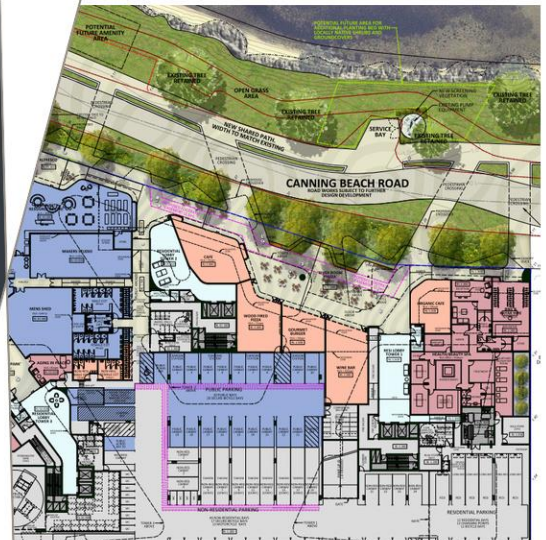


# Transport Impact Assessment

Canning Beach Promenade, 55-61  
Canning Beach Road, 2-6 Moreau  
Mews, Applecross

CW1034800



Prepared for  
Edge Visionary Living

28 January 2022

## Contact Information

### Cardno (WA) Pty Ltd

ABN 77 009 119 000

11 Harvest Terrace  
West Perth 6005  
Australia

www.cardno.com

Phone +61 8 9273 3888

Fax +61 8 9486 8664

Author(s):



Edmond Hoang  
Traffic Engineer

Approved By:



Ray Cook  
Senior Principal/Manager, Traffic &  
Transport Planning

## Document Information

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## Executive Summary

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Cardno has been commissioned by Edge Visionary Living ('the Client') to prepare a Transport Impact Assessment (TIA) for the proposed residential development ('the Site'), located at 55-61 Canning Beach Road and 2-6 Moreau Mews, Applecross.

This report aims to assess the impacts of the proposed development upon the adjacent road network, with a focus on traffic operations, circulation, and car parking requirements.

The findings and conclusions for the proposed development are summarised as follows:

- > The Site comprises of 224 residential apartments and ground floor commercial and community use.
- > The Site has excellent access to public transport with a number of high frequency bus routes located within the vicinity of the Site. Additionally, the Canning Bridge Train Station is also located in relatively close proximity.
- > Walking and cycling infrastructure within the surrounding area of the Site is excellent with a high quality shared path running along the riverside including a connecting route to the Kwinana Freeway PSP.
- > The proposed development has been calculated to have a trip generation of approximately 58 vehicles in the AM peak hour and 79 vehicles in the PM peak hour. As the primary target demographic comprises of mature professionals and retirees, peak hour commuter trips are likely low, resulting in actual peak hour trips to be even less.
- > The swept path assessment shows that a waste truck will be able to enter and exit the Site in a forward gear without issue.
- > The SIDRA assessment shows that the traffic generated by the Site will have a relatively low impact on the surrounding intersections and road network.
- > The car, bicycle and motorcycle parking provision is compliant with the *Canning Bridge Activity Centre Plan* requirements.
- > Overall, it is unlikely that the Site will detrimentally affect traffic safety or flow on the surrounding road network. The main traffic impacts affecting the surrounding road network will be traffic growth which will affect the operation of some intersections.
- > The current and anticipated traffic volumes for the frontage roads are consistent with the current various road classes.

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# 1 Introduction

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## 1.1 Background

Cardno has been commissioned by Edge Visionary Living ('the Client') to prepare a Transport Impact Assessment (TIA) for the proposed residential development ('the Site'), located at 55-61 Canning Beach Road and 2-6 Moreau Mews, Applecross.

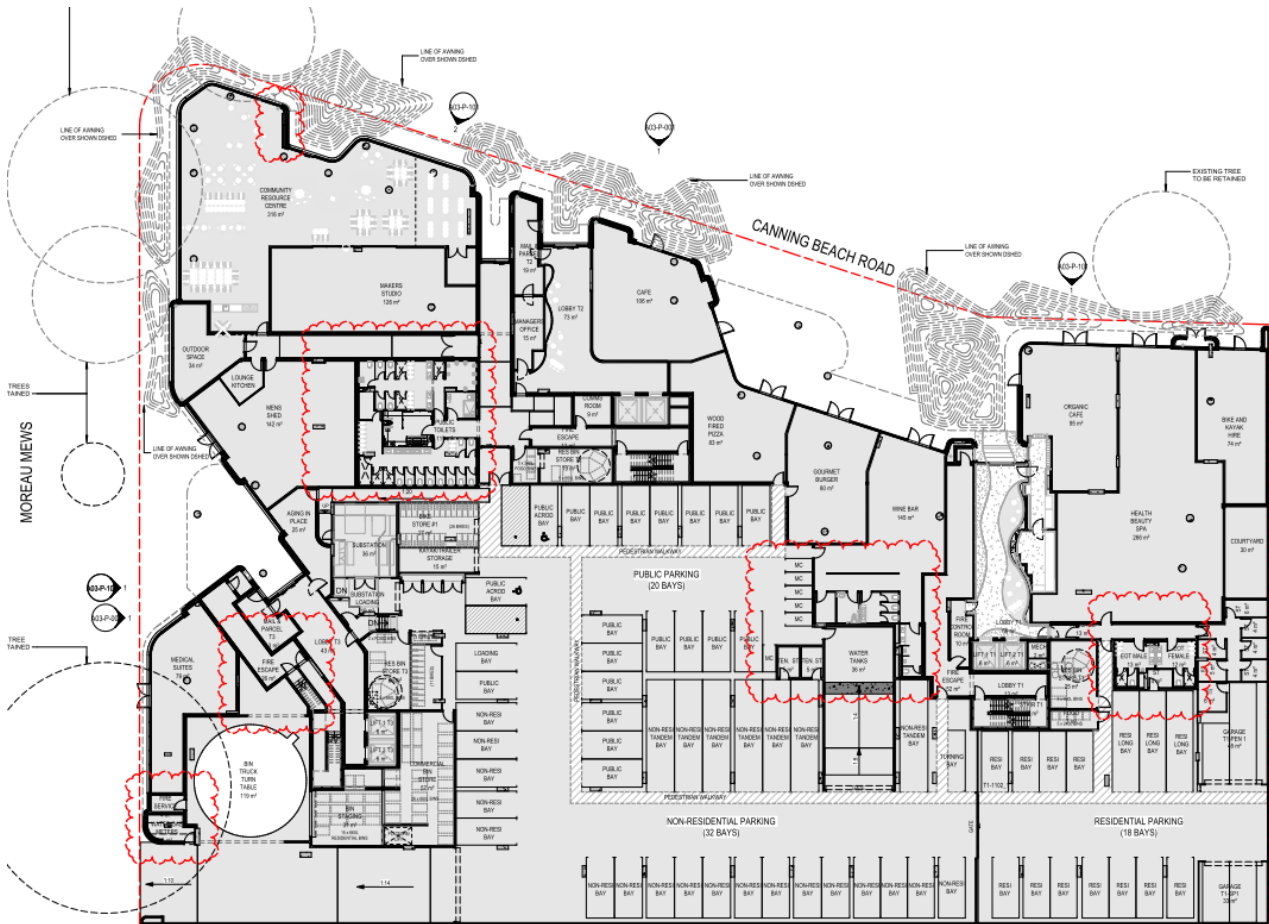
This report aims to assess the impacts of the proposed development upon the adjacent road network, with a focus on traffic operations, circulation, and car parking requirements. This report has been prepared in accordance with the Western Australian Planning Commission (WAPC) Transport Assessment Guidelines for Developments: Volume 4 – Individual Developments (2016) and the checklist is included in **Appendix A**.

## 2 Existing Site Situation

### 2.1 Site Location

The Site is located at 55-61 Canning Beach Road and 2-6 Moreau Mews, in the eastern region of Applecross as shown in **Figure 2-1**. Currently the Site is occupied by private residency and is immediately adjoined by residential uses.

Figure 2-1 Site Location



Source: Hillam Architects

### 2.2 Zoning

Currently the Site is occupied by private residency and is immediately adjoined by residential uses.






















In the City of Melville *Town Planning Scheme No. 6*, the Site is zoned as “Centre C2”. Similarly, the adjacent properties are also zoned in the same category. The surrounding land uses consist of residential dwellings and park recreation. **Figure 2-2** shows the land use zones surrounding the Site.

Figure 2-2 Zoning Map



**LEGEND**









**REGION SCHEME RESERVES (MRS)**

 Civic and Cultural	 Public Purposes
 Other Regional Roads	 Public Purposes - Car Park
 Parks and Recreation	 Public Purposes - Commonwealth Government
 Parks and Recreation - restricted	 Public Purposes - High School
 Port Installations	 Public Purposes - Hospital
 Primary Regional Roads	 Public Purposes - Prison
 Railways	 Public Purposes - Special Uses
 State Forests	 Public Purposes - State Energy Commission
 Waterways	 Public Purposes - Technical School
 Water Catchments	 Public Purposes - University
	 Public Purposes - Water Authority of WA

**LOCAL SCHEME RESERVES**

 District Distributor Road	 Public Open Space
 Local Distributor Road	 Public Purposes : Education
 Local Road	 Public Purposes : Infrastructure Services

**LOCAL SCHEME ZONES**

 Centre	 Residential
 Light Industry	 Service Commercial
 Mixed Use	 Special Use
 Private Clubs, Institutions and Place of Worship	 Urban Development

Source: City of Melville Town Planning Scheme No. 6 (2018)

### 2.3 Context with Surrounds

Key destinations within 300m of the Site include a hotel, library, café, supermarket and petrol station as shown in Figure 2-3. The river foreshore along runs along the northern border of Canning Beach Road.

Figure 2-3 Surrounding Area Key Generators



Source: Nearmap (2018)

#### 2.3.2 3-5 Kintail Road and 908-912 Canning Highway

The proposed development on 3-5 Kintail Road and 908-912 Canning Highway consists of three towers with approximately 440 residential apartments including a mix of retail, office and recreational uses. Construction has commenced for the first stage of this development with early 2022 being the estimated completion date for the whole development.



- > **Canning Beach Road** is located on the northern boundary of the Site. Canning Beach Road is a two-way undivided single carriageway road, with a kerb to kerb width of approximately 10m. The posted speed limit is 50km/h and it has an approximately 1.5-1.8m cycling lane on each side of the road. There is a 3m wide two-way dual use path on the northern side of Canning Beach Road. It is classified as a Local Distributor under the Main Road Functional Hierarchy.

On-street parking is available along Canning Beach Road consisting of 90-degree parking bays (31 bays in close proximity). Off-street paid parking is also available (approximately 59 bays) at the car park located south-east of the Site consisting of 90-degree and disabled parking bays. **Figure 2-5** shows the on-street and off-street parking arrangement along Canning Beach Road.

Figure 2-5 Canning Beach Road On-Street and Off-street Parking



- > **Kintail Road** is located 60m south of the Site. It is a two-way undivided single carriageway road with a kerb to kerb width of approximately 9m. Kintail Road also provides an approximately 1.8m footpath on the northern side and a 1.5m footpath on the southern side of the road. The posted speed limit is 50km/h and is classified as a Distributor B under the Main Road Functional Hierarchy.
- > **Moreau Mews** is located on the western boundary of the Site. It is a two-way undivided single carriageway road, with a kerb to kerb width of approximately 6.5m. Moreau Mews also provides an approximately 1.5-2m footpath on the western side of the road. The posted speed limit is 50km/h and is classified as an Access Road under the Main Road Functional Hierarchy.
- > **Canning Highway** is located 150m south of the Site. It is a dual carriageway with 3 lanes eastbound and 2 lanes westbound and has a posted speed limit of 60km/h. 2.5-3m footpaths are also provide on each side of the road. It is classified as a Primary Distributor under the Main Road Functional Hierarchy and is under the care and control of Main Roads WA.

## 2.5 Traffic Volumes

Existing traffic volumes were provided by the City of Melville and the Main Roads WA Traffic Map. The data is shown in **Table 2-1** below. The peak AM and PM periods are generally between 8:00am-9:00am and 5:00pm - 6:00pm respectively.

Table 2-1 Existing Traffic Volumes (two-way)

Road Name	Date	Average Weekday Two-way Traffic Volume	Vehicles - AM Peak Hour	Vehicles - PM Peak Hour
Canning Beach Road (10-60m North of Kintail Road)	2016	2,523	233	173
Canning Beach Road (100m East of Moreau Mews)	2016	3,038	274	226
Canning Beach Road (60m South of Riverway)	2016	2,501	193	178
Canning Beach Road (70m North of Riverway)	2016	2,258	185	166
Moreau Mews (38m South of Tweeddale Road)	2017	917	96	76
Moreau Mews (70m South of Kintail Road)	2017	1,342	126	126
Kintail Road (60m East of Moreau Mews)	2016	9,019	678	880
Kintail Road (40m East of First Avenue)	2016	7,938	615	773
Tweeddale Road (100m West of Moreau Mews)	2017	538	99	32
Canning Highway (at Canning Bridge)	2018	66,478	5,593	5,255
Canning Highway (East of Sleat Road)	2018	52,755	4,870	4,133

Source: City of Melville, Main Roads WA

## 2.6 Future Road Network

### 2.6.1 Canning Bridge Activity Centre Plan

The City of South Perth and Melville's *Canning Bridge Activity Centre Plan* proposes construction of a new Bus Interchange within the Station Quarter of the Canning Bridge Activity Centre. Construction of the Interchange will be between the Kwinana Freeway and the river and connect to Canning Highway via two ramps adjacent to Canning Bridge. **Figure 2-6** shows an indicative sketch of the proposed interchange.

Figure 2-6 Indicative Sketch of Canning Bridge Station Interchange

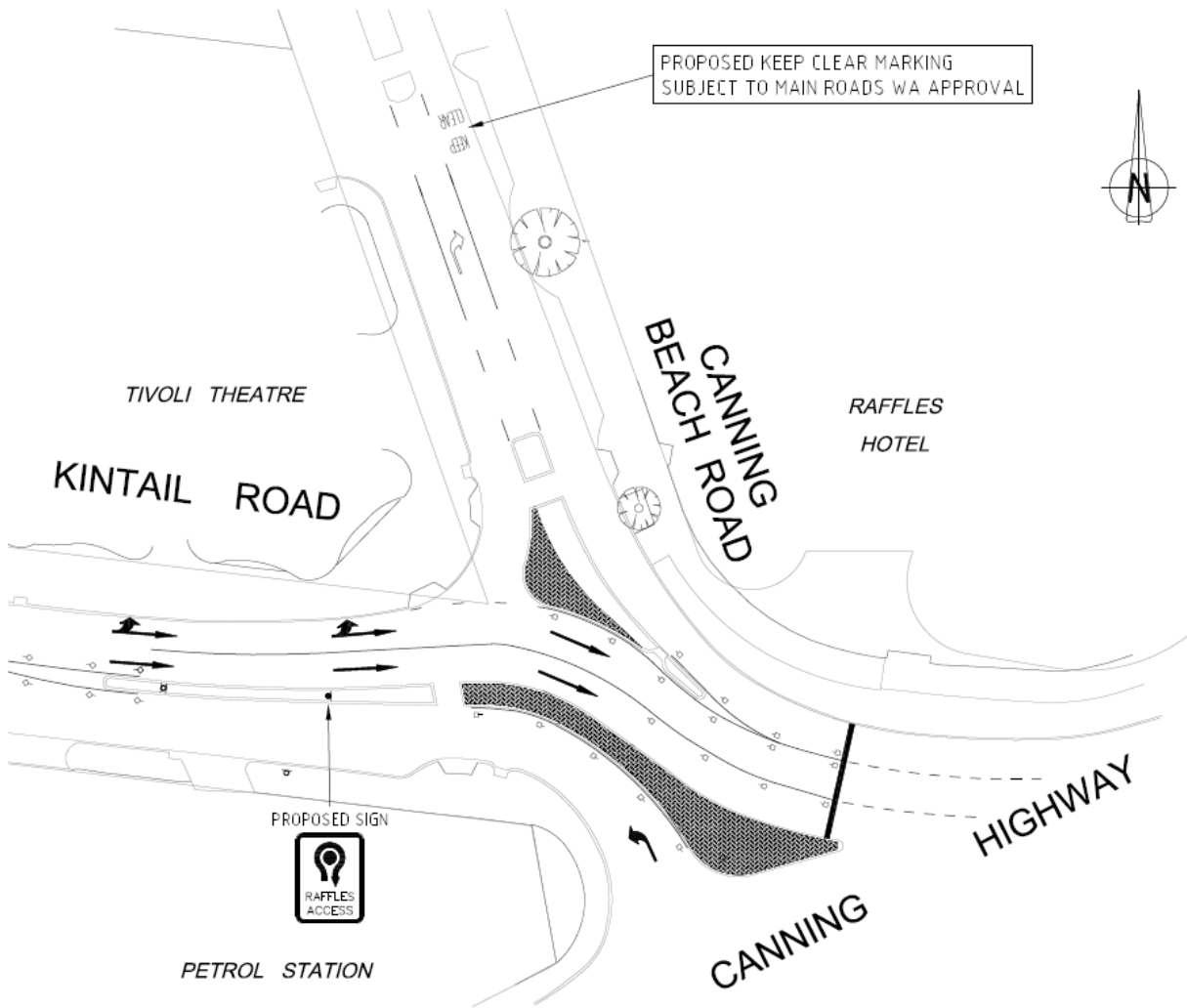


Source: Canning Bridge Activity Centre Plan (2016)

### 2.6.2 Black Spot Proposal (Kintail Road/Canning Beach Road/Canning Highway)

The Kintail Road/Canning Beach Road/Canning Highway intersection has been nominated for the State Black Spot Program with scheduled upgrades to be completed in 2018/19. The proposed treatment includes extending the median through the Kintail Road intersection to ban right turn movements into Canning Beach Road from Canning Highway as shown in **Figure 2-7**. As of February 2020, the Black Spot upgrades at this intersection has since been completed.

Figure 2-7 Black Spot Intersection Layout



Source: City of Melville

### 3 Public Transport Facilities

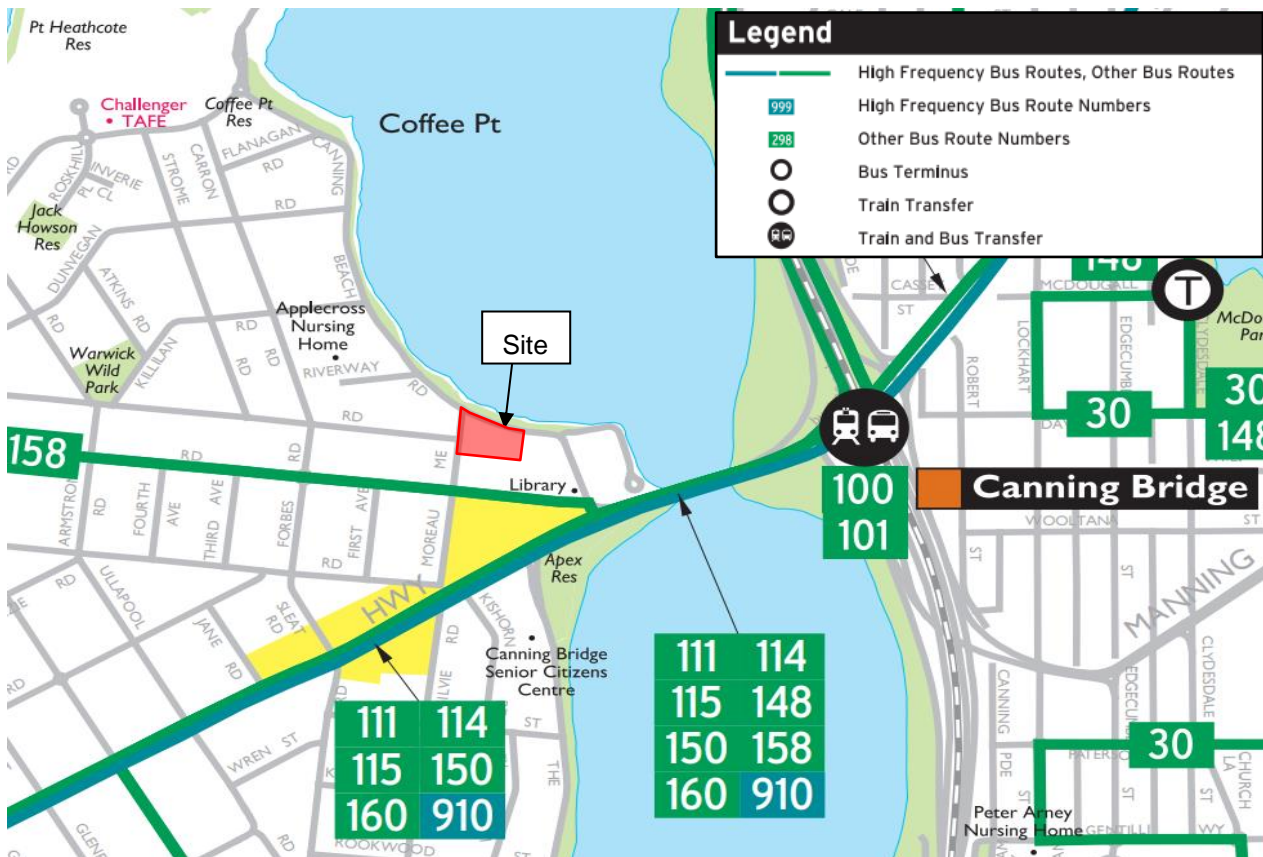
#### 3.1 Existing Public Transport Facilities

The nearest bus stop is located approximately 100m south of the Site along Kintail Road which is serviced by Route 148, 158 and 910. The Canning Bridge Train and Bus Station is located approximately 600m east of the Site on the Canning Highway interchange. Bus services which operate at this Station include Bus Routes 100, 101, 111, 114, 115, 148, 150, 158, 160 and 910. Train services which operate at this Station include the Mandurah Line. The existing bus routes and train station within close vicinity of the Site are shown in **Figure 3-1** and the service frequencies are summarised in **Table 3-1**. The nearest bus stops are shown in **Figure 3-2**.

Table 3-1 Existing Public Transport Services

Route	Route Description	Peak hour frequency	Off peak frequency
Mandurah line (Train)	Perth Underground – Mandurah	5mins	15mins to 1 hour
101, 100	Canning Bridge Stn – Curtin Uni	10mins	15 to 30mins
111	Perth – Fremantle Stn	10mins	15 to 30mins
114	Perth – Munster	20 to 30mins	1 hour
115	Perth – Hamilton Hill	15mins	30mins to 1 hour
148	Applecross – Fremantle Stn	30mins	1.5 to 3 hours
158 (weekdays only)	Perth – Fremantle Stn	15mins	30mins to 1 hour
150, 160	East Perth – Booragoon Stn	15mins	30mins to 1 hour
910	Perth – Fremantle Stn	10 to 15mins	15mins to 1 hour

Figure 3-1 Bus Routes and train station in the Vicinity of the Site



Source: Transperth (2017)

Figure 3-2 Location of Bus Stops



Source: Nearmap (2018)

Overall, the Site has excellent access to public transport with the high frequency bus services located within walking distance and easy access to the Canning Bridge Train Station.

### 3.2 Future Public Transport Facilities

#### 3.2.1 City of Melville Canning Bridge Activity Centre Plan (2016)

- > Canning Bridge Station Interchange - The proposed Canning Bridge Station Interchange aims to provide a major transport hub to be the primary focus for movement within the Canning Bridge precinct. The interchange plans to provide facilities including travel and ticketing information, options for refreshments, access to basic banking, storage facilities, shade and shelter, seating and opportunities for resting.
- > The proposed Canning Bridge Station Interchange serves as the primary transport hub for existing and future bus routes with long term plans of providing a ferry terminus on the river. **Figure 3-3** shows an indicative sketch of the proposed Canning Bridge Station Interchange.
- > The Canning Bridge Activity Centre Plan has also proposed providing public transport boulevards. Public transport boulevards provide dedicated infrastructure for public transport such as bus lanes. **Figure 3-4** shows the proposed layout of a public transport boulevard and **Figure 3-5** shows the movement network plan indicating the locations of these boulevards.

Figure 3-3 Canning Bridge Station Interchange Indicative Sketch



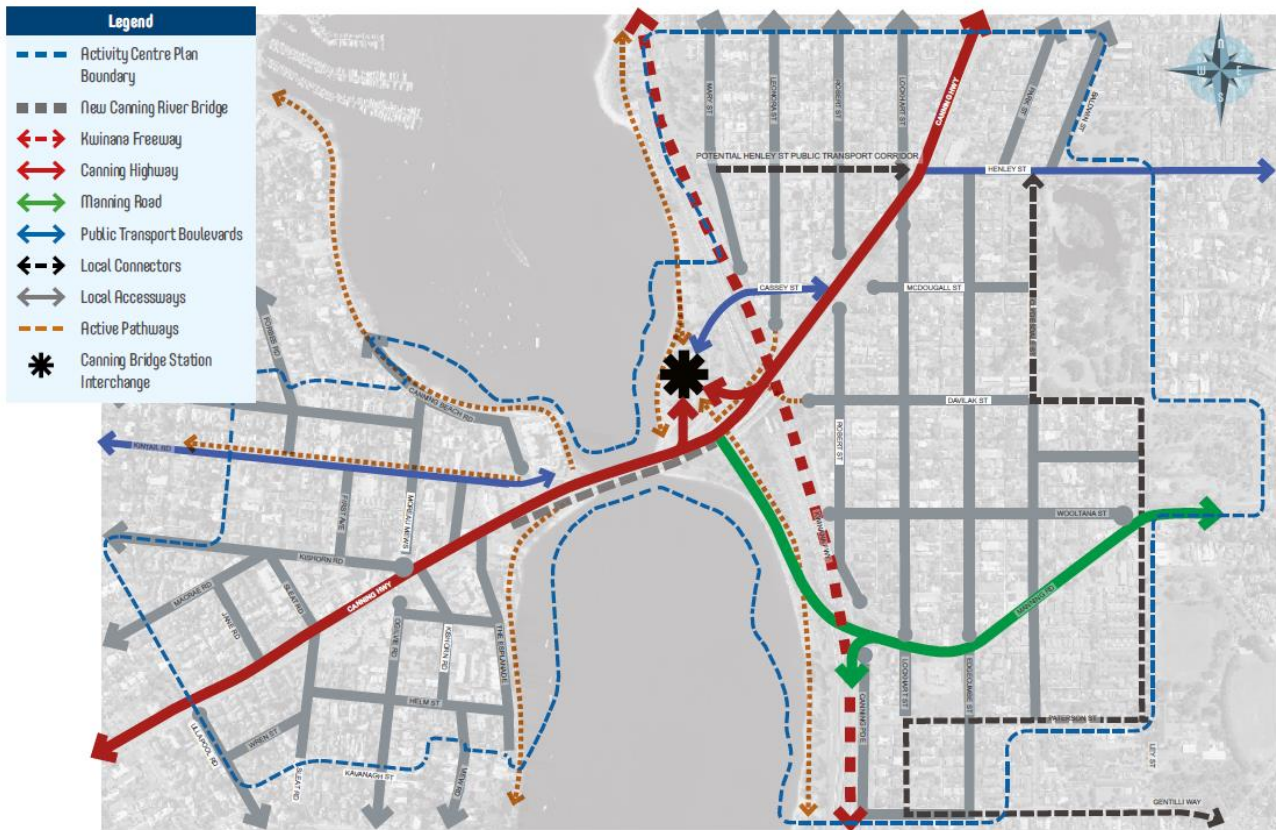
Source: Canning Bridge Activity Centre Plan (2016)

Figure 3-4 Public Transport Boulevard Concept



Source: Canning Bridge Activity Centre Plan (2016)

Figure 3-5 Movement Network Plan



Source: Canning Bridge Activity Centre Plan (2016)

The potential impacts of this movements plan is that it prioritises public transport along Kintail Road. Under this plan, future infrastructure upgrades along Kintail Road is likely to prioritise public transport facilities.

## 4 Pedestrian/Cycle Networks and Facilities

### 4.1 Existing Pedestrian/Cycle Network Facilities

On road cycling lanes are present along Canning Beach Road including a high quality separated shared path present on northern side of Canning Beach Road. **Figure 4-1**, shows the cycling lanes and facilities within the surrounding area of the Site.

Figure 4-1 Existing Pedestrian Cycling Network



#### LEGEND

	Road Bridges, Footbridges and Underpass		Perth Bicycle Network (PBN) - Continuous Signed Routes		Walk Trail		1km Walking Distance 1km Cycling Distance
	Local Government Authority Boundary		PBN Route Number		Major Destination		Birdwatching Site
	Bicycle Lockers		Principal Shared Path		Shopping Area		Playground
	Bicycle Shop, Bicycle Parking		Local Bicycle Friendly Street		Parks and Recreation		Skate Park
	Bicycle Shelter (Covered)		Path (shared by cyclists and pedestrians)		Ovals, Prepared Ground		Cafe
	Kindergarten		Bicycle Lanes or Sealed Shoulders Either Side		Bushland		Public Toilet, Accessible Toilet
	Child Health Centre		Train & Bus Transfer		Industrial Area		Post Office, Post Box
	Police, Fire Station		Bus Station		Supermarket		Telephone, Sporting Facility
	Pedestrian Access Way		Railway		Delicatessen / Convenience Store		Hospital
	Drinking Fountain		Freight Railway		Tertiary Education		Place of Worship
			Major Road, Traffic Light		Cultural Community Centre		Lookout
			Minor Road, Proposed Road		Dog Exercise Area		Shower
					Picnic Area, Barbeque		

Source: Department of Transport WA (2014)

## 4.2 Future Pedestrian/Cycle Network Facilities

### 4.2.1 City of Melville Bike Plan (2012)

Within the City of Melville's Bike Plan (2012), the following upgrades and improvements are proposed in proximity to the Site include the following:

- > Upgrade the shared path along Melville Beach Road - Upgrade approximately 3500m of existing footpath to standard 3.5m width shared path with approximately 900m line marking plus signage.
- > Canning Highway Bicycle Path – the installation of bicycle lanes as it is upgraded to include bus lanes.

### 4.2.2 City of Melville Canning Bridge Activity Centre Plan (2016)

- > **Figure 4-2** and **Figure 4-3** shows the proposed pedestrian and cycling network plans respectively from the Canning Bridge Activity Centre Plan.

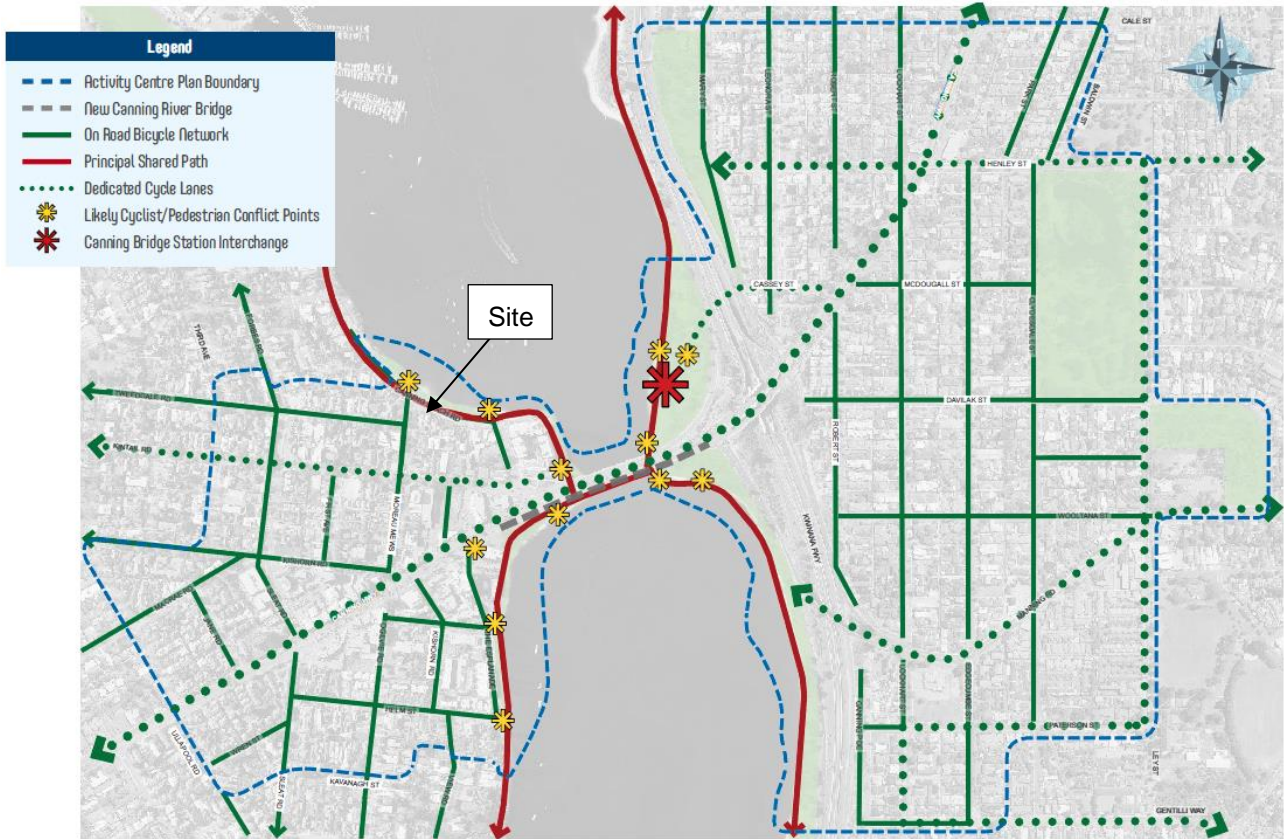
Figure 4-2 Pedestrian Network Plan



Source: Canning Bridge Activity Centre Plan (2016)

Under the pedestrian network plan shown above, Kintail Road is identified as a potential low speed pedestrian environment which facilitates high quality pedestrian facilities to provide a pleasant and safe path/route for pedestrians.

Figure 4-3 Cycling Network Plan



Source: Canning Bridge Activity Centre Plan (2016)

## 5 Proposed Development

### 5.1 Proposed Land Uses

The proposed development will comprise of 3 towers (Edge 10, 11 and 12) consisting of the following land uses:

- > 224 residential apartments comprising of;
  - a) 45 x 1 bed units
  - b) 84 x 2 bed units
  - c) 66 x 3 bed units
  - d) 29 x 4 bed units
- > Approximately 1,512 m<sup>2</sup> NLA of ground floor commercial

The proposed development plans are provided in **Appendix B**.

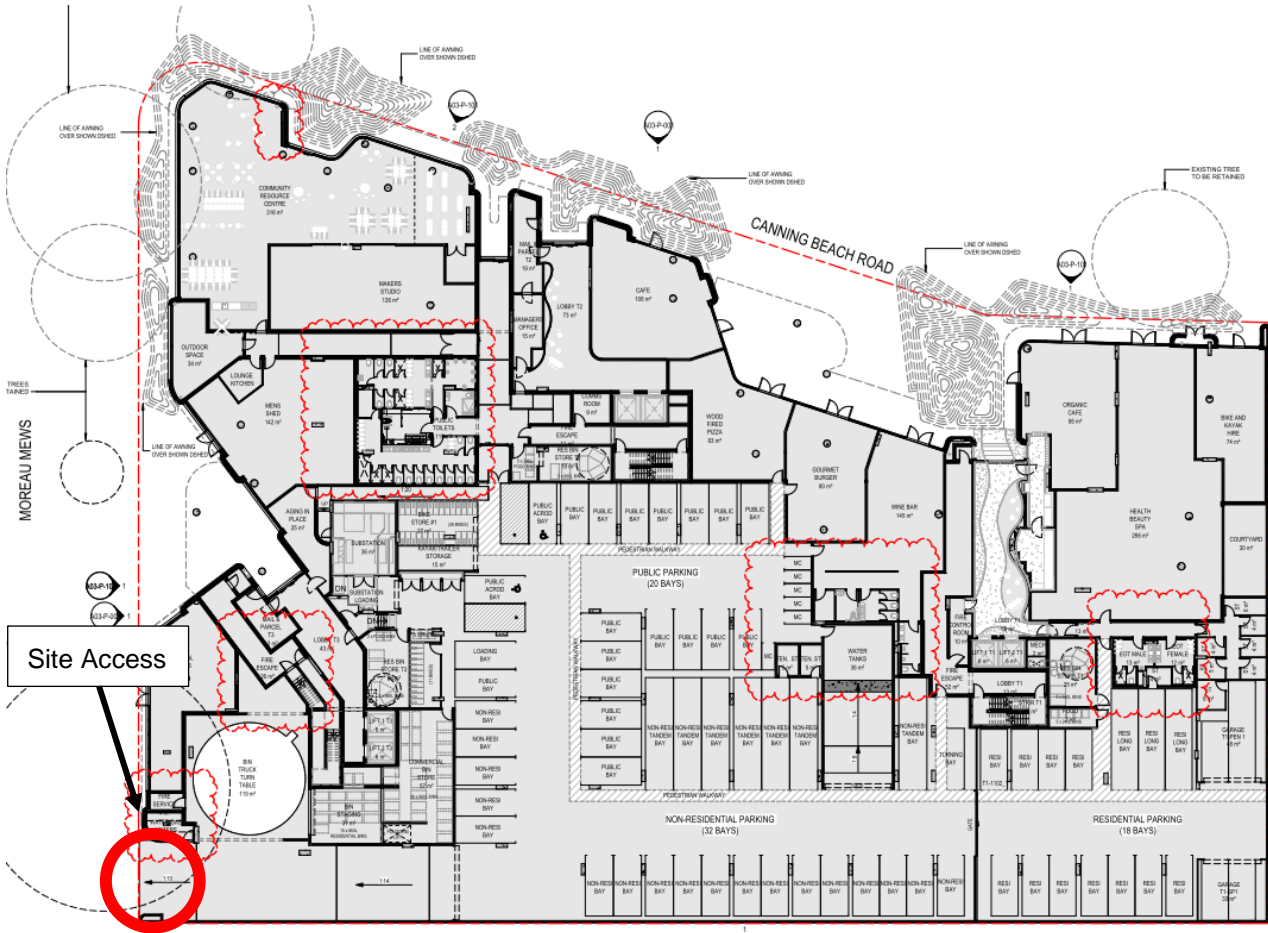
### 5.2 Access Arrangements

As shown on the plans in **Figure 5-2**, a single access point to the Site car park is provided off Moreau Mews. The existing crossovers currently providing access to the individual dwellings will be removed as shown in **Figure 5-1** (i.e. a total of 5 existing crossovers will be removed, 2 on Moreau Mews and 3 on Canning Beach Road). The removal of the crossovers and consolidating the Site access at one location will provide a positive impact on the wider road network.

Figure 5-1 Existing Crossovers to be Removed



Figure 5-2 Site Access



Source: Hillam Architects

### 5.3 Pedestrian and Vehicle Interaction at Site Access

It is noted that currently, there is no existing footpath provided on the eastern side of Moreau Mews, adjacent to the proposed development. While there is a proposed path to be provided as part of the development proposal, it is expected that generally pedestrians will walk on the other side of the road, where footpath is provided. The car park access has been set back to improve sight lines to pedestrians for exiting vehicles.

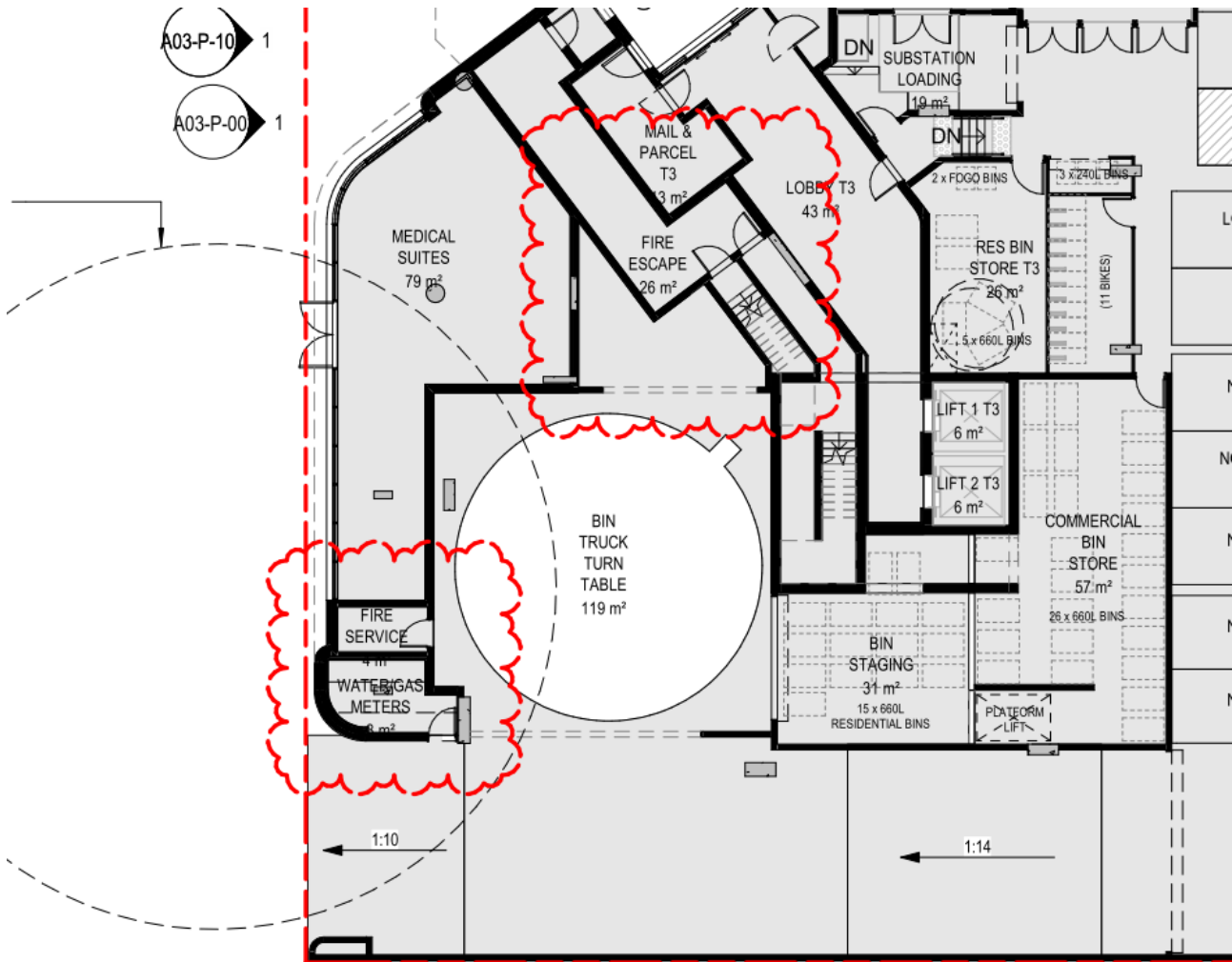
Due to the nature of the proposed residential development, audible alarms alerting pedestrians of vehicles exiting the Site should be avoided as it would have a significant impact on residential amenity.

### 5.4 Provision for Service Vehicles

Individual bin stores are provided for each of the buildings including separate bin stores for the commercial component. During collection days, the bins will be moved to the bin staging area where it is collected. A turntable is provided to allow the waste truck to manoeuvre in and out of the Site in forward gear. A short-term loading bay for light vehicles is also provided on the ground floor. **Figure 5-3** shows the loading/service dock arrangement and loading bay.

A swept path assessment has been conducted for a standard sized refuse collection vehicle entering and exiting the Site. **Figure 5-4** and **Figure 5-5** shows the access and egress movements respectively.

Figure 5-3 Loading/service Dock and Loading Bay





## 6 Parking

### 6.1 Parking Requirements

The car parking provision required for the Site is set out in the “Canning Bridge Activity Centre Plan” provided by the City of South Perth and the City of Melville. The Site is located within the Kintail Quarter (Q1), which determines the residential car parking requirements. These requirements and the provision are summarised in **Table 6-1** and **Table 6-2**.

Table 6-1 Car Parking Requirements

Land Use	Car Parking Requirements
Residential	
<ul style="list-style-type: none"> <li>Studio or 1 bedroom</li> </ul>	Minimum 0.75 bays per dwelling (34 bays) Maximum 1 bay per dwelling (45 bays)
<ul style="list-style-type: none"> <li>2 or 3 bedrooms</li> </ul>	Minimum 1 bay per dwelling (150 bays) Maximum 1.5 bays per dwelling (225 bays)
<ul style="list-style-type: none"> <li>4 or more bedrooms</li> </ul>	Minimum 1.25 bays per dwelling (36 bays) Maximum 2 bays per dwelling (58 bays)
<ul style="list-style-type: none"> <li>Non-residential</li> </ul>	Minimum 1 bay per 50m <sup>2</sup> NLA (30 bays) Maximum 1 bay per 25m <sup>2</sup> NLA (60 bays)
<b>Total</b>	<b>250-388 bays</b>

Table 6-2 Car Parking Provision

Land Use	Car Parking Provision
Residential	
<ul style="list-style-type: none"> <li>Studio or 1 bedroom</li> </ul>	328 bays
<ul style="list-style-type: none"> <li>2 or 3 bedrooms</li> </ul>	
<ul style="list-style-type: none"> <li>4 or more bedrooms</li> </ul>	
<ul style="list-style-type: none"> <li>Non-residential</li> </ul>	32 bays for non-residential 20 public bays ceded to Council
<b>Total bays (including shared)</b>	<b>360 bays + 20 public bays</b>

The Canning Bridge Activity Centre Plan (CBACP) does not specify any visitor parking requirements for residents. However, the non-residential bays (approximately 32 bays) can be shared and allow residential visitors. Additionally, 20 public car bays will be provided within the area fully accessible to the general public. As such, these public bays are not considered to be a part of the CBACP parking requirements and is a surplus to the development requirements. Overall, the parking provision is compliant with the Activity Centre Plan’s requirements.

### 6.2 Bicycle Parking Requirements

The bicycle parking provision required for the Site is set out in the “Canning Bridge Activity Centre Plan”. The Site is located within the Kintail Quarter (Q1) and therefore the bicycle parking requirements and proposed provision for the Site are summarised in **Table 6-3**.

Table 6-3 Bicycle Parking Requirement Rates

Land Use	Bicycle Parking Requirements	Bicycle Parking Provision
Residential	1 bay per dwelling (224 bays)	335 residential bicycle bays (from wall mounted bike racks) 26 secure public bicycle bays 11 secure commercial bicycle bays
Non-residential	1 bay per 100m <sup>2</sup> (16 bays)	
<b>Total</b>	<b>240 bicycle bays</b>	<b>372 bicycle bays</b>

Overall, the bicycle parking provision is compliant with the Activity Centre Plan’s requirements.

### 6.3 Motorcycle Parking Requirements

The motorcycle parking provision required for the Site is set out in the “Canning Bridge Activity Centre Plan”. The Site is located within the Kintail Quarter (Q1) and therefore the motorcycle parking requirements for the Site are summarised in **Table 6-4**. Overall, the motorcycle parking provision is compliant with the Activity Centre Plan’s requirements.

Table 6-4 Motorcycle Parking Requirement Rates

Land Use	Motorcycle Parking Requirements	Motorcycle Parking Provision
Non-residential	1 bay per 5 non-residential car parking bays (6-12 bays)	6 motorcycle bays
<b>Total</b>	<b>6-12 motorcycle bays</b>	<b>6 motorcycle bays</b>

## 7 Analysis of Transport Network

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### 7.1 Analysis Overview

#### 7.1.1 Key Intersections

A SIDRA analysis has been undertaken for the following intersections to assess the potential impact of Site-generated traffic on the surrounding road network.

- > Canning Highway/Canning Beach Road/Kintail Road
- > Kintail Road/Moreau Mews
- > Canning Beach Road/Moreau Mews
- > Moreau Mews/Site Access
- > Canning Highway/Sleat Road
- > Kintail Road/Forbes Road

#### 7.1.2 Assessment Years

As identified in the WAPC's *Transport Impact Assessment Guidelines: Individual Developments* (August 2016), it is recommended that, for analysis purposes, the appropriate assessment years include the year of full opening of the development and 10 years after full opening.

A conservative growth rate of 1% per annum has been adopted based on the anticipated traffic growth within the area. This provides a robust assessment of the future road network volumes.

#### 7.1.3 Assessment Scenarios

The exact opening year has not been confirmed, however for the purpose of this assessment, it is assumed to occur in the year 2021. Therefore, the following three scenarios have been analysed:

- > Scenario 1 – Background 2019
- > Scenario 2 – 2021:
  - a) Opening year without development
  - b) Opening year with development
- > Scenario 3 – 2031:
  - a) Future background without development
  - b) Future background with development

#### 7.1.4 Signal Phasings

Signal phasing and timings for Canning Highway/Canning Beach Road/Kintail Road and Canning Highway Sleat Road intersections have been based on the current signal phasing provided by MRWA through IDM (Intersection Diagnostics Monitor) data.

### 7.2 Development Trip Generation

Trip generation has been calculated for the Site, utilising the trip generation rates from the *RTA Guide to Traffic Generating Developments*, the *Institute of Transportation Engineering (ITE) "Trip Generation" 10<sup>th</sup> Ed* and the *WAPC Transport Impact Assessment Guidelines – Volumes 5*.

**Table 7-1** shows the trip generation, **Table 7-2** shows the directional distribution of the traffic and **Table 7-3** presents the total potential trip generation of the proposed development for the full development buildout.

Table 7-1 Trip Generation Rates

Land Use	Source	AM Peak	PM Peak
Residential (High Rise)	RTA	0.19 trips per dwelling	0.15 trips per dwelling
Café/Restaurant	WAPC	(IN) 1.4 trips per 100m <sup>2</sup> (OUT) 0.4 trips per 100m <sup>2</sup>	(IN) 5 trips per 100m <sup>2</sup> (OUT) 5 trips per 100m <sup>2</sup>
Commercial	WAPC	(IN) 1.6 trips per 100m <sup>2</sup> (OUT) 0.4 trips per 100m <sup>2</sup>	(IN) 0.4 trips per 100m <sup>2</sup> (OUT) 1.6 trips per 100m <sup>2</sup>
Health/Beauty	ITE	1.3 trips per 100m <sup>2</sup>	2.09 trips per 100m <sup>2</sup>
Community Hub	ITE	6.73 trips per 100m <sup>2</sup>	9.18 trips per 100m <sup>2</sup>

Table 7-2 Directional Distribution

Land Use	AM Peak		PM Peak	
	In	Out	In	Out
Residential (High Rise)	42%	58%	57%	43%
Café/Restaurant	-	-	-	-
Commercial	-	-	-	-
Health/Beauty	50%	50%	38%	62%
Community Hub	49%	51%	52%	48%

Table 7-3 Estimated Net Trip Generation of the Proposed Development

Land Use	AM Peak		PM Peak	
	In	Out	In	Out
Residential (High Rise) *	15	20	16	12
Café/Restaurant**	4	2	14	14
Commercial**	2	1	1	2
Health/Beauty	3	3	3	5
Community Hub***	4	4	6	6
<b>Total</b>	<b>28</b>	<b>30</b>	<b>44</b>	<b>42</b>

\* A 20% reduction has been applied to the residential component as some of these apartments are anticipated to be vacant throughout the year. This assumption was made to reflect the lifestyle of the target demographic which will be primarily mature professionals and retirees. The target demographic is also likely to result in lower peak hour commuter trips.

\*\* A 30% reduction has been applied to the commercial and café/restaurant components to account for internal trips.

\*\*\* The majority of visitors to the community hub will be people residing in this building, therefore, an 80% reduction has been applied to the community hub to account for internal trips.

Based on the trip rate calculations, the proposed development will only have a trip generation of approximately 58 vehicles in the AM peak hour and 86 vehicles in the PM peak hour.

### 7.3 Development Trip Distribution

All vehicular trips will access the Site via Moreau Mews. It is anticipated that the majority of Site generated traffic will travel to/from Canning Highway.

As the result of the Black Spot modifications at the Canning Highway/Canning Beach Road/Kintail Road intersection, the traffic distribution within the surrounding area will be redirected. **Figure 7-1** and **Figure 7-2** shows the anticipated Site traffic movements. A majority of the traffic currently using the section of Canning Beach Road, between Kintail Road and Moreau Mews will likely deviate to more convenient routes. Therefore, the only traffic remaining on this section of road are people travelling to the Raffles Hotel and/or the Library.

Figure 7-1 Inbound Movements



Figure 7-2 Outbound Movements



## 7.4 Assumptions

For the purpose of this assessment the following assumptions were made:

- > The anticipated traffic growth within the surrounding road network is forecast to be approximately 1% per annum. This provides a robust assessment of the future road network volumes.
- > The signal phasing and timing for the intersections assessed (Canning Highway/Canning Beach Road and Canning Highway/Sleat Road) in all scenarios uses the current phasing and timing specified by Main Roads. For future scenarios, this will likely result in unoptimised signal timings and phasings as it does not account for road and traffic changes over time. It is likely that further assessments will need to be conducted over time.
- > Black Spot upgrades for the Canning Highway/Canning Beach Road/Kintail Road intersection will likely be completed before the opening of the development. Note: the intersection upgrades has since been completed as of February 2020.
- > The Canning Highway/Canning Beach Road and Canning Beach Road/Kintail Road intersections have been assessed as a network.
- > The turning movement volumes for key intersections were surveyed during the peak hours to determine base volumes and turning movements. Other more minor intersections were determined using a simple gravity model which calculates turning movement traffic based on the inbound and outbound demand for each intersection leg.
- > Heavy vehicle percentage is assumed to be 6% based on the background traffic volumes.
- > The trip generation for the residential component of the development is based on the number of apartment units rather than the number of bedrooms. A comparison of the trip generation based on the number of units and the number of bedrooms per unit showed that the difference is negligible. Additionally, apartment vacancies and the proximity to public transport will further reduce the anticipated residential trips below the trip numbers assumed within this report.
- > An assumption of 30% internal trips was used for the ground floor commercial and food and beverage tenancies.

## 7.5 Background and Development Traffic

The traffic volumes adopted for the 5 assessment scenarios are shown in **Figure 7-3** to **Figure 7-7**.



Figure 7-4 Scenario 2a – Opening Year without Development (2021) – Weekday AM and PM Peak

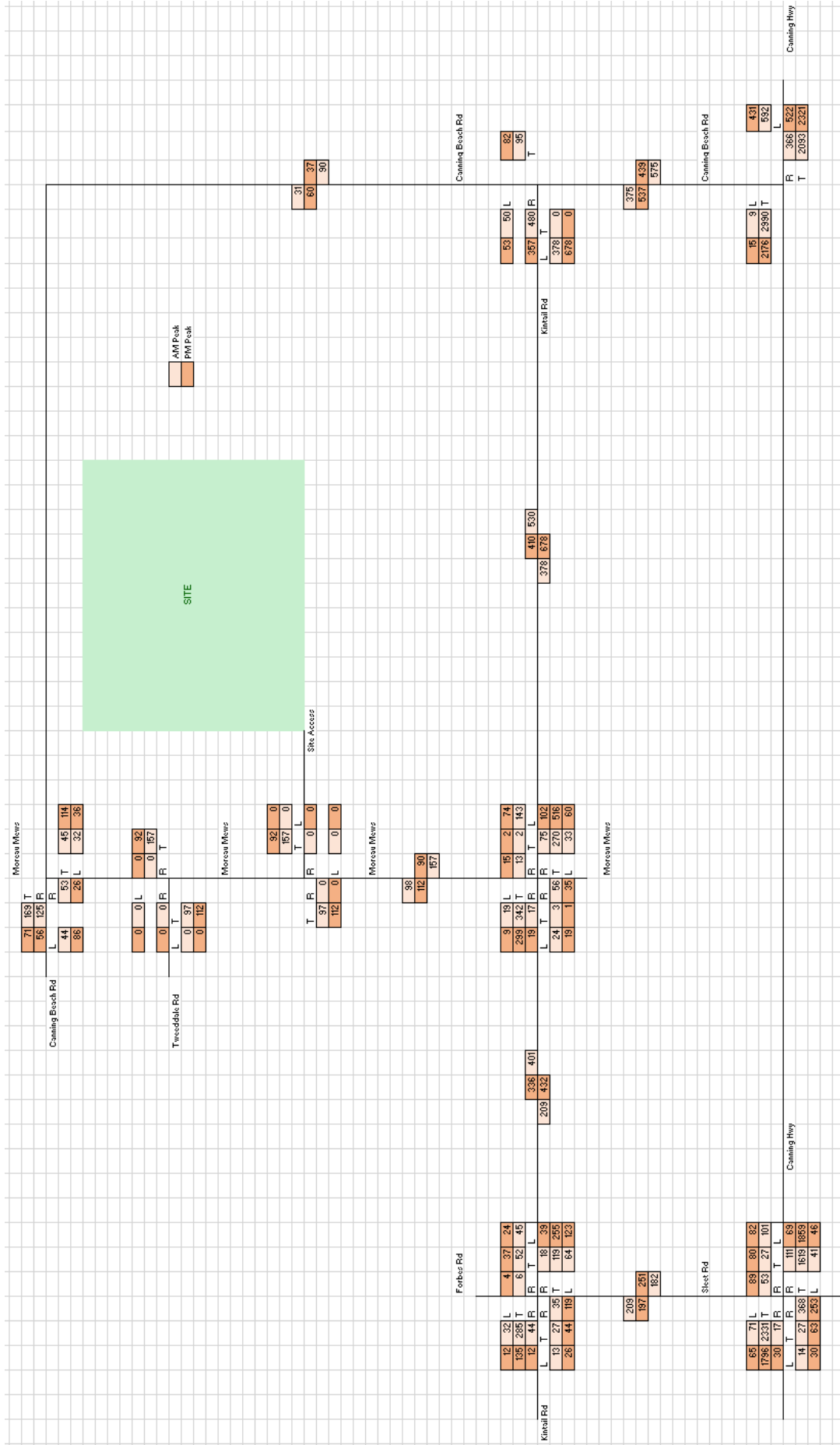


Figure 7-5 Scenario 2b – Opening Year with Development (2021) – Weekday AM and PM Peak

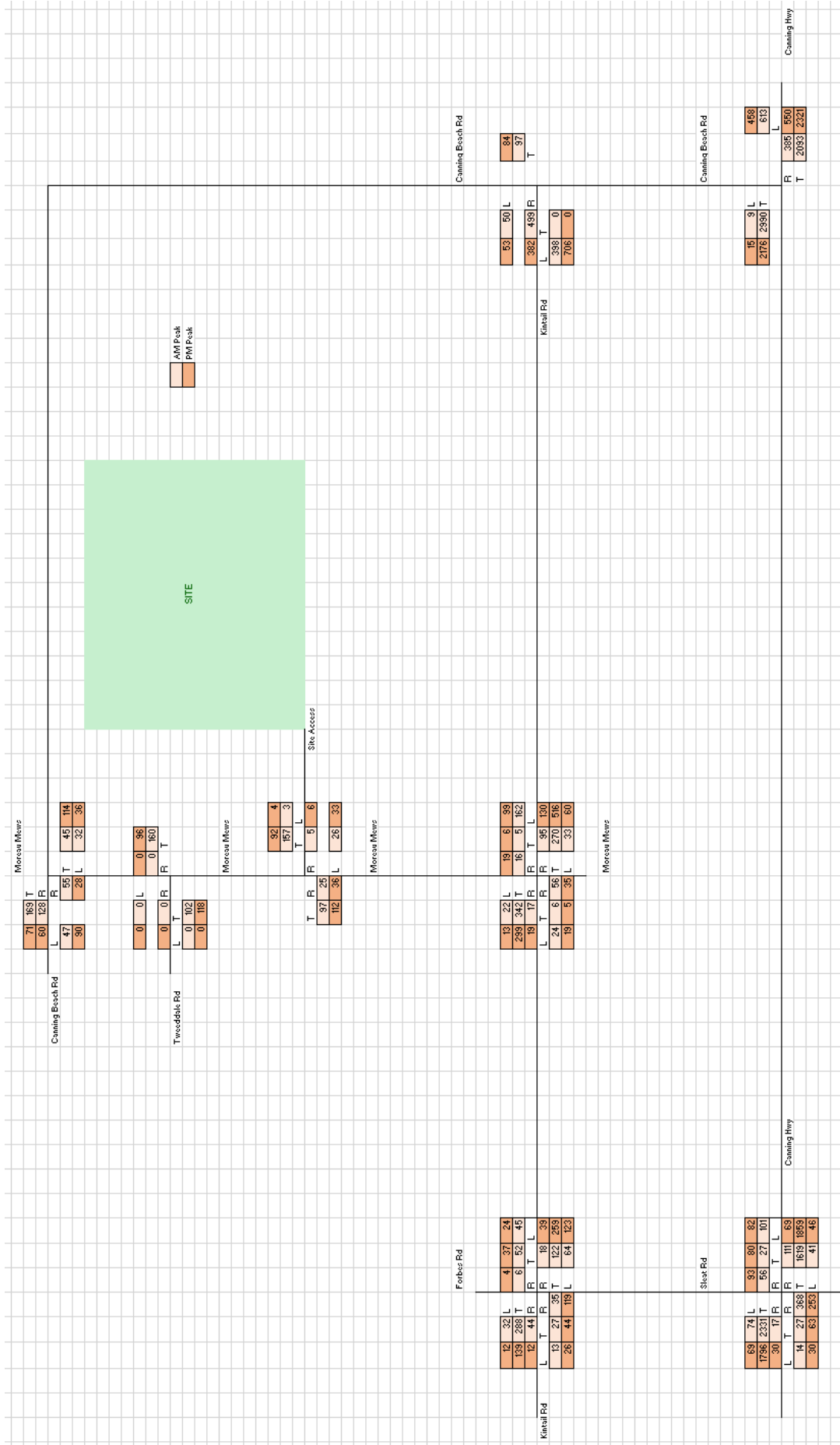


Figure 7-6 Scenario 3a – Future Background without Development (2031) – Weekday AM and PM Peak

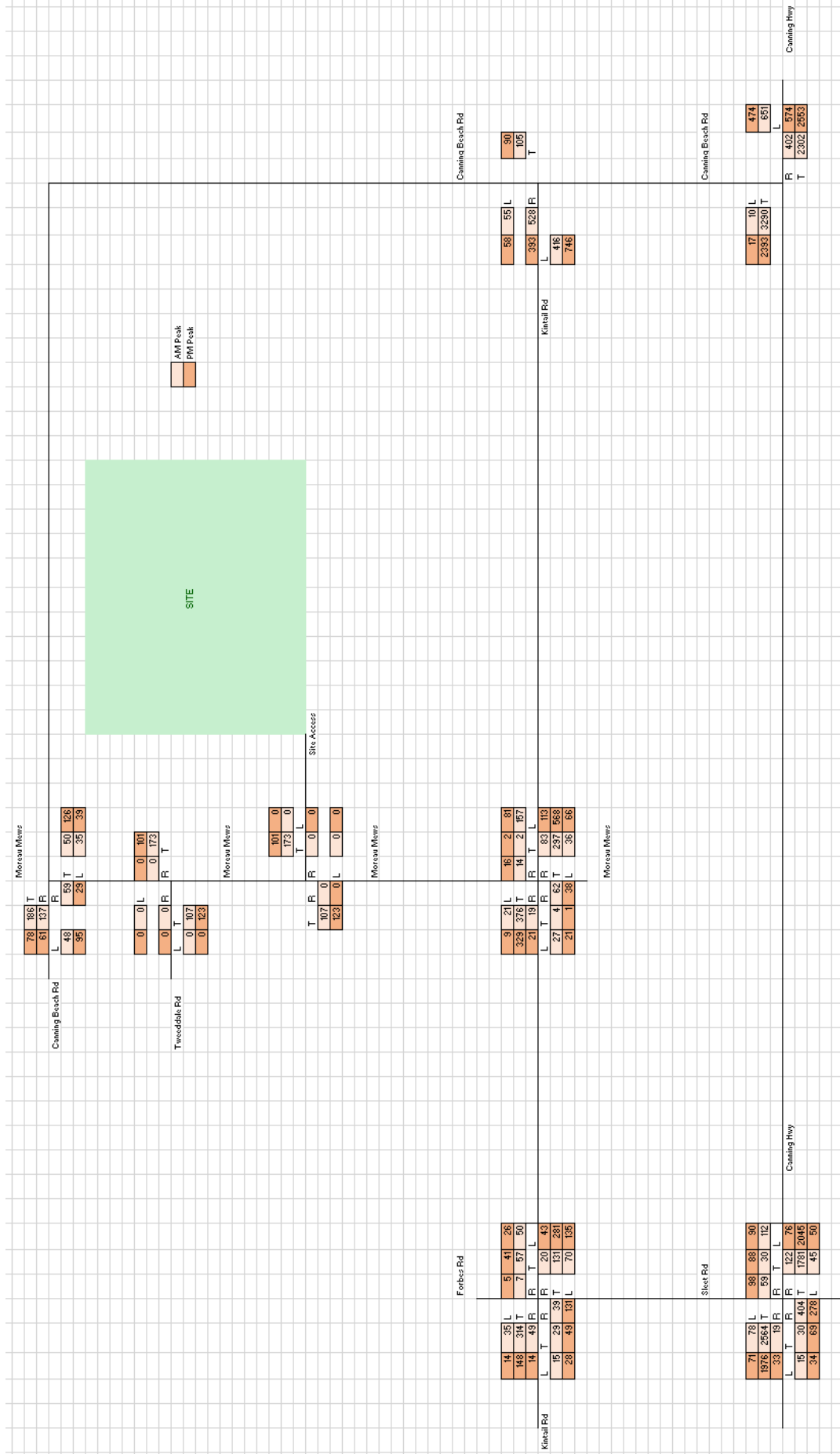
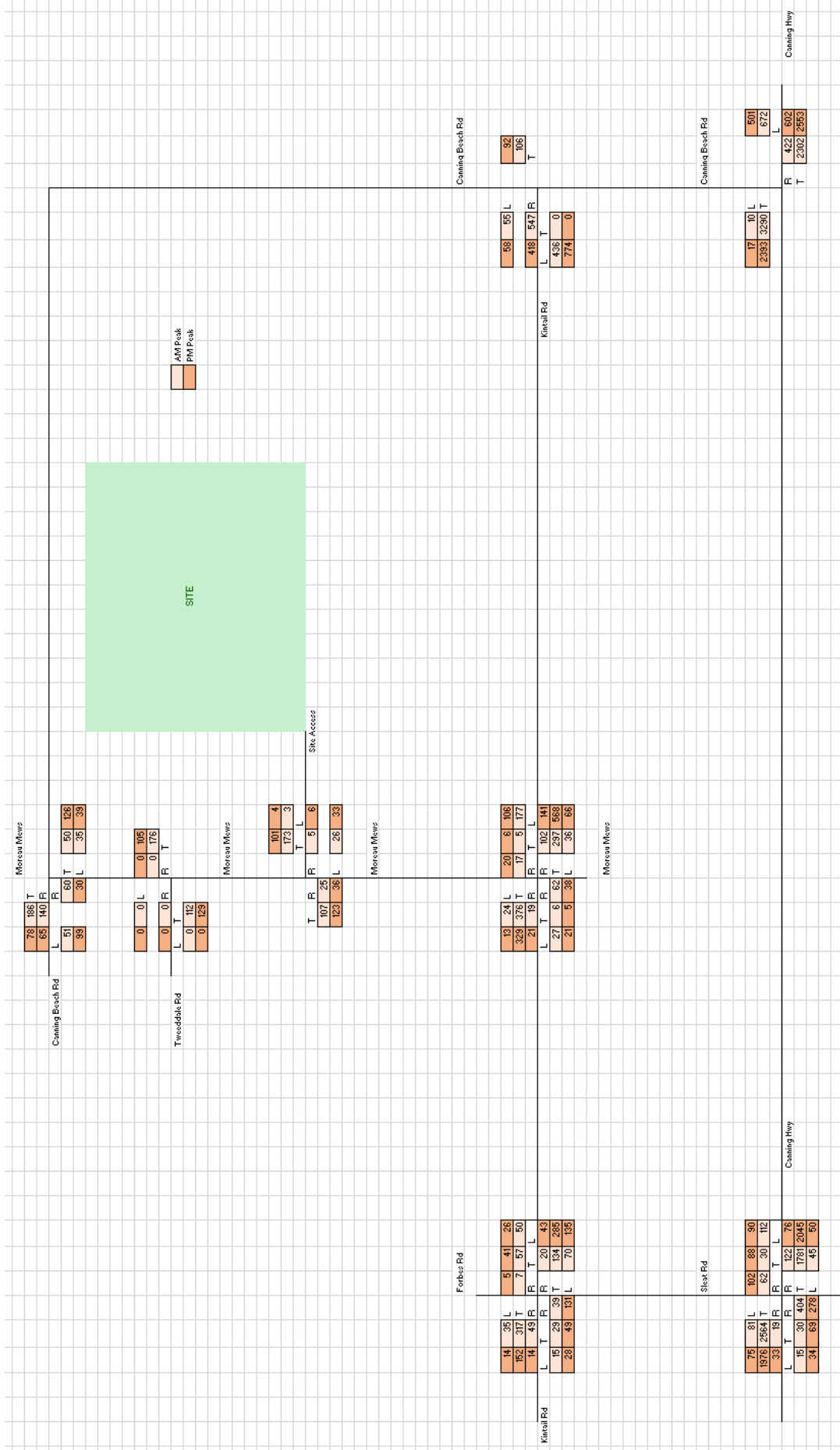


Figure 7-7 Scenario 3b – Future Background with Development (2031) – Weekday AM and PM Peak



## 7.6 Intersection Performance

The identified intersections and accesses have been analysed for the three scenarios using the SIDRA analysis program. This program calculates the performance of intersections based on input parameters, including geometry and traffic volumes. As an output SIDRA provides values for the Degree of Saturation (DOS), queue lengths, delays, level of service, and 95th Percentile Queue. These parameters are defined as follows:

- > **Degree of Saturation (DOS):** is the ratio of the arrival traffic flow to the capacity of the approach during the same period. The theoretical intersection capacity is exceeded for an un-signalized intersection where  $DOS > 0.80$ ;
- > **95% Queue:** is the statistical estimate of the queue length up to or below which 95% of all observed queues would be expected;
- > **Average Delay:** is the average of all travel time delays for vehicles through the intersection. An unsignalised intersection can be considered to be operating at capacity where the average delay exceeds 40 seconds for any movement;
- > **Level of Service (LOS):** is the qualitative measure describing operational conditions within a traffic stream and the perception by motorists and/or passengers. The different levels of service can generally be described as shown in **Table 7-4**.

Table 7-4 Level of Service (LoS) Performance Criteria

LOS	Description	Signalised Intersection	Unsignalised Intersection
A	Free-flow operations (best condition)	≤10 sec	≤10 sec
B	Reasonable free-flow operations	10-20 sec	10-15 sec
C	At or near free-flow operations	20-35 sec	15-25 sec
D	Decreasing free-flow levels	35-55 sec	25-35 sec
E	Operations at capacity	55-80 sec	35-50 sec
F	A breakdown in vehicular flow (worst condition)	≥80 sec	≥50 sec

A LOS exceeding these values indicates that the intersection is exceeding its practical capacity. Above these values, users of the intersections are likely to experience unsatisfactory queueing and delays during the peak hour periods. All SIDRA outputs referenced herein are included in **Appendix C**.

### 7.6.2 Scenario 1 – Background (2019)

#### 7.6.2.1 Canning Highway/Canning Beach Road/Kintail Road

The following presents the results of the analysis of the Canning Highway/Canning Beach Road/Kintail Road intersection for all scenarios. **Figure 7-8** is a SIDRA layout representation of the intersection. **Table 7-5** and **Table 7-6** shows the results of the analysis for Scenario 1.

Figure 7-8 SIDRA Layout for Canning Highway/Canning Beach Road/Kintail Road

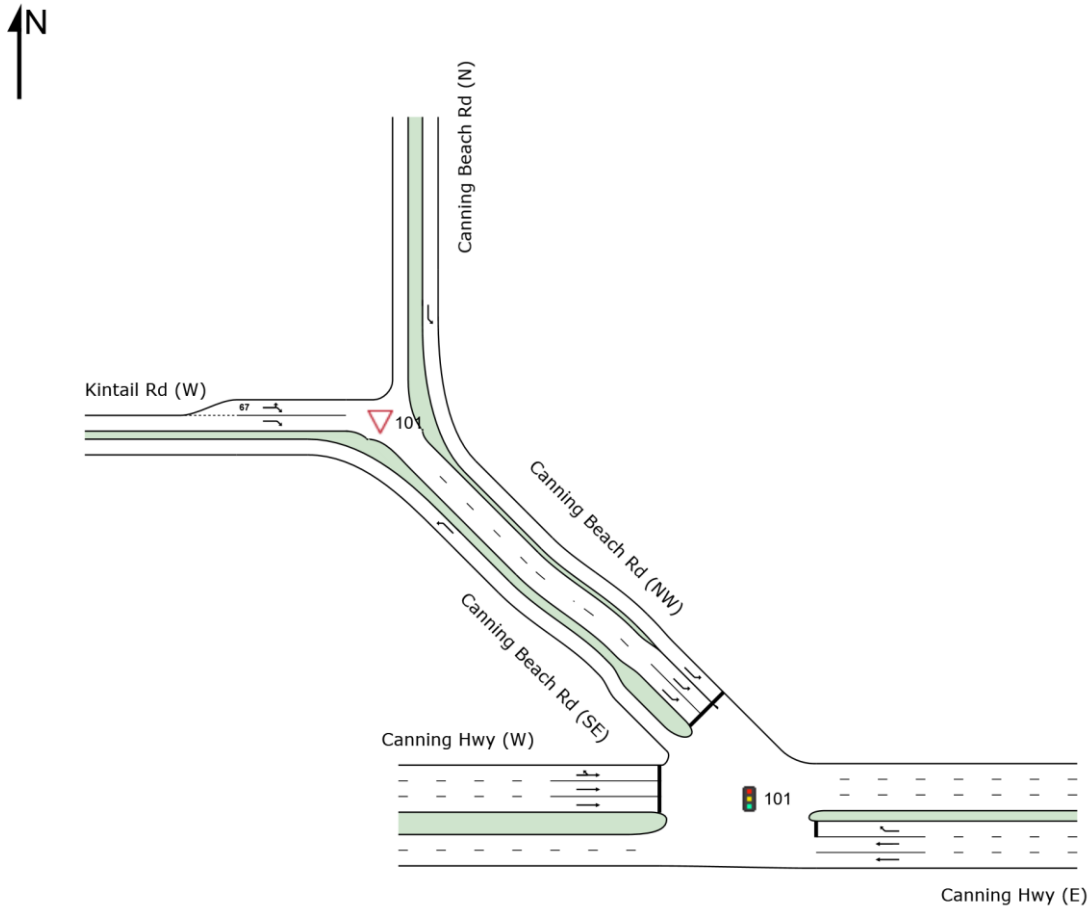


Table 7-5 Canning Highway/Canning Beach Road Intersection – Scenario 1

Intersection Approach	Scenario 1 – Background 2019 (AM)				Scenario 1 – Background 2019 (PM)				
	DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)	
Canning Hwy (E)	T	0.541	0.1	A	0	0.599	0.1	A	0
	R	0.848	82.2	F	232.6	0.985	106.8	F	231.1
Canning Beach Rd (NW)	L	0.489	66	E	32.6	0.271	48.8	D	20
Canning Hwy (W)	L	0.733	23.4	C	370.6	0.587	23.4	C	136.4
	T	0.733	16.9	B	371.2	0.587	16.9	B	137

Table 7-6 Canning Beach Road/Kintail Road Intersection – Scenario 1

Intersection Approach	Scenario 1 – Background 2019 (AM)				Scenario 1 – Background 2019 (PM)				
	DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)	
Canning Beach Rd (SE)	L	0.2	2.1	A	0	0.359	2.1	A	0
Canning Beach Rd (N)	L	0.05	4.7	A	74	0.043	4.7	A	18
Kintail Rd (W)	L	0.141	5.6	A	74	0.109	5.6	A	18
	R	0.141	4.6	A	74	0.109	4.6	A	18

Canning Highway/Canning Beach Road Phase Timing Summary AM

Phase	A	B
Phase Change Time (sec)	0	133
Green Time (sec)	127	41
Phase Time (sec)	133	47
Phase Split	74%	26%

Canning Highway/Canning Beach Road Phase Timing Summary PM

Phase	A	B
Phase Change Time (sec)	0	107
Green Time (sec)	101	44
Phase Time (sec)	107	50
Phase Split	68%	32%

7.6.2.2 Kintail Road/Moreau Mews

The following presents the results of the analysis of the Kintail Road/Moreau Mews intersection for all scenarios. **Figure 7-9** is a SIDRA layout representation of the intersection. **Table 7-7** shows the results of the analysis for Scenario 1.

Figure 7-9 SIDRA Layout for Kintail Road/Moreau Mews

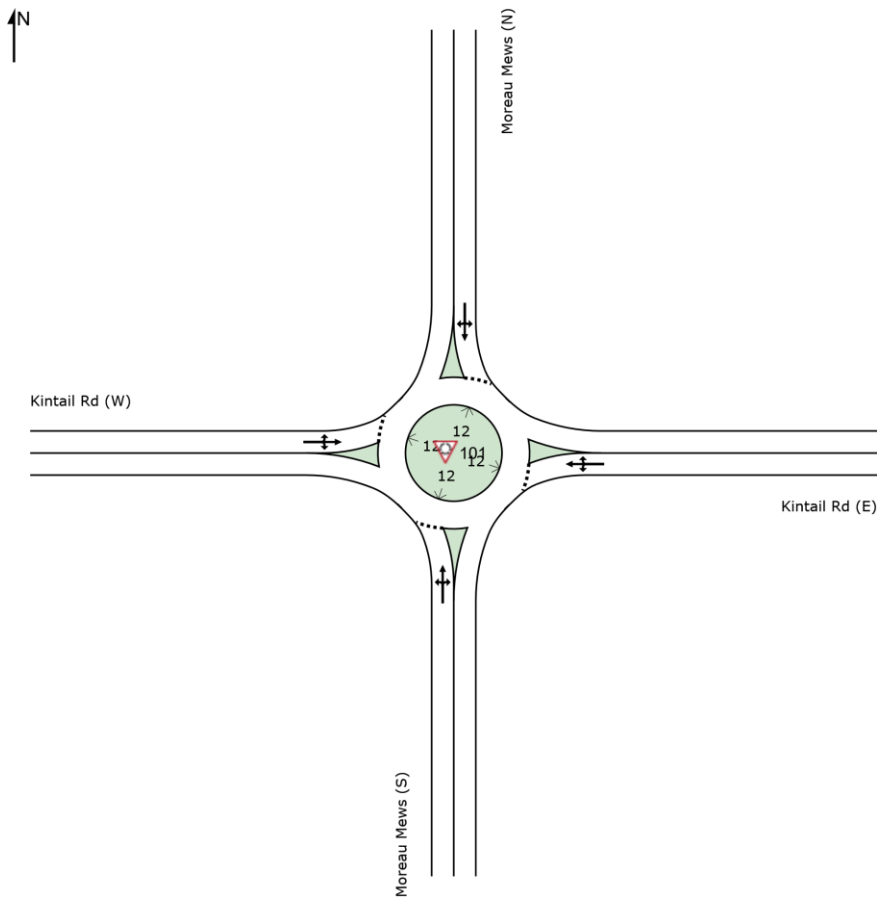


Table 7-7 Kintail Road/Moreau Mews Intersection – Scenario 1

Intersection Approach	Scenario 1 – Background 2019 (AM)				Scenario 1 – Background 2019 (PM)				
	DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)	
Moreau Mews (S)	L	0.088	6.6	A	3.2	0.073	8.5	A	2.9
	T	0.088	6.6	A	3.2	0.073	8.6	A	2.9
	R	0.088	10.2	B	3.2	0.073	12.1	B	2.9
Kintail Rd (E)	L	0.261	4.7	A	11.9	0.457	4.8	A	26.6
	T	0.261	4.7	A	11.9	0.457	4.8	A	26.6
	R	0.261	8.3	A	11.9	0.457	8.4	A	26.6
Moreau Mews (N)	L	0.178	7.2	A	7.3	0.098	6.6	A	3.7
	T	0.178	7.2	A	7.3	0.098	6.6	A	3.7
	R	0.178	10.7	B	7.3	0.098	10.1	B	3.7
Kintail Rd (W)	L	0.316	5.4	A	14.5	0.275	5.4	A	11.9
	T	0.316	5.4	A	14.5	0.275	5.4	A	11.9
	R	0.316	9	A	14.5	0.275	9	A	11.9

7.6.2.3 Canning Beach Road/Moreau Mews

The following presents the results of the analysis of the Canning Beach Road/Moreau Mews intersection for all scenarios. **Figure 7-10** is a SIDRA layout representation of the intersection. **Table 7-8** shows the results of the analysis for Scenario 1.

Figure 7-10 SIDRA Layout for Moreau Mews/Canning Beach Road

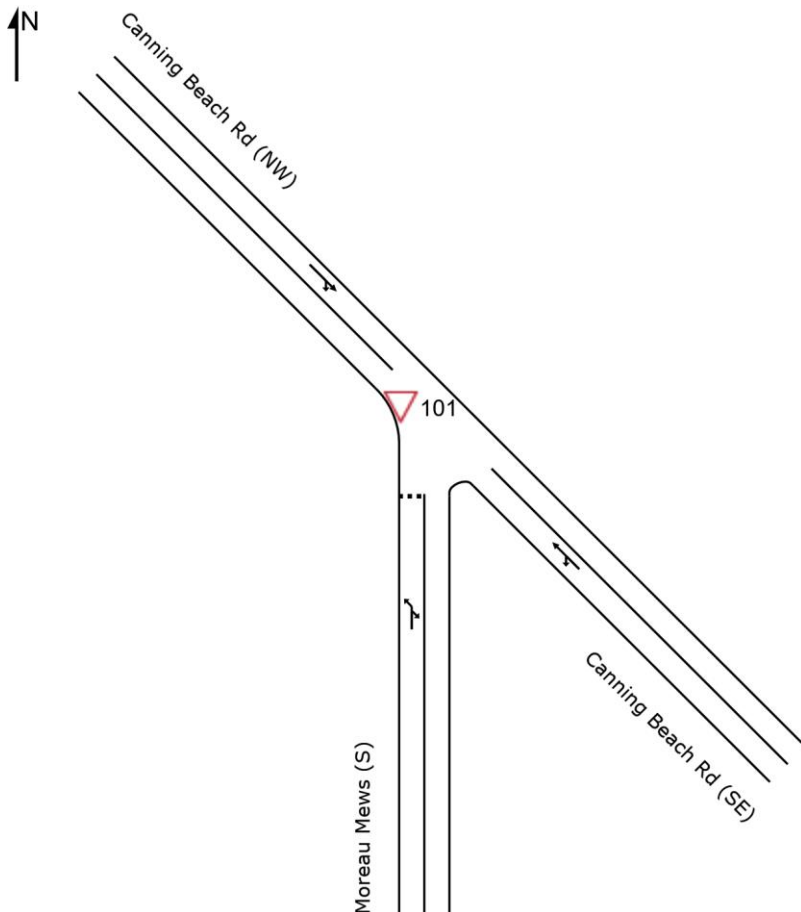


Table 7-8 Canning Beach Road/Moreau Mews Intersection – Scenario 1

Intersection Approach	Scenario 1 – Background 2019 (AM)				Scenario 1 – Background 2019 (PM)				
	DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)	
Moreau Mews (S)	L	0.087	5.5	A	2.3	0.084	5.8	A	2.4
	R	0.087	7.7	A	2.3	0.084	7.2	A	2.4
Canning Beach Rd (SE)	L	0.045	6.5	A	0	0.082	6.5	A	0
	T	0.045	0	A	0	0.082	0	A	0
Canning Beach Rd (NW)	T	0.163	0.2	A	5.2	0.073	0.3	A	2.2
	R	0.163	4.9	A	5.2	0.073	5.1	A	2.2

7.6.2.4 Canning Highway/ Sleat Road

The following presents the results of the analysis of the Canning Highway/ Sleat Road intersection for all scenarios. **Figure 7-11** is a SIDRA layout representation of the intersection. **Table 7-9** shows the results of the analysis for Scenario 1.

Figure 7-11 SIDRA Layout for Canning Highway/ Sleat Road

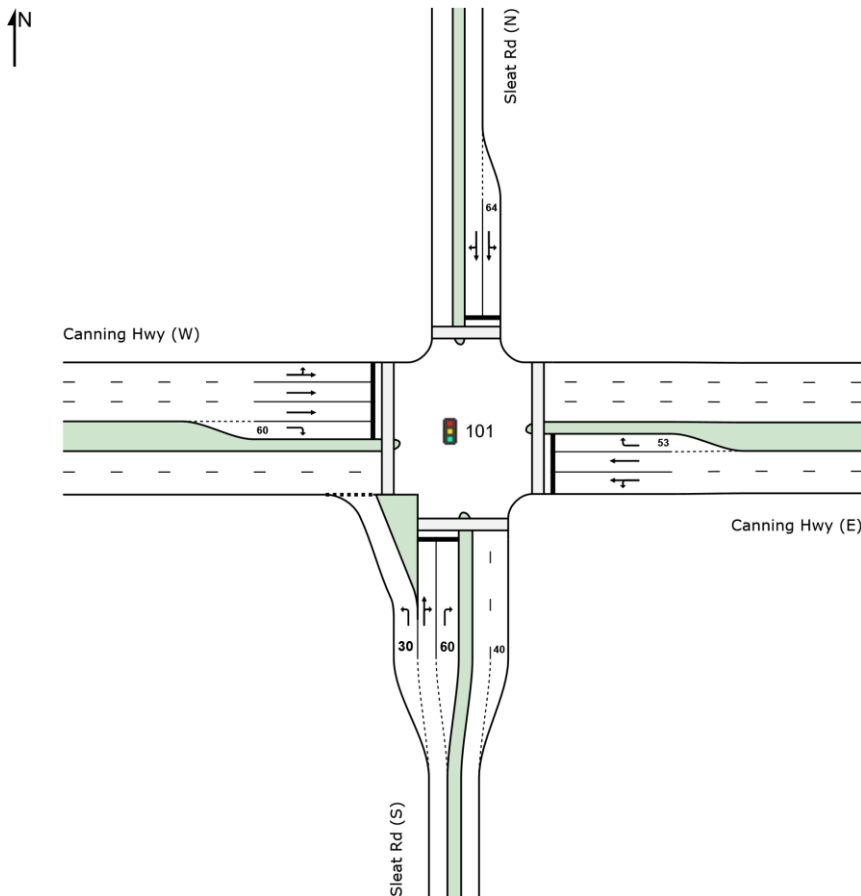


Table 7-9 Canning Highway/Sleat Road Intersection – Scenario 1

Intersection Approach	Scenario 1 – Background 2019 (AM)				Scenario 1 – Background 2019 (PM)				
	DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)	
Sleat Rd (S)	L	0.023	19.6	B	3.3	0.054	26.8	C	8.4
	T	0.992	144.7	F	162.9	0.753	77.8	E	82.7
	R	0.992	150	F	165.5	0.753	83.6	F	89.9
Canning Hwy (E)	L	0.771	35.4	D	410	0.883	39.2	D	481.2
	T	0.771	28.6	C	410	0.883	33.6	C	481.2
	R	0.791	100.3	F	73.2	0.555	86.8	F	38.9
Sleat Rd (N)	L	0.557	90.5	F	61.3	0.395	78	E	42.3
	T	0.432	83.6	F	47.6	0.806	80.8	F	97.4
	R	0.432	89.2	F	47.6	0.806	86.4	F	97.4
Canning Hwy (W)	L	0.715	33.7	C	350.6	0.573	28.8	C	218.2
	T	0.715	28	C	352.3	0.573	23.1	C	219.4
	R	0.117	90.3	F	9.8	0.24	84.3	F	16.3

Canning Highway/Sleat Road Phase Timing Summary AM

Phase	A	D	E	F
Phase Change Time (sec)	0	111	138	161
Green Time (sec)	105	21	18	14
Phase Time (sec)	111	26	23	20
Phase Split	62%	14%	13%	11%

Canning Highway/Sleat Road Phase Timing Summary PM

Phase	A	D	E	F
Phase Change Time (sec)	0	97	121	144
Green Time (sec)	91	18	18	11
Phase Time (sec)	97	23	23	17
Phase Split	61%	14%	14%	11%

7.6.2.5 Kintail Road/Forbes Road

The following presents the results of the analysis of the Kintail Road/Forbes Road intersection for all scenarios. **Figure 7-12** is a SIDRA layout representation of the intersection. **Table 7-10** shows the results of the analysis for Scenario 1.

Figure 7-12 SIDRA Layout for Kintail Road/Forbes Road

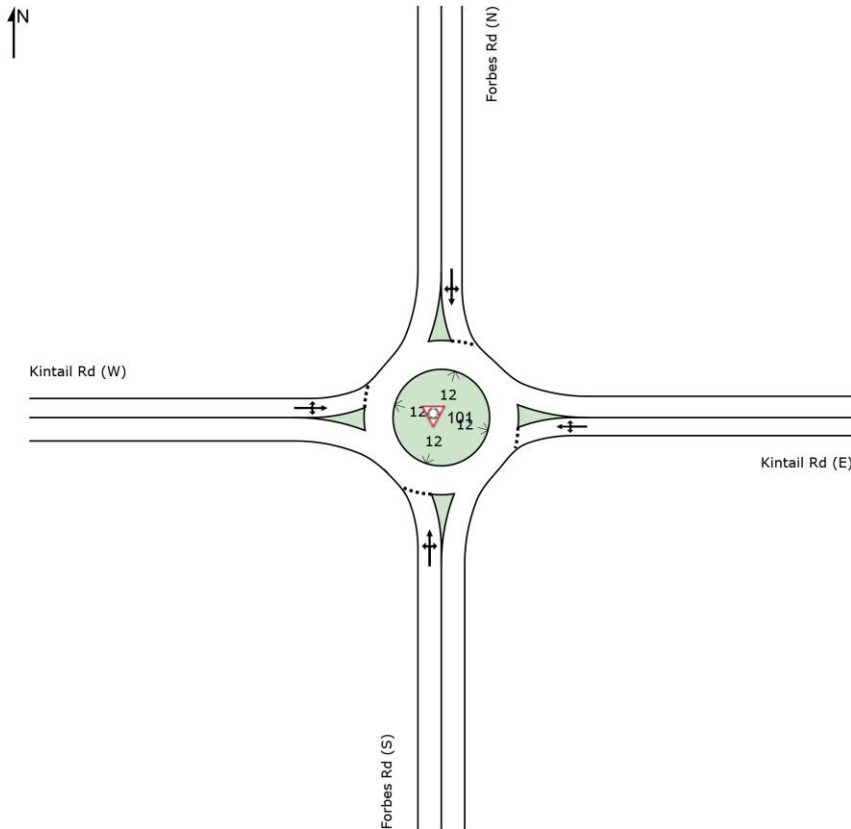


Table 7-10 Kintail Road/Forbes Road Intersection – Scenario 1

Intersection Approach	Scenario 1 – Background 2019 (AM)				Scenario 1 – Background 2019 (PM)				
	DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)	
Forbes Rd (S)	L	0.068	5.2	A	2.3	0.186	6.1	A	7
	T	0.068	5.2	A	2.3	0.186	6.1	A	7
	R	0.068	8.8	A	2.3	0.186	9.7	A	7
Kintail Rd (E)	L	0.167	5.2	A	7.5	0.296	4.8	A	15.8
	T	0.167	5.3	A	7.5	0.296	4.9	A	15.8
	R	0.167	8.8	A	7.5	0.296	8.5	A	15.8
Forbes Rd (N)	L	0.09	6.7	A	3.5	0.056	6	A	2
	T	0.09	6.8	A	3.5	0.056	6.1	A	2
	R	0.09	10.3	B	3.5	0.056	9.6	A	2
Kintail Rd (W)	L	0.283	5	A	13.9	0.154	5.8	A	6.6
	T	0.283	5.1	A	13.9	0.154	5.8	A	6.6
	R	0.283	8.6	A	13.9	0.154	9.4	A	6.6

### 7.6.3 Scenario 2a – Opening Year without Development (2021)

#### 7.6.3.1 Canning Highway/Canning Beach Road/Kintail Road

**Table 7-11** and **Table 7-12** shows the results of the analysis for Scenario 2a.

Table 7-11 Canning Highway/Canning Beach Road Intersection – Scenario 2a

Intersection Approach	Scenario 2a – Opening Year without Development 2021 (AM)				Scenario 2a – Opening Year without Development 2021 (PM)				
	DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)	
Canning Hwy (E)	T	0.557	0.1	A	0	0.618	0.1	A	0
	R	0.875	85.8	F	247.4	1.014	122.9	F	255.8
Canning Beach Rd (NW)	L	0.473	66.2	E	32.6	0.28	48.9	D	20
Canning Hwy (W)	L	0.754	24	C	394.3	0.605	23.7	C	143.1
	T	0.754	17.5	B	395	0.605	17.2	B	143.7

Table 7-12 Canning Beach Road/Kintail Road Intersection – Scenario 2a

Intersection Approach	Scenario 2a – Opening Year without Development 2021 (AM)				Scenario 2a – Opening Year without Development 2021 (PM)				
	DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)	
Canning Beach Rd (SE)	L	0.206	2.1	A	0	0.366	2.1	A	0
Canning Beach Rd (N)	L	0.052	4.7	A	77.3	0.045	4.7	A	18.4
Kintail Rd (W)	L	0.145	5.6	A	77.3	0.112	5.6	A	18.4
	R	0.145	4.6	A	77.3	0.112	4.6	A	18.4

#### Canning Highway/Canning Beach Road Phase Timing Summary AM

Phase	A	B
Phase Change Time (sec)	0	133
Green Time (sec)	127	41
Phase Time (sec)	133	47
Phase Split	74%	26%

#### Canning Highway/Canning Beach Road Phase Timing Summary PM

Phase	A	B
Phase Change Time (sec)	0	107
Green Time (sec)	101	44
Phase Time (sec)	107	50
Phase Split	68%	32%

7.6.3.2 *Kintail Road/Moreau Mews*

**Table 7-13** shows the results of the analysis for Scenario 2a.

Table 7-13 Kintail Road/Moreau Mews Intersection – Scenario 2a

Intersection Approach	Scenario 2a – Opening Year without Development 2021 (AM)				Scenario 2a – Opening Year without Development 2021 (PM)				
	DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)	
Moreau Mews (S)	L	0.092	6.7	A	3.4	0.078	8.7	A	3.1
	T	0.092	6.7	A	3.4	0.078	8.7	A	3.1
	R	0.092	10.2	B	3.4	0.078	12.3	B	3.1
Kintail Rd (E)	L	0.269	4.7	A	12.4	0.471	4.8	A	28
	T	0.269	4.7	A	12.4	0.471	4.8	A	28
	R	0.269	8.3	A	12.4	0.471	8.4	A	28
Moreau Mews (N)	L	0.186	7.3	A	7.7	0.102	6.6	A	3.9
	T	0.186	7.3	A	7.7	0.102	6.7	A	3.9
	R	0.186	10.9	B	7.7	0.102	10.2	B	3.9
Kintail Rd (W)	L	0.326	5.5	A	15.1	0.286	5.5	A	12.5
	T	0.326	5.5	A	15.1	0.286	5.5	A	12.5
	R	0.326	9	A	15.1	0.286	9	A	12.5

7.6.3.3 *Canning Beach Road/Moreau Mews*

**Table 7-14** shows the results of the analysis for Scenario 2a.

Table 7-14 Canning Beach Road/Moreau Mews Intersection – Scenario 2a

Intersection Approach	Scenario 2a – Opening Year without Development 2021 (AM)				Scenario 2a – Opening Year without Development 2021 (PM)				
	DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)	
Moreau Mews (S)	L	0.089	5.5	A	2.3	0.086	5.8	A	2.5
	R	0.089	7.8	A	2.3	0.086	7.2	A	2.5
Canning Beach Rd (SE)	L	0.044	6.5	A	0	0.084	6.5	A	0
	T	0.044	0	A	0	0.084	0	A	0
Canning Beach Rd (NW)	T	0.168	0.2	A	5.4	0.075	0.3	A	2.3
	R	0.168	4.9	A	5.4	0.075	5.1	A	2.3

7.6.3.4 Canning Highway/Sleat Road

**Table 7-15** shows the results of the analysis for Scenario 2a.

Table 7-15 Canning Highway/Sleat Road Intersection – Scenario 2a

Intersection Approach	Scenario 2a – Opening Year without Development 2021 (AM)				Scenario 2a – Opening Year without Development 2021 (PM)				
	DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)	
Sleat Rd (S)	L	0.023	20.8	C	3.5	0.054	29.5	C	8.9
	T	1.027	183.3	F	193.2	0.778	78.9	E	86.2
	R	1.027	188.7	F	195.7	0.778	84.6	F	93.9
Canning Hwy (E)	L	0.794	36.2	D	433.2	0.91	45.5	D	543.7
	T	0.794	29.2	C	433.2	0.91	40.2	D	543.7
	R	0.813	101.4	F	75.9	0.572	86.9	F	40.1
Sleat Rd (N)	L	0.568	90.7	F	62.7	0.41	78.2	E	44
	T	0.442	83.7	F	48.8	0.825	82.1	F	100.9
	R	0.442	89.3	F	48.8	0.825	87.7	F	100.9
Canning Hwy (W)	L	0.736	34.4	C	369.3	0.59	29.2	C	228.1
	T	0.736	28.6	C	371	0.59	23.4	C	229.3
	R	0.125	90.4	F	10.4	0.249	84.3	F	16.9

Canning Highway/Sleat Road Phase Timing Summary AM

Phase	A	D	E	F
Phase Change Time (sec)	0	111	138	161
Green Time (sec)	105	21	18	14
Phase Time (sec)	111	26	23	20
Phase Split	62%	14%	13%	11%

Canning Highway/Sleat Road Phase Timing Summary PM

Phase	A	D	E	F
Phase Change Time (sec)	0	97	121	144
Green Time (sec)	91	18	18	11
Phase Time (sec)	97	23	23	17
Phase Split	61%	14%	14%	11%

### 7.6.3.5 Kintail Road/Forbes Road

**Table 7-16** shows the results of the analysis for Scenario 2a.

Table 7-16 Kintail Road/Forbes Road Intersection – Scenario 2a

Intersection Approach	Scenario 2a – Opening Year without Development 2021 (AM)				Scenario 2a – Opening Year without Development 2021 (PM)				
	DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)	
Forbes Rd (S)	L	0.068	5.3	A	2.3	0.194	6.3	A	7.3
	T	0.068	5.2	A	2.3	0.194	6.3	A	7.3
	R	0.068	8.8	A	2.3	0.194	9.8	A	7.3
Kintail Rd (E)	L	0.175	5.2	A	8	0.314	4.9	A	17.1
	T	0.175	5.3	A	8	0.314	4.9	A	17.1
	R	0.175	8.9	A	8	0.314	8.5	A	17.1
Forbes Rd (N)	L	0.116	6.8	A	4.6	0.067	6.1	A	2.5
	T	0.116	6.8	A	4.6	0.067	6.1	A	2.5
	R	0.116	10.4	B	4.6	0.067	9.7	A	2.5
Kintail Rd (W)	L	0.289	5.1	A	14.2	0.158	5.9	A	6.8
	T	0.289	5.1	A	14.2	0.158	6	A	6.8
	R	0.289	8.7	A	14.2	0.158	9.5	A	6.8

### 7.6.4 Scenario 2b – Opening Year with Development (2021)

#### 7.6.4.1 Canning Highway/Canning Beach Road/Kintail Road

**Table 7-17** and **Table 7-18** shows the results of the analysis for Scenario 2b.

Table 7-17 Canning Highway/Canning Beach Road Intersection – Scenario 2b

Intersection Approach	Scenario 2b – Opening Year with Development 2021 (AM)				Scenario 2b – Opening Year with Development 2021 (PM)				
	DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)	
Canning Hwy (E)	T	0.557	0.1	A	0	0.618	0.1	A	0
	R	0.92	95.2	F	278.6	1.068	158.1	F	305.9
Canning Beach Rd (NW)	L	0.49	66.5	E	32.6	0.297	49.2	D	20
Canning Hwy (W)	L	0.754	24	C	394.3	0.605	23.7	C	143.1
	T	0.754	17.5	B	395	0.605	17.2	B	143.7

Table 7-18 Canning Beach Road/Kintail Road Intersection – Scenario 2b

Intersection Approach	Scenario 2b – Opening Year with Development 2021 (AM)				Scenario 2b – Opening Year with Development 2021 (PM)				
	DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)	
Canning Beach Rd (SE)	L	0.217	2.1	A	0	0.366	2.1	A	0
Canning Beach Rd (N)	L	0.053	4.7	A	81.7	0.046	4.7	A	21.1
Kintail Rd (W)	L	0.15	5.6	A	81.7	0.119	5.6	A	21.1
	R	0.15	4.6	A	81.7	0.119	4.6	A	21.1

Canning Highway/Canning Beach Road Phase Timing Summary AM

Phase	A	B
Phase Change Time (sec)	0	133
Green Time (sec)	127	41
Phase Time (sec)	133	47
Phase Split	74%	26%

Canning Highway/Canning Beach Road Phase Timing Summary PM

Phase	A	B
Phase Change Time (sec)	0	107
Green Time (sec)	101	44
Phase Time (sec)	107	50
Phase Split	68%	32%

7.6.4.2 Kintail Road/Moreau Mews

**Table 7-19** shows the results of the analysis for Scenario 2b.

Table 7-19 Kintail Road/Moreau Mews Intersection – Scenario 2b

Intersection Approach	Scenario 2b – Opening Year with Development 2021 (AM)				Scenario 2b – Opening Year with Development 2021 (PM)				
	DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)	
Moreau Mews (S)	L	0.097	6.8	A	3.6	0.086	9	A	3.5
	T	0.097	6.8	A	3.6	0.086	9.1	A	3.5
	R	0.097	10.4	B	3.6	0.086	12.6	B	3.5
Kintail Rd (E)	L	0.288	4.7	A	13.7	0.5	4.9	A	31.4
	T	0.288	4.8	A	13.7	0.5	4.9	A	31.4
	R	0.288	8.3	A	13.7	0.5	8.4	A	31.4
Moreau Mews (N)	L	0.217	7.3	A	9.1	0.139	6.7	A	5.6
	T	0.217	7.4	A	9.1	0.139	6.8	A	5.6
	R	0.217	10.9	B	9.1	0.139	10.3	B	5.6
Kintail Rd (W)	L	0.339	5.7	A	15.7	0.303	5.7	A	13.4
	T	0.339	5.7	A	15.7	0.303	5.7	A	13.4
	R	0.339	9.2	A	15.7	0.303	9.3	A	13.4

### 7.6.4.3 Canning Beach Road/Moreau Mews

**Table 7-20** shows the results of the analysis for Scenario 2b.

Table 7-20 Canning Beach Road/Moreau Mews Intersection – Scenario 2b

Intersection Approach	Scenario 2b – Opening Year with Development 2021 (AM)				Scenario 2b – Opening Year with Development 2021 (PM)				
	DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)	
Moreau Mews (S)	L	0.093	5.5	A	2.5	0.091	5.8	A	2.6
	R	0.093	7.8	A	2.5	0.091	7.2	A	2.6
Canning Beach Rd (SE)	L	0.044	6.5	A	0	0.084	6.5	A	0
	T	0.044	0	A	0	0.084	0	A	0
Canning Beach Rd (NW)	T	0.17	0.2	A	5.5	0.078	0.4	A	2.5
	R	0.17	4.9	A	5.5	0.078	5.1	A	2.5

### 7.6.4.4 Canning Highway/Sleat Road

**Table 7-21** shows the results of the analysis for Scenario 2b.

Table 7-21 Canning Highway/Sleat Road Intersection – Scenario 2b

Intersection Approach	Scenario 2b – Opening Year with Development 2021 (AM)				Scenario 2b – Opening Year with Development 2021 (PM)				
	DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)	
Sleat Rd (S)	L	0.023	20.8	C	3.5	0.054	29.5	C	8.9
	T	1.027	183.3	F	193.2	0.778	78.9	E	86.2
	R	1.027	188.7	F	195.7	0.778	84.6	F	93.9
Canning Hwy (E)	L	0.794	36.2	D	433.2	0.91	45.5	D	543.7
	T	0.794	29.2	C	433.2	0.91	40.2	D	543.7
	R	0.813	101.4	F	75.9	0.572	86.9	F	40.1
Sleat Rd (N)	L	0.568	90.7	F	62.7	0.41	78.2	E	44
	T	0.459	83.9	F	50.8	0.845	83.7	F	104.7
	R	0.459	89.5	F	50.8	0.845	89.3	F	104.7
Canning Hwy (W)	L	0.737	34.4	C	370	0.591	29.2	C	228.8
	T	0.737	28.6	C	371.8	0.591	23.4	C	230.1
	R	0.125	90.4	F	10.4	0.249	84.3	F	16.9

#### Canning Highway/Sleat Road Phase Timing Summary AM

Phase	A	D	E	F
Phase Change Time (sec)	0	111	138	161
Green Time (sec)	105	21	18	14
Phase Time (sec)	111	26	23	20
Phase Split	62%	14%	13%	11%

#### Canning Highway/Sleat Road Phase Timing Summary PM

Phase	A	D	E	F
Phase Change Time (sec)	0	97	121	144
Green Time (sec)	91	18	18	11
Phase Time (sec)	97	23	23	17
Phase Split	61%	14%	14%	11%

#### 7.6.4.5 Kintail Road/Forbes Road

**Table 7-22** shows the results of the analysis for Scenario 2b.

Table 7-22 Kintail Road/Forbes Road Intersection – Scenario 2b

Intersection Approach	Scenario 2b – Opening Year with Development 2021 (AM)				Scenario 2b – Opening Year with Development 2021 (PM)				
	DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)	
Forbes Rd (S)	L	0.069	5.3	A	2.3	0.195	6.3	A	7.4
	T	0.069	5.3	A	2.3	0.195	6.3	A	7.4
	R	0.069	8.8	A	2.3	0.195	9.8	A	7.4
Kintail Rd (E)	L	0.178	5.2	A	8.1	0.317	4.9	A	17.3
	T	0.178	5.3	A	8.1	0.317	4.9	A	17.3
	R	0.178	8.9	A	8.1	0.317	8.5	A	17.3
Forbes Rd (N)	L	0.117	6.8	A	4.6	0.067	6.1	A	2.5
	T	0.117	6.9	A	4.6	0.067	6.1	A	2.5
	R	0.117	10.4	B	4.6	0.067	9.7	A	2.5
Kintail Rd (W)	L	0.292	5.1	A	14.4	0.162	5.9	A	7
	T	0.292	5.1	A	14.4	0.162	6	A	7
	R	0.292	8.7	A	14.4	0.162	9.6	A	7

#### 7.6.4.6 Site Access/Moreau Mews

The following presents the results of the analysis of the Site Access/Moreau Mews intersection for all scenarios. **Figure 7-13** is a SIDRA layout representation of the intersection. **Table 7-23** shows the results of the analysis for Scenario 2b.

Figure 7-13 SIDRA Layout for Site Access/Moreau Mews

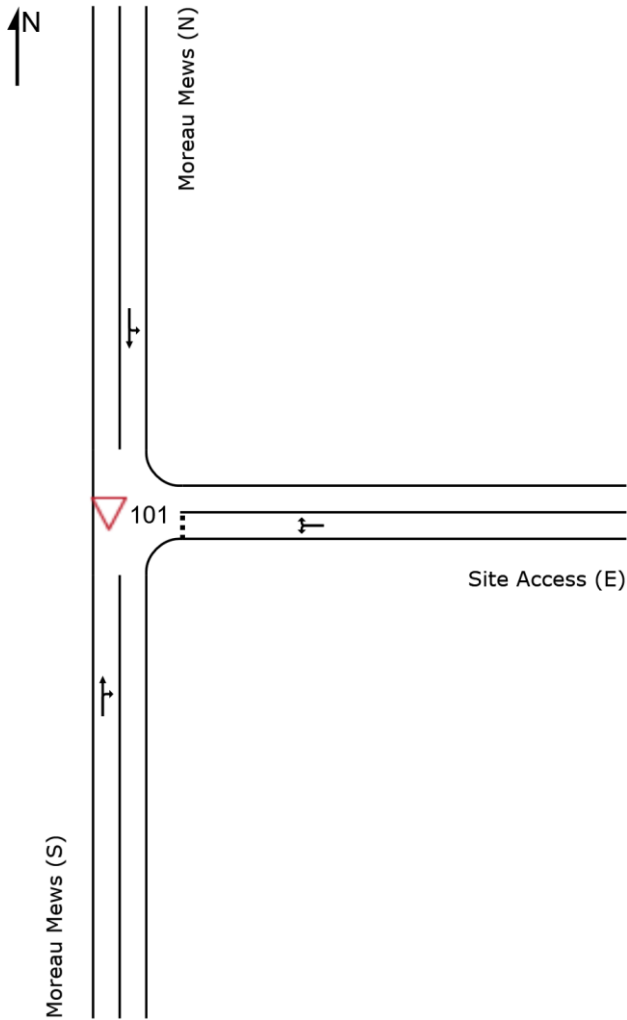


Table 7-23 Site Access/Moreau Mews Intersection – Scenario 2b

Intersection Approach	Scenario 2b – Opening Year with Development 2021 (AM)				Scenario 2b – Opening Year with Development 2021 (PM)				
	DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)	
Moreau Mews (S)	T	0.068	0.2	A	1.2	0.082	0.1	A	1.6
	R	0.068	6	A	1.2	0.082	5.7	A	1.6
Site Access (E)	L	0.023	6	A	0.6	0.028	5.8	A	0.7
	R	0.023	6.5	A	0.6	0.028	6.3	A	0.7
Moreau Mews (N)	L	0.085	5.5	A	0	0.051	5.5	A	0
	T	0.085	0	A	0	0.051	0	A	0

### 7.6.5 Scenario 3a – Future Background without Development (2031)

#### 7.6.5.1 Canning Highway/Canning Beach Road/Kintail Road

**Table 7-24** and **Table 7-25** shows the results of the analysis for Scenario 3a.

Table 7-24 Canning Highway/Canning Beach Road Intersection – Scenario 3a

Intersection Approach	Scenario 3a – Future Background without Development 2031 (AM)				Scenario 3a – Future Background without Development 2031 (PM)				
	DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)	
Canning Hwy (E)	T	0.613	0.1	A	0	0.679	0.2	A	0
	R	0.961	109.1	F	314.6	1.115	192.8	F	352.9
Canning Beach Rd (NW)	L	0.52	67.1	E	32.6	0.308	49.3	D	20
Canning Hwy (W)	L	0.83	26.3	C	490	0.665	24.9	C	168.2
	T	0.83	19.7	B	490.9	0.665	18.3	B	168.9

Table 7-25 Canning Beach Road/Kintail Road Intersection – Scenario 3a

Intersection Approach	Scenario 3a – Future Background without Development 2031 (AM)				Scenario 3a – Future Background without Development 2031 (PM)				
	DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)	
Canning Beach Rd (SE)	L	0.227	2.1	A	0	0.375	2.1	A	0
Canning Beach Rd (N)	L	0.057	4.7	A	89.8	0.049	4.7	A	22.7
Kintail Rd (W)	L	0.16	5.6	A	89.8	0.124	5.6	A	22.7
	R	0.16	4.6	A	89.8	0.124	4.6	A	22.7

#### Canning Highway/Canning Beach Road Phase Timing Summary AM

Phase	A	B
Phase Change Time (sec)	0	133
Green Time (sec)	127	41
Phase Time (sec)	133	47
Phase Split	74%	26%

#### Canning Highway/Canning Beach Road Phase Timing Summary PM

Phase	A	B
Phase Change Time (sec)	0	107
Green Time (sec)	101	44
Phase Time (sec)	107	50
Phase Split	68%	32%

7.6.5.2 *Kintail Road/Moreau Mews*

**Table 7-26** shows the results of the analysis for Scenario 3a.

Table 7-26 Kintail Road/Moreau Mews Intersection – Scenario 3a

Intersection Approach	Scenario 3a – Future Background without Development 2031 (AM)				Scenario 3a – Future Background without Development 2031 (PM)				
	DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)	
Moreau Mews (S)	L	0.106	6.9	A	4	0.09	9.4	A	3.7
	T	0.106	7	A	4	0.09	9.4	A	3.7
	R	0.106	10.5	B	4	0.09	13	B	3.7
Kintail Rd (E)	L	0.297	4.7	A	14.2	0.52	4.8	A	33.4
	T	0.297	4.7	A	14.2	0.52	4.9	A	33.4
	R	0.297	8.3	A	14.2	0.52	8.4	A	33.4
Moreau Mews (N)	L	0.213	7.6	A	9	0.115	6.9	A	4.5
	T	0.213	7.7	A	9	0.115	6.9	A	4.5
	R	0.213	11.2	B	9	0.115	10.5	B	4.5
Kintail Rd (W)	L	0.365	5.6	A	17.5	0.318	5.6	A	14.4
	T	0.365	5.6	A	17.5	0.318	5.6	A	14.4
	R	0.365	9.2	A	17.5	0.318	9.2	A	14.4

7.6.5.3 *Canning Beach Road/Moreau Mews*

**Table 7-27** shows the results of the analysis for Scenario 3a.

Table 7-27 Canning Beach Road/Moreau Mews Intersection – Scenario 3a

Intersection Approach	Scenario 3a – Future Background without Development 2031 (AM)				Scenario 3a – Future Background without Development 2031 (PM)				
	DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)	
Moreau Mews (S)	T	0.101	5.6	A	2.7	0.097	5.8	A	2.8
	R	0.101	8	A	2.7	0.097	7.4	A	2.8
Canning Beach Rd (SE)	L	0.049	6.5	A	0	0.092	6.5	A	0
	R	0.049	0	A	0	0.092	0	A	0
Canning Beach Rd (NW)	L	0.185	0.2	A	6	0.083	0.4	A	2.6
	T	0.185	4.9	A	6	0.083	5.2	A	2.6

7.6.5.4 Canning Highway/Sleat Road

**Table 7-28** shows the results of the analysis for Scenario 3a.

Table 7-28 Canning Highway/Sleat Road Intersection – Scenario 3a

Intersection Approach	Scenario 3a – Future Background without Development 2031 (AM)				Scenario 3a – Future Background without Development 2031 (PM)				
	DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)	
Sleat Rd (S)	L	0.026	26.9	C	4.4	0.065	42.9	D	12.5
	T	1.129	334.9	F	301.7	0.86	84.8	F	98.9
	R	1.129	340.3	F	305.9	0.86	90.4	F	109.2
Canning Hwy (E)	L	0.873	39.1	D	521.2	1	109.4	F	938.3
	T	0.873	31.9	C	521.2	1	105.8	F	938.3
	R	0.886	108	F	86.6	0.63	87.8	F	44.6
Sleat Rd (N)	L	0.63	91.4	F	70.1	0.45	78.6	E	48.6
	T	0.492	84.2	F	54.7	0.908	92.4	F	120.2
	R	0.492	89.9	F	54.7	0.908	98	F	120.2
Canning Hwy (W)	L	0.81	36.7	D	439.5	0.649	30.4	C	264.3
	T	0.81	30.9	C	441.5	0.649	24.6	C	265.8
	R	0.139	90.6	F	11.7	0.273	84.6	F	18.6

Canning Highway/Sleat Road Phase Timing Summary AM

Phase	A	D	E	F
Phase Change Time (sec)	0	111	138	161
Green Time (sec)	105	21	18	14
Phase Time (sec)	111	26	23	20
Phase Split	62%	14%	13%	11%

Canning Highway/Sleat Road Phase Timing Summary PM

Phase	A	D	E	F
Phase Change Time (sec)	0	97	121	144
Green Time (sec)	91	18	18	11
Phase Time (sec)	97	23	23	17
Phase Split	61%	14%	14%	11%

7.6.5.5 *Kintail Road/Forbes Road*

**Table 7-29** shows the results of the analysis for Scenario 3a.

Table 7-29 Kintail Road/Forbes Road Intersection – Scenario 3a

Intersection Approach	Scenario 3a – Future Background without Development 2031 (AM)				Scenario 3a – Future Background without Development 2031 (PM)				
	DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)	
Forbes Rd (S)	L	0.077	5.3	A	2.7	0.22	6.5	A	8.6
	T	0.077	5.3	A	2.7	0.22	6.5	A	8.6
	R	0.077	8.9	A	2.7	0.22	10.1	B	8.6
Kintail Rd (E)	L	0.195	5.3	A	9	0.349	4.9	A	19.9
	T	0.195	5.4	A	9	0.349	5	A	19.9
	R	0.195	9	A	9	0.349	8.6	A	19.9
Forbes Rd (N)	L	0.133	7.1	A	5.3	0.077	6.3	A	2.9
	T	0.133	7.2	A	5.3	0.077	6.3	A	2.9
	R	0.133	10.7	B	5.3	0.077	9.9	A	2.9
Kintail Rd (W)	L	0.322	5.2	A	16.4	0.18	6.1	A	7.9
	T	0.322	5.2	A	16.4	0.18	6.2	A	7.9
	R	0.322	8.8	A	16.4	0.18	9.7	A	7.9

**7.6.6 Scenario 3b – Future Background with Development (2031)**

7.6.6.1 *Canning Highway/Canning Beach Road/Kintail Road*

**Table 7-30** and **Table 7-31** shows the results of the analysis for Scenario 3b.

Table 7-30 Canning Highway/Canning Beach Road Intersection – Scenario 3b

Intersection Approach	Scenario 3b – Future Background with Development (AM)				Scenario 3b – Future Background with Development (PM)				
	DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)	
Canning Hwy (E)	T	0.613	0.1	A	0	0.679	0.2	A	0
	R	1.008	133.5	F	367.1	1.169	236	F	410.2
Canning Beach Rd (NW)	L	0.537	67.4	E	32.6	0.325	49.6	D	20
Canning Hwy (W)	L	0.83	26.3	C	490	0.665	24.9	C	168.2
	T	0.83	19.7	B	490.9	0.665	18.3	B	168.9

Table 7-31 Canning Beach Road/Kintail Road Intersection – Scenario 3b

Intersection Approach	Scenario 3b – Future Background with Development (AM)				Scenario 3b – Future Background with Development (PM)				
	DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)	
Canning Beach Rd (SE)	L	0.182	2.1	A	0	0.4	2.1	A	0
Canning Beach Rd (N)	L	0.058	4.7	A	94.3	0.05	4.7	A	23.6
Kintail Rd (W)	L	0.165	5.6	A	94.3	0.13	5.6	A	23.6
	R	0.165	4.6	A	94.3	0.13	4.6	A	23.6

Canning Highway/Canning Beach Road Phase Timing Summary AM

Phase	A	B
Phase Change Time (sec)	0	133
Green Time (sec)	127	41
Phase Time (sec)	133	47
Phase Split	74%	26%

Canning Highway/Canning Beach Road Phase Timing Summary PM

Phase	A	B
Phase Change Time (sec)	0	107
Green Time (sec)	101	44
Phase Time (sec)	107	50
Phase Split	68%	32%

7.6.6.2 Kintail Road/Moreau Mews

**Table 7-32** shows the results of the analysis for Scenario 3b.

Table 7-32 Kintail Road/Moreau Mews Intersection – Scenario 3b

Intersection Approach	Scenario 3b – Future Background with Development (AM)				Scenario 3b – Future Background with Development (PM)				
	DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)	
Moreau Mews (S)	L	0.111	7.1	A	4.2	0.101	9.8	A	4.2
	T	0.111	7.1	A	4.2	0.101	9.8	A	4.2
	R	0.111	10.7	B	4.2	0.101	13.3	B	4.2
Kintail Rd (E)	L	0.315	4.8	A	15.6	0.55	4.9	A	37.5
	T	0.315	4.8	A	15.6	0.55	4.9	A	37.5
	R	0.315	8.4	A	15.6	0.55	8.5	A	37.5
Moreau Mews (N)	L	0.246	7.7	A	10.7	0.154	7	A	6.2
	T	0.246	7.8	A	10.7	0.154	7	A	6.2
	R	0.246	11.3	B	10.7	0.154	10.6	B	6.2
Kintail Rd (W)	L	0.377	5.8	A	18.2	0.336	5.9	A	15.5
	T	0.377	5.8	A	18.2	0.336	5.9	A	15.5
	R	0.377	9.4	A	18.2	0.336	9.5	A	15.5

### 7.6.6.3 Canning Beach Road/Moreau Mews

**Table 7-33** shows the results of the analysis for Scenario 3b.

Table 7-33 Canning Beach Road/Moreau Mews Intersection – Scenario 3b

Intersection Approach	Scenario 3b – Future Background with Development (AM)				Scenario 3b – Future Background with Development (PM)				
	DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)	
Moreau Mews (S)	T	0.105	5.6	A	2.8	0.101	5.8	A	2.9
	R	0.105	8	A	2.8	0.101	7.4	A	2.9
Canning Beach Rd (SE)	L	0.049	6.5	A	0	0.092	6.5	A	0
	R	0.049	0	A	0	0.092	0	A	0
Canning Beach Rd (NW)	L	0.187	0.2	A	6.2	0.086	0.4	A	2.7
	T	0.187	4.9	A	6.2	0.086	5.2	A	2.7

### 7.6.6.4 Canning Highway/Sleat Road

**Table 7-34** shows the results of the analysis for Scenario 3b.

Table 7-34 Canning Highway/Sleat Road Intersection – Scenario 3b

Intersection Approach	Scenario 3b – Future Background with Development (AM)				Scenario 3b – Future Background with Development (PM)				
	DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)	
Sleat Rd (S)	L	0.026	27.4	C	4.4	0.065	42.9	D	12.5
	T	1.129	334.9	F	301.7	0.86	84.8	F	98.9
	R	1.129	340.3	F	305.9	0.86	90.4	F	109.2
Canning Hwy (E)	L	0.874	39.1	D	521.7	1	109.4	F	938.3
	T	0.874	32	C	521.7	1	105.8	F	938.3
	R	0.893	109.1	F	87.9	0.63	87.8	F	44.6
Sleat Rd (N)	L	0.63	91.4	F	70.1	0.45	78.6	E	48.6
	T	0.509	84.4	F	56.6	0.928	97.4	F	126.9
	R	0.509	90	F	56.6	0.928	103	F	126.9
Canning Hwy (W)	L	0.811	36.7	D	440.4	0.65	30.5	C	265.1
	T	0.811	31	C	442.5	0.65	24.6	C	266.6
	R	0.139	90.6	F	11.7	0.273	84.6	F	18.6

#### Canning Highway/Sleat Road Phase Timing Summary AM

Phase	A	D	E	F
Phase Change Time (sec)	0	111	138	161
Green Time (sec)	105	21	18	14
Phase Time (sec)	111	26	23	20
Phase Split	62%	14%	13%	11%

#### Canning Highway/Sleat Road Phase Timing Summary PM

Phase	A	D	E	F
Phase Change Time (sec)	0	97	121	144
Green Time (sec)	91	18	18	11
Phase Time (sec)	97	23	23	17
Phase Split	61%	14%	14%	11%

### 7.6.6.5 Kintail Road/Forbes Road

**Table 7-35** shows the results of the analysis for Scenario 3b.

Table 7-35 Kintail Road/Forbes Road Intersection – Scenario 3b

Intersection Approach	Scenario 3b – Future Background with Development (AM)				Scenario 3b – Future Background with Development (PM)				
	DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)	
Forbes Rd (S)	L	0.077	5.4	A	2.7	0.221	6.5	A	8.6
	T	0.077	5.3	A	2.7	0.221	6.5	A	8.6
	R	0.077	8.9	A	2.7	0.221	10.1	B	8.6
Kintail Rd (E)	L	0.198	5.3	A	9.2	0.352	4.9	A	20.2
	T	0.198	5.4	A	9.2	0.352	5	A	20.2
	R	0.198	9	A	9.2	0.352	8.6	A	20.2
Forbes Rd (N)	L	0.134	7.1	A	5.4	0.077	6.3	A	2.9
	T	0.134	7.2	A	5.4	0.077	6.3	A	2.9
	R	0.134	10.7	B	5.4	0.077	9.9	A	2.9
Kintail Rd (W)	L	0.324	5.2	A	16.5	0.184	6.1	A	8.1
	T	0.324	5.2	A	16.5	0.184	6.2	A	8.1
	R	0.324	8.8	A	16.5	0.184	9.7	A	8.1

### 7.6.6.6 Site Access/Moreau Mews

**Table 7-36** shows the results of the analysis for Scenario 3b.

Table 7-36 Site Access/Moreau Mews Intersection – Scenario 3b

Intersection Approach	Scenario 3b – Future Background with Development (AM)				Scenario 3b – Future Background with Development (PM)				
	DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)	
Moreau Mews (S)	T	0.074	0.2	A	1.2	0.088	0.1	A	1.6
	R	0.074	6	A	1.2	0.088	5.8	A	1.6
Site Access (E)	L	0.024	6.1	A	0.6	0.028	5.8	A	0.7
	R	0.024	6.6	A	0.6	0.028	6.4	A	0.7
Moreau Mews (N)	L	0.094	5.5	A	0	0.056	5.5	A	0
	T	0.094	0	A	0	0.056	0	A	0

### 7.6.7 SIDRA Analysis Summary

The results of the SIDRA analysis are summarised below;

- > The Canning Highway/Canning Beach Road and Kintail Road/Canning Beach Road intersections have been modelled as a network as the two intersections are immediately adjacent to each other.
- > The arrangement of the Canning Highway/Canning Beach Road/Kintail Road intersection is based on the Black Spot geometry as shown in **Figure 2-7**.
- > The Canning Highway/Canning Beach Road/Kintail Road intersection operates at capacity or beyond practical capacity for the 3 assessment scenarios. The main cause for this due to the high volumes of traffic that currently run along Canning Highway resulting in a high degree of delays and queues which is further intensified in the future as a result of background traffic growth. Modifications to the signal phasing and timing is likely to be required in the future to ensure the intersection operates without issues.

- > The Kintail Road/Moreau Mews intersection operated at an acceptable level of service for all scenarios.
- > The Canning Beach Road/Moreau Mews intersection operated at an acceptable level of service for all scenarios.
- > The Canning Highway/Sleat Road intersection operated beyond practical capacity for all scenarios. The main cause for this due to the high volumes of traffic that currently run along Canning Highway resulting in a high degree of delays and queues which is further intensified in the future as a result of background traffic growth. Regardless, this intersection will likely require upgrades in order for it to operate at an acceptable level of service.
- > The Kintail Road/Forbes Road intersection operated at an acceptable level of service for all scenarios.
- > The Site Access/Moreau Mews intersection operated at an acceptable level of service for all scenarios.
- > Comparing the results of Scenario 3a with Scenario 3b shows minimal change in delays, queues and level of service. Based on this, it can be concluded that the main traffic impacts to the surrounding network are the result of traffic growth as opposed to the traffic generated by the development.
- > The original MRWA phasing generally prioritises traffic throughput of major roads (i.e. Canning Highway), therefore, the signal timing generally favours more green time for major arterial roads. Movements out of minor roads will continue to deteriorate as traffic volumes along Canning Highway continues to grow and require more green time at signalised intersections.
- > Over time, the increase in background traffic volumes and changing traffic conditions is likely to decrease intersection performance which is likely to prompt the local government (City of Melville) to engage with Main Roads with regards to further assessments and signal phase optimisation.

## 8 Site-Specific Issues

### 8.1 Crash Data

A review of the Main Roads WA Crash Database was undertaken for a 5-year period between 1<sup>st</sup> January 2016 and 31<sup>st</sup> December 2020 for the following road sections/intersections:

- > Canning Beach Road (between Canning Highway and Moreau Mews)
- > Kintail Road/Canning Beach Road intersection
- > Moreau Mews (between Canning Beach Road and Kintail Road)
- > Canning Beach Road/Canning Highway intersection

The Canning Beach Road/Moreau Mews intersection did not have any recorded crashes in the last 5 years.

The results are summarised in **Table 8-1** through to **Table 8-4**.

Table 8-1 Canning Beach Road Midblock Crashes Between Canning Highway and Moreau Mews

Type of Crash	Fatal	Hospital	Medical	Major Property Damage	Minor Property Damage	Total Crashes
Rear End	-	-	-	1	1	2
Right Turn Thru	-	-	-	1	2	3
Right Angle	-	-	2	2	-	4
Sideswipe Same Direction	-	1	1	-	-	2
Other	-	-	-	-	2	2
<b>Total</b>	<b>0</b>	<b>1</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>13</b>

Table 8-2 Kintail Road/Canning Beach Road Intersection

Type of Crash	Fatal	Hospital	Medical	Major Property Damage	Minor Property Damage	Total Crashes
Right Angle	0	1	7	18	4	30
<b>Total</b>	<b>0</b>	<b>1</b>	<b>7</b>	<b>18</b>	<b>4</b>	<b>30</b>

Table 8-3 Moreau Mews Midblock Crashes Between Canning Beach Road and Kintail Road

Type of Crash	Fatal	Hospital	Medical	Major Property Damage	Minor Property Damage	Total Crashes
Rear End	-	-	-	1	-	1
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>

Table 8-4 Canning Beach Road/Canning Highway Intersection

Type of Crash	Fatal	Hospital	Medical	Major Property Damage	Minor Property Damage	Total Crashes
Rear End	-	-	5	19	15	39
Sideswipe Same Direction	-	-	-	2	-	2
Hit Object	-	-	-	1	-	1
<b>Total</b>	<b>0</b>	<b>0</b>	<b>5</b>	<b>22</b>	<b>15</b>	<b>42</b>

A summary of the crash data is provided below:

- > The Kintail Road/Canning Beach Road and Canning Beach Road/Canning Highway intersections have a significant volume of recorded crashes. It is noted that both these intersections have been nominated for the State Black Spot Program with scheduled upgrades with the upgrades to Kintail Road/Canning Beach Road completed in 2020. As these upgrades have only recently been completed, the crashes at this intersection are mostly associated with the old layout.
- > All other intersections and road midblock sections have a relatively low crash rate and does not imply any safety issues.

## 8.2 Other Site-Specific Issues

### 8.2.1 Canning Bridge Activity Centre Plan (CBACP) Bonus Provisions

Section 21.4.3 of the CBACP states that for bonus provisions *“a traffic statement is submitted showing that the additional floorspace allowed will not unduly impact on the surrounding centre”*.

The traffic volumes generated by this development are considered to be low and the SIDRA results show the traffic impacts of the development will have a relatively low impact on the surrounding roads and intersections.

The architectural report demonstrates the proposed 15 level development has the same GFA as a "compliant" 10 level development. As there is no additional floorspace generated by the increase from 10 to 15 levels, the additional height will have no impact on the surrounding centre.

## 9 Conclusion

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This Transport Impact Assessment outlines the transport aspects of the proposed development focusing on traffic operations, loading vehicle operations, access and car parking. Provided also are walking, cycling, and public transport considerations.

This statement has been prepared in accordance with the WAPC *Transport Assessment Guidelines for Developments: Volume 4 – Individual Developments (2016)*.

The following conclusions are regarding the proposed development:

- > The Site comprises of 224 residential apartments and ground floor commercial and community use.
- > The Site has excellent access to public transport with a number of high frequency bus routes located within the vicinity of the Site. Additionally, the Canning Bridge Train Station is also located in relatively close proximity.
- > Walking and cycling infrastructure within the surrounding area of the Site is excellent with a high quality shared path running along the riverside including a connecting route to the Kwinana Freeway PSP.
- > The proposed development has been calculated to have a trip generation of approximately 58 vehicles in the AM peak hour and 86 vehicles in the PM peak hour. As the primary target demographic comprises of mature professionals and retirees, peak hour commuter trips are likely low, resulting in actual peak hour trips to be even less.
- > The swept path assessment shows that a waste truck will be able to enter and exit the Site in a forward gear without issue.
- > The SIDRA assessment shows that the traffic generated by the Site will have a relatively low impact on the surrounding intersections and road network.
- > The car, bicycle and motorcycle parking provision is compliant with the *Canning Bridge Activity Centre Plan* requirements.
- > Overall, it is unlikely that the Site will detrimentally affect traffic safety or flow on the surrounding road network. The main traffic impacts affecting the surrounding road network will be background traffic growth which will affect the operation of some intersections.
- > The current and anticipated traffic volumes for the frontage roads are consistent with the current various road classes.

# APPENDIX

# A

WAPC TRANSPORT ASSESSMENT CHECKLIST  
FOR DEVELOPMENT

**WAPC Checklist for a Transport Assessment, Individual Development, August 2016**

Item	Provided	Comments / Proposals
<b>Summary</b>		
<b>Introduction/Background</b>		
name of applicant and consultant	Section 1	
development location and context	Section 2	
brief description of development proposal	Section 5	
key issues	N/A	
background information	Section 2	
<b>Existing situation</b>		
existing site uses (if any)	Section 2	
existing parking and demand (if appropriate)	N/A	
existing access arrangements	Section 2	
existing site traffic	Section 2	
surrounding land uses	Section 2	
surrounding road network	Section 2	
traffic management on frontage roads	Section 2	
traffic flows on surrounding roads (usually am and pm peak hours)	Section 2	
traffic flows at major intersections (usually am and pm peak hours)	Section 2	
operation of surrounding intersections	Section 2	
existing pedestrian/cycle networks	Section 4	
existing public transport services surrounding the development	Section 3	
crash data	Section 8	
<b>Development proposal</b>		
regional context	Section 5	
proposed land uses	Section 5	
table of land uses and quantities	Section 5	
access arrangements	Section 5	
parking provision	Section 5	
end of trip facilities	Section 5	
any specific issues	Section 8	
road network	Section 5	
intersection layouts and controls	Section 5	

Item	Provided	Comments / Proposals
pedestrian/cycle networks and crossing facilities	Section 5	
public transport services	Section 3	
<b>Integration with surrounding area</b>		
surrounding major attractors/generators	Section 2	
committed developments and transport proposals	Section 2	
proposed changes to land uses within 1200 metres	Section 2	
travel desire lines from development to these attractors/generators	Section 5	
adequacy of existing transport networks	N/A	
deficiencies in existing transport networks	N/A	
remedial measures to address deficiencies	N/A	
<b>Analysis of transport networks</b>		
assessment years	Section 7	
time periods	Section 7	
development generated traffic	Section 7	
distribution of generated traffic	Section 7	
parking supply & demand	Section 7	
base and "with development" traffic flows	Section 7	
analysis of development accesses	Section 7	
impact on surrounding roads	Section 7	
impact on intersections	Section 7	
impact on neighbouring areas	Section 7	
road safety	Section 8	
public transport access	Section 3	
pedestrian access / amenity	Section 4	
cycle access / amenity	Section 4	
analysis of pedestrian / cycle networks	Section 3 & 4	
safe walk/cycle to school (for residential and school site developments only)	N/A	
Traffic management plan (where appropriate)	N/A	

APPENDIX

# B

PROPOSED DEVELOPMENT LAYOUT PLANS

APPENDIX

# C

SWEPT PATHS

APPENDIX

# D

SIDRA RESULTS

## About Cardno

Cardno is a professional infrastructure and environmental services company, with expertise in the development and improvement of physical and social infrastructure for communities around the world. Cardno's team includes leading professionals who plan, design, manage and deliver sustainable projects and community programs. Cardno is an international company listed on the Australian Securities Exchange [ASX:CDD].

## Contact

11 Harvest Terrace  
West Perth 6005  
Australia

Phone +61 8 9273 3888  
Fax +61 8 9486 8664

Web Address  
[www.cardno.com](http://www.cardno.com)

