Teal Park - Light Industry & Residential Development

Brigham Creek Road, Whenuapai

Integrated Transport Assessment Report

team

Address	Brigham Creek Road, Whenuapai
Project:	Teal Park - Light Industry & Residential Development
File Path:	C:\TEAM projects\2020\20350 - Whenuapai land holdings\doc\BCR North (Kauri Rd)\Lignt Industry & Residential Development (Kauri Rd) - ITA, 16-11-22.docx
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Executive Summary

Neil Construction Ltd (NCL) owns a section of land of approximately twenty hectares on the northern side of Brigham Creek Road, and to the west of Kauri Road, in Whenuapai. This area has been recognised as a key growth location in Council planning documents since the late 1990's, where it was first identified for urbanisation in the Auckland Regional Council's regional growth strategy. When Auckland Council's proposed Unitary Plan was released in 2013, Whenuapai was intended to be urbanised by being zoned as Future Urban Zone (FUZ). The Whenuapai Structure Plan was released in 2016 and subsequently Whenuapai was identified as development ready in Council's Future Urban Land Supply Strategy (FULSS), and the Whenuapai Proposed Plan Change 5 (PPC5) was publicly notified in September 2017. PPC5 sought to rezone 360 hectares of mostly FUZ land in Whenuapai to a mix of business and residential zones, with the subject land to be zoned as a mix of Business – Light Industry Zone and Residential – Single House Zone. PPC5 was withdrawn by Auckland Council on 16th June 2022.

The proposed development of 273 dwelling units and 9,270m^2 gross floor area of light industry activity is referred to as Teal Park.

The location of the site and the proposed roading infrastructure improvements provide accessibility to a range of transport modes. Private vehicles will be well catered for with convenient links to the State Highway network and supporting infrastructure. Local services and retail are within walking and cycling distance of the site. A new transportation network within the site will provide for vehicle, cycle and pedestrian connections throughout and to the existing network. Allowance has been made for the future internal network to integrate with existing roads surrounding the site. The adjacent section of connecting road (Brigham Creek Road) will be upgraded to an urban standard, providing for private vehicles and active transport modes. Brigham Creek Road will be provided with an off-street separated footpath and cycleway on its northern side that connects to existing off-street shared paths to the east and west along Brigham Creek Road.

The traffic lanes on Brigham Creek Road and Kauri Road adjacent to the site and on the internal roads will be wide enough to accommodate their intended mix of traffic and volume. A signalised intersection on Brigham Creek Road to be established as part of a separate application by NCL on the southern side of Brigham Creek Road to the site (Whenuapai Business Park) and this provides the main access for the proposed development. Future roading extensions to the north to eventually connect to Kauri Road is allowed for when these neighbouring properties are developed.

The light industry and residential development enabled by the proposal can be achieved in a manner that is consistent with, and encourages, key national, regional and district transportation objectives and policies. Additionally, the proposed transport network for the proposal has been developed to align with the Te Tupu Ngatāhi Supporting Growth's, Northwest Indicative Strategic Transport Network plan (April 2022).

New bus stops on Kauri Road adjacent to the development have been designed for convenient access to an existing bus route serving Whenuapai. New public transport infrastructure planned at Westgate will provide a nearby node for improved bus services to key destinations. The extent of development enabled by the proposed development and the additional expected future development in the surrounding area can be accommodated by the surrounding road network while maintaining acceptable levels of safety and performance, given the signalisation of the main internal road / Brigham Creek Road intersection.

The effects of the proposed development at the State Highway 16 and State Highway 18 interchanges are acceptable. Accordingly, it is concluded that there is no traffic engineering or transportation planning reason to preclude acceptance of this proposal, since the full extent of development will be appropriately supported by and integrated with a new future transport network and upgrades to existing roading, to provide appropriate levels of accessibility, safety and efficiency for all travel modes.

1 Introduction

Neil Construction Ltd (NCL) owns a section of land of approximately twenty hectares on the northern side of Brigham Creek Road, and to the west of Kauri Road, in Whenuapai. This area is currently identified in Auckland Council's Unitary Plan maps as Future Urban Zone.

This Integrated Transport Assessment (ITA) report was prepared for NCL by Team Traffic to assess the traffic engineering and transportation planning aspects of a proposed Light Industry and Residential development consisting of 9,270m^2 of light industrial gross floor area and 273 terraced, duplex and stand alone dwellings. This development is referred to as Teal Park.

Team Traffic also prepared an ITA for a Whenuapai Business Park subdivision on the opposite side of Brigham Creek Road to the site, which included a signalised intersection on Brigham Creek Road that is the main site access for the proposal.

The transportation issues central to this proposal include:

- the existing and future land uses and transport networks in the area.
- accessibility of the site to various modes of transport.
- the ability of the Teal Park development to meet key national and regional strategies relating to site accessibility and sustainability; and,
- the mitigation required to the surrounding road network to safely and efficiently support the proposed development and other committed and likely development in the area.

The above points and other matters will be addressed in detail in this report. This report covers the effects of the development as a whole, and also provides further information with respect to construction traffic associated with roading upgrade works proposed to Brigham Creek Road, and establishment of new internal roads. It is noted that bulk earthworks associated with the development at the time of writing is 90% complete and these works have been managed under an earthworks consent without reported traffic issues.

2 Existing Transport Context

Figure 1 is a March 2022 aerial photograph with road network overlay, which identifies the site in relation to the surrounding area.

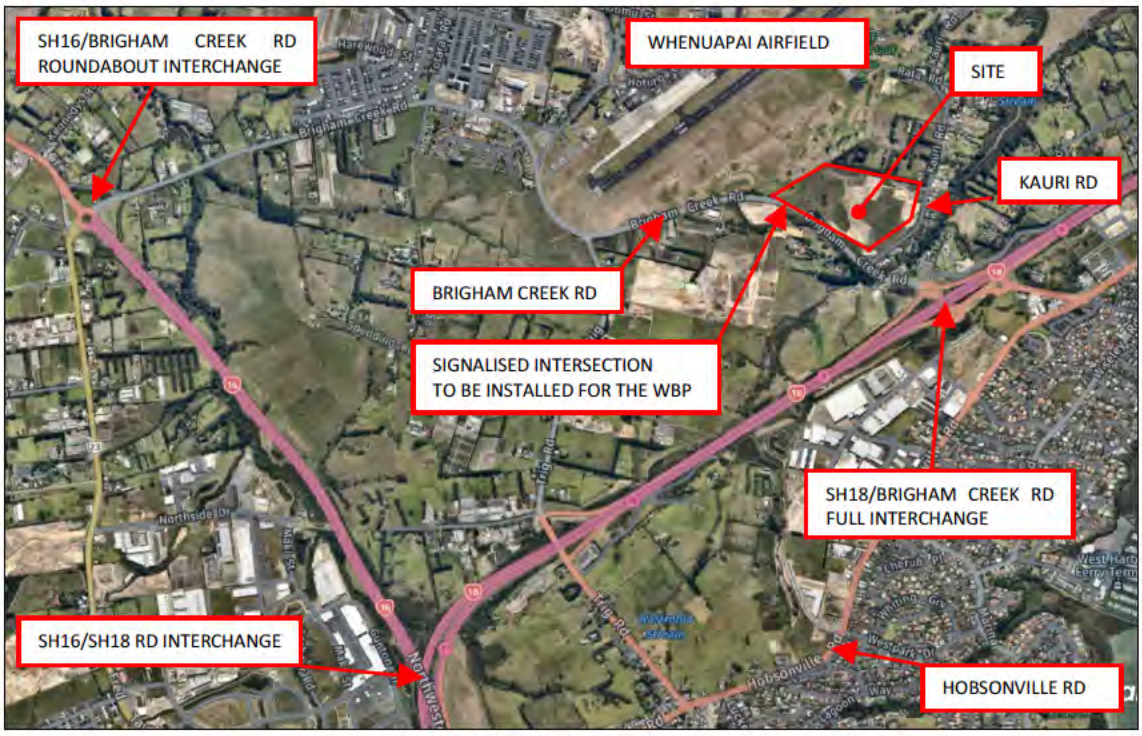


Figure 1: Site Location

2.1 Site Location

The site is located in Whenuapai 800 metres from State Highway 18's full interchange with Brigham Creek Road. On the southern side of State Highway 18 is Hobsonville Road, which is generally the current extent of Auckland's urban expansion in the Whenuapai and Hobsonville region. A list of the existing notable surrounding services relevant to the proposed development includes:

- Whenuapai the local village shops and primary school, 1.5km away.
- Hobsonville commercial precinct, secondary school and ferry, within 4km away.
- West Harbour ferry, 2km away.
- Westgate shopping centre with bus interchange, 4.6km away.

The Brigham Creek Road SH18 motorway interchange is approximately 20km (driving distance) from Auckland City Centre when travelling along State Highway 16 and then linking to State Highway 18.

2.1.1 Brigham Creek Road

Brigham Creek Road is classified as an arterial in the Auckland Unitary Plan, and as such caters for traffic between major nodes or suburbs of the city. The layout of State Highway 16 and State Highway 18 does not provide a direct north to east connection; therefore, Brigham Creek Road

provides a key strategic route for this connection between the two State Highways. Additionally, Brigham Creek Road is identified as being on the strategic freight network and over dimension vehicle route.

Brigham Creek Road is a two-way, two-lane road with the lanes adjacent to the site separated by a centreline. The carriageway has sealed shoulders of varying width and grassed berms. There is a footpath on the northern side of Brigham Creek Road that connects to shared footpath and cycle paths further to the east and west on Brigham Creek Road.

The speed limit of Brigham Creek Road in the vicinity of the site is currently 80km/h. However, a recent Auckland Transport speed limit review has been carried out and it has been confirmed that the speed limit will be reducing to 60km/hr sometime between December 2022 and March 2023.

Figures 2 & 3 below show the view of Brigham Creek Road in both directions from the location of a future signalised intersection that is to be established as part of a separate application by NCL called the Whenuapai Business Park, which will include a fourth northern leg to access the proposed Teal Park development.

Figure 2: Brigham Creek Road Looking East from the Location of a Future Signalised Intersection

Figure 3: Brigham Creek Road looking West from a Future Signalised Intersection

A recent morning and evening peak weekday traffic survey of the State Highway 18 / Brigham Creek Road interchange that was undertaken on Tuesday 31st May 2022 indicated a daily traffic count for the section of Brigham Creek Road between the site and the interchange to be circa 12,500 vehicles per day. Mobileroad.org also has a similar recorded daily traffic volume of 12,537 vehicles. 15min traffic volume graphs for each approach and departure leg of the State Highway 18 / Brigham Creek Road roundabout interchange are presented in **Figure 4** (the Sinton Road roundabout).

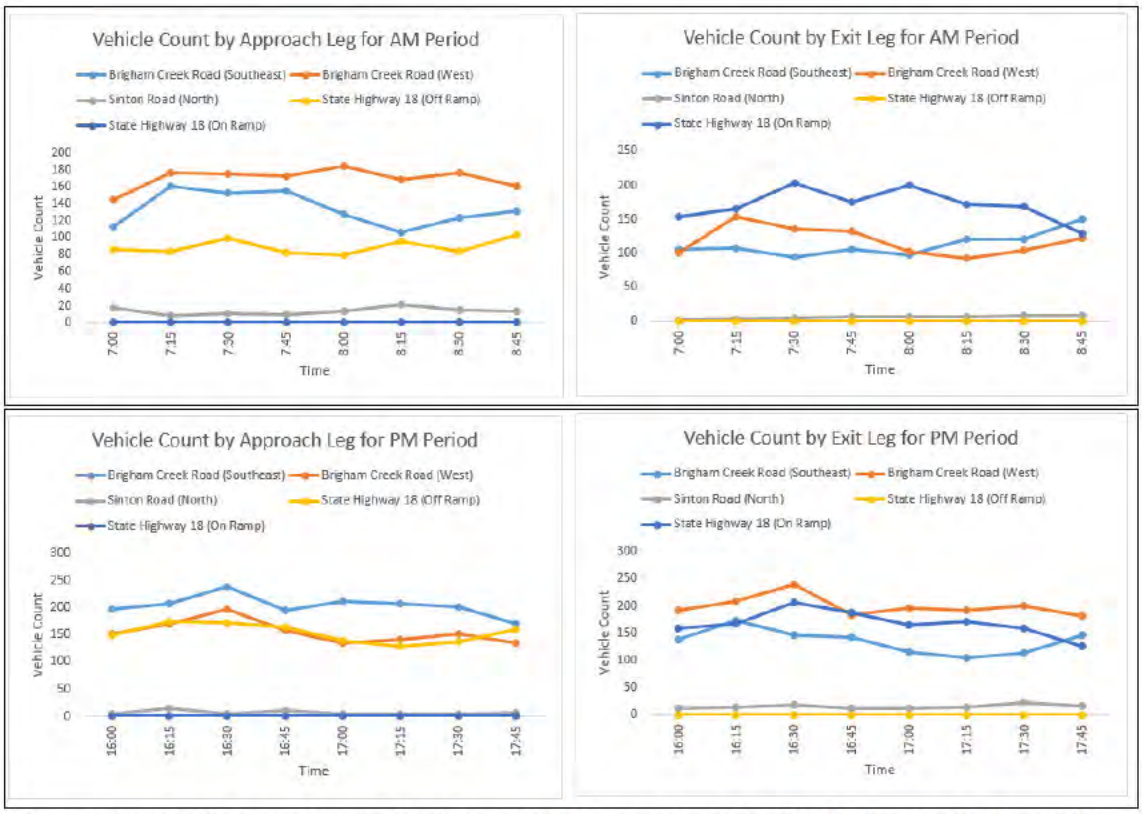


Figure 4: 15min Traffic Volume Graphs of Each Approach & Departure Leg of the SH18/Brigham Creek Rd Roundabout (Sinton Rd Roundabout)

As illustrated in **Figure 4**, Brigham Creek Road between the site and the roundabout (Brigham Creek Road West) experiences 15 minute traffic volumes in each direction ranging between 100 to 225 vehicles. There is a bias to the eastbound direction in the morning, and in the westbound direction in the evening.

In terms of traffic capacity along the two-lane mid-block section of Brigham Creek Road in the vicinity of the site, it is generally accepted that urban midblock capacity becomes sensitive when exceeding 20,000 vehicles per day. On this basis, the midblock section of Brigham Creek Road in the vicinity of the site is currently comfortably at 63% capacity.

In anticipation of traffic volumes along Brigham Creek Road increasing in future years Te Tupu Ngatāhi Supporting Growth have been progressing preliminary upgrade designs for Brigham Creek Road to determine road widening designations required for this upgrade. These designations are expected to be notified in late 2022.

In the site's vicinity it is understood that these designations and associated Notice of Requirement are to be applied to the northern side of Brigham Creek Road (same side as the site) namely because this avoids strategic telecommunication infrastructure, and a tributary to the Waiarohia Stream, which are located on the southern side of Brigham Creek Road.

The indicative Te Tupu Ngatāhi Supporting Growth upgrade cross-section is detailed in **Figure 5,** and it consists of two traffic lanes in each direction with off-street separated footpaths and cycleways on both sides.

Figure 5: Te Tupu Ngatāhi Supporting Growth Indicative Brigham Creek Road Upgrade Cross-section

The critical property boundary on the northern side of Brigham Creek Road that currently prevents the preferred alignment, and the **Figure 5** cross-section, is New Zealand Defence Force land (Royal New Zealand Air Force Base and Royal New Zealand Air Force Golf Club). The proposed development has made allowances for the expected designations in consultation with Te Tupu Ngatāhi Supporting Growth.

The Brigham Creek Road widening and upgrade project is included in the Te Tupu Ngatāhi's North-West Indicative Strategic Transport Network plan, **Figure 6**, and as of April 2022 none of these projects have been allocated funding for detailed design or construction. The indicated timeframe for construction of the Brigham Creek Road widening and upgrade project is in the next 10 to 30 years.

In the interim, NCL (the applicant) proposes to upgrade the section of Brigham Creek Road and Kauri Road adjacent to the site, and this design is discussed in Section 3 of this report.

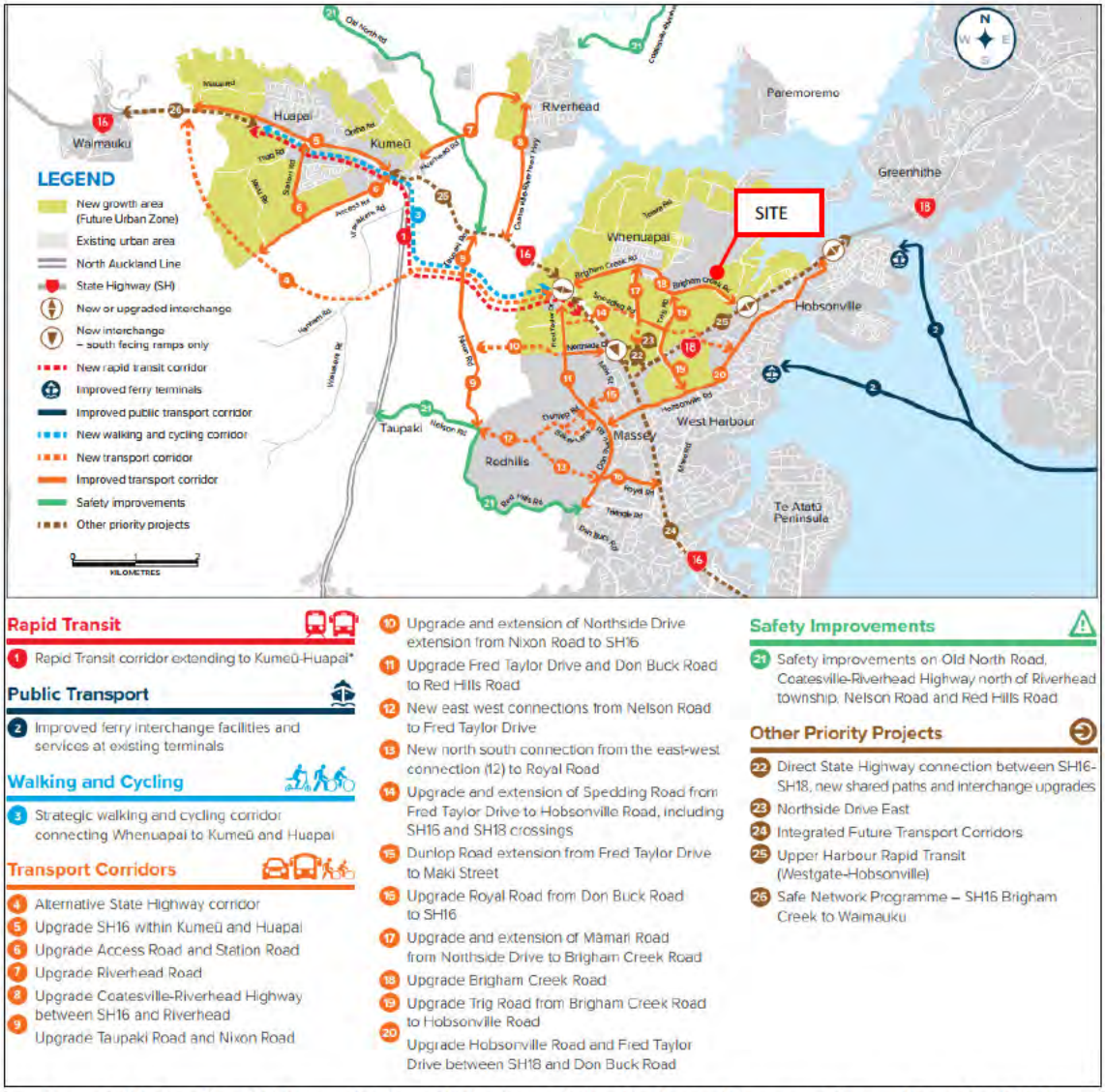


Figure 6: Te Tupu Ngatāhi Supporting Growth Northwest Indicative Strategic Transport Network as of April 2022

2.2 Accessibility

2.2.1 Private Vehicles

Private vehicle access from the immediate roading network to the site is possible from the site's Brigham Creek Road frontage, and from the wider Auckland region primarily via the Brigham Creek Road / State Highway 18 interchange and secondarily from the Brigham Creek Road / State Highway 16 interchange. The State Highway 18 interchange provides a linkage to central, east, west and southern regions of Auckland, while the State Highway 16 interchange links to the north-west of Auckland where significant greenfield development is planned as detailed in **Figure 6**.

The relevant roading infrastructure projects expected to be in place by 2048 that benefits the proposed development includes:

- an upgraded Brigham Creek Road / State Highway 16 interchange,
- new bridges over State Highway 16 and State Highway 18 linking Spedding Road to Marina View Drive,
- new north-east motorway link between State Highway 16 and 18 (both directions).

2.2.2 Passenger Transport

The nearest bus route to the site is Route 114, as identified in **Figure 7**. The bus route travels between Westgate and the Hobsonville Ferry via Trig Road, Brigham Creek Road and Kauri Road.

Figure 7: 114 Bus Route

New bus stops along the route can be established on Kauri Road adjacent to the proposed development. Additional bus routes and increased frequency are expected to be added in tandem with development of the **Figure 6** North West Indicative Strategic Transport Network over the next 10 to 30 years.

2.2.3 Walking

Footpath connections to the site currently consist of a footpath on the northern side of Brigham Creek Road, refer to the **Figure 8** photograph below identifying a typical section of this footpath.

Figure 8: Typical Section of Brigham Creek Road footpath.

The footpath extends to the east where it merges into a shared footpath and cycleway at the State Highway 18 interchange. On the eastern side of the interchange the path terminates as shown in **Figure 9**. Extending this path 300 metres would connect it to the existing footpath network along Hobsonville Road.

Figure 9: Shared Footpath & Cycleway Terminates on Brigham Creek Road East of the SH18 Interchange Roundabouts.

To the west of the site Brigham Creek Road's footpath merges with a shared footpath and cycleway, refer to **Figure 10** showing a typical section of this. This path extends 1.5km to the Whenuapai village shops.

Figure 10: Shared Footpath & Cycleway on Brigham Creek Road West of the Site.

2.2.4 Cycling

The **Figure 11** cycleway map identifies the current cycleway facilities in the vicinity of the site. These consist of a shared footpath and cycleway on Brigham Creek Road with onstreet connections available to the wider cycleway network. As part of the Northwest Indicative Strategic Transport Network over the next 10 to 30 years further network connections are expected, and the proposal includes upgraded local connections as detailed in Section 3 of this report.

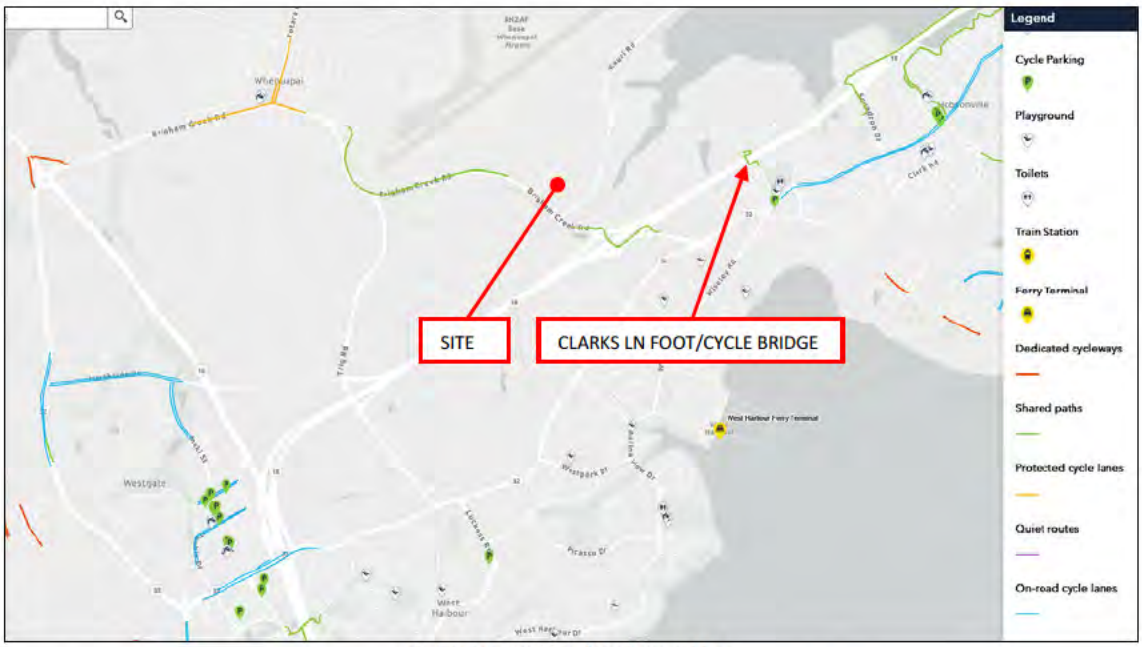


Figure 11: Auckland Cycleway Map

3 The Proposal

3.1 Development Details

The proposed Teal Park light industry and residential development consists of 9,270m² gross floor area of light industry and 273 dwellings. The dwellings are a mixture of terrace, duplex and standalone typologies.

Included in this assessment of traffic effects is the cumulative effect of the Whenuapai Business Park (WBP) subdivision, which consists of an estimated 89,900m² gross floor area of light industry, as detailed in a separate Integrated Transport Assessment (ITA) report.

Figure 12 details the proposed development which is to be accessed via a new signalised intersection on Brigham Creek Road that will be established for the WBP. The WBP is accessed via the southern leg of the new signalised intersection, as shown in **Figure 12**.

Figure 12: Proposed Development Layout

As can be seen in **Figure 12** the light industry component of the proposal is located on the northern side of a new main access road, and the residential component is located on its southern side. The access road has been designed to extend into the neighbouring northern property when these

neighbouring properties are developed. It is envisaged that the road will eventually connect to Kauri Road achieving a desirable connected roading network.

No direct residential property access is proposed on the main access road, which preserves its function as a future collector road. Instead, access for the residential development is served by a network of local streets and Commonly Owned Access Lot (COAL) driveways. Three commercial vehicle crossings are proposed on the main access road to serve the light industrial development. The vehicle crossings access a central corridor where there are parking spaces and loading bays assigned to each of the 28 proposed light industrial units.

The sections of Brigham Creek Road and Kauri Road adjacent to the site are to be upgraded on the subject site's side of the road centreline to a current roading standard consisting of wider traffic lanes, kerbing and offstreet separated footpath and cycleway. In addition, bus stops on both sides of Kauri Road are proposed to enable future residents and workers to conveniently access the existing bus service on Kauri Road.

The Te Tupu Ngatāhi Supporting Growth's anticipated designation along Brigham Creek Road has been accommodated by the design and together with the proposed building line restrictions and building platform levels there are no restrictions imposed on the formation of Te Tupu Ngatāhi Supporting Growth's indicative road cross-section, as detailed in **Figure 5**. The expected timeframe for the full widening work is unclear given that there is currently no funding assigned for the necessary land acquisitions. The proposed upgrade as part of the development satisfies the key safety, capacity and multi modal goals in the interim.

The Brigham Creek Road signalised intersection has been assessed in more detail in the WBP ITA report, which concludes that the signalised intersection design arrived at best achieves the strategic transport network goals compared to a roundabout or staggered intersection that have also been investigated.

The operation and capacity of the signalised intersection has been analysed using SIDRA intersection simulation software, and the analysis confirms the intersection has capacity to accommodate both the WBP and Teal Park developments.

The signalised intersection is to have a raised table to align with Auckland Transport's current expectations in accordance with their Transport Design Manual (TDM) standards to reduce traffic speeds, improve safety, and provide greater pedestrian/cycling amenity.

The road reserve width of the proposed main access road is 24 metres, which has been designed to contain one traffic lane in each direction, recessed parking bays and off-street separated footpath and cycleway on both sides. Traffic lane widths are 3.5 metres wide with an additional 500mm of road shoulder so that the total carriageway width is suited for a collector road (an eight metre carriageway width). The proposed carriageway width provides the potential to easily retrofit a 2.5 metre wide flush median, or bus stops.

The proposed local residential streets have an 18 metre road reserve width consisting of six metre carriageway, recessed parking bays on both sides, front berm, 1.8 metre footpath and back berm.

No-stopping markings are proposed on all new roads to ensure traffic lanes are clear of parked vehicles.

All vehicle crossings have been designed with acceptable separation, gradients and inter-visibility to achieve an acceptable level of safety in respect of passing vehicles and pedestrians.

All intersections have been designed as give-way or stop priority controlled intersections with all bends and corners allowing for the required design and check vehicles in accordance with Auckland Transport's Transportation Design Manual (TDM).

3.2 Light Industrial Trip Rate

NCL has identified that developments at the light industrial component of Teal Park will be similar to the Light Industry Zone recently established nearby to the site on Hobsonville Road. This established industrial / commercial precinct has a traffic catchment currently bounded by Laurenson Road and Dowdens Lane, which has allowed for an accurate trip rate to be quantified by installing traffic counters on Laurenson Road and Dowdens Lane. These counters were placed down for a week starting 10th June 2022.

At that time, 62,314m² of industrial and commercial Gross Floor Area (GFA) had been established in the precinct, refer to **Appendix A** for a spreadsheet detailing all properties in the precinct at that time, including their land area and developed GFA.

Appendix B has the tube count summary spreadsheets for Laurenson Road and Dowdens Lane, and **Figures 13 & 14** detail the hourly traffic volume profile throughout the weekday for each of these roads (blue is inbound, red is outbound, and green is combined inbound and outbound).

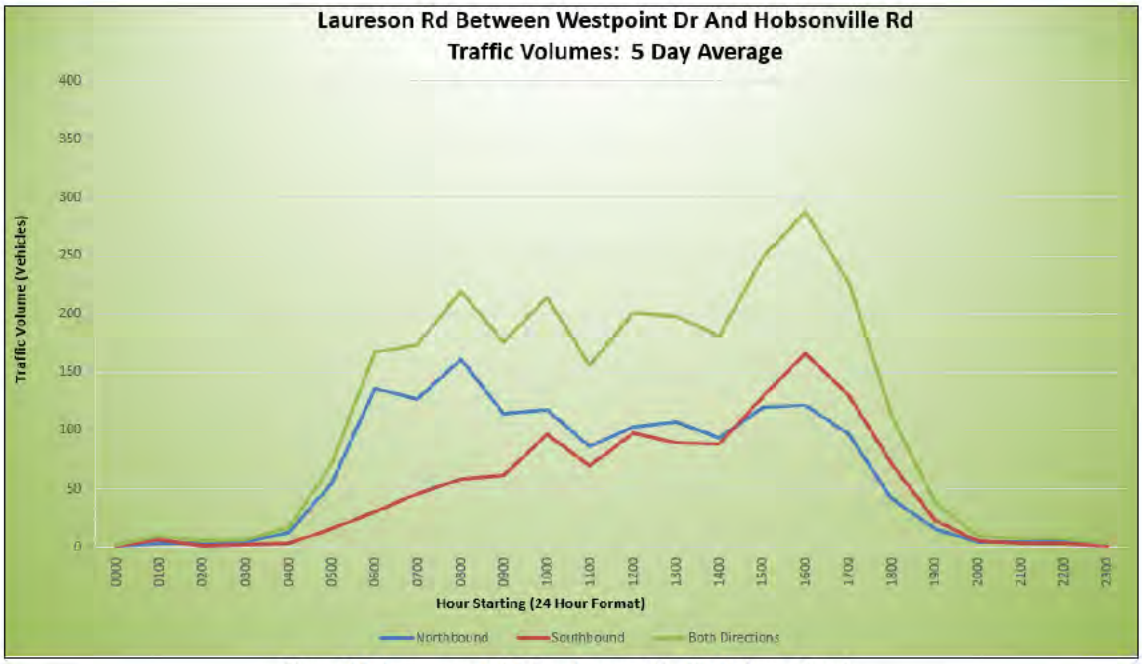


Figure 13: Laurenson Rd 5 Day Average Traffic Volume Graph

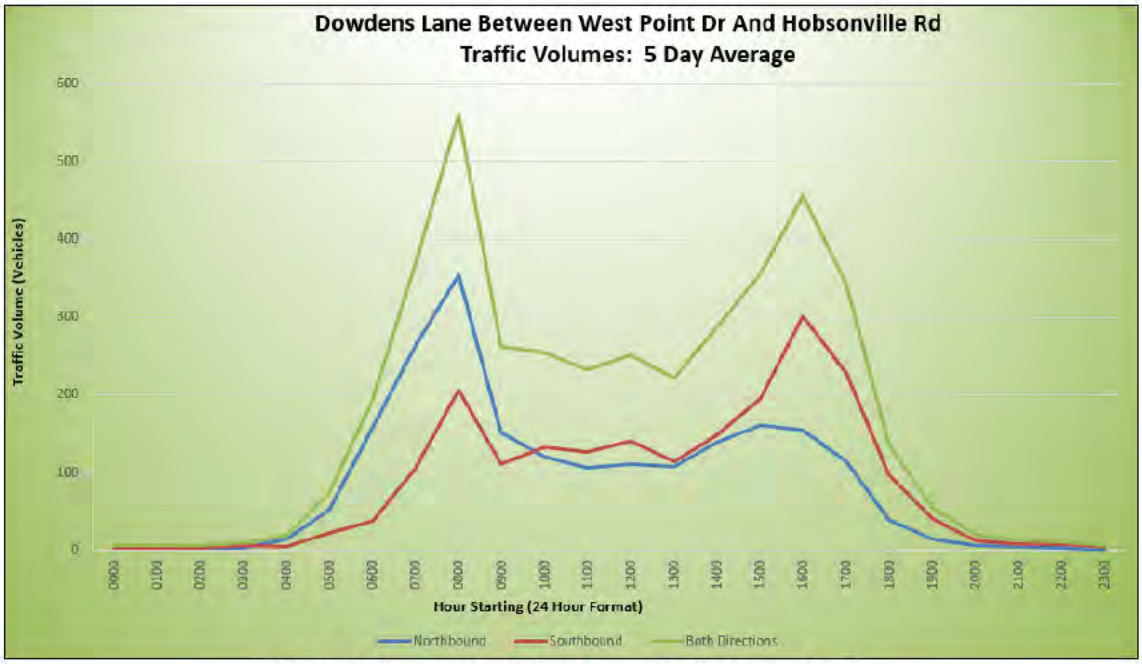


Figure 14: Dowdens Lane 5 Day Average Traffic Volume Graph

As can be seen from **Figures 13 & 14** there is an inbound bias in the morning and outbound bias in the evening. In the morning peak hour, which is from 8:00-9:00am, the inbound bias is 65%. In the evening peak hour, which is from 4:30-5:30pm, the outbound bias is 62%. On this basis, it is reasonable to apply a 65% bias when assessing traffic generation effects. Section 2.7 and 3.8 analyse traffic effects of the proposal using SIDRA computer modelling software.

The peak hour traffic generation recorded for the Hobsonville industrial / commercial Precinct is 828 vehicles in the morning and 838 in the evening.

From this, a trip rate has been calculated for the Hobsonville industrial / commercial Precinct to be 1.3 trips per 100m² GFA for both the morning and evening peak hour. This is expected to be at the higher end of the potential trip rate range for Teal Park's industrial component given that the Hobsonville traffic survey captured traffic generated by one of Hobsonville Primary School's pick-up / drop-off zones, and a childcare activity.

Comparison with other recognised trip generation rates have also been made, as listed below:

- Transport for New South Wales (formerly the Roads and Maritime Services) Guide to Traffic Generating Developments (TfNSW Guide).
- NZTA Research Report 453 Trips and Parking related to land use: and
- Institute of Transportation Engineers Trip Generation Manual (ITE Manual).

An average of these trip generation rates for distribution centres, warehousing and light industrial activities is 1.09 trips per 100m² GFA in the morning peak hour and 1.08 trips per 100m² GFA in the afternoon peak hour, which is comparable to the trip rate arrived at through surveying the comparable Hobsonville industrial / commercial precinct. On this basis a trip rate of 1.3 trips per 100m² GFA for both the morning and evening peak hour has been applied to Teal Park's industrial component.

3.3 Residential Trip Rate

Medium density residential trip rates from the Transport for New South Wales (formerly the Roads and Maritime Services) Guide to Traffic Generating Developments (TfNSW Guide) have hourly trip rates that range between 0.32 and 0.78 trips per unit per hour for low density and high density residential developments. **Table 1** details these peak hourly and daily trip rates.

Table 1: NSW RTA Medium Density Trip Rates

Weekday Rates	Low Density	High Density	Average Rate
AM peak (1 hour) vehicle trips/unit	0.71 trips/hour	0.53 trips/hour	0.62 trips/hour
PM peak (1 hour) vehicle trips/unit	0.78 trips/hour	0.32 trips/hour	0.55 trips/hour
Daily vehicle trips/unit	7.4 trips/day	4.58 trips/day	5.99 trips/day

The average of the peak hour trip rates detailed in **Table 1** is 0.6 trips per unit per hour. Traffic surveys of two medium density developments in Auckland have also been referenced, which return peak hour trip rates of 0.6 and 0.8 trips per unit per hour. On this basis, a peak hour trip rate of 0.6 trips per unit per hour has been applied to the residential component of the proposal.

3.4 Traffic Generation

The light industry component of Teal Park has a total gross floor area of 9,270m^2. Applying the established trip rate of 1.3 trips/100m^2 GFA equates to a total expected peak hour traffic generation for the light industrial component of the proposal of 126 trips.

It is noted that one arrival and one departure equate to two trips, namely the arrival trip and the departure trip.

The residential component of Teal Park has 273 dwellings consisting of terraced, duplex and standalone type buildings. Of these dwellings 40 are two bedroom, 132 are three bedroom and the remaining 101 have four to five bedrooms. Applying the established trip rate of 0.6 trips/dwelling equates to a total expected peak hour traffic generation for the residential component of the proposal of 164 trips.

Combining the peak hour traffic generation of both the light industrial and residential components of Teal Park equates to a total peak hour trip generation of 290. This assumes that the light industrial and residential peak hour coincide exactly where in reality they do not and are typically separated by an hour. The result being that the modelled traffic generation represents a worst case scenario, which is appropriate for assessment purposes.

3.5 Trip Distribution

Trip distribution to/from the wider Whenuapai area is based on the site's accessibility from Brigham Creek Road and its proximity to the State Highway network. The closest State Highway interchange to the site is the Brigham Creek Road / State Highway 18 interchange. This interchange is a full interchange with on and off ramps connecting to the eastern regions of Auckland and on / off ramps connecting to the western and southern regions of Auckland. On this basis 2/3rd of the traffic generation is expected to travel via the Brigham Creek Road/State Highway 18 interchange.

At this interchange the traffic is expected to be distributed evenly between the east, west / south and Hobsonville Road.

The remaining 1/3rd of the traffic generation is expected to travel on the section of Brigham Creek Road to the west of the site, which has connections to the wider roading network via Trig Road and the Brigham Creek Road / State Highway 16 interchange. A minor 1/9th of the traffic generation is expected to Travel via Trig Road with the remaining 2/9th expected to travel via the Brigham Creek Road / State Highway 16 interchange. A small 3% of trips have been assigned to occur between the WBP and the proposed light industry and residential development via the Brigham Creek Road signalised intersection.

In order to provide a robust modelling assessment no other internalisation of trips have been assumed to occur within the site, i.e., all remaining trips arrive from, and depart to, outside of the Whenuapai area. **Figures 15 & 16** detail the expected trip distribution.

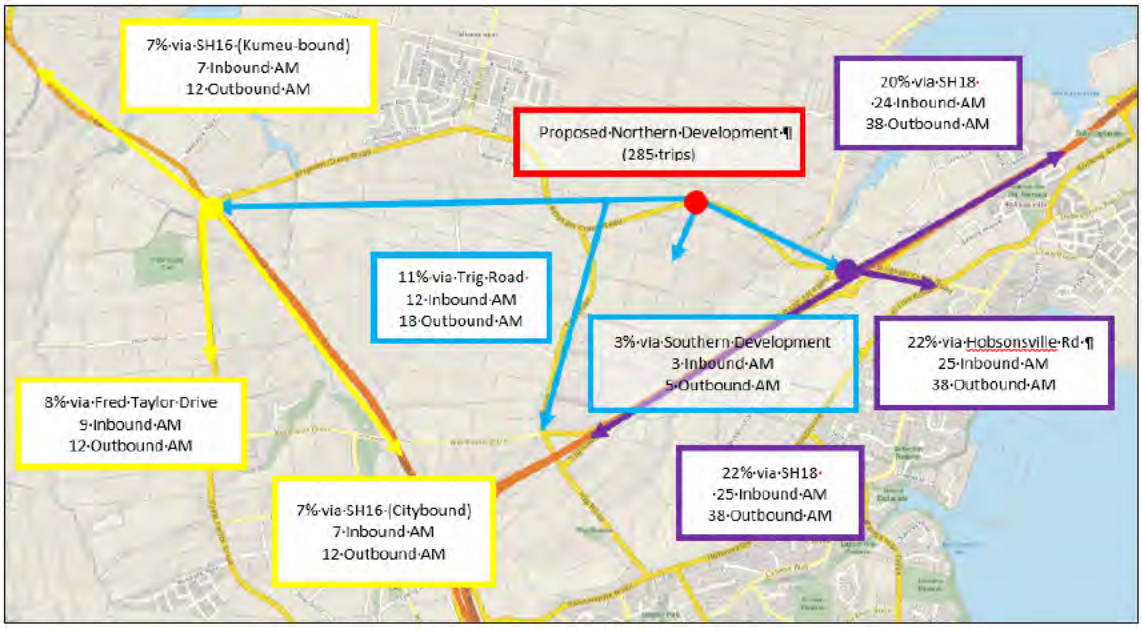


Figure 15: AM Trip Distribution

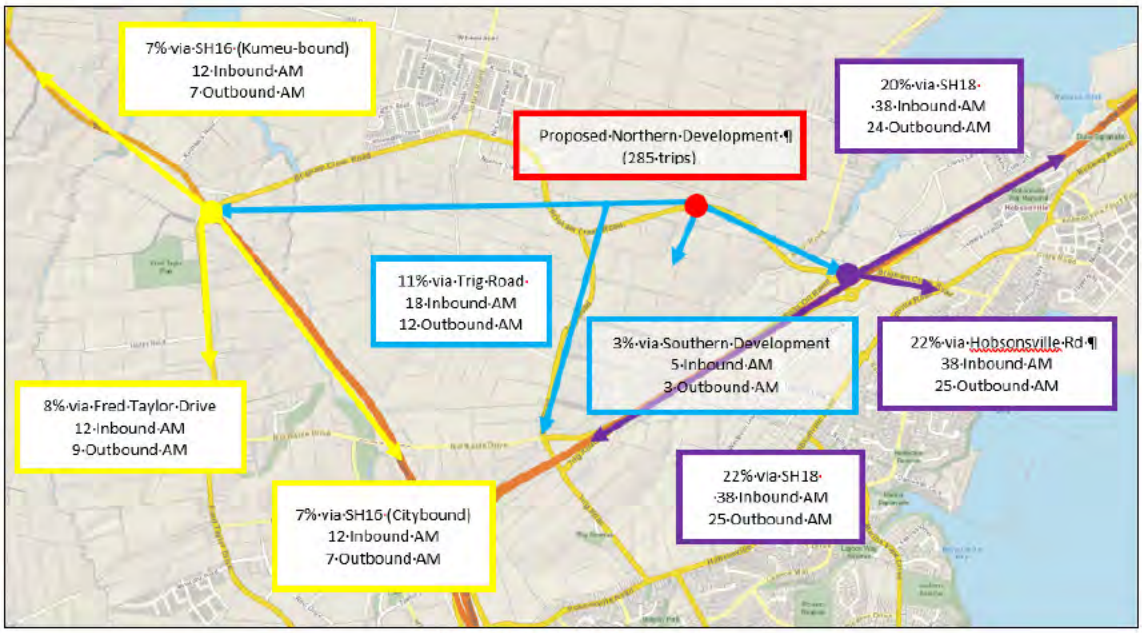


Figure 16: PM Trip Distribution

Given that the Whenuapai Business Park (WBP) is not yet established the expected trip generation for both the WBP and Teal Park have been combined, which is detailed in **Figures 17 & 18.**

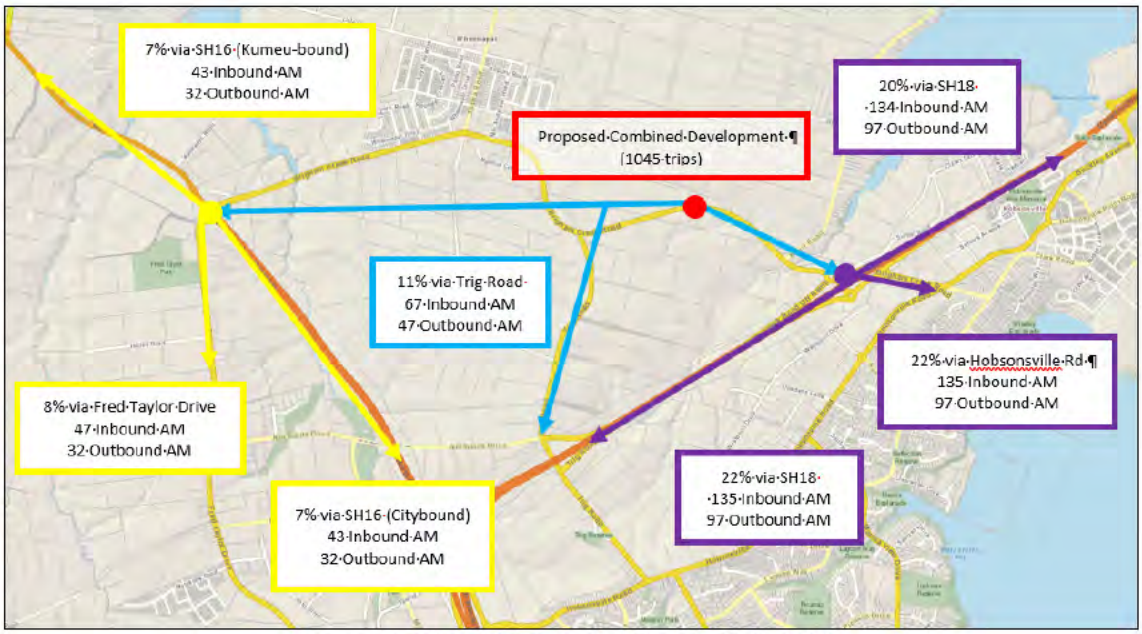


Figure 17: AM Trip Distribution Combined with the WBP

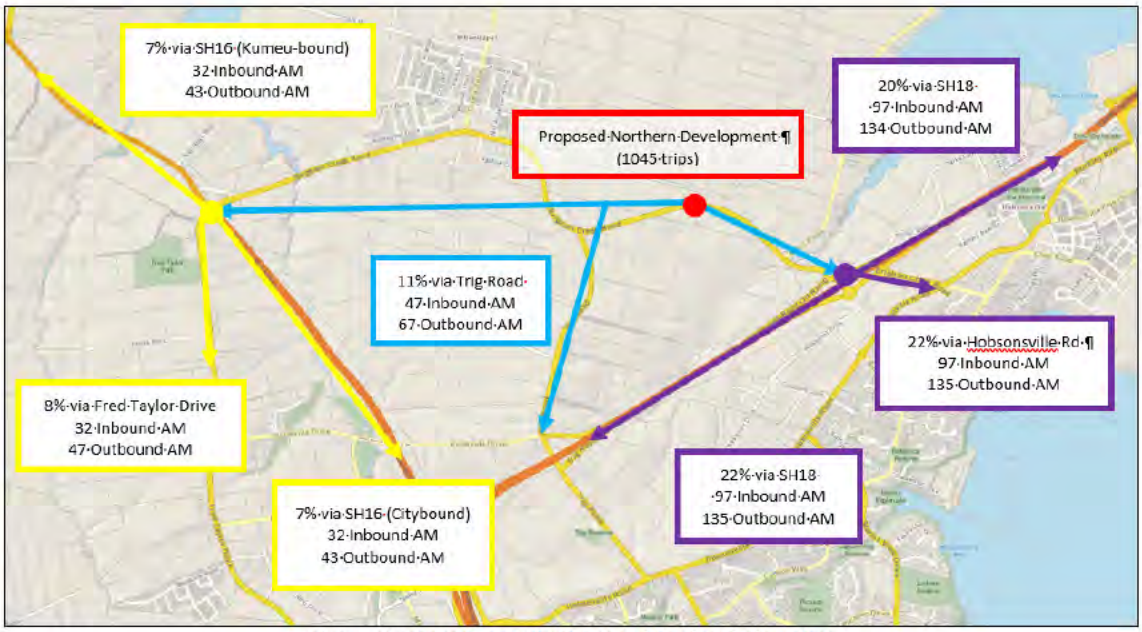


Figure 18: PM Trip Distribution Combined with the WBP

The distribution of trips for the Whenuapai Business Park (WBP) and the subject Light Industry and Residential Development disperses quickly in the wider roading network with the percentage of trips reduced to 7-8% on the roads at the furthest node identified in the trip distribution **Figures 15-18**, which is the State Highway 16 roundabout interchange.

The additional trips through this roundabout interchange are nominal and less than the daily variations experienced at the interchange. On this basis the SIDRA modelling in Sections 3.7 and 3.8 are focussed on the proposed Brigham Creek Road signalised intersection and the State Highway 18 interchange.

3.6 Internal Roads & Intersections

Teal Park's main access road has been designed to be suitable for industrial use and also provide off-street separated footpaths and cycleways that connect to Brigham Creek Road. As neighbouring properties to the north are developed this main access road can be extended to connect with Kauri Road.

Figure 19 details the proposed main access road's 24 metre road corridor cross-sections that consist of one traffic lane in each direction, recessed parking bays, footpath, cycleway, and berms.

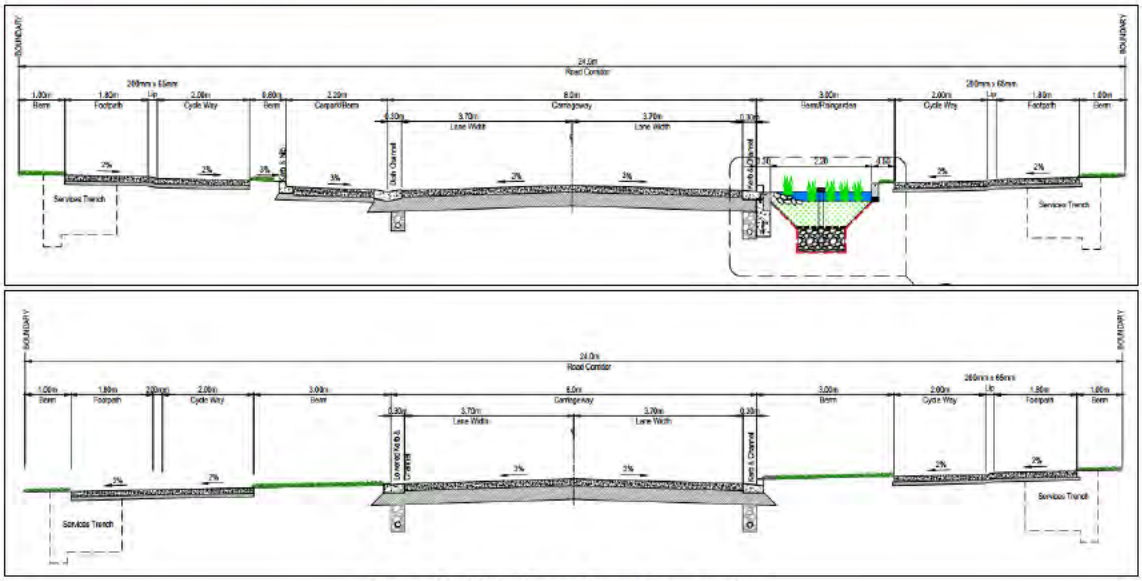


Figure 19: Main Access Road Cross-sections

The proposed cross-section aligns with recognised roading guidelines and standards. The proposed eight metre wide carriageway provides two traffic lanes that are comfortable for slow speed heavy vehicle traffic (50-60km/hr speed zone) and allow for a retrofit to provide flush median or bus stops.

Eight metres is also consistent with the freight traffic lanes prescribed by Auckland Transport's Traffic Design Manual TDM, plus include extra shoulder width in accordance with the Manual of Traffic Signs & Markings (MOTSAM).

Table 2 details the Road Function and Required Design Elements of the main access road.

Table 2: Main Access Road Function & Required Design Elements

Road name	Main Access Road
Proposed role and function of road	Collector
Min roads reserve	24m
Total no. of lanes	2
Design speed	50-60km/hr
Median	No, but with allowance for 2.5m flush median
Cycle provision	both sides
Pedestrian provision	Both sides
Freight or heavy vehicle route	Yes
Access restriction	None
Bus provision	No, but with allowance for bus stops

Termination of the main access roads at the northern boundary is to be provided with a temporary turning head to allow a large rigid truck to turn around, refer to the **Figure 20** tracking curve plan that demonstrates this.

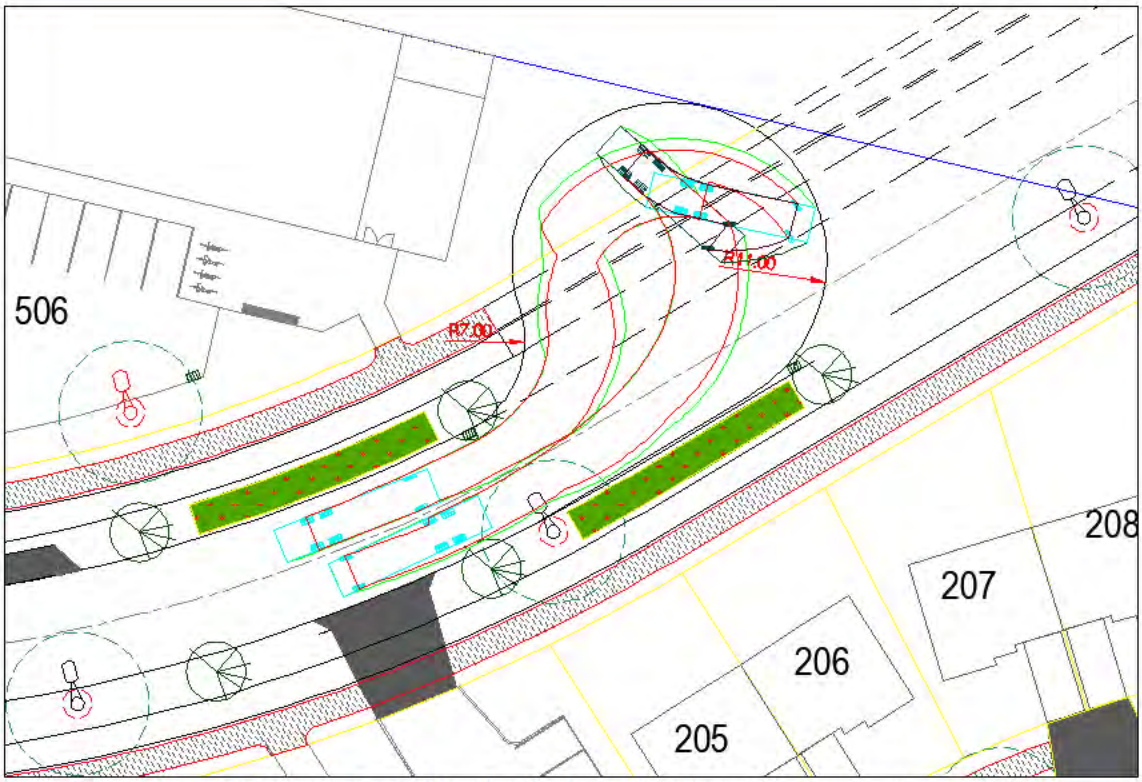


Figure 20: Temporary Turning Head for Main Access Road Large Rigid Truck Tracking Curve

Two priority controlled T-intersections along the main access road provide access to a residential street network. The corner kerb alignments have been designed in accordance with TDM and MOTSAM having tapers and corner radii that are the minimum required to accommodate a left turning large rigid truck without crossing road centrelines, refer to **Figure 21** demonstrating tracking curves of this. The large rigid truck is 11.5 metres long and larger than Auckland Transport's rubbish truck, and therefore it caters for both rubbish trucks and moving trucks.

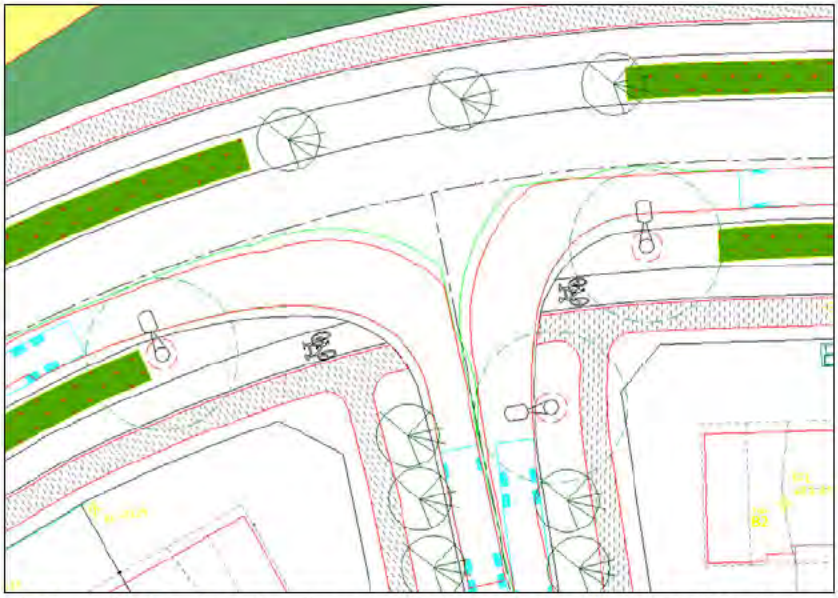


Figure 21: Large Rigid Truck Tracking Curve Plan (Main Access Road / Residential Street Intersection)

Figure 22 details the proposed residential streets 18-20 metre road corridor cross-sections that consist of one traffic lane in each direction, recessed parking bays, footpath, cycleway, and berms. The wider 20 metre cross-section includes a landscaped median island.

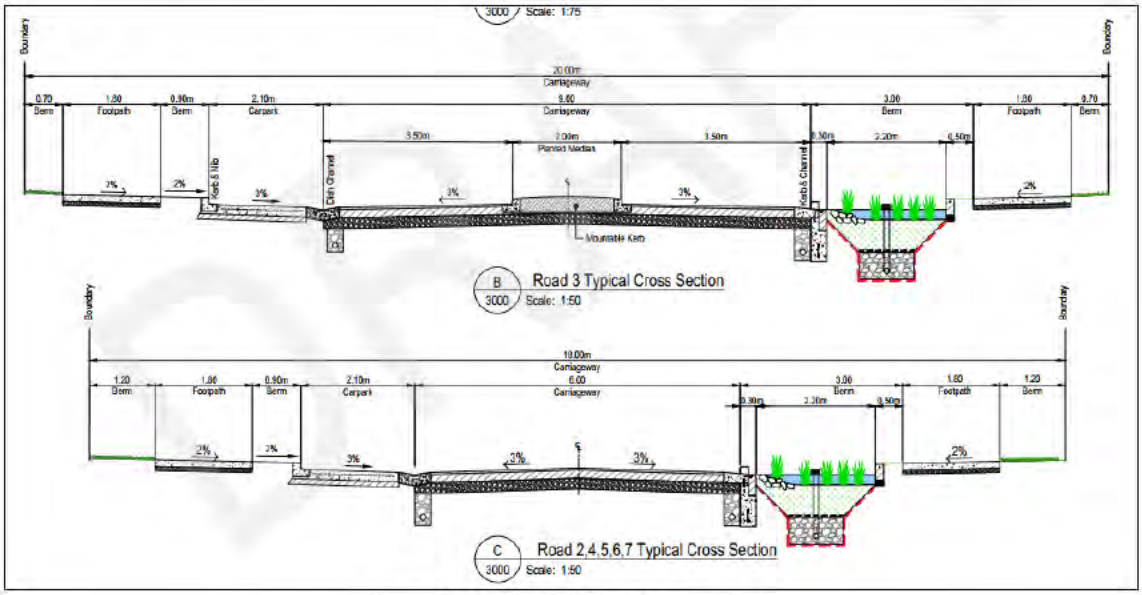


Figure 22: Residential Street Cross-sections

Table 3 details the Road Function and Required Design Elements of the residential streets.

Table 3: Residential Streets Function & Required Design Elements

Road name	Local Residential Streets
Proposed role and function of road	Local
Min roads reserve	18-20m
Total no. of lanes	2
Design speed	30-50km/hr
Median	None or solid landscaped median
Cycle provision	Onstreet shared in carriageway
Pedestrian provision	Both sides
Freight or heavy vehicle route	No
Access restriction	None
Bus provision	No, but with footpath connection to proposed bus stops on Kauri Rd

Transitioning to a 30km/hr speed limit within the residential streets can be demarcated using raised table threshold treatments. Once within the residential catchment the narrow street environment reinforces a 30km/hr speed limit.

Street parking in the form of recessed parking bays can accommodate circa forty street parking spaces to supplement garage and external parking for each dwelling.

No-stopping markings are proposed on both sides of all residential streets, or alternatively on one side to allow parking on the other side, which ensures one or two traffic lanes are clear of parked vehicles at all times.

Bulk earthworks that are already 90% complete provide gentle road gradients with the maximum gradient being an acceptable 5% (1 vertical by 20 horizontal). Residential dwelling building platforms have been designed to achieve gentle driveway gradients to each lot.

The vertical and horizontal alignment along the roads, streets and intersections does not restrict sightlines for safe access and are compliant with Austroads standards. Swept paths of Auckland Transport's 6.3 metre long van and 10.3 metre rubbish truck through all bends have been checked to achieve passing in accordance with TDM criteria.

Overall, the proposed internal roading design is appropriate for Teal Park's residential traffic environment and allows for further connections to the local roading network that aligns with Te Tupu Ngatāhi's Northwest Indicative Strategic Transport Network and the withdrawn Plan Change 5 Precinct Plan showing indicative collector roads.

3.7 Vehicle Crossings, COALS, Parking & Loading

Three commercial vehicle crossings on the main access road are to serve the light industrial component of Teal Park. These vehicle crossings have been designed to accommodate simultaneous two-way light vehicle movements or one-way heavy vehicle movement. The resulting width as measured at the boundary complies with the Auckland Unitary Plan's 7-9 metre commercial width standard (measured at the boundary). One of the light industrial vehicle crossings is located directly opposite a side road for the residential component of Teal Park. By being directly opposite, right turning conflict is avoided and together with sight distances that satisfy Austroads intersection sight distance criteria the interaction of the vehicle crossing with the intersection is appropriate. With three light industrial vehicle crossings traffic generation is distributed between these crossings so that there is no appreciable queuing or delay, including for the anticipated heavy vehicle traffic associated with these activities.

Within the light industrial development, the vehicle crossings are connected by a central corridor and adjacent to the corridor are parking spaces, loading zones, footpaths and bicycle stands.

The parking spaces have dimensions and gradients compliant with the Auckland Unitary Plan standards, and six parking spaces have dimensions suitable for universally accessible parking spaces to satisfy the Building Code requirements in this regard. There are 107 onsite parking spaces proposed, which provides one parking space per 87m^2 of light industrial gross floor area. There are also twenty on street parking spaces in recessed bay bays along the main access road that can supplement the onsite parking spaces. This amount of parking provides a sufficient amount of parking to serve the light industrial activities whilst also restraining parking supply to encourage staff to adopt alternatives to single occupancy car travel such as public transport and active travel modes, which aligns with Auckland Transport's multi modal vision for the Whenuapai area (as identified in Auckland Transport's Future Connect maps).

Each light industrial unit has their own loading door with sufficient manoeuvring area to accommodate access for the size of truck relevant to the size of the unit i.e., truck sizes ranging between a medium rigid truck and a semi-trailer truck.

In summary, the light industrial development satisfies the Auckland Unitary Plan standards in respect of access, parking, loading and pedestrian/cycling requirements.

On the opposite side of the main access road is the proposed residential development with 270 dwellings. There is also a reserve/playground together with a 250m² café and 13 parking space carpark. Of the 273 proposed dwellings 70% have vehicle access to garage or external parking spaces within Commonly Owned Access Lots (COAL), refer to **Figure 23** for the range of COAL cross-section designs proposed.

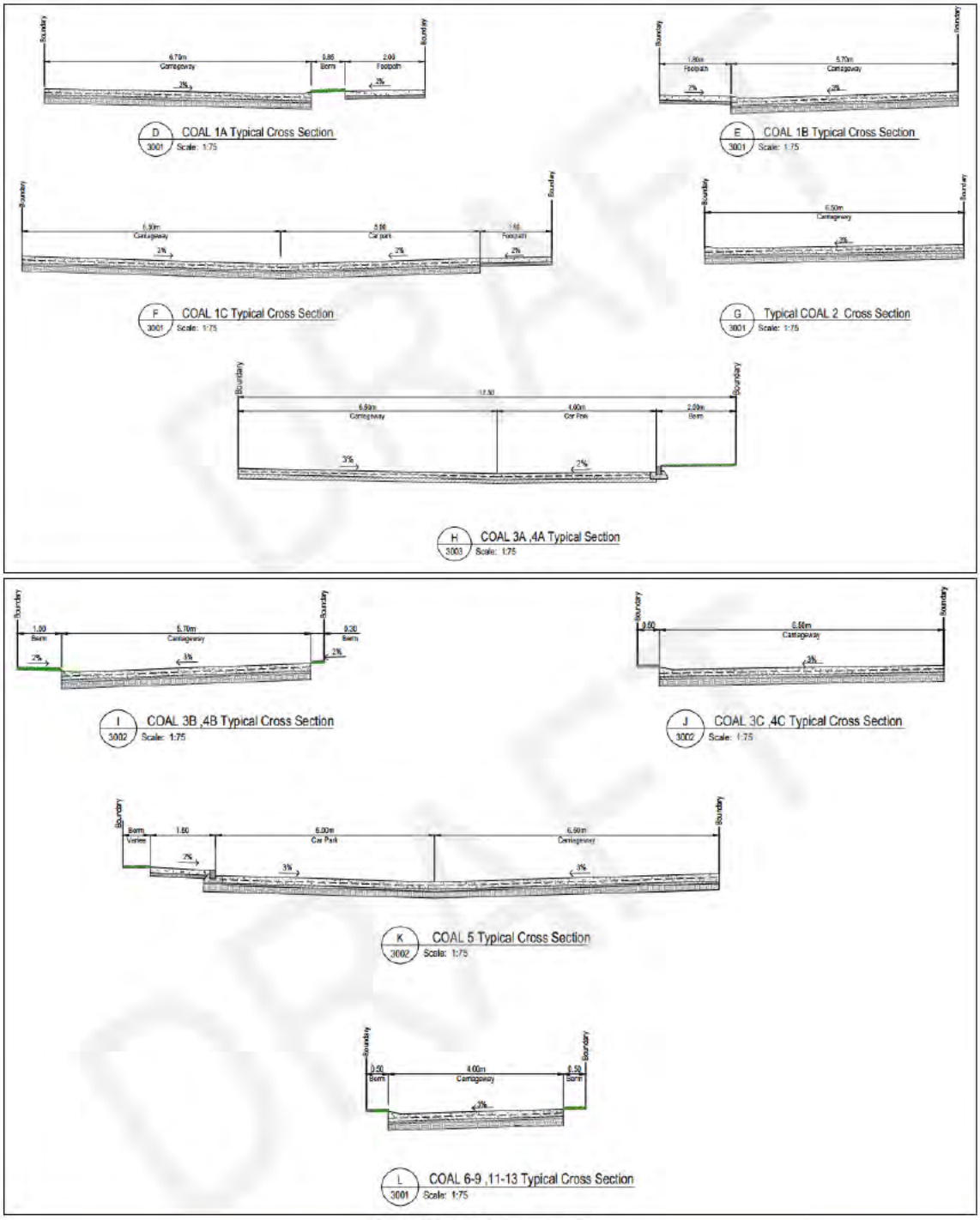


Figure 23: COAL Cross-sections

The vehicle crossings for the COALS are typically six metres wide to accommodate simultaneous two-way traffic movements and comply with the Unitary Plan Standards where access is to ten or more parking spaces. COALS that serve more than ten dwellings have multiple vehicle crossings and shared use designs incorporating demarcated pedestrian paths, colour/texturized speed calming treatments, landscaping and lighting. These designs achieve an acceptable level of traffic and pedestrian safety along the COALS.

The majority of dwellings have direct frontage to a public road (85% of dwellings), which allows rubbish bins for each of these dwellings to be transported to the street kerb for Council collection. All dwellings also have adequate garage or yard space to accommodate bicycles to enable uptake of this travel mode option.

In summary, the residential development satisfies the Auckland Unitary Plan standards in respect of access, parking, servicing and pedestrian/cycling requirements.

3.8 Brigham Creek Road Signalised Intersection

A new signalised intersection is to be established as part of the Whenuapai Business Park (WBP) subdivision, and it consists of widening a 300 metre section of Brigham Creek Road to accommodate additional traffic lanes as detailed in **Figure 24**. For this design, all land that is required to be vested as road reserve is owned by NCL.

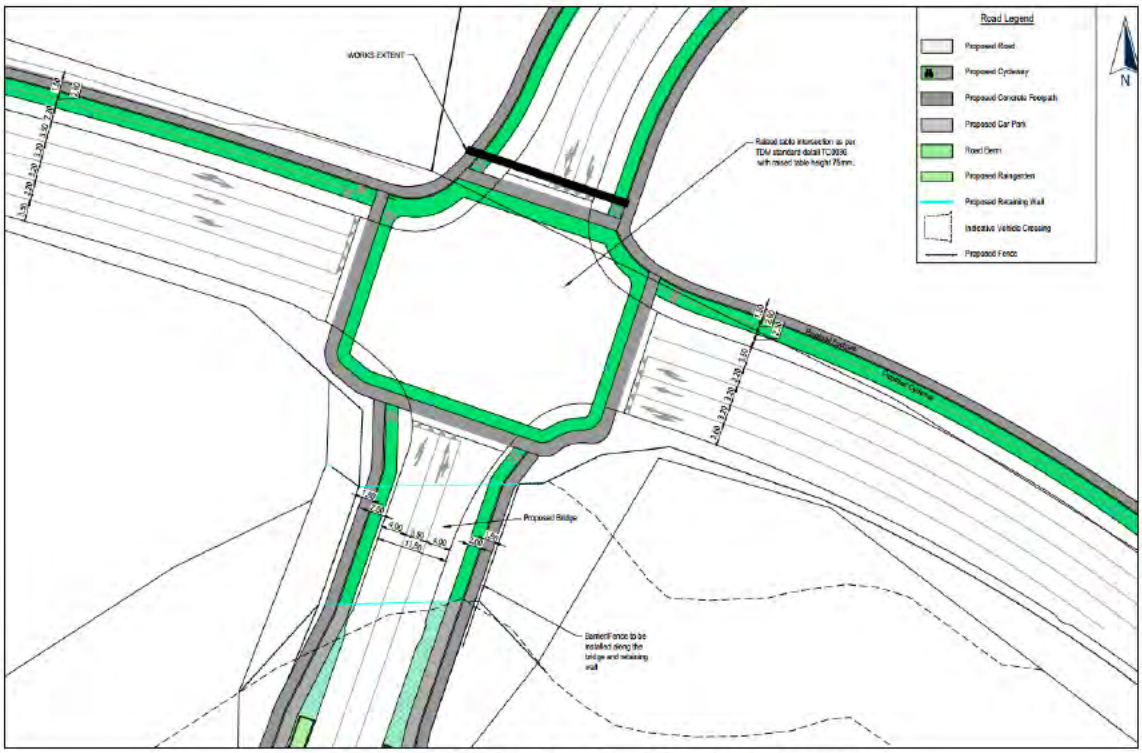


Figure 24: Proposed Brigham Creek Road Signalised Intersection

A raised table treatment is proposed for the signalised intersection together with pedestrian/cycle crossing phases on each leg. The raised table provides an appropriate speed environment for

Auckland Transport's planned speed limit reduction from 80km/hr to 60/km/hr that is scheduled to occur between December 2022 and March 2023.

The intersection's approach sight distances (ASD), and safe intersection sight distances (SISD) exceed the AUSTROADS sight distance criteria of 73 metres and 123 metres respectively (with 2 second reaction time) for the scheduled speed reduction to a 60km/hr speed limit on Brigham Creek Road. There is in excess of 130 metres of available sight distance in all directions from the intersection.

Figure 25 demonstrates tracking curves of a high productivity semi-trailer truck undertaking all turns at the intersection with acceptable clearances to kerbs and opposing lane movements. More detailed tracking plans have been prepared and reviewed as part of the WBP application and have also included a Safe Systems Assessment/Safety Audit of the intersection in relation to other designs such as a staggered T, single lane roundabout and dual lane roundabout.

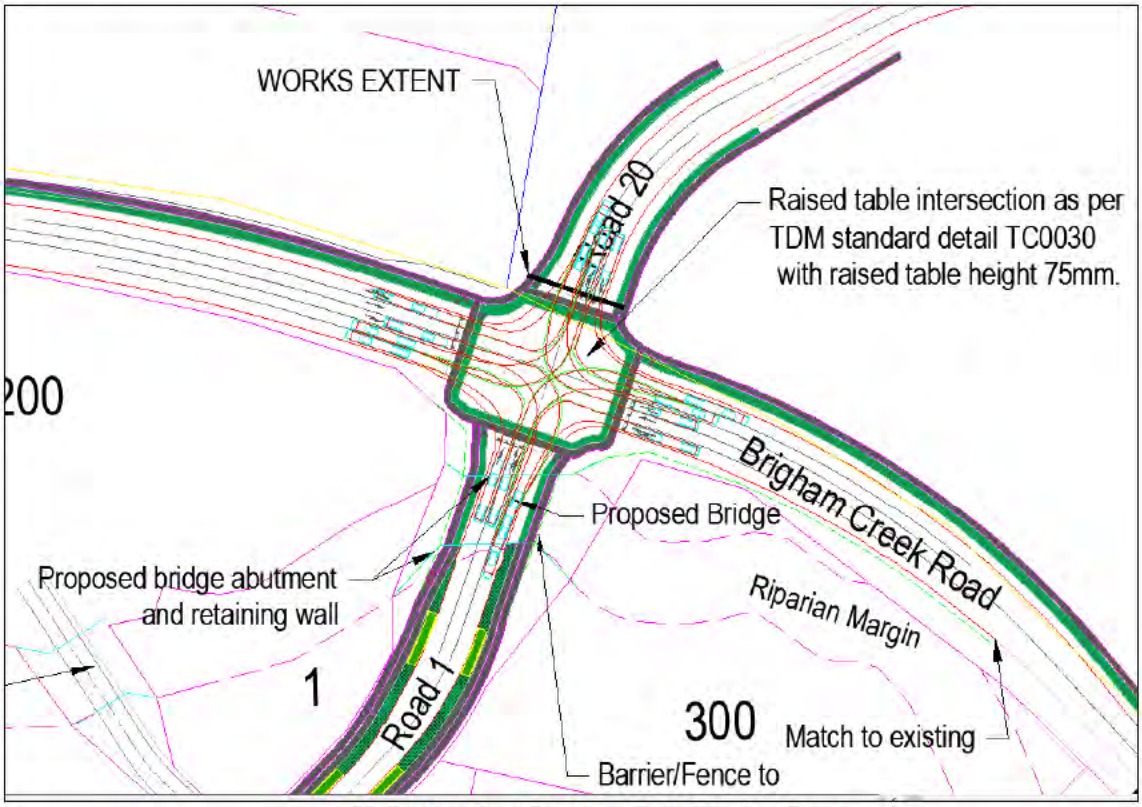


Figure 25: Brigham Creek Road Semi-Trailer Tracking Curves

All traffic lane widths are acceptable for freight movement and are a minimum of 3.2 metres wide. The extra turning lanes proposed on Brigham Creek Road have queue storage lengths of 100 metres, and on Road 1 an extra turning lane is 60 metres, which is comparable to the recent upgrade of the Brigham Creek Road/Totara Road intersection that was established for a significant residential development at the nearby Whenuapai Village, refer to **Figure 26** showing an aerial photo of this intersection.

Figure 26: Brigham Creek Road/Totara Road Intersection (comparable intersection design)

3.9 SIDRA Analysis of the Brigham Creek Road Signalised Intersection

Figure 27 provides the key SIDRA performance output graphs for the analysed morning peak hour period, and **Figure 28** provides these graphs for the analysed evening peak hour period. Traffic analysed includes traffic generated by the Whenuapai Business Park proposal on the southern side of Brigham Creek Road.

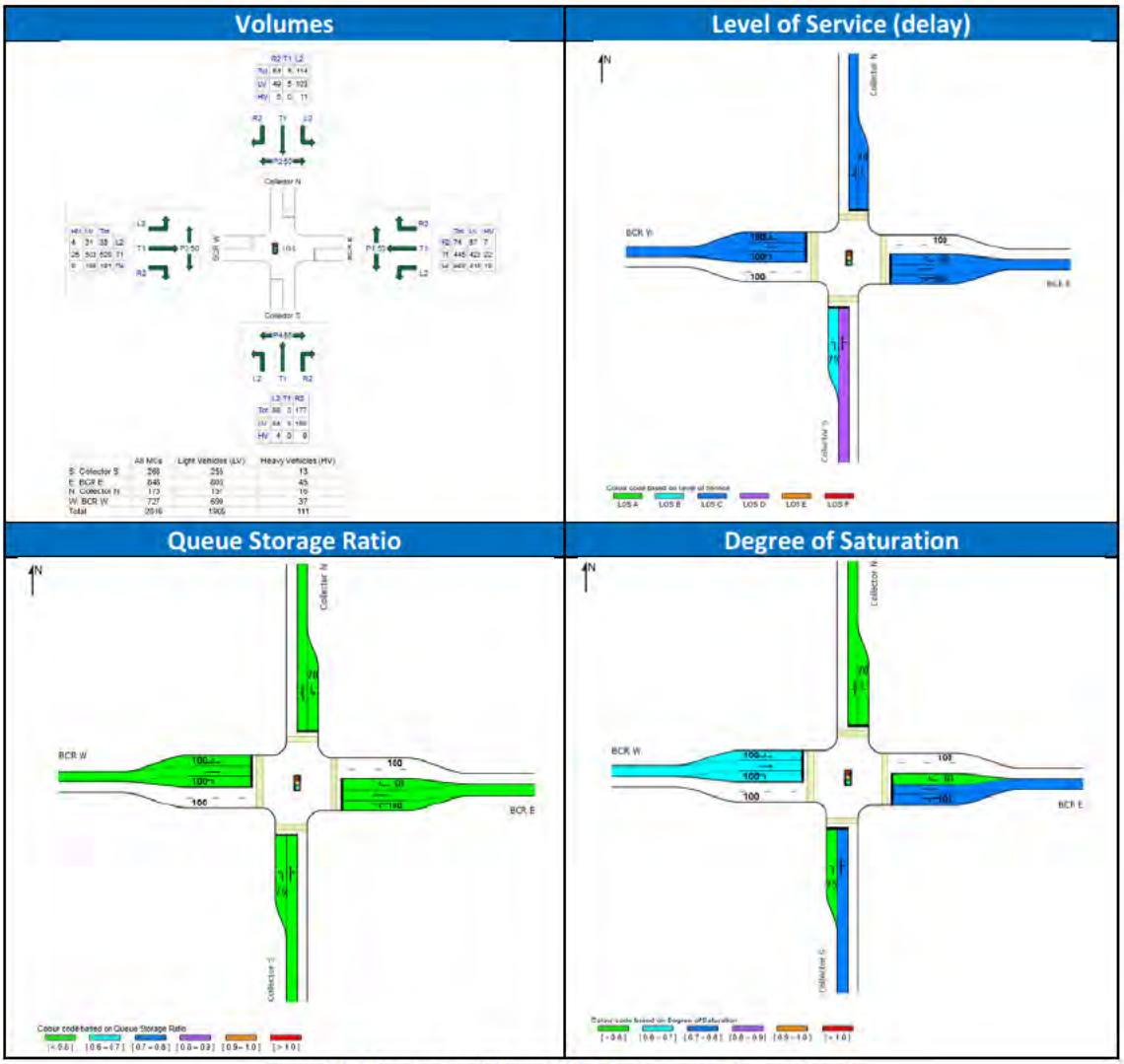


Figure 27: Morning Peak Hour SIDRA Performance Output Graphs

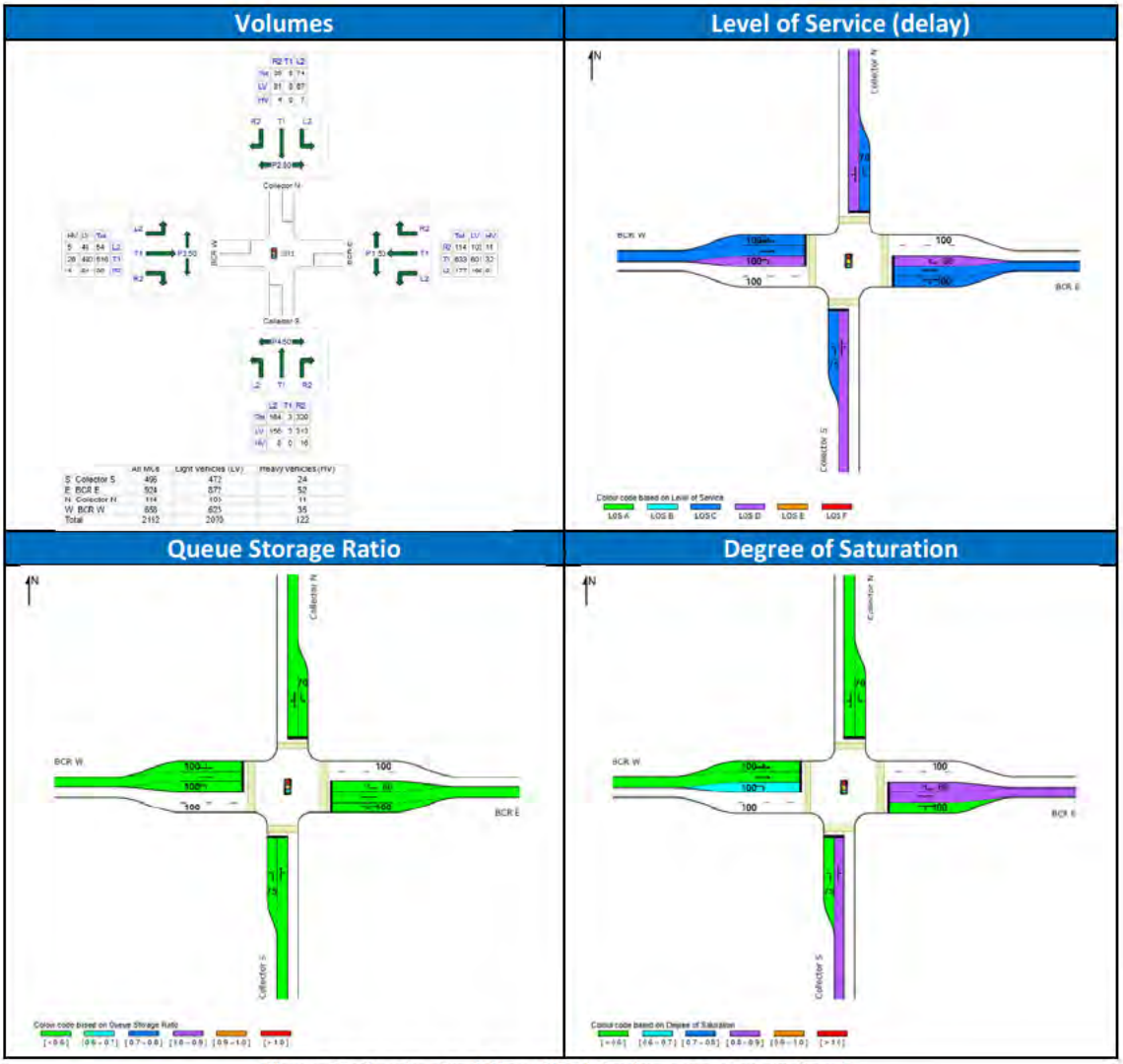


Figure 28: Evening Peak Hour SIDRA Performance Output Graphs

As detailed in the **Figure 27 & 28** SIDRA output graphs the performance of the proposed intersection operates at an acceptable level of service with no capacity issues. Refer to **Appendix D** for detailed SIDRA output.

Sensitivity of the intersection to traffic growth has been analysed by applying a 5% annual growth rate, which indicates capacity in some of the turning lanes can be expected in year five. Operating at capacity is common in Auckland and is typical of most busy urban arterials during peak commuter periods.

Overall, the SIDRA model confirms that the proposed Brigham Creek Road signalised intersection can accommodate traffic generated by the proposed development without compromise to Brigham Creek Road's strategic arterial function in the roading hierarchy.

3.10 SIDRA Analysis of the State Highway 18 Interchange

The Brigham Creek Road / State Highway 18 interchange consists of three roundabouts that connect all four state highway on / off ramps. The critical roundabout relevant to the proposal is the closest one, which has eastbound on / off ramps. **Figure 29** provides the key SIDRA performance output graphs for the analysed morning peak hour period, and **Figure 30** provides these graphs for the analysed evening peak hour period.

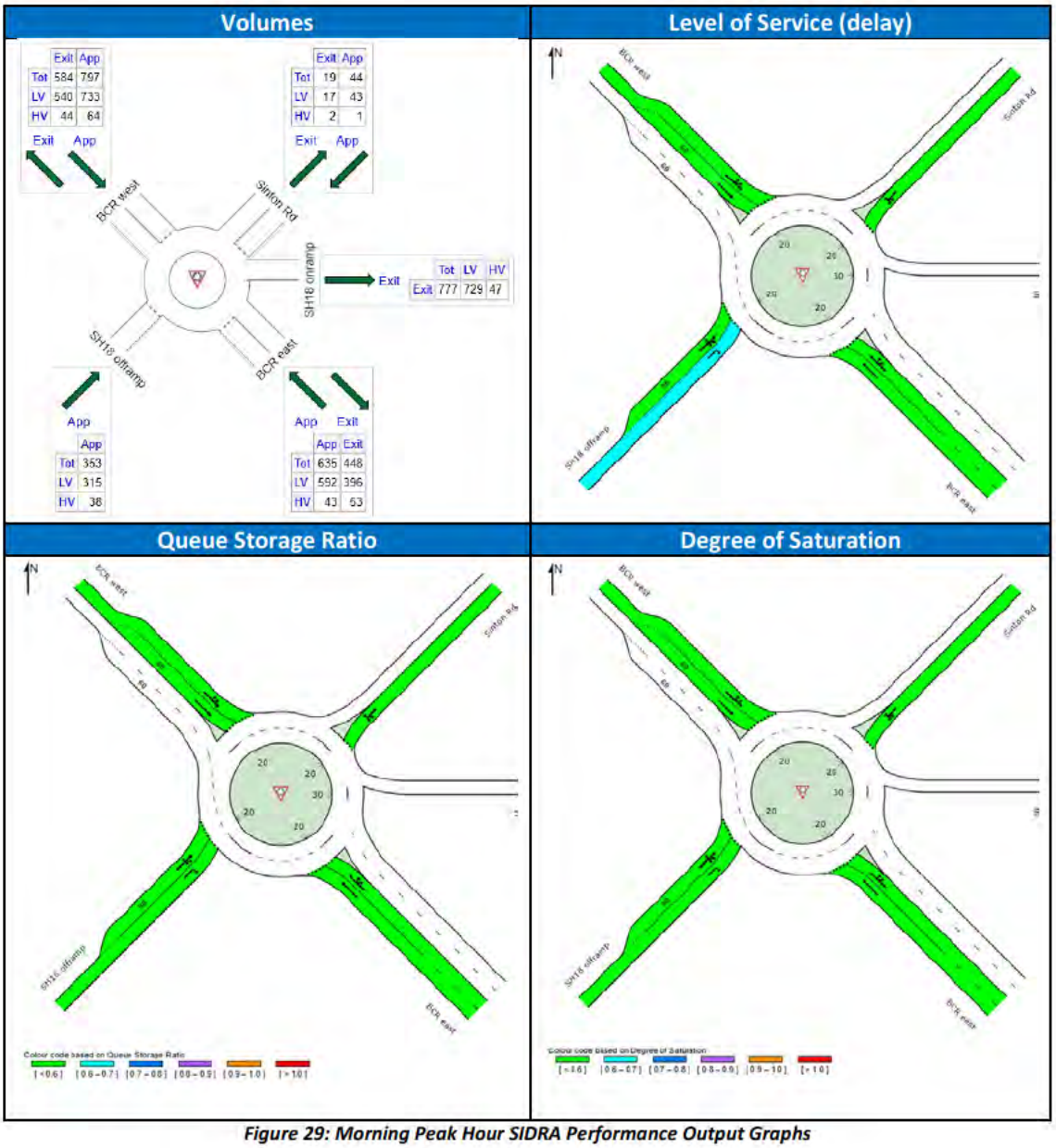


Figure 29: Morning Peak Hour SIDRA Performance Output Graphs

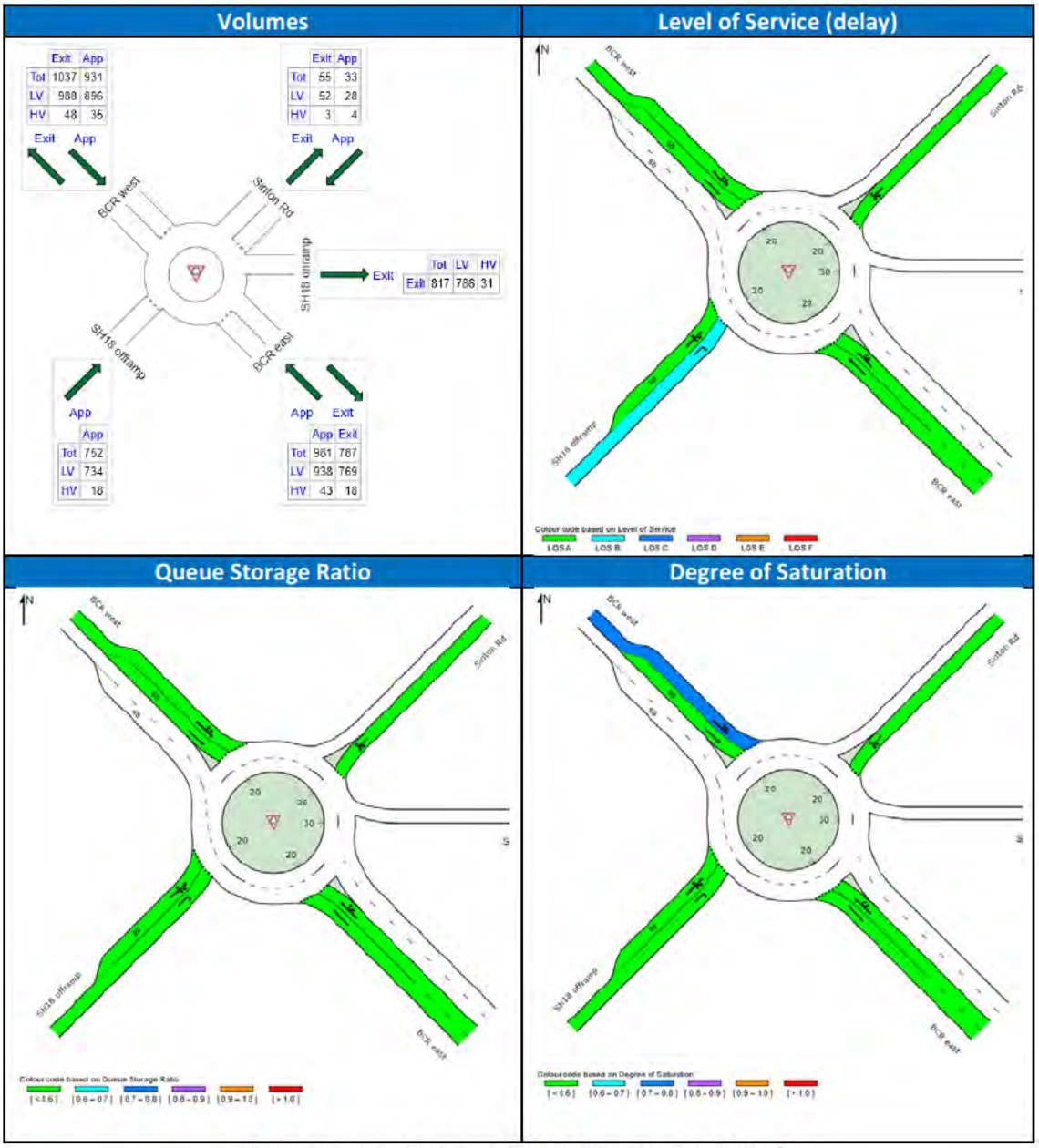


Figure 30: Evening Peak Hour SIDRA Performance Output Graphs

As detailed in the **Figure 29 & 30** SIDRA output graphs the performance of the State Highway 18 interchange operates at an acceptable level of service with no capacity issues. Refer to **Appendix D** for detailed SIDRA output.

The sensitivity of the interchange to traffic growth has been analysed by applying a 5% annual growth rate, which indicates that in year eleven for the morning peak period and year six for the evening peak period the queue storage length in Brigham Creek Road's east bound left turning lane reaches capacity. The State Highway off-ramp short turning lane remains under capacity, which is the critical consideration for the State Highway network.

Overall, the SIDRA model confirms that the State Highway 18 interchange can accommodate the traffic generated by the proposed development without compromise to Brigham Creek Road or the State Highway's s strategic arterial function in the roading hierarchy.

3.11 Pedestrian, Cycling & Passenger Transport Accessibility

The existing shared footpath and cycleway on the northern side of Brigham Creek Road is to be upgraded to a separated footpath and cycleway as part of the proposed development.

The upgraded separated footpath and cycleway provides continuous paths from Kauri Road along Brigham Creek Road and the development along the main access road. The footpath and cycleway merges with existing shared footpath and cycleways to the east and west of the upgraded section of Brigham Creek Road.

Due to property boundary and topography constraints a separated footpath and cycleway is to be provided on only the northern side of Brigham Creek Road. The southern side falls away steeply into a tributary of the Waiarohia Stream. The proposed cycleway has extra width to safely accommodate contraflow cycle lanes in accordance with TDM criteria.

Figure 31 details the upgraded Brigham Creek Road and Kauri Road typical cross-sections adjacent to the site, which identifies retaining required on the southern side of Brigham Creek Road that makes further widening to accommodate paths on this side unfeasible. It is also noted that there are no connecting paths on the southern side of Brigham Creek Road.

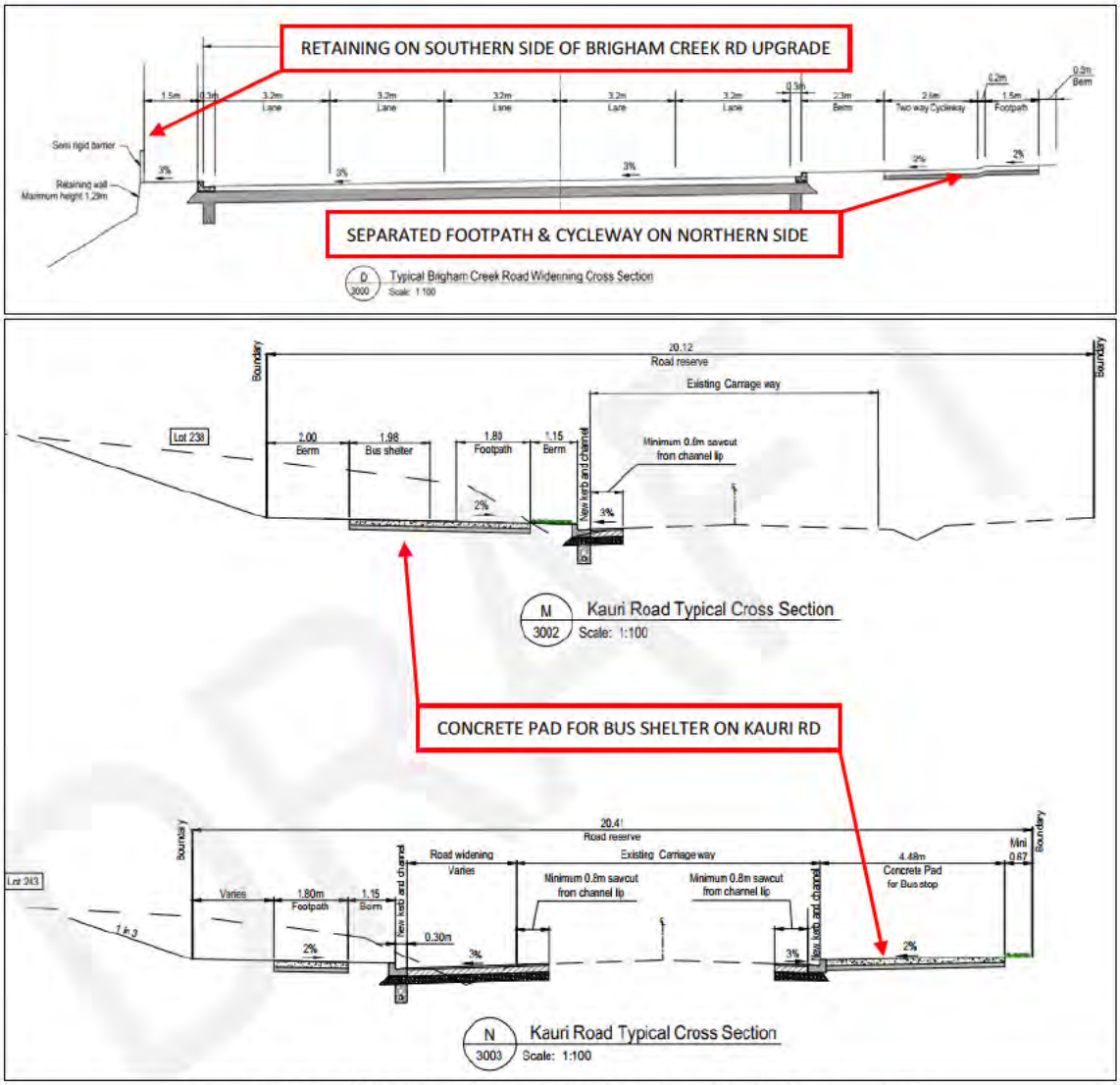


Figure 31: Upgraded Brigham Creek Road and Kauri Road Typical Cross-sections

It is envisaged that when notice of requirements for vesting New Zealand Defence Force land as road reserve are issued, and Brigham Creek Road undergoes an entire route upgrade as part of the Northwest Indicative Strategic Network plan, a footpath and cycleway can be safely accommodated on both sides. Until then, pedestrian and cyclist travel can only occur on the subject site's side of Brigham Creek Road (northern side).

Separated footpath and cycleway on both sides of the main access Road then link to the proposed light industrial development on its northern side and to the residential development on its southern side. Three commercial vehicle crossings with adjacent footpaths then link to the proposed light industrial development and footpaths link into the residential development at its two intersections. A shared foot/cycle path at the southern corner of the residential development provides a direct connection to Brigham Creek Road and Kauri Road where bus stops on both sides of Kauri Road are proposed.

Refer to **Figure 32** that identifies the proposed Kauri Road bus stop locations and their footpath connectivity to the site.

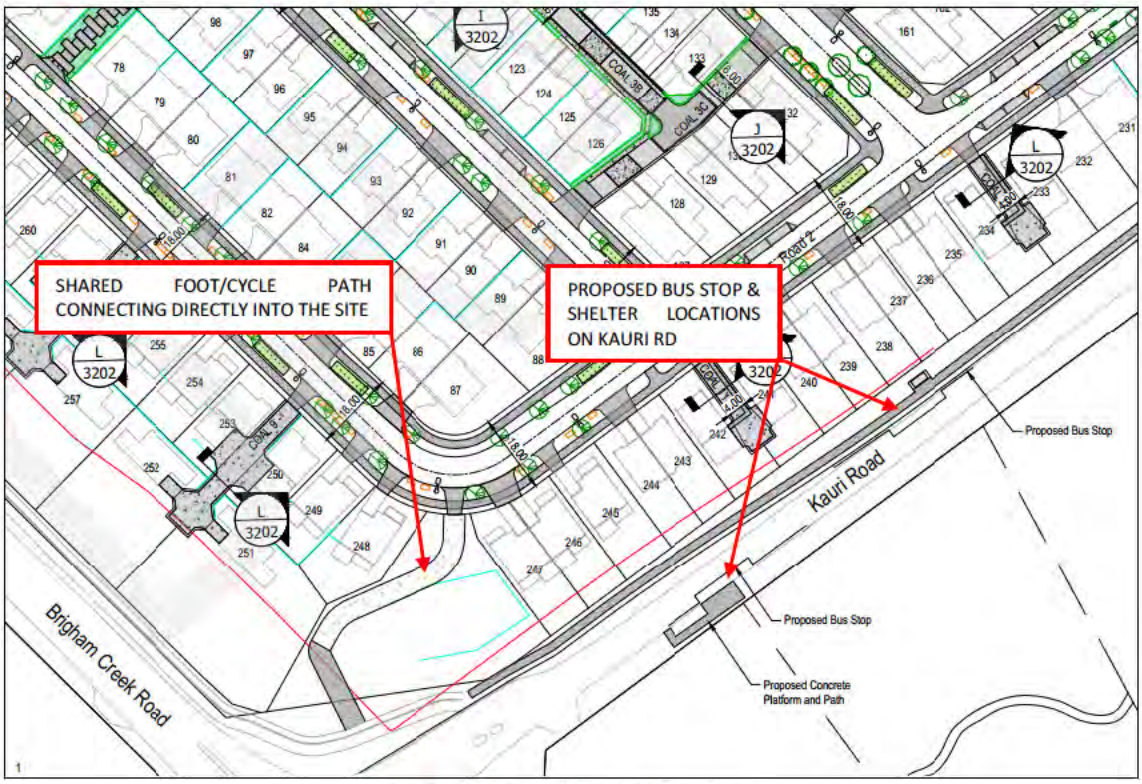


Figure 32: Proposed Kauri Rd Bus Stops

The walking and cycling infrastructure proposed improves the safety and accessibility for pedestrians and cyclists in the vicinity of the site.

A footbridge across State Highway 18, Clarks Lane foot/cycle bridge, is expected to be favoured by cyclists that cycle between Hobsonville Road and the site with a distance of 2.2km for this route via the bridge and Sinton Road. Refer to an aerial photo of the Clarks Lane foot/cycle bridge in **Figure 33**.

Overall, the walking and cycling provisions proposed are expected to encourage the use of these active travel modes, assisting to reduce the potential generation of private vehicle trips.

Figure 33: Clarks Lane Foot / Cycle Bridge

3.12 Road Safety

The Police's crash records have been searched to identify pre-existing roading or traffic issues along Brigham Creek Road adjacent to the site, including the Kauri Road intersection and section to the State Highway 18 roundabout interchange.

In the most recent five year period eight accidents have been recorded. These accidents consisted of two resulting in minor injuries and the remaining six with non-injuries. Refer to **Figure 34** for the collision diagram of these recorded accidents.

The crash listing is attached as **Appendix D**. The crashes consisted of four that where opposing movement crashes where one vehicle crossed the centreline, and the others consisted of two nose to tail, one loss of control and one turning against type crashes. This number and type of crashes is not excessive given the existing rural roading standard with high traffic volume and speed environment on this section of Brigham Creek Road.

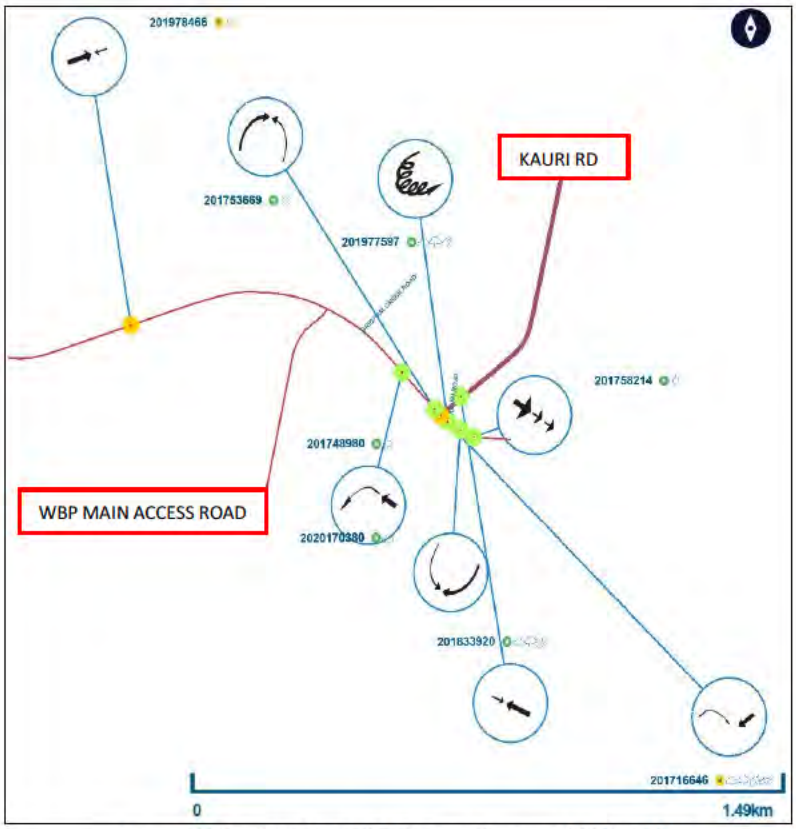


Figure 34: Brigham Creek Rd Collision Diagram (2017-2022)

The new signalised intersection to be established as part of the Whenuapai Business Park (WBP) subdivision and proposed upgrade of Brigham Creek Road adjacent to the site to an urban standard with reduced speed limit from 80km/hr to 60km/hr is expected to improve road safety and consequently reduce the historical crash rate and severity. It is noted that the four opposing movement recorded crashes are considered near misses where severity could have been greater, and the proposed upgrade works with additional traffic lanes and slower speeds is expected to minimise the occurrence and severity of these types of accidents.

An improved off street separated footpath and cycleway will also improve safety for these active travel modes on Brigham Creek Road.

3.13 Construction Traffic Management Plan

It is standard practice that NCL submits a Construction Traffic Management Plan (CTMP) at the start of construction so that any potential adverse effects of construction traffic will be mitigated. The CTMP is to be approved by Auckland Council and this requirement should be included in the conditions of consent. In this case the CTMP will be developed by the contractors as they will have the best information with regards to the staging of the internal roading network and Brigham Creek Road signalised intersection.

Site access for construction of the internal roading network is anticipated to be similar to the approved bulk earthworks consent CTMP that has been underway for the past 12 months without reported traffic issues and is currently 90% complete.

Upgrading of Brigham Creek Road and Kauri Road is expected occur over a three month period with staging of the works undertaken in tandem with Temporary Traffic Management Plans (TTMP) so that peak traffic periods of the day can be accommodated with acceptable queuing and delays.

Construction traffic associated with development of light industrial and residential lots is expected to be accommodated via the new signalised Brigham Creek Road intersection without the need for additional traffic management measures beyond the lot access.

In general, the CTMP needs to address how deliveries would be made to the site, the location of loading areas (such as any temporary use of the on-street traffic lane), how heavy or over dimension vehicles would be brought to and removed from the site, etc.

The CTMP should include details (among other general issues listed in the standard CTMP list) of hours of operation, location of parking for workers or sub-contractors who need to have their vehicles on or close to the site, when vehicles would be able to use the roadway to load or unload (if at all), wheel washing, maintenance of pedestrian access, adequate signage and ensuring that access to neighbouring properties is not compromised.

Overall, the provision of an appropriate CTMP will ensure that details of the construction traffic are carefully considered, and the effects mitigated appropriately.

3.14 Strategic Planning Framework – Regional Land Transport Plan (RLTP)

The Regional Land Transport Plan (2021-2031) lists Auckland's directions and focus areas to support the growth of Auckland over 10 years.

The primary directions are as follows:

- Focus on climate.
- Better connected people, places, goods, and services.
- Increase genuine travel choices for a healthy, vibrant and equitable Auckland.
- Maximise safety and environmental protection.

The primary focus areas are as follows:

- Make better use of existing transport networks
- Target new transport investment to the most significant challenges
- Maximise the benefits from transport technology
- Better integrate land use and transport decisions
- Move to a safe transport network, free from death and serious injury
- Develop a sustainable and resilient transport system
- Make walking, cycling and public transport preferred choices for many more Aucklanders

To achieve the above directions Auckland Transport's online mapping portal 'Future Connect' identifies the Whenuapai area as having a multi modal focus for its 2021-2031 projects. Included in these projects are rapid transit bus routes on State Highway 1 (city-Westgate) and frequent transit bus routes along Hobsonville Road (Westgate-Northshore).

The proposal develops a Future Urban zone and is proposing an upgrade of Brigham Creek Road and Kauri Road to access 9,270m^2 of light industrial gross floor area and 273 medium density dwellings.

The upgrade will bring the section of Brigham Creek Road and Kauri Road adjacent to the site to a standard that will be safer for road users and also bring it closer in line with Auckland Transport's vision for the corridor in the future. Improved footpaths and separated cycleway are also proposed which will support multi modal travel choice. Therefore, the Plan Change is consistent with the direction and focus of the RLTP.

3.15 Consultation Summary & Implementation Plan

The project team have carried out extensive consultation with Auckland Transport (AT) and Te Tupu Ngatāhi Supporting Growth on transport matters relating to the development. This Integrated Transport Assessment (ITA) follows on from a the Whenuapai Business Park (WBP) subdivision ITA, which has been circulated to Auckland Council, Auckland Transport and Te Tupu Ngatāhi. Refer to **Appendix E** for a copy of the response and other correspondences.

An estimate of costs for the Brigham Creek Road and Kauri Road upgrade works is discussed in the Assessment of Environmental Effects (AEE) report. These works are to be undertaken by Neil Construction Limited (NCL, the applicant).

4 Conclusions

The Teal Park descriptions, analyses and assessments provided in this report have shown that:

- the proposed road cross sections and network will provide for ready and convenient accessibility of the site by all transport modes: walking, cycling, bus and private vehicle.
- the proposal consisting of 9,270m^2 GFA of light industrial activities and 273 medium density residential dwellings is consistent with, and will give effect to, national, regional and district transport policies.
- the proposed transport network to support the development aligns with the Te Tupu Ngatāhi Supporting Growth's Northwest Indicative Transport Network goals.
- the extent of development can be accommodated by the surrounding road network while maintaining acceptable levels of safety and performance, given new traffic signals to be established as part of a separate development (Whenuapai Business Park), and upgrades to Brigham Creek Road and Kauri Road as part of the proposed Teal Park development.
- the effects of the development at the SH18 and SH16 interchanges with Brigham Creek Road are acceptable.

Accordingly, it is concluded that there is no traffic engineering or transportation planning reason to preclude acceptance of this proposal, since the full extent of development enabled by the proposed Light Industry and Residential Development will be appropriately supported by a new road network and upgrades to existing roading to maintain appropriate levels of safety and efficiency on the surrounding road network.

APPENDIX A: HOBSONVILLE COMMERCIAL/INDUSTRIAL PRECINCT DEVELOPMENT DETAILS

Dowdens Lane		Traffic can be surveyed here								
Workspace Drive										
Westpoint Drive										
Laurenson Road		Traffic can be surveyed here								
Rawiri Place									Multi Unit - individula FAR is mea	
School	excluded									
Hobsonville Road Front - excluded as cannot measure traffic										
Property Street Address	Property Suburb	Property Postcode	Sale Price	Sale Date (MM/YYYY)	Capital Value	Valuation Date	Category	Age	Land Area (m2)	Floor Area (m2)
Westpoint Drive	Hobsonville	0618	$0		$35,000	1-Jun-21	Other Vacant		816	0
18 Westpoint Drive	Hobsonville	0618	$11,078,125	Jul-10	$21,100,000	1-Jun-21	Industrial Vacant		44263	0
19 Westpoint Drive	Hobsonville	0618	$0		$1,175,000	1-Jun-21	Other Passive reserves	2010-19	11455	0
21 Westpoint Drive	Hobsonville	0618	$0		$2,725,000	1-Jun-21	Industrial Vacant		3233	0
23 Westpoint Drive	Hobsonville	0618	$0		$2,550,000	1-Jun-21	Industrial Vacant		3176	0
25 Westpoint Drive	Hobsonville	0618	$7,546,520	Sep-15	$14,400,000	1-Jun-21	Industrial Warehousing	2010-19	5282	2673
29 Westpoint Drive	Hobsonville	0618	$8,315,450	Jun-18	$5,750,000	1-Jun-21	Industrial Vacant		7687	0
32 Westpoint Drive	Hobsonville	0618	$10,366,500	Dec-19	$6,100,000	1-Jun-21	Industrial Vacant		6911	0
1/33 Westpoint Drive	Hobsonville	0618	$8,315,450	Jun-18	$13,200,000	1-Jun-21	Industrial Warehousing	2010-19	2477.333333	2234
2/33 Westpoint Drive	Hobsonville	0618	$0		$7,950,000	1-Jun-21	Industrial Warehousing	2010-19	2477.333333	1380
3/33 Westpoint Drive	Hobsonville	0618	$0		$8,250,000	1-Jun-21	Industrial Warehousing	2010-19	2477.333333	1336
34 Westpoint Drive	Hobsonville	0618	$0		$3,250,000	1-Jun-21	Industrial Vacant		4009	0
36 Westpoint Drive	Hobsonville	0618	$0		$3,275,000	1-Jun-21	Industrial Vacant		4020	0
37 Westpoint Drive	Hobsonville	0618	$18,430,240	Oct-17	$26,150,000	1-Jun-21	Industrial Vacant		36287	0
38 Westpoint Drive	Hobsonville	0618	$3,608,000	May-16	$23,950,000	1-Jun-21	Industrial Warehousing	2010-19	8023	5080
1/39 Westpoint Drive	Hobsonville	0618	$0		$6,750,000	1-Jun-21	Industrial Warehousing	2010-19	1638.5	1308
2/39 Westpoint Drive	Hobsonville	0618	$0		$4,250,000	1-Jun-21	Industrial Warehousing	2010-19	1638.5	826
42 Westpoint Drive	Hobsonville	0618	$9,300,000	Aug-20	$11,000,000	1-Jun-21	Industrial Warehousing	2020-29	3993	2474
43 Westpoint Drive	Hobsonville	0618	$0		$6,100,000	1-Jun-21	Industrial Vacant		6280	0
44 Westpoint Drive	Hobsonville	0618	$0		$16,950,000	1-Jun-21	Industrial Warehousing	2020-29	5738	2990
46 Westpoint Drive	Hobsonville	0618	$2,733,175	Sep-15	$18,100,000	1-Jun-21	Industrial Warehousing	2010-19	6431	4503
48 Westpoint Drive	Hobsonville	0618	$4,783,625	Feb-16	$21,300,000	1-Jun-21	Industrial Warehousing	2010-19	12703	5343
Workspace Drive	Hobsonville	0618	$0		$12,000	1-Jun-21	Other Vacant		268	0
1 Workspace Drive	Hobsonville	0618	$2,282,500	Feb-15	$13,300,000	1-Jun-21	Industrial Warehousing	2010-19	5497	2954
2 Workspace Drive	Hobsonville	0618	$4,485,000	Aug-16	$5,650,000	1-Jun-21	Commercial Educational	2010-19	2212	709
1/3 Workspace Drive	Hobsonville	0618	$0		$910,000	1-Jun-21	Industrial Warehousing	2010-19	260.3571429	158
2/3 Workspace Drive	Hobsonville	0618	$486,425	Feb-16	$890,000	1-Jun-21	Industrial Warehousing	2010-19	260.3571429	150
3/3 Workspace Drive	Hobsonville	0618	$0		$890,000	1-Jun-21	Industrial Warehousing	2010-19	260.3571429	150
4/3 Workspace Drive	Hobsonville	0618	$0		$890,000	1-Jun-21	Industrial Warehousing	2010-19	260.3571429	150
5/3 Workspace Drive	Hobsonville	0618	$0		$890,000	1-Jun-21	Industrial Warehousing	2010-19	260.3571429	150
6/3 Workspace Drive	Hobsonville	0618	$0		$890,000	1-Jun-21	Industrial Warehousing	2010-19	260.3571429	120
7/3 Workspace Drive	Hobsonville	0618	$0		$860,000	1-Jun-21	Industrial Warehousing	2010-19	260.3571429	155
8/3 Workspace Drive	Hobsonville	0618	$515,000	Mar-16	$860,000	1-Jun-21	Industrial Warehousing	2010-19	260.3571429	155
9/3 Workspace Drive	Hobsonville	0618	$722,000	Oct-17	$860,000	1-Jun-21	Industrial Warehousing	2010-19	260.3571429	155
10/3 Workspace Drive	Hobsonville	0618	$700,000	Dec-17	$860,000	1-Jun-21	Industrial Warehousing	2010-19	260.3571429	155
11/3 Workspace Drive	Hobsonville	0618	$0		$860,000	1-Jun-21	Industrial Warehousing	2010-19	260.3571429	155
12/3 Workspace Drive	Hobsonville	0618	$499,500	Apr-17	$860,000	1-Jun-21	Industrial Warehousing	2010-19	260.3571429	155
13/3 Workspace Drive	Hobsonville	0618	$722,000	May-18	$860,000	1-Jun-21	Industrial Warehousing	2010-19	260.3571429	155
14/3 Workspace Drive	Hobsonville	0618	$665,000	Mar-17	$1,150,000	1-Jun-21	Industrial Warehousing	2010-19	260.3571429	223
1/4 Workspace Drive	Hobsonville	0618	$1,325,362	May-17	$2,775,000	1-Jun-21	Industrial Warehousing	2010-19	582.1666667	488
2/4 Workspace Drive	Hobsonville	0618	$998,269	Mar-18	$2,225,000	1-Jun-21	Industrial Warehousing	2010-19	582.1666667	378
3/4 Workspace Drive	Hobsonville	0618	$879,447	Mar-16	$2,225,000	1-Jun-21	Industrial Warehousing	2010-19	582.1666667	429
4/4 Workspace Drive	Hobsonville	0618	$690,000	Feb-16	$1,550,000	1-Jun-21	Industrial Warehousing	2010-19	582.1666667	245
5/4 Workspace Drive	Hobsonville	0618	$1,081,119	Feb-17	$2,375,000	1-Jun-21	Industrial Warehousing	2010-19	582.1666667	405
6/4 Workspace Drive	Hobsonville	0618	$2,300,000	Oct-20	$2,650,000	1-Jun-21	Industrial Warehousing	2010-19	582.1666667	510
1/5 Workspace Drive	Hobsonville	0618	$2,054,450	Mar-17	$5,050,000	1-Jun-21	Industrial Warehousing	2010-19	1174.666667	910
2/5 Workspace Drive	Hobsonville	0618	$2,114,882	Mar-17	$4,700,000	1-Jun-21	Industrial Warehousing	2010-19	1174.666667	870
3/5 Workspace Drive	Hobsonville	0618	$2,500,000	Mar-18	$4,200,000	1-Jun-21	Industrial Warehousing	2010-19	1174.666667	735
4/5 Workspace Drive	Hobsonville	0618	$3,900,000	Apr-19	$4,950,000	1-Jun-21	Industrial Warehousing	2010-19	1174.666667	856
5/5 Workspace Drive	Hobsonville	0618	$2,650,000	May-17	$4,875,000	1-Jun-21	Industrial Warehousing	2010-19	1174.666667	905
6/5 Workspace Drive	Hobsonville	0618	$2,568,000	May-18	$5,200,000	1-Jun-21	Industrial Warehousing	2010-19	1174.666667	955
6 Workspace Drive	Hobsonville	0618	$1,100,000	May-15	$8,050,000	1-Jun-21	Industrial Warehousing	2010-19	2674	1602
8 Workspace Drive	Hobsonville	0618	$7,500,000	Feb-21	$9,100,000	1-Jun-21	Industrial Warehousing	2010-19	2484	1704
1/4 Laurenson Road	Hobsonville	0618	$2,370,000	Jul-18	$3,275,000	1-Jun-21	Industrial Warehousing	2010-19	0	556
2/4 Laurenson Road	Hobsonville	0618	$1,495,000	Nov-16	$2,675,000	1-Jun-21	Industrial Warehousing	2010-19	0	460
3/4 Laurenson Road	Hobsonville	0618	$1,230,000	Apr-18	$2,075,000	1-Jun-21	Industrial Warehousing	2010-19	0	348
4/4 Laurenson Road	Hobsonville	0618	$1,918,720	Sep-16	$2,925,000	1-Jun-21	Industrial Warehousing	2010-19	0	496
6 Laurenson Road	Hobsonville	0618	$0		$9,900,000	1-Jun-21	Industrial Warehousing	2010-19	3724	2120
8 Laurenson Road	Hobsonville	0618	$3,730,000	Aug-18	$5,500,000	1-Jun-21	Industrial Vacant		7321	0
1 Rawiri Place	Hobsonville	0618	$6,800,000	Oct-20	$8,100,000	1-Jun-21	Industrial Warehousing	2010-19	3100	1582
3 Rawiri Place	Hobsonville	0618	$10,150,000	Dec-18	$15,650,000	1-Jun-21	Industrial Warehousing	2010-19	5003	2780
1/4 Rawiri Place	Hobsonville	0618	$1,520,000	Apr-17	$3,650,000	1-Jun-21	Industrial Warehousing	2010-19	817.375	682
2/4 Rawiri Place	Hobsonville	0618	$1,520,000	Apr-17	$2,100,000	1-Jun-21	Industrial Warehousing	2010-19	817.375	350
3/4 Rawiri Place	Hobsonville	0618	$1,120,125	Jun-17	$2,100,000	1-Jun-21	Industrial Warehousing	2010-19	817.375	350
4/4 Rawiri Place	Hobsonville	0618	$1,520,000	Apr-17	$3,350,000	1-Jun-21	Industrial Warehousing	2010-19	817.375	572
5/4 Rawiri Place	Hobsonville	0618	$2,065,000	May-18	$3,275,000	1-Jun-21	Industrial Warehousing	2010-19	817.375	572
6/4 Rawiri Place	Hobsonville	0618	$1,520,000	Apr-17	$2,100,000	1-Jun-21	Industrial Warehousing	2010-19	817.375	350
7/4 Rawiri Place	Hobsonville	0618	$1,520,000	Apr-17	$2,100,000	1-Jun-21	Industrial Warehousing	2010-19	817.375	350
8/4 Rawiri Place	Hobsonville	0618	$2,882,500	Aug-19	$3,575,000	1-Jun-21	Industrial Warehousing	2010-19	817.375	664
5 Rawiri Place	Hobsonville	0618	$1,405,000	Mar-17	$5,400,000	1-Jun-21	Other Sports	2010-19	3651	1238
6 Rawiri Place	Hobsonville	0618	$1,650,000	Feb-16	$12,300,000	1-Jun-21	Other Multiple/other	2010-19	4801	1856
										62314

APPENDIX B: LAURENSON RD & DOWDENS LANE TUBE COUNT DATA

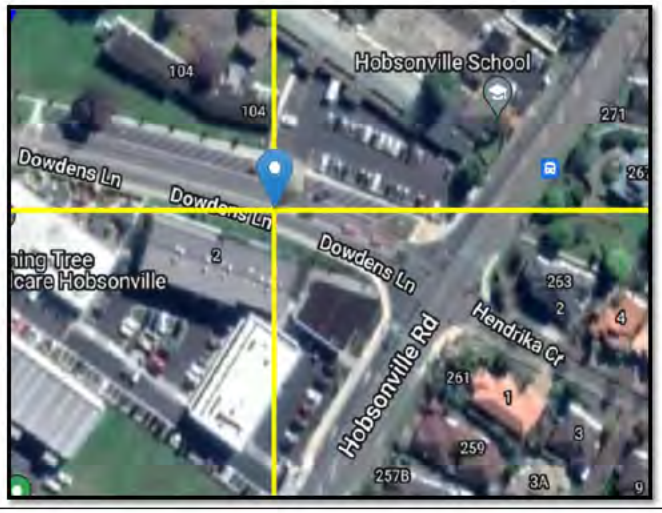
Site Description: **Dowdens Lane Between West Point Dr And Hobsonville Rd**

Location: E1745959 N5925411

Survey Period: **00:00 Friday, 10 June 2022 to 24:00 Thursday, 16 June 2022**

AVERAGES								
5 Day				7 Day				
ADT (Vehicles per Day)			%HCV	ADT (Vehicles per Day)			85th Percentile Speed	
Northbound	Southbound	Both	Both	Northbound	Southbound	Both	Northbound	Southbound
2,086.0	2,060.0	4,146.0	11.8%	1,695.0	1,690.0	3,385.0	43.0	32.8

Notes:



Site Description: **Laureson Rd Between Westpoint Dr And Hobsonville Rd**

Location: E1746142 N5925668

Survey Period: **00:00 Friday, 10 June 2022 to 24:00 Thursday, 16 June 2022**

AVERAGES								
5 Day				7 Day				
ADT (Vehicles per Day)			%HCV	ADT (Vehicles per Day)			85th Percentile Speed	
Northbound	Southbound	Both	Both	Northbound	Southbound	Both	Northbound	Southbound
1,535.0	1,203.0	2,738.0	10.9%	1,235.0	985.0	2,220.0	38.3	29.3

Notes:

APPENDIX C: SIDRA OUTPUT

Proposed Brigham Creek Rd Signalised Intersection AM Peak Period

MOVEMENT SUMMARY

Site: 101 [AM - Update - New Directional Bias - 100% (Site Folder: 2022 Update - New directional Bias + Northern Development (100% residential))]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 60 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h]	INPUT VOLUMES HV] veh/h	DEMAND FLOWS [Total veh/h]	DEMAND FLOWS HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh]	95% BACK OF QUEUE Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Collector S														
10	L2	88	4	88	4.5	0.210	15.9	LOS B	1.4	10.0	0.84	0.73	0.84	40.7
11	T1	3	0	3	0.0	0.752	31.1	LOS C	5.7	42.0	1.00	0.93	1.26	33.5
12	R2	177	9	177	5.1	0.752	35.9	LOS D	5.7	42.0	1.00	0.93	1.26	33.4
Approach		268	13	268	4.9	0.752	29.3	LOS C	5.7	42.0	0.95	0.86	1.12	35.5
East: BCR E														
1	L2	329	16	329	4.9	0.757	26.9	LOS C	12.8	93.2	0.95	0.91	1.08	36.7
2	T1	445	22	445	4.9	0.757	25.4	LOS C	12.8	93.2	0.96	0.93	1.13	36.6
3	R2	74	7	74	9.5	0.310	31.7	LOS C	2.1	15.8	0.94	0.75	0.94	34.8
Approach		848	45	848	5.3	0.757	26.6	LOS C	12.8	93.2	0.96	0.91	1.10	36.5
North: Collector N														
4	L2	114	11	114	9.6	0.219	22.1	LOS C	2.6	19.4	0.79	0.74	0.79	38.1
5	T1	5	0	5	0.0	0.336	29.3	LOS C	1.7	13.1	0.97	0.74	0.97	34.3
6	R2	54	5	54	9.3	0.336	34.1	LOS C	1.7	13.1	0.97	0.74	0.97	34.0
Approach		173	16	173	9.2	0.336	26.1	LOS C	2.6	19.4	0.85	0.74	0.85	36.6
West: BCR W														
7	L2	35	4	35	11.4	0.641	29.9	LOS C	7.5	55.4	0.95	0.86	0.99	36.6
8	T1	528	25	528	4.7	0.641	24.5	LOS C	7.9	57.4	0.95	0.84	0.99	37.4
9	R2	164	8	164	4.9	0.685	34.4	LOS C	5.1	37.0	1.00	0.87	1.15	33.8
Approach		727	37	727	5.1	0.685	27.0	LOS C	7.9	57.4	0.96	0.85	1.03	36.5
All Vehicles		2016	111	2016	5.5	0.757	27.0	LOS C	12.8	93.2	0.95	0.87	1.05	36.4

Proposed Brigham Creek Rd Signalised Intersection AM Peak Period

LANE SUMMARY

Site: 101 [AM - Update - New Directional Bias - 100% (Site Folder: 2022 Update - New directional Bias + Northern Development (100% residential))]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed Time/SCATS) Isolated Cycle Time = 60 seconds (Site Optimum Cycle Time - Minimum Delay)

Lane Use and Performance

	DEMAND FLOWS [Total veh/h]	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Collector S													
Lane 1	68	4.5	420	0.210	100	15.9	LOS B	1.4	10.0	Short	75	0.0	NA
Lane 2	180	5.0	239	0.752	100	35.8	LOS D	5.7	42.0	Full	500	0.0	0.0
Approach	268	4.9		0.752		29.3	LOS C	5.7	42.0				
East: BCR E													
Lane 1	440	4.9	581	0.757	100	25.8	LOS C	12.8	93.2	Short	100	0.0	NA
Lane 2	334	4.9	441	0.757	100	26.5	LOS C	10.1	74.0	Full	500	0.0	0.0
Lane 3	74	9.5	232	0.319	100	31.7	LOS C	2.1	15.6	Short	60	0.0	NA
Approach	848	5.3		0.757		26.6	LOS C	12.8	93.2				
North: Collector N													
Lane 1	114	9.6	521	0.219	100	22.1	LOS C	2.6	19.4	Short	70	0.0	NA
Lane 2	59	8.5	176	0.336	100	33.7	LOS C	1.7	13.1	Full	500	0.0	0.0
Approach	173	9.2		0.336		26.1	LOS C	2.6	19.4				
West: BCR W													
Lane 1	280	5.6	437	0.641	100	25.9	LOS C	7.5	55.4	Short	100	0.0	NA
Lane 2	283	4.7	441	0.641	100	23.8	LOS C	7.9	57.4	Full	500	0.0	0.0
Lane 3	164	4.9	239	0.685	100	34.4	LOS C	5.1	37.0	Short	100	0.0	NA
Approach	727	5.1		0.685		27.0	LOS C	7.9	57.4				
Intersection	2016	5.5		0.757		27.0	LOS C	12.8	93.2				

Proposed Brigham Creek Road Signalised Intersection PM Peak Period

MOVEMENT SUMMARY

Site: 101 [PM - Update - New Directional bias - 100% (Site Folder: 2022 Update - New directional Bias + Northern Development (100% residential))]

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]	INPUT VOLUMES HV [veh/h]	DEMAND FLOWS [Total veh/h]	DEMAND FLOWS HV [ ] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh]	95% BACK OF QUEUE Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Collector S														
10	L2	164	8	164	4.9	0.348	20.3	LOS C	3.7	27.3	0.85	0.77	0.85	38.9
11	T1	3	0	3	0.0	0.870	43.0	LOS D	15.1	110.1	1.00	1.03	1.37	30.3
12	R2	329	16	329	4.9	0.870	47.7	LOS D	15.1	110.1	1.00	1.03	1.37	30.1
Approach		496	24	496	4.8	0.870	36.6	LOS D	15.1	110.1	0.95	0.94	1.20	32.6
East: BCR E														
1	L2	177	9	177	5.1	0.400	25.1	LOS C	9.3	67.6	0.80	0.75	0.80	37.7
2	T1	633	32	633	5.1	0.853	31.4	LOS C	20.9	152.4	0.93	0.97	1.11	34.8
3	R2	114	11	114	9.6	0.875	54.4	LOS D	5.3	40.0	1.00	1.06	1.66	28.5
Approach		924	52	924	5.6	0.875	33.0	LOS C	20.9	152.4	0.91	0.94	1.12	34.4
North: Collector N														
4	L2	74	7	74	9.5	0.213	34.5	LOS C	2.5	18.7	0.87	0.74	0.87	33.8
5	T1	5	0	5	0.0	0.306	40.7	LOS D	1.6	12.1	0.98	0.73	0.98	31.1
6	R2	35	4	35	11.4	0.306	45.4	LOS D	1.6	12.1	0.98	0.73	0.98	30.8
Approach		114	11	114	9.6	0.306	38.1	LOS D	2.5	18.7	0.91	0.74	0.91	32.7
West: BCR W														
7	L2	54	5	54	9.3	0.315	25.9	LOS C	5.1	37.3	0.77	0.72	0.77	37.9
8	T1	516	26	516	5.0	0.564	23.3	LOS C	12.1	88.7	0.85	0.75	0.85	37.6
9	R2	88	4	88	4.5	0.652	47.5	LOS D	3.7	26.8	1.00	0.83	1.14	30.1
Approach		658	35	658	5.3	0.652	26.7	LOS C	12.1	88.7	0.86	0.76	0.88	36.6
All Vehicles		2192	122	2192	5.6	0.875	32.6	LOS C	20.9	152.4	0.91	0.87	1.06	34.5

Proposed Brigham Creek Road Signalised Intersection PM Peak Period

LANE SUMMARY

Site: 101 (PM - Update - New Directional bias - 100% (Site Folder: 2022 Update - New directional Bias + Northern Development (100% residential))]

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

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj %	Prob. Block. %
South: Collector S													
Lane 1	164	4.9	471	0.348	100	20.3	LOS C	3.7	27.3	Short	75	0.0	NA
Lane 2	332	4.8	382	0.870	100	47.6	LOS D	15.1	110.1	Full	500	0.0	0.0
Approach	496	4.8		0.870		38.6	LOS D	15.1	110.1				
East: BCR E													
Lane 1	312	5.1	679	0.460	54[1]	23.2	LOS C	9.3	67.8	Short	100	0.0	NA
Lane 2	490	5.1	564	0.853	100	34.3	LOS C	20.9	152.4	Full	500	0.0	0.0
Lane 3	114	9.6	130	0.875	100	54.4	LOS D	5.3	40.0	Short	60	0.0	NA
Approach	924	5.6		0.875		33.0	LOS C	20.9	152.4				
North: Collector N													
Lane 1	74	9.5	348	0.213	100	34.5	LOS C	2.5	18.7	Short	70	0.0	NA
Lane 2	40	10.0	131	0.306	100	44.0	LOS D	1.6	12.1	Full	500	0.0	0.0
Approach	114	9.6		0.306		38.1	LOS D	2.5	18.7				
West: BCR W													
Lane 1	196	6.2	626	0.315	54[1]	22.8	LOS C	5.1	37.3	Short	100	0.0	NA
Lane 2	372	5.0	637	0.584	100	23.9	LOS C	12.1	88.7	Full	500	0.0	0.0
Lane 3	90	4.5	135	0.652	100	47.5	LOS D	3.7	26.6	Short	100	0.0	NA
Approach	658	5.3		0.652		26.7	LOS C	12.1	88.7				
Intersection	2192	5.6		0.875		32.6	LOS C	20.9	152.4				

State Highway 18 / Brigham Creek Rd Roundabout (Sinton Rd) AM Peak Period

MOVEMENT SUMMARY

Site: 101 [BCR/SH18 2022 base AM - Proposed]

2022 base AM
Site Category: (None)
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	Demand Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: BCR east												
22	T1	443	8.6	0.269	2.8	LOS A	1.7	12.5	0.06	0.40	0.06	48.4
23	R2	9	22.2	0.269	7.5	LOS A	1.7	12.5	0.06	0.44	0.06	48.0
23b	R3	131	2.4	0.269	8.2	LOS A	1.7	12.5	0.06	0.44	0.06	48.7
Approach		583	7.4	0.269	4.1	LOS A	1.7	12.5	0.06	0.41	0.06	48.4
NorthEast: Sinton Rd												
24b	L3	16	0.0	0.075	7.5	LOS A	0.3	2.4	0.67	0.77	0.67	44.9
24	L2	22	0.0	0.075	7.0	LOS A	0.3	2.4	0.67	0.77	0.67	45.4
26	R2	6	16.7	0.075	12.5	LOS B	0.3	2.4	0.67	0.77	0.67	46.5
Approach		44	2.4	0.075	8.0	LOS A	0.3	2.4	0.67	0.77	0.67	45.4
NorthWest: BCR west												
27	L2	4	0.0	0.565	5.6	LOS A	3.8	28.4	0.62	0.70	0.69	46.3
27a	L1	589	7.5	0.565	5.2	LOS A	3.8	28.4	0.62	0.70	0.69	47.1
28	T1	83	24.1	0.152	0.1	LOS A	0.6	4.9	0.52	0.62	0.52	47.5
Approach		677	9.5	0.565	5.3	LOS A	3.8	28.4	0.61	0.69	0.67	47.1
SouthWest: SH18 offramp												
30	L2	57	9.3	0.178	5.3	LOS A	0.7	5.6	0.50	0.71	0.50	46.1
31	T1	5	0.0	0.178	4.7	LOS A	0.7	5.6	0.50	0.71	0.50	46.3
32a	R1	1	0.0	0.178	8.3	LOS A	0.7	5.6	0.50	0.71	0.50	46.0
32	R2	263	12.4	0.178	9.7	LOS A	0.7	5.6	0.50	0.73	0.50	46.0
Approach		326	11.6	0.178	8.9	LOS A	0.7	5.6	0.50	0.73	0.50	45.8
All Vehicles		1631	9.0	0.565	5.7	LOS A	3.8	28.4	0.39	0.60	0.42	47.3

State Highway 18 / Brigham Creek Rd Roundabout (Sinton Rd) AM Peak Period

LANE SUMMARY

Site: 101 [BCR/SH18 2022 base AM - Proposed]

2022 base AM
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
SouthEast: BCR east													
Lane 1	141	8.6	1176	0.120	45[5]	2.9	LOS A	0.6	4.5	Full	500	0.0	0.0
Lane 2[d]	442	7.0	1641	0.269	100	4.5	LOS A	1.7	12.5	Full	500	0.0	0.0
Approach	583	7.4		0.269		4.1	LOS A	1.7	12.5				
NorthEast: Sinton Rd													
Lane 1[d]	44	2.4	588	0.075	100	8.0	LOS A	0.3	2.4	Full	500	0.0	0.0
Approach	44	2.4		0.075		8.0	LOS A	0.3	2.4				
NorthWest: BCR west													
Lane 1[d]	594	7.4	1051	0.565	100	5.2	LOS A	3.8	28.4	Full	500	0.0	0.0
Lane 2	83	24.1	546	0.152	27[5]	6.1	LOS A	0.6	4.9	Short	60	0.0	NA
Approach	677	9.5		0.565		5.3	LOS A	3.8	28.4				
SouthWest: SH18 offramp													
Lane 1[d]	172	10.9	965	0.178	100	8.0	LOS A	0.7	5.6	Short	90	0.0	NA
Lane 2	154	12.4	864	0.178	100	9.9	LOS A	0.7	5.6	Full	500	0.0	0.0
Approach	326	11.6		0.178		8.9	LOS A	0.7	5.6				
Intersection	1631	9.0		0.565		5.7	LOS A	3.8	28.4				

State Highway 18 / Brigham Creek Rd Roundabout (Sinton Rd) PM Peak Period

MOVEMENT SUMMARY

Site: 101 [BCR/SH18 2022 base PM - Stage 1 & 2]

2022 base PM
Site Category: (None)
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	Demand Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: BCR east												
22	T1	779	4.7	0.436	2.8	LOS A	3.5	25.2	0.06	0.39	0.06	48.5
23	R2	33	6.5	0.436	7.4	LOS A	3.5	25.2	0.06	0.42	0.06	48.3
23b	R3	169	2.5	0.436	8.2	LOS A	3.5	25.2	0.06	0.42	0.06	48.9
Approach		981	4.4	0.436	3.9	LOS A	3.5	25.2	0.06	0.39	0.06	48.5
NorthEast: Sinton Rd												
24b	L3	13	0.0	0.076	8.8	LOS A	0.3	2.5	0.74	0.85	0.74	43.7
24	L2	15	28.6	0.076	9.8	LOS A	0.3	2.5	0.74	0.85	0.74	44.1
26	R2	5	0.0	0.076	13.1	LOS B	0.3	2.5	0.74	0.85	0.74	45.4
Approach		33	12.9	0.076	9.9	LOS A	0.3	2.5	0.74	0.85	0.74	44.1
NorthWest: BCR west												
27	L2	9	0.0	0.704	8.1	LOS A	5.8	42.0	0.80	0.98	1.06	45.3
27a	L1	834	4.2	0.704	7.6	LOS A	5.8	42.0	0.80	0.98	1.06	46.0
28	T1	287	2.9	0.422	6.4	LOS A	2.1	15.3	0.67	0.77	0.74	47.2
Approach		931	3.7	0.704	7.2	LOS A	5.8	42.0	0.76	0.91	0.96	46.4
SouthWest: SH18 offramp												
30	L2	253	4.6	0.466	8.1	LOS A	2.7	19.7	0.71	0.91	0.84	44.2
31	T1	13	8.3	0.466	7.9	LOS A	2.7	19.7	0.71	0.91	0.84	45.3
32a	R1	1	0.0	0.466	11.2	LOS B	2.7	19.7	0.71	0.91	0.84	45.1
32	R2	485	1.1	0.466	12.8	LOS B	2.7	19.7	0.71	0.94	0.86	44.4
Approach		752	2.4	0.466	11.2	LOS B	2.7	19.7	0.71	0.93	0.86	44.4
All Vehicles		2696	3.7	0.704	7.2	LOS A	5.8	42.0	0.49	0.73	0.60	46.5

State Highway 18 / Brigham Creek Rd Roundabout (Sinton Rd) PM Peak Period

LANE SUMMARY

Site: 101 [BCR/SH18 2022 base PM - Stage 1 & 2]

2022 base PM
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj %	Prob. Block. %
SouthEast: BCR east													
Lane 1	243	4.7	1248	0.195	45	2.8	LOS A	1.1	7.9	Full	500	0.0	0.0
Lane 2	738	4.3	1693	0.436	100	4.3	LOS A	3.5	25.2	Full	500	0.0	0.0
Approach	981	4.4		0.436		3.9	LOS A	3.5	25.2				
NorthEast: Sinton Rd													
Lane 1	33	12.9	428	0.076	100	9.9	LOS A	0.3	2.5	Full	500	0.0	0.0
Approach	33	12.9		0.076		9.9	LOS A	0.3	2.5				
NorthWest: BCR west													
Lane 1	643	4.1	913	0.704	100	7.6	LOS A	5.8	42.0	Full	500	0.0	0.0
Lane 2	287	2.9	681	0.422	60	6.4	LOS A	2.1	15.3	Short	60	0.0	NA
Approach	931	3.7		0.704		7.2	LOS A	5.8	42.0				
SouthWest: SH18 offramp													
Lane 1	402	3.5	864	0.466	100	9.5	LOS A	2.7	19.7	Short	90	0.0	NA
Lane 2	349	1.1	750	0.466	100	13.1	LOS B	2.6	18.6	Full	500	0.0	0.0
Approach	752	2.4		0.466		11.2	LOS B	2.7	19.7				
Intersection	2696	3.7		0.704		7.2	LOS A	5.8	42.0				

APPENDIX D: CAS CRASH LISTING

TRANSPORT AGENCY CAS

Untitled query

Saved sites

BCR WBP

Crash severity

Fatal Crash, Serious Crash, Minor Crash, Non-Injury Crash

Crash year

2017 – 2022

Plain English report

8 results from your query.

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Crash road	Side road	Feature	Distance from side road/feature	Direction	Reference station	Route position	Easting	Northing	Longitude	Latitude	ID	Date	Day of week	Time	Description of events	Crash factors	Surface condition	Natural light	Weather	Junction	Control	Casualty count fatal	Casualty count serious	Casualty count minor	Social cost $(m)
BRIGHAN CREEK RD	KAURI ROAD		30m	S			1745764	5926105	174.633896	-36.799126	201977597	17/09/2019	Mon	01:28	Car/Wagon1 SDB on BRIGHAM CREEK RD lost control turning left; went off road to left, Car/Wagon1 hit new jersey barrier	CAR/WAGON1, alcohol test below limit, lost control - road conditions, ENV: heavy rain	Wet	Overcast	Heavy rain	Nil (Default)	Unknown	0	0	0	0.02
BRIGHAM CREEK RD	TRIG ROAD		344m	E			1744908	5926414	174.624357	-36.797016	201976466	30/12/2019	Mon	18:49	SUV1 EDB on Brigham Creek Road hit Car/Wagon2 headon on straight	CAR/WAGON2, alcohol test below limit, swerved to avoid vehicle SUV1, alcohol test above limit or test refused, other inattentive, too far right	Dry	Overcast	Fine	Nil (Default)	Unknown	0	0	2	0.11
BRIGHAN CREEK ROAD	KAURI ROAD		63m	S			1745792	5926150	174.634212	-36.799261	2020172080	25/05/2020	Mon	09:00	Car/Wagon1 WDB on BRIGHAM CREEK ROAD cutting corner hit Car/Wagon2 head on	CAR/WAGON1, cutting corner on bend, ENV: road unusually narrow	Null	Overcast	Null	Nil (Default)	Nil	0	0	0	
BRIGHAN CREEK ROAD	KAURI ROAD		250m	N			1745561	5926368	174.631577	-36.797333	201753569	05/11/2017	Sun	18:30	Car/Wagon1 SDB on Brigham Road cutting corner hit Truck2 head on	CAR/WAGON1, attention diverted by animal or insect in vehicle, cutting corner on bend	Dry	Bright sun	Fine	Nil (Default)	Unknown	0	0	0	0.04
BRIGHAM CREEK ROAD	KAURI ROAD		116m	E			1745898	5926132	174.634613	-36.799419	201758219	30/11/2017	Thu	18:40	Car/Wagon1 EDB on Brigham creek road hit rear end of Car/Wagon2 stop/slow for queue	CAR/WAGON1, intentional collision	Dry	Bright sun	Fine	Nil (Default)	Unknown	0	0	0	0.02
BRIGHAN CREEK ROAD	KAURI ROAD		140m	N			1745638	5926290	174.632446	-36.798027	201749930	07/09/2017	Thu	06:15	Van1 NDB on Brigham creek road hit rear of left turning Car/Wagon2 NDB on Brigham creek road, Car/Wagon2 hit non specific fence	VAN1, attn diverted by console inbuilt features radio/ac	Dry	Bright sun	Fine	Driveway	Unknown	0	0	0	0.02
KAURI ROAD	BRIGHAM CREEK ROAD			I			1745735	5926190	174.633560	-36.798912	201716646	01/08/2017	Tue	17:19	Car/Wagon2 turning right hit by oncoming Motorcycle1 SDB on Brigham creek road	CAR/WAGON2, did not check/notice another party from other dirn, failed to give way turning to non-turning traffic	Wet	Overcast	Light rain	T Junction	Give way	0	0	1	0.10
KAURI ROAD	BRIGHAM CREEK ROAD		70m	N			1745748	5926234	174.634716	-36.798550	201833927	26/02/2018	Mon	15:00	Car/Wagon1 NDB on KAURI ROAD hit Car/Wagon2 headon on straight	CAR/WAGON1, too far right	Wet	Overcast	Light rain	Nil (Default)	Unknown	0	0	0	0.02

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APPENDIX E: CORRESPONDENCE