



Lonnegal Property (Cedar Woods Properties)

Eglinton Neighbourhood Centre

Transport Impact Assessment

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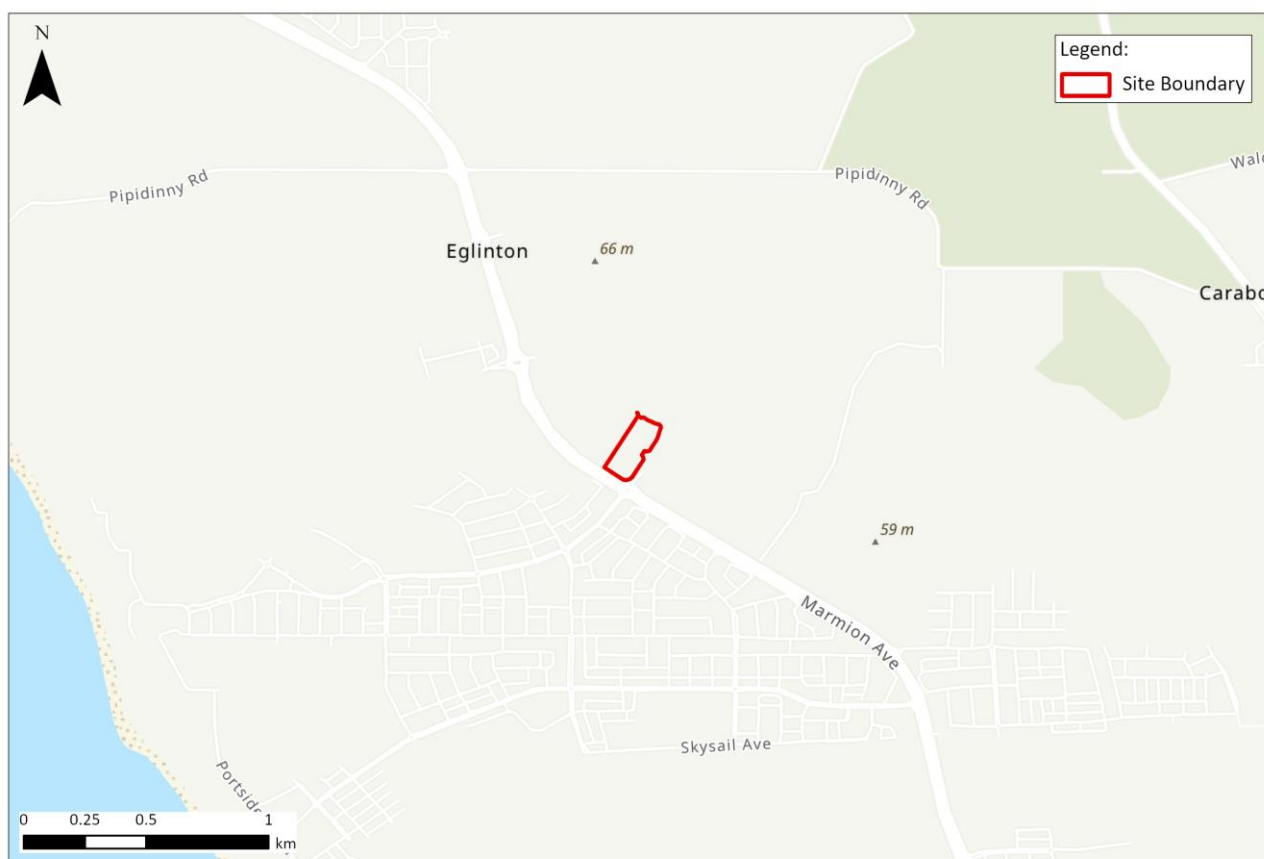
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I Introduction

1.1.1 This Transport Impact Assessment (TIA) has been prepared by PJA on behalf of Lonnegal Property (Cedar Woods Properties) in relation to a proposed commercial development, part classified for a Neighbourhood Centre within the *Eglinton Local Structure No. 82 (ASP 82) Plan Area*¹.

Figure 1-1: Site Location Plan



Service Credits: Esri, HERE, Garmin, Foursquare, METI/NASA, USGS

1.1.2 This submission is for a *Local Development Plan (LDP)* over the subject site and it includes an increase in floorspace from the 2,051sqm set out in Clause 5.3 of the ASP 82, to provide the following:

- Retail space, assumed to comprise:
 - Speciality retail and food / beverage tenancies totalling 1,400sqm gross floor area (GFA)
 - ‘Supermarket’, totalling 2,400sqm trading floorspace with further back of house space
- Two future development sites, assumed to be retail tenancies for the purposes of this TIA. These comprise a land area of circa 200sqm and a land area of circa 2,600sqm. It is assumed that the

¹ https://www.wanneroo.wa.gov.au/downloads/download/121/eglinton_-_asp_82



corresponding gross floor area would be 50% of the larger site area and 100% of the smaller site area, i.e. a total of 1,500sqm.

1.1.3 The site was previously part of a subdivision application, in relation to which a Transport Technical Note was prepared by GTA Consultants for the same site area, dated 3rd July 2018. The Technical Note was prepared based on 1,000 dwellings, a school with 400 students, a 2,500sqm GLA local centre and a service station with six refuelling positions.

1.1.4 The previous subdivision application proposed a 1 hectare commercial site whereas the current LDP application will propose a 2 hectare site and replaces some previously proposed medium density residential development adjacent the supermarket.

1.2 Purpose of this report

1.2.1 The *Western Australia Planning Commission Transport Assessment Guidelines* (WAPC Guidelines) sets out what level of movement network assessment is necessary, based on the expected traffic impact of a proposed development. This specifies that where a development is forecast to generate more than 100 trips per hour in the peaks, a Transport Impact Assessment is required, whilst where this is not the case a Transport Impact Statement (TIS) would suffice. A TIA has a greater focus on the external traffic impact resulting from the development.

1.2.2 Based on the proposed scale of development, the impact is expected to be 'high' and a TIA would be required.

1.3 Transport Assessment Objectives

1.3.1 In line with the WAPC Guidelines, this TIA seeks to demonstrate that the proposed development would:

- *“provide safe and efficient access for all modes;*
- *be well integrated with the surrounding land uses;*
- *not adversely impact the surrounding land uses; and*
- *not adversely impact the surrounding transport networks or the users of those networks.”*

1.3.2 This TIA considers all transport modes, including public transport, walking and cycling, as well as private motor vehicles and freight.

1.4 Layout of this Report

1.4.1 The remaining chapter of this TIA cover the following:

- **Chapter 2** sets out the existing situation



- **Chapter 3** provides details of the development proposal
- **Chapter 4** sets out changes to the surrounding transport networks
- **Chapter 5** seeks to demonstrate the integration with the surrounding area
- **Chapter 6** provides an analysis of transport networks
- **Chapter 7** concludes the TIA.



2 Existing Situation

2.1 Existing (2023) Land Uses

2.1.1 The site is currently vacant and does not generate any traffic at present.

2.1.2 To the southwest the site is bounded by Marmion Avenue. Continuing residential development is located to the west of this arterial road, which will be a main attractor and generator of movement to from this Neighbourhood Centre.

2.1.3 The area surrounding the site to the northeast of Marmion Avenue is currently vacant land. The ASP 82 indicates future plans for the area. This proposes the area northwest of the subject site (denoted as '3' in Figure 2-1) to be a strategic open space, with residential development (R25-R60) to the east and north.

Figure 2-1: Eglinton Local Structure No. 82 Plan Area



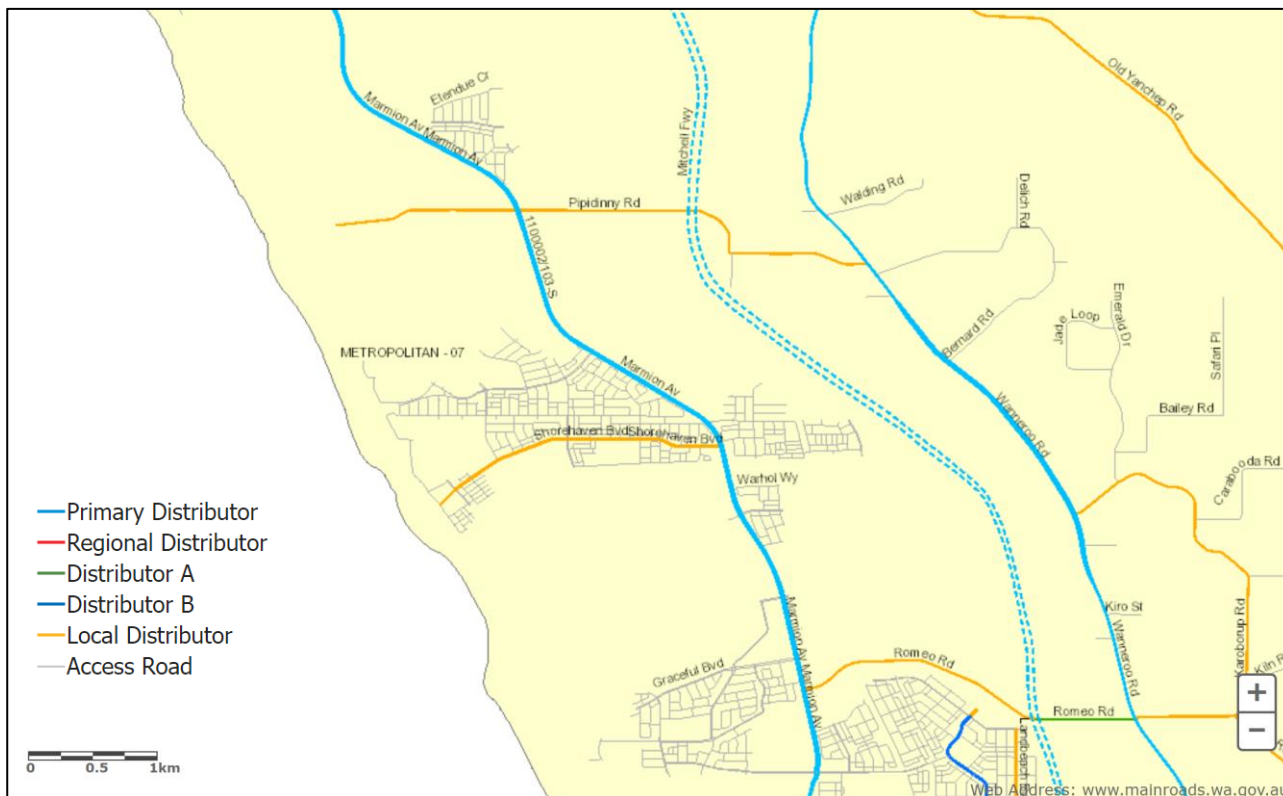
Source: https://www.wanneroo.wa.gov.au/downloads/download/121/eglinton_-_asp_82

2.1.4 A new roundabout with a terminating north-eastern arm was recently constructed at the intersection of Marmion Avenue and Cinnabar Drive. This terminating arm will ultimately provide access to the proposed Neighbourhood Centre development.

2.2 Existing (2023) Road Network

2.2.1 The existing road network is shown in Figure 2-2.

Figure 2-2: Main Roads WA Functional Road Hierarchy



Source: Main Roads WA Road Information Mapping System

Note that the dashed blue line indicates a future State Road (Mitchell Freeway extension)

Marmion Avenue

- 2.2.2 Marmion Avenue (State Route 71) is a Primary Distributor Road (Main Roads WA Road Hierarchy) which provides a link from Perth north to Yanchep. It is subject to an 80km/hr speed limit.
- 2.2.3 The Marmion Avenue upgrade from Butler to Yanchep was constructed in 2019/20. This is now a four-lane dual carriageway, and it was reclassified as a State Administered Road in 2021.
- 2.2.4 As part of the recent works, a new roundabout was constructed at the intersection of Marmion Avenue and Cinnabar Drive. Cinnabar Drive currently routes west from this point, to Amberton Beach and the new residential developments, and is subject to a 50km/hr speed limit.



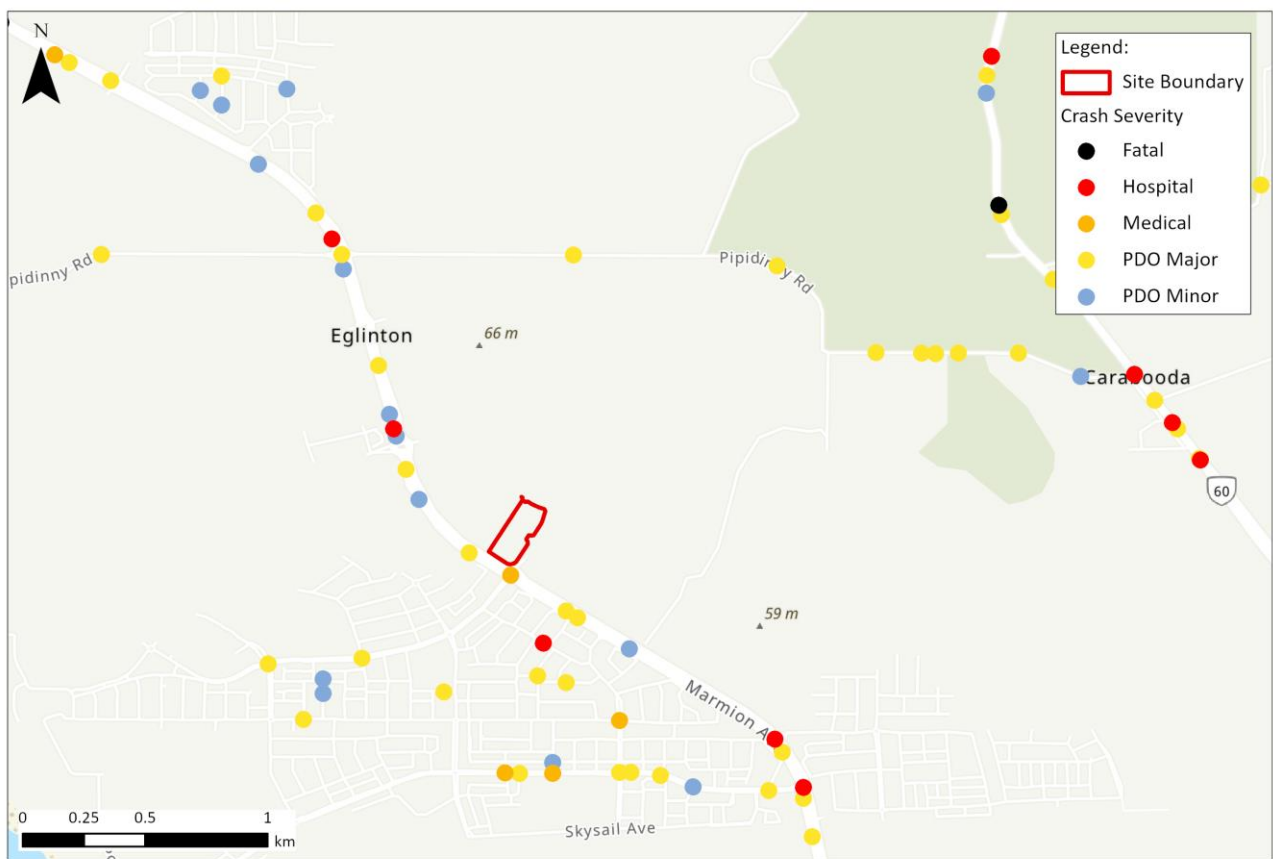
Wanneroo Road

2.2.5 Wanneroo Road is a Primary Distributor Road (Main Roads WA Road Hierarchy) which provides a high speed, high capacity road for longer distance trips north from Perth. Wanneroo Road is subject to a 90km/hr speed limit.

2.3 Collision Data

2.3.1 Collisions over the past five years have been reviewed from the Main Roads WA Crash Information map.

Figure 2-3: Collisions (worst rated collision in each location shown where more than one collision recorded)



2.3.2 Several collisions were recorded at the intersection of Marmion Avenue and Cinnabar Drive. The following resulted in injury:

- 07/05/2018: Medical severity, involved a single vehicle
- 18/08/2019: Medical severity, rear end shunt type collision
- 11/10/2020: Medical severity, right angle type collision.

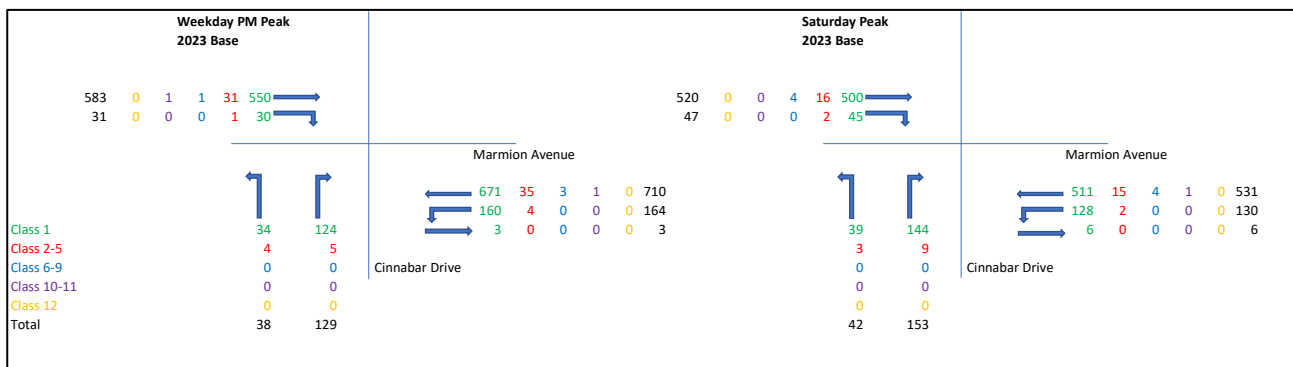
2.3.3 Given the relatively low numbers of collisions recorded compared to the areas up and downstream carrying similar volumes of traffic, and the changes which have been implemented in this location, this level of collisions does not indicate any significant higher order road safety issues which would be exacerbated by the proposed development. It is therefore concluded that no mitigation measures would be required.

2.4 Existing Traffic Flows

2.4.1 Traffic count data has been obtained from Main Roads WA Traffic Map, where available. One suitable count point was identified on Marmion Avenue, south of Pipidinny Road. In 2021/22, Marmion Avenue recorded 1,223 two-way vehicle movements in the AM peak and 1,335 two-way vehicle movements in the PM peak. Monday to Friday, the average two-way vehicle flow was 14,143 vehicles per day.

2.4.2 Due to the developing corridor that is Marmion Avenue, recent traffic surveys have been undertaken at the Marmion Avenue / Cinnabar Drive intersection, on Saturday 11th February 2023 and Thursday 16th February 2023. The full survey output is provided as Appendix A.

Figure 2-4: Traffic Survey Results



2.5 Existing Pedestrian and Cycle Provision

2.5.1 The established roads in the vicinity of the subject site generally have good pedestrian and cycle provision, having recently been constructed or upgraded. It is recognised that Marmion Avenue itself is a walking, wheeling and cycling barrier for east-west movement due to the width of the lanes and reserve; however, a shared path runs north-south along Marmion Avenue, whilst there are segregated cycling and walking paths along both sides of the western arm of Cinnabar Drive.

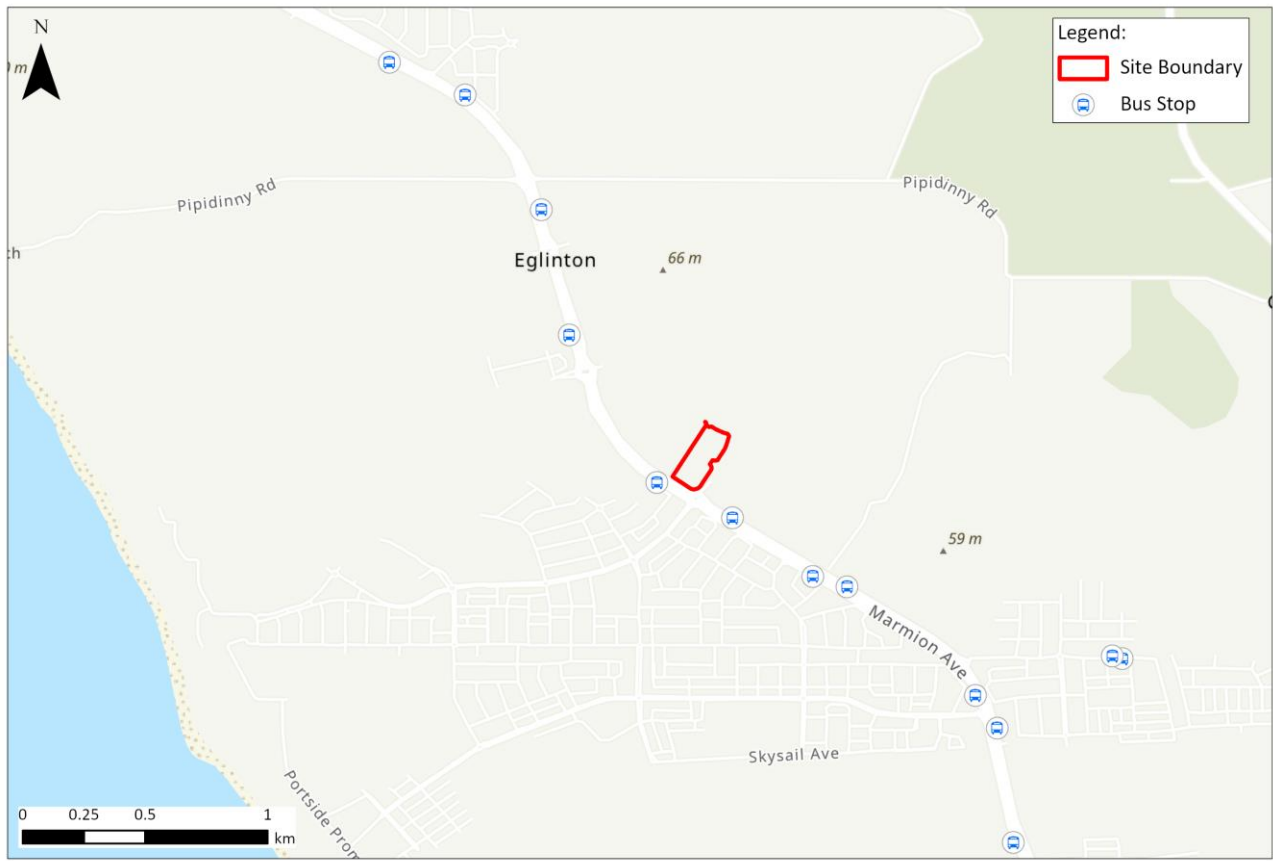
2.5.2 Marmion Avenue does benefit from informal pedestrian / cycle crossings with tactile paving close to the roundabout with Cinnabar Drive, which will allow for pedestrian and cycle access from the site to the existing residential area.



2.6 Existing Public Transport Provision

- 2.6.1 Bus stops are located on Marmion Avenue providing access to services 490 and 491. These stops benefit from shelters with seating.
- 2.6.2 Services 490 and 491 operate from 4:50am to 10:05pm Monday to Friday, with further Saturday and Sunday services. At peak times they run every 10 minutes. The routes connect from Two Rocks to the north, south through Yanchep and Eglinton to Butler, terminating at Butler Station.
- 2.6.3 Butler Station is currently the closest railway station to the site, providing services on the Joondalup Railway Line to central Perth including Perth Underground and Elizabeth Quay. Trains operate from 4:51am to 2:53am, calling at Butler Station every 10 minutes at peak times. Butler Station is within Fare Zone 5.
- 2.6.4 Alkimos Station and Eglinton Station are currently being constructed as part of METRONET.

Figure 2-5: Existing Public Transport Provision





3 Development Proposal

3.1 Development Proposal

3.1.1 The site is classified for development as a Neighbourhood Centre within the ASP 82 Plan Area² for 2,051sqm of commercial space (clause 5.3 of the ASP 82). The northern area of the site was previously proposed for medium density residential development.

3.1.2 This LDP, and therefore this TIA, proposes the following:

- Retail space, assumed to comprise:
 - Speciality retail and food / beverage tenancies totalling 1,400sqm gross floor area (GFA)
 - ‘Supermarket’, totalling 2,400sqm trading floorspace with further back of house space
- Two future development sites, assumed to be retail tenancies for the purposes of this TIA. These comprise a land area of circa 200sqm and a land area of circa 2,600sqm. It is assumed that the corresponding gross floor area would be 50% of the larger site area and 100% of the smaller site area, i.e. a total of 1,500sqm.

3.1.3 A plan showing the proposed development (the Local Development Plan) is provided as Appendix B.

3.1.4 The proposals include for two new roundabouts, one between Imperial Entrance (the name for new eastern leg to the Marmion Avenue / Cinnabar Drive roundabout) and the main retail car park access, and one between Imperial Entrance and Pipeline Boulevard (the name for the new north-south Neighbourhood Connector running parallel to Marmion Avenue).

3.1.5 The area surrounding the site to the northeast of Marmion Avenue is currently vacant land. The ASP 82 indicates future plans for the area, proposing the area northwest of the site to be a strategic open space, with residential development (R25-R60) to the east and north.

3.2 Access Arrangement

3.2.1 Several points of access are proposed:

- Left-in access onto Imperial Entrance – serving main car park. A central median will be provided on Imperial Entrance to ensure that vehicles can only turn left in.

Australian Standards AS/NZS 2890.1 notes that location (and widths) of Access Driveways to off-street parking facilities are based on the user class of facility and category of frontage road. For

² https://www.wanneroo.wa.gov.au/downloads/download/121/eglinton_-_asp_82



this sized car park for Class 3/3A, an entry width of 6m (combined) or 3.0m (minimum if separated) is noted.

The access will need to be designed at least 6m from the tangent point of the entry curve from Marmion Avenue in line with *Australian Standards AS/NZS 2890.1*.

- Roundabout full movement access onto Imperial Entrance – serving main car park.
- Left-out only access onto Imperial Entrance – providing egress from the Click and Collect bays only. A central median will be provided on Imperial Entrance to ensure that vehicles can only turn left. Suitable wayfinding will be provided at the exit to inform motorists of the most appropriate route back to Marmion Avenue.
- Left-in / Right-in access from Pipeline Boulevard – serving general vehicles for the Click and Collect bays and delivery and servicing vehicles. Clear signage will be provided to reduce any potential for conflict between these users.
- Left-out / Right-out intersection onto Pipeline Boulevard for servicing and delivery vehicles only – a median break or flush/line-marked median will be provided to allow for full exit turning movements, designed to accommodate the swept paths of a 19m semi-trailer truck.

3.3 Parking

Main Car Park

- 3.3.1 The supermarket car park will be designed to meet *AS/NZS 2890.1:2004* for User Class 3/3A i.e. 2.6m wide x 5.4m long spaces, with a minimum 5.8m aisle. The number of bays and configuration of the car park will be detailed at the Development Application stage.

Click and Collect

- 3.3.2 Click and Collect bays will be located in the northern area of the site. The number of bays and their configuration will be detailed at the Development Application stage.

Parallel Parking on Cinnabar Drive

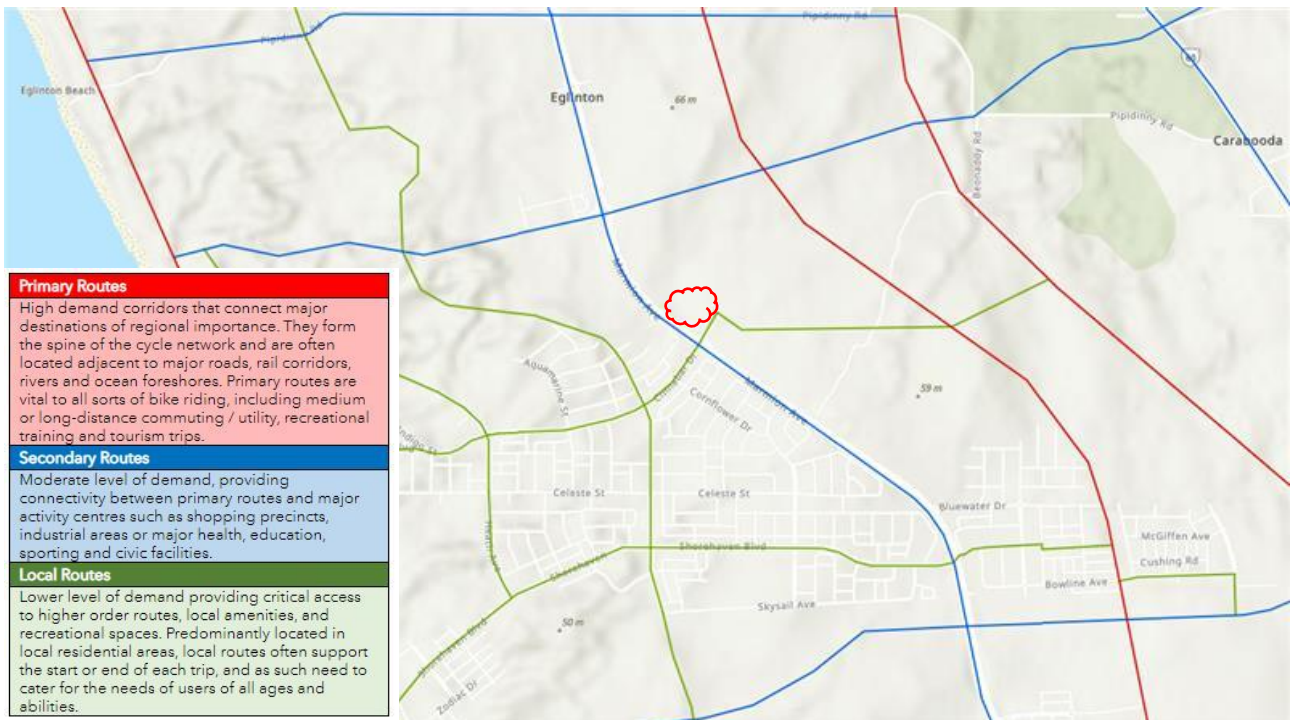
- 3.3.3 Parallel car parking spaces are proposed on Imperial Entrance, although these do not form part of the LDP approval.
- 3.3.4 These parallel parking spaces will be designed to meet the *Australian Standard Part 5: On-Street Parking (AS 2890.5:2020)* which is based on the adjacent speed limit. For Imperial Entrance as an Integrator Arterial B, with 50km/h or less, on street bays could be 2.0m – 2.3m wide x 5.4m – 6.7m long depending on ability to leave space and parking turnover and traffic flow. Where parking turnover is high and vehicle reversing into parking spaces cannot be readily tolerated, increased space lengths, up to 8m, should be considered.

3.3.5 The Imperial Entrance cross section will be detailed as part of the sub-divisional engineering drawings which will incorporate the location of the parking bays.

3.4 Cycling Facilities

3.4.1 Cycling facilities will be detailed at Development Application stage. Imperial Entrance is designated as a Local Route in the Long Term Cycle Network and good walking, wheeling and cycling facilities will be made to cater for users of all ages and abilities.

Figure 3-1: Long Term Cycle Network provision



Source: Department of Transport

3.5 Deliveries and Servicing

3.5.1 The supermarket loading dock has been positioned to the back of the Neighbourhood Centre away from Marmion Avenue and will accommodate for up to two 19m semi-trailer trucks, with space for a further 12.5m rigid heavy truck to access the supermarket waste compactor.

3.5.2 A general retail loading dock will accommodate two further 12.5m heavy rigid trucks.

3.5.3 On the basis of similar Neighbourhood Centres of similar size, these servicing provisions are considered sufficient to accommodate the loading and servicing needs of the centre. Further information, such as swept paths, will be provided at the Development Application stage.



3.6 Specific Issues

- 3.6.1 The proposed development is located within an area allocated for significant development. This has resulted in planned transport improvements to alleviate the pressures on the local transport network.



4 Changes to Surrounding Transport Networks

4.1 Planned Road Network

4.1.1 The planned road network can be seen in Figure 2-1.

Imperial Entrance

4.1.2 Imperial Entrance is proposed as an Integrator B road within the approved Structure Plan.

4.1.3 Within centres under *Liveable Neighbourhoods* (October 2007), Integrator B roads would typically have an indicative road reserve width of some 25.2m and carry up to 15,000 vehicles per day with a maximum speed limit of 40km/hr to 50km/hr and 2 x 7.5m wide footpaths including on-street parking.

4.1.4 Under *Local Government Guidelines for Subdivisional Developments* (2016), Imperial Entrance with an Integrator B function would carry up to 8,000 vehicles per day; have a maximum speed limit of 60km/hr; have a separate footpath and dual use path provision on at least one side; and have parking provisions on carriageway or off carriageway in widened strips. Total reserve width would be minimum 20.0m with 5.0m-6.3m wide verges.

Mitchell Freeway

4.1.5 The Mitchell Freeway is currently being extended from Hester Avenue to Romeo Road, with two lanes in each direction. Alongside this, a new connection will be provided from Wanneroo Road to Marmion Avenue in the location of Romeo Road. A new shared path will be constructed on the western side of the freeway, as well as on the new Romeo Road.³

4.1.6 In the longer term, further extension of Mitchell Freeway north is planned for.

4.2 Planned Public Transport Network

4.2.1 The construction of the Yanchep Rail Extension (YRE) is occurring now, which will extend the Joondalup Line by 14.5km. The YRE includes three new stations: Alkimos Station, Eglinton Station and Yanchep Station⁴.

4.2.2 The plans for Eglinton Station include:

- Two 150m long platforms which will cater for six car trains
- A bus interchange with at least eight active bus stops and four bus layover bays

³ <https://www.mainroads.wa.gov.au/projects-initiatives/all-projects/metropolitan/mitchell-freeway-extension/>

⁴ <https://www.metronet.wa.gov.au/projects/yanchep-rail-extension>



- Two secure cycle parking shelters with separate u-rails adjacent to the entrances
- 23 kiss-and-ride car parking bays
- 436 long term car parking bays⁵.

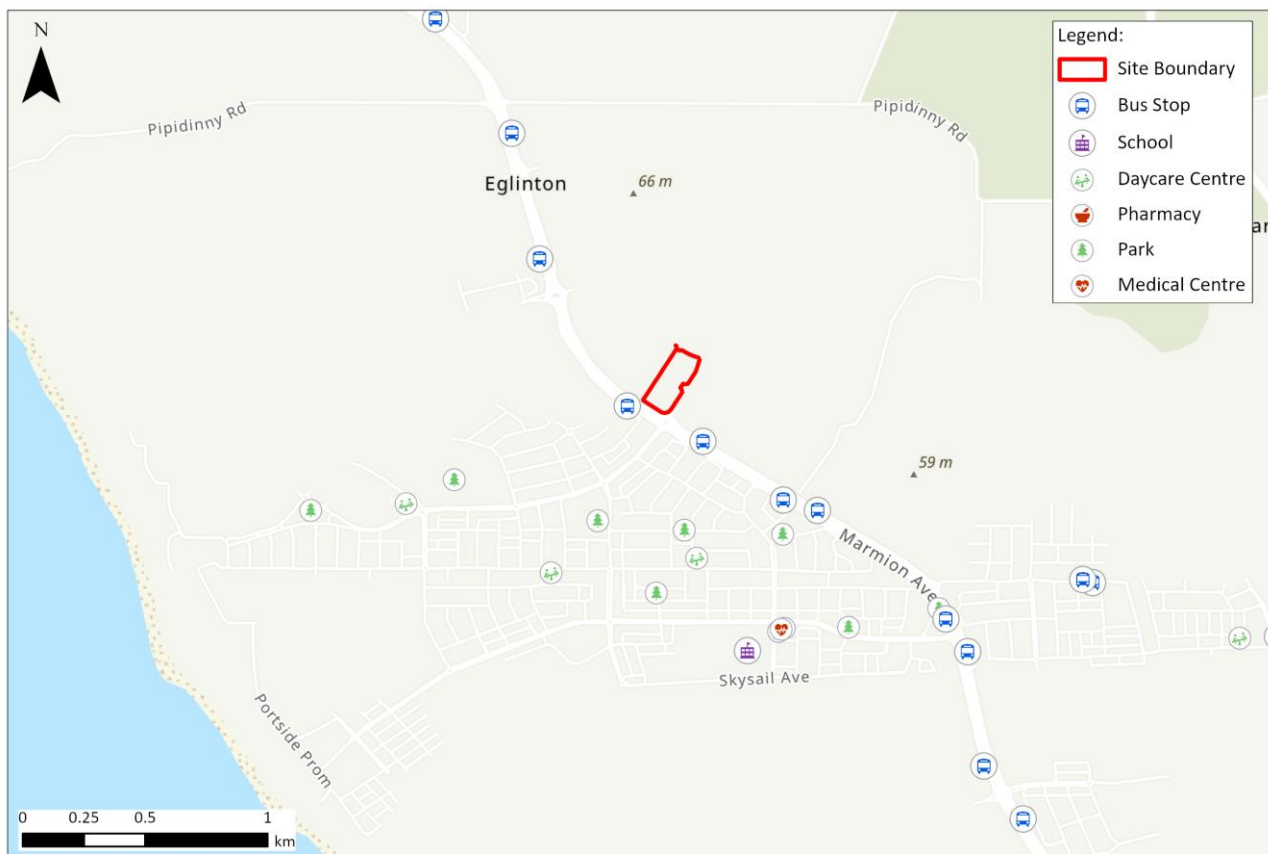
⁵ https://www.wa.gov.au/system/files/2021-06/PRJ-20200910-Upload-Urbis-METRONET-Eglinton-Report-Combined_1.pdf

5 Integration with Surrounding Area

5.1 Local Attractors / Generators

- 5.1.1 Given the proposed commercial uses on the site, it is expected that the majority of the trips to / from the site will be generated by residential dwellings, as well as some pass-by and linked trip potential.
- 5.1.2 The existing residential area in the vicinity of the site is located southwest of Marmion Avenue, with bus stops located on Marmion Avenue.
- 5.1.3 The area surrounding the site to the northeast of Marmion Avenue is currently vacant land. The ASP 82 indicates future plans for the area, with the area northwest of the site to be a strategic open space and residential development (R25-R60) to the east and north.
- 5.1.4 Additionally, there are plans for a new public primary school in the vicinity of the site.

Figure 5-1: Points of Interest



Service Credits: Esri, HERE, Garmin, Foursquare, METI/NASA, USGS



5.2 Travel Desire Lines

Pedestrian / Cycling

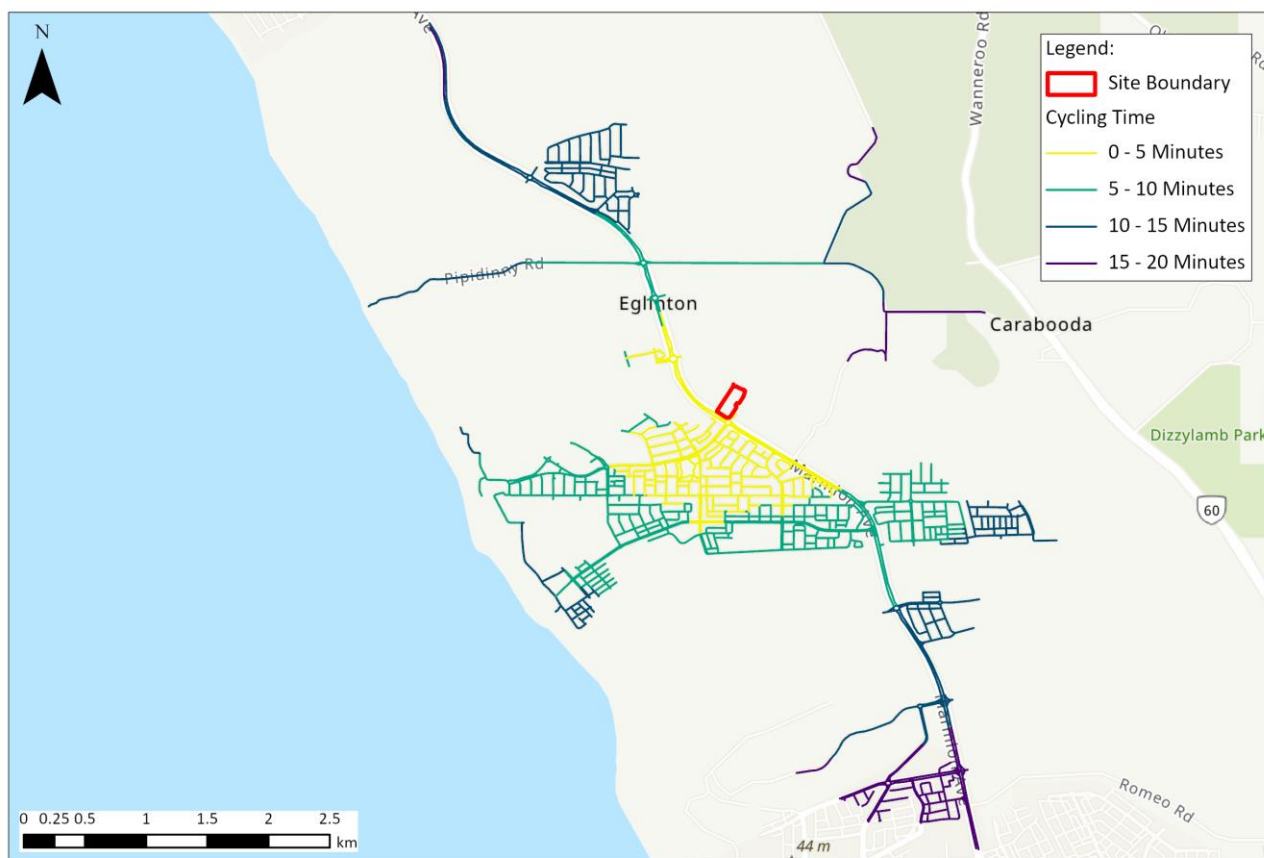
- 5.2.1 To reach the residential area to the southwest of Marmion Avenue, pedestrians and cyclists will cross at the dropped kerb tactile paving crossings on Marmion Avenue, before using the segregated pedestrian and cycle provision alongside Cinnabar Drive.
- 5.2.2 The pedestrian and cycle connections to the proposed residential development to the northeast of Marmion Avenue have not yet been constructed. However, given that this will be newly built with limited existing constraints it is anticipated that this will be of high quality and well connected.
- 5.2.3 The existing and planned pedestrian and cycle provision is deemed acceptable for the able bodied person who is able to pick sufficient gaps in the Marmion Avenue traffic stream to cross, and no remedial measures are required in this regard. However, for those more vulnerable road users moving slower, Main Roads WA should review safety of pedestrian crossing provisions across Marmion Avenue at the roundabout.

Figure 5-2: 20 Minute Walk Catchment



Service Credits: Esri, HERE, Garmin, Foursquare, METI/NASA, USGS

Figure 5-3: 20 Minute Cycle Catchment



Service Credits: Esri, HERE, Garmin, Foursquare, METI/NASA, USGS

Motor Vehicle

- 5.2.4 To the south there is a newly constructed roundabout between Marmion Avenue and Cinnabar Drive, with Marmion Avenue widened to a four-lane carriageway.
- 5.2.5 The road network to the north has not yet been constructed. However, the structure planning for Eglinton has anticipated that Imperial Entrance will be an Integrator B Main Street, with Pipeline Boulevard a Neighbourhood Connector Road.
- 5.2.6 The existing and planned major road provision is deemed acceptable, and no remedial measures are required.

Public Transport

- 5.2.7 Bus services are accessible on Marmion Avenue, and can be accessed via the crossing provision on Marmion Avenue and on Imperial Entrance.
- 5.2.8 The existing public transport provision is deemed acceptable for the able bodied person who is able to pick sufficient gaps in the Marmion Avenue traffic stream to cross to access bus stops, and no



remedial measures are required in this regard. However, for those more vulnerable road users moving slower, Main Roads WA should review safety of pedestrian crossing provisions across Marmion Avenue at the roundabout.

6 Analysis of Transport Networks

6.1 Traffic Impact

Scope of Assessment

- 6.1.1 The traffic impact assessment has been undertaken for the following network of intersections:
- The existing roundabout between Marmion Avenue and Cinnabar Drive
 - The proposed site access / Imperial Entrance roundabout
 - The proposed Imperial Entrance and Pipeline Boulevard mini⁶ roundabout.
- 6.1.2 Assessment has been undertaken for a 2025 base future year, in line with Cedar Woods advised likely opening year.
- 6.1.3 In line with WAPC requirements an opening year + 10 years scenario of 2035 has also been assessed with and without development.

Background Traffic Volumes – Cinnabar Drive / Marmion Avenue Intersection

- 6.1.4 Traffic surveys were undertaken at the Cinnabar Drive / Marmion Avenue roundabout intersection in February 2023.
- 6.1.5 In looking at the calibrated Regional Operation Model (ROM) traffic flows to 2021 and 2021 actual data sourced from Main Roads WA Trafficmap (note: there are not appropriate matches for the 2016 ROM and actuals), the 2021 traffic flows in ROM need to be adjusted down by 8,600vpd on Marmion Avenue. Thus, the calibrated traffic flows are:

Year	Volume daily
2021	13,700
2031	50,700
2041	52,700

- 6.1.6 From the above, traffic flows are expected to grow by about 3,700 vehicles per day each year from 2021 to 2031. Traffic growth then slows between 2031 and 2041 due to the freeway extension anticipated around 2036. Growth from 2031 to 2036 has been assumed to remain at 3,600 vehicles

⁶ The LDP is proposing a mini roundabout at the Imperial Entrance / Pipeline Boulevard T-intersection which will need to be designed to accommodate the 19m long semi-trailer turning to/from the servicing area as well as service the Click and Collect customers turning back around to Marmion Avenue.



per day each year beyond 2031. When the freeway extends, traffic is expected to drop to around 40,000 to 45,000vpd and then increase to the above noted 52,700 by 2041.

6.1.7 It is worth noting that the flows along this road are driven by the new development proposed for the region, as well as the timing of the extension of the Mitchell Freeway beyond Romeo Road.

Figure 6-1: 2025 Weekday PM Peak traffic flows

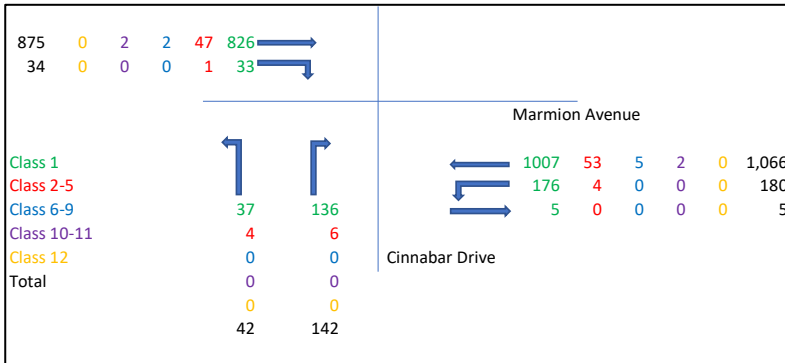


Figure 6-2: 2025 Saturday Peak traffic flows

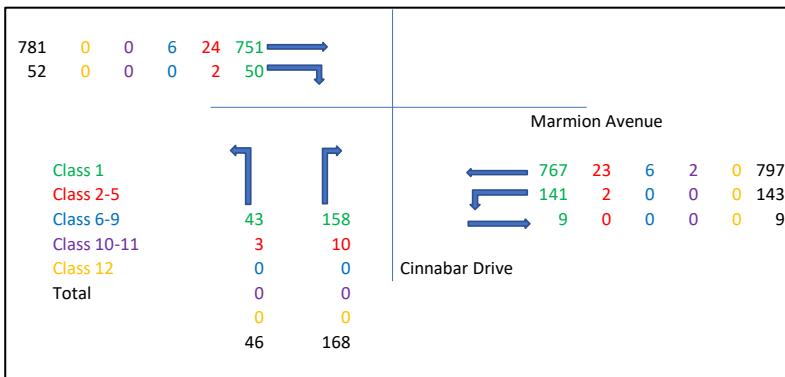


Figure 6-3: 2035 Weekday PM Peak traffic flows

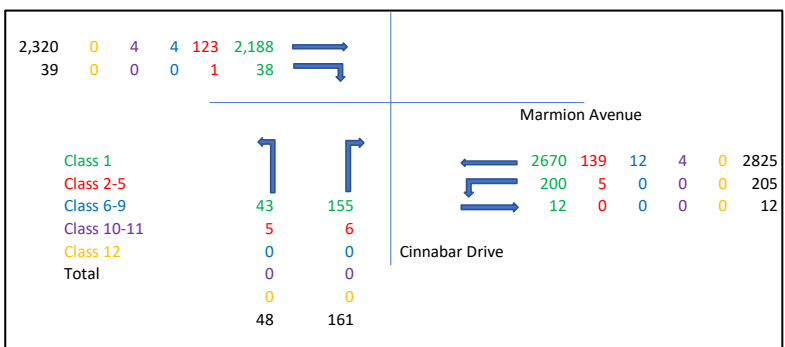
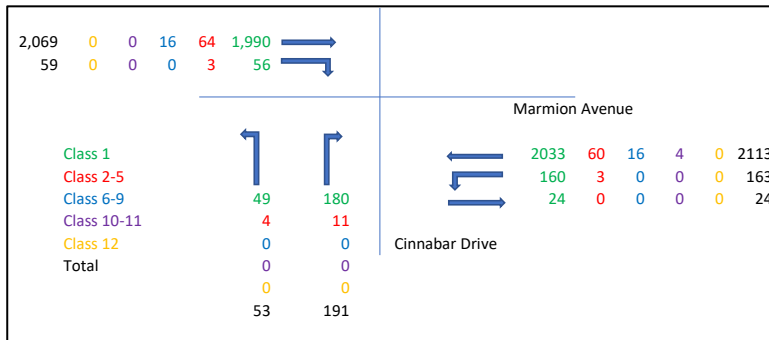


Figure 6-4: 2035 Saturday Peak traffic flows



Commercial Area Traffic Generation

6.1.8 For the proposed retail uses, PJA has adopted the following traffic generation rates based on the *New South Wales RMS Technical Direction TDT 2013/04A*:

- Weekday PM peak hour: 12.5 trips per 100 m² GLFA
- Saturday peak hour: 16.3 trips per 100 m² GLFA

6.1.9 On the basis of the above assumptions, the anticipated peak hour traffic volumes generated by the proposed development are set out in Table 6-1.

Table 6-1: Peak Hour Traffic Generation

Use	Area / No.	Peak Hour Generation Rate	Weekday PM Peak Hour Trip Generation	Saturday Peak Hour Trip Generation
Supermarket and Retail	3,800 m ²	PM: 12.5/100 m ² Sat: 16.3/100 m ²	475 trips	620 trips
Potential future	1,500 m ²	PM: 12.5/100 m ² Sat: 16.3/100 m ²	188 trips	243 trips
Total	5,300 m²		663 trips	863 trips

Arrival / Departure Distribution

6.1.10 We have assumed a 50% arrival / 50% departure split for both the weekday PM and Saturday peak hours as follows:

- Weekday PM peak hour: 332 vph in and 332 vph out
- Saturday peak hour: 432 vph in and 432 vph out.

Directional Distribution

6.1.11 PJA has assumed that 70% of site generated traffic will be to/from Marmion Avenue, with the remaining 30% to Pipeline Boulevard.



6.1.12 In order to provide a robust assessment of the roundabout capacity, it has been assumed that all entering and exiting retail traffic will occur via the 4-way roundabout (i.e. no allowance for the reduction provided by the left-in only access closer to Marmion Avenue or the Click and Collect exit).

Traffic Volume Summary

6.1.13 Based on the preceding assumptions, the estimated 2025 future traffic volumes for the proposed roundabouts are presented below.

Figure 6-5: 2025 Predicted Traffic Volumes

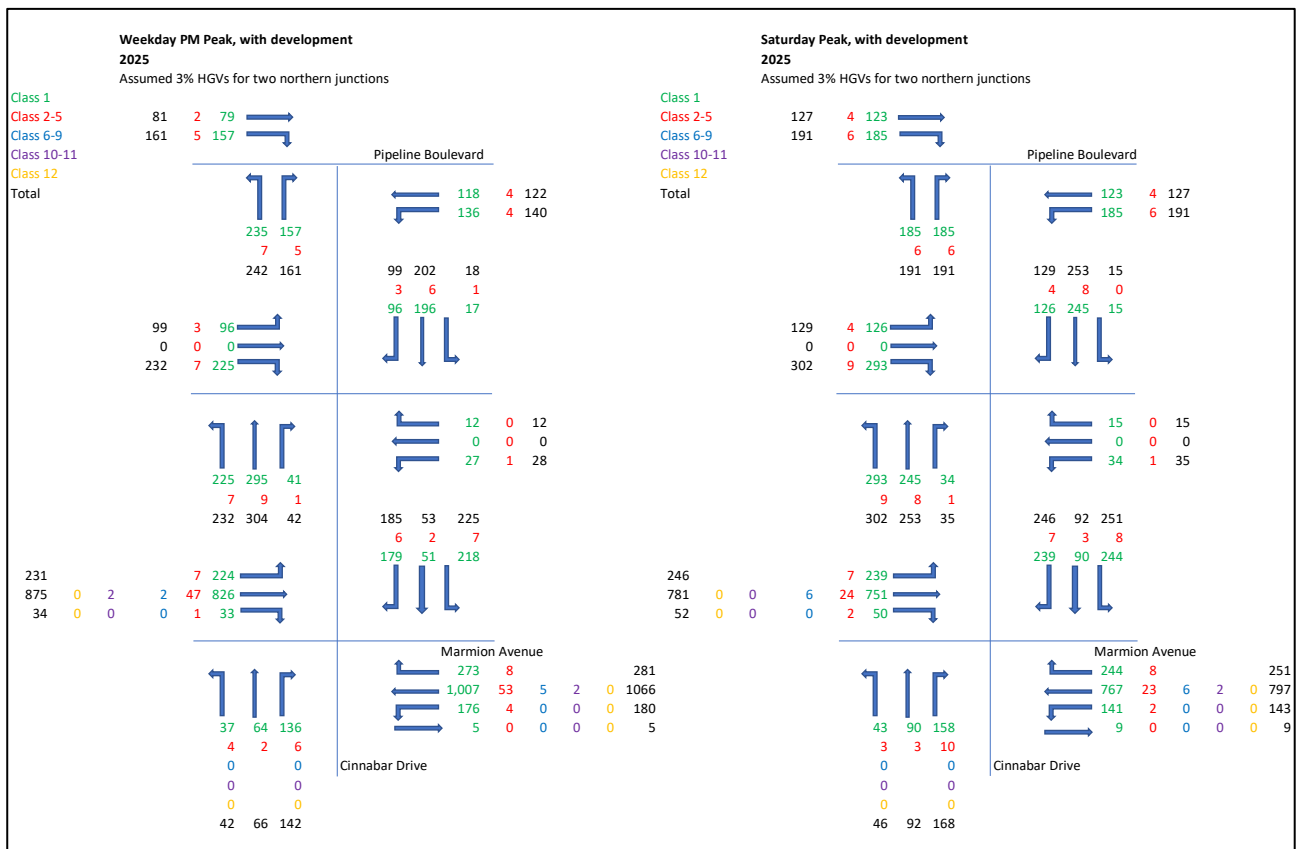
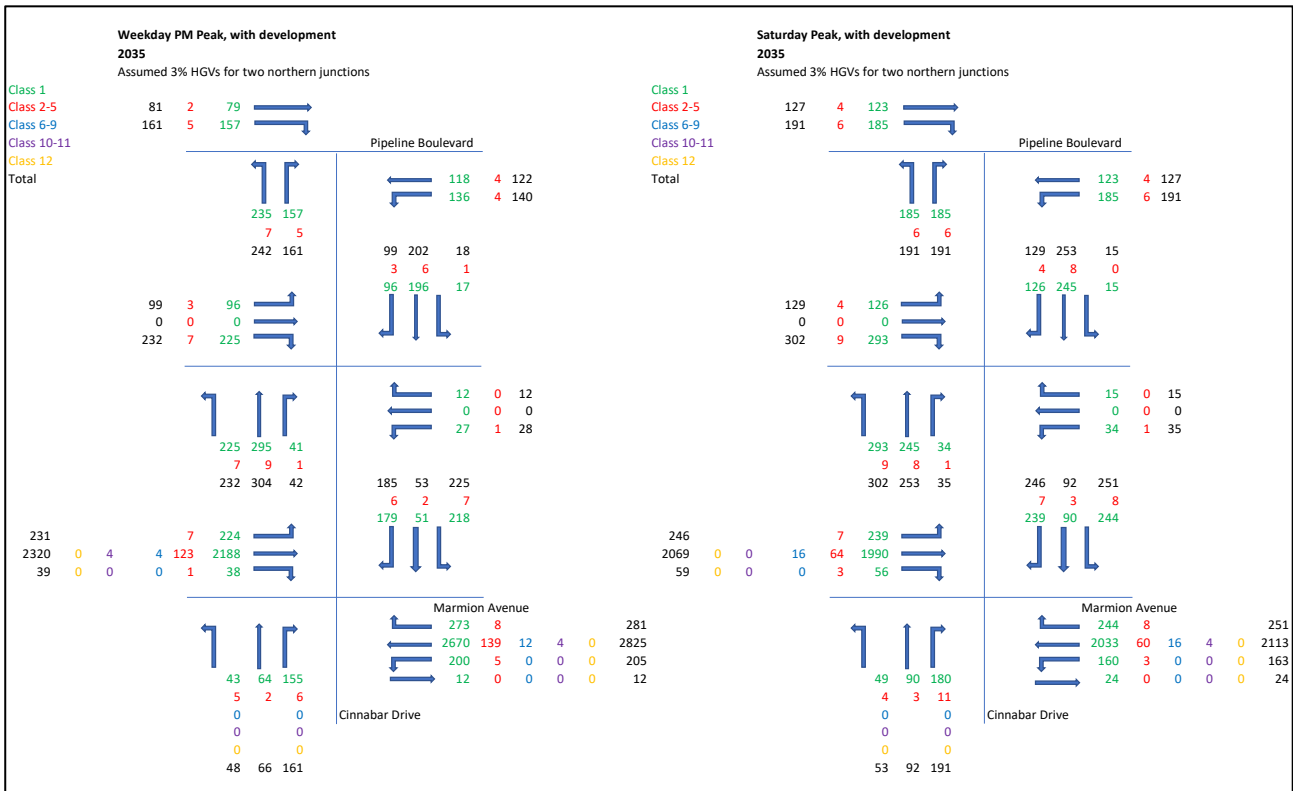


Figure 6-6: 2035 Predicted Traffic Volumes



SIDRA Analysis

6.1.14 The operation of the roundabout has been analysed using SIDRA Intersection (Version 9). The key outputs of SIDRA are summarised below:

- **Degree of Saturation (DOS)** is the ratio of the volume of traffic observed making a particular movement compared to the maximum capacity for that movement.
- The **95th Percentile (95th %ile) Queue** represents the maximum queue length that can be expected in 95% of observed queue lengths in the peak hour.
- **Average Delay** is the delay time that can be expected over all vehicles making a particular movement in the peak hour.

6.1.15 The WAPC Guidelines indicate an average delay of less than 35 seconds (per vehicle) for each approach is considered acceptable operating conditions for roundabouts.

6.1.16 The SIDRA results for the roundabouts for the estimated future volumes is presented in Table 6-2 to Table 6-4.



Table 6-2: Site Access Roundabout – SIDRA Results

Peak Period	Leg	Degree of Saturation	Average Delay (s) Intersection LOS	95 th %ile Queue (m)
2025 With Development				
Weekday PM	Imperial Entrance (SW)	0.46	5	27
	Local Street (SE)	0.05	8	2
	Imperial Entrance (NE)	0.32	7	15
	Site Access (NW)	0.35	10	17
	Intersection	0.46	7 LOS A	27
Saturday peak hour	Imperial Entrance (SW)	0.49	5	30
	Local Street (SE)	0.07	10	3
	Imperial Entrance (NE)	0.42	8	22
	Site Access (NW)	0.44	10	23
	Intersection	0.49	8 LOS A	30
2035 With Development				
Weekday PM	Imperial Entrance (SW)	0.37	5	20
	Local Street (SE)	0.08	8	2
	Imperial Entrance (NE)	0.46	8	18
	Site Access (NW)	0.50	10	20
	Intersection	0.50	7 LOS A	20
Saturday peak hour	Imperial Entrance (SW)	0.43	5	26
	Local Street (SE)	0.13	10	3
	Imperial Entrance (NE)	0.69	11	38
	Site Access (NW)	0.70	12	38
	Intersection	0.70	9 LOS A	38

Table 6-3: Pipeline Boulevard / Imperial Entrance Roundabout – SIDRA Results

Peak Period	Leg	Degree of Saturation	Average Delay Intersection LOS	95 th %ile Queue (m)
2025 With Development				
Weekday PM	Imperial Entrance (SW)	0.33	7	16
	Pipeline Boulevard (SE)	0.23	5	10
	Pipeline Boulevard (NW)	0.21	8	9
	Intersection	0.33	7 LOS A	16
Saturday peak hour	Imperial Entrance (SW)	0.32	7	16
	Pipeline Boulevard (SE)	0.29	5	14
	Pipeline Boulevard (NW)	0.29	8	13
	Intersection	0.32	7 LOS A	16
2035 With Development				
Weekday PM	Imperial Entrance (SW)	0.28	7	13
	Pipeline Boulevard (SE)	0.23	5	10
	Pipeline Boulevard (NW)	0.21	8	9
	Intersection	0.28	7 LOS A	13
Saturday peak hour	Imperial Entrance (SW)	0.29	7	14

Peak Period	Leg	Degree of Saturation	Average Delay Intersection LOS	95 th %ile Queue (m)
	Pipeline Boulevard (SE)	0.29	5	13
	Pipeline Boulevard (NW)	0.28	8	13
	Intersection	0.29	7 LOS A	14

Table 6-4: Marmion Avenue Roundabout – SIDRA Results

Peak Period	Leg	Degree of Saturation	Average Delay (s) Intersection LOS	95 th %ile Queue (m)
2025 Base				
Weekday PM	Cinnabar Drive (SW)	0.21	10	5
	Marmion Avenue (SE)	0.40	6	27
	Marmion Avenue (NW)	0.33	6	20
	Intersection	0.40	6 LOS A	27
Saturday peak hour	Cinnabar Drive (SW)	0.22	10	5
	Marmion Avenue (SE)	0.31	6	18
	Marmion Avenue (NW)	0.30	7	17
	Intersection	0.31	7 LOS A	18
2025 With Development				
Weekday PM	Cinnabar Drive (SW)	0.45	12	19
	Marmion Avenue (SE)	0.64	9	53
	Imperial Entrance (NE)	0.41	10	17
	Marmion Avenue (NW)	0.54	10	40
	Intersection	0.64	10 LOS A	53
Saturday peak hour	Cinnabar Drive (SW)	0.48	11	21
	Marmion Avenue (SE)	0.56	10	41
	Imperial Entrance (NE)	0.44	10	21
	Marmion Avenue (NW)	0.52	10	35
	Intersection	0.56	10 LOS B	41
2035 Base				
Weekday PM	Cinnabar Drive (SW)	1.46	471	369
	Marmion Avenue (SE)	0.99	11	715
	Marmion Avenue (NW)	0.84	7	127
	Intersection	1.46	27 LOS F	715
Saturday peak hour	Cinnabar Drive (SW)	0.57	20	26
	Marmion Avenue (SE)	0.76	6	110
	Marmion Avenue (NW)	0.81	8	108
	Intersection	0.81	8 LOS C	110
2035 With Development				
Weekday PM	Cinnabar Drive (SW)	1.09	142	187
	Marmion Avenue (SE)	1.41	383	2860
	Imperial Entrance (NE)	1.19	122	230
	Marmion Avenue (NW)	1.16	160	1202
	Intersection	1.41	268 LOS F	2860



Peak Period	Leg	Degree of Saturation	Average Delay (s) Intersection LOS	95 th %ile Queue (m)
Saturday peak hour	Cinnabar Drive (SW)	1.12	157	257
	Marmion Avenue (SE)	1.21	207	1410
	Imperial Entrance (NE)	1.18	118	246
	Marmion Avenue (NW)	1.11	123	890
	Intersection	1.21	161 LOS F	1410

- 6.1.17 The SIDRA results indicate that all three roundabouts will operate with average delays well below 35 seconds during typical peak hours for the estimated future volumes in 2025 and at a LOS A/B for all movements and as intersections as a whole. This is a worst-case scenario, with the proposed commercial area of some 2Ha added on top of previously assumed 1Ha area.
- 6.1.18 Additionally, the 95th percentile queues (representing the worst expected queues) at the site access junction in the 2025 peak are 27m to 30m back towards Marmion Avenue which is clear of the Left in only access (~55m from the roundabout) and clear of Marmion Avenue (~85m from roundabout).
- 6.1.19 Irrespective of whether or not the development is implemented, by 2035 the Marmion Avenue roundabout is forecast to operate over capacity. Without the development, long delays are forecast to occur in the PM peak on Cinnabar Drive, of circa 8 minutes with a DoS of 1.46. Long queues are also forecast on Marmion Avenue away from Perth city centre in the PM peak (700 metres and a DoS of 0.99).
- 6.1.20 To alleviate the capacity constraints would require the construction of the Freeway extension beyond Romeo Road by 2035, based on the anticipated growth rates.
- 6.1.21 It is further worth noting that if Marmion Avenue is widened to six lanes, then Marmion Avenue itself would perform better, however the delays on the side streets would worsen.

Road Safety

- 6.1.22 As set out in Chapter 2 of this report, the volume of collisions on the local road network is low compared to the traffic flows. Thus, the level of traffic generated by the proposed development is not anticipated to worsen the existing situation.
- 6.1.23 It is also worth noting that the majority of traffic is expected to be local, short distance trips.

6.2 Public Transport Access

- 6.2.1 Details of the public transport access are provided in previous chapters. In summary, bus stops on Marmion Avenue provide access to services between Two Rocks to the north and Butler Station to the south, running every 10 minutes on weekdays. At present, the closest station is Butler Station



which is on the Joondalup Railway Line, providing connections into central Perth. However, there are plans to extend this line including a new station in Eglinton.

- 6.2.2 There are good pedestrian connections to the nearby bus stops, including a dropped kerb tactile paving crossing on Marmion Avenue, whilst the existing bus provision provides a good connection to Butler Station.

6.3 Pedestrian Access / Amenity

- 6.3.1 The roads in the vicinity of the site have recently been constructed or upgraded. As part of this, there are appropriately located dropped-kerb tactile paving crossings on Marmion Avenue for the able-bodied.
- 6.3.2 Footways will be provided alongside the new Imperial Entrance to ensure the proposed buildings are well connected to the existing provision.

6.4 Cycle Access / Amenity

- 6.4.1 There is a shared cycle / pedestrian way along Marmion Avenue, whilst to the southwest of Marmion Avenue Cinnabar Drive benefits from segregated provision.
- 6.4.2 Appropriate connections will be provided from Marmion Avenue into the site to ensure Imperial Entrance is a well provisioned Local Route in the LTCN.

6.5 Analysis of Pedestrian / Cycle Networks

- 6.5.1 Table 4 of the *WA Transport Impact Assessment Guidelines Volume 3* has been reproduced below.
- 6.5.2 This states that for a four lane divided road, as is the case for Marmion Avenue, the ability of pedestrians to cross would only be affected if there are more than 1,600 vehicles per hour.
- 6.5.3 Traffic count data recorded a peak of 1,592 two-way vehicles per hour. So while the dropped kerb crossing on Marmion Avenue are appropriate for current pedestrian amenity and located close to the intersection with Cinnabar Drive, on the pedestrian desire lines, consideration by Main Roads WA is needed to the serviceability for crossings for all users. These crossings also need to be suitable for access to the bus stops on Marmion Avenue.
- 6.5.4 The crossing north-south on Imperial Entrance will also provide an appropriate level of pedestrian amenity.



Table 6-5: Traffic volumes affecting pedestrian crossing amenity

Road cross-section	Traffic volume affecting ability of pedestrians to cross (vehicles per hour – two-way)
2 lane undivided	1,100 vph
2 lane divided (or with pedestrian refuse islands)	2,800 vph
4 lane undivided (without pedestrian refuge islands)	700 vph
4 lane divided (or with pedestrian refuge islands)	1,600 vph

6.6 Car Parking

6.6.1 For a supermarket land use, a typical requirement for circa 4 car parking spaces per 100sqm LFA has been identified. For strip shops, the requirement typically reduces to circa 2.3 spaces per 100sqm LFA.

6.6.2 The level of car parking, and compliance with any standards, will be confirmed within the Development Application.

6.7 Provision for Service Vehicles

6.7.1 The supermarket loading dock will accommodate two 19m semi-trailer trucks, with space for a further 12.5m rigid heavy truck to access the supermarket waste compactor. A general retail loading dock will accommodate two 12.5m heavy rigid trucks.

6.7.2 This level of servicing provision is in line with the expected servicing demand at the site.



7 Summary and Conclusion

- 7.1.1 This TIA has been prepared by PJA on behalf of Lonnegal Property (Cedar Woods Properties) in relation to a proposed commercial development in Eglinton. The proposals are an update from the Structure Plan, to now include:
- Retail space, assumed to comprise:
 - Speciality retail and food / beverage tenancies totalling 1,400sqm gross floor area (GFA)
 - ‘Supermarket’, totalling 2,400sqm trading floorspace with further back of house space
 - Two future development sites, assumed to be retail tenancies for the purposes of this TIA. These comprise a land area of circa 200sqm and a land area of circa 2,600sqm. It is assumed that the corresponding gross floor area would be 50% of the larger site area and 100% of the smaller site area, i.e. a total of 1,500sqm.
- 7.1.2 The proposals would generate 663 vehicle trips in the weekday PM peak and 863 vehicle trips in the Saturday peak.
- 7.1.3 The SIDRA results indicate that all three roundabouts will operate with average delays well below 35 seconds during typical peak hours for the estimated future volumes in 2025 and at a LOS A/B for all movements and as intersections as a whole. However, by 2035 the Marmion Avenue roundabout is forecast to operate over capacity, even without the addition of the proposed development. To alleviate the capacity constraints would require the construction of the Freeway extension beyond Romeo Road by 2035, based on the anticipated growth rates.
- 7.1.4 The site will connect to existing pedestrian and cycling provisions, with visitors also benefitting from frequent bus services accessed from Marmion Avenue. Further, there are plans for significant improvements to the local transport network, including extensions to existing roads and a new railway station in Eglinton.
- 7.1.5 The site therefore provides a sustainable opportunity for development, providing good crossing facilities are provided across Marmion Avenue by Main Roads WA to service the approved commercial land uses and the local residential areas.



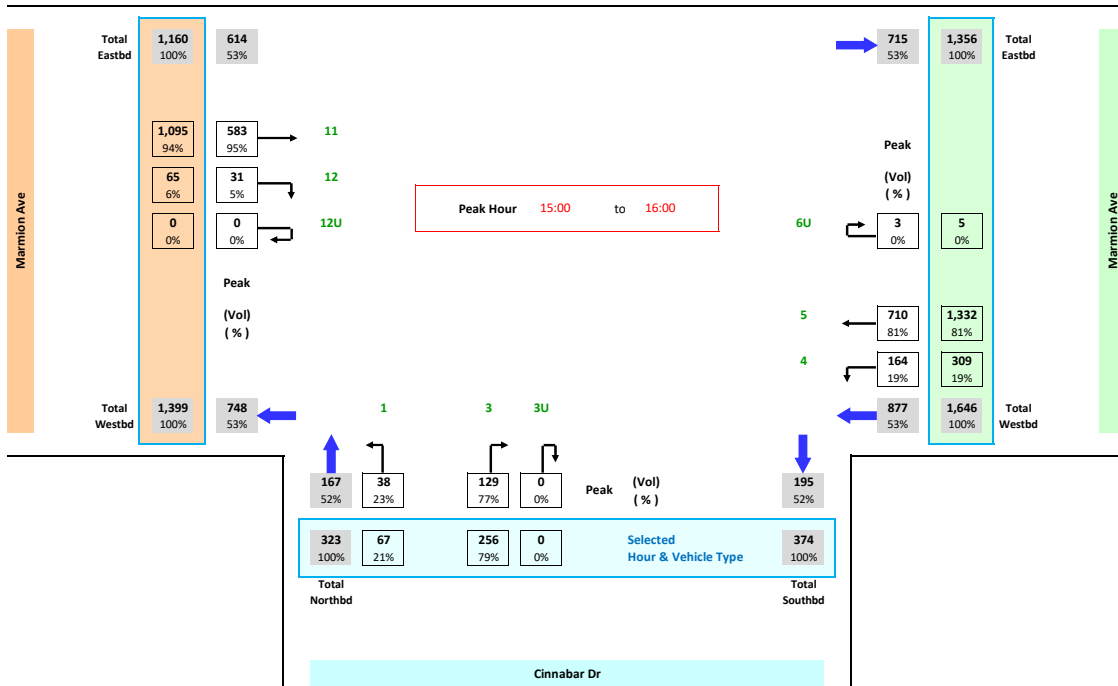
Appendix A Traffic Surveys

Job No. : AUWA6069
Client : PJA
Suburb : Eglington
Location : 1. Cinnabar Dr / Marmion Ave

Day/Date : Thu, 16 Feb 2023
Weather : Fine
Description : Classified Intersection Count
: Intersection Diagram



Hour Starting | **Vehicle Type**
 Total | All Vehicles

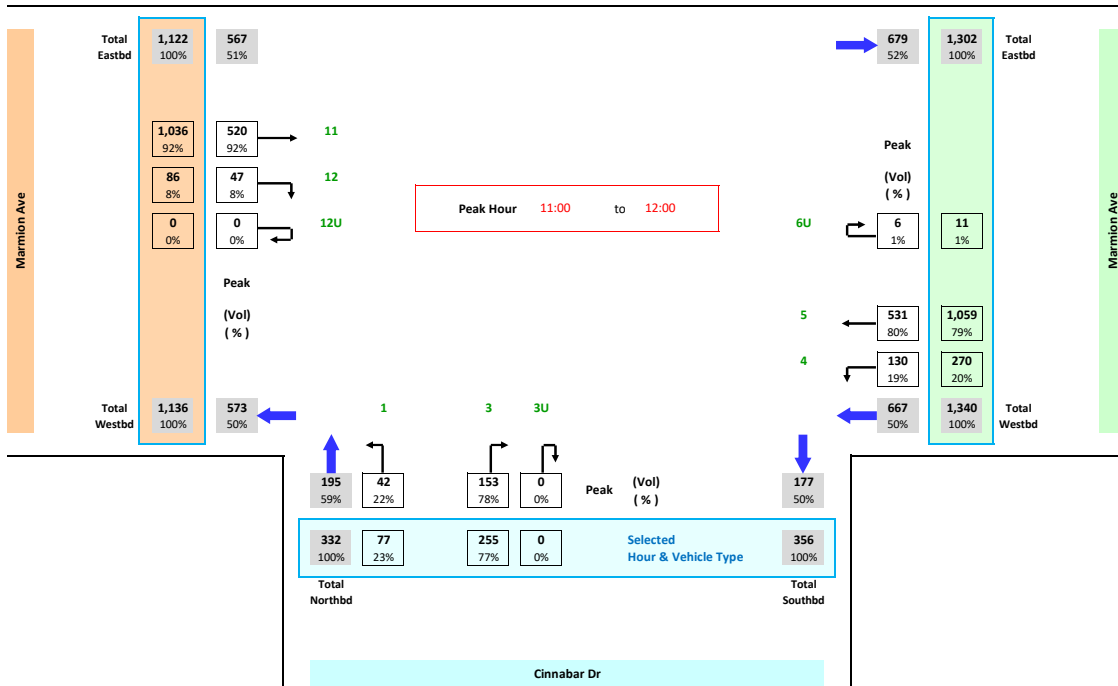


Job No. : AUWA6069
 Client : PJA
 Suburb : Eglington
 Location : 1. Cinnabar Dr / Marmion Ave

 Day/Date : Sat, 11 Feb 2023
 Weather : Fine
 Description : Classified Intersection Count
 : Intersection Diagram



Hour Starting: Total
 Vehicle Type: All Vehicles





Appendix B Proposed Development – Local Development Plan

EGLINTON VILLAGE NEIGHBOURHOOD CENTRE

LOCAL DEVELOPMENT PLAN

APPLICATION OF LOCAL DEVELOPMENT PLAN

Unless provided for below, the provisions of the City of Wanneroo District Planning Scheme No.2 and the Eglinton Agreed Local Structure Plan No. 82 (ASP 82) apply.

VISION

This Local Development Plan (LDP) is prepared to coordinate development of a vibrant, successful neighborhood centre for Eglinton Village that maximises opportunities for integration with adjoining public open space. The Eglinton Village Neighbourhood Centre will provide much needed services and amenities within a walkable catchment for Eglinton Village residents, whilst also fulfilling the broader community's daily and weekly shopping needs in a convenient and accessible location.

PLANNING AND DEVELOPMENT STANDARDS

Retail Floorspace Provision

- Pursuant to clause 5.3 b) of ASP 82, the retail floorspace provision for the 'Neighbourhood Centre - Marmion' (Eglinton Village Neighbourhood Centre) is increased from 2,051m² to 3,250m². In accordance with the definition of retail net lettable area within District Planning Scheme No.2, the calculation of retail floorspace shall only include those areas used for 'Planning Land use Category 5 - Shop/Retail' i.e. trading floorspace used for shop/retail purposes. This excludes areas that are not used as trading floorspace and that are not accessible to the public such as 'back of house' and storage areas.

Primary Building Edges

Where identified, primary building edges shall:

- Have a nil setback to the footpath.
- Have a continuous frontage with a minimum façade height of 4.5 metres.
- Comprise a minimum 50% glazing for the length of the ground floor façade.
- Provide continuous pedestrian shelter that extends over the adjoining footpath.
- Provide the primary pedestrian access point from the footpath to the adjoining tenancy.

Secondary Building Edges

- Secondary building edges shall enhance the visual presentation of the external wall through the use of features such as glazing (only where conducive to the floor plan and use), alternative colours, finishes and textures and/or intrusions and extrusions in the wall.

Active Building Edges

- Active building edges shall enhance opportunities to activate and engage with the adjoining Town Square through the use of glazing to provide surveillance from internal dining areas, pedestrian access points and weather protection to encourage alfresco dining.

Public Open Space Interface

- Where identified on the LDP, the public open space interface shall be designed to maximise opportunities for surveillance and interaction with the adjoining public open space. This includes the coordination of site levels and facilitating pedestrian connectivity between the Town Square and the adjoining path network within the POS.

Pedestrian Access

- Footpaths adjoining 'Primary Building Edges' are to be a minimum of 3.5 metres wide and establish a strong pedestrian connection from the public open space to the building entry points.
- Priority pedestrian links are to be provided within the carpark in logical and functional locations. Indicative locations are shown on the LDP but shall be confirmed as part of future development applications.

Vehicle Access

- Intersection treatments for vehicle access points to the Neighbourhood Centre are to be provided in accordance with the LDP. Alternative intersection treatments may be considered where a Traffic Impact Assessment is provided to the satisfaction of the City of Wanneroo.

Landscaping

- Landscaping is to be provided in the general locations depicted on the LDP to assist screen external walls and soften the presentation of carpark areas with green edges.
- Where car parking areas abut a street, a 0.5 metre wide landscaped setback between the carpark and boundary is to be provided.
- Car parking areas are to include shade trees at a minimum rate of 1 tree per 6 car bays. Where shade structures are proposed over parking areas, trees shall be provided on the periphery of, or adjacent to, the covered area.

Noise Management

- A development application that includes a 'Loading Dock / Service Area' is to be accompanied by an Acoustic Assessment prepared by a suitably qualified Acoustic Consultant that outlines strategies to mitigate and manage potential impacts of noise from delivery vehicles and activities on surrounding sensitive land uses.

Loading Dock / Service Area

- Suitable measures to screen the loading dock / service area from view when not in use are to be demonstrated at the development application stage.

Future Development Site

- Buildings shall have a nil setback to the Marmion Avenue boundary and provide opportunities for surveillance of the adjoining public realm.
- A strong presentation to the corner of Marmion Avenue and Cinnabar Drive is encouraged through the use of additional building height, façade treatments and signage.
- Buildings abutting or adjacent the Marmion Avenue boundary shall enhance the visual presentation of external walls through the use of features such as glazing (only where conducive to the floor plan and use), alternative colours, finishes and textures and/or intrusions and extrusions in the wall.
- Development adjacent the POS boundary shall maximise opportunities for passive surveillance of the POS from outdoor spaces associated with the land uses and/or the building facade.
- Clause 7 'Secondary Building Edges' applies to walls facing the POS.

NOTES

- The LDP depicts indicative building footprints only for the purpose of spatial site planning. The buildings are subject to more detailed design which will be refined as part of the development application but shall be generally consistent with the LDP.
- The car park designs and locations depicted on the LDP are indicative only for the purpose of spatial planning. The exact configuration and location of car parks is to be refined as part of the development application but shall be generally consistent with the LDP.
- The location and alignment of pedestrian crossings are indicative only and subject to change at the detailed development application stage.
- Landscape drawings are to be submitted with development applications demonstrating compliance with the 'Landscaping' development standards of the LDP.



LEGEND

	LDP Boundary		POS Interface		Left Out Only
	Future Development Site		Town Square		Left In Only
	Loading Dock / Service Area		Indicative Car Park		Left In / Left Out Intersection
	Indicative Building Footprint		Indicative Car Park Aisle		Left In / Right In Intersection
	Primary Building Edge		Priority Pedestrian Link		Left Out / Right Out Intersection (Service / Delivery Vehicles Only)
	Secondary Building Edge		Click and Collect		
	Active Building Edge				



Appendix C WAPC Guideline Checklist

Item	Provided	Comments / Proposals
Summary		
Introduction / Background		
name of applicant and consultant	Y	
development location and context	Y	
brief description of development	Y	
proposal	Y	
key issues	Y	Key issues and opportunities identified throughout TIA
background information	Y	
Existing Situation		
existing site uses (if any)	Y	
existing parking and demand (if appropriate)	N/A	Site currently vacant
existing access arrangements	N/A	Site currently vacant
existing site traffic	N/A	Site currently vacant
surrounding land uses	Y	
surrounding road network	Y	
traffic management on frontage roads	Y	
traffic flows on surrounding roads (usually AM and PM peak hours)	Y	
traffic flows at major intersections (usually AM and PM peak hours)	Y	
operation of surrounding intersections	Y	Modelling results provided in Analysis of transport networks chapter
existing pedestrian/cycle networks	Y	
existing public transport services surrounding the development	Y	
crash data	Y	
Development Proposal		
regional context	Y	
proposed land uses	Y	
table of land uses and quantities	Y	Bullet point list provided
access arrangements	Y	
parking provision	Y	To be confirmed at Development Application Stage
end of trip facilities	Y	To be confirmed at Development Application Stage
any specific issues	Y	
road network	Y	
intersection layouts and controls	Y	
pedestrian/cycle networks and crossing facilities	Y	No changes proposed as part of development
public transport services	Y	No changes proposed as part of development



Item	Provided	Comments / Proposals
Integration with surrounding area		
surrounding major attractors/ generators	Y	
committed developments and transport proposals	Y	
proposed changes to land uses within 1200 metres	Y	
travel desire lines from development to these attractors/ generators	Y	
adequacy of existing transport networks	Y	
deficiencies in existing transport networks	Y	
remedial measures to address deficiencies	Y	
Analysis of transport networks		
assessment years	Y	
time periods	Y	
development generated traffic	Y	
distribution of generated traffic	Y	
parking supply and demand	N/A	To be confirmed at Development Application stage
base and 'with development' traffic flows	Y	
analysis of development accesses	Y	
impact on surrounding roads	Y	
impact on intersections	Y	
impact on neighbouring areas	Y	
road safety	Y	
public transport access	Y	
pedestrian access/amenity	Y	
cycle access/amenity	Y	
analysis of pedestrian/cycle networks	Y	
safe walk/cycle to school (for residential and school site developments only)	N/A	
traffic management plan (where appropriate)	N/A	
Conclusions		