	1.00	2.65	4.54	24.2
East: Saleyard Road														
4	L2	1	0.0	1	0.0	0.013	11.3	LOS B	0.1	0.6	0.87	0.68	0.87	42.0
5	T1	1	0.0	1	0.0	0.013	11.2	LOS B	0.1	0.6	0.87	0.68	0.87	42.9
6	R2	4	0.0	4	0.0	0.013	15.7	LOS B	0.1	0.6	0.87	0.68	0.87	43.1
Approach		6	0.0	6	0.0	0.013	14.2	LOS B	0.1	0.6	0.87	0.68	0.87	42.9
North: Whitford Park Road														
7	L2	2	0.0	2	0.0	0.678	3.4	LOS A	8.9	64.5	0.43	0.50	0.43	45.3
8	T1	261	5.7	281	5.7	0.678	3.4	LOS A	8.9	64.5	0.43	0.50	0.43	46.2
9	R2	677	3.7	728	3.7	0.678	7.9	LOS A	8.9	64.5	0.43	0.50	0.43	46.4
Approach		940	4.3	1011	4.3	0.678	6.6	LOS A	8.9	64.5	0.43	0.50	0.43	46.4
West: Sandstone Road														
10	L2	193	16.1	212	16.1	0.337	6.0	LOS A	2.3	18.7	0.73	0.74	0.73	45.7
11	T1	1	0.0	1	0.0	0.337	5.5	LOS A	2.3	18.7	0.73	0.74	0.73	46.9
12	R2	41	36.6	45	36.6	0.337	11.2	LOS B	2.3	18.7	0.73	0.74	0.73	46.6
Approach		235	19.6	258	19.6	0.337	6.9	LOS A	2.3	18.7	0.73	0.74	0.73	45.9
All Vehicles		1824	7.1	2041	7.2	1.103	33.8	LOS C	45.8	339.2	0.68	1.34	2.01	34.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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 (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 7_N1D2aam [7_2024_BuildOut_AM (Site Folder: 2024 Buildout AM N1 D2a)]

New Site
Site Category: (None)
Roundabout Metering

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Point View Drive														
1	L2	27	0.0	47	0.0	0.259	8.0	LOS A	1.0	7.1	0.79	0.89	0.80	44.4
2	T1	25	0.0	44	0.0	0.259	7.9	LOS A	1.0	7.1	0.79	0.89	0.80	45.4
3	R2	7	0.0	12	0.0	0.259	11.5	LOS B	1.0	7.1	0.79	0.89	0.80	45.2
Approach		59	0.0	104	0.0	0.259	8.4	LOS A	1.0	7.1	0.79	0.89	0.80	44.9
East: Whitford Road														
4	L2	2	0.0	2	0.0	0.900	11.1	LOS B	14.2	101.8	1.00	1.15	1.49	43.0
5	T1	774	3.2	841	3.2	0.900	11.4	LOS B	14.2	101.8	1.00	1.15	1.49	43.6
6	R2	95	3.2	103	3.2	0.900	15.0	LOS B	14.2	101.8	1.00	1.15	1.49	43.6
Approach		871	3.2	947	3.2	0.900	11.8	LOS B	14.2	101.8	1.00	1.15	1.49	43.6
North: Somerville														
7	L2	89	2.2	106	2.2	1.012	76.7	LOS F	41.6	293.0	0.99	2.44	4.08	24.1
8	T1	91	1.1	108	1.1	1.012	76.5	LOS F	41.6	293.0	0.99	2.44	4.08	24.4
9	R2	246	0.0	293	0.0	1.012	80.1	LOS F	41.6	293.0	0.99	2.44	4.08	24.3
Approach		426	0.7	507	0.7	1.012	78.6	LOS F	41.6	293.0	0.99	2.44	4.08	24.3
West: Whitford Road														
10	L2	95	2.1	117	2.1	0.423	3.4	LOS A	1.4	10.6	0.32	0.44	0.32	46.5
11	T1	302	12.6	373	12.6	0.423	3.7	LOS A	1.4	10.6	0.32	0.44	0.32	47.2
12	R2	15	0.0	19	0.0	0.423	7.3	LOS A	1.4	10.6	0.32	0.44	0.32	47.3
Approach		412	9.7	509	9.7	0.423	3.8	LOS A	1.4	10.6	0.32	0.44	0.32	47.1
All Vehicles		1768	4.0	2066	4.0	1.012	26.0	LOS C	41.6	293.0	0.82	1.28	1.80	37.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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 (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 1_N1D2apm [1_2024_BuildOut_PM (Site Folder: 2024 Buildout PM N1 D2a)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Whitford-Maraetai Road														
1b	L3	59	0	61	0.0	0.796	7.3	LOS A	12.2	86.1	0.87	0.76	0.99	45.3
1	L2	632	6	658	0.9	0.796	7.0	LOS A	12.2	86.1	0.87	0.76	0.99	45.7
2	T1	247	0	257	0.0	0.796	6.8	LOS A	12.2	86.1	0.87	0.76	0.99	46.9
3	R2	1	0	1	0.0	0.796	11.8	LOS B	12.2	86.1	0.87	0.76	0.99	47.3
Approach		939	6	978	0.6	0.796	7.0	LOS A	12.2	86.1	0.87	0.76	0.99	46.0
East: Access														
4	L2	1	0	1	0.0	0.012	5.5	LOS A	0.1	0.5	0.62	0.56	0.62	45.6
4a	L1	2	0	2	0.0	0.012	5.0	LOS A	0.1	0.5	0.62	0.56	0.62	46.3
5	T1	3	0	3	0.0	0.012	5.3	LOS A	0.1	0.5	0.62	0.56	0.62	46.7
6	R2	4	0	4	0.0	0.012	10.3	LOS B	0.1	0.5	0.62	0.56	0.62	47.1
Approach		10	0	11	0.0	0.012	7.3	LOS A	0.1	0.5	0.62	0.56	0.62	46.7
North: Whitford-Maraetai Road														
7	L2	1	0	1	0.0	0.318	4.0	LOS A	2.1	15.0	0.53	0.60	0.53	45.5
8	T1	104	4	132	3.8	0.318	3.9	LOS A	2.1	15.0	0.53	0.60	0.53	46.6
9a	R1	51	0	65	0.0	0.318	7.9	LOS A	2.1	15.0	0.53	0.60	0.53	46.5
9	R2	127	1	161	0.8	0.318	8.9	LOS A	2.1	15.0	0.53	0.60	0.53	47.0
Approach		283	5	358	1.8	0.318	6.9	LOS A	2.1	15.0	0.53	0.60	0.53	46.8
West: Beachlands Road														
10	L2	151	2	172	1.3	0.393	4.9	LOS A	2.7	20.0	0.66	0.71	0.66	45.4
11	T1	3	0	3	0.0	0.393	4.7	LOS A	2.7	20.0	0.66	0.71	0.66	46.6
12	R2	184	15	209	8.2	0.393	10.0	LOS A	2.7	20.0	0.66	0.71	0.66	46.9
12b	R3	4	0	5	0.0	0.393	10.7	LOS B	2.7	20.0	0.66	0.71	0.66	47.5
Approach		342	17	389	5.0	0.393	7.7	LOS A	2.7	20.0	0.66	0.71	0.66	46.2
SouthWest: Kouka Road														
30b	L3	3	0	4	0.0	0.301	12.4	LOS B	2.3	16.4	1.00	0.95	1.00	42.1
30a	L1	68	0	86	0.0	0.301	11.7	LOS B	2.3	16.4	1.00	0.95	1.00	43.1
32a	R1	1	0	1	0.0	0.301	16.0	LOS B	2.3	16.4	1.00	0.95	1.00	43.4
32b	R3	31	0	39	0.0	0.301	17.9	LOS B	2.3	16.4	1.00	0.95	1.00	44.3
Approach		103	0	130	0.0	0.301	13.6	LOS B	2.3	16.4	1.00	0.95	1.00	43.4
All Vehicles		1677	28	1866	1.7	0.796	7.6	LOS A	12.2	86.1	0.77	0.73	0.83	46.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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 (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 2_N1D2apm [2_2024_BuildOut_PM (Site Folder: 2024 Buildout PM N1 D2a)]

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

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Jack Lachlan Drive														
5	T1	108	0.9	119	0.9	0.062	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
6	R2	39	2.6	43	2.6	0.031	6.4	LOS A	0.1	1.0	0.36	0.57	0.36	48.8
Approach		147	1.4	162	1.4	0.062	1.7	NA	0.1	1.0	0.09	0.15	0.09	56.5
North: Kahawairahi Drive														
7	L2	20	10.0	32	10.0	0.029	8.7	LOS A	0.1	0.8	0.32	0.87	0.32	47.4
9	R2	6	0.0	10	0.0	0.015	9.9	LOS A	0.1	0.4	0.47	0.86	0.47	46.6
Approach		26	7.7	41	7.7	0.029	9.0	LOS A	0.1	0.8	0.36	0.87	0.36	47.2
West: Jack Lachlan Drive														
10	L2	28	0.0	49	0.0	0.138	5.6	LOS A	0.0	0.0	0.00	0.11	0.00	57.3
11	T1	122	2.5	214	2.5	0.138	0.0	LOS A	0.0	0.0	0.00	0.11	0.00	58.9
Approach		150	2.0	263	2.0	0.138	1.1	NA	0.0	0.0	0.00	0.11	0.00	58.6
All Vehicles		323	2.2	466	2.3	0.138	2.0	NA	0.1	1.0	0.06	0.19	0.06	56.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 3_N1D2apm [3_2024_BuildOut_PM (Site Folder: 2024 Buildout PM N1 D2a)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Whitford-Maraetai Road														
1	L2	181	1	185	0.6	0.128	8.7	LOS A	1.2	8.3	0.26	0.67	0.26	58.3
2	T1	905	7	923	0.8	* 0.511	11.1	LOS B	13.3	93.7	0.63	0.55	0.63	66.6
Approach		1086	8	1108	0.7	0.511	10.7	LOS B	13.3	93.7	0.57	0.57	0.57	65.2
North: Whitford-Maraetai Road														
8	T1	305	21	401	6.9	0.200	4.0	LOS A	3.4	25.5	0.35	0.29	0.35	74.5
9	R2	15	0	20	0.0	* 0.142	46.7	LOS D	0.8	5.4	0.96	0.70	0.96	39.6
Approach		320	21	421	6.6	0.200	6.0	LOS A	3.4	25.5	0.38	0.31	0.38	71.6
West: Jack Lachlan Drive														
10	L2	34	0	54	0.0	0.137	33.7	LOS C	1.7	12.2	0.85	0.73	0.85	43.9
12	R2	118	6	187	5.1	* 0.505	41.3	LOS D	4.7	34.5	0.96	0.77	0.96	36.8
Approach		152	6	241	3.9	0.505	39.6	LOS D	4.7	34.5	0.93	0.76	0.93	38.4
All Vehicles		1558	35	1770	2.6	0.511	13.5	LOS B	13.3	93.7	0.57	0.54	0.57	61.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
North: Whitford-Maraetai Road												
P3	Full	25	26	34.3	LOS D	0.1	0.1	0.93	0.93	202.3	218.5	1.08
West: Jack Lachlan Drive												
P4	Full	25	26	34.3	LOS D	0.1	0.1	0.93	0.93	199.8	215.2	1.08
All Pedestrians		0	53	34.3	LOS D	0.1	0.1	0.93	0.93	201.1	216.9	1.08

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 4_N1D2apm [4_2024_BuildOut_PM (Site Folder: 2024 Buildout PM N1 D2a)]

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

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Trig Road														
1	L2	16	0.0	26	0.0	0.026	7.5	LOS A	0.1	0.7	0.48	0.65	0.48	48.7
3	R2	7	0.0	11	0.0	0.157	53.8	LOS F	0.4	3.1	0.95	0.98	0.97	31.1
Approach		23	0.0	38	0.0	0.157	21.6	LOS C	0.4	3.1	0.62	0.76	0.63	41.6
East: Whitford-Maraetai Road														
4	L2	6	16.7	6	16.7	0.283	5.8	LOS A	0.0	0.0	0.00	0.20	0.00	56.4
5	T1	488	9.0	514	9.0	0.283	1.2	LOS A	0.0	0.0	0.00	0.20	0.00	59.3
Approach		494	9.1	520	9.1	0.283	1.3	NA	0.0	0.0	0.00	0.20	0.00	59.2
West: Whitford-Maraetai Road														
11	T1	1148	0.9	1184	0.9	0.616	0.4	LOS A	0.0	0.0	0.00	0.00	0.00	49.5
12	R2	30	3.3	31	3.3	0.029	6.6	LOS A	0.1	0.9	0.51	0.64	0.51	48.2
Approach		1178	0.9	1214	0.9	0.616	0.6	NA	0.1	0.9	0.01	0.02	0.01	49.4
All Vehicles		1695	3.3	1772	3.3	0.616	1.2	NA	0.4	3.1	0.02	0.09	0.02	51.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 5_N1D2apm [5_2024_BuildOut_PM (Site Folder: 2024 Buildout PM N1 D2a)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Whitford Park Road														
1	L2	238	4	264	1.7	0.313	2.0	LOS A	1.7	12.0	0.53	0.42	0.53	19.8
2	T1	8	0	9	0.0	0.338	1.9	LOS A	1.9	13.3	0.53	0.42	0.53	27.7
3	R2	670	9	744	1.3	0.460	2.4	LOS A	2.9	20.8	0.56	0.45	0.56	19.8
Approach		916	13	1018	1.4	0.460	2.3	LOS A	2.9	20.8	0.55	0.44	0.55	19.8
East: Whitford Maraetai Road														
4	L2	285	37	303	13.0	0.409	2.4	LOS A	2.4	19.0	0.60	0.50	0.60	19.7
5	T1	272	19	289	7.0	0.378	2.3	LOS A	2.2	16.5	0.58	0.47	0.58	19.8
6	R2	1	0	1	0.0	0.378	2.1	LOS A	2.2	16.5	0.58	0.47	0.58	28.1
Approach		558	56	594	10.0	0.409	2.3	LOS A	2.4	19.0	0.59	0.48	0.59	19.8
North: Whitford Wharf Road														
7	L2	11	0	19	0.0	0.173	15.7	LOS B	0.7	4.8	0.80	0.92	0.80	25.6
8	T1	11	0	19	0.0	0.173	17.3	LOS B	0.7	4.8	0.80	0.92	0.80	25.6
9	R2	5	0	8	0.0	0.173	19.2	LOS B	0.7	4.8	0.80	0.92	0.80	25.6
Approach		27	0	46	0.0	0.173	17.0	LOS B	0.7	4.8	0.80	0.92	0.80	25.6
West: Whitford Road														
10	L2	5	0	5	0.0	0.595	8.2	LOS A	3.6	25.5	0.78	0.98	1.03	26.4
11	T1	534	3	587	0.6	0.927	14.6	LOS B	12.4	88.6	0.88	1.47	1.58	18.6
12	R2	229	9	252	3.9	0.927	20.4	LOS C	12.4	88.6	0.98	1.96	2.14	18.0
Approach		768	12	844	1.6	0.927	16.3	LOS B	12.4	88.6	0.91	1.61	1.75	18.5
All Vehicles		2269	81	2501	3.5	0.927	7.3	LOS A	12.4	88.6	0.68	0.85	0.97	19.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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 (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 6_N1D2apm [6_2024_BuildOut_PM (Site Folder: 2024 Buildout PM N1 D2a)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Whitford Park Road														
1	L2	56	23.2	67	23.2	0.417	4.7	LOS A	3.1	22.6	0.55	0.50	0.55	46.1
2	T1	338	2.7	402	2.7	0.417	4.3	LOS A	3.1	22.6	0.55	0.50	0.55	47.3
3	R2	1	0.0	1	0.0	0.417	8.7	LOS A	3.1	22.6	0.55	0.50	0.55	47.5
Approach		395	5.6	470	5.6	0.417	4.4	LOS A	3.1	22.6	0.55	0.50	0.55	47.1
East: Saleyard Road														
4	L2	1	0.0	1	0.0	0.005	7.2	LOS A	0.0	0.2	0.74	0.57	0.74	44.8
5	T1	1	0.0	1	0.0	0.005	7.2	LOS A	0.0	0.2	0.74	0.57	0.74	45.8
6	R2	1	0.0	1	0.0	0.005	11.7	LOS B	0.0	0.2	0.74	0.57	0.74	45.9
Approach		3	0.0	3	0.0	0.005	8.7	LOS A	0.0	0.2	0.74	0.57	0.74	45.5
North: Whitford Park Road														
7	L2	1	0.0	1	0.0	0.507	4.3	LOS A	4.4	33.2	0.64	0.58	0.64	45.4
8	T1	318	9.4	342	9.4	0.507	4.5	LOS A	4.4	33.2	0.64	0.58	0.64	46.4
9	R2	200	9.5	215	9.5	0.507	9.0	LOS A	4.4	33.2	0.64	0.58	0.64	46.5
Approach		519	9.4	558	9.4	0.507	6.2	LOS A	4.4	33.2	0.64	0.58	0.64	46.4
West: Sandstone Road														
10	L2	582	1.2	640	1.2	0.861	14.4	LOS B	16.4	116.2	1.00	1.16	1.53	41.3
11	T1	2	0.0	2	0.0	0.861	14.3	LOS B	16.4	116.2	1.00	1.16	1.53	42.2
12	R2	194	1.0	213	1.0	0.861	18.8	LOS B	16.4	116.2	1.00	1.16	1.53	42.3
Approach		778	1.2	855	1.2	0.861	15.5	LOS B	16.4	116.2	1.00	1.16	1.53	41.6
All Vehicles		1695	4.7	1886	4.7	0.861	10.0	LOS A	16.4	116.2	0.78	0.82	1.02	44.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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 (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 7_N1D2apm [7_2024_BuildOut_PM (Site Folder: 2024 Buildout PM N1 D2a)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Point View Drive														
1	L2	44	2.3	54	2.3	0.346	9.1	LOS A	2.3	16.4	0.82	0.85	0.82	44.0
2	T1	127	0.0	157	0.0	0.346	8.8	LOS A	2.3	16.4	0.82	0.85	0.82	45.0
3	R2	15	0.0	19	0.0	0.346	12.4	LOS B	2.3	16.4	0.82	0.85	0.82	44.8
Approach		186	0.5	230	0.5	0.346	9.2	LOS A	2.3	16.4	0.82	0.85	0.82	44.7
East: Whitford Road														
4	L2	6	0.0	6	0.0	0.533	4.8	LOS A	4.6	33.6	0.63	0.61	0.63	45.3
5	T1	428	6.1	460	6.1	0.533	5.2	LOS A	4.6	33.6	0.63	0.61	0.63	46.0
6	R2	119	1.7	128	1.7	0.533	8.7	LOS A	4.6	33.6	0.63	0.61	0.63	46.0
Approach		553	5.1	595	5.1	0.533	5.9	LOS A	4.6	33.6	0.63	0.61	0.63	46.0
North: Somerville														
7	L2	145	0.0	179	0.0	0.665	16.6	LOS B	7.0	49.3	1.00	1.16	1.37	39.9
8	T1	35	0.0	43	0.0	0.665	16.4	LOS B	7.0	49.3	1.00	1.16	1.37	40.7
9	R2	101	1.0	125	1.0	0.665	20.1	LOS C	7.0	49.3	1.00	1.16	1.37	40.5
Approach		281	0.4	347	0.4	0.665	17.8	LOS B	7.0	49.3	1.00	1.16	1.37	40.2
West: Whitford Road														
10	L2	211	0.0	220	0.0	0.912	15.7	LOS B	22.0	156.3	1.00	1.13	1.53	40.9
11	T1	689	2.5	718	2.5	0.912	16.0	LOS B	22.0	156.3	1.00	1.13	1.53	41.4
12	R2	46	2.2	48	2.2	0.912	19.7	LOS B	22.0	156.3	1.00	1.13	1.53	41.4
Approach		946	1.9	985	1.9	0.912	16.1	LOS B	22.0	156.3	1.00	1.13	1.53	41.3
All Vehicles		1966	2.4	2157	2.4	0.912	12.8	LOS B	22.0	156.3	0.88	0.96	1.18	42.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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 (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 1_NVD2gam [1_2031_BuildOut_AM (Site Folder: 2031 Buildout AM NV D2g)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Whitford-Maraetai Road														
1b	L3	12	0	15	0.0	0.283	3.2	LOS A	2.1	16.4	0.33	0.39	0.33	47.1
1	L2	187	19	237	10.2	0.283	3.1	LOS A	2.1	16.4	0.33	0.39	0.33	47.5
2	T1	78	11	99	14.1	0.283	2.9	LOS A	2.1	16.4	0.33	0.39	0.33	48.8
3	R2	13	12	16	92.3	0.283	9.0	LOS A	2.1	16.4	0.33	0.39	0.33	48.1
Approach		290	42	367	14.5	0.283	3.3	LOS A	2.1	16.4	0.33	0.39	0.33	47.8
East: Access														
4	L2	1	0	1	0.0	0.019	26.6	LOS C	0.1	0.9	1.00	0.78	1.00	36.6
4a	L1	1	0	1	0.0	0.019	26.1	LOS C	0.1	0.9	1.00	0.78	1.00	37.1
5	T1	1	0	1	0.0	0.019	26.4	LOS C	0.1	0.9	1.00	0.78	1.00	37.4
6	R2	1	0	1	0.0	0.019	31.4	LOS C	0.1	0.9	1.00	0.78	1.00	37.6
Approach		4	0	4	0.0	0.019	27.6	LOS C	0.1	0.9	1.00	0.78	1.00	37.2
North: Whitford-Maraetai Road														
7	L2	1	0	1	0.0	1.143	112.4	LOS F	39.7	282.1	1.00	2.47	4.34	19.8
8	T1	401	5	413	1.2	1.143	112.3	LOS F	39.7	282.1	1.00	2.47	4.34	20.0
9a	R1	16	0	16	0.0	1.143	116.2	LOS F	39.7	282.1	1.00	2.47	4.34	20.0
9	R2	72	4	74	5.6	1.143	117.6	LOS F	39.7	282.1	1.00	2.47	4.34	20.1
Approach		490	9	505	1.8	1.143	113.2	LOS F	39.7	282.1	1.00	2.47	4.34	20.0
West: Beachlands Road														
10	L2	4	3	5	75.0	0.771	9.6	LOS A	10.8	77.4	0.83	0.80	0.95	43.0
11	T1	2	1	2	50.0	0.771	8.4	LOS A	10.8	77.4	0.83	0.80	0.95	44.3
12	R2	797	21	916	2.6	0.771	12.0	LOS B	10.8	77.4	0.83	0.80	0.95	44.7
12b	R3	1	0	1	0.0	0.771	12.8	LOS B	10.8	77.4	0.83	0.80	0.95	45.2
Approach		804	25	924	3.1	0.771	11.9	LOS B	10.8	77.4	0.83	0.80	0.95	44.7
SouthWest: Kouka Road														
30b	L3	2	0	3	0.0	0.133	5.0	LOS A	0.7	5.3	0.56	0.68	0.56	44.2
30a	L1	14	1	20	7.1	0.133	4.4	LOS A	0.7	5.3	0.56	0.68	0.56	45.2
32a	R1	1	0	1	0.0	0.133	8.6	LOS A	0.7	5.3	0.56	0.68	0.56	45.5
32b	R3	77	1	108	1.3	0.133	10.6	LOS B	0.7	5.3	0.56	0.68	0.56	46.5
Approach		94	2	132	2.1	0.133	9.5	LOS A	0.7	5.3	0.56	0.68	0.56	46.2
All Vehicles		1682	78	1933	4.9	1.143	36.6	LOS D	39.7	282.1	0.76	1.15	1.69	34.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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 (Geometric Delay is included).
Queue Model: SIDRA Standard.

MOVEMENT SUMMARY

Site: 2_NVD2gam [2_2031_BuildOut_AM (Site Folder: 2031 Buildout AM NV D2g)]

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

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Jack Lachlan Drive														
5	T1	301	0.3	358	0.3	0.186	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
6	R2	13	23.1	15	23.1	0.018	8.3	LOS A	0.1	0.6	0.53	0.65	0.53	47.7
Approach		314	1.3	374	1.3	0.186	0.4	NA	0.1	0.6	0.02	0.03	0.02	59.3
North: Kahawairahi Drive														
7	L2	24	4.2	34	4.2	0.044	10.4	LOS B	0.2	1.2	0.51	0.91	0.51	46.8
9	R2	20	0.0	28	0.0	0.097	18.3	LOS C	0.3	2.3	0.75	1.00	0.75	42.3
Approach		44	2.3	62	2.3	0.097	14.0	LOS B	0.3	2.3	0.62	0.95	0.62	44.6
West: Jack Lachlan Drive														
10	L2	6	0.0	7	0.0	0.269	5.6	LOS A	0.0	0.0	0.00	0.01	0.00	58.2
11	T1	418	0.2	516	0.2	0.269	0.1	LOS A	0.0	0.0	0.00	0.01	0.00	59.8
Approach		424	0.2	523	0.2	0.269	0.2	NA	0.0	0.0	0.00	0.01	0.00	59.8
All Vehicles		782	0.8	959	0.8	0.269	1.1	NA	0.3	2.3	0.05	0.08	0.05	58.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 3_NVD2gam [3_2031_BuildOut_AM (Site Folder: 2031 Buildout AM NV D2g)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Whitford-Maraetai Road														
1	L2	218	3	273	1.4	0.209	9.3	LOS A	1.9	13.2	0.35	0.69	0.35	57.8
2	T1	235	40	294	17.0	0.323	22.6	LOS C	5.4	43.0	0.79	0.65	0.79	56.5
Approach		453	43	566	9.5	0.323	16.2	LOS B	5.4	43.0	0.58	0.67	0.58	57.1
North: Whitford-Maraetai Road														
8	T1	1197	38	1392	3.2	* 0.858	18.2	LOS B	31.2	224.5	0.73	0.71	0.81	61.7
9	R2	108	0	126	0.0	0.318	36.4	LOS D	4.2	29.7	0.89	0.78	0.89	43.6
Approach		1305	38	1517	2.9	0.858	19.7	LOS B	31.2	224.5	0.74	0.72	0.81	59.6
West: Jack Lachlan Drive														
10	L2	51	0	62	0.0	0.072	18.3	LOS B	1.3	9.4	0.58	0.69	0.58	52.0
12	R2	413	2	504	0.5	* 0.818	40.1	LOS D	12.6	88.3	0.93	0.87	1.06	38.6
Approach		464	2	566	0.4	0.818	37.7	LOS D	12.6	88.3	0.89	0.85	1.01	39.9
All Vehicles		2222	83	2650	3.8	0.858	22.8	LOS C	31.2	224.5	0.74	0.74	0.81	54.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
North: Whitford-Maraetai Road												
P3	Full	25	26	34.3	LOS D	0.1	0.1	0.93	0.93	202.3	218.5	1.08
West: Jack Lachlan Drive												
P4	Full	25	26	34.3	LOS D	0.1	0.1	0.93	0.93	199.8	215.2	1.08
All Pedestrians		0	53	34.3	LOS D	0.1	0.1	0.93	0.93	201.1	216.9	1.08

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 4_NVD2gam [4_2031_BuildOut_AM (Site Folder: 2031 Buildout AM NV D2g)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site Practical Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Trig Road														
1	L2	30	6.7	32	6.7	0.079	33.9	LOS C	1.0	7.3	0.82	0.71	0.82	36.6
3	R2	3	0.0	3	0.0	* 0.023	43.9	LOS D	0.1	0.8	0.95	0.63	0.95	34.2
Approach		33	6.1	35	6.1	0.079	34.8	LOS C	1.0	7.3	0.83	0.70	0.83	36.3
East: Whitford-Maraetai Road														
4	L2	1	0.0	1	0.0	0.546	14.2	LOS B	14.1	101.1	0.60	0.62	0.60	50.5
5	T1	1559	2.8	1641	2.8	* 0.854	16.8	LOS B	34.8	249.7	0.75	0.78	0.80	44.2
Approach		1560	2.8	1642	2.8	0.854	16.8	LOS B	34.8	249.7	0.75	0.78	0.80	44.2
West: Whitford-Maraetai Road														
11	T1	507	13.2	534	13.2	0.383	3.1	LOS A	6.6	51.4	0.34	0.31	0.34	52.5
12	R2	19	21.1	20	21.1	* 0.165	44.9	LOS D	0.8	6.5	0.97	0.70	0.97	31.9
Approach		526	13.5	554	13.5	0.383	4.6	LOS A	6.6	51.4	0.37	0.32	0.37	51.3
All Vehicles		2119	5.5	2231	5.5	0.854	14.1	LOS B	34.8	249.7	0.65	0.67	0.70	45.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

MOVEMENT SUMMARY

Site: 5_NVD2gam [5_2031_BuildOut_AM (Site Folder: 2031 Buildout AM NV D2g)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Whitford Park Road														
1	L2	333	23	370	6.9	0.646	10.0	LOS B	6.1	45.0	0.95	1.24	1.26	19.0
2	T1	1	0	1	0.0	0.349	7.5	LOS A	1.9	14.9	0.81	0.85	0.85	26.5
3	R2	312	37	347	11.9	0.473	8.2	LOS A	3.3	25.1	0.84	0.94	0.95	19.2
Approach		646	60	718	9.3	0.646	9.2	LOS A	6.1	45.0	0.90	1.10	1.11	19.1
East: Whitford Maraetai Road														
4	L2	894	29	951	3.2	1.072	47.0	LOS D	48.4	348.6	1.00	2.41	2.62	15.9
5	T1	703	13	748	1.8	0.789	5.0	LOS A	10.6	75.1	0.84	0.78	0.97	19.5
6	R2	1	0	1	0.0	0.789	4.9	LOS A	10.6	75.1	0.84	0.78	0.97	27.5
Approach		1598	42	1700	2.6	1.072	28.5	LOS C	48.4	348.6	0.93	1.69	1.89	17.3
North: Whitford Wharf Road														
7	L2	1	0	1	0.0	0.014	9.3	LOS A	0.0	0.3	0.59	0.75	0.59	26.6
8	T1	2	0	2	0.0	0.014	11.4	LOS B	0.0	0.3	0.59	0.75	0.59	26.6
9	R2	3	0	3	0.0	0.014	13.3	LOS B	0.0	0.3	0.59	0.75	0.59	26.6
Approach		6	0	6	0.0	0.014	12.0	LOS B	0.0	0.3	0.59	0.75	0.59	26.6
West: Whitford Road														
10	L2	6	0	7	0.0	0.286	2.6	LOS A	1.3	10.3	0.57	0.52	0.57	27.4
11	T1	253	32	284	12.6	0.445	3.1	LOS A	2.5	18.8	0.59	0.56	0.60	19.7
12	R2	181	11	203	6.1	0.445	2.9	LOS A	2.5	18.8	0.63	0.60	0.65	19.7
Approach		440	43	494	9.8	0.445	3.0	LOS A	2.5	18.8	0.61	0.57	0.62	19.8
All Vehicles		2690	145	2918	5.5	1.072	19.4	LOS B	48.4	348.6	0.87	1.35	1.48	18.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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 (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 6_NVD2gam [6_2031_BuildOut_AM (Site Folder: 2031 Buildout AM NV D2g)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Whitford Park Road														
1	L2	235	6.0	280	6.0	0.932	27.1	LOS C	23.5	173.8	0.94	1.44	1.98	36.5
2	T1	446	7.0	531	7.0	0.932	35.5	LOS D	23.5	173.8	1.00	1.75	2.57	34.3
3	R2	1	0.0	1	0.0	0.932	39.7	LOS D	23.5	173.8	1.00	1.75	2.57	34.4
Approach		682	6.6	812	6.6	0.932	32.6	LOS C	23.5	173.8	0.98	1.65	2.37	35.1
East: Saleyard Road														
4	L2	1	0.0	1	0.0	0.020	15.0	LOS B	0.1	1.0	0.95	0.74	0.95	40.3
5	T1	1	0.0	1	0.0	0.020	14.9	LOS B	0.1	1.0	0.95	0.74	0.95	41.1
6	R2	5	0.0	5	0.0	0.020	19.4	LOS B	0.1	1.0	0.95	0.74	0.95	41.2
Approach		7	0.0	7	0.0	0.020	18.1	LOS B	0.1	1.0	0.95	0.74	0.95	41.1
North: Whitford Park Road														
7	L2	2	0.0	2	0.0	0.769	3.5	LOS A	13.0	94.0	0.54	0.49	0.54	45.0
8	T1	298	5.0	320	5.0	0.769	3.5	LOS A	13.0	94.0	0.54	0.49	0.54	46.0
9	R2	774	3.2	832	3.2	0.769	8.0	LOS A	13.0	94.0	0.54	0.49	0.54	46.1
Approach		1074	3.7	1155	3.7	0.769	6.8	LOS A	13.0	94.0	0.54	0.49	0.54	46.1
West: Sandstone Road														
10	L2	211	15.2	232	15.2	0.400	6.9	LOS A	2.9	23.3	0.82	0.82	0.82	45.3
11	T1	1	0.0	1	0.0	0.400	6.3	LOS A	2.9	23.3	0.82	0.82	0.82	46.4
12	R2	41	36.6	45	36.6	0.400	12.2	LOS B	2.9	23.3	0.82	0.82	0.82	46.1
Approach		253	18.6	278	18.6	0.400	7.8	LOS A	2.9	23.3	0.82	0.82	0.82	45.4
All Vehicles		2016	6.5	2252	6.6	0.932	16.2	LOS B	23.5	173.8	0.73	0.95	1.23	41.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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 (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 7_NVD2gam [7_2031_BuildOut_AM (Site Folder: 2031 Buildout AM NV D2g)]

New Site
Site Category: (None)
Roundabout Metering

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Point View Drive														
1	L2	27	0.0	47	0.0	0.301	8.6	LOS A	1.1	7.6	0.83	0.92	0.86	44.1
2	T1	25	0.0	44	0.0	0.301	8.5	LOS A	1.1	7.6	0.83	0.92	0.86	45.0
3	R2	8	0.0	14	0.0	0.301	12.0	LOS B	1.1	7.6	0.83	0.92	0.86	44.9
Approach		60	0.0	105	0.0	0.301	9.0	LOS A	1.1	7.6	0.83	0.92	0.86	44.6
East: Whitford Road														
4	L2	2	0.0	2	0.0	0.965	17.7	LOS B	22.4	160.5	1.00	1.38	1.94	39.9
5	T1	867	2.9	942	2.9	0.965	18.0	LOS B	22.4	160.5	1.00	1.38	1.94	40.4
6	R2	106	2.8	115	2.8	0.965	21.6	LOS C	22.4	160.5	1.00	1.38	1.94	40.4
Approach		975	2.9	1060	2.9	0.965	18.4	LOS B	22.4	160.5	1.00	1.38	1.94	40.4
North: Somerville														
7	L2	101	2.0	120	2.0	1.081	125.4	LOS F	56.5	397.8	0.90	3.34	5.95	18.3
8	T1	89	1.1	106	1.1	1.081	125.3	LOS F	56.5	397.8	0.90	3.34	5.95	18.5
9	R2	242	0.0	288	0.0	1.081	128.8	LOS F	56.5	397.8	0.90	3.34	5.95	18.4
Approach		432	0.7	514	0.7	1.081	127.3	LOS F	56.5	397.8	0.90	3.34	5.95	18.4
West: Whitford Road														
10	L2	93	2.2	115	2.2	0.461	3.5	LOS A	1.7	12.6	0.36	0.45	0.36	46.4
11	T1	338	11.2	417	11.2	0.461	3.8	LOS A	1.7	12.6	0.36	0.45	0.36	47.1
12	R2	14	0.0	17	0.0	0.461	7.4	LOS A	1.7	12.6	0.36	0.45	0.36	47.2
Approach		445	9.0	549	9.0	0.461	3.8	LOS A	1.7	12.6	0.36	0.45	0.36	47.0
All Vehicles		1912	3.7	2229	3.7	1.081	39.5	LOS D	56.5	397.8	0.81	1.58	2.43	32.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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 (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 1_N9D17fam [1_2038_BuildOut_AM (Site Folder: 2038 Buildout AM N9 D17f)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Whitford-Maraetai Road														
1b	L3	13	0	14	0.0	0.268	3.3	LOS A	1.9	15.1	0.34	0.39	0.34	47.1
1	L2	200	20	222	10.0	0.268	3.1	LOS A	1.9	15.1	0.34	0.39	0.34	47.5
2	T1	83	11	92	13.3	0.268	2.9	LOS A	1.9	15.1	0.34	0.39	0.34	48.7
3	R2	13	12	14	92.3	0.268	9.1	LOS A	1.9	15.1	0.34	0.39	0.34	48.0
Approach		309	43	343	13.9	0.268	3.3	LOS A	1.9	15.1	0.34	0.39	0.34	47.8
East: Access														
4	L2	1	0	1	0.0	0.018	26.1	LOS C	0.1	0.9	1.00	0.76	1.00	36.8
4a	L1	1	0	1	0.0	0.018	25.6	LOS C	0.1	0.9	1.00	0.76	1.00	37.3
5	T1	1	0	1	0.0	0.018	25.9	LOS C	0.1	0.9	1.00	0.76	1.00	37.5
6	R2	1	0	1	0.0	0.018	30.9	LOS C	0.1	0.9	1.00	0.76	1.00	37.8
Approach		4	0	4	0.0	0.018	27.1	LOS C	0.1	0.9	1.00	0.76	1.00	37.3
North: Whitford-Maraetai Road														
7	L2	1	0	1	0.0	1.113	94.4	LOS F	39.7	282.7	1.00	2.46	4.28	22.0
8	T1	431	6	479	1.4	1.113	94.3	LOS F	39.7	282.7	1.00	2.46	4.28	22.2
9a	R1	16	0	18	0.0	1.113	98.3	LOS F	39.7	282.7	1.00	2.46	4.28	22.2
9	R2	70	5	78	7.1	1.113	99.7	LOS F	39.7	282.7	1.00	2.46	4.28	22.3
Approach		518	11	576	2.1	1.113	95.2	LOS F	39.7	282.7	1.00	2.46	4.28	22.2
West: Beachlands Road														
10	L2	83	3	92	3.6	0.755	5.9	LOS A	9.7	69.6	0.76	0.72	0.83	44.2
11	T1	2	1	2	50.0	0.755	6.9	LOS A	9.7	69.6	0.76	0.72	0.83	45.1
12	R2	766	23	851	3.0	0.755	10.7	LOS B	9.7	69.6	0.76	0.72	0.83	45.6
12b	R3	1	0	1	0.0	0.755	11.6	LOS B	9.7	69.6	0.76	0.72	0.83	46.1
Approach		852	27	947	3.2	0.755	10.2	LOS B	9.7	69.6	0.76	0.72	0.83	45.4
SouthWest: Kouka Road														
30b	L3	2	0	2	0.0	0.099	4.8	LOS A	0.5	3.8	0.53	0.66	0.53	44.2
30a	L1	13	1	14	7.7	0.099	4.3	LOS A	0.5	3.8	0.53	0.66	0.53	45.3
32a	R1	1	0	1	0.0	0.099	8.4	LOS A	0.5	3.8	0.53	0.66	0.53	45.5
32b	R3	74	1	82	1.4	0.099	10.4	LOS B	0.5	3.8	0.53	0.66	0.53	46.5
Approach		90	2	100	2.2	0.099	9.4	LOS A	0.5	3.8	0.53	0.66	0.53	46.3
All Vehicles		1773	83	1970	4.7	1.113	33.8	LOS C	39.7	282.7	0.75	1.17	1.74	35.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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 (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 2_N9D17fam [2_2038_BuildOut_AM (Site Folder: 2038 Buildout AM N9 D17f)]

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

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Jack Lachlan Drive														
5	T1	331	0.3	368	0.3	0.190	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
6	R2	13	23.1	14	23.1	0.020	9.5	LOS A	0.1	0.7	0.59	0.71	0.59	47.0
Approach		344	1.2	382	1.2	0.190	0.4	NA	0.1	0.7	0.02	0.03	0.02	59.3
North: Kahawairahi Drive														
7	L2	23	4.3	26	4.3	0.040	11.6	LOS B	0.1	1.0	0.57	0.94	0.57	46.1
9	R2	20	0.0	22	0.0	0.103	22.8	LOS C	0.3	2.3	0.82	1.00	0.82	40.2
Approach		43	2.3	48	2.3	0.103	16.8	LOS C	0.3	2.3	0.68	0.97	0.68	43.2
West: Jack Lachlan Drive														
10	L2	6	0.0	7	0.0	0.335	5.6	LOS A	0.0	0.0	0.00	0.01	0.00	58.1
11	T1	581	0.2	646	0.2	0.335	0.1	LOS A	0.0	0.0	0.00	0.01	0.00	59.7
Approach		587	0.2	652	0.2	0.335	0.2	NA	0.0	0.0	0.00	0.01	0.00	59.7
All Vehicles		974	0.6	1082	0.6	0.335	1.0	NA	0.3	2.3	0.04	0.06	0.04	58.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 3_N9D17fam [3_2038_BuildOut_AM (Site Folder: 2038 Buildout AM N9 D17f)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Whitford-Maraetai Road														
1	L2	238	3	264	1.3	0.202	9.3	LOS A	1.8	12.7	0.34	0.69	0.34	57.8
2	T1	261	43	290	16.5	0.361	25.2	LOS C	5.6	44.8	0.84	0.68	0.84	54.6
Approach		499	46	554	9.2	0.361	17.6	LOS B	5.6	44.8	0.60	0.69	0.60	56.0
North: Whitford-Maraetai Road														
8	T1	1194	41	1327	3.4	* 0.896	24.9	LOS C	34.6	249.5	0.79	0.80	0.92	56.8
9	R2	118	0	131	0.0	0.353	37.6	LOS D	4.5	31.7	0.90	0.78	0.90	43.1
Approach		1312	41	1458	3.1	0.896	26.0	LOS C	34.6	249.5	0.80	0.80	0.92	55.2
West: Jack Lachlan Drive														
10	L2	55	0	61	0.0	0.066	16.6	LOS B	1.2	8.5	0.54	0.69	0.54	53.1
12	R2	570	2	633	0.4	* 0.914	44.5	LOS D	17.7	124.6	0.91	0.93	1.15	37.1
Approach		625	2	694	0.3	0.914	42.0	LOS D	17.7	124.6	0.88	0.90	1.10	38.3
All Vehicles		2436	89	2707	3.7	0.914	28.4	LOS C	34.6	249.5	0.78	0.80	0.90	50.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
North: Whitford-Maraetai Road												
P3	Full	25	26	34.3	LOS D	0.1	0.1	0.93	0.93	202.3	218.5	1.08
West: Jack Lachlan Drive												
P4	Full	25	26	34.3	LOS D	0.1	0.1	0.93	0.93	199.8	215.2	1.08
All Pedestrians		0	53	34.3	LOS D	0.1	0.1	0.93	0.93	201.1	216.9	1.08

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 4_N9D17fam [4_2038_BuildOut_AM (Site Folder: 2038 Buildout AM N9 D17f)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 105 seconds (Site Optimum Cycle Time - Minimum Delay)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Trig Road														
1	L2	29	2	32	6.9	* 0.319	63.4	LOS E	1.7	12.6	0.99	0.72	0.99	28.5
3	R2	3	0	3	0.0	0.031	57.9	LOS E	0.2	1.2	0.97	0.63	0.97	30.2
Approach		32	2	36	6.3	0.319	62.9	LOS E	1.7	12.6	0.99	0.71	0.99	28.6
East: Whitford-Maraetai Road														
4	L2	1	0	1	0.0	0.543	11.7	LOS B	16.7	119.9	0.47	0.54	0.47	52.3
5	T1	1682	48	1869	2.9	* 0.849	12.2	LOS B	35.4	253.9	0.58	0.63	0.59	47.6
Approach		1683	48	1870	2.9	0.849	12.2	LOS B	35.4	253.9	0.58	0.63	0.59	47.6
West: Whitford-Maraetai Road														
11	T1	586	71	651	12.1	0.425	2.0	LOS A	7.8	60.1	0.26	0.24	0.26	53.3
12	R2	20	5	22	25.0	* 0.247	59.8	LOS E	1.2	10.0	0.99	0.71	0.99	28.2
Approach		606	76	673	12.5	0.425	3.9	LOS A	7.8	60.1	0.28	0.25	0.28	51.8
All Vehicles		2321	126	2579	5.4	0.849	10.7	LOS B	35.4	253.9	0.51	0.53	0.52	48.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

MOVEMENT SUMMARY

Site: 5_N9D17fam [5_2038_BuildOut_AM (Site Folder: 2038 Buildout AM N9 D17f)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Whitford Park Road														
1	L2	322	25	358	7.8	0.760	16.8	LOS B	8.4	62.8	1.00	1.50	1.53	18.3
2	T1	1	0	1	0.0	0.450	10.0	LOS A	2.9	22.5	0.89	1.02	1.03	26.1
3	R2	355	40	394	11.3	0.611	11.9	LOS B	5.0	38.8	0.94	1.15	1.17	18.8
Approach		678	65	753	9.6	0.760	14.3	LOS B	8.4	62.8	0.97	1.31	1.34	18.6
East: Whitford Maraetai Road														
4	L2	961	31	1068	3.2	1.139	73.0	LOS F	69.2	497.9	1.00	3.11	3.33	14.3
5	T1	756	14	840	1.9	0.872	7.4	LOS A	16.0	113.7	1.00	0.99	1.22	19.2
6	R2	1	0	1	0.0	0.872	7.4	LOS A	16.0	113.7	1.00	0.99	1.22	27.0
Approach		1718	45	1909	2.6	1.139	44.1	LOS D	69.2	497.9	1.00	2.18	2.40	16.1
North: Whitford Wharf Road														
7	L2	1	0	1	0.0	0.016	9.7	LOS A	0.1	0.4	0.62	0.77	0.62	26.5
8	T1	2	0	2	0.0	0.016	11.8	LOS B	0.1	0.4	0.62	0.77	0.62	26.5
9	R2	3	0	3	0.0	0.016	13.7	LOS B	0.1	0.4	0.62	0.77	0.62	26.5
Approach		6	0	7	0.0	0.016	12.4	LOS B	0.1	0.4	0.62	0.77	0.62	26.5
West: Whitford Road														
10	L2	6	0	7	0.0	0.315	3.0	LOS A	1.5	11.5	0.61	0.59	0.61	27.3
11	T1	287	34	319	11.8	0.491	3.7	LOS A	3.0	22.5	0.64	0.65	0.67	19.6
12	R2	174	11	193	6.3	0.491	3.6	LOS A	3.0	22.5	0.68	0.72	0.74	19.6
Approach		467	45	519	9.6	0.491	3.6	LOS A	3.0	22.5	0.65	0.67	0.70	19.7
All Vehicles		2869	155	3188	5.4	1.139	30.4	LOS C	69.2	497.9	0.93	1.73	1.87	17.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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 (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 6_N9D17fam [6_2038_BuildOut_AM (Site Folder: 2038 Buildout AM N9 D17f)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Whitford Park Road														
1	L2	226	6.6	251	6.6	0.517	15.1	LOS B	4.5	33.2	0.98	1.09	1.21	41.3
2	T1	466	7.1	518	7.1	0.782	23.0	LOS C	12.2	90.9	1.00	1.35	1.76	38.9
3	R2	1	0.0	1	0.0	0.782	27.2	LOS C	12.2	90.9	1.00	1.35	1.76	39.0
Approach		693	6.9	770	6.9	0.782	20.5	LOS C	12.2	90.9	0.99	1.27	1.58	39.6
East: Saleyard Road														
4	L2	1	0.0	1	0.0	0.027	19.3	LOS B	0.2	1.4	1.00	0.78	1.00	38.5
5	T1	1	0.0	1	0.0	0.027	19.3	LOS B	0.2	1.4	1.00	0.78	1.00	39.2
6	R2	5	0.0	6	0.0	0.027	23.8	LOS C	0.2	1.4	1.00	0.78	1.00	39.3
Approach		7	0.0	8	0.0	0.027	22.5	LOS C	0.2	1.4	1.00	0.78	1.00	39.2
North: Whitford Park Road														
7	L2	3	0.0	3	0.0	0.838	3.7	LOS A	18.4	133.0	0.67	0.48	0.67	44.7
8	T1	314	5.1	349	5.1	0.838	3.7	LOS A	18.4	133.0	0.67	0.48	0.67	45.7
9	R2	818	3.3	909	3.3	0.838	8.2	LOS A	18.4	133.0	0.67	0.48	0.67	45.8
Approach		1135	3.8	1261	3.8	0.838	7.0	LOS A	18.4	133.0	0.67	0.48	0.67	45.8
West: Sandstone Road														
10	L2	221	15.4	246	15.4	0.415	6.9	LOS A	3.0	24.5	0.82	0.82	0.82	45.3
11	T1	1	0.0	1	0.0	0.415	6.3	LOS A	3.0	24.5	0.82	0.82	0.82	46.5
12	R2	41	39.0	46	39.0	0.415	12.3	LOS B	3.0	24.5	0.82	0.82	0.82	46.1
Approach		263	19.0	292	19.0	0.415	7.7	LOS A	3.0	24.5	0.82	0.82	0.82	45.4
All Vehicles		2098	6.7	2331	6.7	0.838	11.6	LOS B	18.4	133.0	0.80	0.78	0.99	43.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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 (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 7_N9D17fam [7_2038_BuildOut_AM (Site Folder: 2038 Buildout AM N9 D17f)]

New Site
Site Category: (None)
Roundabout Metering

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Point View Drive														
1	L2	26	0	29	0.0	0.200	8.5	LOS A	0.7	4.7	0.83	0.91	0.83	44.1
2	T1	24	0	27	0.0	0.200	8.3	LOS A	0.7	4.7	0.83	0.91	0.83	45.1
3	R2	9	0	10	0.0	0.200	11.9	LOS B	0.7	4.7	0.83	0.91	0.83	44.9
Approach		59	0	66	0.0	0.200	8.9	LOS A	0.7	4.7	0.83	0.91	0.83	44.6
East: Whitford Road														
4	L2	2	0	2	0.0	1.002	20.5	LOS C	26.9	192.8	1.00	1.48	2.15	38.7
5	T1	905	27	1006	3.0	1.002	20.8	LOS C	26.9	192.8	1.00	1.48	2.15	39.2
6	R2	111	3	123	2.7	1.002	24.5	LOS C	26.9	192.8	1.00	1.48	2.15	39.2
Approach		1018	30	1131	2.9	1.002	21.2	LOS C	26.9	192.8	1.00	1.48	2.15	39.2
North: Somerville														
7	L2	107	2	119	1.9	1.024	80.3	LOS F	39.6	278.8	0.98	2.53	4.30	23.6
8	T1	85	1	94	1.2	1.024	80.1	LOS F	39.6	278.8	0.98	2.53	4.30	23.8
9	R2	232	0	258	0.0	1.024	83.7	LOS F	39.6	278.8	0.98	2.53	4.30	23.8
Approach		424	3	471	0.7	1.024	82.1	LOS F	39.6	278.8	0.98	2.53	4.30	23.7
West: Whitford Road														
10	L2	89	2	99	2.2	0.424	3.4	LOS A	1.4	10.6	0.32	0.44	0.32	46.5
11	T1	358	41	398	11.5	0.424	3.7	LOS A	1.4	10.6	0.32	0.44	0.32	47.2
12	R2	14	0	16	0.0	0.424	7.3	LOS A	1.4	10.6	0.32	0.44	0.32	47.3
Approach		461	43	512	9.3	0.424	3.8	LOS A	1.4	10.6	0.32	0.44	0.32	47.1
All Vehicles		1962	76	2180	3.9	1.024	29.9	LOS C	39.6	278.8	0.83	1.45	2.14	35.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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 (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 8_N9D17fam [8_2038_BuildOut_AM (Site Folder: 2038 Buildout AM N9 D17f)]

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

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Whitford-Maraetai Rd														
1	L2	100	0.0	111	0.0	0.060	4.5	LOS A	0.0	0.0	0.00	0.49	0.00	47.2
2	T1	524	13.5	582	13.5	0.325	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	49.8
Approach		624	11.4	693	11.4	0.325	0.8	LOS A	0.0	0.0	0.00	0.08	0.00	49.4
North: Whitford-Maraetai Rd														
8	T1	1730	2.5	1922	2.5	1.002	11.0	LOS B	0.0	0.0	0.00	0.00	0.00	38.5
Approach		1730	2.5	1922	2.5	1.002	11.0	NA	0.0	0.0	0.00	0.00	0.00	38.5
West: Access														
10	L2	31	0.0	34	0.0	0.019	4.5	LOS A	0.0	0.0	0.00	0.47	0.00	47.8
Approach		31	0.0	34	0.0	0.019	4.5	NA	0.0	0.0	0.00	0.47	0.00	47.8
All Vehicles		2385	4.8	2650	4.8	1.002	8.2	NA	0.0	0.0	0.00	0.03	0.00	41.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 1_N9D17fpm [1_2038_BuildOut_PM (Site Folder: 2038 Buildout PM N9 D17f)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Whitford-Maraetai Road														
1b	L3	66	0	73	0.0	0.942	12.9	LOS B	28.0	196.8	1.00	0.93	1.34	42.5
1	L2	739	7	821	0.9	0.942	12.7	LOS B	28.0	196.8	1.00	0.93	1.34	42.8
2	T1	289	0	321	0.0	0.942	12.5	LOS B	28.0	196.8	1.00	0.93	1.34	43.9
3	R2	1	0	1	0.0	0.942	17.5	LOS B	28.0	196.8	1.00	0.93	1.34	44.2
Approach		1095	7	1217	0.6	0.942	12.7	LOS B	28.0	196.8	1.00	0.93	1.34	43.1
East: Access														
4	L2	1	0	1	0.0	0.013	5.5	LOS A	0.1	0.5	0.63	0.57	0.63	45.5
4a	L1	2	0	2	0.0	0.013	5.1	LOS A	0.1	0.5	0.63	0.57	0.63	46.3
5	T1	3	0	3	0.0	0.013	5.4	LOS A	0.1	0.5	0.63	0.57	0.63	46.7
6	R2	4	0	4	0.0	0.013	10.4	LOS B	0.1	0.5	0.63	0.57	0.63	47.0
Approach		10	0	11	0.0	0.013	7.3	LOS A	0.1	0.5	0.63	0.57	0.63	46.6
North: Whitford-Maraetai Road														
7	L2	1	0	1	0.0	0.335	4.0	LOS A	2.3	16.2	0.53	0.56	0.53	45.8
8	T1	175	5	194	2.9	0.335	3.8	LOS A	2.3	16.2	0.53	0.56	0.53	46.9
9a	R1	50	0	56	0.0	0.335	7.8	LOS A	2.3	16.2	0.53	0.56	0.53	46.8
9	R2	120	1	133	0.8	0.335	8.8	LOS A	2.3	16.2	0.53	0.56	0.53	47.3
Approach		346	6	384	1.7	0.335	6.1	LOS A	2.3	16.2	0.53	0.56	0.53	47.0
West: Beachlands Road														
10	L2	143	2	159	1.4	0.390	5.2	LOS A	2.8	20.4	0.71	0.74	0.71	45.3
11	T1	3	0	3	0.0	0.390	5.0	LOS A	2.8	20.4	0.71	0.74	0.71	46.5
12	R2	175	16	194	9.1	0.390	10.3	LOS B	2.8	20.4	0.71	0.74	0.71	46.7
12b	R3	4	0	4	0.0	0.390	11.0	LOS B	2.8	20.4	0.71	0.74	0.71	47.4
Approach		325	18	361	5.5	0.390	8.0	LOS A	2.8	20.4	0.71	0.74	0.71	46.1
SouthWest: Kouka Road														
30b	L3	3	0	3	0.0	0.426	22.7	LOS C	3.7	25.9	1.00	1.06	1.13	37.7
30a	L1	64	0	71	0.0	0.426	22.0	LOS C	3.7	25.9	1.00	1.06	1.13	38.5
32a	R1	1	0	1	0.0	0.426	26.3	LOS C	3.7	25.9	1.00	1.06	1.13	38.7
32b	R3	35	0	39	0.0	0.426	28.2	LOS C	3.7	25.9	1.00	1.06	1.13	39.4
Approach		103	0	114	0.0	0.426	24.2	LOS C	3.7	25.9	1.00	1.06	1.13	38.8
All Vehicles		1879	31	2088	1.6	0.942	11.3	LOS B	28.0	196.8	0.86	0.83	1.06	44.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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 (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 2_N9D17fpm [2_2038_BuildOut_PM (Site Folder: 2038 Buildout PM N9 D17f)]

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

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Jack Lachlan Drive														
5	T1	393	0.3	437	0.3	0.226	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
6	R2	36	2.8	40	2.8	0.037	7.4	LOS A	0.2	1.1	0.49	0.65	0.49	48.4
Approach		429	0.5	477	0.5	0.226	0.7	NA	0.2	1.1	0.04	0.05	0.04	58.7
North: Kahawairahi Drive														
7	L2	19	10.5	21	10.5	0.026	10.2	LOS B	0.1	0.7	0.47	0.88	0.47	46.8
9	R2	8	0.0	9	0.0	0.032	18.4	LOS C	0.1	0.7	0.75	1.00	0.75	42.2
Approach		27	7.4	30	7.4	0.032	12.6	LOS B	0.1	0.7	0.56	0.92	0.56	45.3
West: Jack Lachlan Drive														
10	L2	32	0.0	36	0.0	0.246	5.6	LOS A	0.0	0.0	0.00	0.04	0.00	57.9
11	T1	397	0.8	441	0.8	0.246	0.1	LOS A	0.0	0.0	0.00	0.04	0.00	59.5
Approach		429	0.7	477	0.7	0.246	0.5	NA	0.0	0.0	0.00	0.04	0.00	59.3
All Vehicles		885	0.8	983	0.8	0.246	0.9	NA	0.2	1.1	0.04	0.08	0.04	58.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 3_N9D17fpm [3_2038_BuildOut_PM (Site Folder: 2038 Buildout PM N9 D17f)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Whitford-Maraetai Road														
1	L2	409	1	454	0.2	0.322	9.2	LOS A	3.5	24.5	0.35	0.70	0.35	57.9
2	T1	923	8	1026	0.9	* 0.636	13.6	LOS B	16.1	113.6	0.70	0.62	0.70	64.2
Approach		1332	9	1480	0.7	0.636	12.3	LOS B	16.1	113.6	0.59	0.65	0.59	62.4
North: Whitford-Maraetai Road														
8	T1	318	23	353	7.2	0.187	5.1	LOS A	3.4	25.0	0.39	0.32	0.39	73.2
9	R2	65	0	72	0.0	* 0.519	48.6	LOS D	2.9	20.6	1.00	0.76	1.01	38.9
Approach		383	23	426	6.0	0.519	12.5	LOS B	3.4	25.0	0.49	0.40	0.49	63.7
West: Jack Lachlan Drive														
10	L2	175	0	194	0.0	0.419	33.4	LOS C	6.5	45.5	0.88	0.80	0.88	44.1
12	R2	253	7	281	2.8	* 0.586	38.9	LOS D	7.0	49.9	0.95	0.79	0.95	38.0
Approach		428	7	476	1.6	0.586	36.7	LOS D	7.0	49.9	0.92	0.79	0.92	40.5
All Vehicles		2143	39	2381	1.8	0.636	17.2	LOS B	16.1	113.6	0.64	0.63	0.64	56.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
North: Whitford-Maraetai Road												
P3	Full	25	26	34.3	LOS D	0.1	0.1	0.93	0.93	202.3	218.5	1.08
West: Jack Lachlan Drive												
P4	Full	25	26	34.3	LOS D	0.1	0.1	0.93	0.93	199.8	215.2	1.08
All Pedestrians		0	53	34.3	LOS D	0.1	0.1	0.93	0.93	201.1	216.9	1.08

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 4_N9D17fpm [4_2038_BuildOut_PM (Site Folder: 2038 Buildout PM N9 D17f)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site Optimum Cycle Time - Minimum Delay)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Trig Road														
1	L2	15	0.0	17	0.0	* 0.209	79.5	LOS E	1.2	8.2	1.00	0.69	1.00	24.9
3	R2	9	0.0	10	0.0	0.126	78.7	LOS E	0.7	4.9	0.99	0.67	0.99	25.8
Approach		24	0.0	27	0.0	0.209	79.2	LOS E	1.2	8.2	0.99	0.69	0.99	25.2
East: Whitford-Maraetai Road														
4	L2	6	16.7	7	16.7	0.183	9.7	LOS A	4.4	33.0	0.27	0.39	0.27	53.2
5	T1	609	7.9	677	7.9	0.286	5.4	LOS A	7.7	57.2	0.29	0.40	0.29	50.6
Approach		615	8.0	683	8.0	0.286	5.4	LOS A	7.7	57.2	0.29	0.40	0.29	50.6
West: Whitford-Maraetai Road														
11	T1	1430	0.8	1589	0.8	* 0.942	11.3	LOS B	74.4	524.1	0.70	0.70	0.73	46.9
12	R2	29	3.4	32	3.4	0.277	74.8	LOS E	2.2	15.8	0.99	0.73	0.99	25.4
Approach		1459	0.8	1621	0.8	0.942	12.6	LOS B	74.4	524.1	0.70	0.70	0.73	46.2
All Vehicles		2098	2.9	2331	2.9	0.942	11.3	LOS B	74.4	524.1	0.58	0.61	0.61	46.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

MOVEMENT SUMMARY

Site: 5_N9D17fpm [5_2038_BuildOut_PM (Site Folder: 2038 Buildout PM N9 D17f)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Whitford Park Road														
1	L2	225	5	250	2.2	0.351	3.0	LOS A	1.9	13.4	0.59	0.52	0.59	19.7
2	T1	8	0	9	0.0	0.439	2.6	LOS A	2.6	18.6	0.62	0.54	0.62	27.6
3	R2	825	10	917	1.2	0.596	4.1	LOS A	4.9	34.9	0.68	0.63	0.73	19.7
Approach		1058	15	1176	1.4	0.596	3.8	LOS A	4.9	34.9	0.66	0.61	0.70	19.7
East: Whitford Maraetai Road														
4	L2	353	40	392	11.3	0.471	1.9	LOS A	3.1	23.9	0.57	0.43	0.57	19.7
5	T1	322	20	358	6.2	0.423	1.7	LOS A	2.7	19.7	0.54	0.41	0.54	19.8
6	R2	1	0	1	0.0	0.423	1.6	LOS A	2.7	19.7	0.54	0.41	0.54	28.1
Approach		676	60	751	8.9	0.471	1.8	LOS A	3.1	23.9	0.56	0.42	0.56	19.8
North: Whitford Wharf Road														
7	L2	10	0	11	0.0	0.124	17.7	LOS B	0.5	3.3	0.82	0.92	0.82	25.3
8	T1	11	0	12	0.0	0.124	18.7	LOS B	0.5	3.3	0.82	0.92	0.82	25.3
9	R2	5	0	6	0.0	0.124	20.6	LOS C	0.5	3.3	0.82	0.92	0.82	25.3
Approach		26	0	29	0.0	0.124	18.7	LOS B	0.5	3.3	0.82	0.92	0.82	25.3
West: Whitford Road														
10	L2	5	0	6	0.0	0.806	15.9	LOS B	6.4	45.1	0.89	1.39	1.54	25.0
11	T1	658	3	731	0.5	1.255	77.6	LOS F	51.7	368.3	0.95	3.89	4.62	14.1
12	R2	217	10	241	4.6	1.255	128.7	LOS F	51.7	368.3	1.00	6.03	7.24	11.8
Approach		880	13	978	1.5	1.255	89.8	LOS F	51.7	368.3	0.96	4.41	5.25	13.5
All Vehicles		2640	88	2933	3.3	1.255	32.1	LOS C	51.7	368.3	0.74	1.83	2.18	17.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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 (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 6_N9D17fpm [6_2038_BuildOut_PM (Site Folder: 2038 Buildout PM N9 D17f)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Whitford Park Road														
1	L2	54	25.9	60	25.9	0.083	5.6	LOS A	0.4	3.7	0.52	0.57	0.52	46.2
2	T1	457	2.2	508	2.2	0.394	4.2	LOS A	3.0	21.2	0.58	0.48	0.58	47.2
3	R2	1	0.0	1	0.0	0.394	8.7	LOS A	3.0	21.2	0.58	0.48	0.58	47.4
Approach		512	4.7	569	4.7	0.394	4.4	LOS A	3.0	21.2	0.57	0.49	0.57	47.1
East: Saleyard Road														
4	L2	1	0.0	1	0.0	0.007	8.0	LOS A	0.0	0.3	0.79	0.62	0.79	44.0
5	T1	1	0.0	1	0.0	0.007	8.0	LOS A	0.0	0.3	0.79	0.62	0.79	44.9
6	R2	2	0.0	2	0.0	0.007	12.5	LOS B	0.0	0.3	0.79	0.62	0.79	45.1
Approach		4	0.0	4	0.0	0.007	10.2	LOS B	0.0	0.3	0.79	0.62	0.79	44.8
North: Whitford Park Road														
7	L2	1	0.0	1	0.0	0.569	4.4	LOS A	5.3	40.3	0.67	0.59	0.67	45.2
8	T1	325	10.2	361	10.2	0.569	4.5	LOS A	5.3	40.3	0.67	0.59	0.67	46.2
9	R2	249	8.0	277	8.0	0.569	9.0	LOS A	5.3	40.3	0.67	0.59	0.67	46.3
Approach		575	9.2	639	9.2	0.569	6.5	LOS A	5.3	40.3	0.67	0.59	0.67	46.2
West: Sandstone Road														
10	L2	604	1.3	671	1.3	0.986	34.0	LOS C	30.6	216.6	1.00	1.75	2.59	33.9
11	T1	2	0.0	2	0.0	0.986	33.8	LOS C	30.6	216.6	1.00	1.75	2.59	34.5
12	R2	183	1.1	203	1.1	0.986	38.4	LOS D	30.6	216.6	1.00	1.75	2.59	34.6
Approach		789	1.3	877	1.3	0.986	35.0	LOS C	30.6	216.6	1.00	1.75	2.59	34.0
All Vehicles		1880	4.6	2089	4.6	0.986	17.9	LOS B	30.6	216.6	0.78	1.05	1.45	40.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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 (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 7_N9D17fpm [7_2038_BuildOut_PM (Site Folder: 2038 Buildout PM N9 D17f)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Point View Drive														
1	L2	41	1	46	2.4	0.314	9.4	LOS A	2.1	14.8	0.83	0.85	0.83	43.8
2	T1	120	0	133	0.0	0.314	9.1	LOS A	2.1	14.8	0.83	0.85	0.83	44.8
3	R2	17	0	19	0.0	0.314	12.7	LOS B	2.1	14.8	0.83	0.85	0.83	44.6
Approach		178	1	198	0.6	0.314	9.5	LOS A	2.1	14.8	0.83	0.85	0.83	44.5
East: Whitford Road														
4	L2	6	0	7	0.0	0.564	4.7	LOS A	5.1	37.3	0.62	0.59	0.62	45.4
5	T1	463	28	514	6.0	0.564	5.0	LOS A	5.1	37.3	0.62	0.59	0.62	46.1
6	R2	118	2	131	1.7	0.564	8.6	LOS A	5.1	37.3	0.62	0.59	0.62	46.1
Approach		587	30	652	5.1	0.564	5.7	LOS A	5.1	37.3	0.62	0.59	0.62	46.1
North: Somerville														
7	L2	174	0	193	0.0	0.796	29.0	LOS C	10.1	70.7	1.00	1.31	1.71	35.2
8	T1	33	0	37	0.0	0.796	28.9	LOS C	10.1	70.7	1.00	1.31	1.71	35.8
9	R2	95	1	106	1.1	0.796	32.5	LOS C	10.1	70.7	1.00	1.31	1.71	35.7
Approach		302	1	336	0.3	0.796	30.1	LOS C	10.1	70.7	1.00	1.31	1.71	35.4
West: Whitford Road														
10	L2	198	0	220	0.0	1.004	29.8	LOS C	39.6	281.6	1.00	1.48	2.14	35.3
11	T1	764	18	849	2.4	1.004	30.1	LOS C	39.6	281.6	1.00	1.48	2.14	35.8
12	R2	43	1	48	2.3	1.004	33.8	LOS C	39.6	281.6	1.00	1.48	2.14	35.8
Approach		1005	19	1117	1.9	1.004	30.2	LOS C	39.6	281.6	1.00	1.48	2.14	35.7
All Vehicles		2072	51	2302	2.5	1.004	21.5	LOS C	39.6	281.6	0.88	1.15	1.53	38.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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 (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 8_N9D17fpm [8_2038_BuildOut_PM (Site Folder: 2038 Buildout PM N9 D17f)]

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

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Whitford-Maraetai Rd														
1	L2	136	0.0	151	0.0	0.081	4.5	LOS A	0.0	0.0	0.00	0.49	0.00	47.2
2	T1	1328	0.8	1476	0.8	0.761	0.8	LOS A	0.0	0.0	0.00	0.00	0.00	49.0
Approach		1464	0.8	1627	0.8	0.761	1.2	LOS A	0.0	0.0	0.00	0.05	0.00	48.8
North: Whitford-Maraetai Rd														
8	T1	545	5.3	606	5.3	0.321	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	49.8
Approach		545	5.3	606	5.3	0.321	0.1	NA	0.0	0.0	0.00	0.00	0.00	49.8
West: Access														
10	L2	70	0.0	78	0.0	0.042	7.1	LOS A	0.0	0.0	0.00	0.47	0.00	47.8
Approach		70	0.0	78	0.0	0.042	7.1	NA	0.0	0.0	0.00	0.47	0.00	47.8
All Vehicles		2079	1.9	2310	1.9	0.761	1.1	NA	0.0	0.0	0.00	0.05	0.00	49.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 1_N10D18am [1_2051_BuildOut_AM (Site Folder: 2051 Buildout AM N10 D18a)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Whitford-Maraetai Road														
1b	L3	15	0	17	0.0	0.291	3.3	LOS A	2.2	16.7	0.36	0.40	0.36	47.0
1	L2	218	20	242	9.2	0.291	3.1	LOS A	2.2	16.7	0.36	0.40	0.36	47.4
2	T1	90	11	100	12.2	0.291	3.0	LOS A	2.2	16.7	0.36	0.40	0.36	48.7
3	R2	13	12	14	92.3	0.291	9.1	LOS A	2.2	16.7	0.36	0.40	0.36	48.0
3u	U	1	0	1	0.0	0.291	9.9	LOS A	2.2	16.7	0.36	0.40	0.36	50.3
Approach		337	43	374	12.8	0.291	3.3	LOS A	2.2	16.7	0.36	0.40	0.36	47.8
East: Access														
4	L2	1	0	1	0.0	0.011	13.5	LOS B	0.1	0.4	0.83	0.72	0.83	42.8
4a	L1	1	0	1	0.0	0.011	11.4	LOS B	0.1	0.4	0.83	0.72	0.83	43.5
5	T1	1	0	1	0.0	0.011	11.6	LOS B	0.1	0.4	0.83	0.72	0.83	43.8
6	R2	1	0	1	0.0	0.011	16.7	LOS B	0.1	0.4	0.83	0.72	0.83	44.2
Approach		4	0	4	0.0	0.011	13.3	LOS B	0.1	0.4	0.83	0.72	0.83	43.6
North: Whitford-Maraetai Road														
7	L2	1	0	1	0.0	0.359	10.5	LOS B	2.7	18.9	0.95	0.93	0.95	44.1
8	T1	450	6	500	1.3	0.582	12.7	LOS B	6.6	47.4	0.98	1.02	1.16	43.9
9a	R1	15	0	17	0.0	0.582	17.1	LOS B	6.6	47.4	1.00	1.08	1.28	43.1
9	R2	67	4	74	6.0	0.582	18.3	LOS B	6.6	47.4	1.00	1.08	1.28	43.5
Approach		533	10	592	1.9	0.582	13.5	LOS B	6.6	47.4	0.98	1.03	1.18	43.9
West: Beachlands Road														
10	L2	81	3	90	3.7	0.743	5.8	LOS A	9.2	66.3	0.75	0.72	0.82	44.2
11	T1	2	1	2	50.0	0.743	6.9	LOS A	9.2	66.3	0.75	0.72	0.82	45.1
12	R2	749	22	832	2.9	0.743	10.8	LOS B	9.2	66.3	0.75	0.72	0.82	45.6
12b	R3	1	0	1	0.0	0.743	11.5	LOS B	9.2	66.3	0.75	0.72	0.82	46.1
Approach		833	26	926	3.1	0.743	10.3	LOS B	9.2	66.3	0.75	0.72	0.82	45.5
SouthWest: Kouka Road														
30b	L3	2	0	2	0.0	0.099	5.0	LOS A	0.5	3.9	0.55	0.67	0.55	44.2
30a	L1	13	1	14	7.7	0.099	4.5	LOS A	0.5	3.9	0.55	0.67	0.55	45.2
32a	R1	1	0	1	0.0	0.099	8.6	LOS A	0.5	3.9	0.55	0.67	0.55	45.5
32b	R3	72	1	80	1.4	0.099	10.7	LOS B	0.5	3.9	0.55	0.67	0.55	46.5
Approach		88	2	98	2.3	0.099	9.6	LOS A	0.5	3.9	0.55	0.67	0.55	46.2
All Vehicles		1795	81	1994	4.5	0.743	9.9	LOS A	9.2	66.3	0.74	0.75	0.82	45.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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 (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 2_N10D18am [2_2051_BuildOut_AM (Site Folder: 2051 Buildout AM N10 D18a)]

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

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Jack Lachlan Drive														
5	T1	99	1.0	110	1.0	0.057	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
6	R2	13	23.1	14	23.1	0.016	8.1	LOS A	0.1	0.5	0.51	0.64	0.51	47.8
Approach		112	3.6	124	3.6	0.057	0.9	NA	0.1	0.5	0.06	0.07	0.06	58.3
North: Kahawairahi Drive														
7	L2	22	4.5	24	4.5	0.030	10.1	LOS B	0.1	0.8	0.49	0.89	0.49	46.9
9	R2	19	0.0	21	0.0	0.046	12.7	LOS B	0.2	1.1	0.59	0.95	0.59	45.0
Approach		41	2.4	46	2.4	0.046	11.3	LOS B	0.2	1.1	0.53	0.92	0.53	46.0
West: Jack Lachlan Drive														
10	L2	6	0.0	7	0.0	0.250	5.6	LOS A	0.0	0.0	0.00	0.01	0.00	58.2
11	T1	432	0.2	480	0.2	0.250	0.1	LOS A	0.0	0.0	0.00	0.01	0.00	59.8
Approach		438	0.2	487	0.2	0.250	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.8
All Vehicles		591	1.0	657	1.0	0.250	1.1	NA	0.2	1.1	0.05	0.08	0.05	58.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 3_N10D18am [3_2051_BuildOut_AM (Site Folder: 2051 Buildout AM N10 D18a)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Whitford-Maraetai Road														
1	L2	203	3	226	1.5	0.170	9.2	LOS A	1.5	10.6	0.33	0.69	0.33	57.9
2	T1	292	43	324	14.7	0.314	20.3	LOS C	5.6	44.4	0.76	0.62	0.76	58.3
Approach		495	46	550	9.3	0.314	15.8	LOS B	5.6	44.4	0.58	0.65	0.58	58.1
North: Whitford-Maraetai Road														
8	T1	1203	40	1337	3.3	* 0.606	9.9	LOS A	17.0	122.1	0.65	0.58	0.65	67.6
9	R2	101	0	112	0.0	0.322	38.2	LOS D	3.9	27.3	0.91	0.78	0.91	42.9
Approach		1304	40	1449	3.1	0.606	12.1	LOS B	17.0	122.1	0.67	0.60	0.67	64.7
West: Jack Lachlan Drive														
10	L2	41	0	46	0.0	0.058	20.0	LOS C	1.0	7.3	0.62	0.69	0.62	50.9
12	R2	434	2	482	0.5	* 0.606	35.1	LOS D	8.5	59.5	0.93	0.81	0.93	39.8
Approach		475	2	528	0.4	0.606	33.8	LOS C	8.5	59.5	0.90	0.80	0.90	40.7
All Vehicles		2274	88	2527	3.9	0.606	17.4	LOS B	17.0	122.1	0.70	0.65	0.70	57.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
North: Whitford-Maraetai Road												
P3	Full	25	26	34.3	LOS D	0.1	0.1	0.93	0.93	202.3	218.5	1.08
West: Jack Lachlan Drive												
P4	Full	25	26	34.3	LOS D	0.1	0.1	0.93	0.93	199.8	215.2	1.08
All Pedestrians		0	53	34.3	LOS D	0.1	0.1	0.93	0.93	201.1	216.9	1.08

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 4_N10D18am [4_2051_BuildOut_AM (Site Folder: 2051 Buildout AM N10 D18a)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site Practical Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Whitford-Maraetai Road														
4a	L1	678	0	714	0.0	0.373	3.8	LOS A	0.0	0.0	0.00	0.50	0.00	46.9
5	T1	1137	20	1263	1.8	* 0.904	21.5	LOS C	49.6	352.6	0.87	0.96	1.01	41.3
Approach		1815	20	1977	1.1	0.904	15.1	LOS B	49.6	352.6	0.56	0.79	0.65	43.2
West: Whitford-Maraetai Road														
11	T1	317	31	352	9.8	0.265	4.0	LOS A	4.6	35.0	0.36	0.32	0.36	51.8
Approach		317	31	352	9.8	0.265	4.0	LOS A	4.6	35.0	0.36	0.32	0.36	51.8
SouthWest: Trig Rd														
30b	L3	28	2	29	7.1	0.088	22.6	LOS C	0.8	5.7	0.72	0.70	0.72	38.7
32a	R1	222	43	234	19.4	* 0.827	45.8	LOS D	7.6	62.3	0.99	0.92	1.22	30.4
Approach		250	45	263	18.0	0.827	43.2	LOS D	7.6	62.3	0.96	0.89	1.17	31.2
All Vehicles		2382	96	2592	4.0	0.904	16.4	LOS B	49.6	352.6	0.57	0.74	0.66	42.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
West: Whitford-Maraetai Road												
P4	Full	50	53	34.3	LOS D	0.1	0.1	0.93	0.93	194.8	208.6	1.07
SouthWest: Trig Rd												
P8	Full	50	53	34.3	LOS D	0.1	0.1	0.93	0.93	198.8	213.9	1.08
All Pedestrians		50	105	34.3	LOS D	0.1	0.1	0.93	0.93	196.8	211.3	1.07

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 5_N10D18am [5_2051_BuildOut_AM (Site Folder: 2051 Buildout AM N10 D18a)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Whitford Park Road														
1	L2	315	25	350	7.9	0.843	25.7	LOS C	10.5	78.6	1.00	1.74	1.80	17.5
2	T1	1	0	1	0.0	0.138	10.1	LOS B	0.7	4.8	0.83	0.83	0.83	26.1
3	R2	68	0	76	0.0	0.187	10.3	LOS B	0.9	6.6	0.83	0.83	0.83	19.0
Approach		384	25	427	6.5	0.843	23.0	LOS C	10.5	78.6	0.97	1.58	1.63	17.8
East: Whitford Maraetai Road														
4	L2	341	3	379	0.9	0.535	2.9	LOS A	3.5	24.4	0.57	0.48	0.59	19.7
5	T1	829	13	921	1.6	1.019	28.7	LOS C	37.2	264.2	1.00	1.74	1.98	17.3
6	R2	1	0	1	0.0	1.019	28.6	LOS C	37.2	264.2	1.00	1.74	1.98	23.4
Approach		1171	16	1301	1.4	1.019	21.2	LOS C	37.2	264.2	0.88	1.37	1.57	17.9
North: Whitford Wharf Road														
7	L2	1	0	1	0.0	0.012	8.0	LOS A	0.0	0.3	0.52	0.70	0.52	26.8
8	T1	2	0	2	0.0	0.012	10.1	LOS B	0.0	0.3	0.52	0.70	0.52	26.8
9	R2	3	0	3	0.0	0.012	12.0	LOS B	0.0	0.3	0.52	0.70	0.52	26.8
Approach		6	0	7	0.0	0.012	10.7	LOS B	0.0	0.3	0.52	0.70	0.52	26.8
West: Whitford Road														
10	L2	6	0	7	0.0	0.210	0.5	LOS A	1.1	8.3	0.28	0.15	0.28	27.8
11	T1	306	34	340	11.1	0.328	0.6	LOS A	2.0	14.8	0.29	0.14	0.29	19.9
12	R2	171	11	190	6.4	0.328	0.5	LOS A	2.0	14.8	0.30	0.12	0.30	19.9
Approach		483	45	537	9.3	0.328	0.6	LOS A	2.0	14.8	0.29	0.13	0.29	19.9
All Vehicles		2044	86	2271	4.2	1.019	16.6	LOS B	37.2	264.2	0.75	1.12	1.28	18.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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 (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 6_N10D18am [6_2051_BuildOut_AM (Site Folder: 2051 Buildout AM N10 D18a)]

New Site
Site Category: (None)
Roundabout Metering

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Whitford Park Road														
1	L2	222	6.8	247	6.8	0.508	7.5	LOS A	2.5	18.2	0.77	0.91	0.87	45.2
2	T1	398	6.8	442	6.8	0.826	12.0	LOS B	7.7	57.4	0.96	1.17	1.44	43.6
3	R2	79	7.6	88	7.6	0.826	16.5	LOS B	7.7	57.4	0.96	1.17	1.44	43.7
Approach		699	6.9	777	6.9	0.826	11.1	LOS B	7.7	57.4	0.90	1.09	1.26	44.1
East: Saleyard Road														
4	L2	1	0.0	1	0.0	0.846	7.8	LOS A	9.5	68.6	0.93	1.02	1.21	45.0
5	T1	712	3.8	791	3.8	0.846	7.8	LOS A	9.5	68.6	0.93	1.02	1.21	46.0
6	R2	1	0.0	1	0.0	0.846	12.2	LOS B	9.5	68.6	0.93	1.02	1.21	46.2
Approach		714	3.8	793	3.8	0.846	7.8	LOS A	9.5	68.6	0.93	1.02	1.21	46.0
North: Whitford Park Road														
7	L2	3	0.0	3	0.0	0.518	12.0	LOS B	4.1	30.1	0.90	0.95	0.93	43.1
8	T1	339	4.7	377	4.7	0.875	18.7	LOS B	14.4	102.6	0.96	1.14	1.36	40.3
9	R2	171	0.0	190	0.0	0.875	28.8	LOS C	14.4	102.6	1.00	1.29	1.71	37.8
Approach		513	3.1	570	3.1	0.875	22.0	LOS C	14.4	102.6	0.97	1.19	1.48	39.4
West: Sandstone Road														
10	L2	1	0.0	1	0.0	0.469	5.4	LOS A	2.4	19.4	0.70	0.67	0.75	45.6
11	T1	227	15.0	252	15.0	0.469	5.5	LOS A	2.4	19.4	0.70	0.67	0.75	46.5
12	R2	40	40.0	44	40.0	0.469	10.2	LOS B	2.4	19.4	0.70	0.67	0.75	46.3
Approach		268	18.7	298	18.7	0.469	6.2	LOS A	2.4	19.4	0.70	0.67	0.75	46.5
All Vehicles		2194	6.4	2438	6.4	0.875	12.0	LOS B	14.4	102.6	0.90	1.04	1.23	43.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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 (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 7_N10D18am [7_2051_BuildOut_AM (Site Folder: 2051 Buildout AM N10 D18a)]

New Site
Site Category: (None)
Roundabout Metering

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Point View Drive														
1	L2	25	0	28	0.0	0.210	8.7	LOS A	0.7	4.6	0.84	0.92	0.84	44.0
2	T1	23	0	26	0.0	0.210	8.5	LOS A	0.7	4.6	0.84	0.92	0.84	45.0
3	R2	9	0	10	0.0	0.210	12.1	LOS B	0.7	4.6	0.84	0.92	0.84	44.8
Approach		57	0	63	0.0	0.210	9.2	LOS A	0.7	4.6	0.84	0.92	0.84	44.5
East: Whitford Road														
4	L2	3	0	3	0.0	1.021	23.1	LOS C	30.5	218.8	1.00	1.56	2.31	37.7
5	T1	966	27	1073	2.8	1.021	23.3	LOS C	30.5	218.8	1.00	1.56	2.31	38.2
6	R2	118	3	131	2.5	1.021	27.0	LOS C	30.5	218.8	1.00	1.56	2.31	38.2
Approach		1087	30	1208	2.8	1.021	23.7	LOS C	30.5	218.8	1.00	1.56	2.31	38.2
North: Somerville														
7	L2	110	2	122	1.8	1.102	133.3	LOS F	54.8	385.6	0.90	3.53	6.56	17.6
8	T1	84	1	93	1.2	1.102	133.1	LOS F	54.8	385.6	0.90	3.53	6.56	17.8
9	R2	227	0	252	0.0	1.102	136.7	LOS F	54.8	385.6	0.90	3.53	6.56	17.7
Approach		421	3	468	0.7	1.102	135.1	LOS F	54.8	385.6	0.90	3.53	6.56	17.7
West: Whitford Road														
10	L2	88	2	98	2.3	0.434	3.5	LOS A	1.5	11.3	0.34	0.44	0.34	46.5
11	T1	368	40	409	10.9	0.434	3.7	LOS A	1.5	11.3	0.34	0.44	0.34	47.2
12	R2	13	0	14	0.0	0.434	7.3	LOS A	1.5	11.3	0.34	0.44	0.34	47.3
Approach		469	42	521	9.0	0.434	3.8	LOS A	1.5	11.3	0.34	0.44	0.34	47.1
All Vehicles		2034	75	2260	3.7	1.102	41.8	LOS D	54.8	385.6	0.82	1.69	2.69	32.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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 (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 8_N10D18am [8_2051_BuildOut_AM (Site Folder: 2051 Buildout AM N10 D18a)]

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

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Whitford-Maraetai Rd														
1	L2	41	0.0	46	0.0	0.025	4.5	LOS A	0.0	0.0	0.00	0.49	0.00	47.2
2	T1	521	13.6	579	13.6	0.162	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
Approach		562	12.6	624	12.6	0.162	0.4	LOS A	0.0	0.0	0.00	0.04	0.00	49.7
North: Whitford-Maraetai Rd														
8	T1	1638	2.6	1820	2.6	0.475	0.2	LOS A	0.0	0.0	0.00	0.00	0.00	49.7
Approach		1638	2.6	1820	2.6	0.475	0.2	NA	0.0	0.0	0.00	0.00	0.00	49.7
West: Access														
10	L2	31	0.0	34	0.0	0.019	4.5	LOS A	0.0	0.0	0.00	0.47	0.00	47.8
Approach		31	0.0	34	0.0	0.019	4.5	NA	0.0	0.0	0.00	0.47	0.00	47.8
All Vehicles		2231	5.1	2479	5.1	0.475	0.3	NA	0.0	0.0	0.00	0.02	0.00	49.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 9_N10D18am [9_2051_BuildOut_AM (Site Folder: 2051 Buildout AM N10 D18a)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 42 seconds (Site Optimum Cycle Time - Minimum Delay)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Whitford-Maraetai Road														
1	L2	120	0	133	0.0	0.130	11.2	LOS B	0.8	5.5	0.53	0.72	0.53	55.9
2	T1	511	71	568	13.9	0.556	14.5	LOS B	5.2	40.9	0.90	0.75	0.90	75.0
Approach		631	71	701	11.3	0.556	13.9	LOS B	5.2	40.9	0.83	0.74	0.83	70.9
North: Whitford-Maraetai Road														
8	T1	1561	43	1734	2.8	*0.731	7.2	LOS A	13.5	96.8	0.75	0.70	0.80	85.7
9	R2	183	0	203	0.0	0.511	24.5	LOS C	3.9	27.5	0.93	0.80	0.93	50.1
Approach		1744	43	1938	2.5	0.731	9.0	LOS A	13.5	96.8	0.77	0.71	0.81	79.7
West: 650 Access														
10	L2	36	0	40	0.0	0.720	25.6	LOS C	4.6	32.2	1.00	0.92	1.24	44.7
12	R2	321	0	357	0.0	*0.720	25.9	LOS C	4.6	32.2	1.00	0.92	1.25	42.9
Approach		357	0	397	0.0	0.720	25.9	LOS C	4.6	32.2	1.00	0.92	1.25	43.1
All Vehicles		2732	114	3036	4.2	0.731	12.4	LOS B	13.5	96.8	0.81	0.75	0.87	70.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
West: 650 Access												
P4	Full	50	53	15.5	LOS B	0.1	0.1	0.86	0.86	180.0	213.9	1.19
All Pedestrians		0	53	15.5	LOS B	0.1	0.1	0.86	0.86	180.0	213.9	1.19

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 1_N10D18pm [1_2051_BuildOut_PM (Site Folder: 2051 Buildout PM N10 D18a)]

New Site
Site Category: (None)
Roundabout Metering

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Whitford-Maraetai Road														
1b	L3	68	0	76	0.0	0.888	3.3	LOS A	5.6	39.4	0.64	0.42	0.64	46.2
1	L2	774	7	860	0.9	0.888	3.1	LOS A	5.6	39.4	0.64	0.42	0.64	46.7
2	T1	304	0	338	0.0	0.888	2.9	LOS A	5.6	39.4	0.64	0.42	0.64	47.9
3	R2	1	0	1	0.0	0.888	7.9	LOS A	5.6	39.4	0.64	0.42	0.64	48.3
3u	U	4	0	4	0.0	0.888	9.9	LOS A	5.6	39.4	0.64	0.42	0.64	49.4
Approach		1151	7	1279	0.6	0.888	3.1	LOS A	5.6	39.4	0.64	0.42	0.64	47.0
East: Access														
4	L2	1	0	1	0.0	0.013	3.3	LOS A	0.0	0.2	0.41	0.52	0.41	46.4
4a	L1	2	0	2	0.0	0.013	2.8	LOS A	0.0	0.2	0.41	0.52	0.41	47.1
5	T1	3	0	3	0.0	0.013	3.1	LOS A	0.0	0.2	0.41	0.52	0.41	47.5
6	R2	4	0	4	0.0	0.013	8.1	LOS A	0.0	0.2	0.41	0.52	0.41	47.9
Approach		10	0	11	0.0	0.013	5.0	LOS A	0.0	0.2	0.41	0.52	0.41	47.5
North: Whitford-Maraetai Road														
7	L2	1	0	1	0.0	0.484	11.2	LOS B	2.6	18.6	0.93	0.97	1.00	43.8
8	T1	207	4	230	1.9	0.785	12.2	LOS B	6.4	45.3	0.96	1.07	1.24	43.6
9a	R1	49	0	54	0.0	0.785	18.0	LOS B	6.4	45.3	1.00	1.21	1.58	41.7
9	R2	117	1	130	0.9	0.785	19.0	LOS B	6.4	45.3	1.00	1.21	1.58	42.1
Approach		374	5	416	1.3	0.785	15.1	LOS B	6.4	45.3	0.98	1.13	1.39	42.9
West: Beachlands Road														
10	L2	140	2	156	1.4	0.361	3.5	LOS A	1.3	9.5	0.50	0.63	0.51	45.8
11	T1	3	0	3	0.0	0.361	3.3	LOS A	1.3	9.5	0.50	0.63	0.51	47.0
12	R2	172	16	191	9.3	0.361	8.4	LOS A	1.3	9.5	0.50	0.63	0.51	47.2
12b	R3	4	0	4	0.0	0.361	9.3	LOS A	1.3	9.5	0.50	0.63	0.51	47.9
Approach		319	18	354	5.6	0.361	6.2	LOS A	1.3	9.5	0.50	0.63	0.51	46.6
SouthWest: Kouka Road														
30b	L3	3	0	3	0.0	0.273	6.2	LOS A	0.7	5.2	0.82	0.82	0.86	44.8
30a	L1	62	0	69	0.0	0.273	5.5	LOS A	0.7	5.2	0.82	0.82	0.86	45.9
32a	R1	1	0	1	0.0	0.273	9.8	LOS A	0.7	5.2	0.82	0.82	0.86	46.2
32b	R3	32	0	36	0.0	0.273	11.7	LOS B	0.7	5.2	0.82	0.82	0.86	47.2
Approach		98	0	109	0.0	0.273	7.6	LOS A	0.7	5.2	0.82	0.82	0.86	46.3
All Vehicles		1952	30	2169	1.5	0.888	6.1	LOS A	6.4	45.3	0.69	0.61	0.77	46.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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 (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 2_N10D18pm [2_2051_BuildOut_PM (Site Folder: 2051 Buildout PM N10 D18a)]

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

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Jack Lachlan Drive														
5	T1	76	1.3	84	1.3	0.044	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
6	R2	36	2.8	40	2.8	0.032	6.8	LOS A	0.1	1.0	0.42	0.60	0.42	48.6
Approach		112	1.8	124	1.8	0.044	2.2	NA	0.1	1.0	0.13	0.19	0.13	55.8
North: Kahawairahi Drive														
7	L2	18	11.1	20	11.1	0.021	9.4	LOS A	0.1	0.6	0.40	0.87	0.40	47.1
9	R2	8	0.0	9	0.0	0.015	10.6	LOS B	0.1	0.4	0.51	0.87	0.51	46.2
Approach		26	7.7	29	7.7	0.021	9.8	LOS A	0.1	0.6	0.44	0.87	0.44	46.8
West: Jack Lachlan Drive														
10	L2	29	0.0	32	0.0	0.185	5.6	LOS A	0.0	0.0	0.00	0.05	0.00	57.8
11	T1	292	1.0	324	1.0	0.185	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	59.4
Approach		321	0.9	357	0.9	0.185	0.5	NA	0.0	0.0	0.00	0.05	0.00	59.3
All Vehicles		459	1.5	510	1.5	0.185	1.5	NA	0.1	1.0	0.06	0.13	0.06	57.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 3_N10D18pm [3_2051_BuildOut_PM (Site Folder: 2051 Buildout PM N10 D18a)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Whitford-Maraetai Road														
1	L2	384	1	427	0.3	0.302	9.1	LOS A	3.2	22.5	0.34	0.70	0.34	58.0
2	T1	1029	8	1143	0.8	*0.606	10.9	LOS B	17.2	121.0	0.65	0.58	0.65	66.9
Approach		1413	9	1570	0.6	0.606	10.4	LOS B	17.2	121.0	0.56	0.61	0.56	64.5
North: Whitford-Maraetai Road														
8	T1	352	22	391	6.3	0.142	3.3	LOS A	2.2	16.2	0.31	0.26	0.31	75.5
9	R2	60	0	67	0.0	*0.479	48.4	LOS D	2.7	18.9	1.00	0.75	1.00	39.0
Approach		412	22	458	5.3	0.479	9.8	LOS A	2.7	18.9	0.41	0.33	0.41	66.4
West: Jack Lachlan Drive														
10	L2	122	0	136	0.0	0.389	37.6	LOS D	4.8	33.5	0.92	0.78	0.92	42.4
12	R2	200	7	222	3.5	*0.545	43.9	LOS D	4.4	31.4	0.99	0.78	0.99	36.0
Approach		322	7	358	2.2	0.545	41.5	LOS D	4.8	33.5	0.96	0.78	0.97	38.4
All Vehicles		2147	38	2386	1.8	0.606	15.0	LOS B	17.2	121.0	0.59	0.58	0.59	59.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
North: Whitford-Maraetai Road												
P3	Full	25	26	34.3	LOS D	0.1	0.1	0.93	0.93	202.3	218.5	1.08
West: Jack Lachlan Drive												
P4	Full	25	26	34.3	LOS D	0.1	0.1	0.93	0.93	199.8	215.2	1.08
All Pedestrians		0	53	34.3	LOS D	0.1	0.1	0.93	0.93	201.1	216.9	1.08

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 4_N10D18pm [4_2051_BuildOut_PM (Site Folder: 2051 Buildout PM N10 D18a)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 40 seconds (Site Practical Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Whitford-Maraetai Road														
4a	L1	218	21	229	9.6	0.128	3.8	LOS A	0.0	0.0	0.00	0.50	0.00	46.8
5	T1	429	27	477	6.3	0.463	7.1	LOS A	5.8	42.5	0.64	0.63	0.64	49.4
Approach		647	48	706	7.4	0.463	6.0	LOS A	5.8	42.5	0.44	0.59	0.44	48.5
West: Whitford-Maraetai Road														
11	T1	842	1	936	0.1	*0.873	17.2	LOS B	21.9	153.7	0.93	1.08	1.25	43.7
Approach		842	1	936	0.1	0.873	17.2	LOS B	21.9	153.7	0.93	1.08	1.25	43.7
SouthWest: Trig Rd														
30b	L3	28	2	29	7.1	0.040	8.1	LOS A	0.2	1.4	0.48	0.63	0.48	45.5
32a	R1	222	43	234	19.4	*0.689	24.0	LOS C	3.7	30.3	0.97	0.86	1.14	37.4
Approach		250	45	263	18.0	0.689	22.2	LOS C	3.7	30.3	0.92	0.83	1.07	38.2
All Vehicles		1739	94	1905	5.3	0.873	13.7	LOS B	21.9	153.7	0.75	0.86	0.92	44.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
West: Whitford-Maraetai Road												
P4	Full	50	53	14.5	LOS B	0.1	0.1	0.85	0.85	174.9	208.6	1.19
SouthWest: Trig Rd												
P8	Full	50	53	14.5	LOS B	0.1	0.1	0.85	0.85	179.0	213.9	1.19
All Pedestrians		50	105	14.5	LOS B	0.1	0.1	0.85	0.85	177.0	211.3	1.19

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 5_N10D18pm [5_2051_BuildOut_PM (Site Folder: 2051 Buildout PM N10 D18a)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Whitford Park Road														
1	L2	219	4	243	1.8	0.268	2.0	LOS A	1.5	10.3	0.55	0.44	0.55	19.8
2	T1	8	0	9	0.0	0.126	3.1	LOS A	0.6	3.9	0.54	0.45	0.54	27.5
3	R2	178	0	198	0.0	0.172	2.7	LOS A	0.8	5.8	0.53	0.43	0.53	19.7
Approach		405	4	450	1.0	0.268	2.4	LOS A	1.5	10.3	0.54	0.44	0.54	19.9
East: Whitford Maraetai Road														
4	L2	158	19	176	12.0	0.280	2.7	LOS A	1.4	10.6	0.52	0.43	0.52	19.7
5	T1	336	20	373	6.0	0.455	2.2	LOS A	2.8	20.6	0.57	0.46	0.57	19.8
6	R2	1	0	1	0.0	0.455	2.1	LOS A	2.8	20.6	0.57	0.46	0.57	28.1
Approach		495	39	550	7.9	0.455	2.4	LOS A	2.8	20.6	0.56	0.45	0.56	19.8
North: Whitford Wharf Road														
7	L2	10	0	11	0.0	0.086	12.0	LOS B	0.3	2.3	0.71	0.88	0.71	26.2
8	T1	11	0	12	0.0	0.086	14.0	LOS B	0.3	2.3	0.71	0.88	0.71	26.2
9	R2	5	0	6	0.0	0.086	15.9	LOS B	0.3	2.3	0.71	0.88	0.71	26.2
Approach		26	0	29	0.0	0.086	13.6	LOS B	0.3	2.3	0.71	0.88	0.71	26.2
West: Whitford Road														
10	L2	5	0	6	0.0	0.450	1.9	LOS A	2.6	18.3	0.51	0.40	0.51	27.6
11	T1	717	3	797	0.4	0.701	2.7	LOS A	6.7	48.0	0.60	0.50	0.64	19.7
12	R2	213	10	237	4.7	0.701	3.1	LOS A	6.7	48.0	0.68	0.59	0.74	19.7
Approach		935	13	1039	1.4	0.701	2.8	LOS A	6.7	48.0	0.62	0.52	0.66	19.7
All Vehicles		1861	56	2068	3.0	0.701	2.7	LOS A	6.7	48.0	0.59	0.49	0.61	19.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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 (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 6_N10D18pm [6_2051_BuildOut_PM (Site Folder: 2051 Buildout PM N10 D18a)]

New Site
Site Category: (None)
Roundabout Metering

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Whitford Park Road														
1	L2	52	25.0	58	25.0	0.198	9.3	LOS A	1.0	8.9	0.76	0.85	0.76	44.2
2	T1	410	2.0	456	2.0	0.962	36.8	LOS D	24.8	176.7	1.00	1.44	2.09	33.8
3	R2	101	2.0	112	2.0	0.962	41.3	LOS D	24.8	176.7	1.00	1.44	2.09	33.9
Approach		563	4.1	626	4.1	0.962	35.0	LOS D	24.8	176.7	0.98	1.39	1.96	34.5
East: Saleyard Road														
4	L2	1	0.0	1	0.0	0.317	5.3	LOS A	1.5	11.0	0.60	0.59	0.60	46.1
5	T1	214	9.3	238	9.3	0.317	5.2	LOS A	1.5	11.0	0.60	0.59	0.60	47.1
6	R2	1	0.0	1	0.0	0.317	9.6	LOS A	1.5	11.0	0.60	0.59	0.60	47.3
Approach		216	9.3	240	9.3	0.317	5.2	LOS A	1.5	11.0	0.60	0.59	0.60	47.1
North: Whitford Park Road														
7	L2	1	0.0	1	0.0	0.240	5.8	LOS A	1.0	7.4	0.66	0.62	0.66	45.8
8	T1	326	10.1	362	10.1	0.406	5.6	LOS A	2.3	17.5	0.72	0.67	0.74	46.4
9	R2	49	0.0	54	0.0	0.406	10.0	LOS B	2.3	17.5	0.76	0.69	0.78	46.4
Approach		376	8.8	418	8.8	0.406	6.2	LOS A	2.3	17.5	0.73	0.67	0.75	46.4
West: Sandstone Road														
10	L2	1	0.0	1	0.0	0.926	10.3	LOS B	13.1	92.7	1.00	1.14	1.42	43.5
11	T1	620	1.3	689	1.3	0.926	10.2	LOS B	13.1	92.7	1.00	1.14	1.42	44.4
12	R2	179	1.1	199	1.1	0.926	14.8	LOS B	13.1	92.7	1.00	1.14	1.42	44.6
Approach		800	1.3	889	1.3	0.926	11.2	LOS B	13.1	92.7	1.00	1.14	1.42	44.4
All Vehicles		1955	4.4	2172	4.4	0.962	16.4	LOS B	24.8	176.7	0.90	1.06	1.36	41.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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 (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 7_N10D18pm [7_2051_BuildOut_PM (Site Folder: 2051 Buildout PM N10 D18a)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Point View Drive														
1	L2	40	1	44	2.5	0.313	9.5	LOS A	2.1	14.7	0.83	0.86	0.83	43.8
2	T1	117	0	130	0.0	0.313	9.2	LOS A	2.1	14.7	0.83	0.86	0.83	44.7
3	R2	18	0	20	0.0	0.313	12.8	LOS B	2.1	14.7	0.83	0.86	0.83	44.6
Approach		175	1	194	0.6	0.313	9.6	LOS A	2.1	14.7	0.83	0.86	0.83	44.5
East: Whitford Road														
4	L2	6	0	7	0.0	0.569	4.6	LOS A	5.2	38.1	0.62	0.59	0.62	45.4
5	T1	472	28	524	5.9	0.569	5.0	LOS A	5.2	38.1	0.62	0.59	0.62	46.1
6	R2	118	2	131	1.7	0.569	8.6	LOS A	5.2	38.1	0.62	0.59	0.62	46.1
Approach		596	30	662	5.0	0.569	5.7	LOS A	5.2	38.1	0.62	0.59	0.62	46.1
North: Somerville														
7	L2	188	0	209	0.0	0.854	35.9	LOS D	12.0	84.4	1.00	1.40	1.93	33.0
8	T1	33	0	37	0.0	0.854	35.7	LOS D	12.0	84.4	1.00	1.40	1.93	33.5
9	R2	93	1	103	1.1	0.854	39.4	LOS D	12.0	84.4	1.00	1.40	1.93	33.4
Approach		314	1	349	0.3	0.854	36.9	LOS D	12.0	84.4	1.00	1.40	1.93	33.2
West: Whitford Road														
10	L2	194	0	216	0.0	1.033	37.6	LOS D	46.5	330.9	1.00	1.68	2.46	32.8
11	T1	802	18	891	2.2	1.033	38.0	LOS D	46.5	330.9	1.00	1.68	2.46	33.2
12	R2	42	1	47	2.4	1.033	41.7	LOS D	46.5	330.9	1.00	1.68	2.46	33.2
Approach		1038	19	1153	1.8	1.033	38.1	LOS D	46.5	330.9	1.00	1.68	2.46	33.1
All Vehicles		2123	51	2359	2.4	1.033	26.5	LOS C	46.5	330.9	0.88	1.26	1.73	36.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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 (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 8_N10D18pm [8_2051_BuildOut_PM (Site Folder: 2051 Buildout PM N10 D18a)]

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

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Whitford-Maraetai Rd														
1	L2	64	0.0	71	0.0	0.038	4.5	LOS A	0.0	0.0	0.00	0.49	0.00	47.2
2	T1	1386	0.8	1540	0.8	0.397	0.2	LOS A	0.0	0.0	0.00	0.00	0.00	49.8
Approach		1450	0.8	1611	0.8	0.397	0.4	LOS A	0.0	0.0	0.00	0.02	0.00	49.7
North: Whitford-Maraetai Rd														
8	T1	552	5.3	613	5.3	0.163	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
Approach		552	5.3	613	5.3	0.163	0.0	NA	0.0	0.0	0.00	0.00	0.00	49.9
West: Access														
10	L2	91	0.0	101	0.0	0.054	4.8	LOS A	0.0	0.0	0.00	0.47	0.00	47.8
Approach		91	0.0	101	0.0	0.054	4.8	NA	0.0	0.0	0.00	0.47	0.00	47.8
All Vehicles		2093	1.9	2326	1.9	0.397	0.5	NA	0.0	0.0	0.00	0.04	0.00	49.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 9_N10D18pm [9_2051_BuildOut_PM (Site Folder: 2051 Buildout PM N10 D18a)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 84 seconds (Site Optimum Cycle Time - Minimum Delay)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Whitford-Maraetai Road														
1	L2	237	0	263	0.0	0.215	11.9	LOS B	2.9	20.6	0.42	0.72	0.42	55.4
2	T1	1336	11	1484	0.8	* 0.750	16.7	LOS B	24.5	172.6	0.83	0.75	0.84	72.2
Approach		1573	11	1748	0.7	0.750	16.0	LOS B	24.5	172.6	0.77	0.75	0.77	69.4
North: Whitford-Maraetai Road														
8	T1	487	29	541	6.0	0.178	1.9	LOS A	2.4	17.8	0.24	0.20	0.24	95.8
9	R2	290	0	322	0.0	* 0.767	44.1	LOS D	13.4	93.9	0.99	0.88	1.12	40.8
Approach		777	29	863	3.7	0.767	17.6	LOS B	13.4	93.9	0.52	0.46	0.57	63.8
West: 650 Access														
10	L2	102	0	113	0.0	0.537	41.3	LOS D	5.8	40.5	0.97	0.80	0.97	38.5
12	R2	94	0	104	0.0	* 0.537	46.2	LOS D	5.8	40.5	0.99	0.78	1.01	34.7
Approach		196	0	218	0.0	0.537	43.7	LOS D	5.8	40.5	0.98	0.79	0.99	36.7
All Vehicles		2546	40	2829	1.6	0.767	18.6	LOS B	24.5	172.6	0.71	0.66	0.73	63.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
West: 650 Access												
P4	Full	50	53	36.3	LOS D	0.1	0.1	0.93	0.93	200.8	213.9	1.07
All Pedestrians		0	53	36.3	LOS D	0.1	0.1	0.93	0.93	200.8	213.9	1.07

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

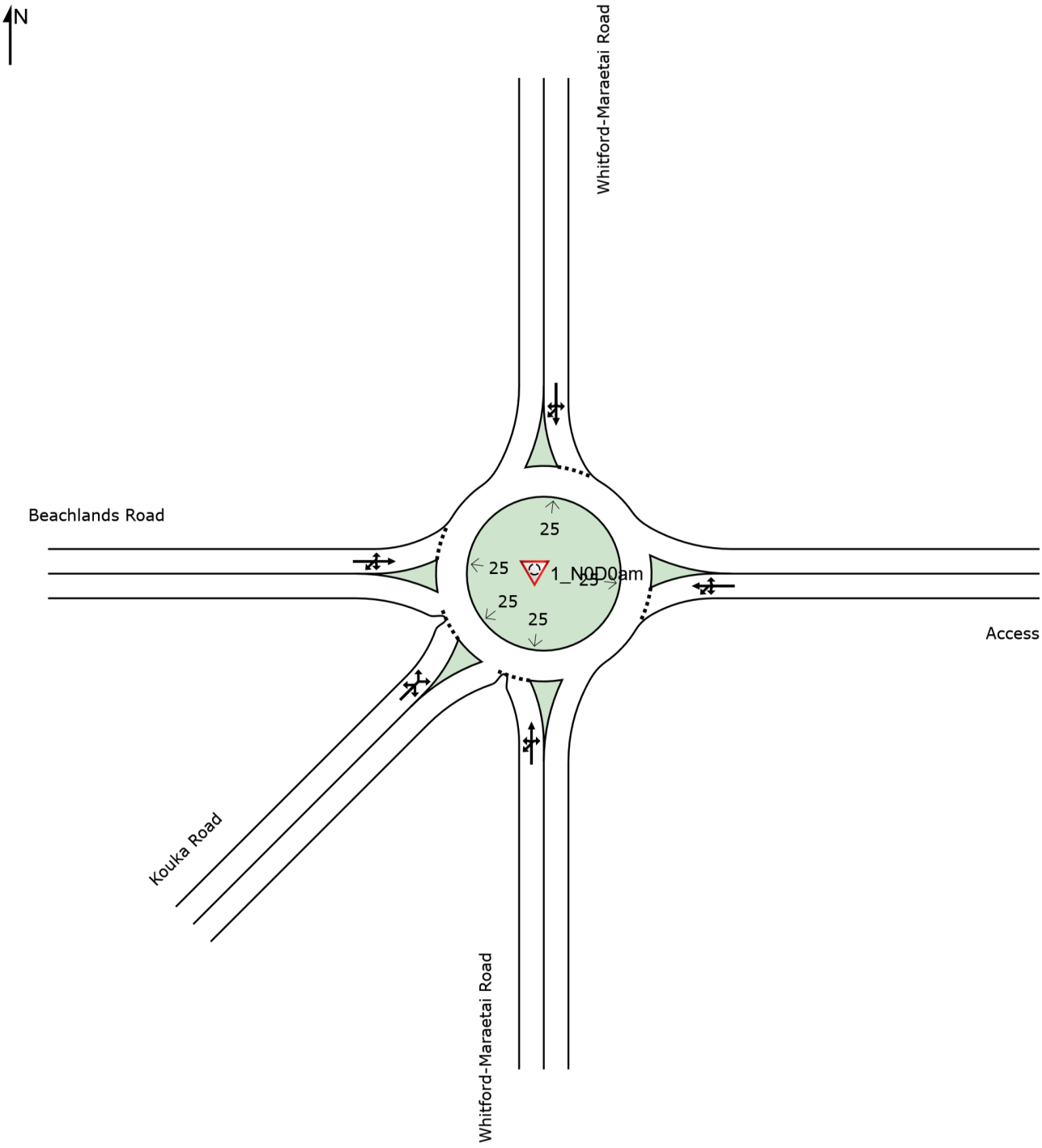
Appendix C 2020 SIDRA Layouts

SITE LAYOUT

Site: 1_N0D0am [1_2020_Base_AM (Site Folder: 2020 Base AM N0 D0)]

New Site
Site Category: (None)
Roundabout

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

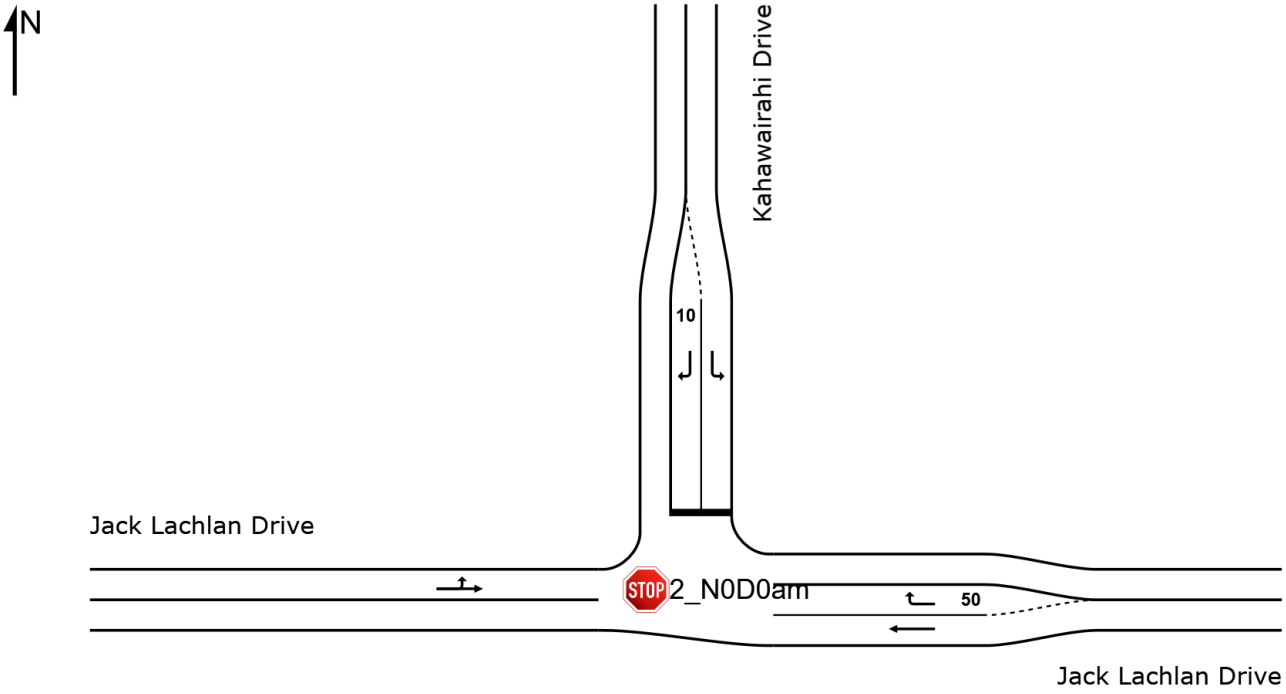


SITE LAYOUT

Site: 2_N0D0am [2_2020_Base_AM (Site Folder: 2020 Base AM N0 D0)]

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

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

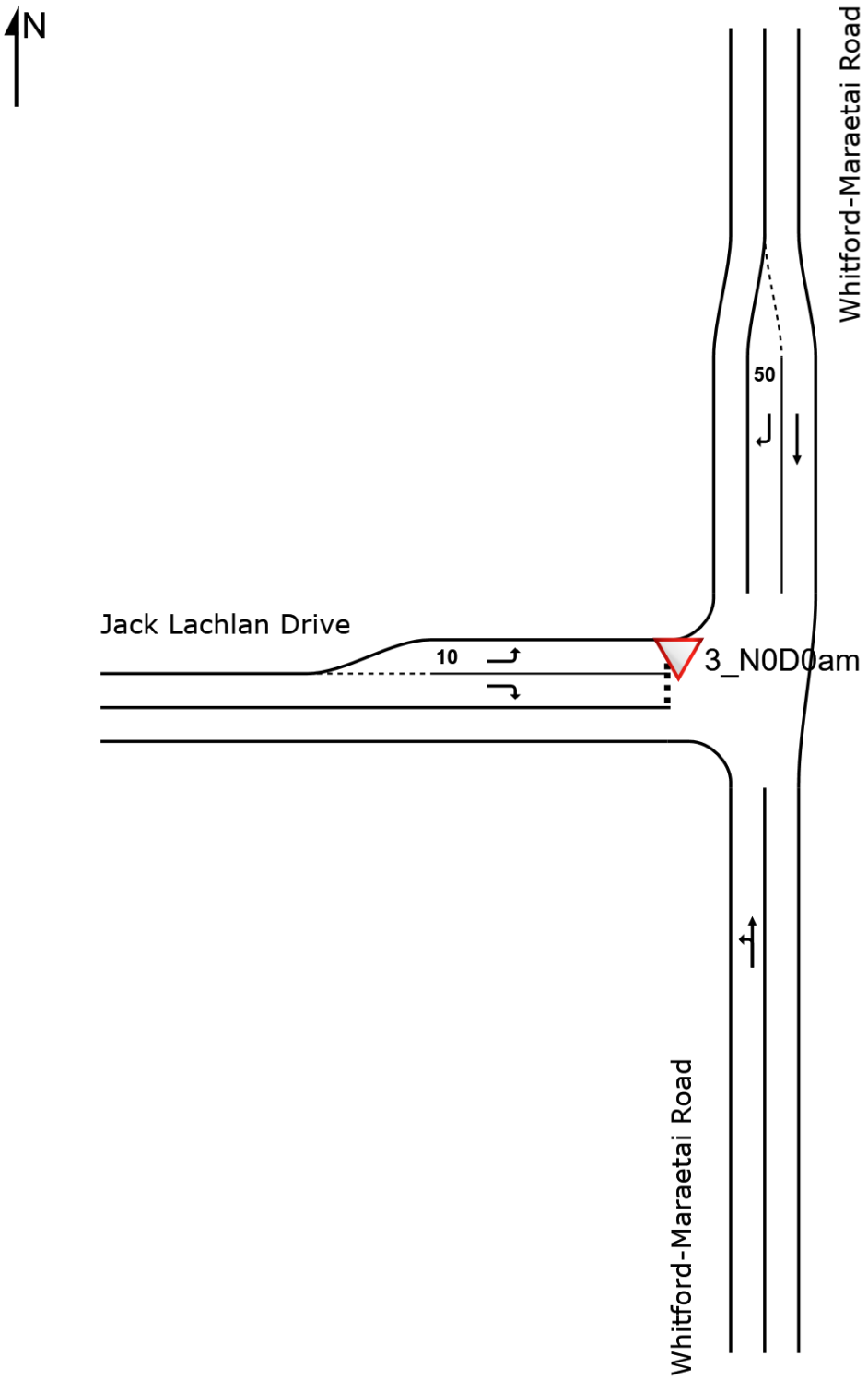


SITE LAYOUT

Site: 3_N0D0am [3_2020_Base_AM (Site Folder: 2020 Base AM N0 D0)]

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

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

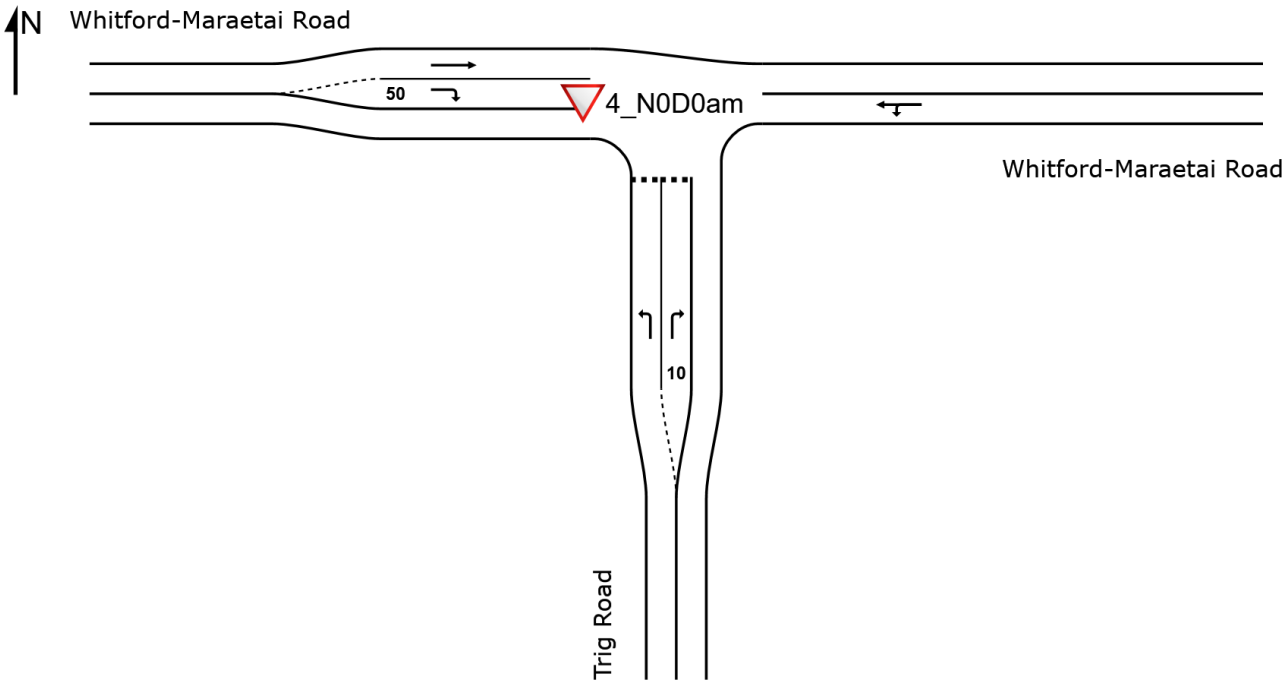


SITE LAYOUT

Site: 4_N0D0am [4_2020_Base_AM (Site Folder: 2020 Base AM N0 D0)]

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

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

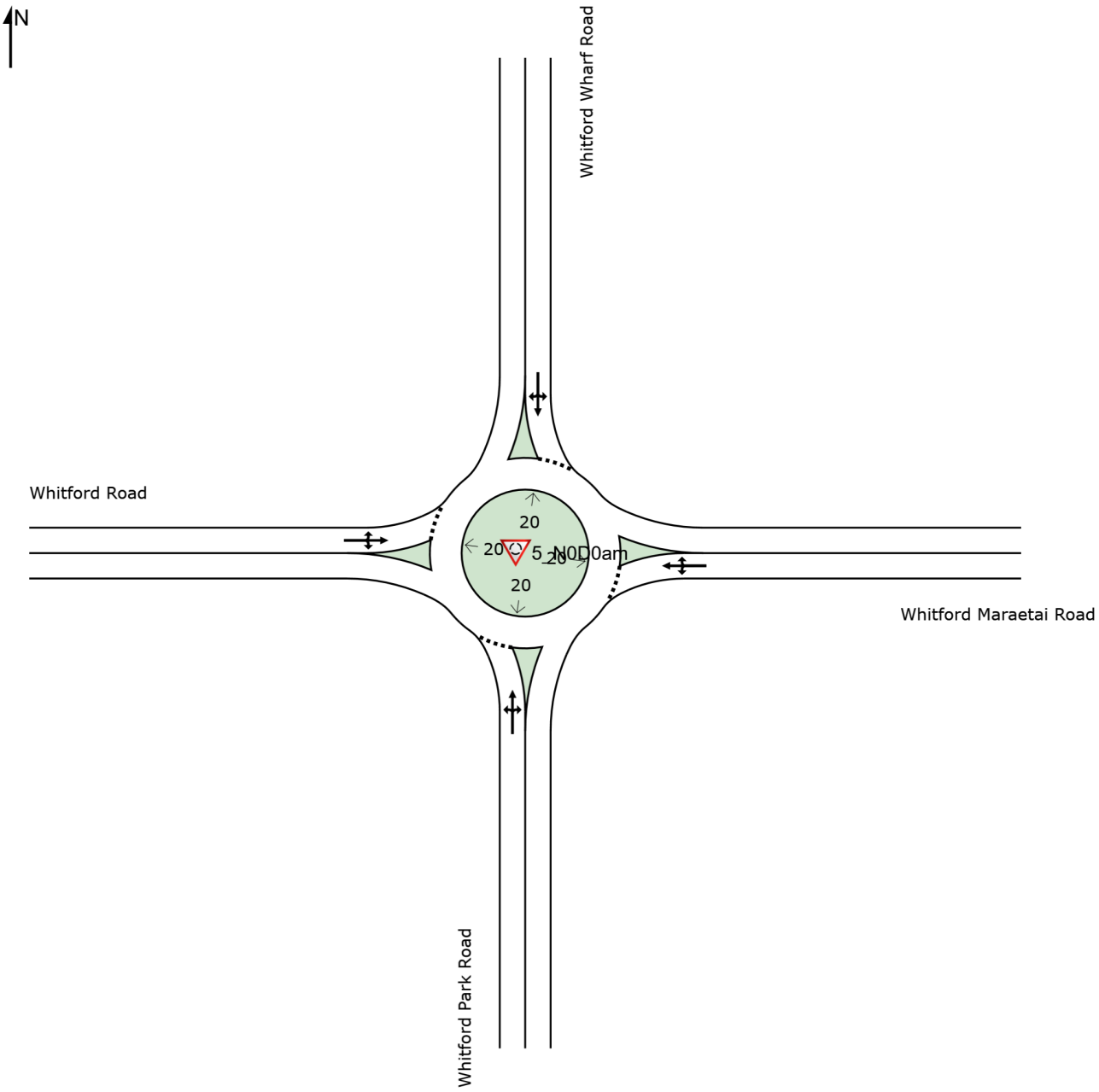


SITE LAYOUT

Site: 5_N0D0am [5_2020_Base_AM (Site Folder: 2020 Base AM N0 D0)]

New Site
Site Category: (None)
Roundabout

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

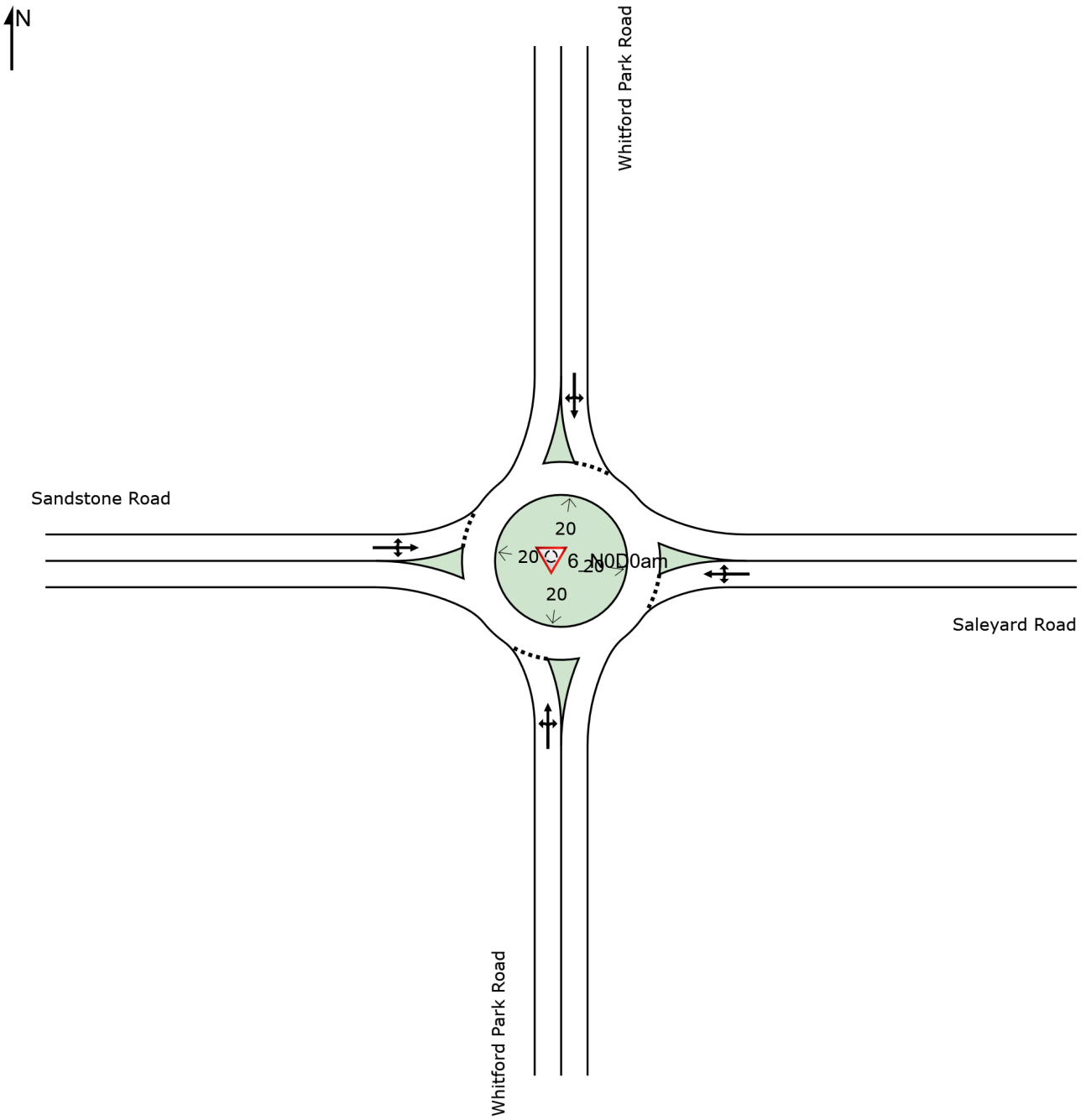


SITE LAYOUT

Site: 6_N0D0am [6_2020_Base_AM (Site Folder: 2020 Base AM N0 D0)]

New Site
Site Category: (None)
Roundabout

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

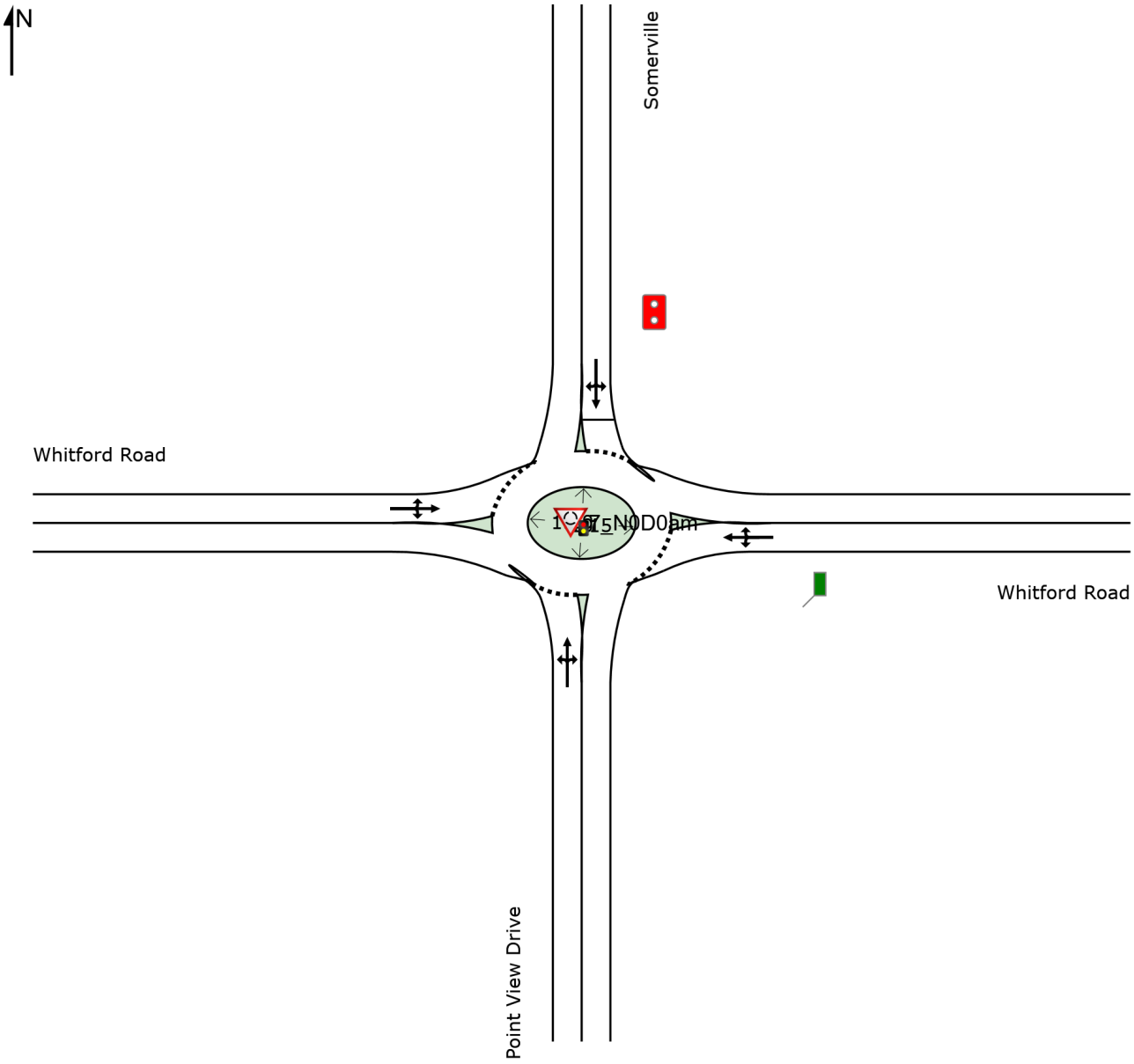


SITE LAYOUT

Site: 7_N0D0am [7_2020_Base_AM (Site Folder: 2020 Base AM N0 D0)]

New Site
Site Category: (None)
Roundabout Metering

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



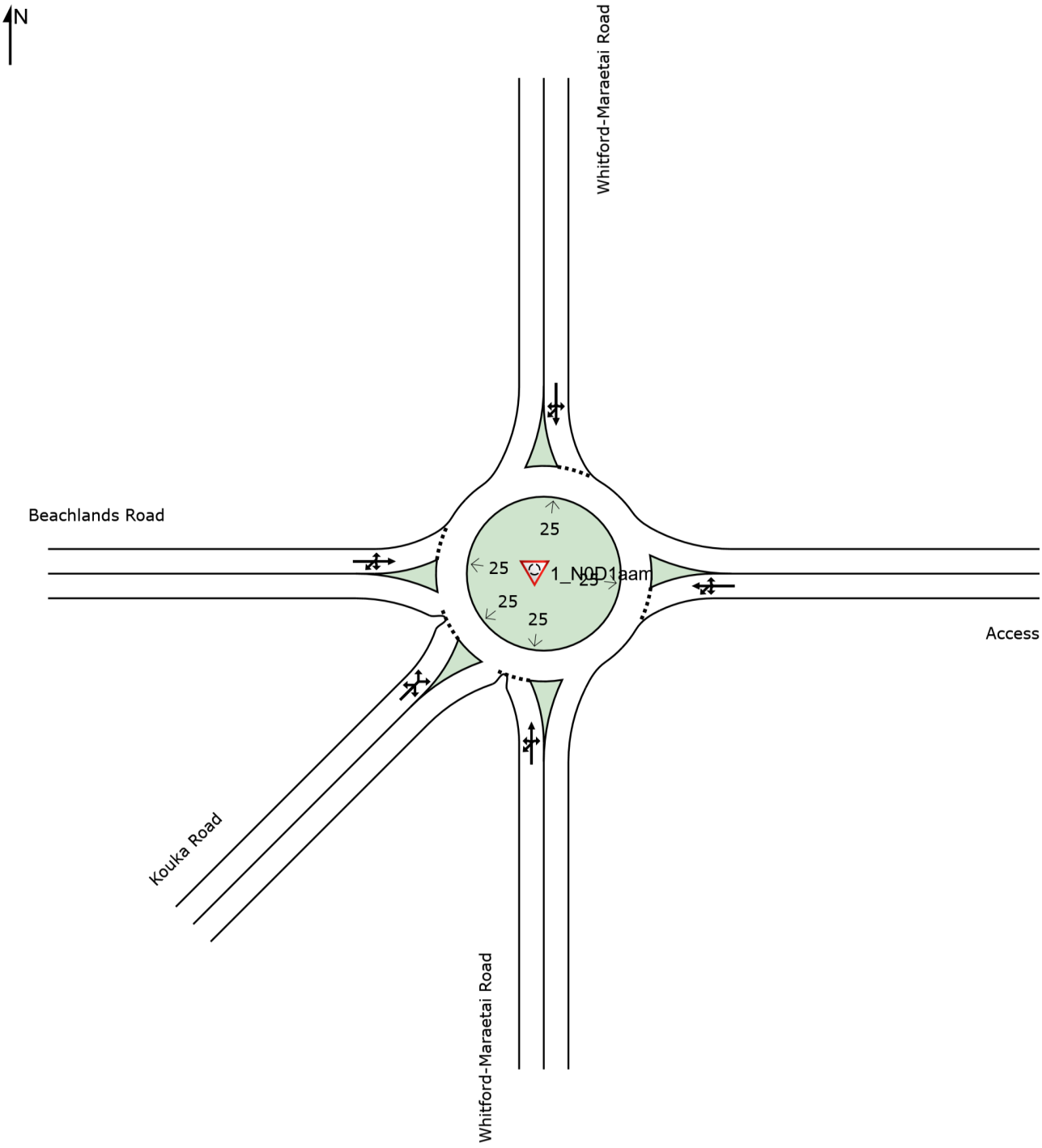
Appendix D 2024 Baseline SIDRA Layouts

SITE LAYOUT

Site: 1_N0D1aam [1_2024_Base_AM (Site Folder: 2024 Base AM N0 D1a)]

New Site
Site Category: (None)
Roundabout

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

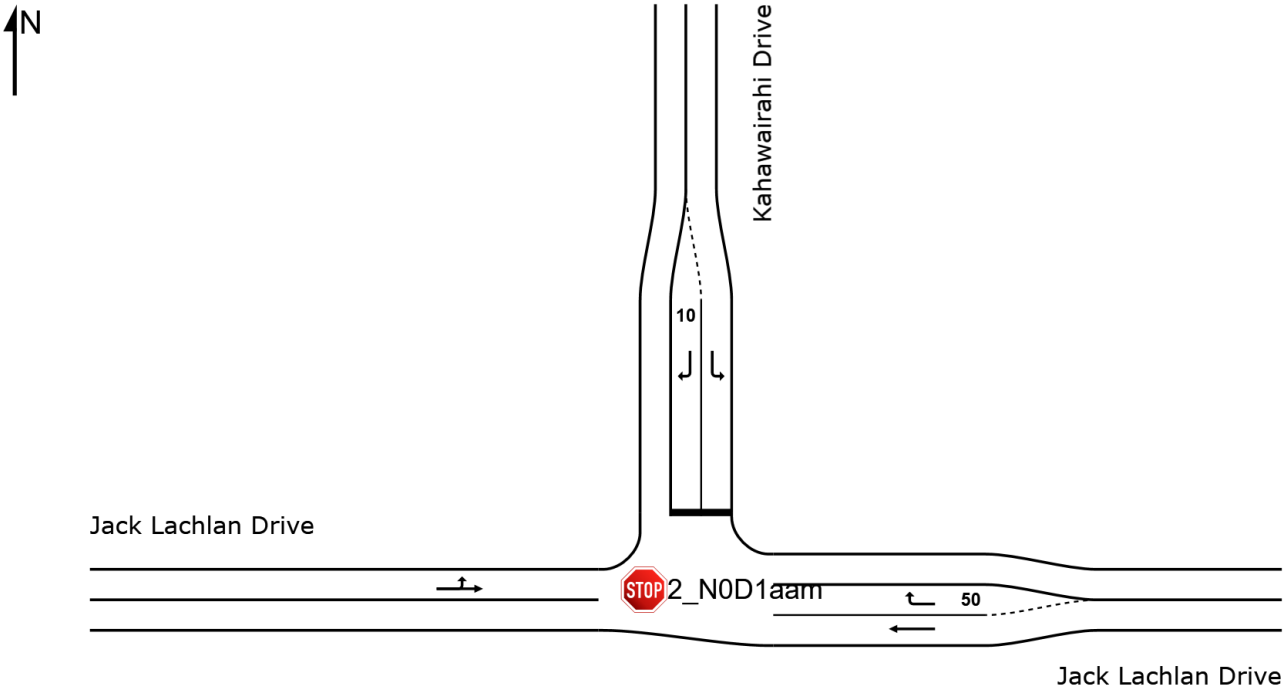


SITE LAYOUT

Site: 2_N0D1aam [2_2024_Base_AM (Site Folder: 2024 Base AM N0 D1a)]

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

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

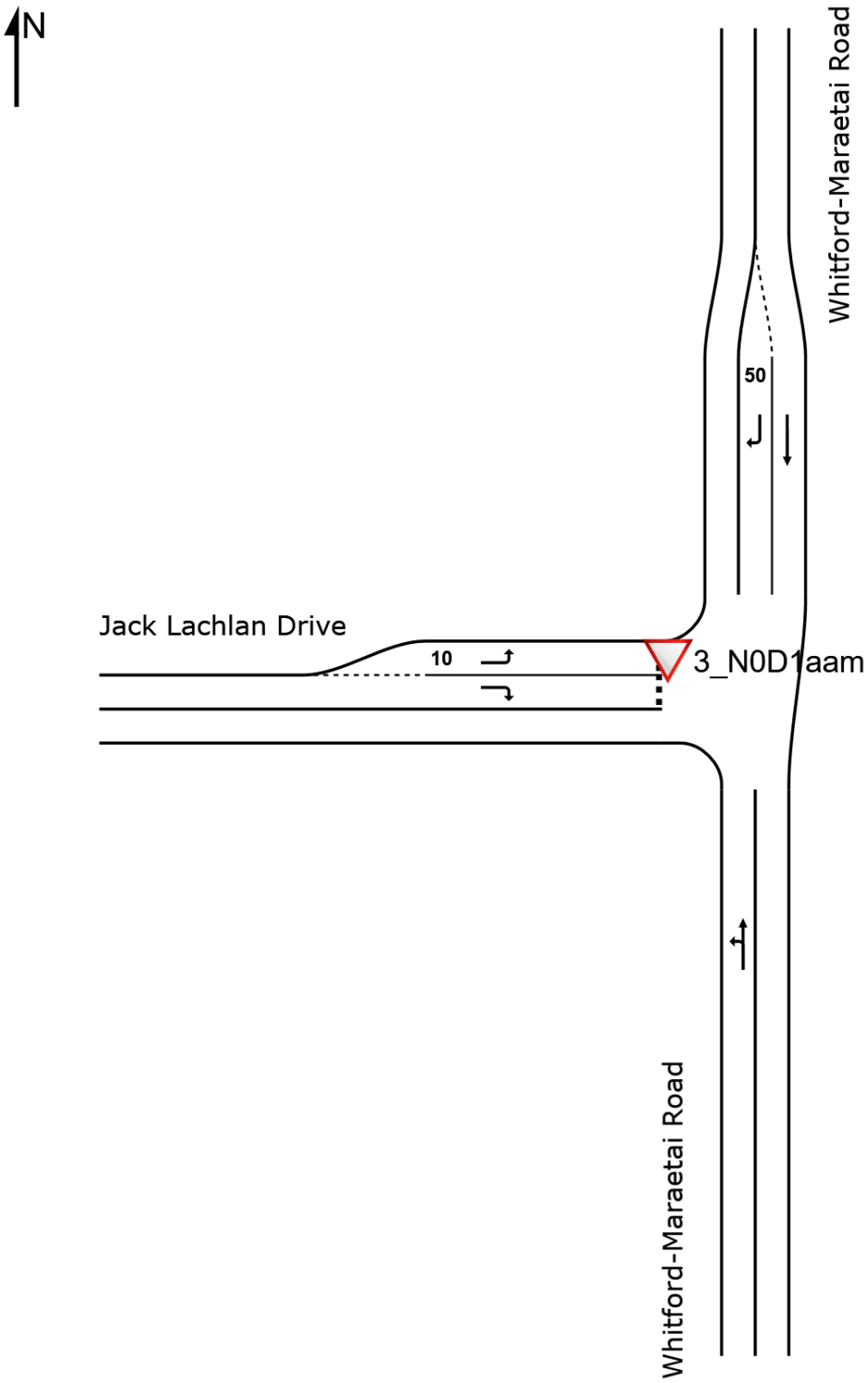


SITE LAYOUT

Site: 3_N0D1aam [3_2024_Base_AM (Site Folder: 2024 Base AM N0 D1a)]

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

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

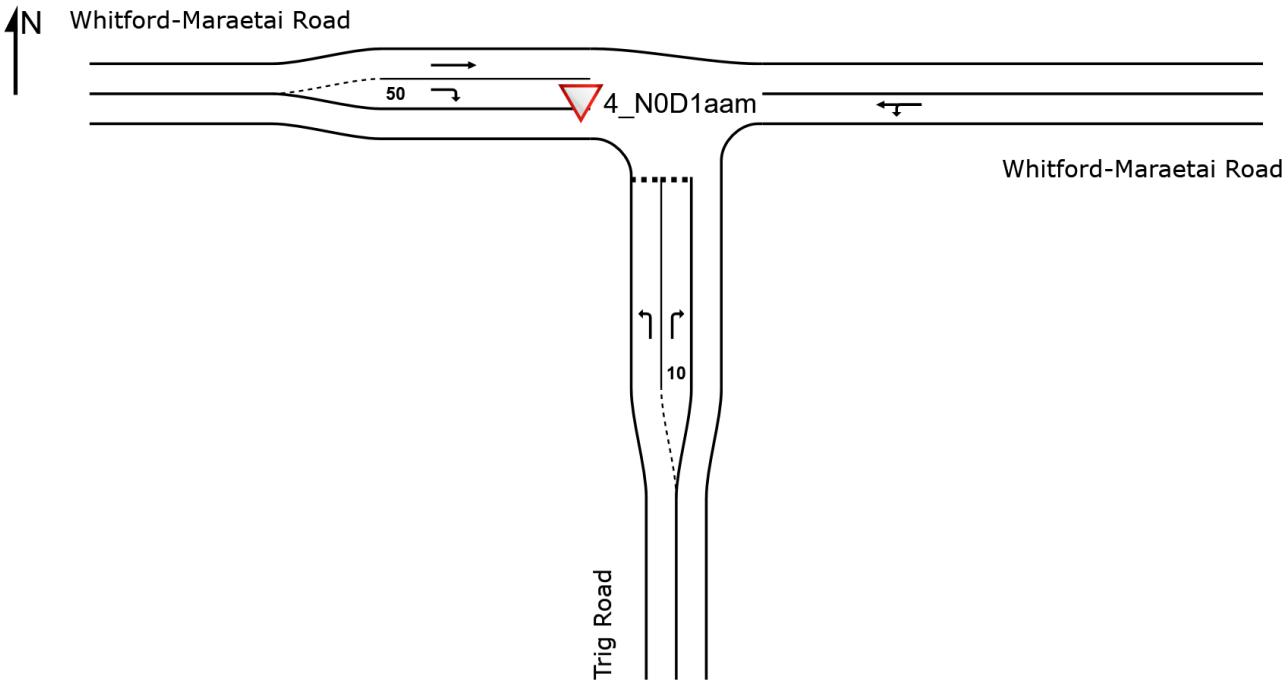


SITE LAYOUT

Site: 4_N0D1aam [4_2024_Base_AM (Site Folder: 2024 Base AM N0 D1a)]

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

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

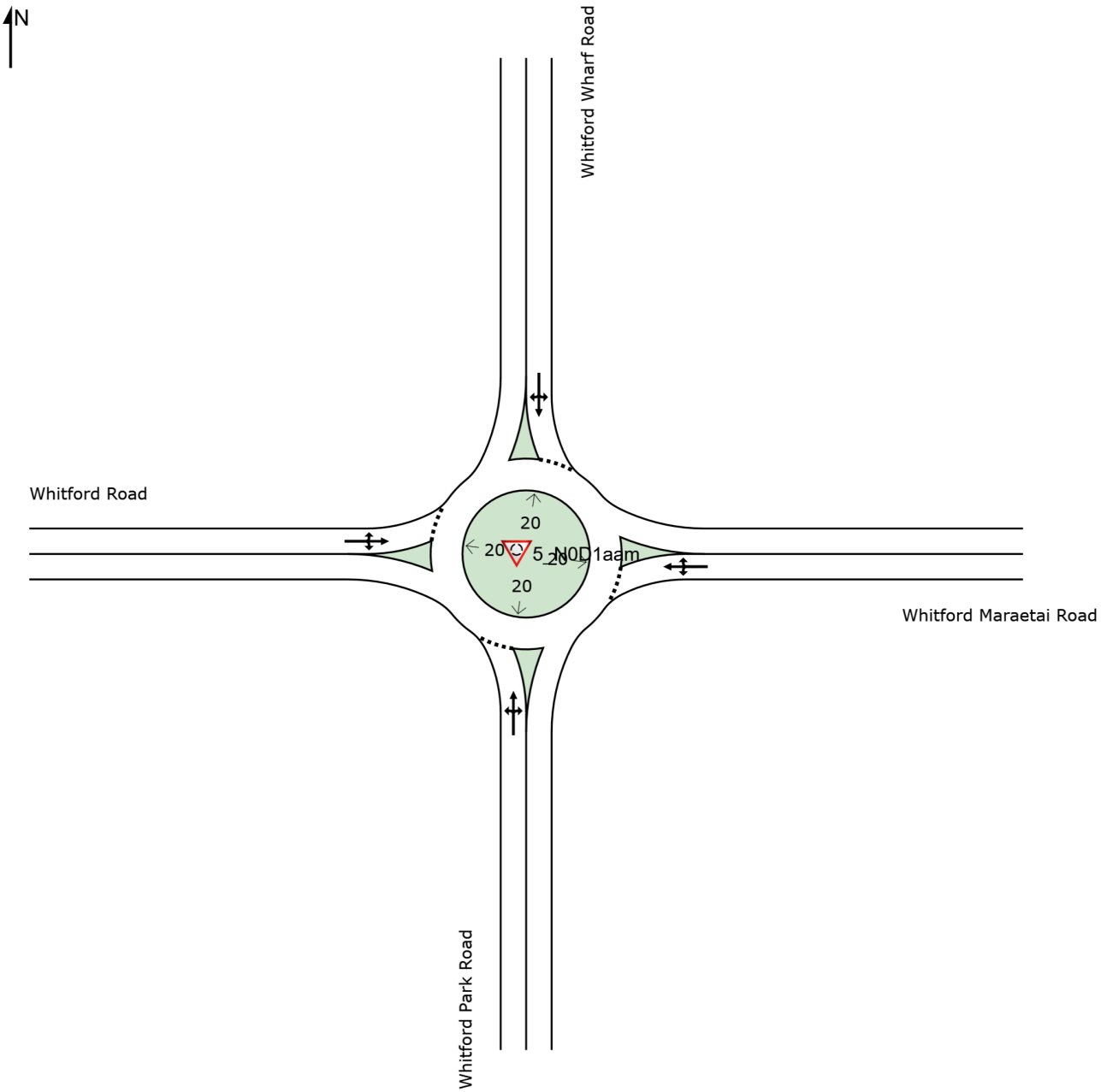


SITE LAYOUT

Site: 5_N0D1aam [5_2024_Base_AM (Site Folder: 2024 Base AM N0 D1a)]

New Site
Site Category: (None)
Roundabout

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

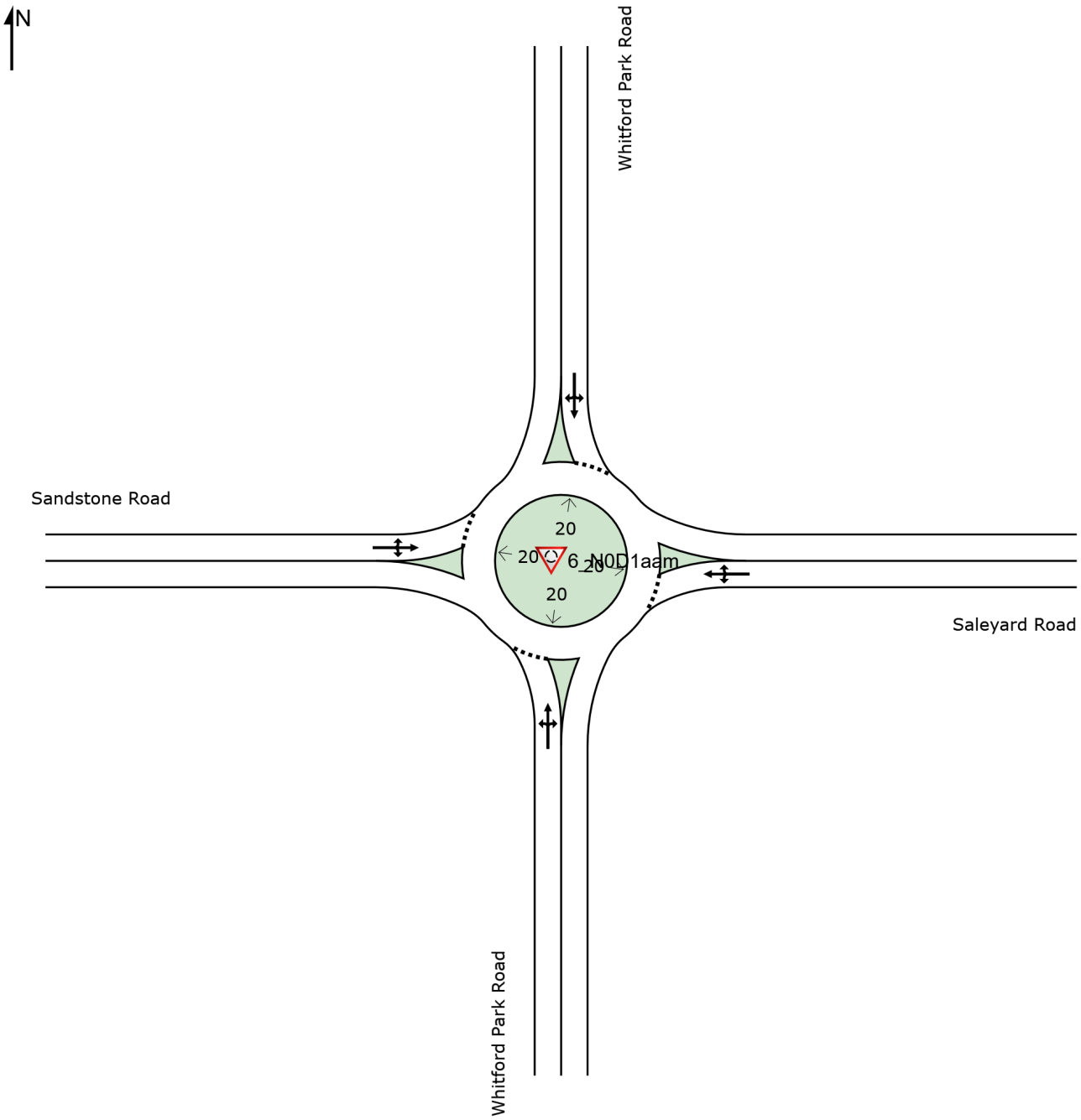


SITE LAYOUT

Site: 6_N0D1aam [6_2024_Base_AM (Site Folder: 2024 Base AM N0 D1a)]

New Site
Site Category: (None)
Roundabout

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

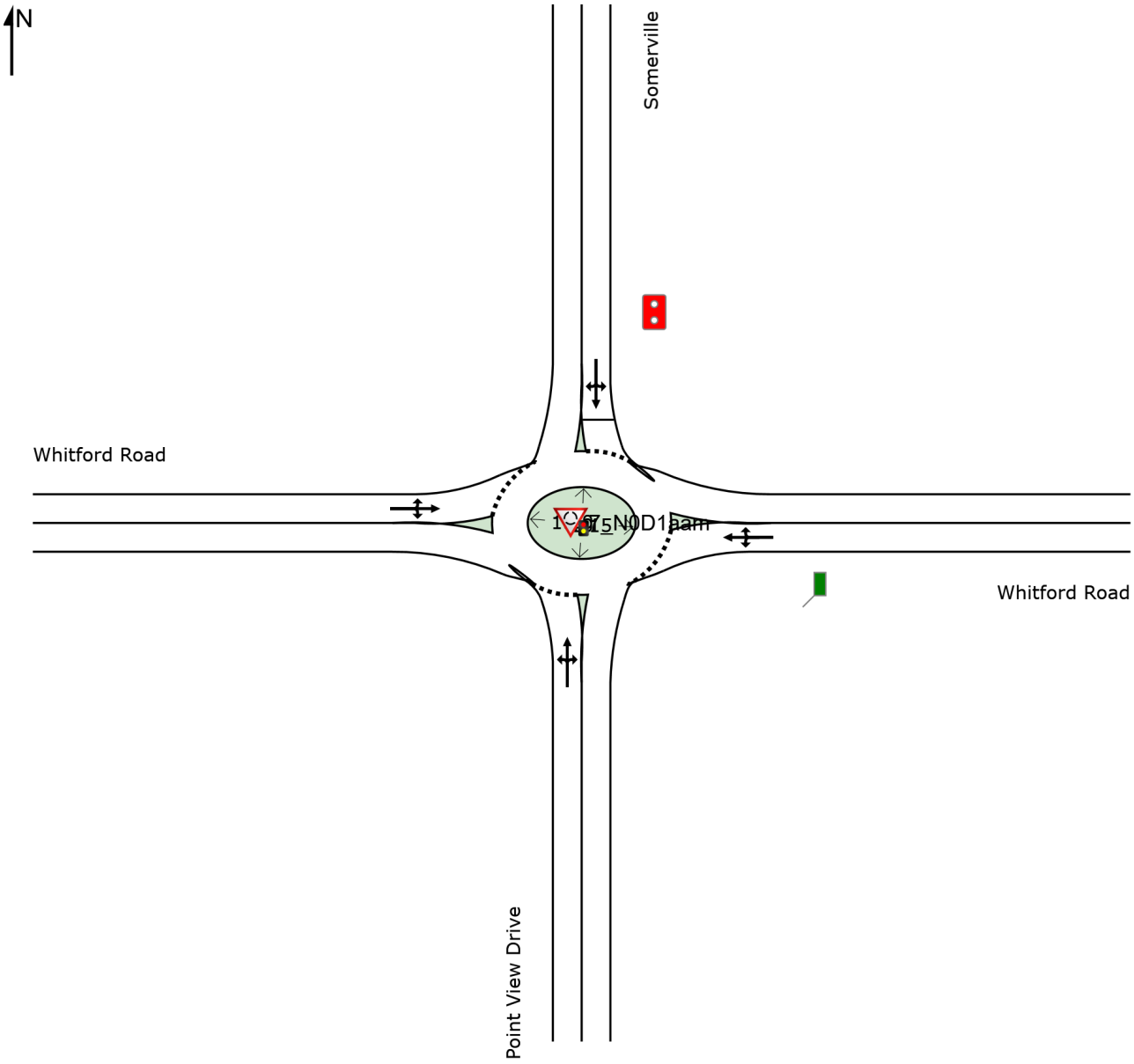


SITE LAYOUT

Site: 7_N0D1aam [7_2024_Base_AM (Site Folder: 2024 Base AM N0 D1a)]

New Site
Site Category: (None)
Roundabout Metering

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



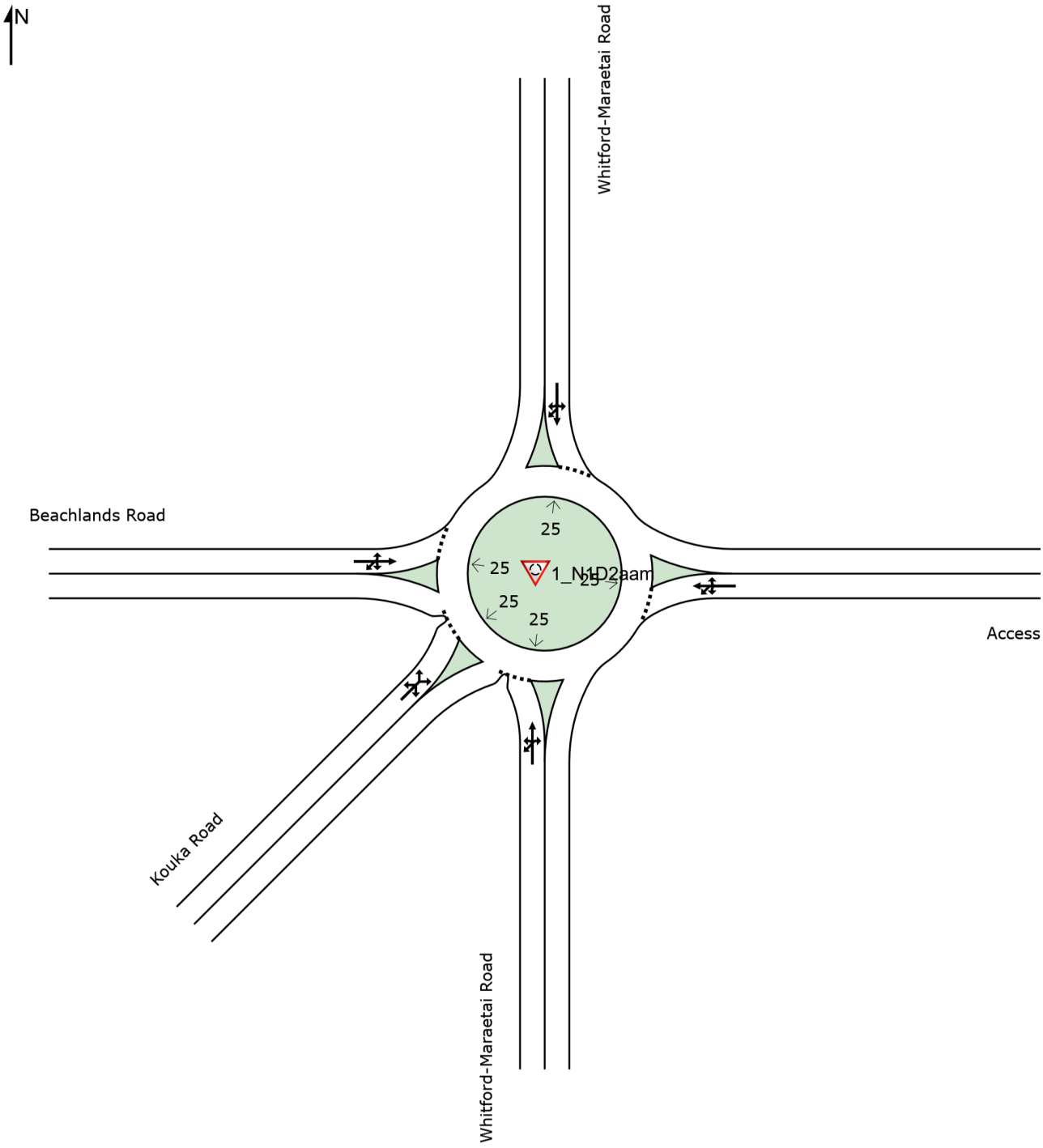
Appendix E 2024 Development SIDRA Layouts

SITE LAYOUT

Site: 1_N1D2aam [1_2024_BuildOut_AM (Site Folder: 2024 Buildout AM N1 D2a)]

New Site
Site Category: (None)
Roundabout

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

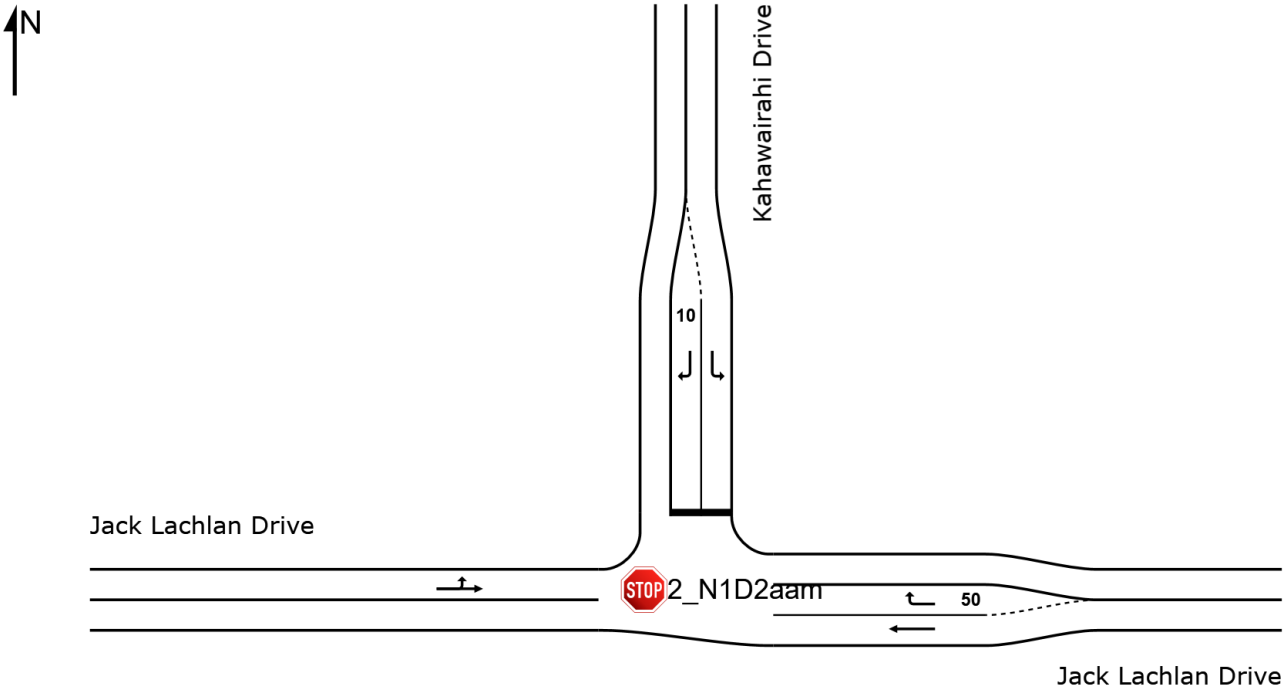


SITE LAYOUT

Site: 2_N1D2aam [2_2024_BuildOut_AM (Site Folder: 2024 Buildout AM N1 D2a)]

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

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

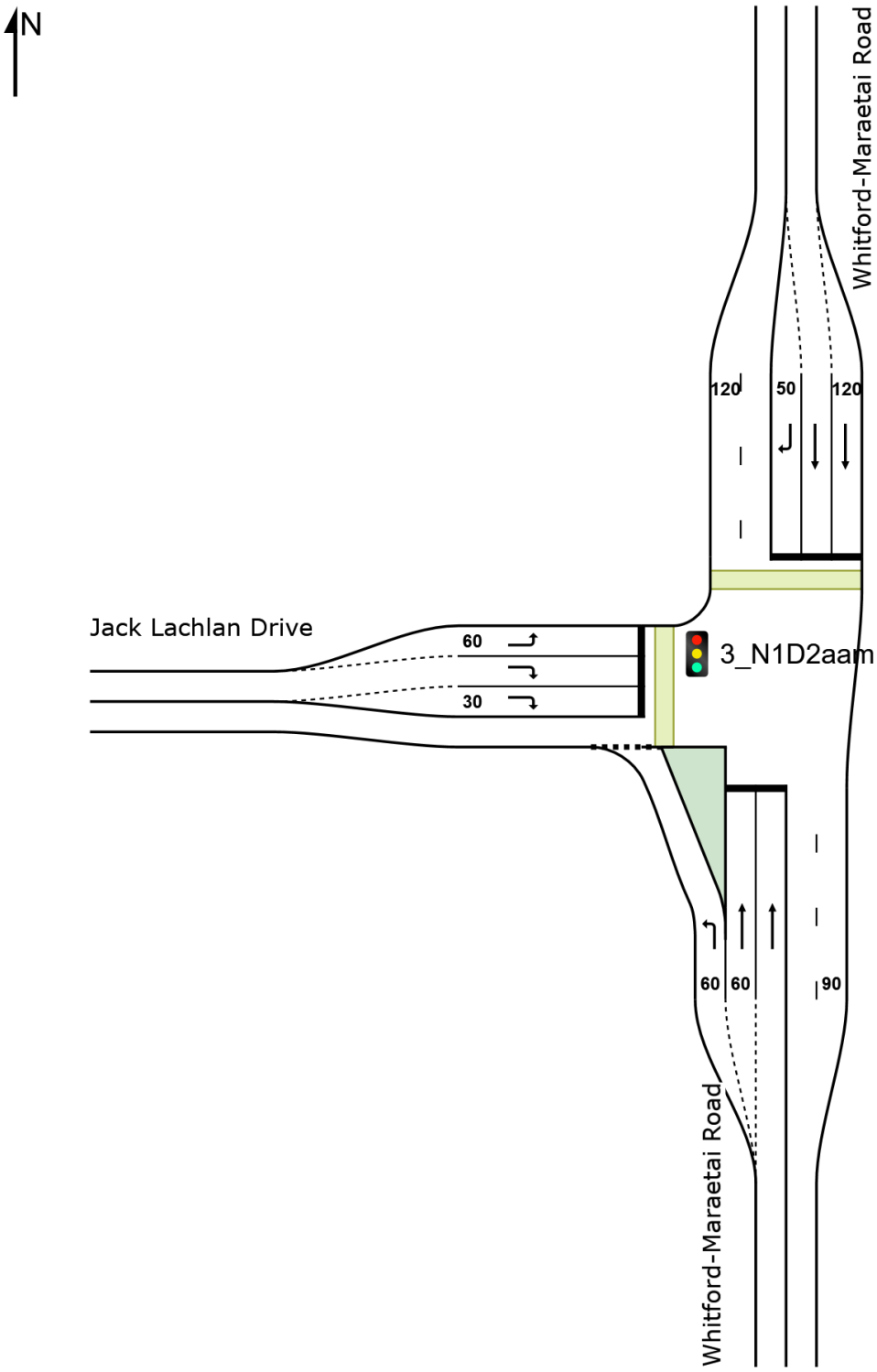


SITE LAYOUT

Site: 3_N1D2aam [3_2024_BuildOut_AM (Site Folder: 2024 Buildout AM N1 D2a)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

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

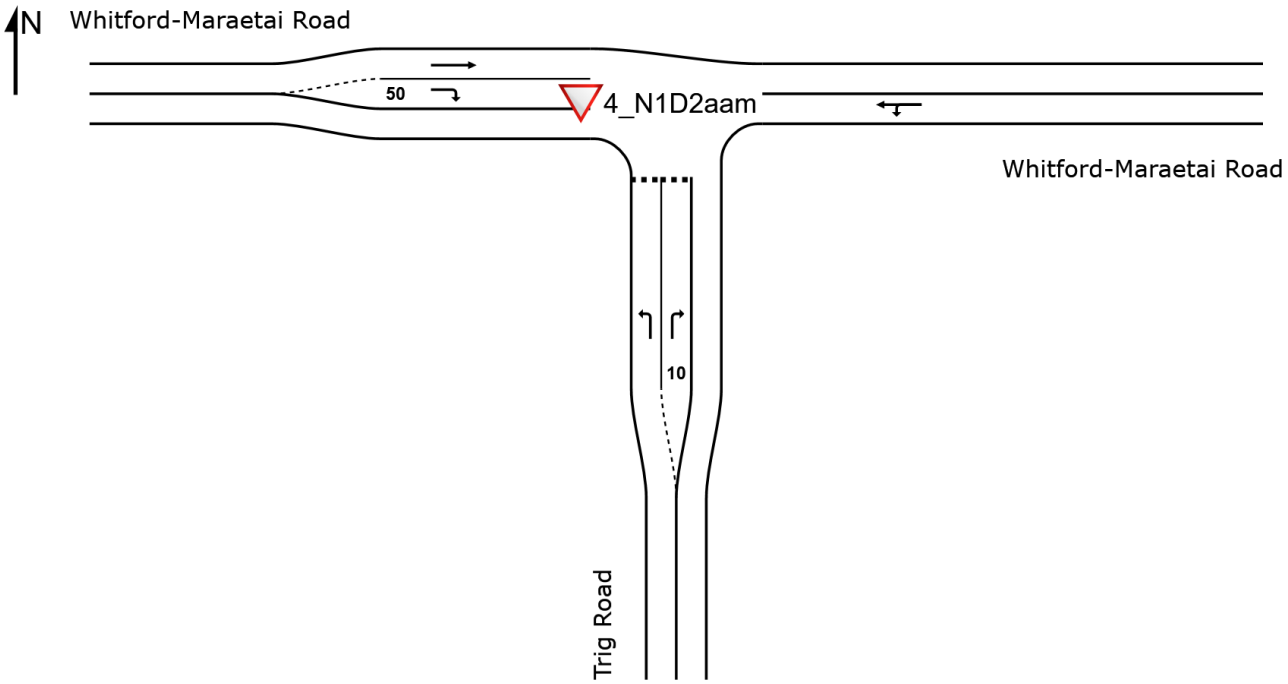


SITE LAYOUT

Site: 4_N1D2aam [4_2024_BuildOut_AM (Site Folder: 2024 Buildout AM N1 D2a)]

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

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

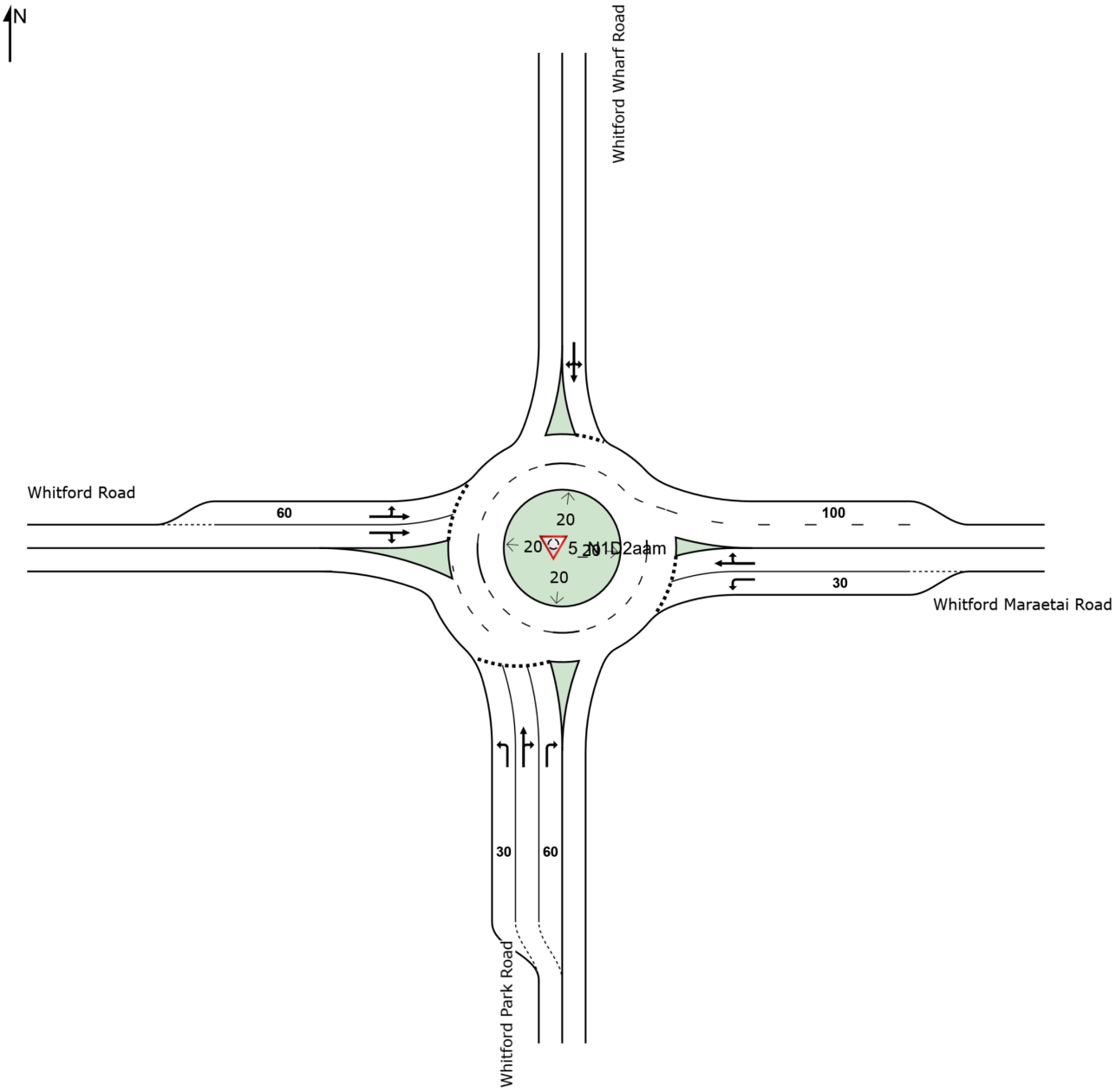


SITE LAYOUT

Site: 5_N1D2aam [5_2024_BuildOut_AM (Site Folder: 2024 Buildout AM N1 D2a)]

New Site
Site Category: (None)
Roundabout

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

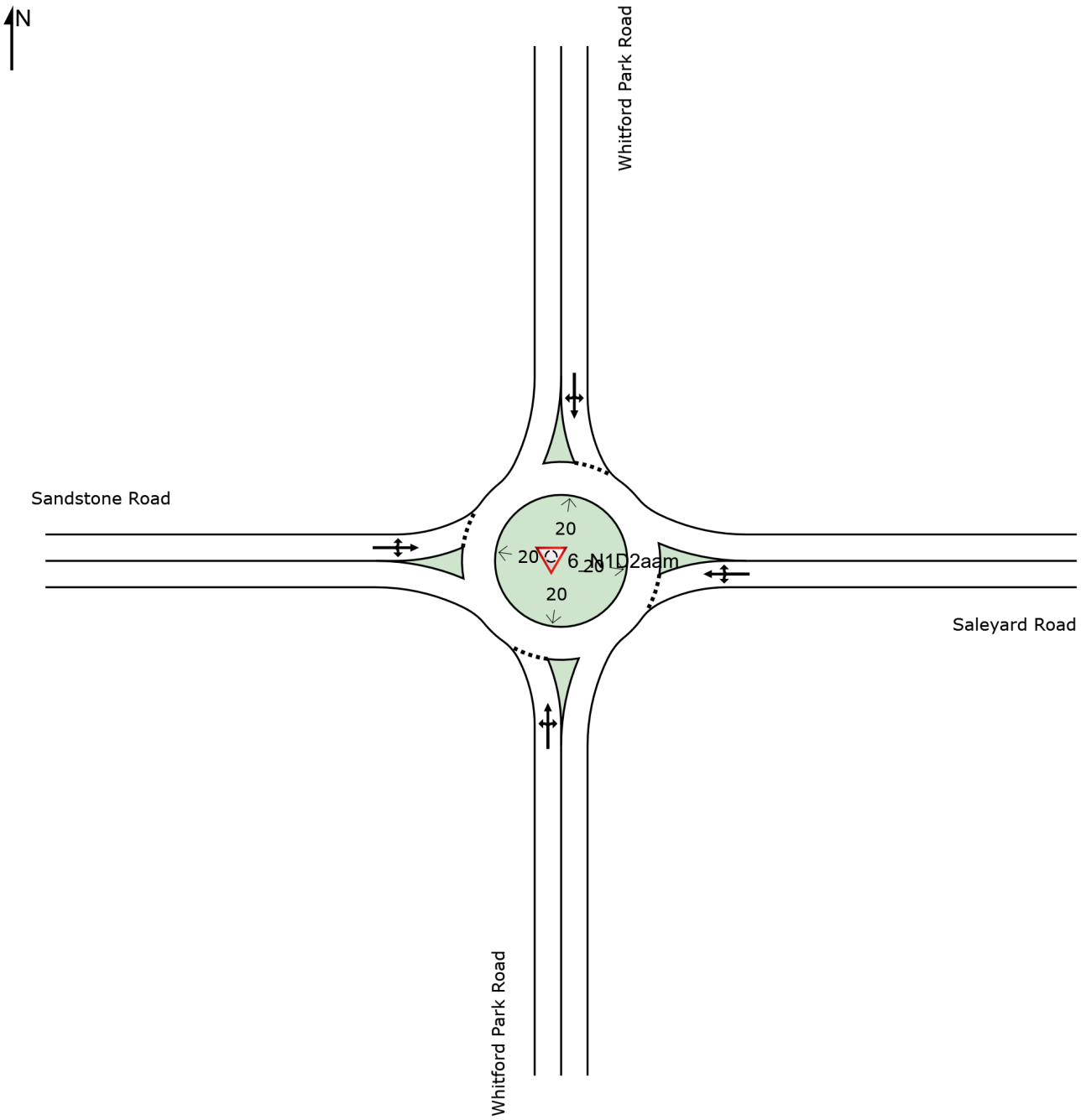


SITE LAYOUT

Site: 6_N1D2aam [6_2024_BuildOut_AM (Site Folder: 2024 Buildout AM N1 D2a)]

New Site
Site Category: (None)
Roundabout

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

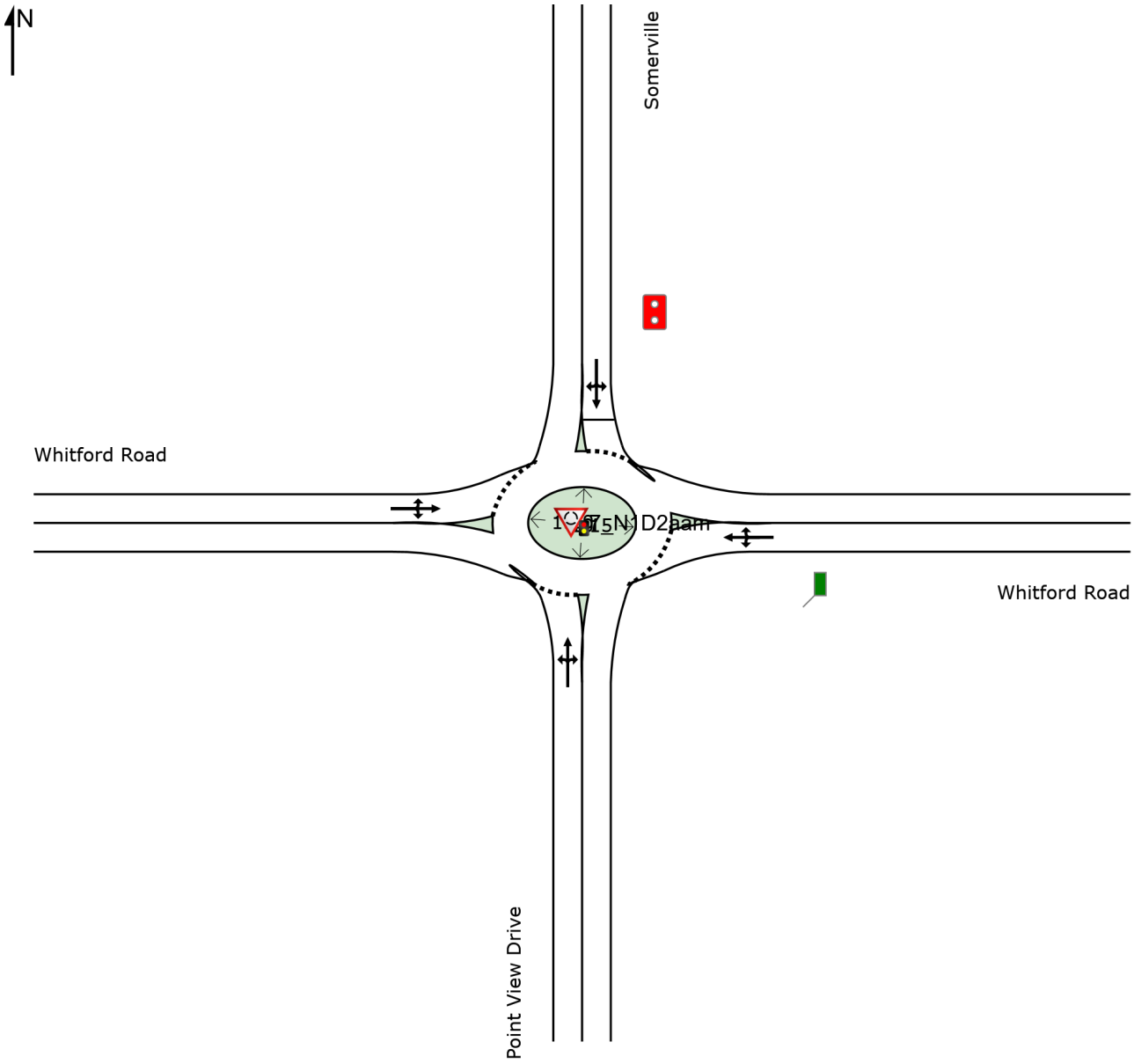


SITE LAYOUT

Site: 7_N1D2aam [7_2024_BuildOut_AM (Site Folder: 2024 Buildout AM N1 D2a)]

New Site
Site Category: (None)
Roundabout Metering

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



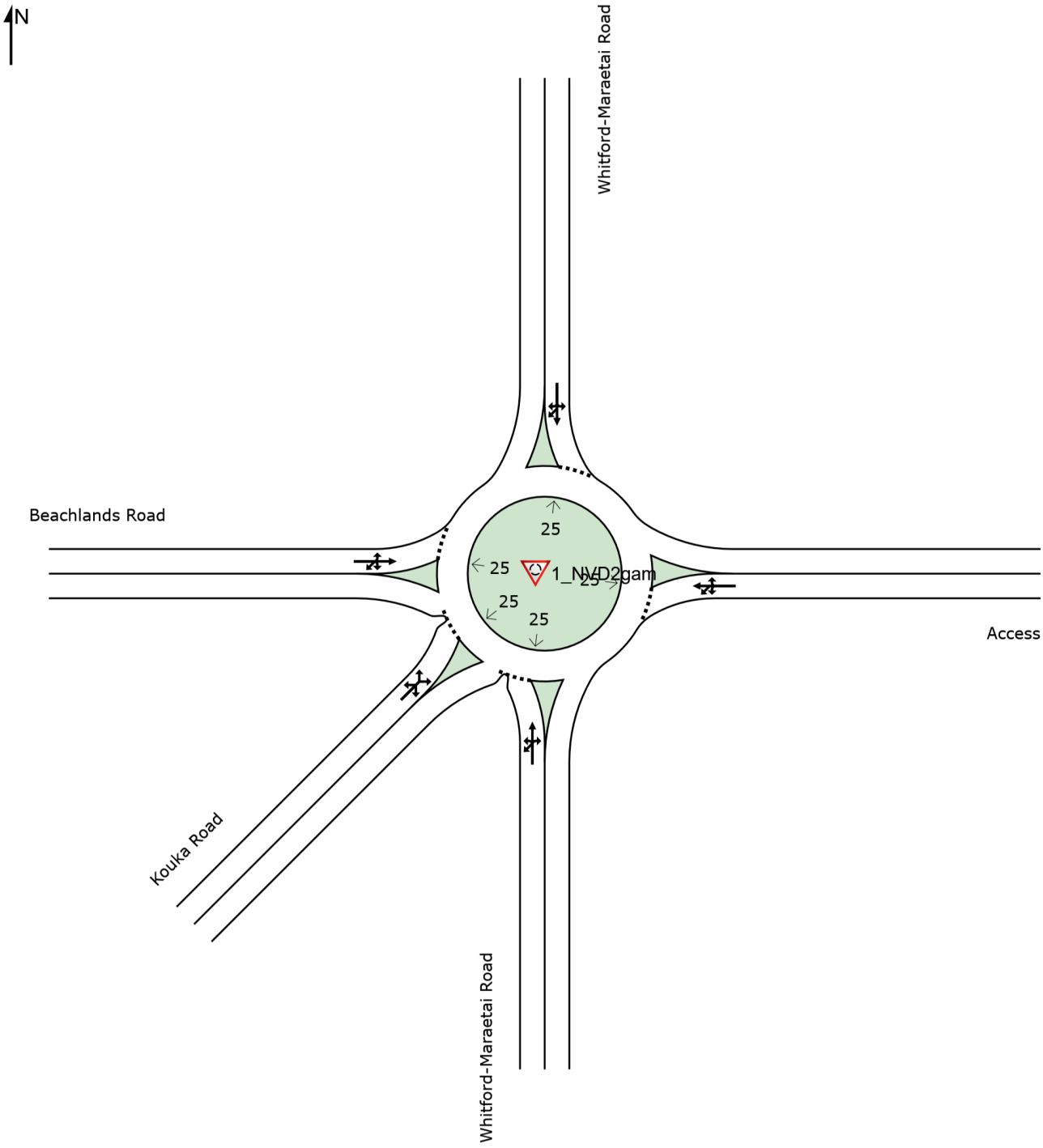
Appendix F 2031 Development SIDRA Layouts

SITE LAYOUT

Site: 1_NVD2gam [1_2031_BuildOut_AM (Site Folder: 2031 Buildout AM NV D2g)]

New Site
Site Category: (None)
Roundabout

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

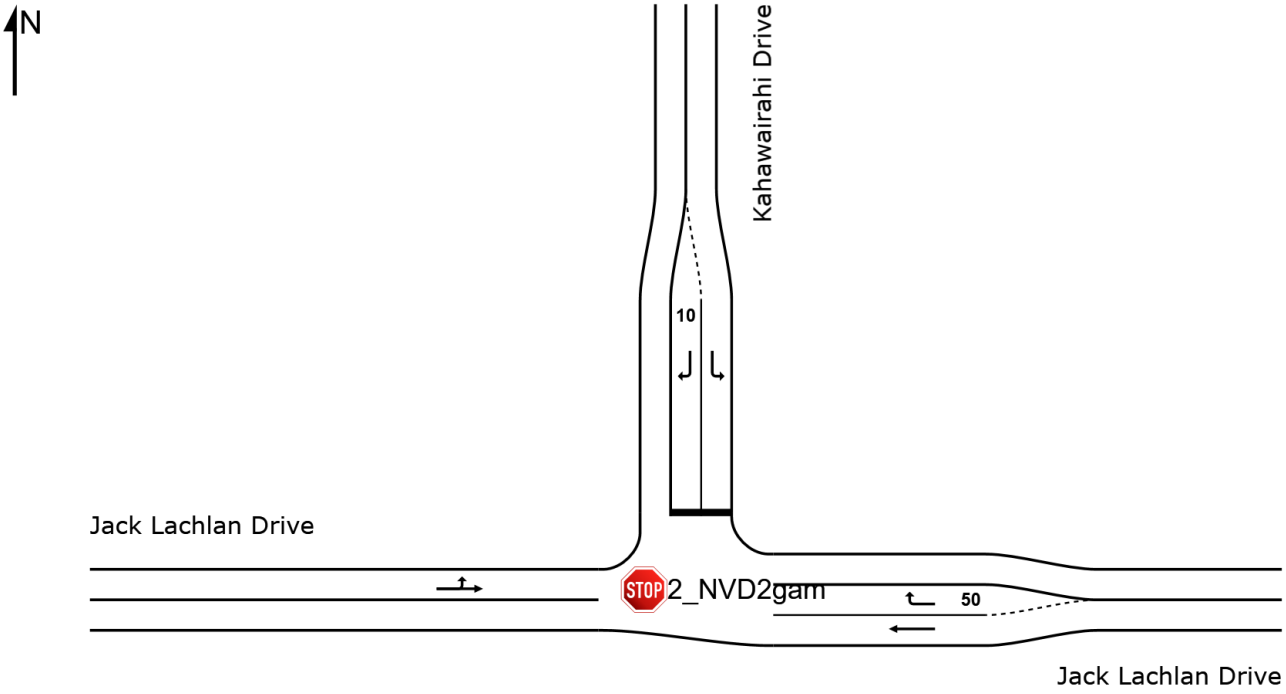


SITE LAYOUT

Site: 2_NVD2gam [2_2031_BuildOut_AM (Site Folder: 2031 Buildout AM NV D2g)]

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

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

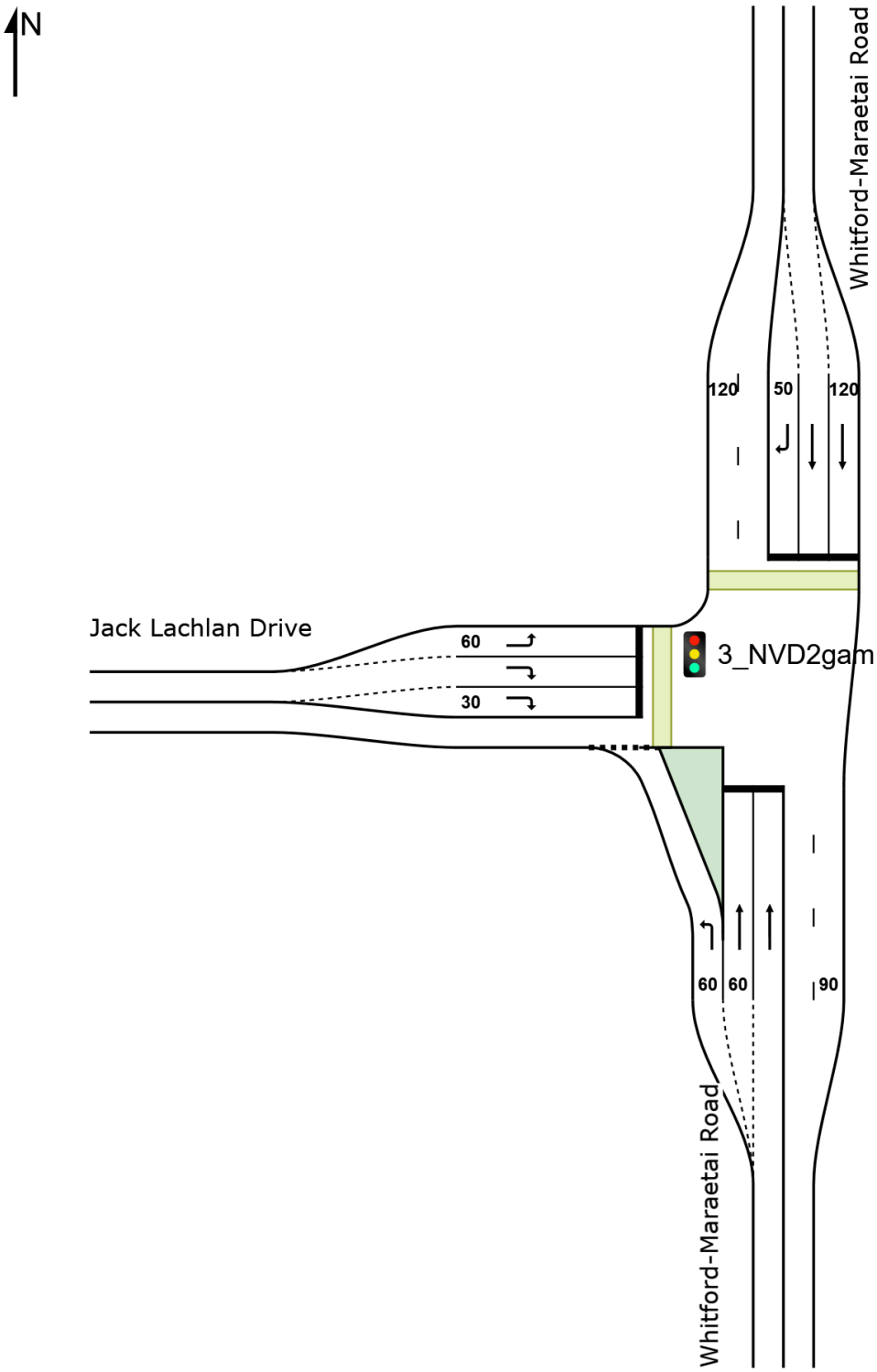


SITE LAYOUT

Site: 3_NVD2gam [3_2031_BuildOut_AM (Site Folder: 2031 Buildout AM NV D2g)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

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

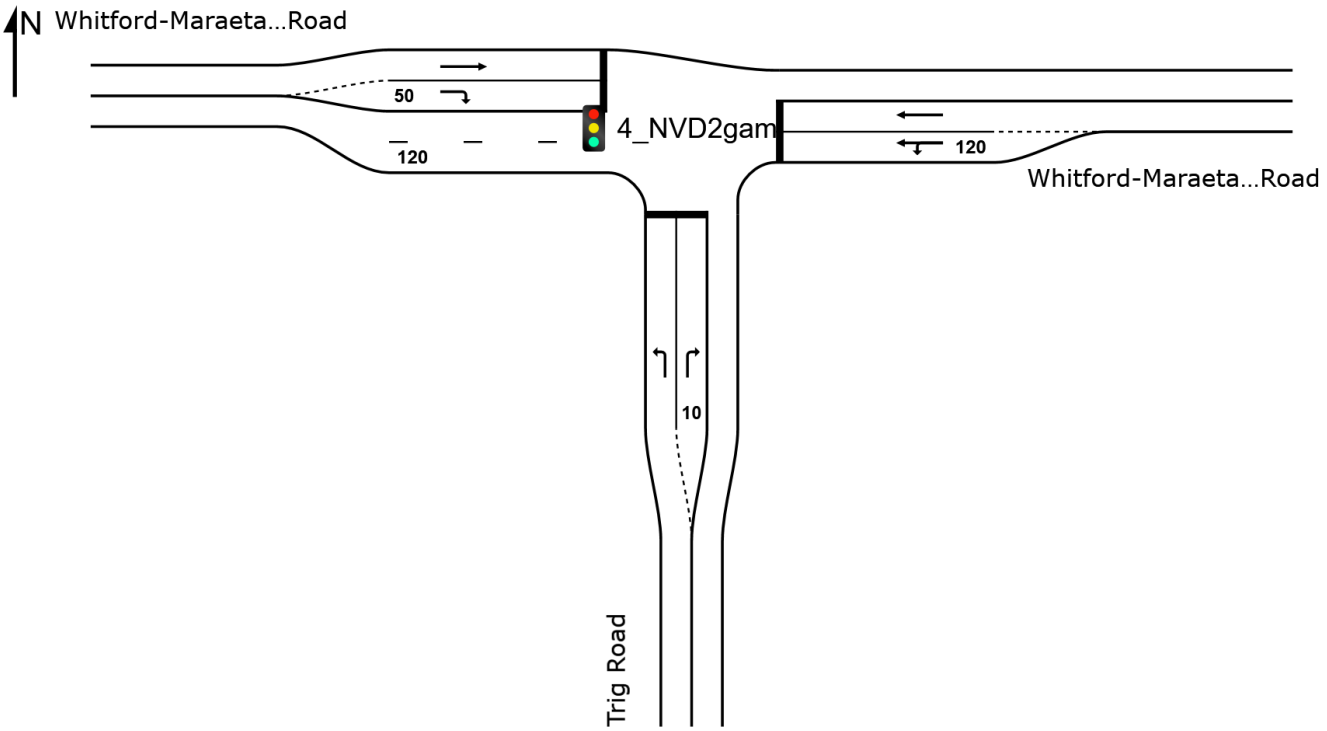


SITE LAYOUT

Site: 4_NVD2gam [4_2031_BuildOut_AM (Site Folder: 2031 Buildout AM NV D2g)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

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

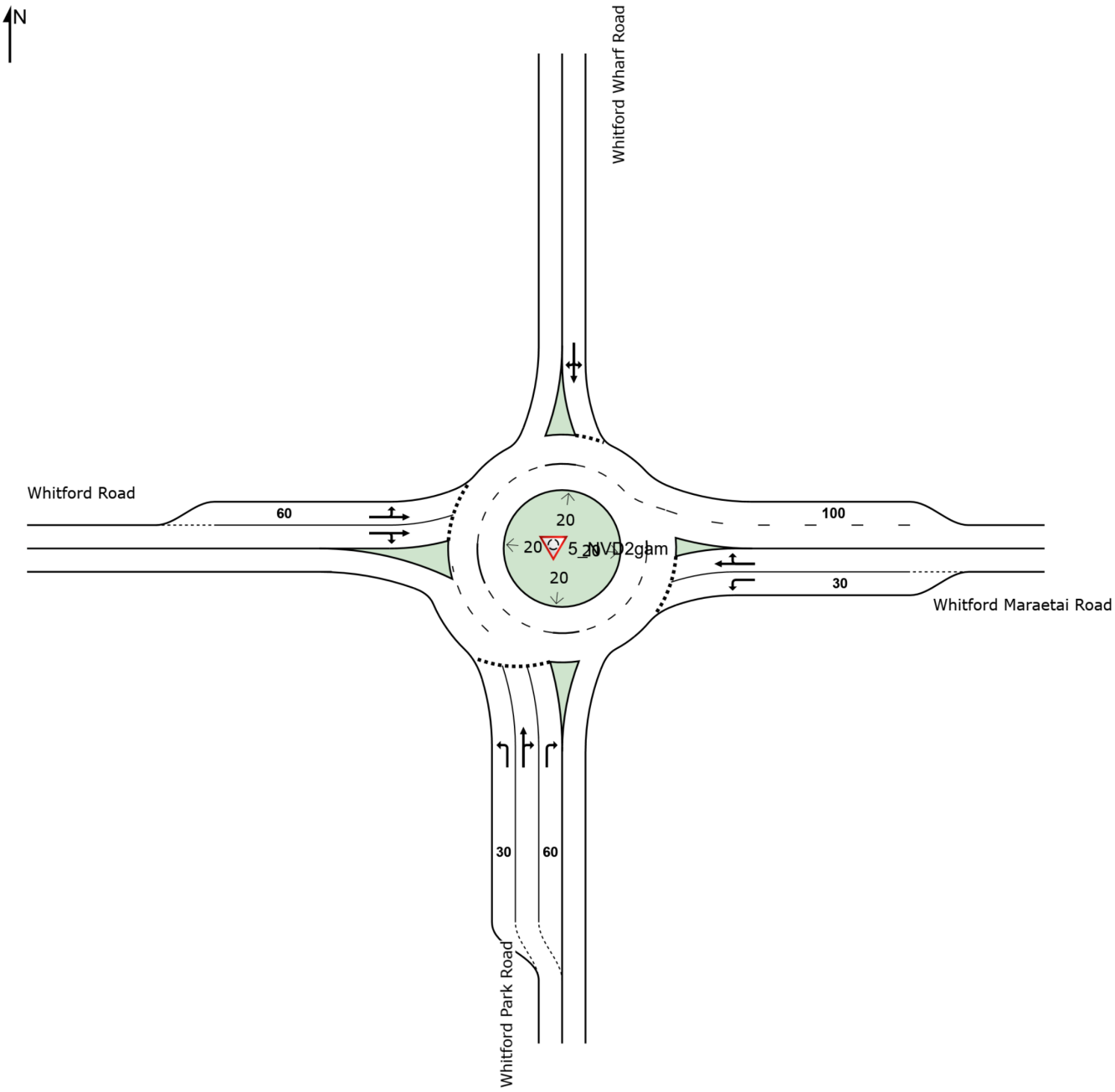


SITE LAYOUT

Site: 5_NVD2gam [5_2031_BuildOut_AM (Site Folder: 2031 Buildout AM NV D2g)]

New Site
Site Category: (None)
Roundabout

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

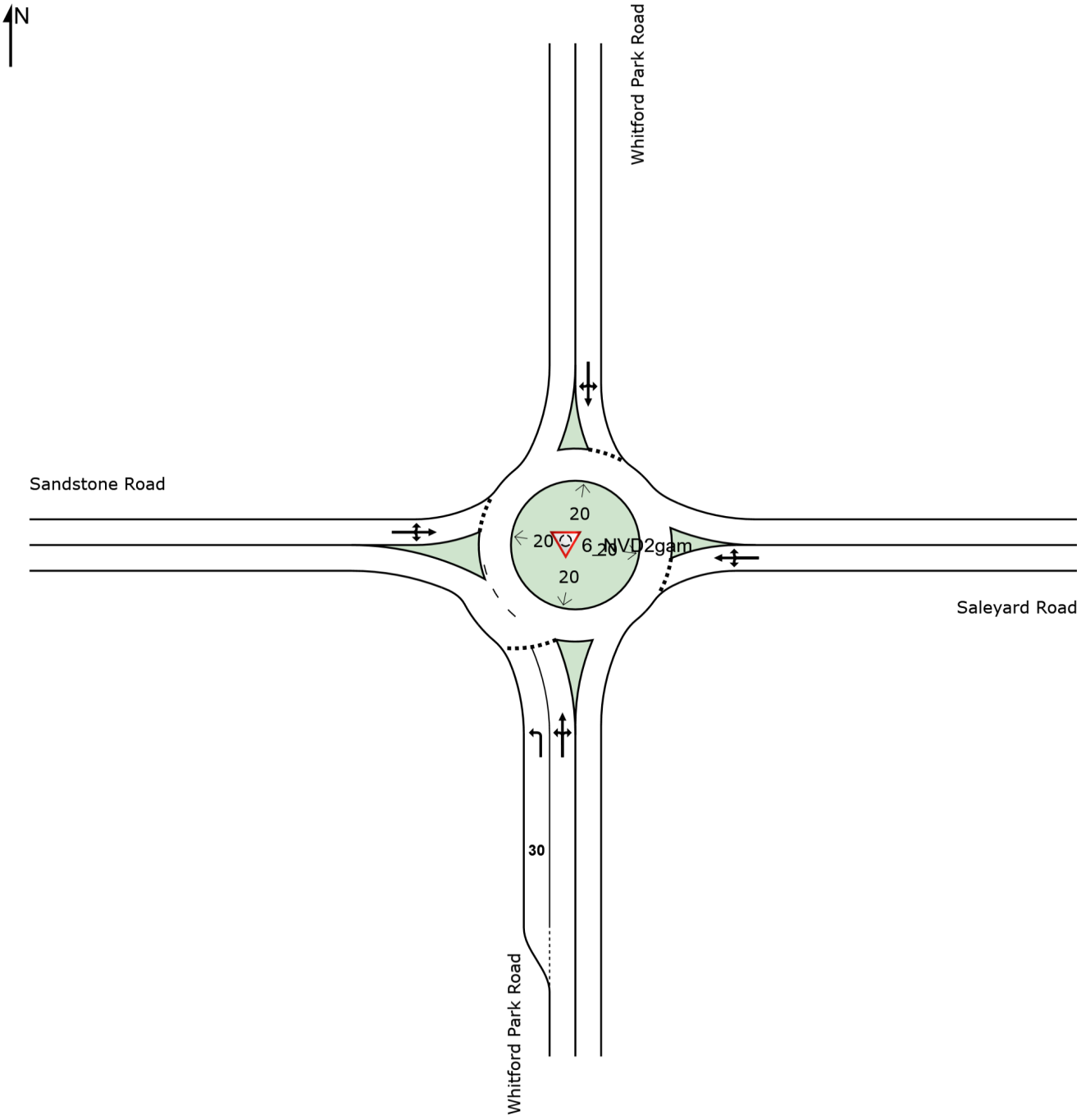


SITE LAYOUT

Site: 6_NVD2gam [6_2031_BuildOut_AM (Site Folder: 2031 Buildout AM NV D2g)]

New Site
Site Category: (None)
Roundabout

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

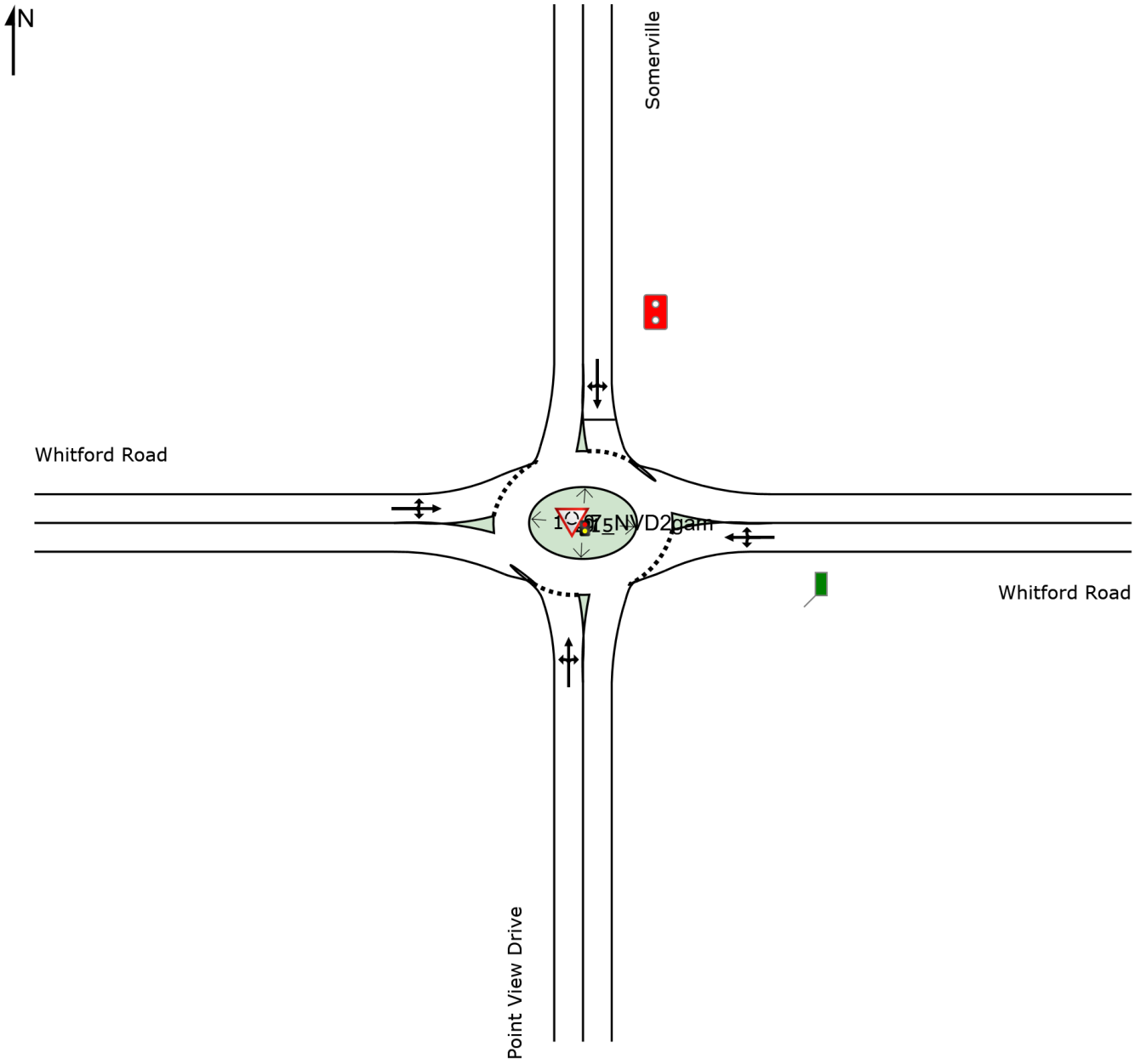


SITE LAYOUT

Site: 7_NVD2gam [7_2031_BuildOut_AM (Site Folder: 2031 Buildout AM NV D2g)]

New Site
Site Category: (None)
Roundabout Metering

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



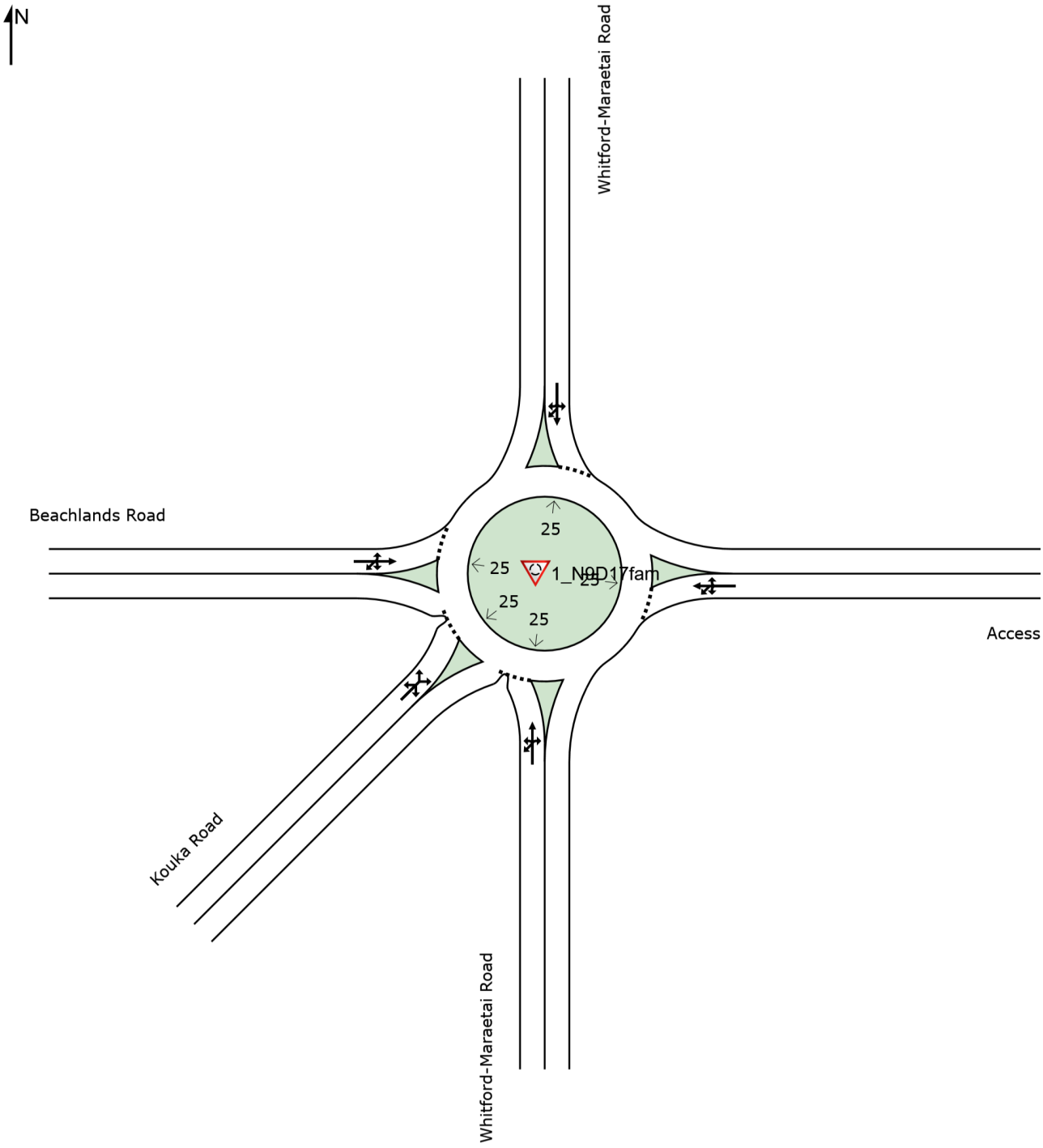
Appendix G 2038 Development SIDRA Layouts

SITE LAYOUT

Site: 1_N9D17fam [1_2038_BuildOut_AM (Site Folder: 2038 Buildout AM N9 D17f)]

New Site
Site Category: (None)
Roundabout

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

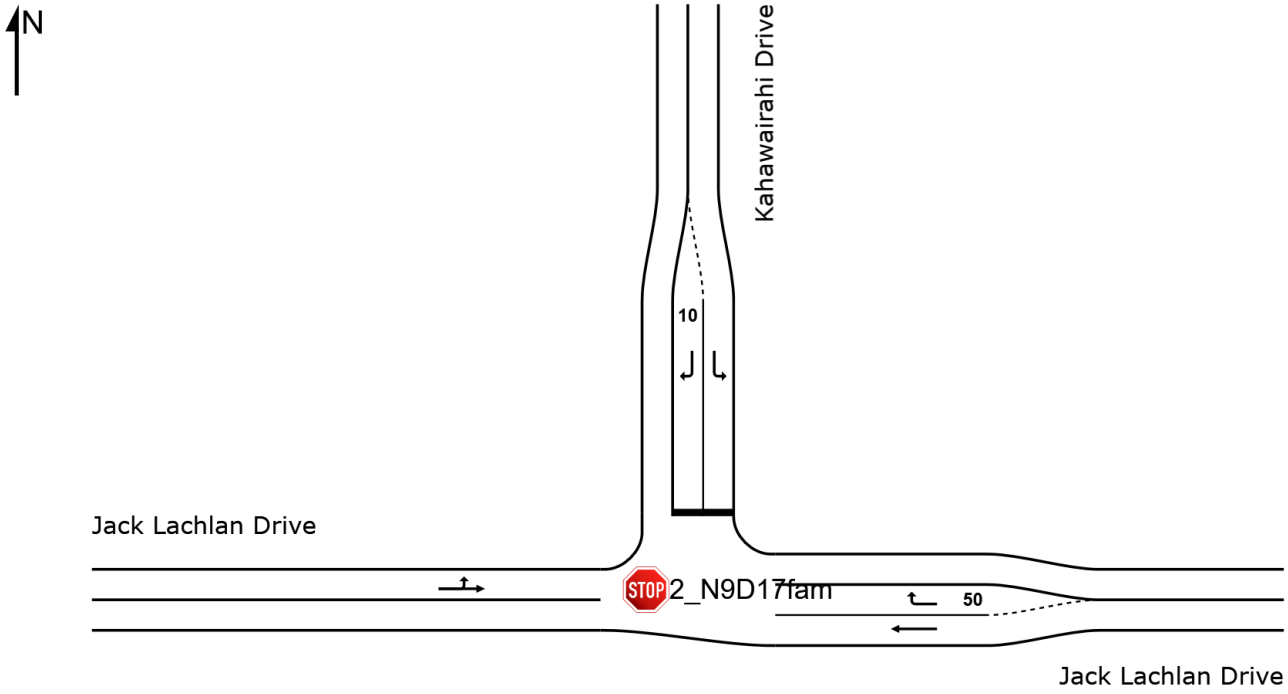


SITE LAYOUT

Site: 2_N9D17fam [2_2038_BuildOut_AM (Site Folder: 2038 Buildout AM N9 D17f)]

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

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

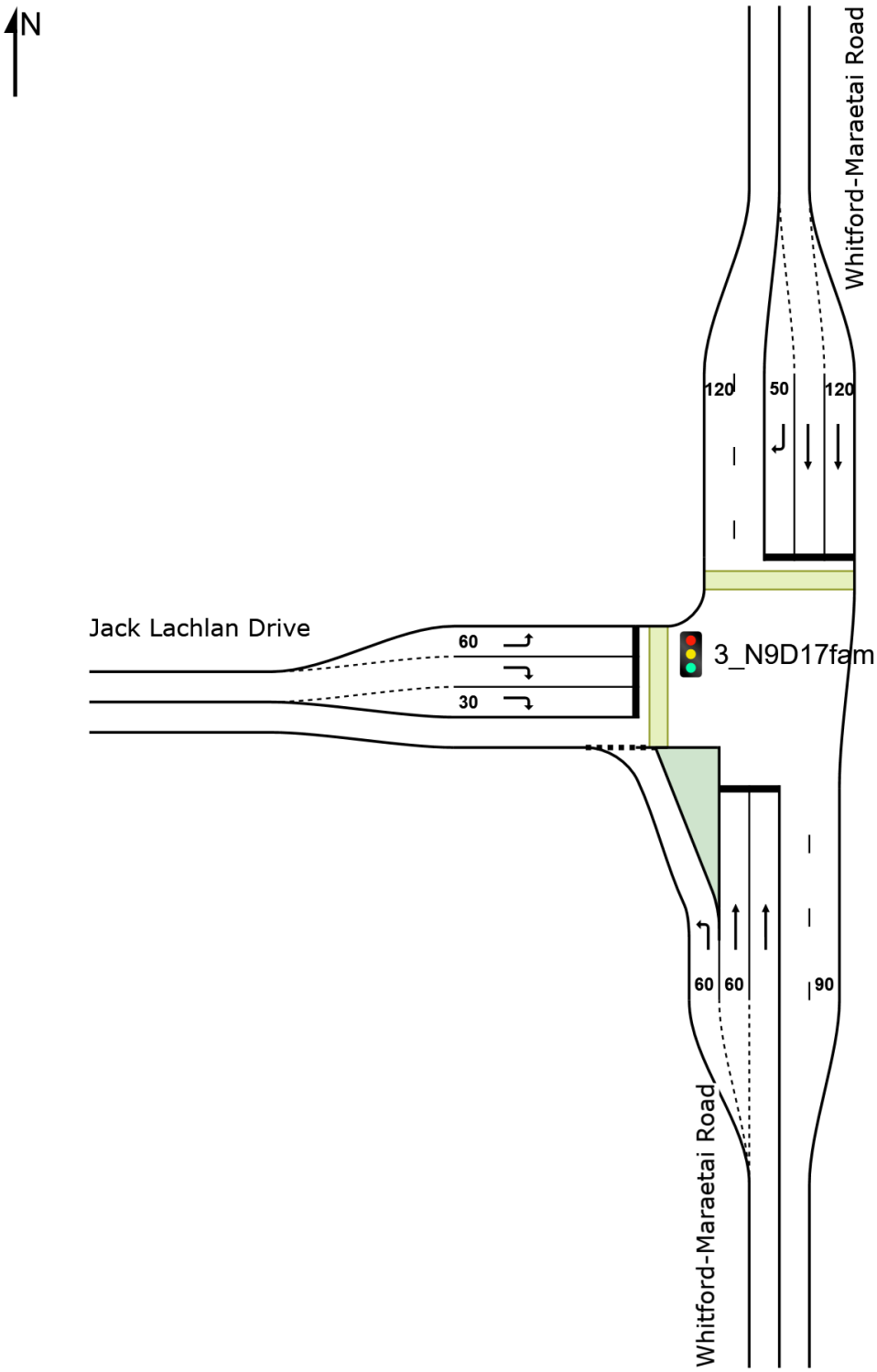


SITE LAYOUT

Site: 3_N9D17fam [3_2038_BuildOut_AM (Site Folder: 2038 Buildout AM N9 D17f)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

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

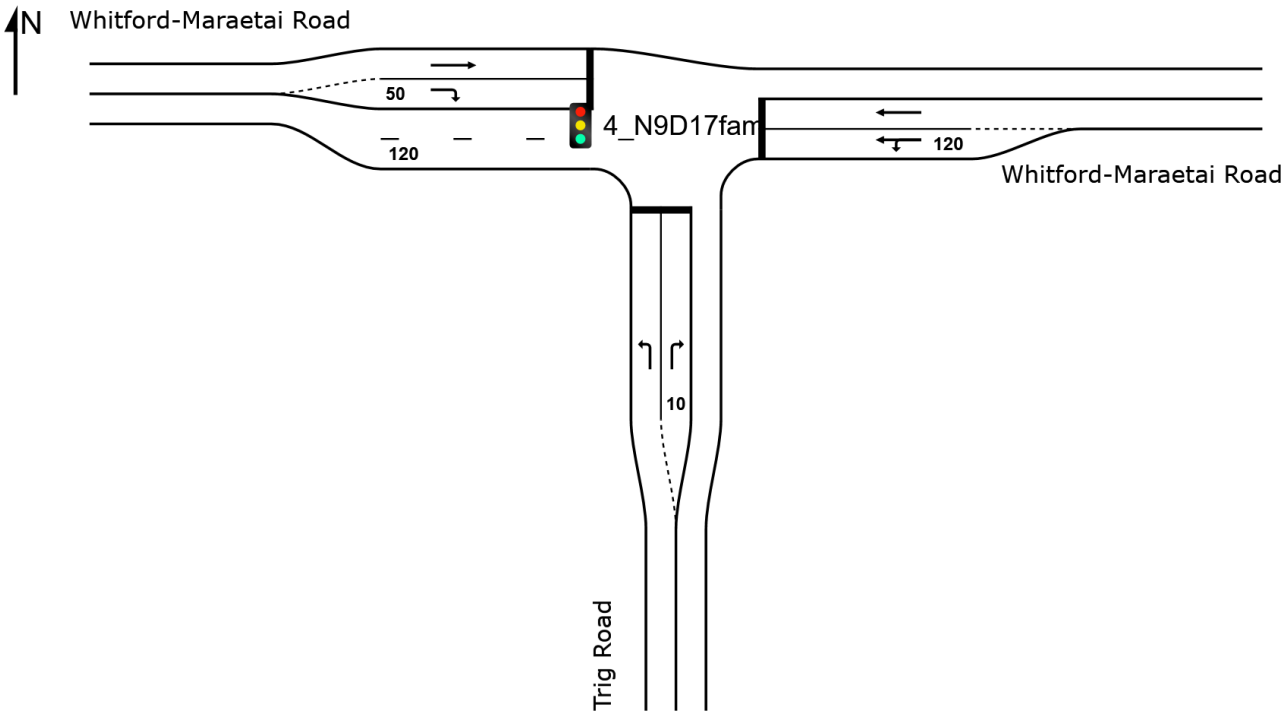


SITE LAYOUT

Site: 4_N9D17fam [4_2038_BuildOut_AM (Site Folder: 2038 Buildout AM N9 D17f)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

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

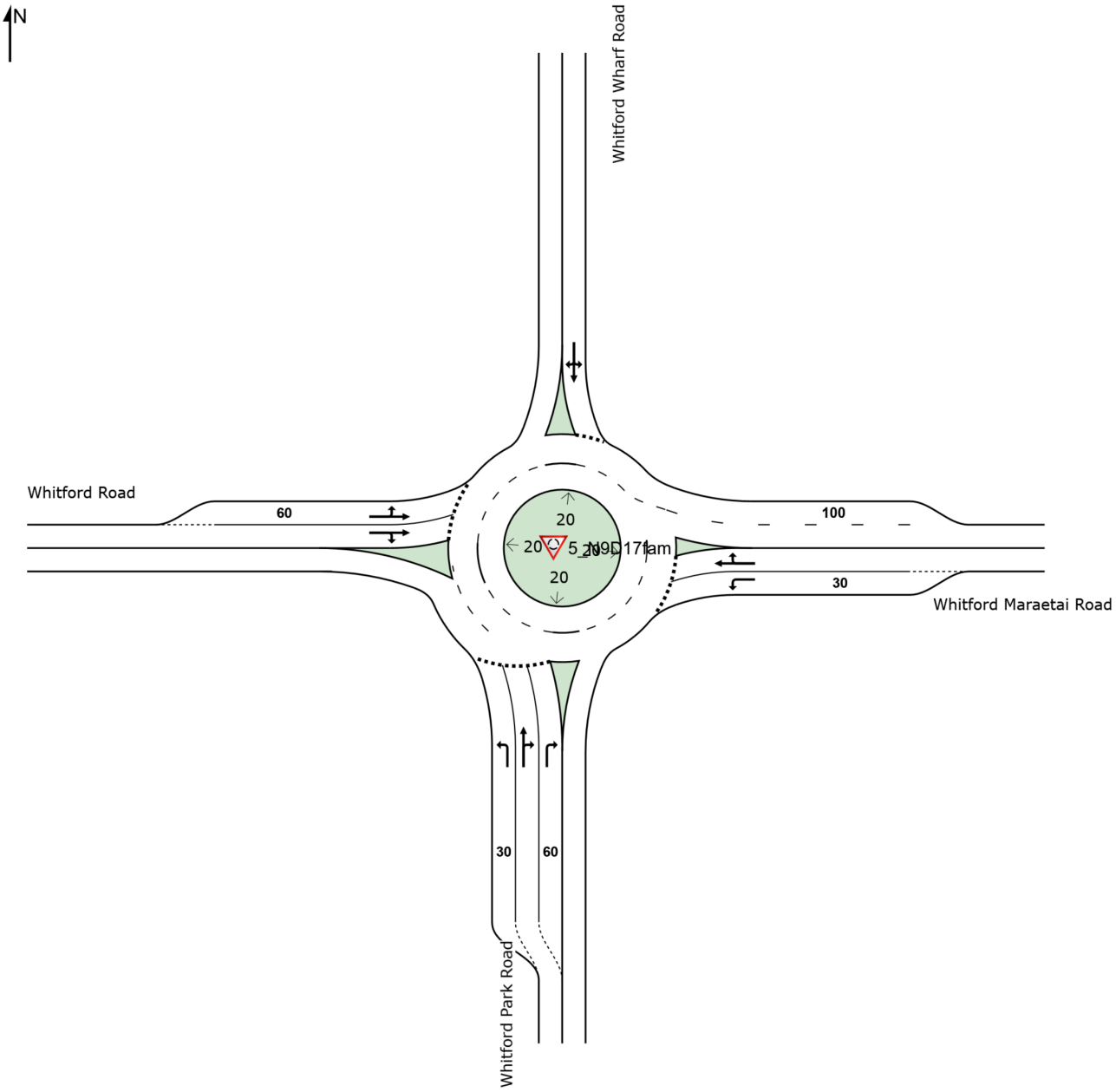


SITE LAYOUT

Site: 5_N9D17fam [5_2038_BuildOut_AM (Site Folder: 2038 Buildout AM N9 D17f)]

New Site
Site Category: (None)
Roundabout

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

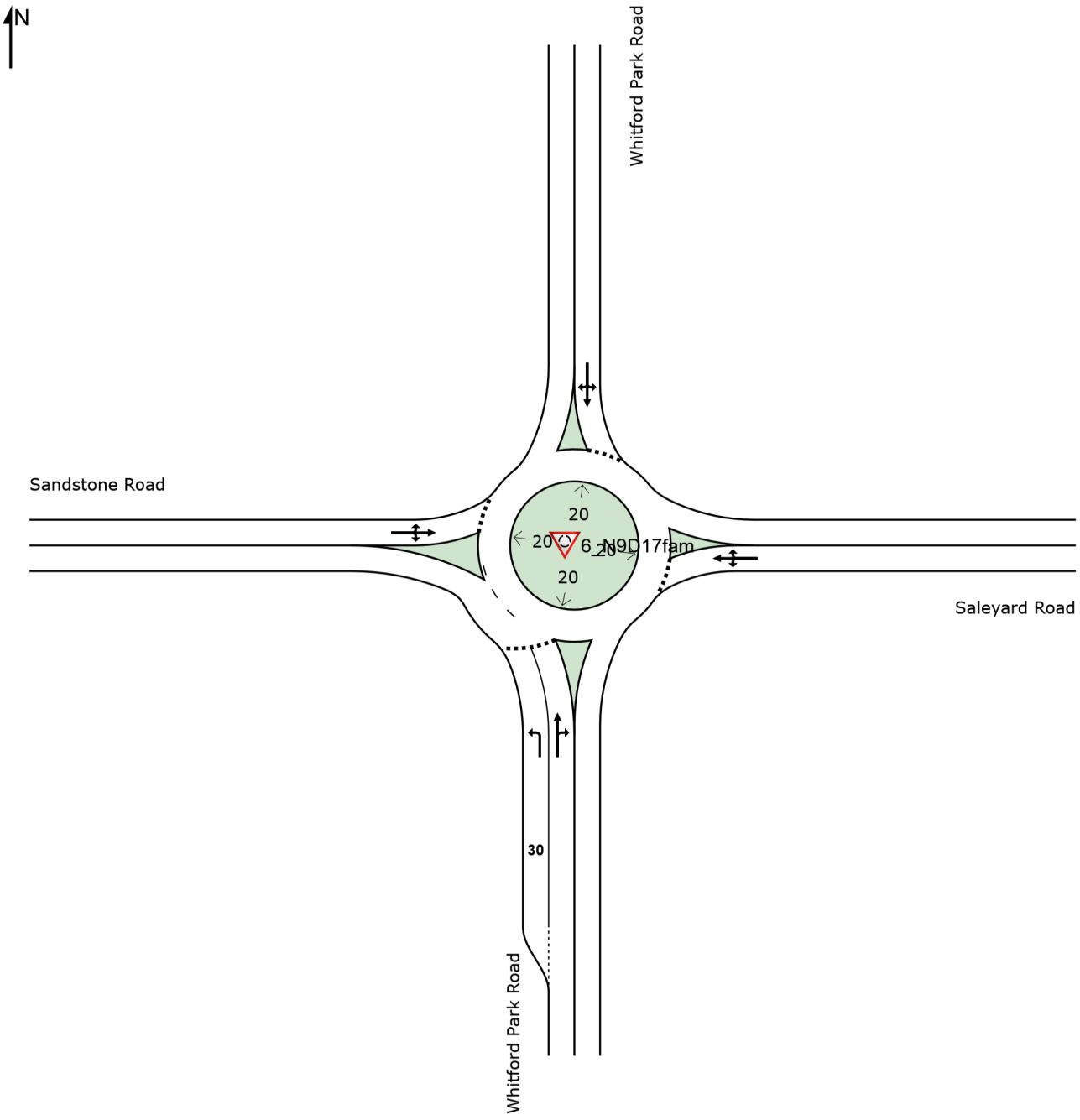


SITE LAYOUT

Site: 6_N9D17fam [6_2038_BuildOut_AM (Site Folder: 2038 Buildout AM N9 D17f)]

New Site
Site Category: (None)
Roundabout

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

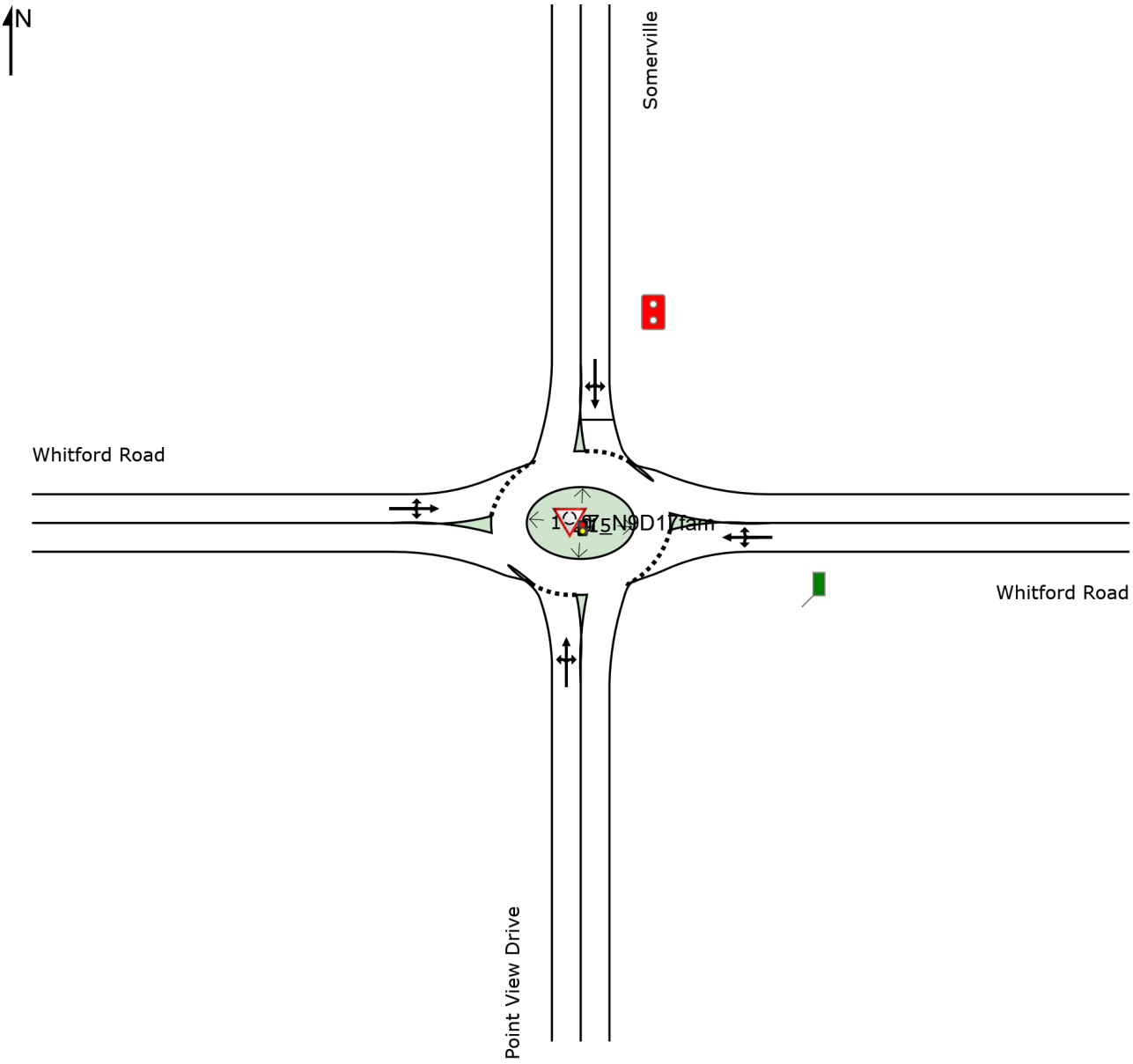


SITE LAYOUT

Site: 7_N9D17fam [7_2038_BuildOut_AM (Site Folder: 2038 Buildout AM N9 D17f)]

New Site
Site Category: (None)
Roundabout Metering

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

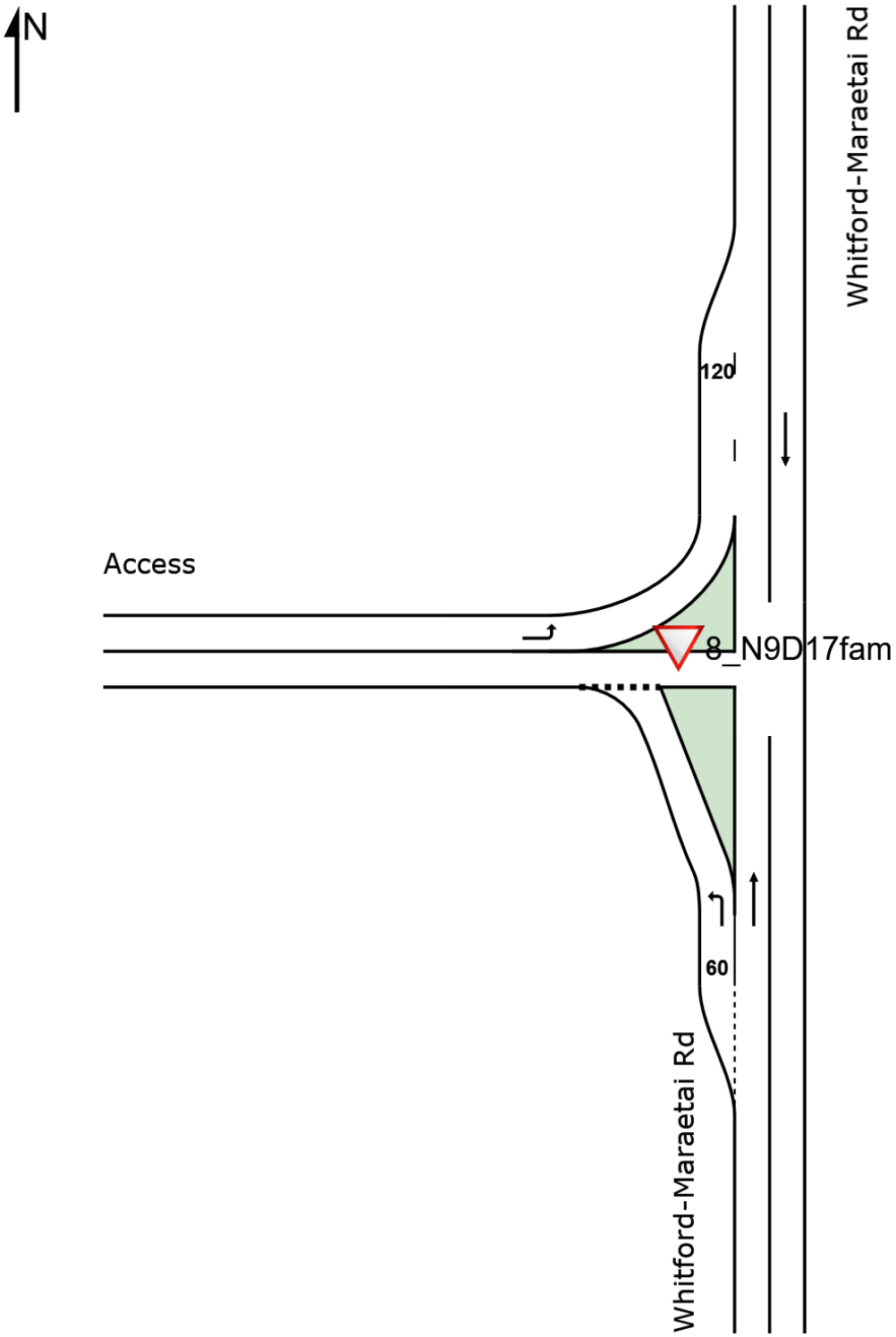


SITE LAYOUT

Site: 8_N9D17fam [8_2038_BuildOut_AM (Site Folder: 2038 Buildout AM N9 D17f)]

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

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



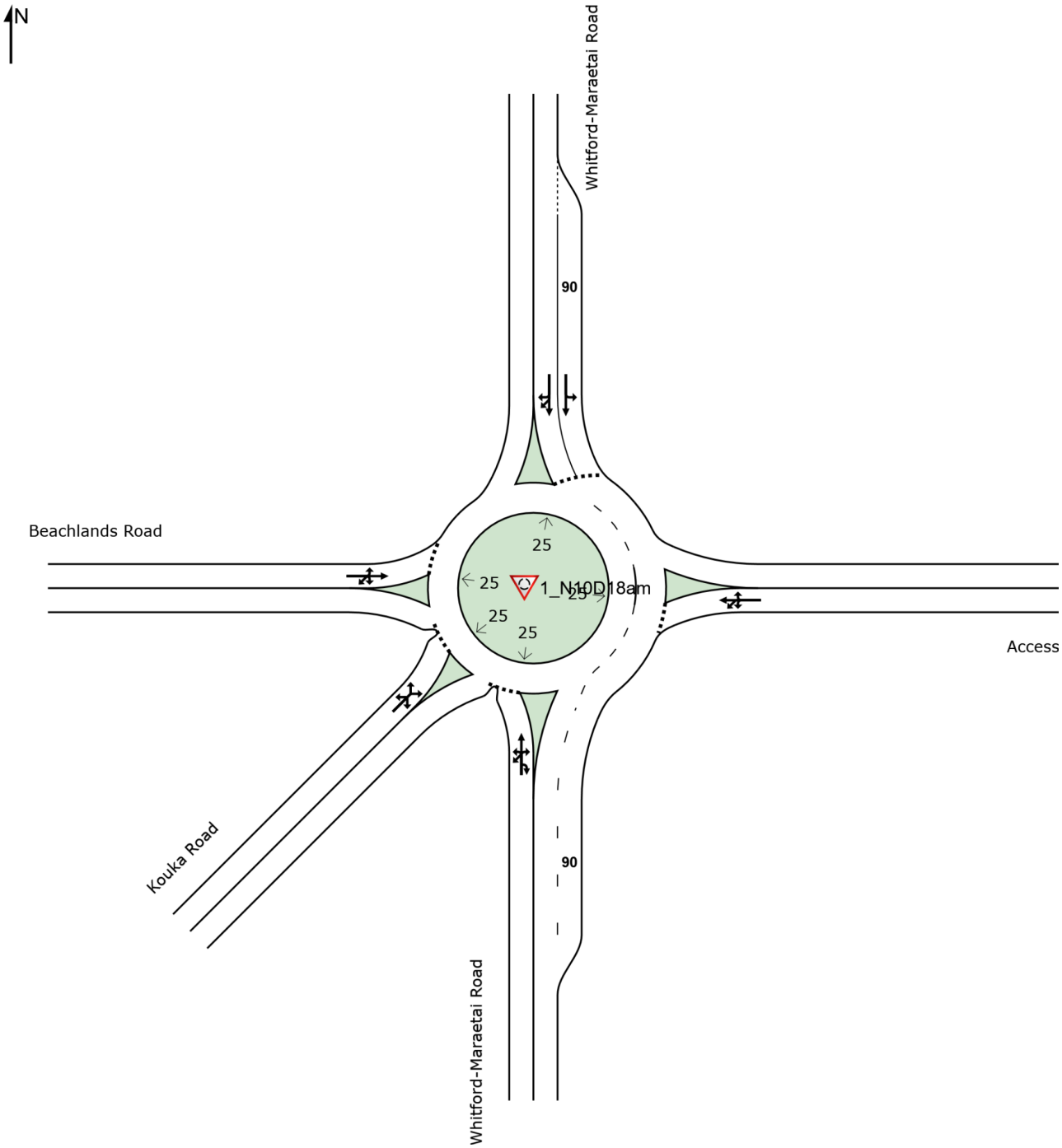
Appendix H FUZ SIDRA Layouts

SITE LAYOUT

Site: 1_N10D18am [1_2051_BuildOut_AM (Site Folder: 2051 Buildout AM N10 D18a)]

New Site
Site Category: (None)
Roundabout

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

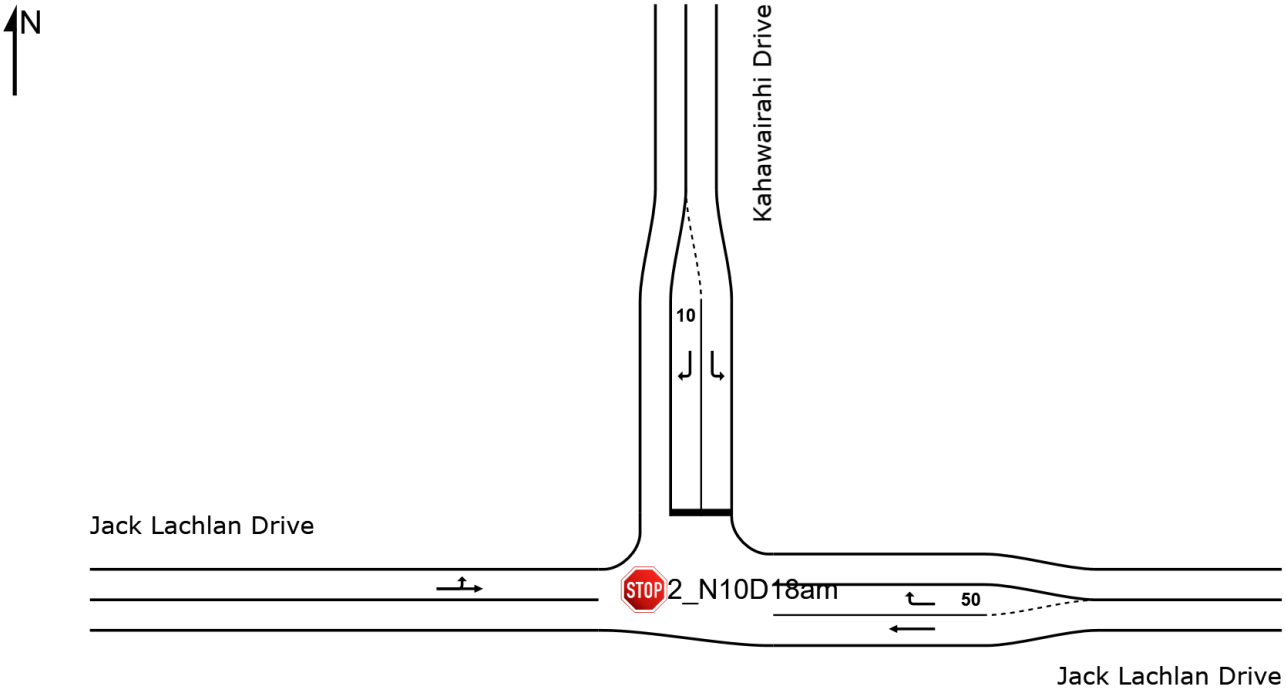


SITE LAYOUT

Site: 2_N10D18am [2_2051_BuildOut_AM (Site Folder: 2051 Buildout AM N10 D18a)]

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

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

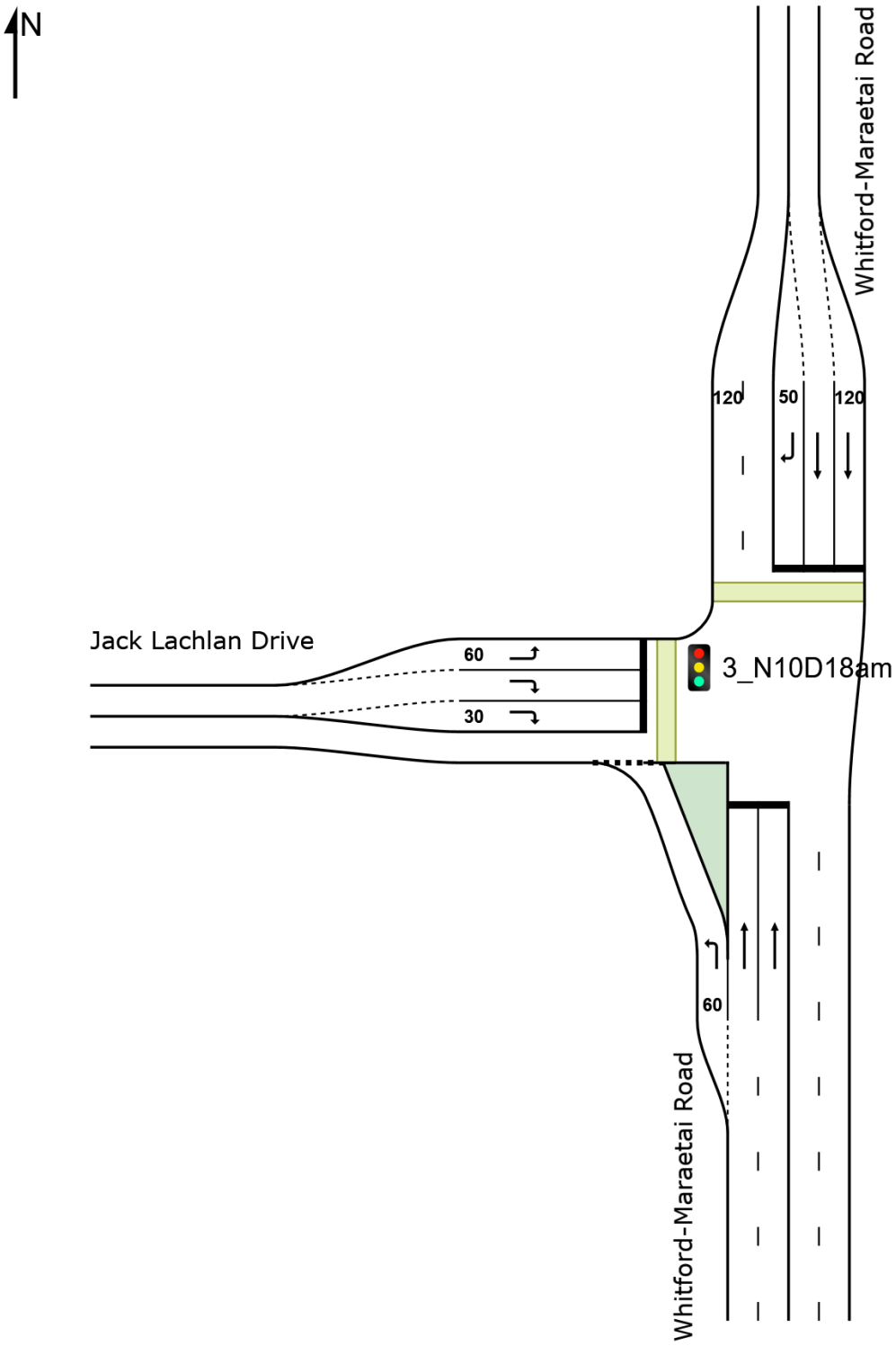


SITE LAYOUT

Site: 3_N10D18am [3_2051_BuildOut_AM (Site Folder: 2051 Buildout AM N10 D18a)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

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

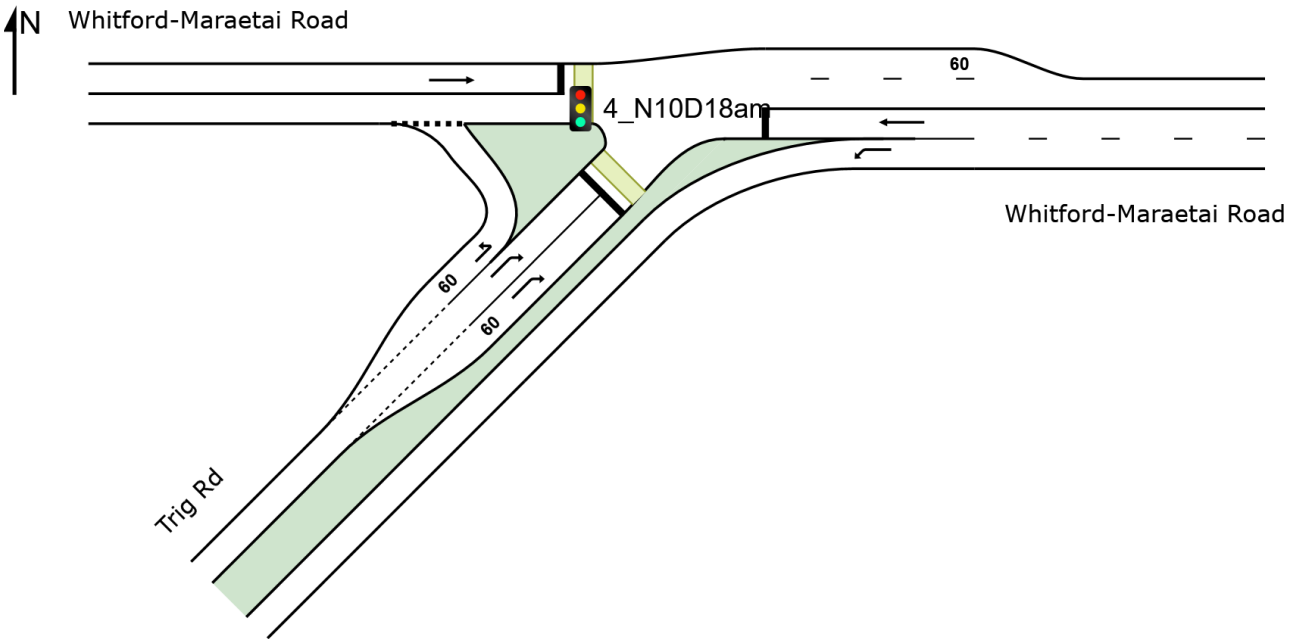


SITE LAYOUT

Site: 4_N10D18am [4_2051_BuildOut_AM (Site Folder: 2051 Buildout AM N10 D18a)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

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

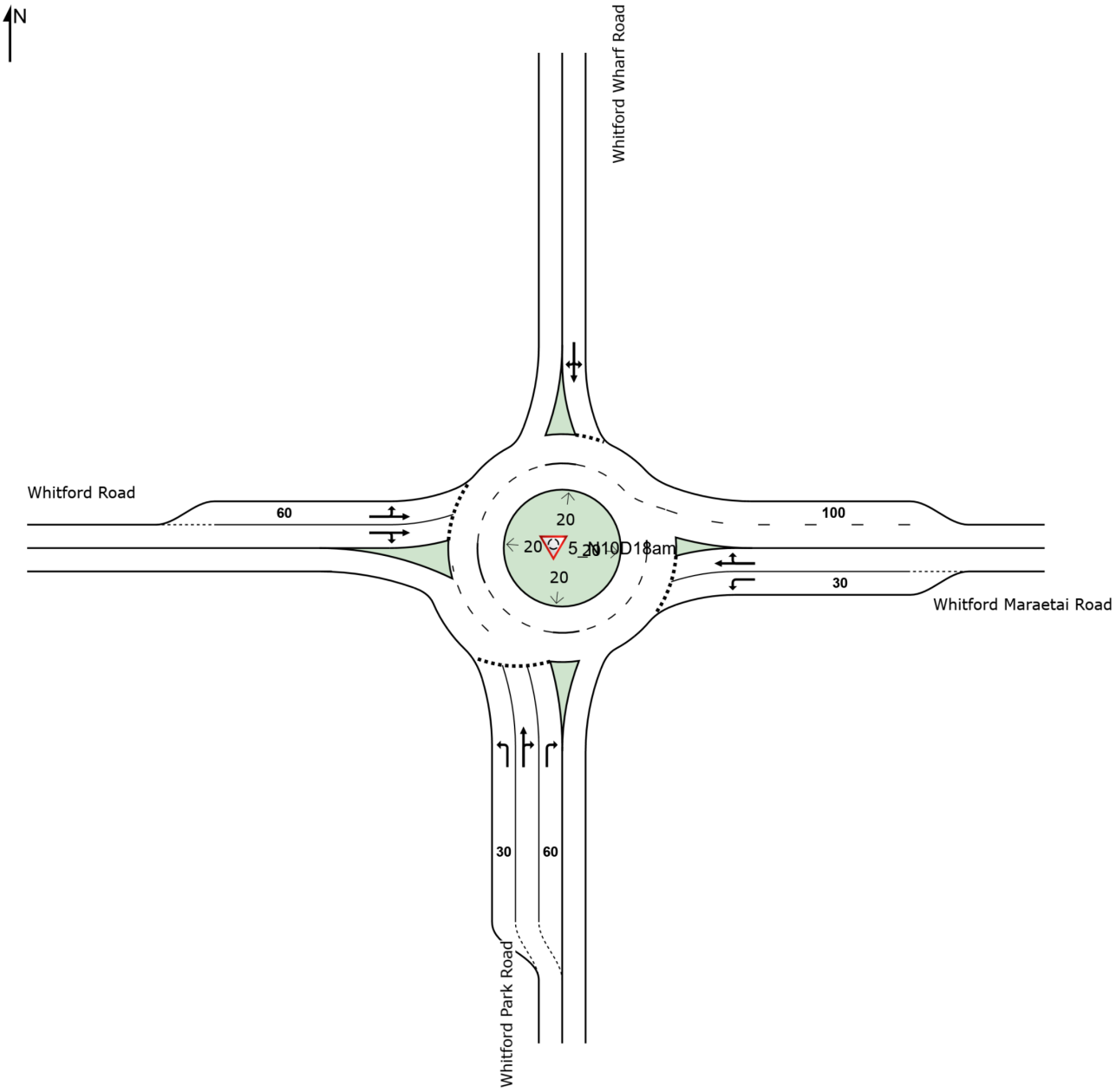


SITE LAYOUT

Site: 5_N10D18am [5_2051_BuildOut_AM (Site Folder: 2051 Buildout AM N10 D18a)]

New Site
Site Category: (None)
Roundabout

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

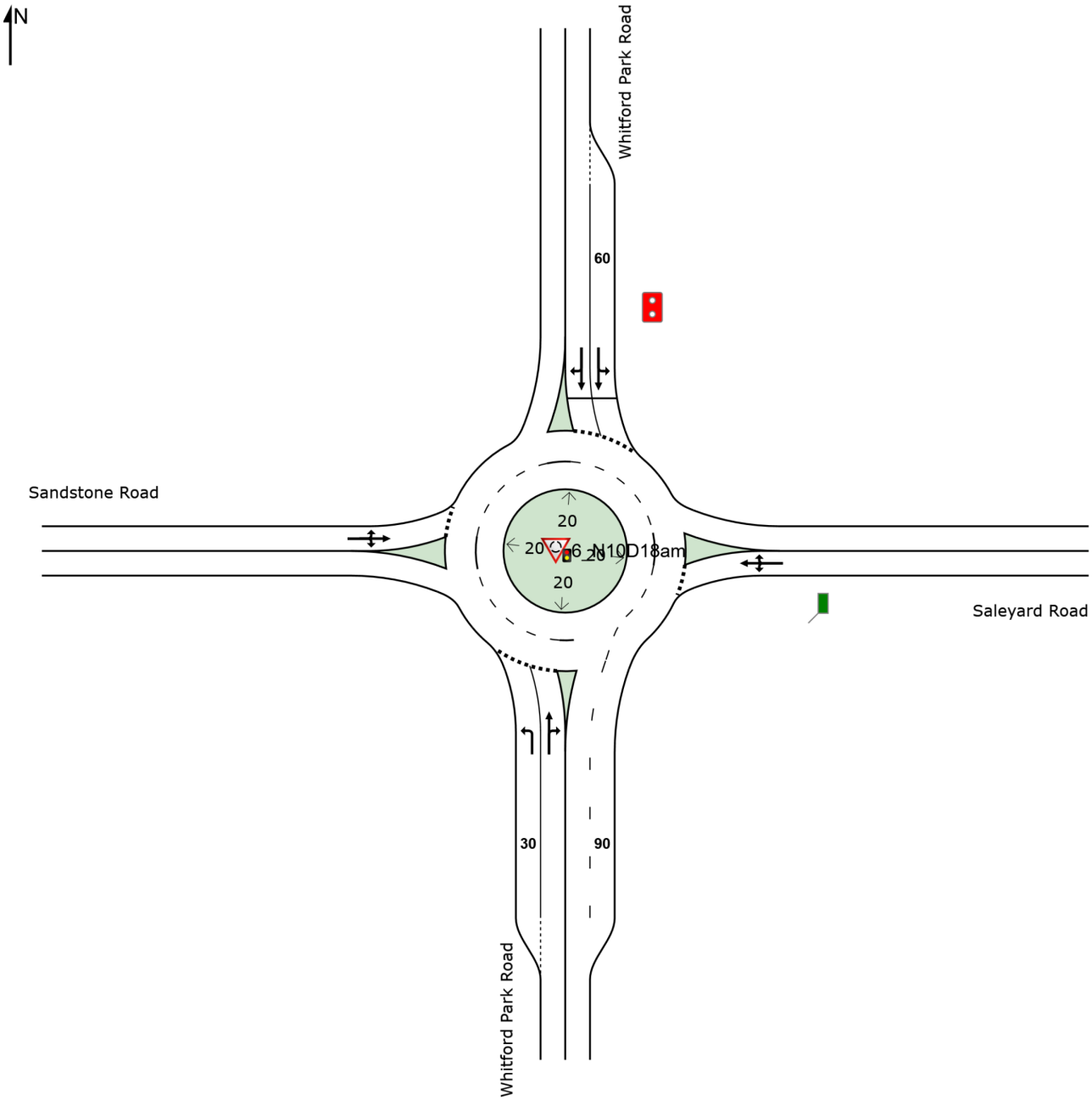


SITE LAYOUT

Site: 6_N10D18am [6_2051_BuildOut_AM (Site Folder: 2051 Buildout AM N10 D18a)]

New Site
Site Category: (None)
Roundabout Metering

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

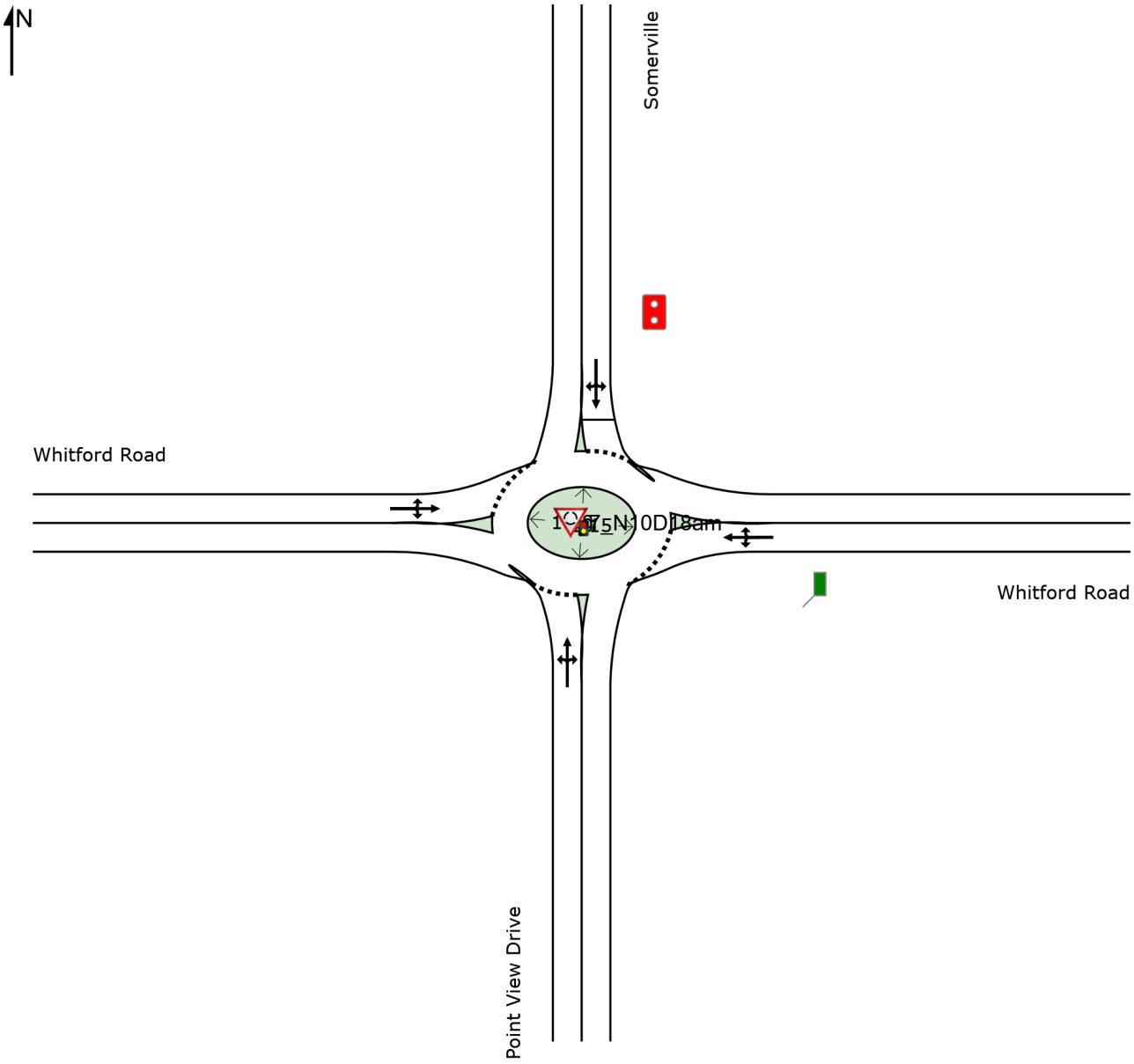


SITE LAYOUT

Site: 7_N10D18am [7_2051_BuildOut_AM (Site Folder: 2051 Buildout AM N10 D18a)]

New Site
Site Category: (None)
Roundabout Metering

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

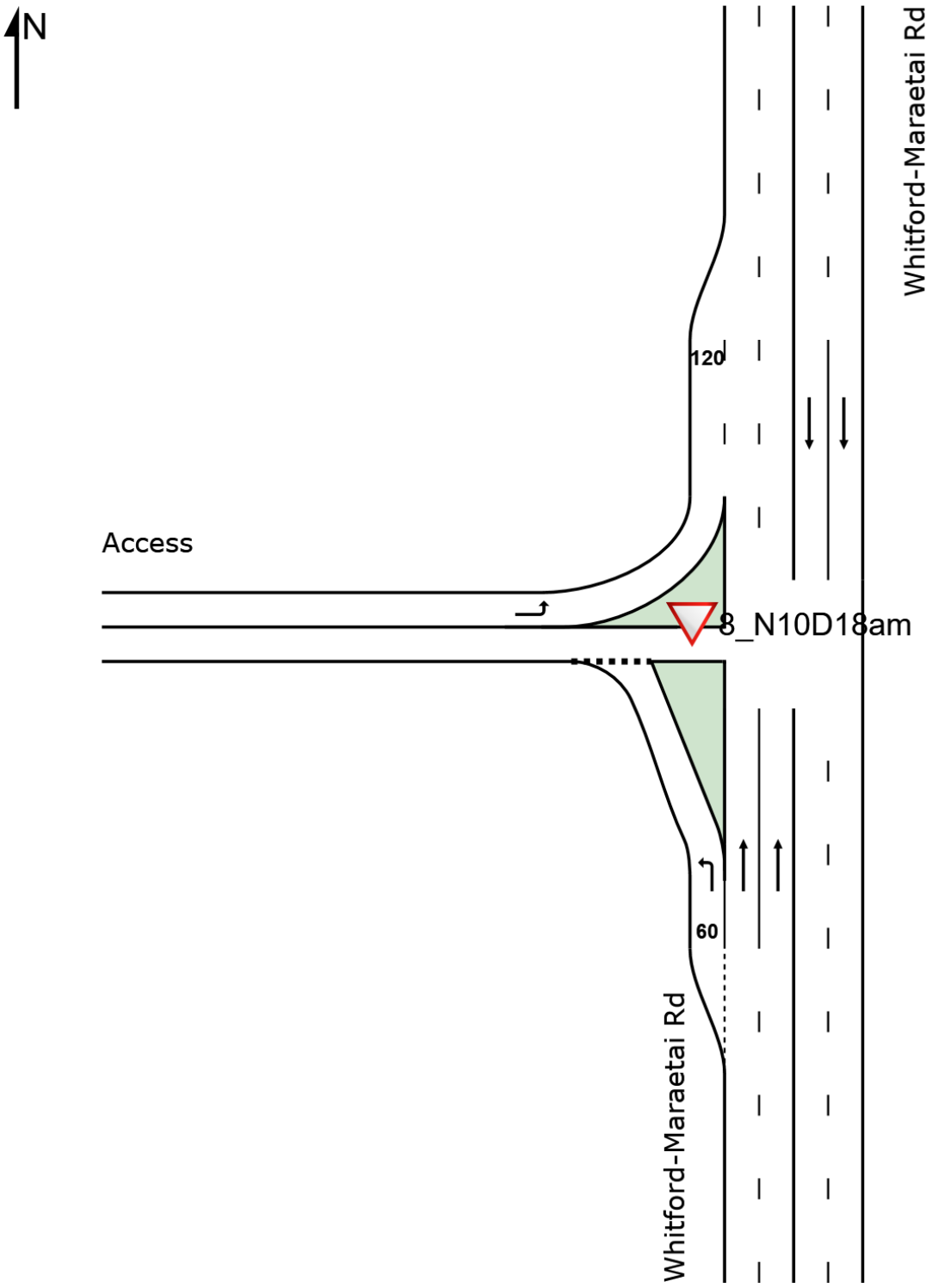


SITE LAYOUT

Site: 8_N10D18am [8_2051_BuildOut_AM (Site Folder: 2051 Buildout AM N10 D18a)]

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

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

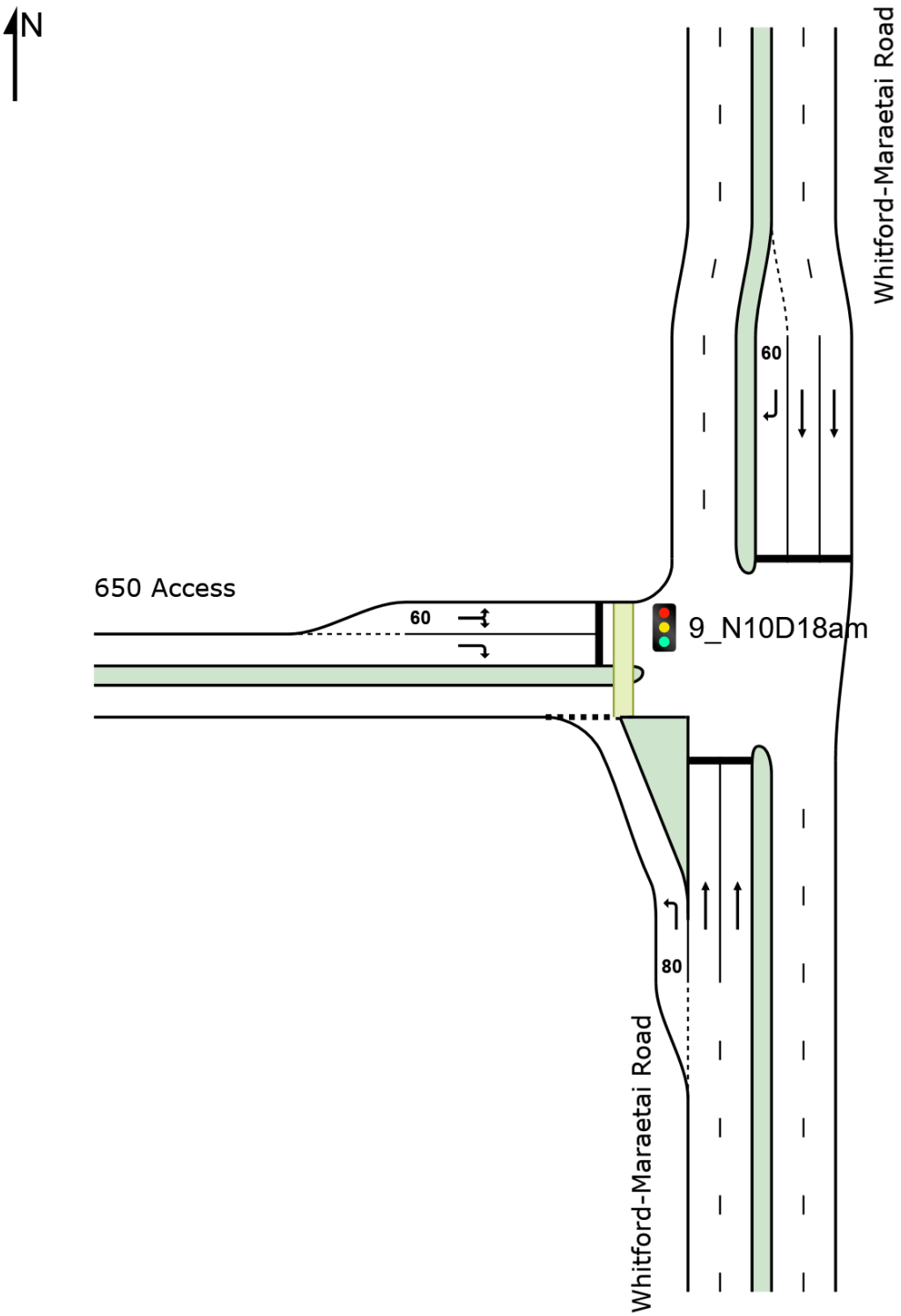


SITE LAYOUT

Site: 9_N10D18am [9_2051_BuildOut_AM (Site Folder: 2051 Buildout AM N10 D18a)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

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



CREATING COMMUNITIES

Communities are fundamental. Whether around the corner or across the globe, they provide a foundation, a sense of belonging. That's why at Stantec, we always **design with community in mind**.

We care about the communities we serve—because they're our communities too. We're designers, engineers, scientists, and project managers, innovating together at the intersection of community, creativity, and client relationships. Balancing these priorities results in projects that advance the quality of life in communities across the globe.

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