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Point Grey

Proposed Local Structure Plan

Transport Impact Assessment

PREPARED FOR:
Point Grey Development Company Pty Ltd
July 2024

Document history and status

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1 Introduction and Background

This Transport Impact Assessment (TIA) report has been prepared by Transcore for Point Grey Development Company Pty Ltd. The subject of this report is the proposed Local Structure Plan (LSP) for Point Grey.

Transcore prepared a TIA for the Point Grey Outlined Development Plan (ODP) in November 2009. The November 2009 TIA outlined the proposed land uses in the ODP area and estimated the future traffic volumes anticipated on the internal and external road network of the ODP area. A copy of the approved ODP is included in **Appendix A**.

Transcore also prepare a TIA for the proposed Marina Village Activity Centre in August 2020. It is our understanding that the Shire of Murray have amended their Town Planning Scheme No. 3 to make 'Marina' a non-permitted use on the Point Grey site. Accordingly, an updated LSP has been prepared to replace the Marina Village Precinct with a traditional Neighbourhood Centre.

The purpose of this TIA is to is to evaluate the traffic impact of the proposed LSP. This TIA report will determine the traffic generation and distribution patterns of the proposed LSP. The performance of the existing Greenlands Road/Forrest Highway intersection will be investigated to establish the available spare capacity at the intersection and determine the extent of development progress within the proposed LSP before future upgrades (in the form of an interchange) are provided at this intersection.

The proposed LSP is situated approximately 20km west of the Pinjarra Townsite and 12km southeast of the Mandurah City Centre. The site location is shown in **Figure 1**. The site in context of the Peel Regional Scheme (PRS) is shown in **Figure 2**.

Figure 1: Location of the subject site

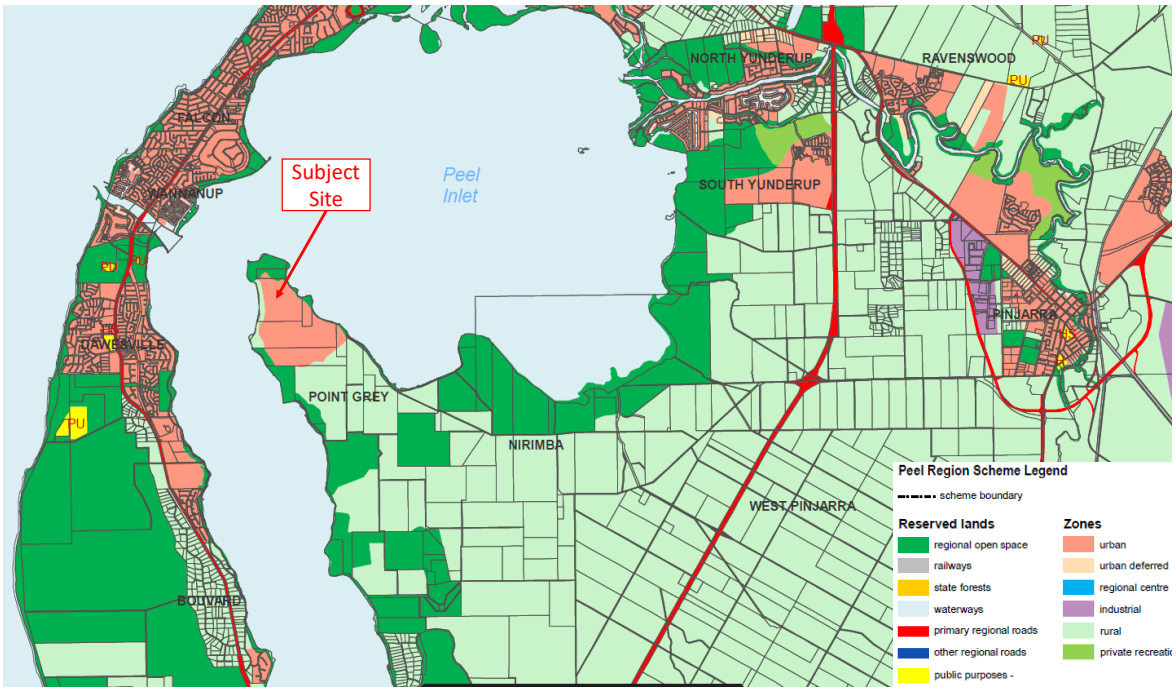


Figure 2: Peel Regional Scheme map

2 Proposed Local Structure Plan

The proposed Point Grey LSP is provided in **Appendix B**. Overall, the Point Grey LSP appears to envision a mixed-use community with a balanced program of residential, commercial, and tourism-oriented elements, designed to create a vibrant and sustainable new development. Key elements of the proposed Point Grey LSP are provided below:

Residential:
The LSP provides approximately 2,650 residential dwellings. The majority of these (77%) will be single-family homes, with the remaining dwellings divided between terrace/villa homes (17%) and apartments (6%). This mix provides a diverse range of housing options to serve different demographics and family types within the development.

Commercial and Retail:
The proposed LSP includes 8,000 sqm of retail space, likely organised into a neighbourhood centre to serve the daily needs of residents. An additional 2,000 sqm of general commercial space is also proposed, providing opportunities for employment, services, and other non-retail uses.

Tourism:
A key component is a 150-key resort development, featuring hotel rooms, villas, a conference centre, restaurant, and spa. This will anchor the tourism and hospitality offerings. Complementary uses include food and beverage venues, a regional playground, access to the nearby estuary, and an indigenous cultural centre. These amenities are intended to attract visitors and support the area's tourism economy.

Construction and Phasing:
The proposed LSP is expected to commence construction in 2030. The lot uptake is projected to be 80-100 lots per year, indicating a gradual, phased buildout over several years to accommodate demand and market absorption.

The proposed Point Grey LSP is expected to be 50% developed by the year 2041. The traffic modelling and analysis undertaken for this project indicates that the existing configuration of the Greenlands Road (west) / Forrest Highway intersection would be sufficient to accommodate the traffic generated by the 50% development of the LSP, as well as general traffic growth on Forrest Highway.

However, beyond 2041, upgrades in the form of a grade-separated interchange would be expected at the Greenlands Road (west) / Forrest Highway intersection.

It should be noted that any upgrades at this intersection should also consider the potential improvements at the Greenlands Road (east) / Forrest Highway intersection. Review of the traffic counts shows that the Greenlands Road (east) intersection is busier than the Greenlands Road (west) intersection, and it is likely that the

requirement for the interchange would be triggered by the Greenlands Road (east) / Forrest Highway intersection.

Once the necessary grade-separated interchange upgrades are provided at these key intersections, the proposed Point Grey LSP can be progressed to full development.

3 Existing Situation

The site is currently a vacant land.

3.1 Existing Road Network

The existing surrounding road network and their classification in the Main Roads WA functional road hierarchy is illustrated in **Figure 3**.

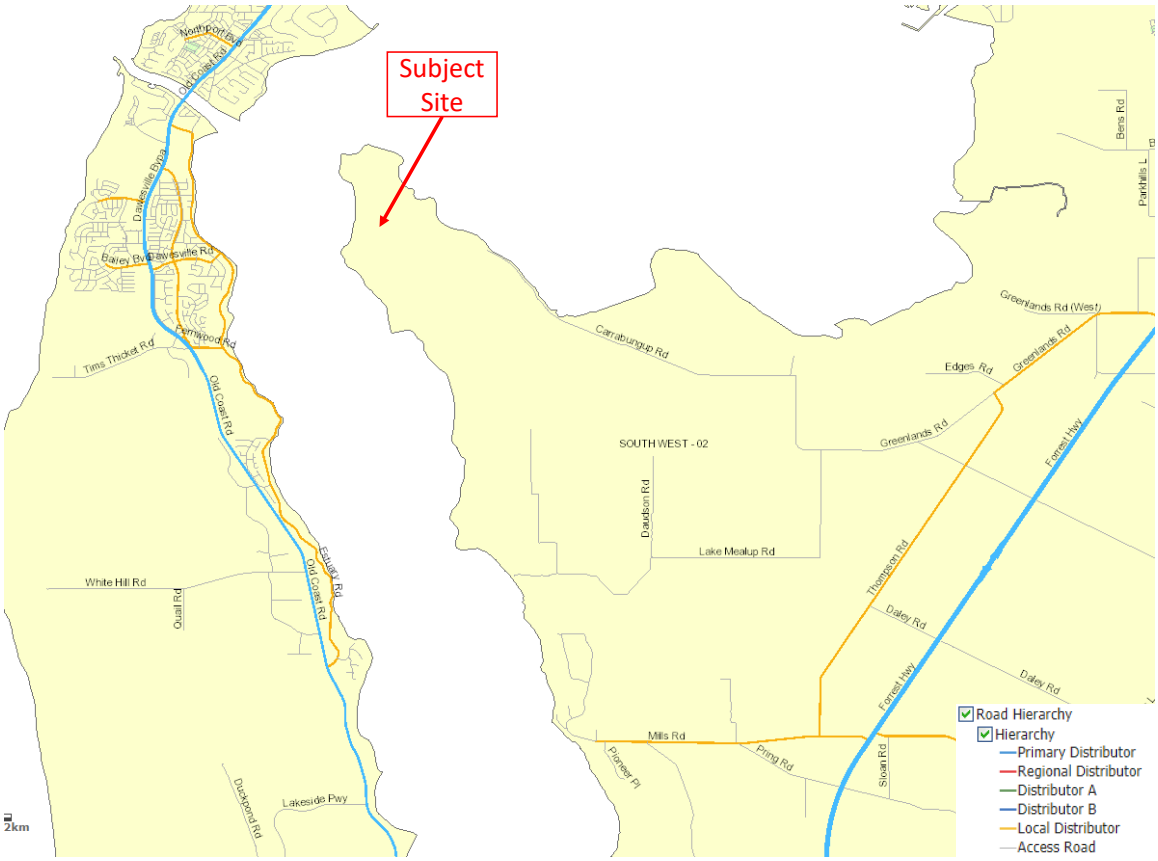


Figure 3: Existing road hierarchy

The existing standard of the intersection of Greenlands Road (west)/ Forrest Highway is illustrated in **Figure 4**. As evident the wide median along Forrest Highway allows for right turn movements out of Greenlands Road to occur in two stages. Separate left and right turn lanes are provided on Greenlands Road and appropriate turn lanes are also in place on Forrest Highway at the intersection.

Figure 4: Existing standard of the intersection of Greenlands Road (west)/ Forrest Highway

3.2 Existing Traffic Volumes

Existing average weekday traffic (AWT) volumes on the surrounding roads have been obtained from Main Roads WA and are illustrated in **Figure 5**.

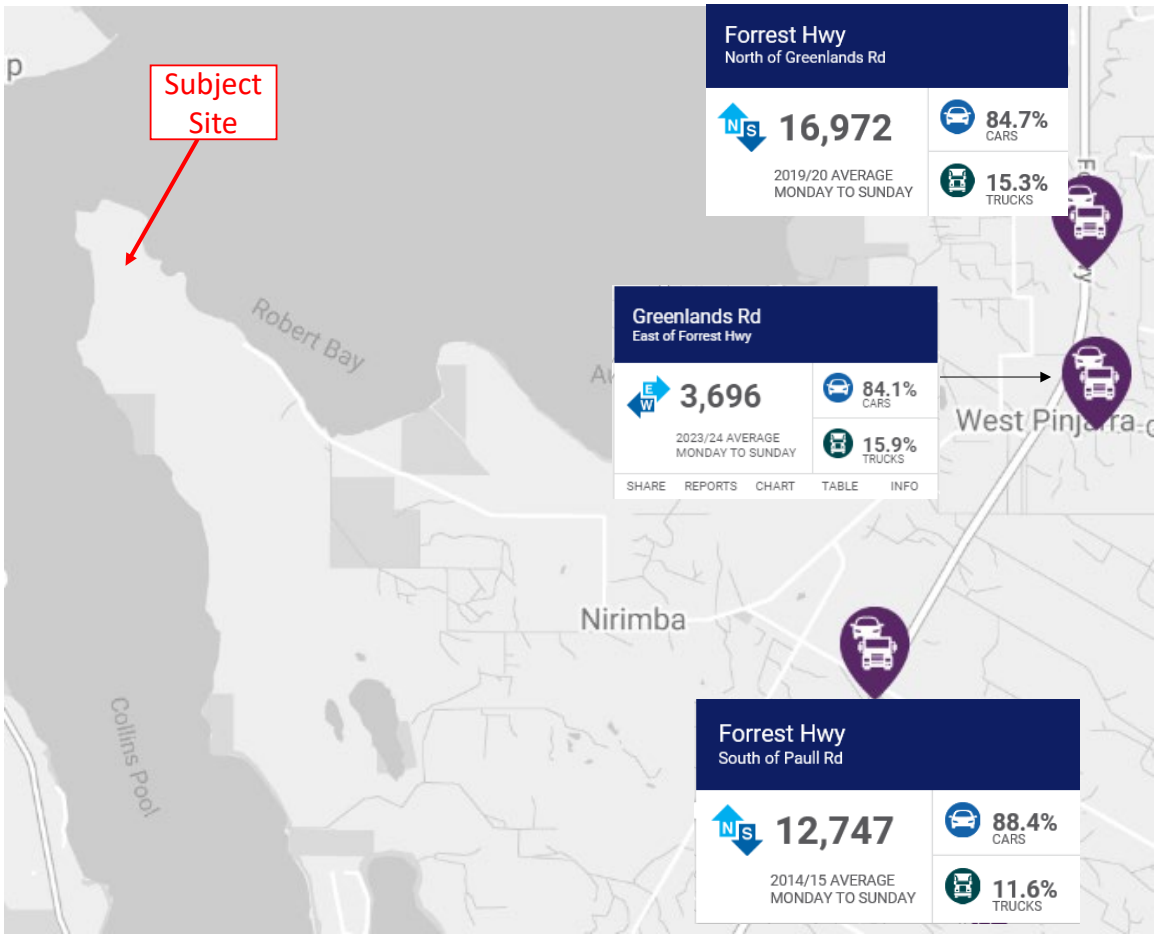


Figure 5: Existing traffic volumes

The existing turning counts at the intersection of Forrest Highway/ Greenlands Road (west) were manually recorded by Transcore (video survey) on Friday 12 June 2020. Review of the manual traffic counts indicates that Greenlands Road to the west of the Forrest Highway carried less than 50vph in 2020. The traffic volume on this road is not anticipated to have changed since 2020.

The latest traffic counts on Forrest Highway/ Greenlands Road (east) have also been sourced from Main Roads WA dated 16 February 2024 which is presented in **Figure 6**. For the purposes of the SIDRA analysis, the June 2020 traffic counts on Forrest Highway were adjusted and uplifted to align with the February 2024 counts.

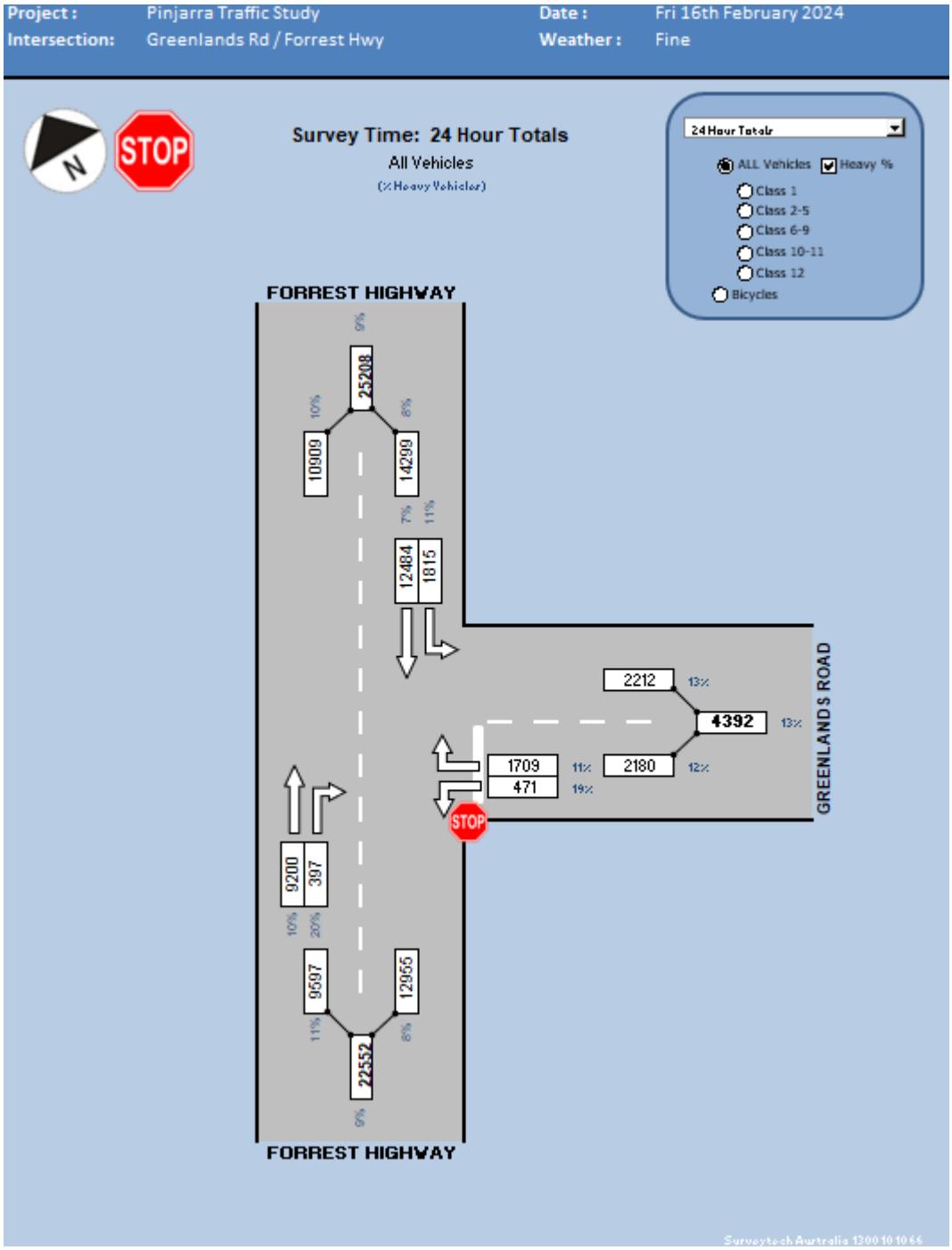


Figure 6: Existing traffic counts at Forrest Road/ Greenlands Road (East)

3.3 Heavy Vehicles

Restricted Access Vehicle (RAV) Network routes are designated for access by large heavy vehicle combinations, which are managed by Main Roads WA. Forrest Highway and Greenlands Road form part of RAV Tandem Drive Network 4 as shown in **Figure 7**. The RAV 4 Network classification permits a variety of prime mover and trailer combinations, up to a maximum length of 27.5m.

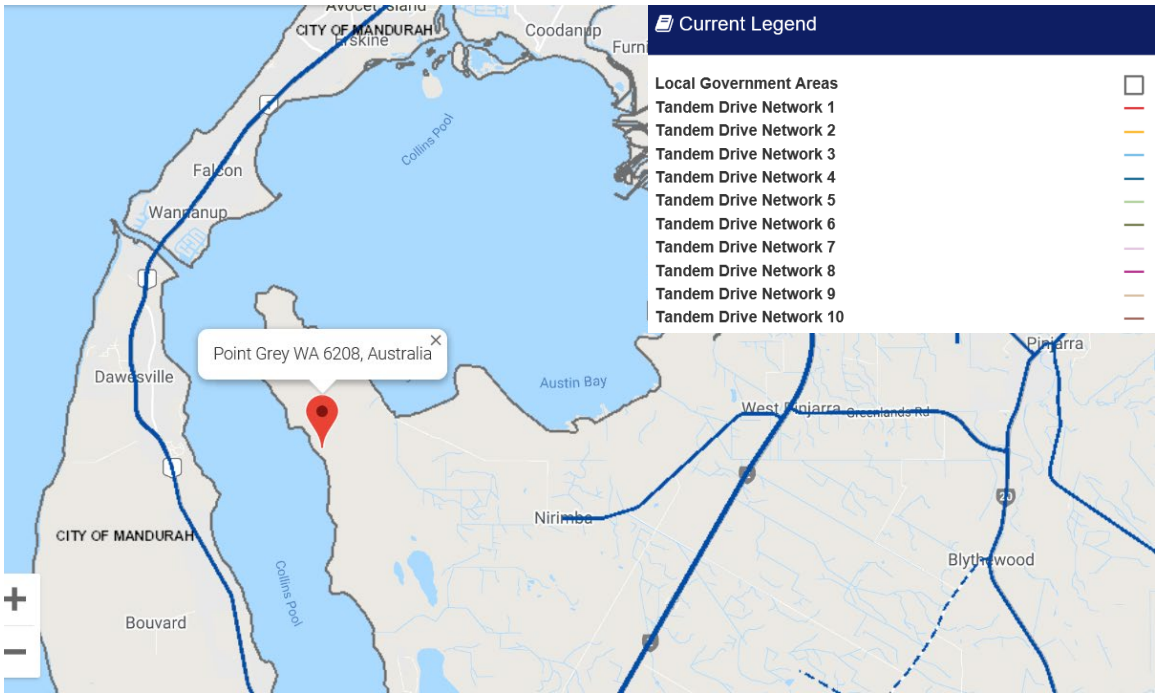


Figure 7: RAV network

3.4 Public Transport

There are currently no public transport services to or from the proposed LSP area.

3.5 Pedestrian and Cyclist Facilities

The subject site is in developing stage and therefore no pedestrian and cyclist facilities are currently available.

3.6 Crash Data

Information available on the Main Roads WA website indicates that the intersection of Forrest Highway and Greenlands Road (171621) in the vicinity of the subject site recorded a total of 5 road crash with 2 casualties during the five-year period ending in December 2023 as illustrated in Table 1.

Table 1. Crash statistics for Forrest Hwy/Greenlands Rd intersection (171621)

Intersection				Total Crashes	Casualty
Forrest Hwy/Greenlands Rd (171621)				5	2
Right angle	Right turn thru	PDO Major	Medical	Dawn or Dusk	Wet
2	3	2	1	0	1

3.7 Changes to the Surrounding Road Network

The road network changes in the locality based on the Transport Network Perth and Peel@3.5million is shown in **Figure 8**.

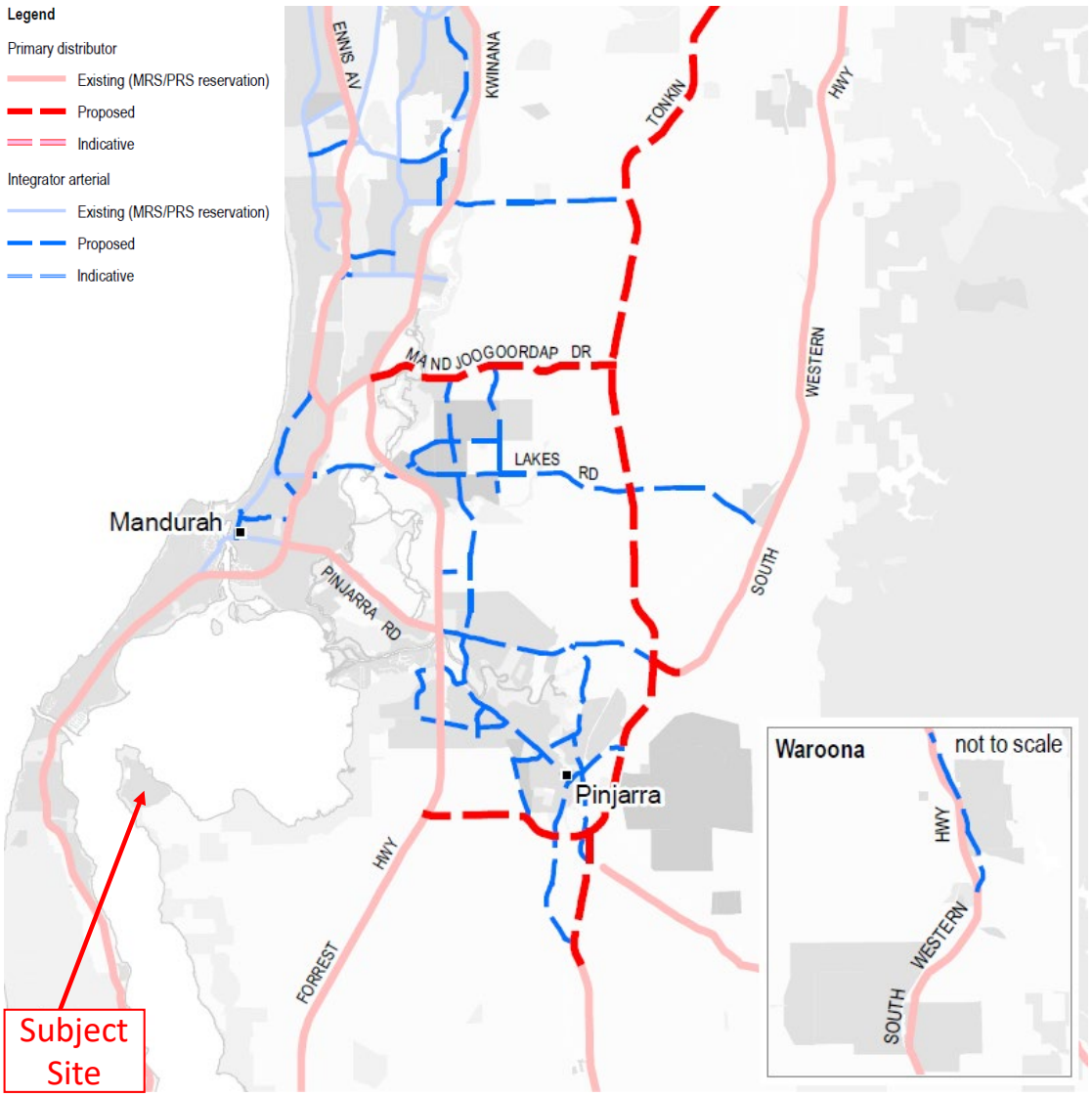


Figure 8: Changes to the road network

According to the information obtained from Main Roads WA, the intersection of Forrest Highway/ Greenlands Road is *"ultimately planned to become a 4-way grade separated interchange (likely dumbbell layout) however the timing to secure funding to finalise the designs and construct this intersection is currently not clear and subject to future state and federal budgetary processes. There may also be some consideration being given for a west bound (Greenlands) to south bound (Forrest) left acceleration lane in the medium term as a potential interim measure".*

3.8 Public Transport Network Planning

There are currently no public transport services to or from the LSP area however, there is potential for future bus services to connect Point Grey to Pinjarra and for a future ferry service to connect Point Grey to Mandurah City Centre. Currently a school bus service operates along Carrabungup Road and this service would be extended to Point Grey to service children attending secondary school in Pinjarra.

4 Proposed Internal Transport Network

4.1 Road Hierarchy

The proposed hierarchy of roads within the proposed LSP area is illustrated in **Figure 8**. The proposed road hierarchy was based on traffic projections and the road classification of the WAPC Liveable Neighbourhoods guidelines (2007).

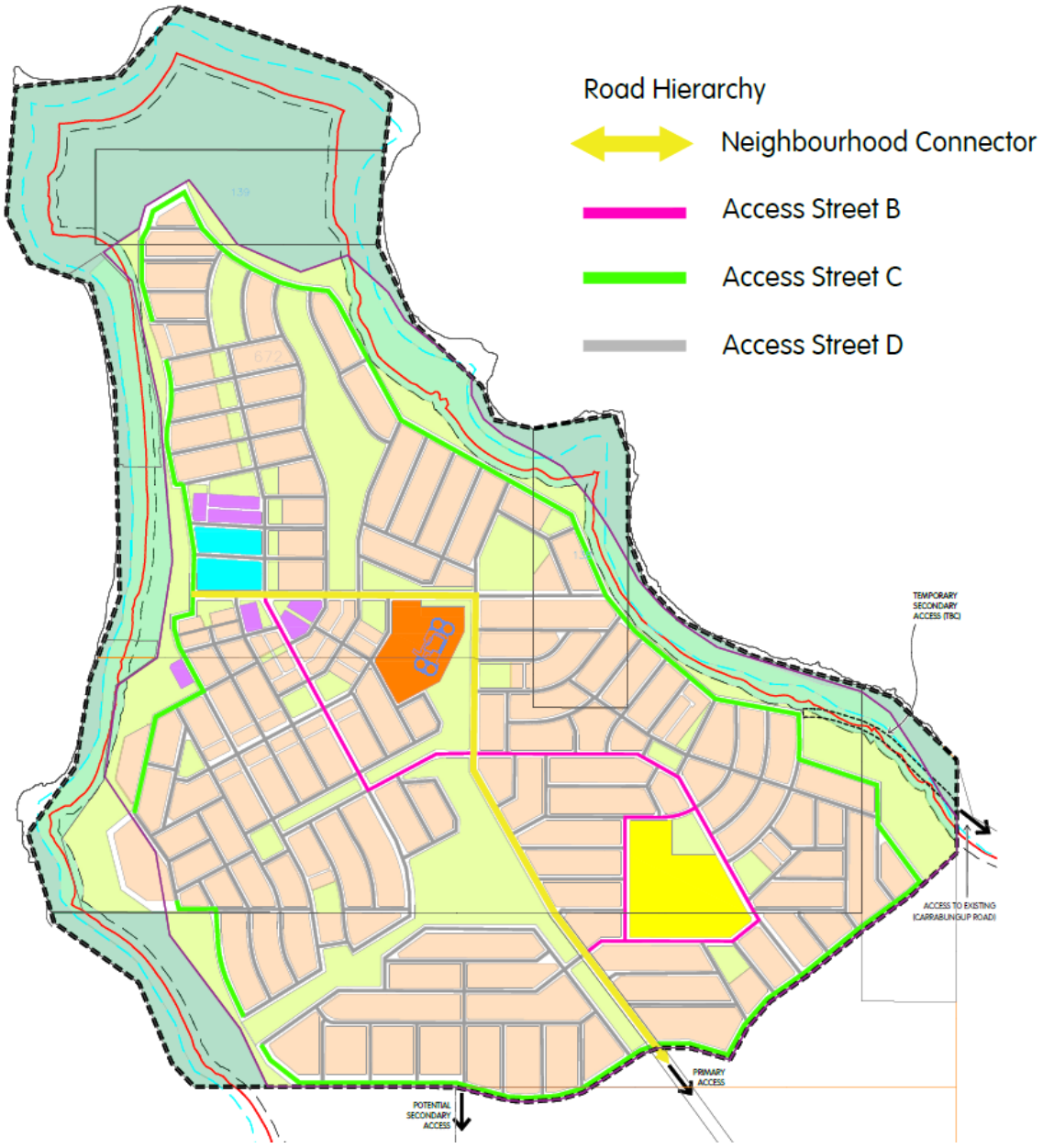


Figure 9: Proposed road hierarchy

Some key characteristics of the relevant road classifications have been summarised in Table 4. These are generally based on Liveable Neighbourhoods (LN) guidelines.

Table 2: Key characteristics for the proposed LSP area road classifications

Road Classification	Indicative upper volume (vpd)	Indicative road reserve width (m)	Indicative road pavement width (m)
Neighbourhood Connector A	7,000	25m	2 x 5m (incl. cycle lanes), 2m median and embayed parking
Access Street B	3,000	15m in town centre and 20m elsewhere	5.5m and embayed parking
Access Street C	3,000	16m	6m (plus embayed parking) or 7.2m (with no embayed parking)
Access Street D	1,000	15m	6m

It should be noted that the outlined reservation widths are indicative only and are subject to specific circumstances including preservation of trees within the road reserves, interfaces with town centre development / foreshore reserves / public open space etc and further adjustment in consultation with the Department of Planning, Lands and Heritage (DPLH) and Shire of Murray during the detailed subdivision design process. It is anticipated that the typical road cross sections agreed with the Shire for the approved ODP area will continue to form the basis for local road network development of the LSP area.

Neighbourhood Connectors

The section of Entry Road inside the LSP area would be constructed as neighbourhood connector A road. The proposed neighbourhood connector A road would provide access/ egress to the village centre. This road would be able to accommodate potential future buses within the LSP area.

Access Streets

The majority of the proposed LSP area internal roads are classified as Access Streets C and D. The typical Access Street cross section entails 4.7m verges on both sides, with embayed parking provided in the verges as appropriate, such as for visitor parking for rear loading lots. The proposed cross section of the Access Streets should be consistent with the agreed cross sections of Access Streets within the approved ODP area. The continuation of Carrabungup Road inside the LSP area would be classified as Access Street C.

4.2 Pedestrian and Cyclist Facilities

Figure 10 outlines the proposed pedestrian and cyclist network for the proposed LSP area. The proposed pedestrian and cyclist facilities aim to provide a permeable road network within the LSP area and create excellent opportunities for the provision of good pedestrian and cyclist facilities that maximise the use of non-motorised transport modes.

According to Liveable Neighbourhood Guidelines on road cycle lanes are proposed on Neighbourhood Connector A roads. Shared paths are proposed along the Neighbourhood Connector A roads and adjoining the POS as shown in Figure 10. Footpaths will also be provided on at least one side of all roads within the LSP area.

Figure 10: Proposed shared path network

4.3 Integration with Surrounding Area

The proposed LSP has been designed to integrate with the adjacent estuary environment and is in line with the previously approved ODP.

5 Analysis of the Transport Network

5.1 Assessment Period

The assessment year that has been adopted for this analysis is 2041 with the following assumptions:

- The development of the proposed LSP area would start in 2031;
- By 2041 approximately 50% of the LSP area would be developed; and,
- By 2041 the existing intersection of Greenlands Road/ Forrest Highway has not yet been upgraded to interchange.

In order to determine the appropriate road hierarchy and standards for the LSP area's road network and the access road, the trip generation of the ultimate development has been established and utilised.

5.2 Traffic generation and distribution

The daily traffic generation rate used for this transport assessment is 8 vehicle trips per day (vpd) per dwelling, which corresponds to peak hour trip generation rates of 0.8vph per dwelling recommended in the Western Australian Planning Commission (WAPC) *Transport Impact Assessment Guidelines* (2016). The trip rate of 8vpd per dwellings is slightly higher than the 6.25vpd per dwellings used for the ODP area to provide a more conservative and robust assessment.

The trip generation of the proposed apartments, hotel rooms and villas were established by reviewing the "*Guide to Traffic Generating Developments, Roads and Traffic Authority (RTA) of New South Wales*" document and the updated traffic survey (TDT 2013/2014).

Same Guideline were used for establishing the trip rates of the proposed retail/ commercial land uses within the proposed LSP area.

For the proposed primary school, the trip rate used is 1.0 vph per student during before and after school peak periods (typically 8-9am and 3-4pm) and 2vpd per student overall. For this assessment the Education Department's standard 540 student primary school design has been assumed, so this primary school is assumed to attract traffic flows of 1080vpd.

The LSP is situated in a tourism/coastal development area, which is expected to attract a diverse demographic profile of residents and visitors including second/holiday home owners and short-stay tourists which reduces the home occupancy ratio in Point Grey. Currently the occupancy ratio of dwellings within Shire of Murray is about 87.9% in

accordance with 2021 census data[1]. It is expected that the occupancy ratio of the Point Grey LSP area would be less than 87.9% however, conservatively the same ratio was applied to the proposed residential dwellings of the LSP area. For hotels and villas, the occupancy rate is estimated to be 65.9% in accordance with the Western Australia South-West accommodation performance sourced from Tourism Western Australia[2].

Further, by providing a wide range of residential, commercial, tourism, and community amenities within the LSP boundaries, it is expected that a high degree of internal trips and self-sufficiency can be achieved. Residents and visitors will have access to services, employment, recreation, and leisure opportunities without needing to travel outside the LSP which support the self-sufficiency and internal trip capture of the Point Grey community.

The percentage of internal trips for the proposed attractors within the proposed LSP area (retail/commercial and school) is estimated to be approximately 85.2% according to the information provided by Pracsys.

Table 5 and **Table 6** summarise the trip generation of the proposed LSP area for the 100% and 50% development respectively.

The proposed LSP area is estimated to ultimately generate a total of approximately 28,403 trips per typical weekday, including both inbound and outbound trips. Out of this total, approximately 18,530 trips would be internal to the LSP area, with the remaining trips being external.

By the year 2041, when the development is estimated to be 50% complete, the internal and external trip figures would be around 50% of the ultimate totals.

The projected traffic volumes on the Entry Road are estimated to be 5,000 vpd in 2041. After full development of the LSP area, the traffic volumes on the Access Road are expected to increase to approximately 10,000 vpd.

[1] https://abs.gov.au/census/find-census-data/quickstats/2021/LGA56230

[2] https://www.parliament.wa.gov.au/parliament/commit.nsf/(Report+Lookup+by+Com+ID)/42EE6EB7C8AF9C454825847E000FDA9D/$file/SSA+Report+-+FINAL+-+Online+version+with+cover.pdf

Table 3: Trip generation of the proposed LSP (100% development)

Typical Weekday (full development)												External Trips			
Land use	Quantity	Occupancy/ utilisation	Daily Rate	Weekd-AM 7 to 8	Weekd-PM 5 to 6	Daily Trips (total)	Internal trips (%)	Daily Trips (Internal)	Daily Trips (External)	Weekd-AM 7 to 8	Weekd-PM 5 to 6	Weekd-AM		Weekd-PM	
												IN	OUT	IN	OUT
Commercial/ office	2000	1	0.11	0.02	0.01	220	0.85	187	33	5	4	4	1	1	3
Retail	8,000	1	1.2	0.03075	0.123	9600	0.85	8160	1440	37	148	18	19	74	74
Hotel/ Resort (rooms)	150	0.66	2	0.2	0.2	198	0.53	105	93	9	9	2	7	7	2
Single Dwellings	2075	0.88	8	0.8	0.8	14608	0.53	7732	6876	688	688	172	516	430	258
Terrace/ Villa	425	0.66	8	0.8	0.8	2244	0.53	1188	1056	106	106	26	80	66	40
Apartments	150	0.66	4.58	0.53	0.5	453	0.53	240	213	25	23	6	19	15	8
Primary school	540	1	2	1	0	1080	0.85	918	162	81	0	16	65	0	0
TOTAL TRAFFIC						**28403**		**18530**	**9873**	**950**	**977**	**244**	**706**	**593**	**384**

Table 4: Trip generation of the proposed LSP (50% development)

Typical Weekday (50% development)												External Trips			
Land use	Quantity	Occupancy/ utilisation	Daily Rate	Weekd-AM 7 to 8	Weekd-PM 5 to 6	Daily Trips (total)	Internal trips (%)	Daily Trips (Internal)	Daily Trips (External)	Weekd-AM 7 to 8	Weekd-PM 5 to 6	Weekd-AM		Weekd-PM	
												IN	OUT	IN	OUT
Commercial/ office	1000	1	0.11	0.02	0.01	110	0.85	94	17	2	2	2	0	0	2
Retail	4,000	1	1.2	0.031	0.123	4800	0.85	4080	720	18	74	9	9	37	37
Hotel/ Resort (rooms)	75	0.66	2	0.2	0.2	99	0.53	52	47	5	5	1	4	4	1
Single Dwellings	1,038	0.88	8	0.8	0.8	7304	0.53	3866	3438	344	344	86	258	215	129
Terrace/ Villa	213	0.66	8	0.8	0.8	1122	0.53	594	528	53	53	13	40	33	20
Apartments	75	0.66	4.58	0.53	0.5	227	0.53	120	107	12	12	3	9	7	5
Primary school	270	1	2	1	0	540	0.85	459	81	41	0	8	33	0	0
TOTAL TRAFFIC						**14202**		**9265**	**4937**	**475**	**488**	**122**	**353**	**296**	**192**

5.3 Traffic Flow Forecasts

5.3.1 Internal Roads

The projected daily traffic volumes on the LSP internal road network are illustrated in Figure 11.

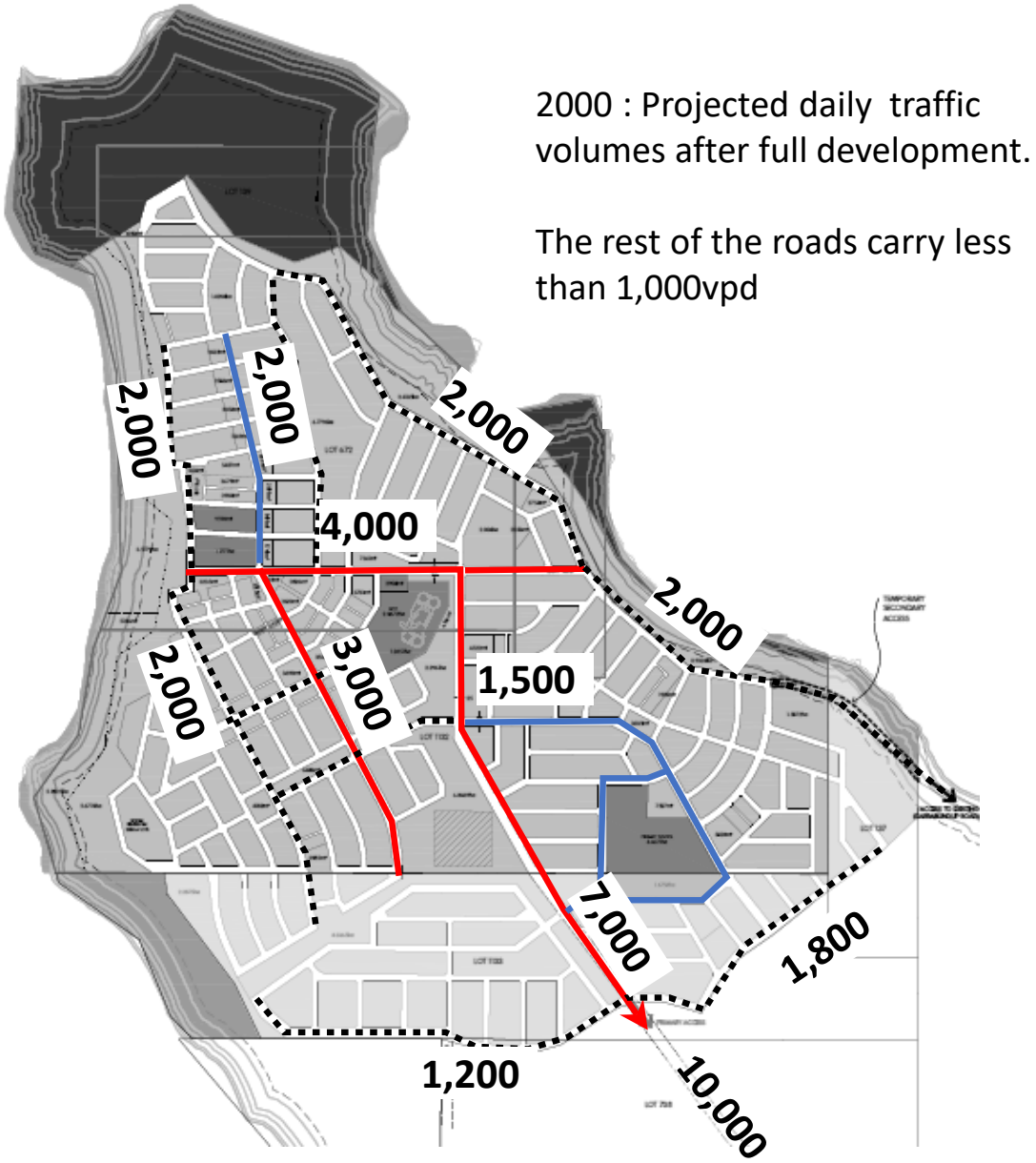


Figure 11: Projected daily traffic volumes after full development of the LSP

5.3.2 Entry Road

The projected traffic volume on Entry Road is about 10,000vpd after full development of the LSP area. The 50% development of the LSP area by 2041 is estimated to generate about 5,000vpd on the Entry Road.

In order to establish the peak hour traffic projections on the Entry Road in 2041 and the turning volumes at the intersection of Greenlands Road (west)/ Forrest Highway the existing traffic counts at the intersection were recorded and added to the LSP area traffic after 50% development.

The existing turning counts at the intersection of Forrest Highway/ Greenlands Road were manually recorded by Transcore in June 2020 using video survey. **Figure 11** illustrates the existing traffic counts at the intersection. The latest traffic counts on Forrest Highway/ Greenlands Road (east) have also been sourced from Main Roads WA dated 16 February 2024 which indicated higher traffic volumes on Forrest Highway in February 2024 than June 2020. For the purposes of the SIDRA analysis, the June 2020 traffic counts were adjusted and uplifted to align with the February 2024 counts.

Figure 12 shows the adjusted existing June 2020 traffic counts on Forrest Highway.

The total traffic for the assessment year of 2041 includes the existing adjusted background traffic plus the LSP traffic. For year 2041 a 2% annual traffic growth was applied to the background traffic.

Figure 13 and **Figure 14** illustrate the total weekday AM and PM peak hour traffic projections in 2041.

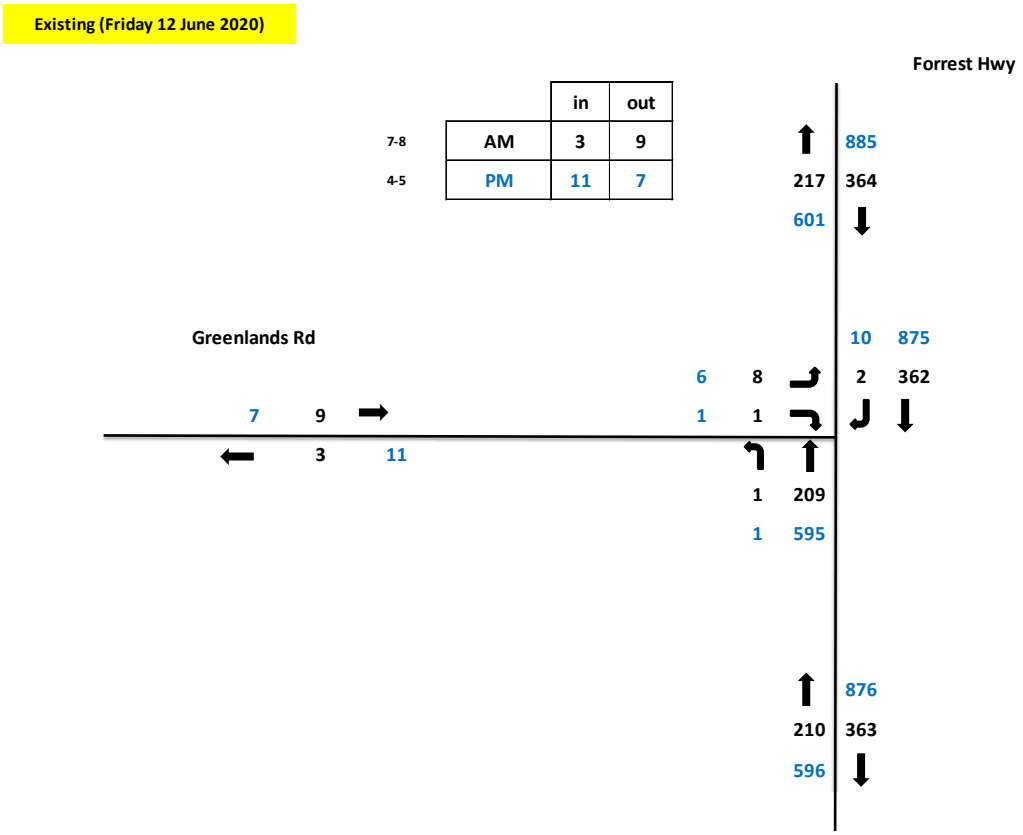


Figure 12: Existing traffic counts at the intersection AM and PM peak hours

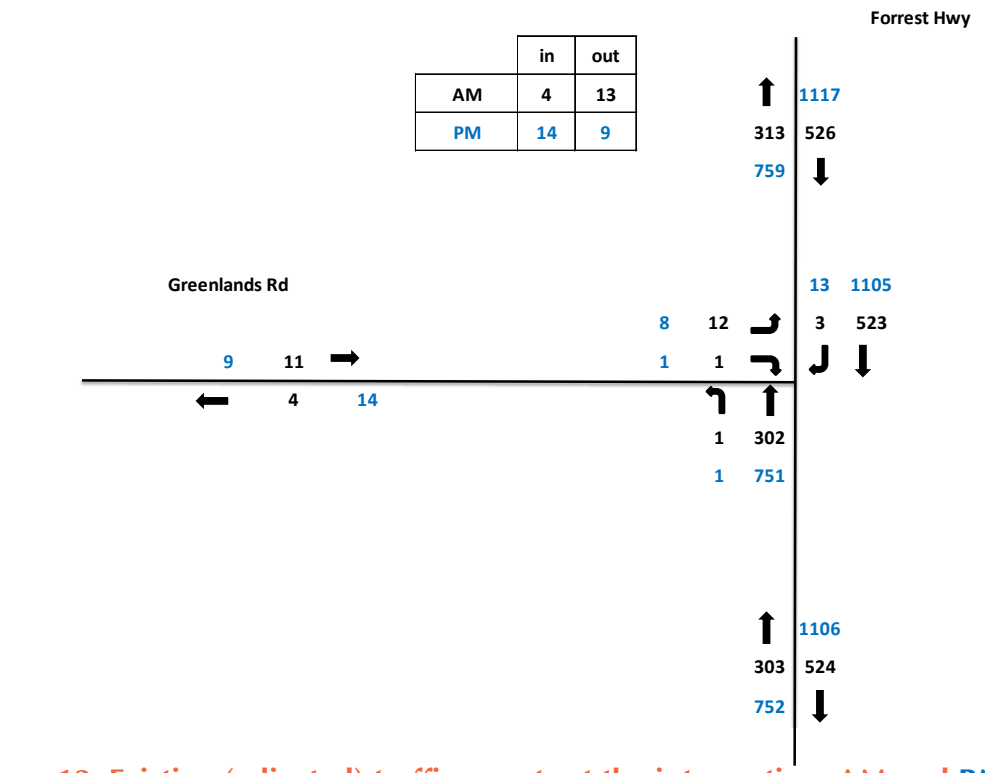


Figure 13: Existing (adjusted) traffic counts at the intersection, AM and PM peak hours

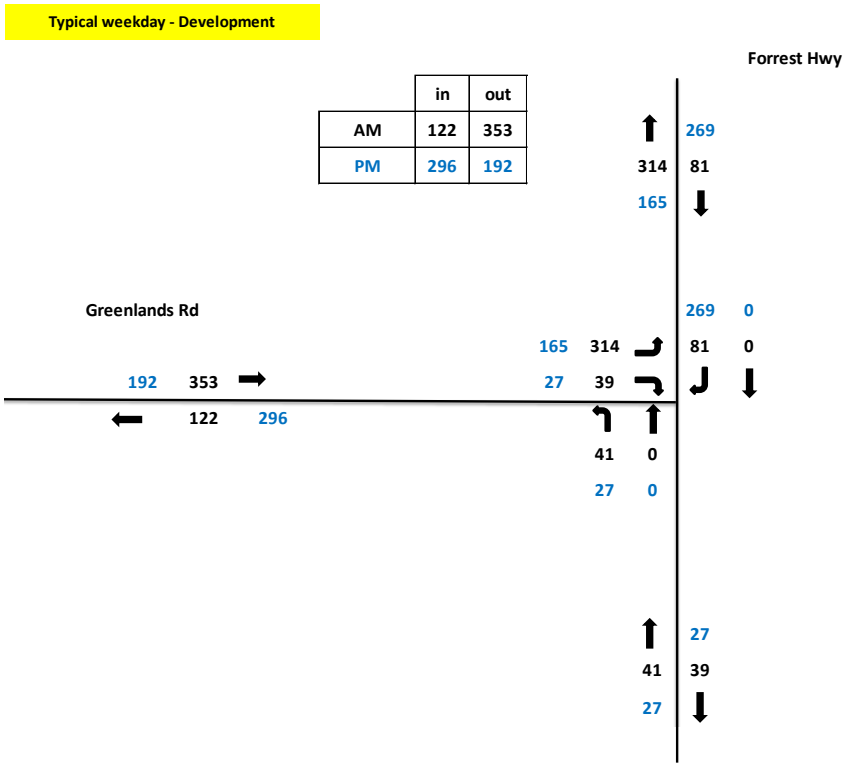


Figure 14: 50% development traffic – typical weekday AM and PM peak hours

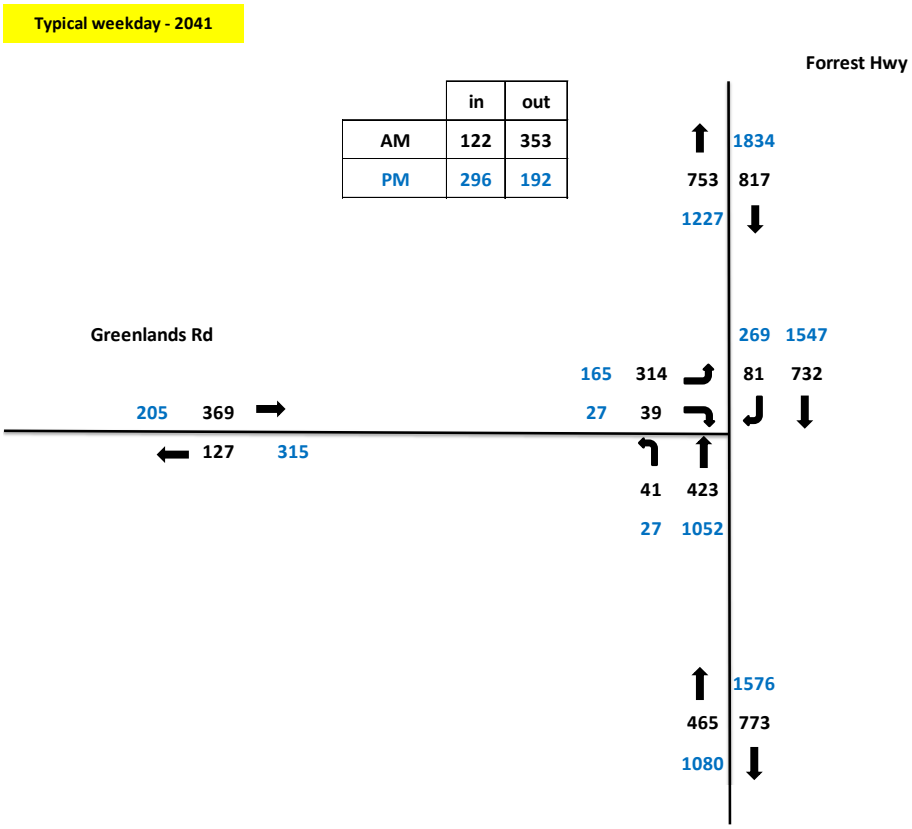


Figure 15: 2041 traffic – typical weekday AM and PM peak hours

5.4 Intersection Analysis

The operation of the intersection of Forrest Highway/ Greenlands Road (west) was analysed in SIDRA for the weekday AM and PM peak hours for existing and year 2041 (with 50% of the LSP traffic).

Capacity analysis was undertaken using the SIDRA computer software package. SIDRA is an intersection modelling tool commonly used by traffic engineers for all types of intersections. SIDRA outputs are presented in the form of Degree of Saturation, Level of Service, Average Delay and 95% Queue. These characteristics 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 Degree of Saturation ranges from close to zero for varied traffic flow up to one for saturated flow or capacity.
- **Level of Service (LoS)**: is the qualitative measure describing operational conditions within a traffic stream and the perception by motorists and/or passengers. In general, there are 6 levels of service, designated from A to F, with Level of Service A representing the best operating condition (i.e. free flow) and Level of Service F the worst (i.e. forced or breakdown flow).
- **Average Delay**: is the average of all travel time delays for vehicles through the intersection.
- **95% Queue**: is the queue length below which 95% of all observed queue lengths fall.

The results of the SIDRA analysis are attached in **Appendix D** and briefly discussed in the following paragraphs. The intersection layout modelled in SIDRA is shown in **Figure 16**.

The SIDRA analysis results and site observations (video survey undertaken by Transcore for Friday 12/06/2020) indicate that the intersection presently operates satisfactorily and with good level of service and with almost no queues and delays during the peak hours.

The SIDRA assessment for year 2041 during AM (7:00-8:00) and PM (400: -5:00) peak periods indicated that the existing standard of the intersection would be able to accommodate the 50% build out of the LSP area. Some level of queues for the right turns in from Forrest Highway to Greenlands Road during the PM peak hour was reported but the reported queues would be accommodated within the existing right turn pocket along Forrest Highway.

It is therefore concluded that the existing standard of the intersection of Forrest Highway/ Greenlands Road is sufficient to accommodate the 50% build out of the Mastre Plan area, and general traffic growth along Forrest Highway by year 2041.

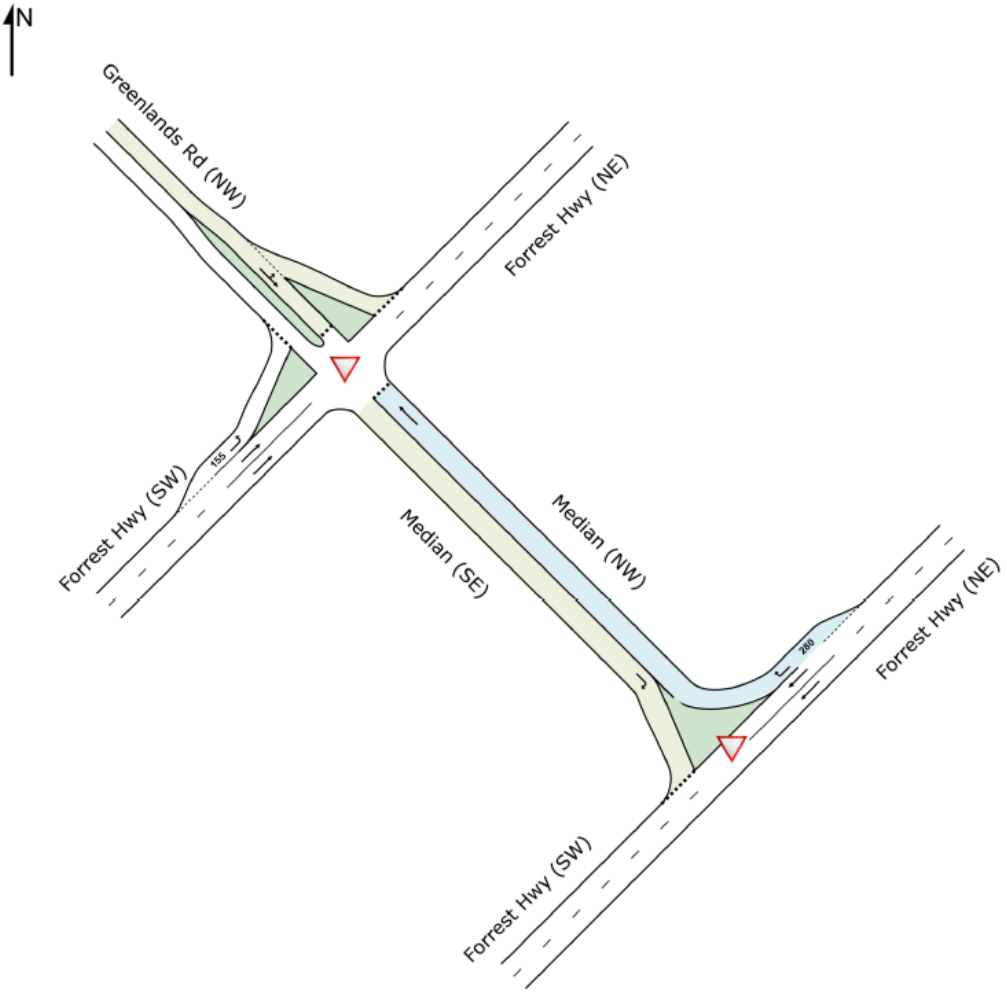


Figure 16: Modelled intersection layout in SIDRA

However, beyond 2041, upgrades in the form of a grade-separated interchange would be expected at the Greenlands Road (west) / Forrest Highway intersection.

It should be noted that any upgrades at this intersection should also consider the potential improvements at the Greenlands Road (east) / Forrest Highway intersection.

Once the necessary grade-separated interchange upgrades are provided at these key intersections, the proposed Point Grey LSP can be progressed to full development.

5.5 Entry Road standard

The projected traffic volume on Entry Road is expected to be more than 3,000vpd after 50% development of the LSP area in a typical weekday. Table 4.5 of the Austroads Guide to Roads Design Part 3: Geometric Design provides information on widths for single carriageway rural roads. According to this table (refer **Table 5**), the future standard of these roads as a rural road should include 2x3.5m traffic lanes plus shoulder width of 2.5m including 1.5m sealed shoulder on each side of the roads between the LSP area and Forrest Highway.

Table 5: Single carriageway rural road widths

Element	Design AADT				
	1-150	150-500	500-1,000	1,000-3,000	>3,000
Traffic Lanes	3.5m (1x3.5)	6.2m (2x3.1)	6.2-7.0m (2x3.1/3.5)	7.0m (2x3.5)	7.0m (2x3.5)
Total Shoulder	2m	1.5m	1.5m	2m	2.5m
Shoulder Seal	0.5m	0.5m	0.5m	1m	1.5m

It is our understanding that the LSP development occurs in different stages. Therefore, the proposed upgrades for each stage of the development would be established by the projected traffic volumes on different sections of Entry Road.

The ultimate alignment of the Entry Road to the Point Grey ODP area is identified in the Shire of Murray approved Access Road Construction Management Plan which involves the construction of approximate twelve kilometres, 30m wide reservation between Forrest Highway/ Greenlands Road West intersection and Point Grey ODP area.

It is our understanding that the 30-meter road reserve for the Entry Roadwas initially established during the Outline Development Plan (ODP) assessment. This wider reserve was intended to accommodate potential overtaking lanes, due to the expected heavy vehicle traffic associated with the originally proposed Marina Village Precinct and boat pens.

However, the updated Point Grey LSP has replaced the Marina Village Precinct with a more traditional Neighbourhood Centre. As a result, the need for overtaking lanes on the Entry Road is no longer required which in turn would result in narrower road reserve. Therefore, it is suggested that the final alignment and reservation width of the proposed Entry Road should be further investigated and refined during the subsequent stages of the development process. The 30-meter road reserve may no longer be necessary and could potentially be reduced, based on the updated LSP and revised traffic projections.

The final alignment and reservation of the Entry Road should be revisited and optimised as the development progresses, to ensure it appropriately serves the needs of the Neighbourhood Centre and the overall Point Grey LSP.

Figure 17 illustrates the alignment of the Entry Road. This figure also shows the potential alignment of an option for secondary access for emergency vehicles. The specific details and alignment of both the Entry Road and the secondary access for emergency vehicles will require further investigation and refinement as the LSP planning process advances. However, the initial illustration in **Figure 17** demonstrates the intent to provide a comprehensive transportation solution that serves the daily access needs as well as the secondary access for emergency vehicles.

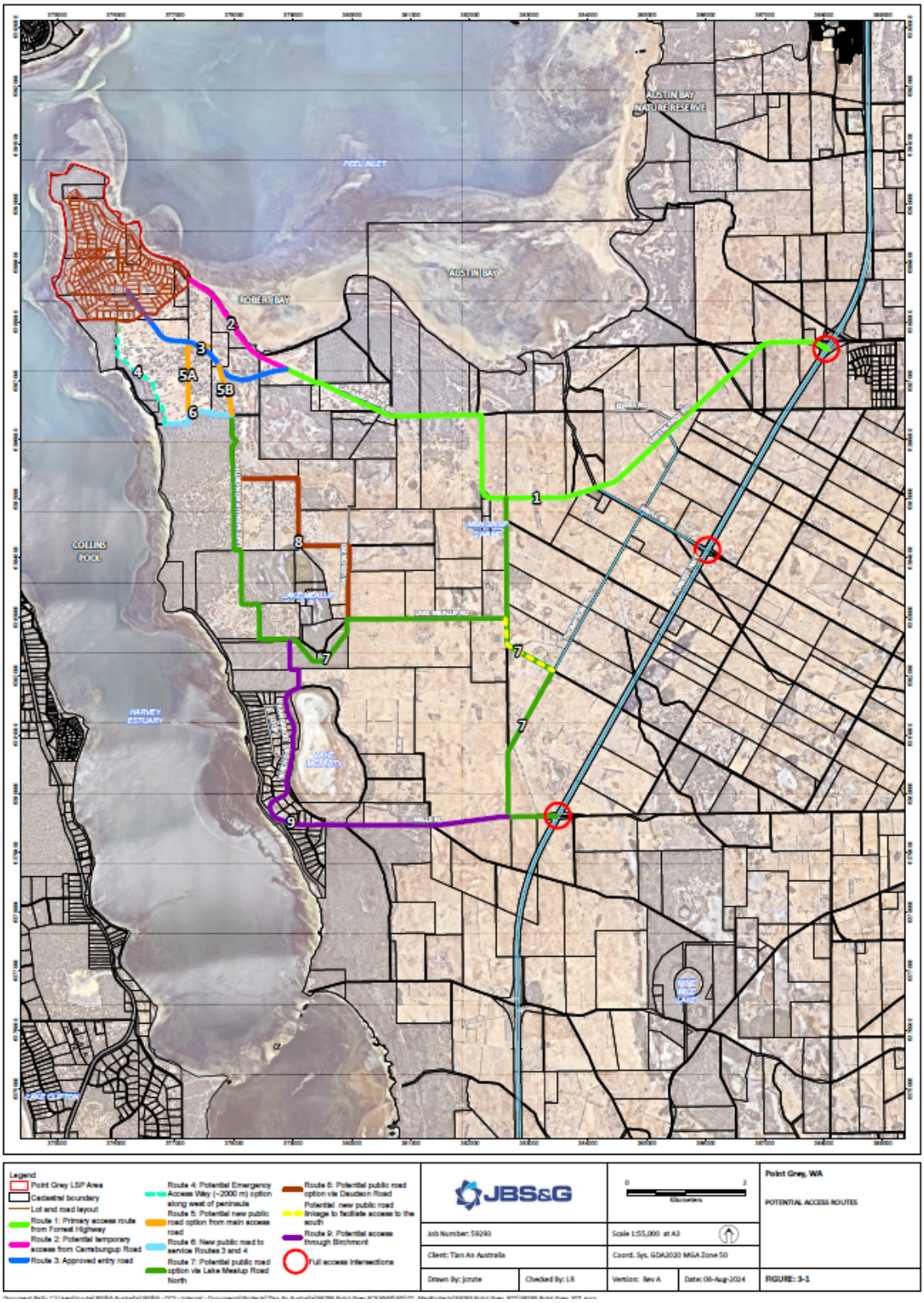


Figure 17: Proposed alignment of Entry Road and potential secondary access roads

It is our understanding that Main Roads WA have raised concerns regarding the potential "rat run" along some of the proposed secondary access roads including Mills Road, Thompson Road, Greenlands or Paul Road, Greenlands Road. It should be noted that:

- The majority of the LSP traffic is expected to travel north towards Mandurah and Perth, rather than south towards Bunbury. Therefore, the concerns about "rat running" on the secondary routes only apply to a few vehicle movements, not the majority.
- The route along Mills Road, Thompson Road, and Greenlands Road is very convoluted, with a longer travel time, making it unattractive for LSP traffic.
- The western end of Paul Road that connects to Greenlands Road is only a gravel standard road, which would not be attractive for the LSP traffic.
- The suggested Entry Road alignment would be upgraded to an adequate standard, providing the fastest and safest route to the Forrest Highway, which would be the preferred route used by the LSP traffic.

In summary, the secondary access routes are not expected to be attractive options for the majority of the LSP traffic due to the longer travel times, convoluted routes, and lower road standards compared to the upgraded Entry Road alignment.

5.6 Access to Frontage Properties

The WAPC *Liveable Neighbourhoods* policy requires that *"Development along integrator B and neighbourhood connector streets with ultimate vehicle volumes over 5000 vehicles per day should be designed either so vehicles entering the street can do so travelling forward, or are provided with alternative forms of vehicle access. Wider lots with paired driveways and protected reversing areas in the parking lane may be used on streets with up to 7000 vehicles per day."*

All of the roads within the proposed LSP area are expected to carry less than 7,000vpd, so no restriction on vehicular access is required.

5.7 Pedestrian / Cycle Networks

The proposed network of pedestrian and cycleways is described in section 4.2 of this transport assessment. This network of cycleways and paths will provide an excellent level of accessibility and connectivity for pedestrians and cyclists within the proposed LSP area.

5.8 Access to Public Transport

At this stage of the planning process the details of the bus route planning and the location of bus stops are not known. However, in these circumstances the WAPC *Transport Assessment Guidelines for Developments* (2006) suggest that it is desirable for at least 90 per cent of dwellings to be within 400m straight line distance of a bus route. The potential future bus route proposed for the ODP area would service the majority of the residential development within the proposed LSP area.

6 Conclusions

This Transport Impact Assessment (TIA) report has been prepared by Transcore for Point Grey Development Company Pty Ltd. The subject of this report is the proposed LSP for Point Grey.

It is our understanding that the Shire of Murray have amended their Town Planning Scheme No. 3 to make 'Marina' a non-permitted use on the Point Grey site. Accordingly, the updated LSP would replace the Marina Village Precinct with a traditional Neighbourhood Centre.

The LSP is situated in a tourism/coastal development area, which is expected to attract a diverse demographic profile of residents and visitors including second/holiday home owners and short-stay tourists which reduces the occupancy ratio in Point Grey. Further, by providing a wide range of residential, commercial, tourism, and community amenities within the LSP boundaries, it is expected that a high degree of internal trips and self-sufficiency can be achieved.

The proposed LSP area is estimated to ultimately generate a total of approximately 28,403 trips per typical weekday, including both inbound and outbound trips. Out of this total, approximately 18,530 trips would be internal to the LSP area, with the remaining trips being external.

By the year 2041, when the development is estimated to be 50% complete, the internal and external trip figures would be around 50% of the ultimate totals. The projected traffic volumes on the Entry Road are estimated to be 5,000 vpd in 2041. After full development of the LSP area, the traffic volumes on the Entry Road are expected to increase to approximately 10,000 vpd.

The SIDRA analysis results indicate that the intersection of Forrest Highway/ Greenlands Road (west) presently operates satisfactorily and with good level of service and with almost no queues and delays during the peak hours.

The SIDRA assessment for year 2041 indicates that the existing standard of the intersection of Forrest Highway/ Greenlands Road is sufficient to accommodate the 50% build out of the Mastre Plan area, and general traffic growth along Forrest Highway by year 2041.

However, beyond 2041, upgrades in the form of a grade-separated interchange would be expected at the Greenlands Road (west) / Forrest Highway intersection. Once the necessary grade-separated interchange upgrades are provided at the Greenldands Road intersections (east and west), the proposed Point Grey LSP can be progressed to full development.

The 30-meter road reserve for the Entry Road as depicted in the Shire of Murray approved Access Road Construction Management Plan was initially established during the Outline Development Plan (ODP) assessment. This wider reserve was

intended to accommodate potential overtaking lanes, due to the expected heavy vehicle traffic associated with the originally proposed Marina Village Precinct and boat pens.

However, the updated Point Grey LSP has replaced the Marina Village Precinct with a more traditional Neighbourhood Centre. As a result, the need for overtaking lanes on the Entry Road is no longer required.

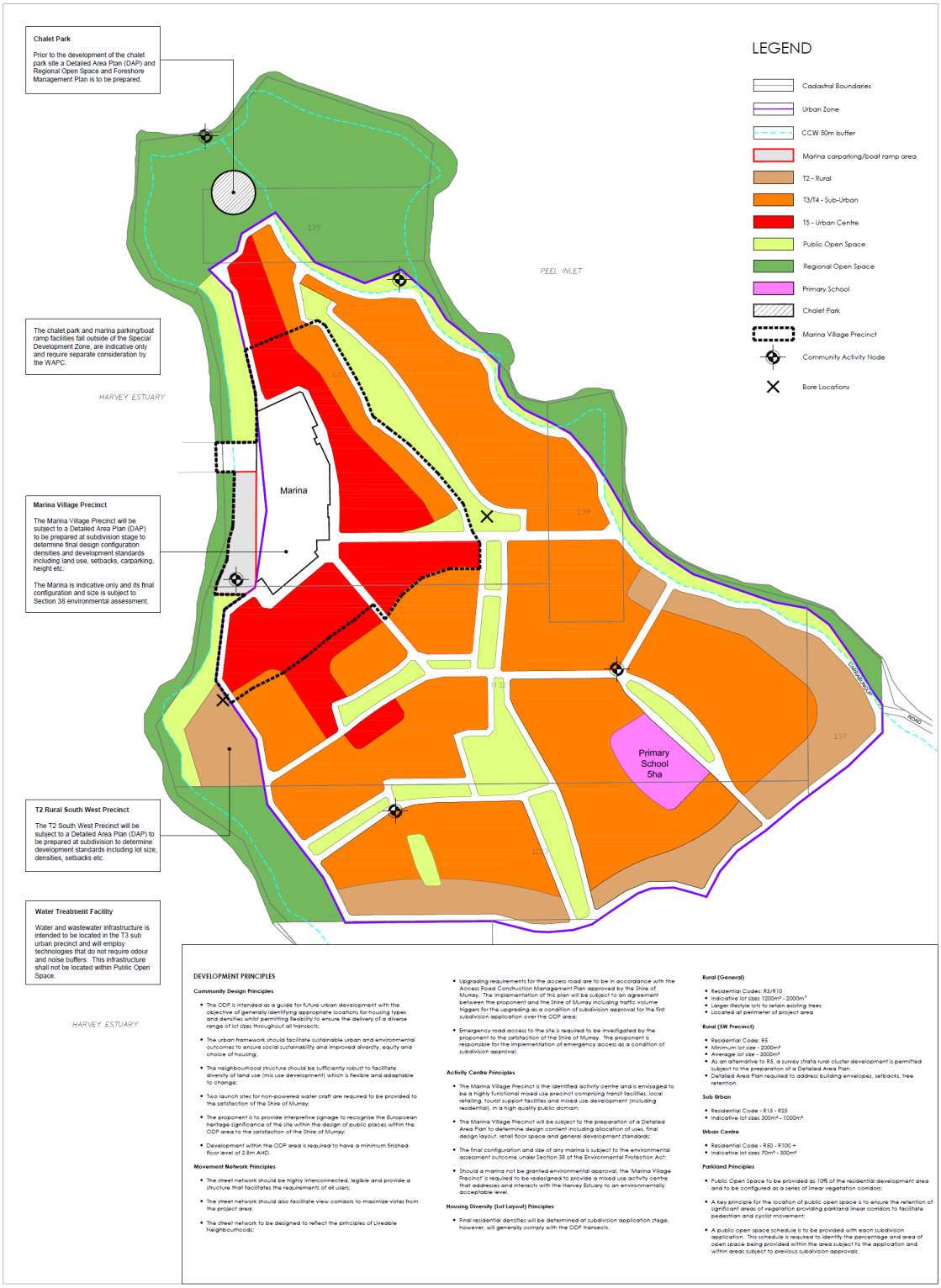
Therefore, it is suggested that the final alignment and reservation width of the proposed Entry Road should be further investigated and refined during the subsequent stages of the development process. The 30-meter road reserve may no longer be necessary and could potentially be reduced, based on the updated LSP and revised traffic projections.

The final alignment and reservation of the Entry Road should be revisited and optimised as the development progresses, to ensure it appropriately serves the needs of the Neighbourhood Centre and the overall Point Grey LSP.

The secondary access routes are not expected to be attractive options for the majority of the LSP traffic due to the longer travel times, convoluted routes, and lower road standards compared to the upgraded Entry Road alignment.

Appendix A

APPROVED OUTLINED DEVELOPMENT PLAN (ODP)

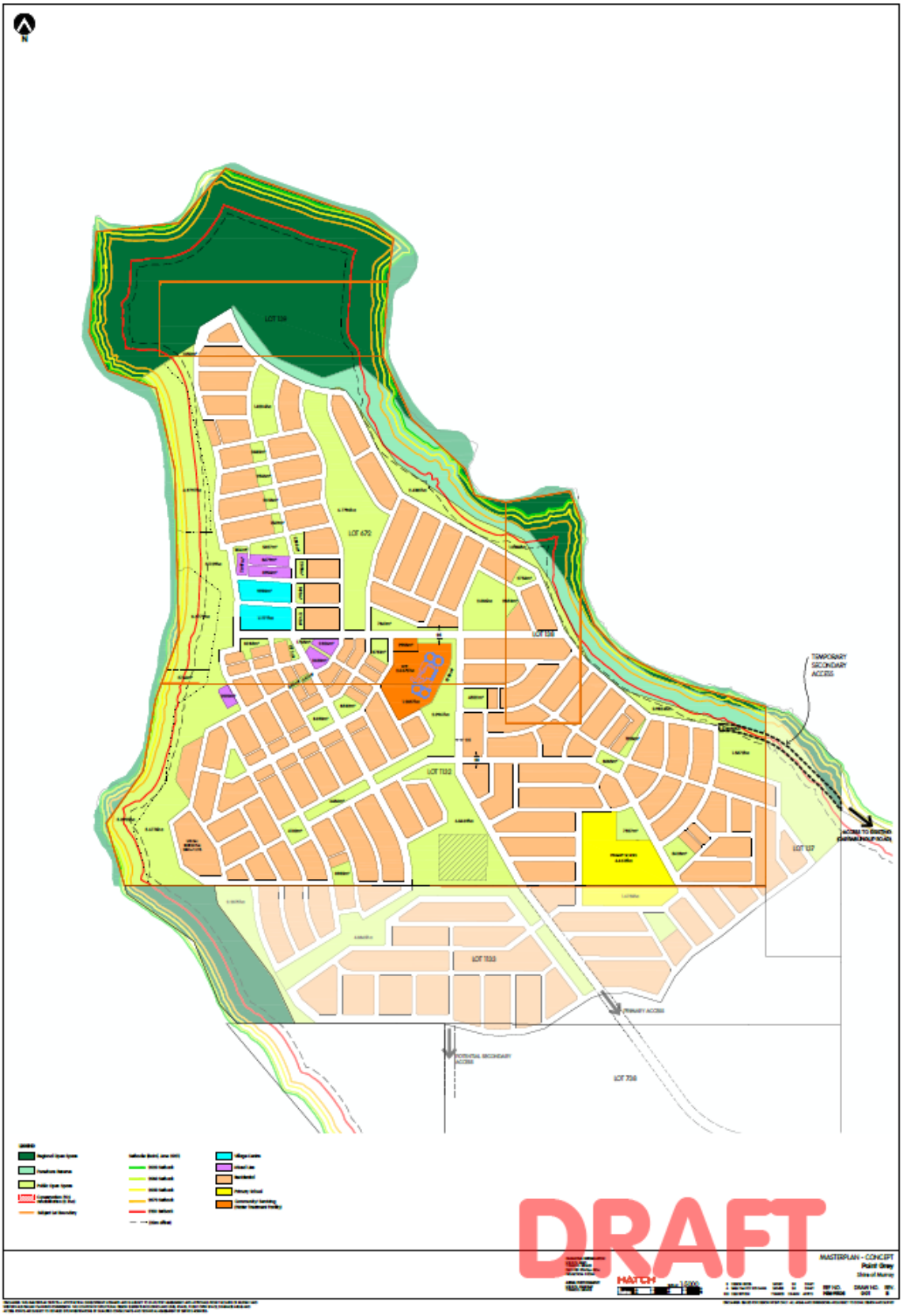


Outline Development Plan
Point Grey
Shire of Murray

PORT BOUVARD LIMITED

Appendix B

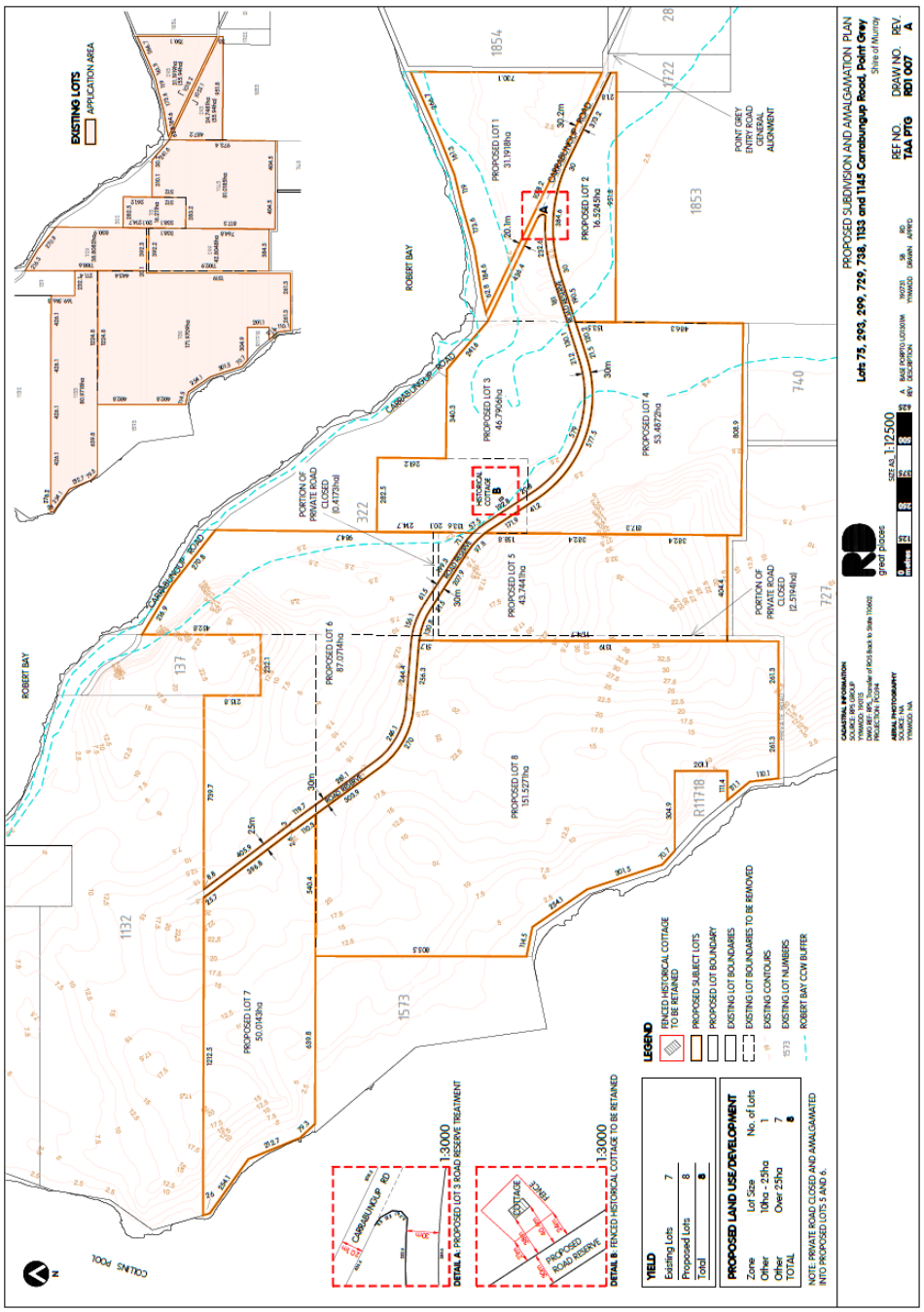
PROPOSED POINT GREY LOCAL STRUCTURE PLAN


LOT 670
LOT 720
LOT 733
LOT 727
LOT 734
TEMPORARY SECONDARY ACCESS
DRAFT

Appendix C

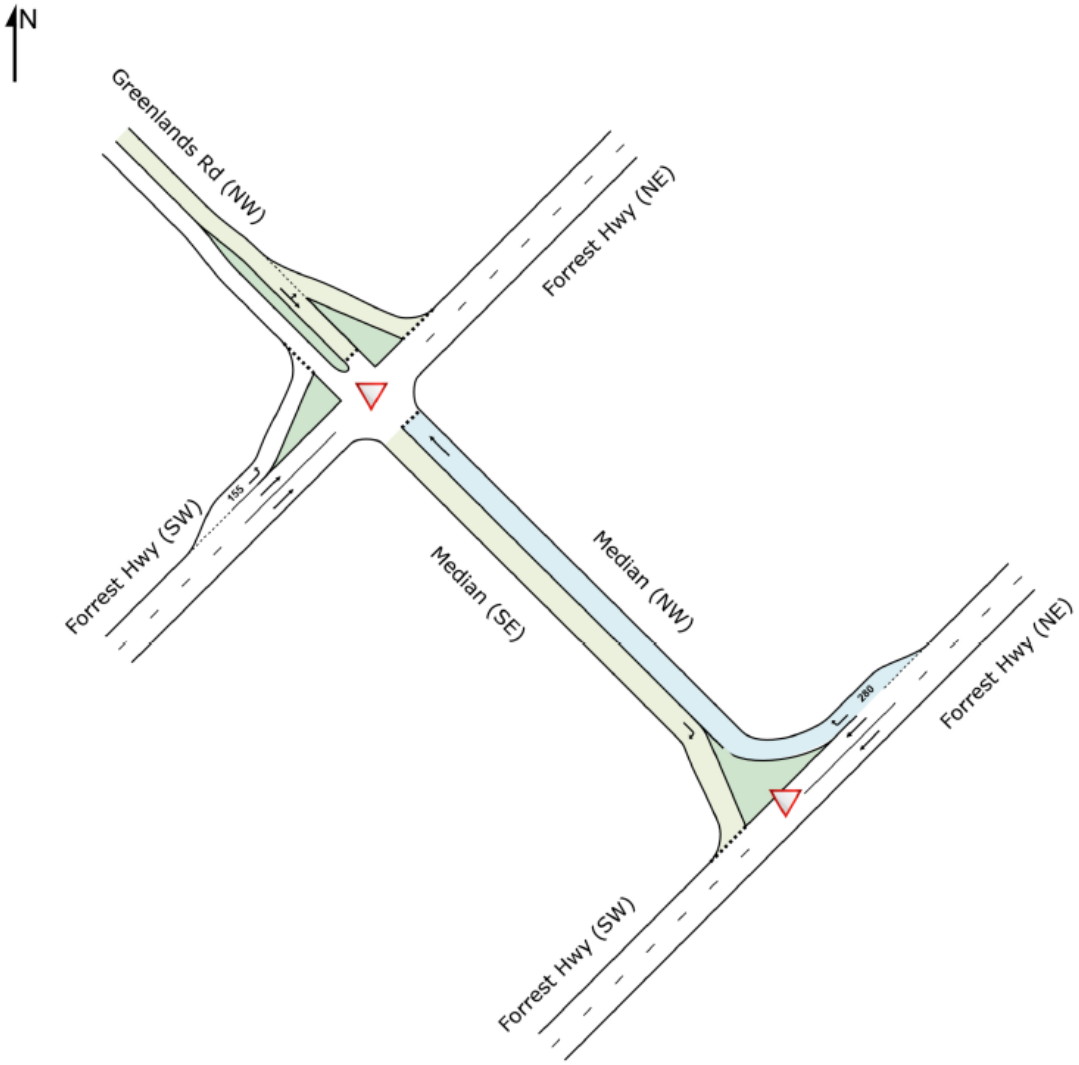
THE SHIRE OF MURRAY APPROVED ACCESS ROAD CONSTRUCTION MANAGEMENT PLAN


LEGEND
Site Boundary
Cadastre
Proposed Entrance Road Alignment
PEEL INLET
Robert Bay
Austin Bay
SITE
PROPOSED ROAD ALIGNMENT
RPS
Figure 1
Site Location


PROPOSED SUBDIVISION AND AMALGAMATION PLAN
Lots 75, 293, 299, 729, 738, 1133 and 1145 Carnbungup Road, Point Grey
Shire of Murray
REF NO. TAA PTG
DRAW NO. RD1 007
REV. A
EXISTING LOTS
APPLICATION AREA
ROBERT BAY
CARNBUNGUP ROAD
COLLINS POOL
PROPOSED LOT 1 31.1918ha
PROPOSED LOT 2 16.5245ha
PROPOSED LOT 3 46.7906ha
PROPOSED LOT 4 53.4872ha
PROPOSED LOT 5 43.7449ha
PROPOSED LOT 6 87.0774ha
PROPOSED LOT 7 50.0143ha
PROPOSED LOT 8 151.527ha
HISTORICAL COTTAGE B
PORTION OF PRIVATE ROAD CLOSED (0.4173ha)
PORTION OF PRIVATE ROAD CLOSED (2.5794ha)
POINT GREY ENTRY ROAD GENERAL ALIGNMENT
R11718
DETAIL A: PROPOSED LOT 3 ROAD RESERVE TREATMENT
1:3000
DETAIL B: FENCED HISTORICAL COTTAGE TO BE RETAINED
1:3000
YIELD
Existing Lots 7
Proposed Lots 8
Total 8
PROPOSED LAND USE/DEVELOPMENT
Zone Lot Size No. of Lots
Other 10ha - 25ha 1
Other Over 25ha 7
TOTAL 8
LEGEND
FENCED HISTORICAL COTTAGE TO BE RETAINED
PROPOSED SUBJECT LOTS
PROPOSED LOT BOUNDARY
EXISTING LOT BOUNDARIES
EXISTING LOT BOUNDARIES TO BE REMOVED
EXISTING CONTOURS
EXISTING LOT NUMBERS
ROBERT BAY CCW BUFFER
NOTE: PRIVATE ROAD CLOSED AND AMALGAMATED INTO PROPOSED LOTS 5 AND 6.
CADASTRAL INFORMATION
AERIAL PHOTOGRAPHY
gtred places
SCALE 1:12500

Appendix D

SIDRA ANALYSIS


N
Greenlands Rd (NW)
Forrest Hwy (NE)
Forrest Hwy (SW)
155
Median (SE)
Median (NW)
200
Forrest Hwy (NE)
Forrest Hwy (SW)

MOVEMENT SUMMARY

Site: [Forrest Hwy - Greenlands Rd - Stage 1 - Existing - AM (Site Folder: Existing)]

Network: N101 [AM (Network Folder: Existing)]

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

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
SouthEast: Median (SE)														
5	T1	3	2.0	3	2.0	0.003	1.2	LOS A	0.0	0.1	0.37	0.19	0.37	40.8
Approach		3	2.0	3	2.0	0.003	1.2	LOS A	0.0	0.1	0.37	0.19	0.37	40.8
NorthWest: Greenlands Rd (NW)														
1	L2	13	2.0	13	2.0	0.010	5.1	LOS A	0.0	0.3	0.27	0.48	0.27	48.7
2	T1	1	2.0	1	2.0	0.010	5.6	LOS A	0.0	0.3	0.27	0.48	0.27	42.1
Approach		14	2.0	14	2.0	0.010	5.1	LOS A	0.0	0.3	0.27	0.48	0.27	48.4
SouthWest: Forrest Hwy (SW)														
3	L2	1	2.0	1	2.0	0.001	8.8	LOS A	0.0	0.0	0.02	0.64	0.02	60.8
4	T1	318	21.5	318	21.5	0.111	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	110.0
Approach		319	21.4	319	21.4	0.111	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	109.7
All Vehicles		336	20.5	336	20.5	0.111	0.3	NA	0.0	0.3	0.01	0.02	0.01	104.2

MOVEMENT SUMMARY

Site: [Forrest Hwy - Greenlands Rd - Stage 1 - Existing - PM (Site Folder: Existing)]

Network: N101 [PM (Network Folder: Existing)]

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

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
SouthEast: Median (SE)														
5	T1	14	2.0	14	2.0	0.023	4.5	LOS A	0.1	0.6	0.61	0.55	0.61	37.9
Approach		14	2.0	14	2.0	0.023	4.5	LOS A	0.1	0.6	0.61	0.55	0.61	37.9
NorthWest: Greenlands Rd (NW)														
1	L2	8	2.0	8	2.0	0.010	6.2	LOS A	0.0	0.3	0.46	0.57	0.46	48.1
2	T1	1	2.0	1	2.0	0.010	8.8	LOS A	0.0	0.3	0.46	0.57	0.46	41.1
Approach		9	2.0	9	2.0	0.010	6.5	LOS A	0.0	0.3	0.46	0.57	0.46	47.6
SouthWest: Forrest Hwy (SW)														
3	L2	1	2.0	1	2.0	0.001	8.8	LOS A	0.0	0.0	0.06	0.62	0.06	60.6
4	T1	791	17.0	791	17.0	0.270	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	109.9
Approach		792	17.0	792	17.0	0.270	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	109.8
All Vehicles		815	16.6	815	16.6	0.270	0.2	NA	0.1	0.6	0.02	0.02	0.02	106.9

MOVEMENT SUMMARY

Site: [Forrest Hwy - Greenlands Rd - Stage 2 - Existing - AM (Site Folder: Existing)]

Network: N101 [AM (Network Folder: Existing)]

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

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
NorthEast: Forrest Hwy (NE)														
2	T1	551	15.2	551	15.2	0.171	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	109.9
3	R2	3	2.0	3	2.0	0.002	7.8	LOS A	0.0	0.0	0.00	0.68	0.00	75.3
Approach		554	15.1	554	15.1	0.171	0.1	NA	0.0	0.0	0.00	0.00	0.00	109.8
NorthWest: Median (NW)														
1	R2	1	2.0	1	2.0	0.002	3.2	LOS A	0.0	0.0	0.47	0.36	0.47	51.8
Approach		1	2.0	1	2.0	0.002	3.2	LOS A	0.0	0.0	0.47	0.36	0.47	51.8
All Vehicles		555	15.1	555	15.1	0.171	0.1	NA	0.0	0.0	0.00	0.00	0.00	109.7

MOVEMENT SUMMARY

Site: [Forrest Hwy - Greenlands Rd - Stage 2 - Existing - PM (Site Folder: Existing)]

Network: N101 [PM (Network Folder: Existing)]

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

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
NorthEast: Forrest Hwy (NE)														
2	T1	1163	17.0	1163	17.0	0.367	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	109.8
3	R2	14	2.0	14	2.0	0.008	7.8	LOS A	0.0	0.0	0.00	0.68	0.00	75.3
Approach		1177	16.8	1177	16.8	0.367	0.1	NA	0.0	0.0	0.00	0.01	0.00	109.5
NorthWest: Median (NW)														
1	R2	1	2.0	1	2.0	0.004	11.4	LOS B	0.0	0.1	0.79	0.72	0.79	42.5
Approach		1	2.0	1	2.0	0.004	11.4	LOS B	0.0	0.1	0.79	0.72	0.79	42.5
All Vehicles		1178	16.8	1178	16.8	0.367	0.1	NA	0.0	0.1	0.00	0.01	0.00	109.4

MOVEMENT SUMMARY

Site: [Forrest Hwy - Greenlands Rd - Stage 1 - 2041 - AM (Site Folder: 2041)]

Network: N102 [AM (Network Folder: 2041)]

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

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
SouthEast: Median (SE)														
5	T1	85	2.0	85	2.0	0.093	2.1	LOS A	0.3	2.5	0.46	0.39	0.46	40.2
Approach		85	2.0	85	2.0	0.093	2.1	LOS A	0.3	2.5	0.46	0.39	0.46	40.2
NorthWest: Greenlands Rd (NW)														
1	L2	331	2.0	331	2.0	0.309	5.7	LOS A	1.5	11.0	0.41	0.60	0.41	48.2
2	T1	41	2.0	41	2.0	0.309	7.7	LOS A	1.5	11.0	0.41	0.60	0.41	41.3
Approach		372	2.0	372	2.0	0.309	5.9	LOS A	1.5	11.0	0.41	0.60	0.41	47.8
SouthWest: Forrest Hwy (SW)														
3	L2	43	2.0	43	2.0	0.029	9.0	LOS A	0.1	0.9	0.17	0.60	0.17	60.1
4	T1	445	21.5	445	21.5	0.155	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	109.9
Approach		488	19.8	488	19.8	0.155	0.8	LOS A	0.1	0.9	0.02	0.05	0.02	103.0
All Vehicles		945	11.2	945	11.2	0.309	2.9	NA	1.5	11.0	0.21	0.30	0.21	68.4

MOVEMENT SUMMARY

Site: [Forrest Hwy - Greenlands Rd - Stage 2 - 2041 - AM (Site Folder: 2041)]

Network: N102 [AM (Network Folder: 2041)]

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

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
NorthEast: Forrest Hwy (NE)														
2	T1	771	15.2	771	15.2	0.240	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	109.9
3	R2	85	2.0	85	2.0	0.047	7.8	LOS A	0.0	0.0	0.00	0.68	0.00	75.3
Approach		856	13.9	856	13.9	0.240	0.8	NA	0.0	0.0	0.00	0.07	0.00	107.3
NorthWest: Median (NW)														
1	R2	41	2.0	41	2.0	0.079	5.5	LOS A	0.2	1.9	0.61	0.66	0.61	48.7
Approach		41	2.0	41	2.0	0.079	5.5	LOS A	0.2	1.9	0.61	0.66	0.61	48.7
All Vehicles		897	13.3	897	13.3	0.240	1.0	NA	0.2	1.9	0.03	0.10	0.03	104.0

MOVEMENT SUMMARY

Site: [Forrest Hwy - Greenlands Rd - Stage 1 - 2041 - PM (Site Folder: 2041)] **Network: N102 [PM (Network Folder: 2041)]**

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

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
SouthEast: Median (SE)														
5	T1	283	2.0	283	2.0	0.819	25.1	LOS D	5.5	41.6	0.95	1.93	2.43	25.4
Approach		283	2.0	283	2.0	0.819	25.1	LOS D	5.5	41.6	0.95	1.93	2.43	25.4
NorthWest: Greenlands Rd (NW)														
1	L2	174	2.0	174	2.0	0.325	8.6	LOS A	1.4	10.8	0.65	0.88	0.79	45.6
2	T1	28	2.0	28	2.0	0.325	20.9	LOS C	1.4	10.8	0.65	0.88	0.79	37.3
Approach		202	2.0	202	2.0	0.325	10.4	LOS B	1.4	10.8	0.65	0.88	0.79	44.9
SouthWest: Forrest Hwy (SW)														
3	L2	28	2.0	28	2.0	0.023	9.7	LOS A	0.1	0.7	0.35	0.63	0.35	59.2
4	T1	1107	17.0	1107	17.0	0.378	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	109.8
Approach		1136	16.6	1136	16.6	0.378	0.3	LOS A	0.1	0.7	0.01	0.02	0.01	107.7
All Vehicles		1621	12.2	1621	12.2	0.819	5.9	NA	5.5	41.6	0.25	0.46	0.53	74.4

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
NorthEast: Forrest Hwy (NE)														
2	T1	1628	17.0	1628	17.0	0.514	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	109.7
3	R2	283	2.0	283	2.0	0.186	7.8	LOS A	0.0	0.0	0.00	0.68	0.00	75.3
Approach		1912	14.8	1912	14.8	0.514	1.2	NA	0.0	0.0	0.00	0.10	0.00	105.8
NorthWest: Median (NW)														
1	R2	28	2.0	28	2.0	0.300	41.2	LOS E	0.8	6.4	0.95	1.01	1.05	25.7
Approach		28	2.0	28	2.0	0.300	41.2	LOS E	0.8	6.4	0.95	1.01	1.05	25.7
All Vehicles		1940	14.6	1940	14.6	0.514	1.8	NA	0.8	6.4	0.01	0.11	0.02	103.1