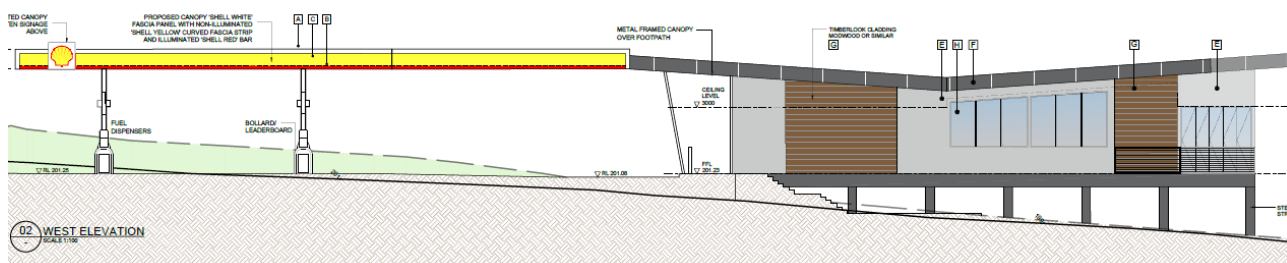


PROPOSED SERVICE STATION (ROADHOUSE)

LOT 860 (SN239) YILGARN AVENUE, (CNR GREAT EASTERN HWY) MALABAIN (NORTHAM)

TRANSPORT IMPACT STATEMENT



Final 1-0

Prepared by i3 consultants WA for


Procon Developments

Project details

Project	Proposed Service Station (Roadhouse)
Location	Lot 860 (SN239) Yilgarn Avenue, (Cnr Great Eastern Hwy) Malabaine (Northam)
Project ID	15502
Client	Procon Developments
Description	A Transport Impact Statement for a proposed Service Station/ Roadhouse at 239 Yilgarn Ave on the southwest corner of Great Eastern Highway within the Shire of Northam locality of Malabaine prepared in accordance with the WAPC 2016 Transport Impact Assessment Guidelines.

Document control

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ABOUT THE AUTHOR

David Wilkins is an RTA NSW Certified Level 3 Lead Auditor (RSA-08-0178) and Main Roads Western Australia (MRWA) accredited Senior Road Safety Auditor (SRSA 0101). In addition to this, David is an MRWA accredited Crash Investigation Team Leader and Roadworks Traffic Manager (MRWA-RTM-10-RTM20). David has undertaken 80 road safety audits in the last five years and 202 road safety audits since 2011 across the full range of stages from feasibility through to pre-opening, including roadworks, existing roads, schools and mine sites.

David's specialist skills are in the management and development of transport infrastructure and planning, particularly with respect to road safety engineering, roadworks traffic management, traffic engineering, crash investigation, road safety audits, alternative transport systems (TravelSmart, shared paths, cycle facilities), transport statements, transport assessments, parking demand management, local area traffic management, speed management, accessible environments and innovation.

David specialises in undertaking and preparing traffic impact assessments in accordance with either the WAPC document 'Transport Impact Assessment Guidelines' ⁽¹⁾ or Austroads 'Guide to Traffic Management Part 12: Traffic Impacts of Developments' ⁽²⁾.

1 INTRODUCTION

This Transport Impact Assessment report has been prepared in accordance with the WAPC publication ‘Transport Impact Assessment Guidelines’. These guidelines indicate that a Transport Impact Statement (TIS) “is required for those developments that would be likely to generate moderate volumes of traffic and therefore would have a moderate overall impact on the surrounding land uses and transport networks, (in accordance with Table 1.)”

LAND USE	MODERATE IMPACT	HIGH IMPACT
	Transport Impact Statement required	Transport Impact Assessment required
	10 – 100 vehicle trips in the peak hour	> 100 vehicle trips in the peak hour
Residential	10–100 dwellings	>100 dwellings
Schools	10–100 students	>100 students
Entertainment venues, restaurants, etc.	100–1000 persons (seats) OR 200–2000 m ² gross floor area	>1000 persons (seats) OR >2000 m ² gross floor area
Fast food restaurants	50–500 m ² gross floor area	>500 m ² gross floor area
Food retail /Shopping centres with a significant food retail content	100–1000 m ² gross floor area	>1000 m ² gross floor area
Non-food retail	250–2500 m ² gross floor area	>2500 m ² gross floor area
Offices	500–5000 m ² gross floor area	>5000 m ² gross floor area
Service Station*	1–7 refueling positions	>7 refueling positions
Industrial/Warehouse	1000–10,000 m ² gross floor	>10,000 m ² gross floor area
Other Uses	Discuss with approving authority	Discuss with approving authority

Table 1 - Level of TIA required by land use and size

* Service Stations generally rely on very high levels of passing trade, and do not normally require a full TIA. Impacts are usually limited to the access points and the nearest significant intersection; however, some may be coupled with other land uses.

Table 1 - Level of TIA required by land use and size

As indicated above, service stations generally rely on very high levels of passing trade. The proposed site is adjacent to the Northam Tourist Bay on the corner of Great Eastern Hwy and Yilgarn Ave and is expected to attract passing traffic from both of these roads in both directions.

The proposed facility will have 3 heavy vehicle refuelling positions and 8 light vehicle refuelling positions. Whilst Table 1 above suggests this indicates a requirement for a Transport Impact Assessment this is not considered the case for a rural location as it will not generate more than 100 vehicle trips in an hour, as would be the case for a similar sized service station on a busy street in the metropolitan area. On this basis, the impact is considered to be ‘moderate’ and requires a ‘Transport Impact Statement’ with some technical assessment of key issues such as modelling of light and heavy vehicle movements into and out of the site and through the nearby Great Eastern Hwy/ Yilgarn Ave intersection.

As the proposal is for a service station/ roadhouse in a rural area designed for use by road trains, tourists and light vehicles there is no assessed demand for pedestrian or cycle movements to or from the site. In addition to this, there is no demand for public transport and none exists in this rural area.

In accordance with the WAPC Guidelines and the assessed level of impact, the extent of this assessment includes, as a minimum:

- The proposed development site;
- All roads fronting the site, for the extent of the site frontage plus 100 metres beyond the site; and
- The area(s) likely to be affected by any site-specific issue(s).

The location of the development site in the context of the existing and proposed road network is shown in Figure 1 below.



Figure 1 – Development Site location and 100 m area of influence

The development site is currently zoned 'Rural' in the Shire of Northam Local Planning Scheme No 6 (3), as shown in Figure 2 below. Scheme Amendment No. 167 to the Shire of Northam Town Planning Scheme has been progressed and will be imminently approved by the Minister for Planning. This Scheme Amendment will rezone the subject site to "Special Use" (SU13) and provide for a "Roadhouse" use.

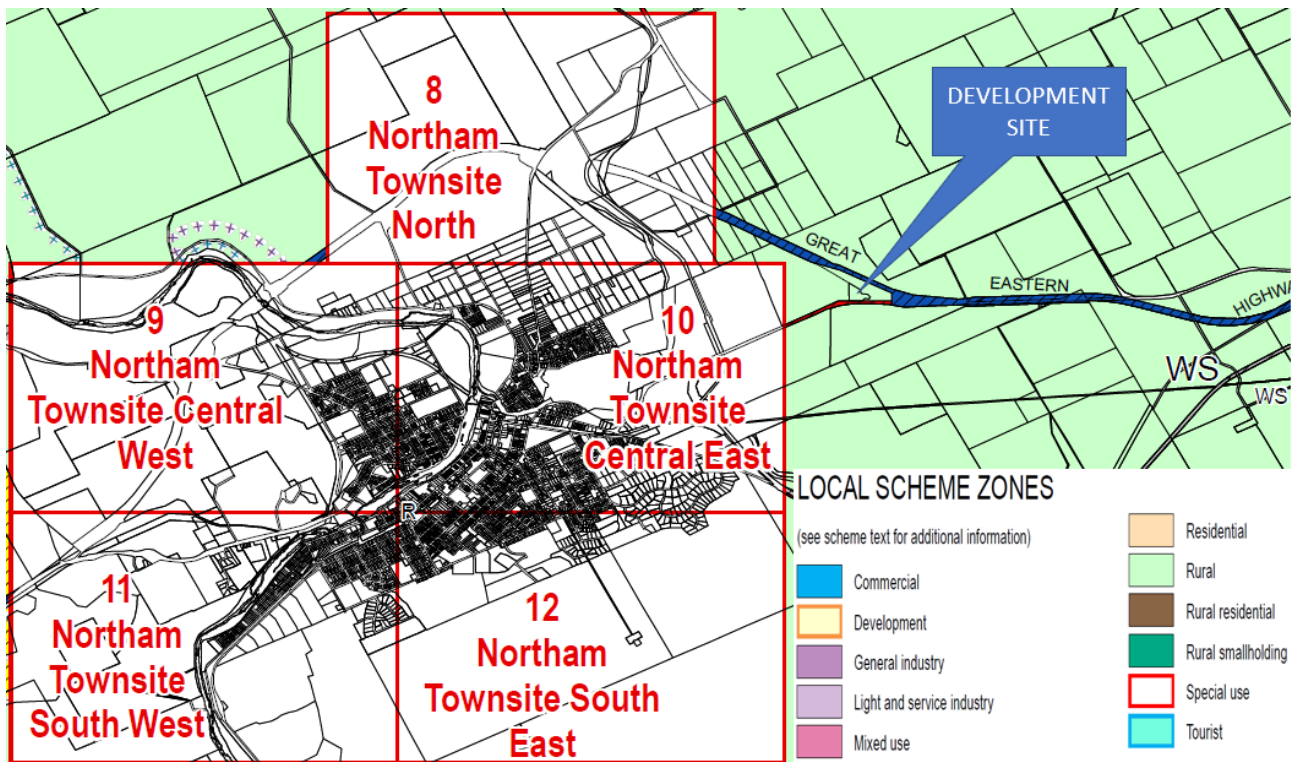


Figure 2 – Extract from Shire of Northam Local Planning Scheme No 6 Map 01 – Northam Overall

2 PROPOSED DEVELOPMENT

The proposed development comprises of a service station/ roadhouse with 3 heavy vehicle refuelling positions, 8 light vehicle refuelling positions, 7 Heavy Vehicle parking spaces (up to triple road train), 47 car parking spaces (including two ‘disabled’), 5 car + caravan parking spaces and a Service Centre and Truckers Facilities Building of approximately 800 m² as shown in Figure 3 below and in more detail in the Development Drawings included as **Appendix A**. All access is off Yilgarn Avenue.



Figure 3 – Site Plan

The existing site is vacant cleared land with some regrowth, as shown in Photograph 1 below.



Photograph 1 – Looking west at development site from tourist bay area off Yilgarn Ave

3 VEHICLE ACCESS AND PARKING

The Development Drawings show that all access is proposed via a separate IN and OUT access driveway, each of which is shaped to suit the swept path of a 53 m A-Triple Road Train, as shown in Figure 3 on the previous page and Figure 4 below.

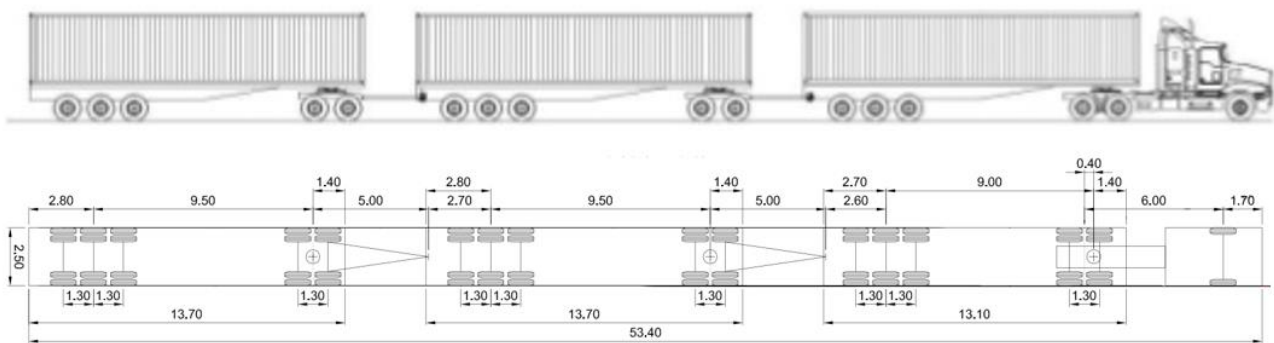


Figure 4 – A-Triple Road Train (Design Vehicle Details)

The site has excellent vehicular access and egress via the designated primary and regional distributor road network in all directions, as shown in Figure 5 below.

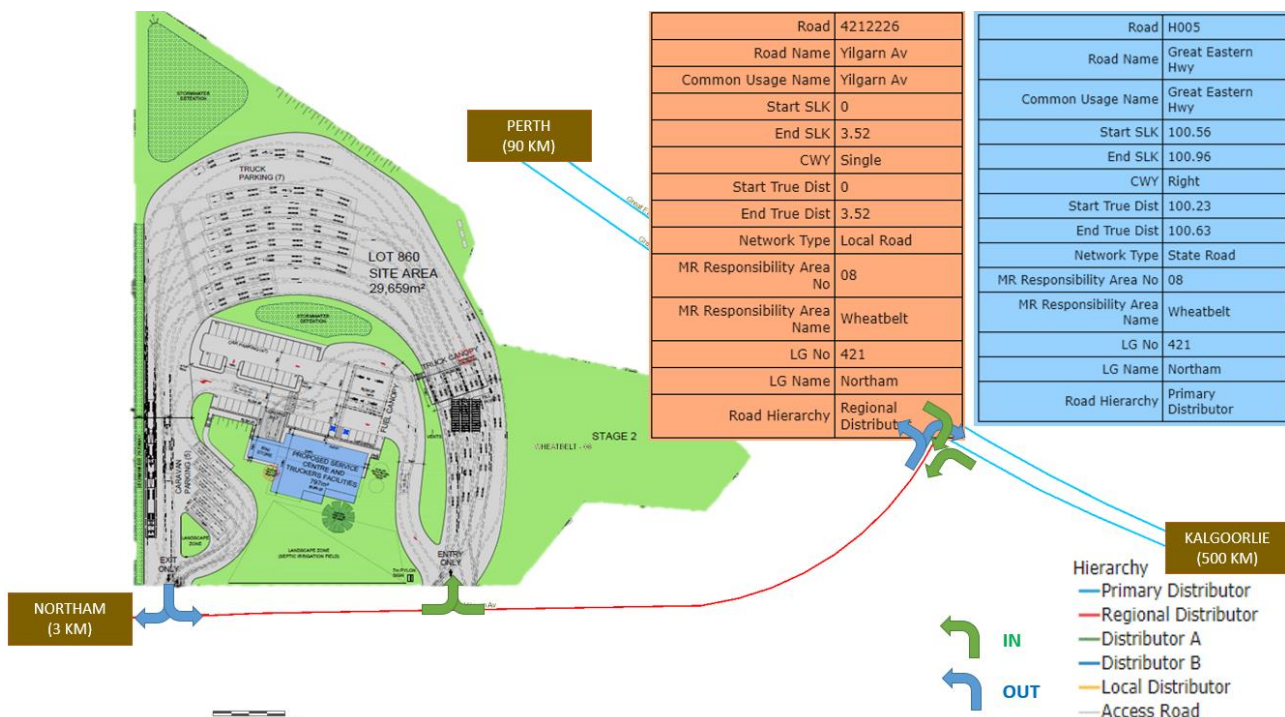


Figure 5 – Vehicular access and egress routes via distributor road network
(Base Plan: Main Roads WA Functional Rd Hierarchy)

Clause 4.13.1 of LPS6 indicates that “A person shall not develop or use any land or erect, use or adapt any building unless a suitable number of car parking spaces are provided on site and in accordance with the car parking requirements for particular developments and land uses as listed in ‘Table 3: Car Parking Guidelines’ or as varied by the provisions of this Scheme.”

An extract from Table 3 from LSP6 as it relates to the development proposal is provided as Table 2 below.

LANDUSE	MINIMUM NUMBER OF CAR PARKING SPACES REQUIRED
Service Station	1 / 200m ² gross site area + 1 / employee

Table 2 – Car Parking Guidelines (Extract from Table 3 of LPS6)

Gross Site Area is not defined in LPS6. Assuming the industry accepted definition of “Gross site area means the total horizontal area included within the property lines of a single site”, the Gross site area is 29,659 m² and hence has a statutory requirement for 148 car parking spaces + 1 for every employee which indicates a requirement of around 150 car parking spaces.

The Development Drawings indicate that it is proposed to provide 52 car parking spaces on site, including 2 ‘disabled’ and 5 car + caravan spaces. In addition to this, there are parking spaces provided for 7 triple road trains or smaller heavy vehicles.

Ignoring the heavy vehicle component of the development site, the gross site area would be around 10,000 m² which results in a statutory requirement for around 50 car parking spaces + 1 for every employee which indicates a requirement of around 52 car parking spaces, as are proposed.

Based on the above, the proposal is considered to meet the statutory parking bay requirement.

The Development Drawings (**Appendix A**) show the swept paths of each relevant design vehicle and hence demonstrates compliance in this regard. Parking bays have been provided in accordance with the requirements of AS/ NZS 2890.1 ⁽⁴⁾.

4 PROVISION FOR SERVICE VEHICLES

The largest service vehicle expected to service the site is the 53 m A-Triple Road Train fuel tanker. The site has been designed for this size of vehicle to be refuelled as well as serviced, as shown in Figure 3 on page 8 and in the Development Drawings in **Appendix A**.

There is a Loading Bay in front of the Bin Store and Service Centre Store that is 12 m long and 10.1 m wide and can easily accommodate large delivery vehicles and the waste collection vehicle, as shown in Figure 6 below.

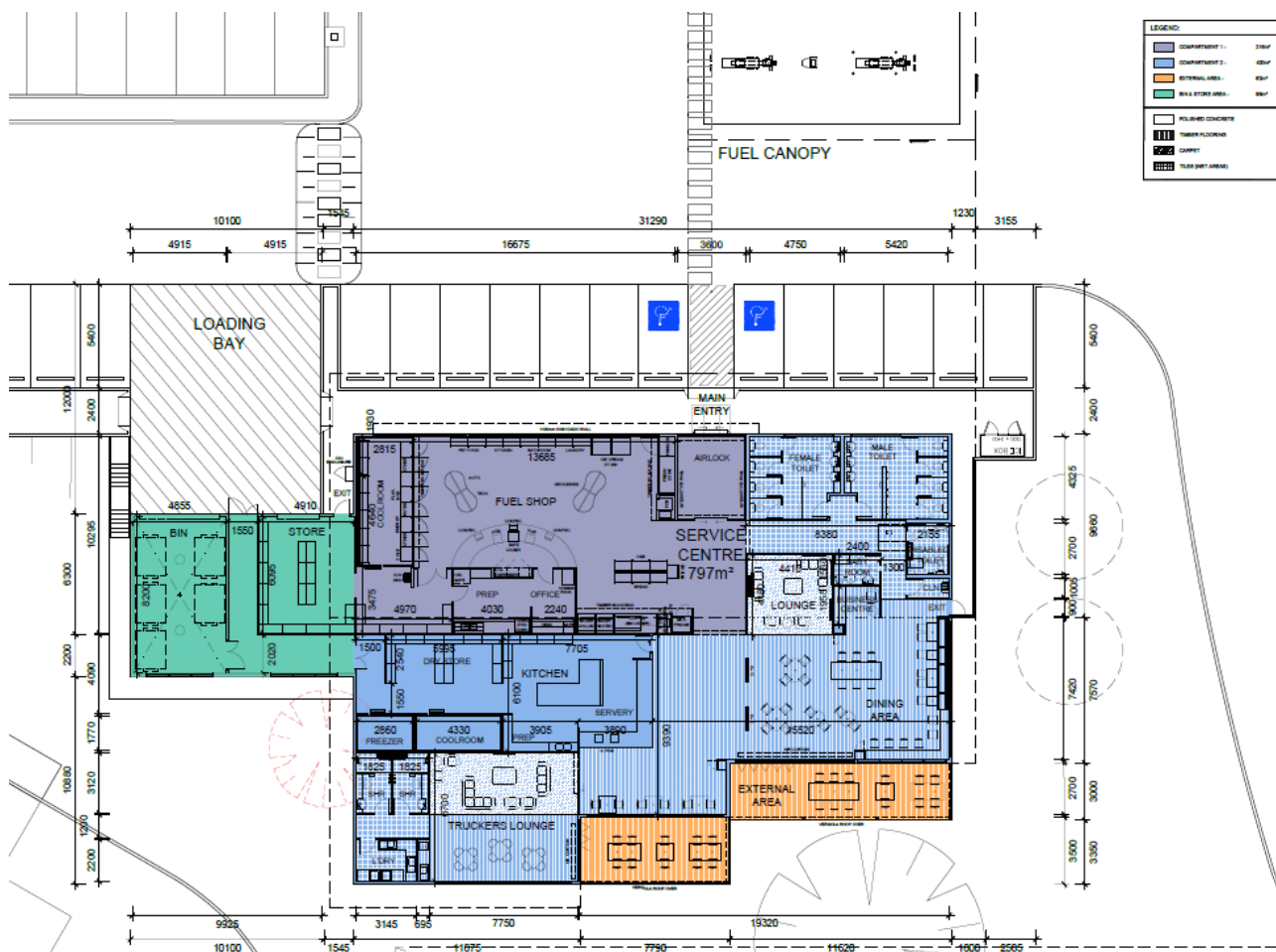


Figure 6 – Extract from Development Drawings showing Loading Bay

5 HOURS OF OPERATION

The development is proposed to operate 24 hours per day, 7 days per week, as per the many other service stations along Great Eastern Highway.

6 TRAFFIC VOLUMES AND VEHICLE TYPES

Main Roads WA does not have any traffic count data for Great Eastern Highway in the vicinity of the development site, as shown in Figure 7 below.

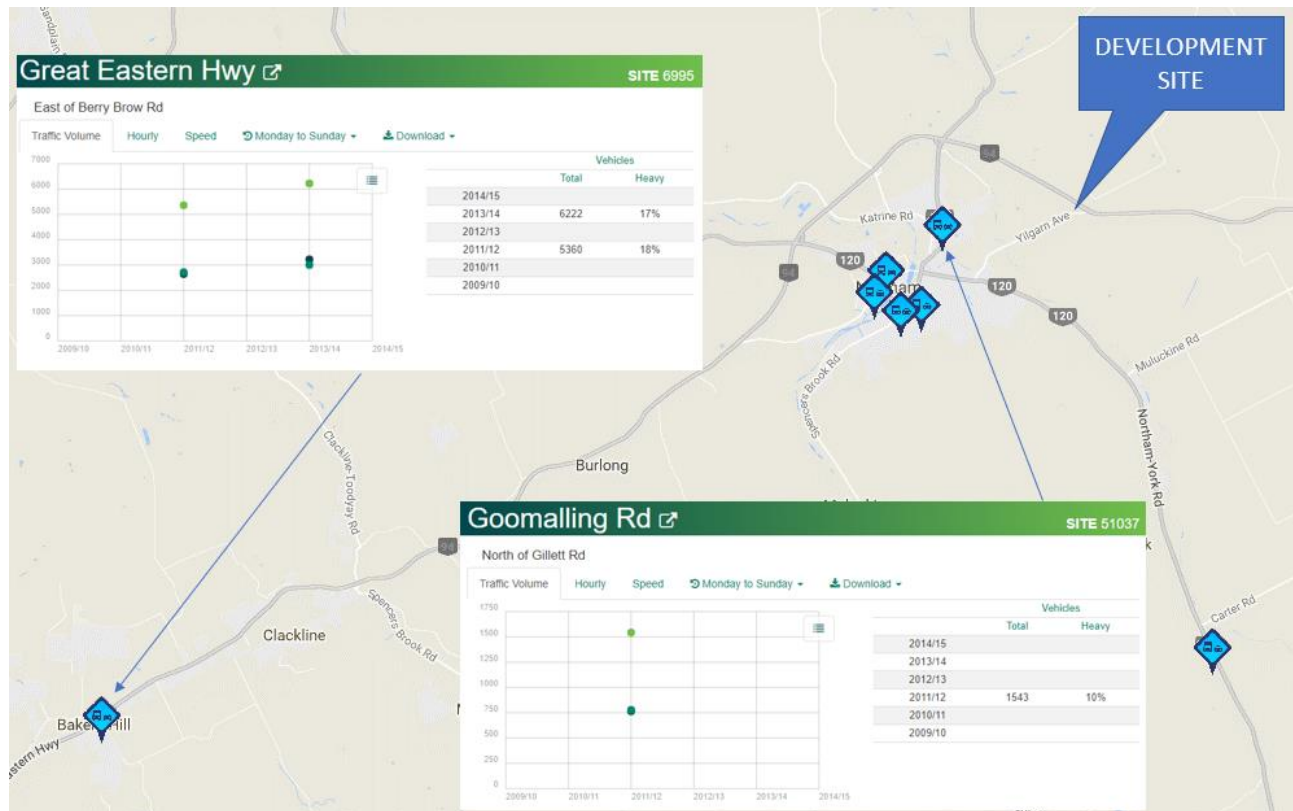


Figure 7 – Main Roads WA traffic volume profile at nearest survey location

In the absence of this data, the proponent commissioned austraffic to undertake detailed traffic counts on Great Eastern Highway and Yilgarn Ave in December 2016. The hourly profile data from these counts is shown in Figure 8 and Figure 9 on the following page.

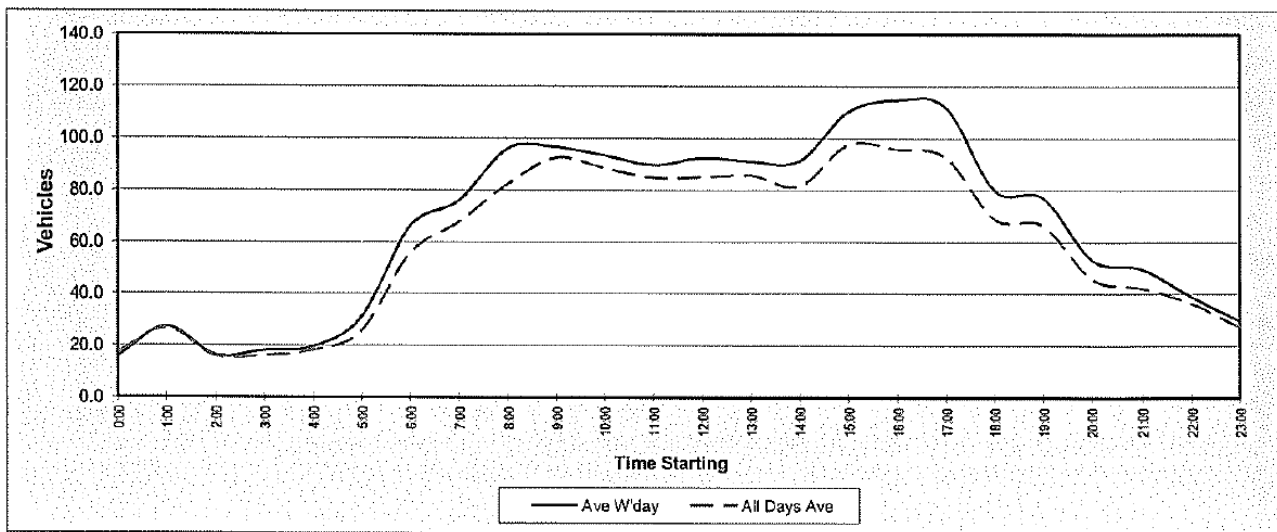


Figure 8 – Hourly volumes: Yilgarn Ave south of Great Eastern Hwy

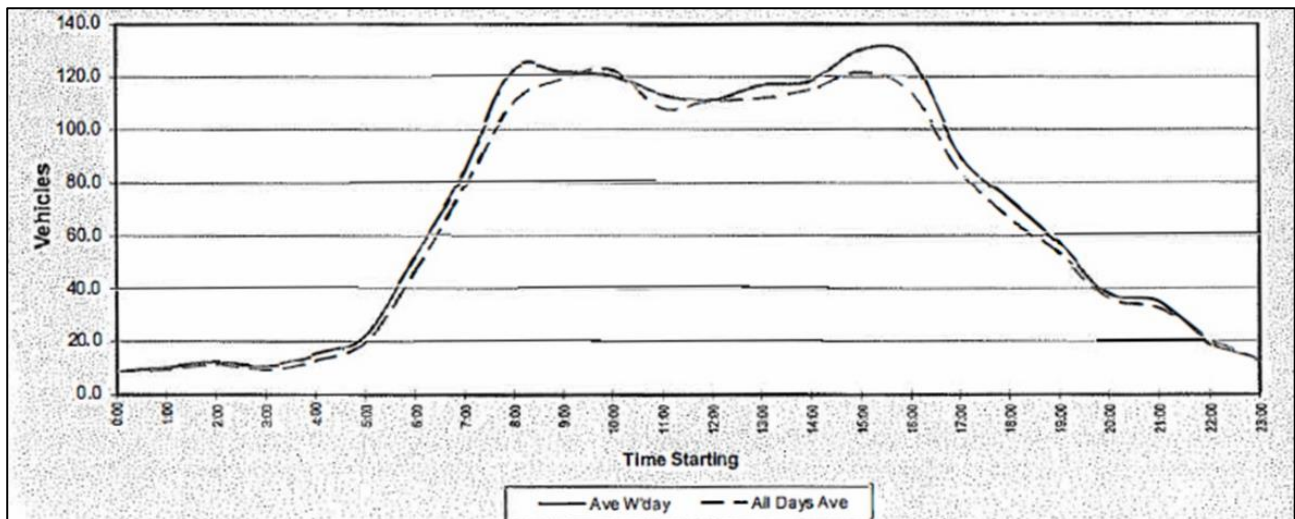


Figure 9 – Hourly volumes: Great Eastern Hwy east of Yilgarn Ave

The austraffic data does not show turning movements into and out of the Great Eastern Hwy/ Yilgarn Ave intersection and hence does not allow for an assessment to be made of the likely impact on increased turning movements at this intersection as a result of the proposed development. In order to address this the author undertook detailed turning movement surveys at the intersection on Thursday 2nd October between 4 PM and 6 PM, as per the peak times indicated in Figure 8 and Figure 9 above.

The survey data revealed that the busiest hour was between 4.30 PM and 5.30 PM with a total of 254 vehicles movements through the intersection, 71% of which were Light Vehicles (cars & cars + caravans/ trailers), 18% Heavy Vehicles (Trucks and semi-trailers) and 11% were Road Trains (B-doubles & A triples). There were no recorded cyclists or pedestrians. The survey data in 5-minute intervals is shown in Table 3 on the following page.


Monday, 2 October 2017	GEH Left into Yilgarn				GEH Right into Yilgarn				Total IN	Yilgarn Left into GEH				Yilgarn right into GEH				Total IN	GEH Westbound Through				GEH Eastbound Through				Total IN
	LV	HV	RT		LV	HV	RT			LV	HV	RT		LV	HV	RT			LV	HV	RT		LV	HV	RT		
																											
4:30 PM - 4:35 PM		1				1			2			1		2				5			4	1			10		
4:35 PM - 4:40 PM	4					1			5				3			1		4			1				6		
4:40 PM - 4:45 PM	2	1				1			4				3			1		4			2	1			6		
4:45 PM - 4:50 PM	3								3		1		6					7			5	1	1	2	10		
4:50 PM - 4:55 PM	4					1			5				3					3			4	2		6	14		
4:55 PM - 5:00 PM	2						1		3				6					6			7	2	3	6	1	19	
5:00 PM - 5:05 PM	6		2			2		1	11		2		1					3			7	3	1	2		13	
5:05 PM - 5:10 PM	1	2			1				4				3	1				4			2	1	1	3	1	1	9
5:10 PM - 5:15 PM	8	1							9				2					2			7	1	2	4		2	16
5:15 PM - 5:20 PM	2								2		1		5					6			4	1	2	1			8
5:20 PM - 5:25 PM	4	1				1	1		7		1		3			1		5			5	2	2	3	1	1	14
5:25 PM - 5:30 PM	1	1			2				4			3		3		1		7			7				2		16
4:30 PM - 5:30 PM	37	7	2		3	7	3		59	0	9	0	40	1	4			54	60	13	13	40	8	7			141

Table 3 – Great Eastern Hwy/ Yilgarn Ave 5 min turning movement data 4.30 PM – 5.30 PM Thu 2 Nov 2017

An hourly turning movement diagram based on the survey data is provided as Figure 10 below.

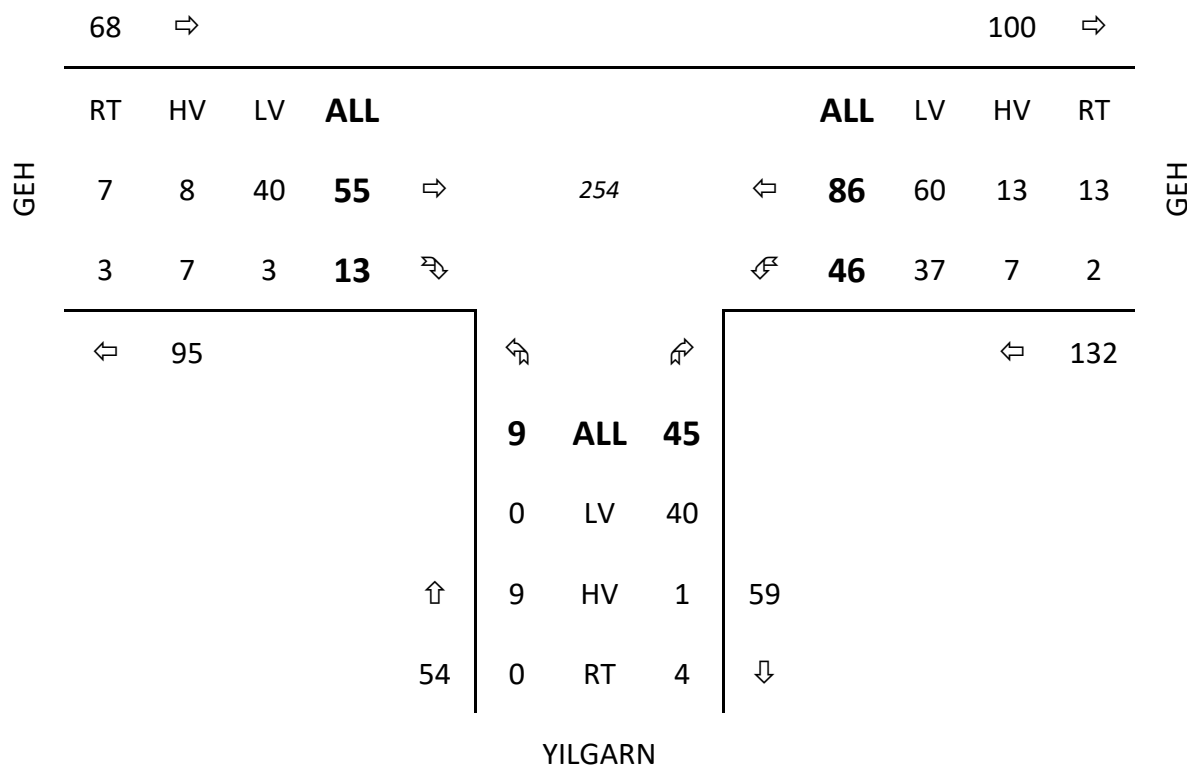


Figure 10 – Great Eastern Hwy/ Yilgarn Ave peak hour turning movement data 4.30 PM – 5.30 PM Thu 2 Nov 2017

Each of the three refuelling positions will be provided with a high-speed diesel bowser capable of refuelling road trains at a rate of 160 litres per minute. Based on an average triple road train fuel carrying capacity of 2,000 litres, this equates to a refuelling time of approximately 12-13 minutes. Allowing for time before and after refuelling, the total refuelling time is assumed to be around 15 minutes. This results in a maximum patronage within any hour of 12 road trains, as shown in Table 4 below.

Refuelling Rate	RT Capacity (litres)	Refuel Time (minutes)	Total Time (minutes)	RT/ hr/ bowser	RT/ hr/ site
160 litres per minute	2000	12.5	15	4	12

Table 4 – Determination of maximum trip generation (RT = Road Train)

Using typical metropolitan trip generation rates for light vehicle trips is not considered appropriate as the site is very unlikely to generate trips instead attracting traffic that is already passing the site. An estimation of the attracted passing trips is shown in Figure 11 below on the right.

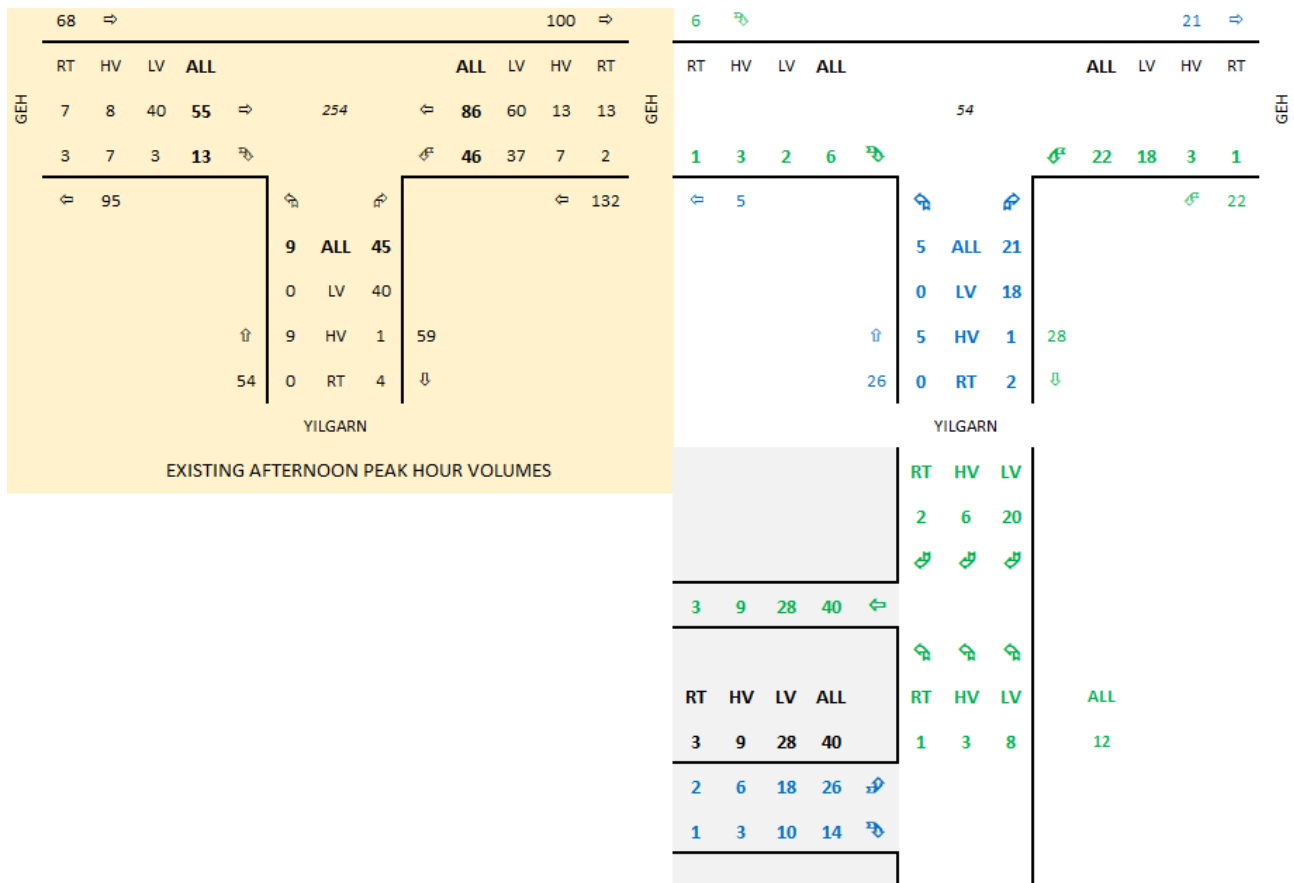


Figure 11 – Estimated bypass trips to and from the development site during the PM Peak Hour

The above trip generation and distribution data is based on the site attracting 12 heavy/ road train vehicles in the proportion surveyed and 20% of passing light vehicles in the proportions surveyed. As the volume of generated traffic is likely to increase proportionately to the volume of passing traffic, growth can be assessed using an annual growth factor of 2% within the SIDRA Intersection modelling software.

The assessed 2018 peak hour trips to, from and past the development site are shown in Figure 12 below.

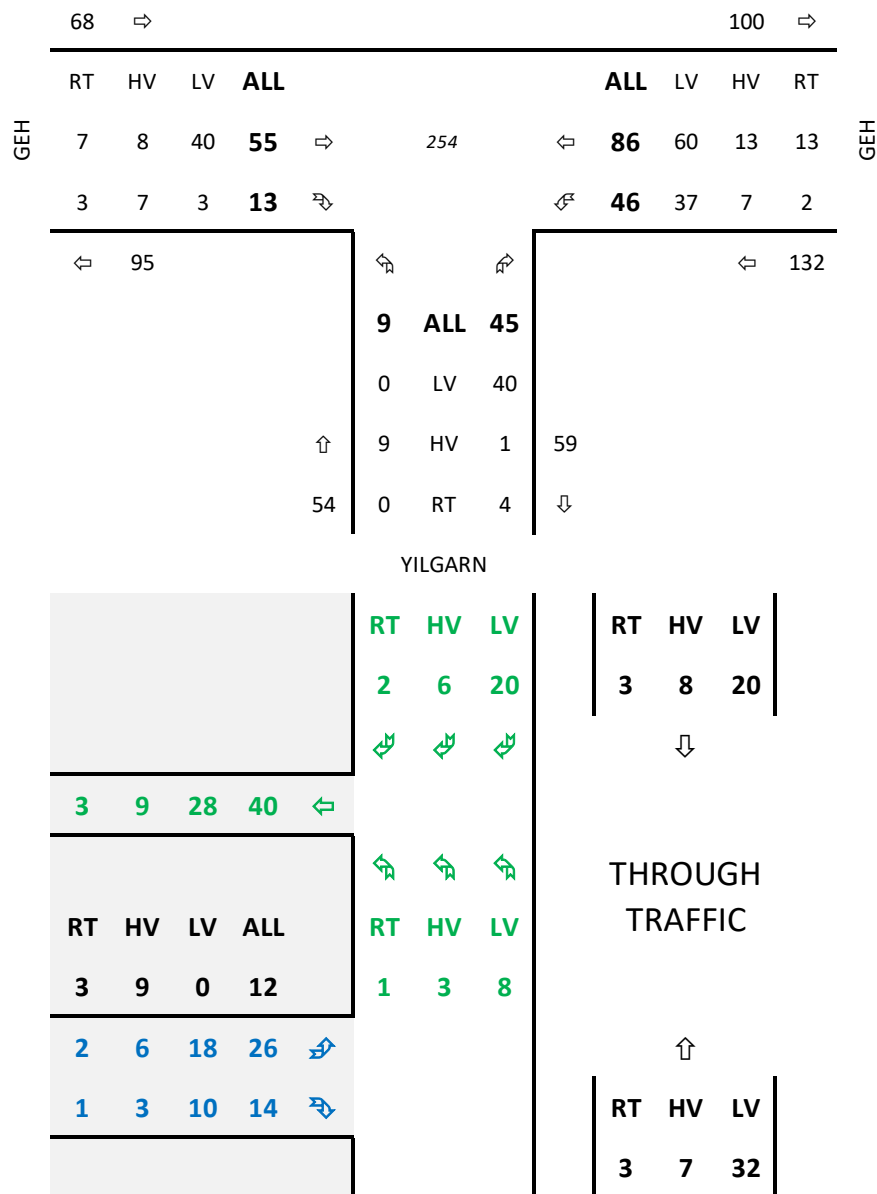


Figure 12 – Forecast weekday 2018 PM peak hour trips to, from and past the development site

An assessment of the capacity (Degree of Saturation) and Blockage Probability of each of the two access driveways (i.e. IN and OUT) has been undertaken by modelling these access driveways with the Great Eastern Highway/ Yilgarn Ave intersection within a SIDRA Intersection 6.1 network model* and assessing and reporting on the key intersection performance criterion of ‘Degree of Saturation’ (referred to as DoS or v/c), as described and defined in Table 5 on the following page.

* SIDRA: Signalised (and unsignalised) Intersection Design and Research Aid. The SIDRA Intersection software (older versions known as SIDRA and aaSIDRA) is an advanced lane-based micro-analytical tool for the design and evaluation of individual intersections and networks of intersections including modelling of separate Movement Classes (Light Vehicles, Heavy Vehicles, Buses, Bicycles, Large Trucks, Light Rail / Trams etc...). It provides estimates of capacity, level of service and a wide range of performance measures including delay, queue length and stops for vehicles and pedestrians, as well as fuel consumption, pollutant emissions and operating cost.

In order to accurately model the triple road trains, the SIDRA model made use of the separate 'large trucks' input category with a pcu value of 9 (as per MRWA Guidance for Triple Road Trains).

SIDRA v/c & colour code	LoS	Average Delay per vehicle (d) in seconds				v/c Range	Performance Comments
		Unsignalised intersections	Roundabouts	Signalised intersections	All (RTA)		
< 0.6	A	$d \leq 10$	$d \leq 10$	$d \leq 10$	$d \leq 14.5$	≤ 0.44	Good operation and plenty of spare capacity <i>Stable free flow conditions where drivers are able to select desired speeds and to easily manoeuvre within the traffic stream.</i>
	B	$10 < d \leq 15$	$10 < d \leq 20$	$10 < d \leq 20$	$14.5 < d \leq 28.5$		
	C	$15 < d \leq 25$	$20 < d \leq 35$	$20 < d \leq 35$	$28.5 < d \leq 42.5$	0.45 - 0.64	Acceptable delays and spare capacity <i>Stable flow but most drivers are restricted to some extent in their ability to select their desired speed and to manoeuvre within the traffic stream.</i>
0.6 - 0.7							
0.7 - 0.8	D	$25 < d \leq 35$	$35 < d \leq 50$	$35 < d \leq 55$	$42.5 < d \leq 56.5$	0.65 - 0.84	Acceptable delays (Expected typical peak hour conditions) <i>Close to the limit of stable flow. All drivers are restricted in their ability to select their desired speed and to manoeuvre within the traffic stream. Small increases in traffic flow may cause operational problems.</i>
0.8 - 0.9							
0.9 - 1.0	E	$35 < d \leq 50$	$50 < d \leq 70$	$55 < d \leq 80$	$56.5 < d \leq 70.5$	0.85 - 1.04	Near capacity and sensitive to disturbances in flows <i>Traffic volumes are close to capacity and there is virtually no freedom to select desired speeds. Flow is unstable and minor disturbances within the traffic stream will cause breakdown leading to long queues and delays.</i>
> 1.0	F	$50 < d$	$70 < d$	$80 < d$	$70.5 < d$	> 1.25	At Capacity - Requires other control mode and/or additional lanes <i>In the zone of forced flow where the amount of traffic approaching the point under consideration exceeds that which can pass. Flow breakdown occurs and extensive queues and delays result.</i>

Table 5 – Key intersection performance data

A summary of assessed criteria for the existing layout and forecast afternoon peak hour movements IN and OUT of the proposed site is provided as Figure 13 and Figure 14 on the following page with more detailed Summary Reports included in **Appendix B**. These show that the access driveways and the Great Eastern Hwy/ Yilgarn Ave intersection are expected to continue to operate “at a good level with plenty of spare capacity.”

DEGREE OF SATURATION

Ratio of Demand Volume to Capacity (v/c ratio)

☼☼ Network: Service Station

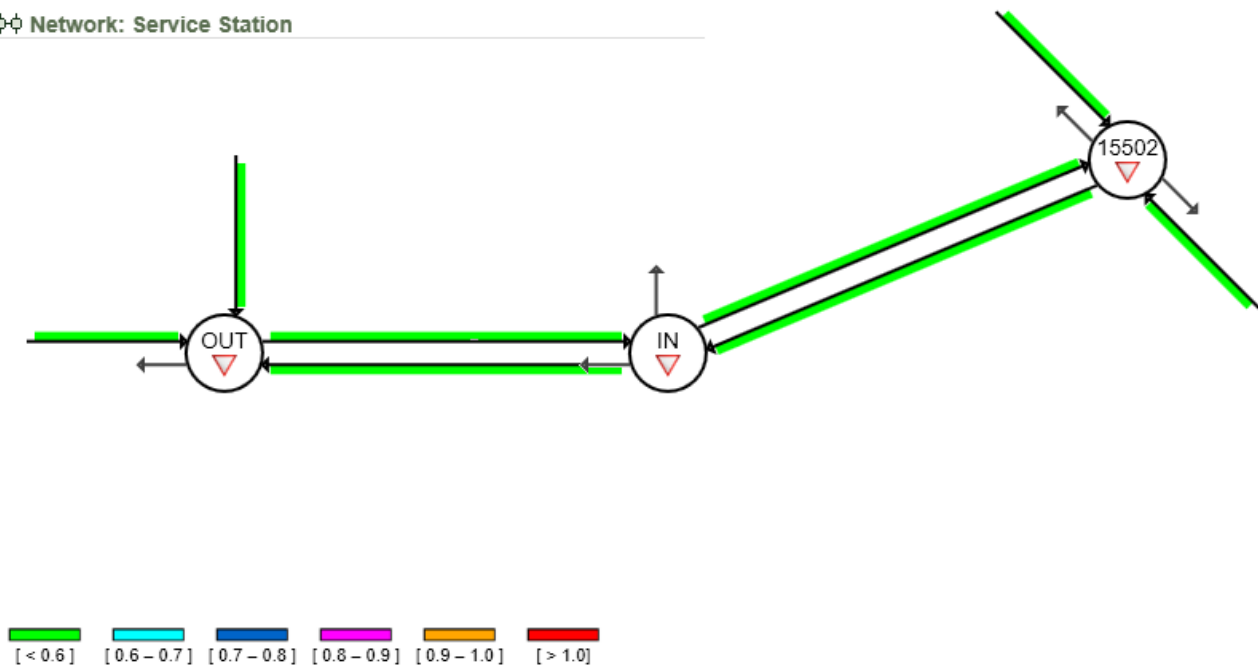


Figure 13 – Forecast degree of saturation for development site IN/ OUT and Yilgarn/ GEH Intersection

LANE BLOCKAGE PROBABILITY

Probability of blockage of upstream Site lanes (worst full-length or two-segme approach)

☼☼ Network: Service Station

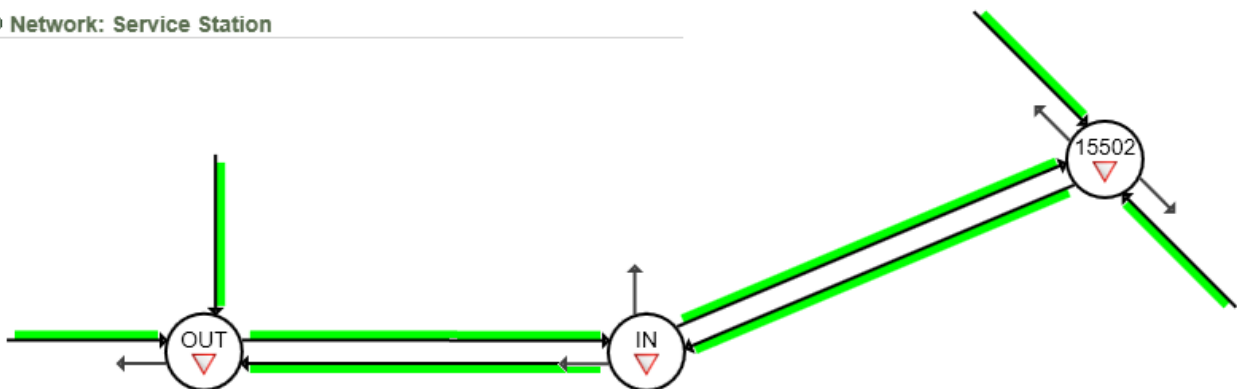
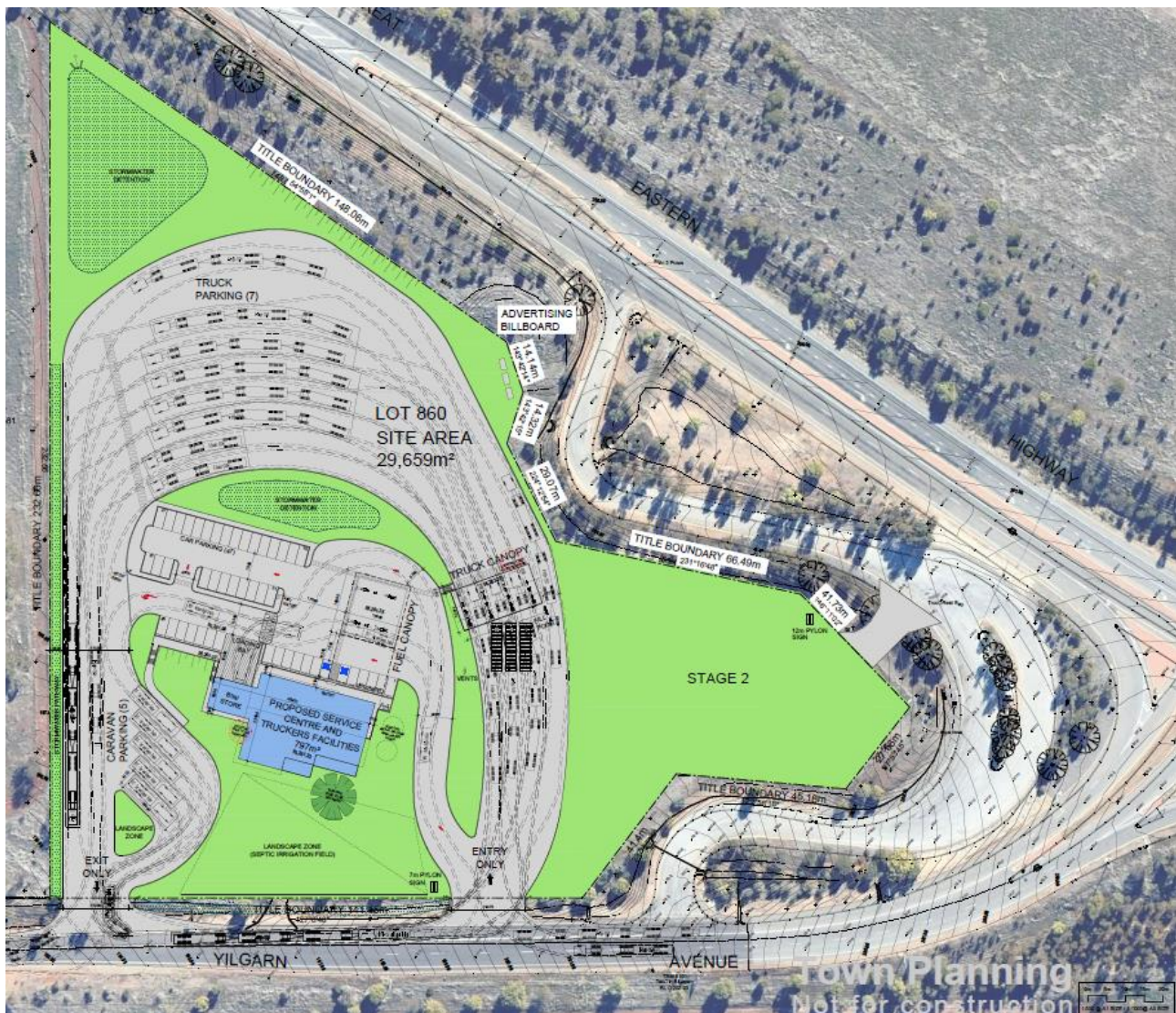


Figure 14 – Forecast degree of saturation for development site IN/ OUT and Yilgarn/ GEH Intersection

As indicated previously, the above assessment does not take into account future traffic growth for 10 years from opening, assumed to be 2018 and 2028. Sensitivity testing has been undertaken within the SIDRA model using a 2% annual growth for all movements over 10 years and this has indicated that the intersection, access and egress will continue to operate at a good level with plenty of spare capacity. The sensitivity testing graph is included in **Appendix B**.

7 TRAFFIC MANAGEMENT ON FRONTAGE STREETS

The layout of Great Eastern Hwy/ Yilgarn Ave, the Tourist Bay and the proposed development is best described through an overlay of the development on an aerial photograph provided as Photograph 2 below and 'street view' photographs taken by the author in November 2017 provided as Photograph 3 and Photograph 4 on the following page. Great Eastern Highway and Yilgarn Ave past the development site, are subject to a 70 km/h posted speed limit.



Photograph 2 – Aerial Photograph of roads in the vicinity of development site



Photograph 3 – looking north on Yilgarn Av towards GEH (proposed development access/ egress on left)



Photograph 4 – Looking south on Yilgarn Ave from GEH (proposed development access/ egress on right)

8 SITE SPECIFIC ISSUES

The proposed access to the service station is off the outside added lane for southbound traffic on Yilgarn Ave, as shown in Figure 15 below.

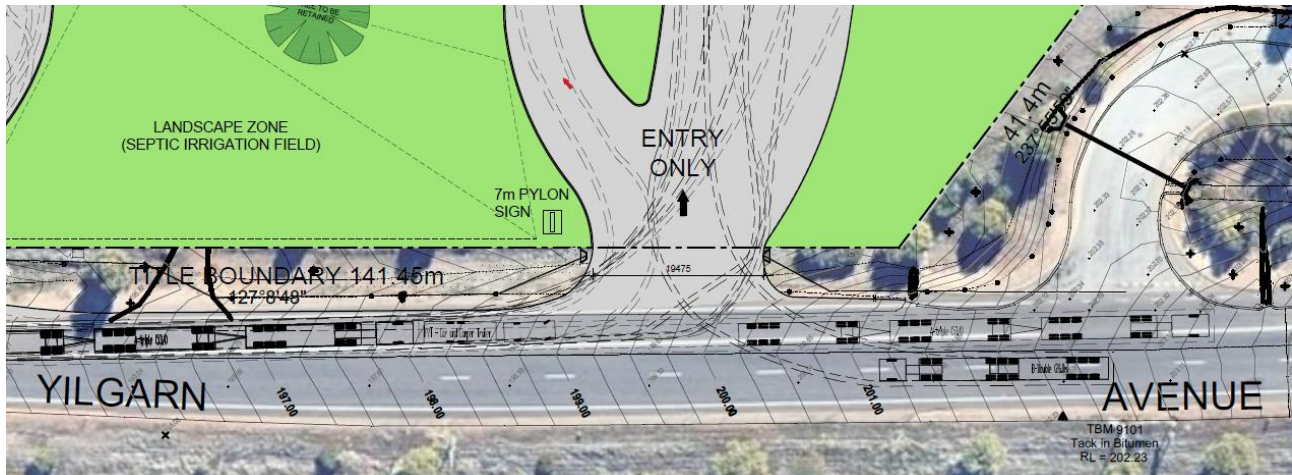


Figure 15 – Extract from Development Drawings showing right turn into site from southbound middle lane

Whilst unusual, this arrangement has been in operation for right turns into the Tourist Bay for many years with aerial photographs showing this in place prior to 2009. Refer comments under **Section 9** regarding the safety performance of this arrangement.

9 SAFETY ISSUES

As indicated in **Section 6**, the proposed development is not expected to result in any queues at the IN and OUT access driveways of the proposed development and hence unlikely to introduce any hazards associated with this or the nearby Great Eastern Hwy/ Yilgarn Ave intersection or the Tourist Bay.

A crash plot of all reported crash locations within 1 km of the development site is shown in Figure 16 below. This shows one reported crash that occurred on Yilgarn Ave adjacent to the development site. Detailed assessment of this crash revealed that it occurred at 7:20 PM on Wednesday 28th January 2015 and involved two cars travelling south with one car sideswiping the other as it turned right into the Tourist Bay. This crash was reported as a Property Damage Only crash (i.e. no injuries). The two other crash locations (at GEH/ Yilgarn Ave intersection) are typical of major intersections.

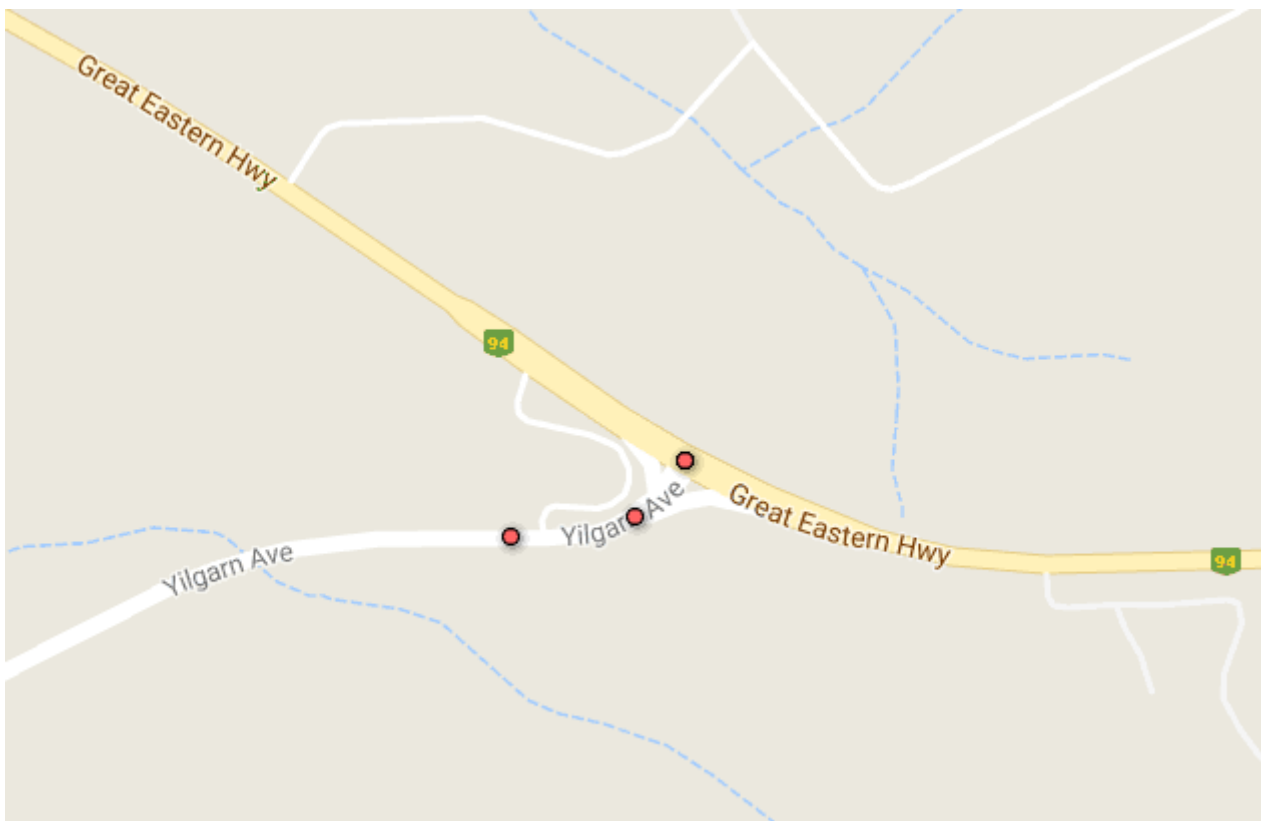


Figure 16 – Reported crashes in vicinity of development site 1 Jan 2011 – 31 Dec 2016

The crash record suggests that there is merit in reviewing the lane markings in Yilgarn Ave between Great Eastern Hwy and just south of the development site to determine if it is possible to introduce a designated right turn lane into both the Tourist Bay area and the development site.

References

1. **Western Australian Planning Commission.** *Transport Impact Assessment Guidelines*. Department of Planning, Government of Western Australia. Perth, Western Australia : Western Australian Planning Commission, August 2016. p. 182, Revised August 2016. The current version of the TIA guidelines (August 2016) has been endorsed by the WAPC..
2. **Austroads.** *Guide to Traffic Management Part 12: Traffic Impacts of Developments*. [ed.] Gary Veith, et al. 1st edition. Sydney : Austroads, 2009. p. 115. Vol. 12. ISBN 978-1-921551-61-1.
3. **The Government of Western Australia.** *Shire of Northam Local Planning Scheme No. 6*. Department of Planning. Perth, WA : The Government of Western Australia, Updated to include AMD 7 GG 4/07/17. p. 85, Scheme Text.
4. **Standards Australia.** *AS/NZS 2890.1 - 2004 Parking facilities Part 1: Off-street car parking*. Sydney : Standards Australia/ Standards New Zealand, 2004. p. 77. (Incorporating Amendment No 1). ISBN 0 7337 5742 1.

Transport Impact Statement

Proposed Service Station (Roadhouse), Lot 860 (SN239) Yilgarn Avenue, (Cnr Great Eastern Hwy) Malabaine (Northam)

Prepared for Procon Developments



APPENDIX A

DEVELOPMENT DRAWINGS



PLANNING ISSUE
NO. 15405
AMENDMENT DETAILS
15405
DATE
15/09/17

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The Roadhouse Pty Ltd ABN 62 081 124 698
RSP No. DP-021006

PROCON DEVELOPMENTS
GREAT EASTERN HIGHWAY
NORTHAM
WA 6041
EXISTING
SITE PLAN

DATE
SEP'17
SCALE @ 1:500
DRAWN
KM
CHECKED
AB
PLANNING ISSUE
PROJECT No. 15405
DESIGNED By TP02
CHECKED By P1
SHEET 02 of 06



AREA SCHEDULE:	
TOTAL SITE AREA -	29,659m²
SERVICE CENTRE -	636m²
EXTERNAL AREA -	620m²
BINSTORE AREA -	900m²
TOTAL AREA -	797m²
CAR SPACES PROVIDED -	47 cars
CARAVAN PARKING -	5 vans

ALL AREAS ARE APPROXIMATE AND
SUBJECT TO FINAL SURVEY

PR	PLANNING ISSUE	AB	18-11-17
PT	PLANNING ISSUE	AB	20-11-17
PR	PLANNING ISSUE	AB	30-10-17
PR	PLANNING ISSUE	AB	27-10-17
PR	PLANNING ISSUE	AB	29-10-17
PR	PLANNING ISSUE	AB	29-10-17
PR	PLANNING ISSUE	AB	29-10-17
PT	PLANNING ISSUE	AB	19-09-17

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RFP No: DP-021999

PROCON DEVELOPMENTS
PROPOSED SERVICE STATION
DEVELOPMENT

PROJECT ADDRESS
GREAT EASTERN HIGHWAY

NORTHAM
WA 6041

PROPOSED SITE PLAN

PROCON DEVELOPMENTS

DATE
SEP'17

SCALE
1:500

DESIGN
KM

PLANNING ISSUE
TP03

PROJECT NO
16405

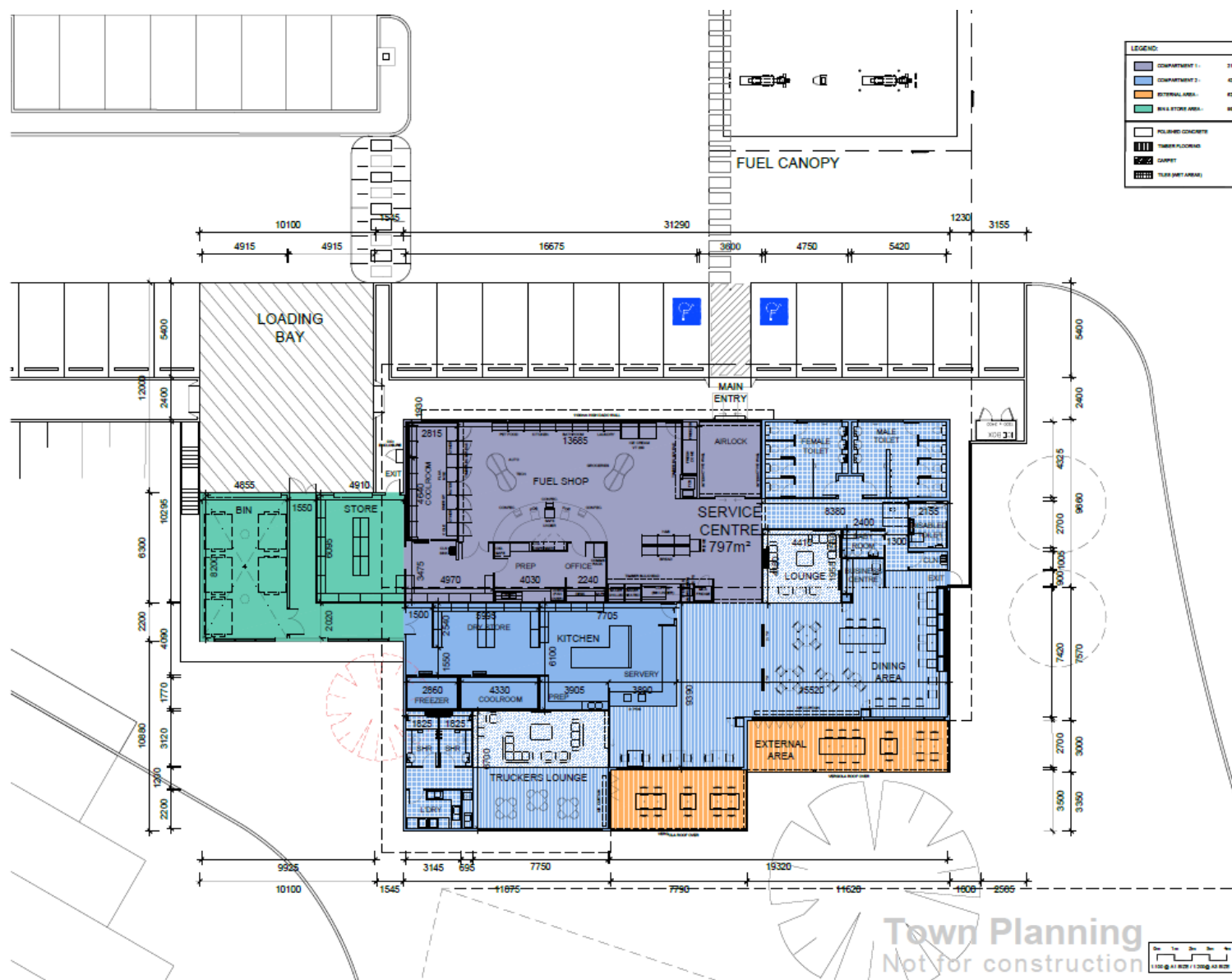
DESIGN NO
P8

DATE
03rd 07

Transport Impact Statement

Proposed Service Station (Roadhouse), Lot 860 (SN239) Yilgarn Avenue, (Cnr Great Eastern Hwy) Malabaine (Northam)

Prepared for Procon Developments



Transport Impact Statement

Proposed Service Station (Roadhouse), Lot 860 (SN239) Yilgarn Avenue, (Cnr Great Eastern Hwy) Malabaine (Northam)

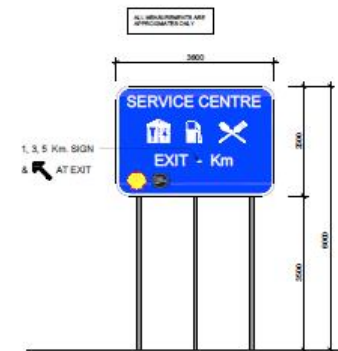
Prepared for Procon Developments



A LOCALITY PLAN (WEST)
SCALE: 1:1000



B LOCALITY PLAN (EAST)
SCALE: 1:1000



01 SERVICE CENTRE SIGN
SCALE: 1:1000

PLANNING ISSUE
REVISIONS
DATE
16/05/17

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The Roadhouse Pty Ltd ABN 60 155 134 686
GPO No. 100-01000

PROJECT: PROPOSED SERVICE STATION DEVELOPMENT

PROJECT ADDRESS: GREAT EASTERN HIGHWAY NORTHAM WA 6041

CLIENT: PROCON DEVELOPMENTS

DATE: SEP-17
DRAWN: KM
CHECKED: AS
SCALE: AS SHOWN

PLANNING ISSUE: TP07

PROJECT NO: 16405
REVISION NO: P1
REVISION NO: 07 of 07

APPENDIX B SIDRA INTERSECTION DATA

GRAPHS - Design Life Analysis

Average control delay per vehicle for the worst vehicle movement (seconds) and Highest degree of saturation in any lane

▽ Site: Great Eastern Hwy/ Yilgarn Ave PM Peak Hour

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Giveaway / Yield (Two-Way)

Design Life Analysis (Practical Capacity): Results for 10 years

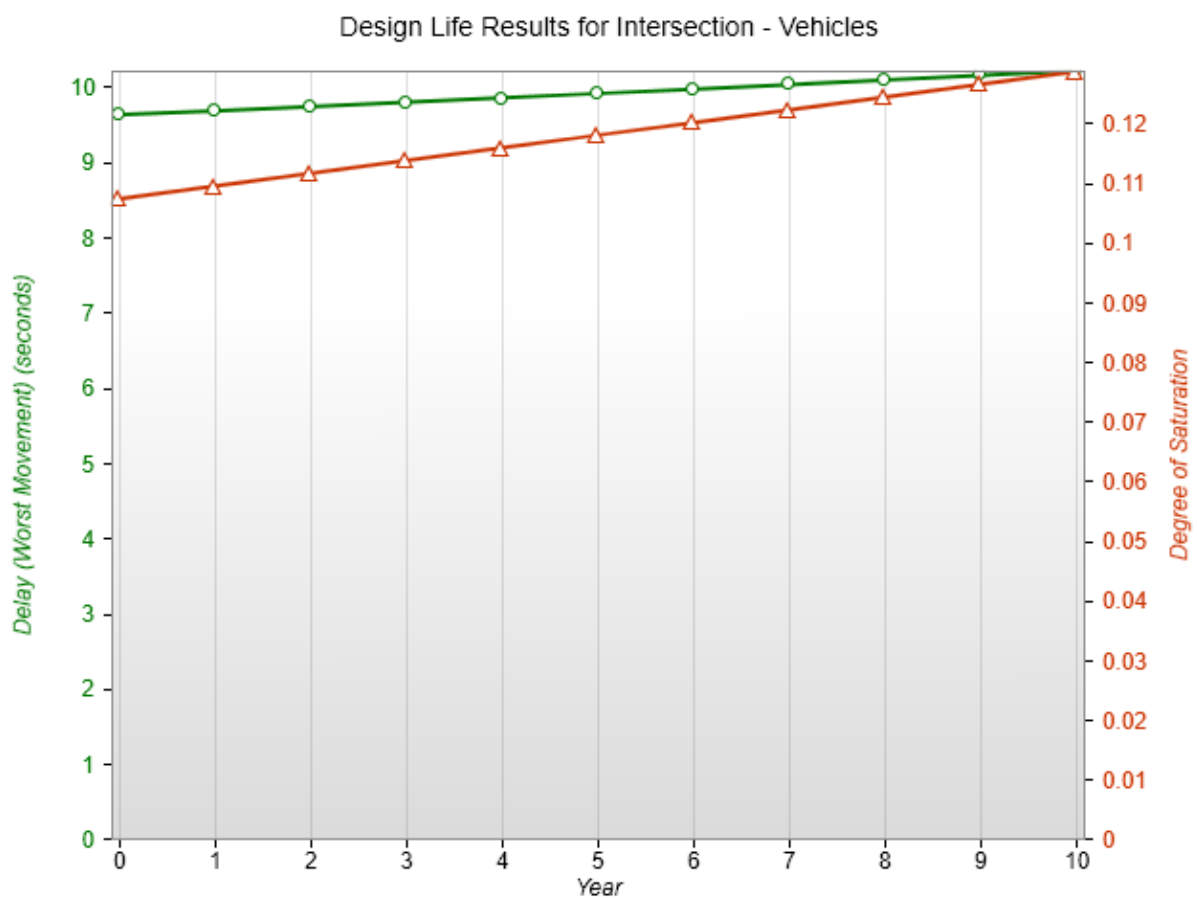


Figure 17 – Sensitivity testing with 2% traffic growth on all legs and movement for 10 years

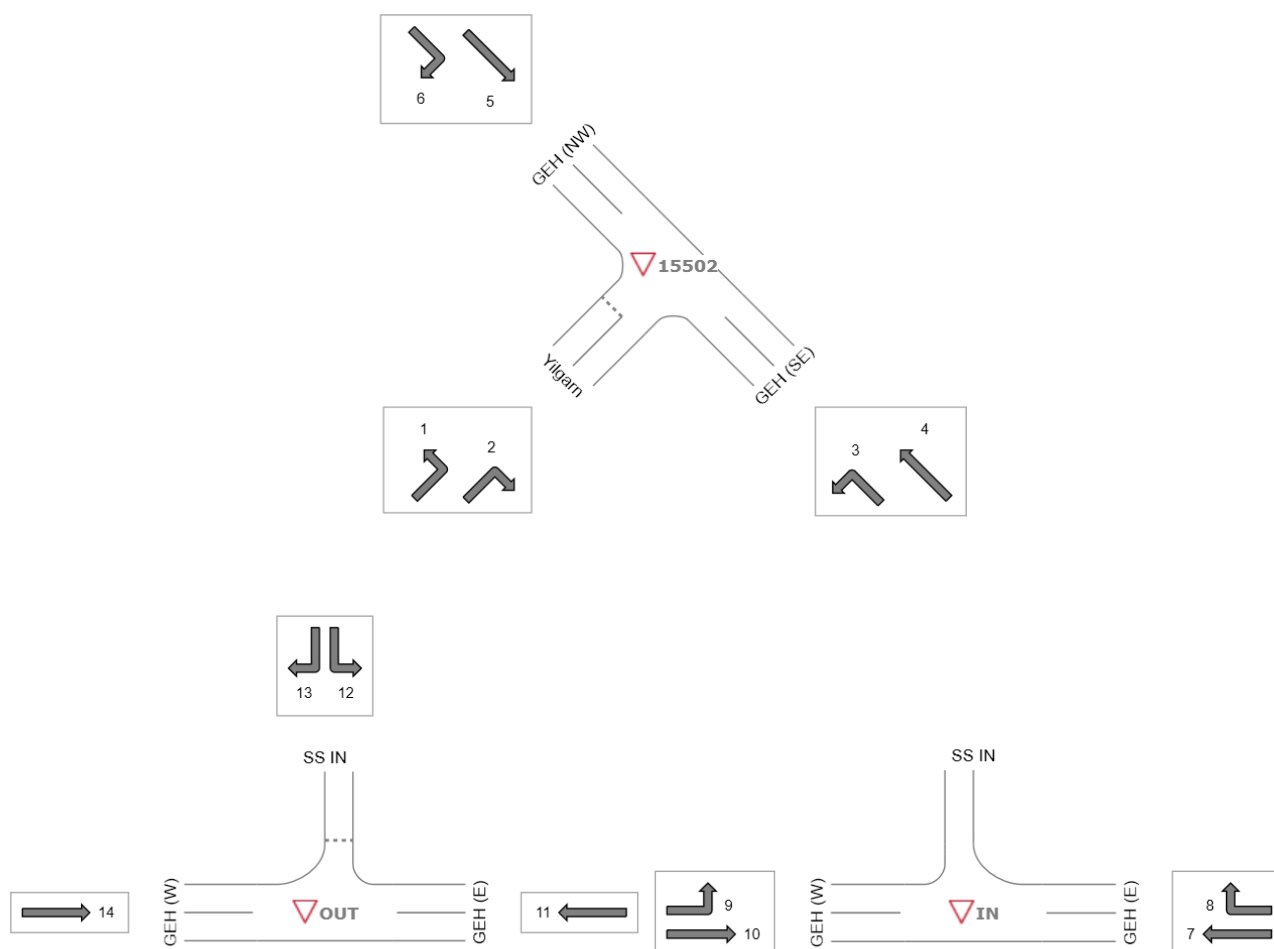


Figure 18 – SIDRA Intersection Model Movement IDs

MOVEMENT SUMMARY

Site: Great Eastern Hwy/ Yilgarn Ave PM Peak Hour

Network: SS-GEH

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Giveaway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	ODMo v	Demand Flows		Arrival Flows		Deg. Satn	Average Delay sec	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
		Total veh/h	HV %	Total veh/h	HV %	v/c			Vehicles veh	Distance m			
SouthEast: GEH (SE)													
3	L2	48	19.6	48	19.6	0.038	8.5	LOS A	0.0	0.0	0.00	0.61	80.7
4	T1	91	30.2	91	30.2	0.107	0.5	LOS A	0.0	0.0	0.00	0.06	85.4
Approach		139	26.5	139	26.5	0.107	3.3	NA	0.0	0.0	0.00	0.25	84.3
NorthWest: GEH (NW)													
5	T1	58	27.3	58	27.3	0.063	0.4	LOS A	0.0	0.0	0.00	0.06	86.1
6	R2	14	76.9	14	76.9	0.015	9.6	LOS A	0.1	0.9	0.29	0.58	75.9
Approach		72	36.8	72	36.8	0.063	2.2	NA	0.1	0.9	0.05	0.16	84.9
SouthWest: Yilgarn													
1	L2	9	88.9	9	88.9	0.013	8.6	LOS A	0.0	0.0	0.00	0.57	69.2
2	R2	47	11.1	47	11.1	0.070	9.6	LOS A	0.3	2.3	0.40	0.67	75.0
Approach		57	24.1	57	24.1	0.070	9.4	LOS A	0.3	2.3	0.34	0.65	73.9
All Vehicles		267	28.7	267	28.7	0.107	4.3	NA	0.3	2.3	0.09	0.31	82.8

MOVEMENT SUMMARY

 **Site: Service Station IN**

 **Network: SS-GEH**

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Giveaway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	ODMo v	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Average Speed
		Total veh/h	HV %	Total veh/h	HV %	v/c	sec		Vehicles veh	Distance m		per veh	km/h
East: GEH (E)													
7	T1	33	35.5	33	35.5	0.022	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
8	R2	29	28.6	29	28.6	0.021	6.3	LOS A	0.1	0.9	0.18	0.57	37.0
Approach		62	32.2	62	32.2	0.022	3.0	NA	0.1	0.9	0.08	0.27	47.4
West: GEH (W)													
9	L2	13	33.3	13	33.3	0.036	5.1	LOS A	0.0	0.0	0.00	0.13	19.4
10	T1	44	23.8	44	23.8	0.036	0.0	LOS A	0.0	0.0	0.00	0.13	50.5
Approach		57	25.9	57	25.9	0.036	1.1	NA	0.0	0.0	0.00	0.13	35.0
All Vehicles		119	29.2	119	29.2	0.036	2.1	NA	0.1	0.9	0.04	0.20	43.5

MOVEMENT SUMMARY

 **Site: Service Station OUT**

 **Network: SS-GEH**

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Giveaway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	ODMo v	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Average Speed
		Total veh/h	HV %	Total veh/h	HV %	v/c	sec		Vehicles veh	Distance m		per veh	km/h
East: GEH (E)													
11	T1	33	35.5	33	35.5	0.022	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		33	35.5	33	35.5	0.022	0.0	NA	0.0	0.0	0.00	0.00	60.0
North: SS IN													
12	L2	27	30.8	27	30.8	0.037	3.3	LOS A	0.1	1.3	0.15	0.51	25.8
13	R2	15	28.6	15	28.6	0.037	3.5	LOS A	0.1	1.3	0.15	0.51	56.3
Approach		42	30.0	42	30.0	0.037	3.4	LOS A	0.1	1.3	0.15	0.51	53.8
West: GEH (W)													
14	T1	44	23.8	44	23.8	0.028	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		44	23.8	44	23.8	0.028	0.0	NA	0.0	0.0	0.00	0.00	60.0
All Vehicles		119	29.2	119	29.2	0.037	1.2	NA	0.1	1.3	0.05	0.18	58.9

APPENDIX C WAPC TRANSPORT IMPACT STATEMENT CHECKLIST

CHECKLIST FOR A TRANSPORT IMPACT STATEMENT FOR INDIVIDUAL DEVELOPMENT

- Tick the provided column for items for which information is provided.
- Enter N/A in the provided column if the item is not appropriate and enter reason in comment column.
- Provide brief comments on any relevant issues.
- Provide brief description of any proposed transport improvements, for example, new bus routes or signalisation of an existing intersection.

ITEM	PROVIDED	COMMENTS/PROPOSALS
Proposed development		
existing land uses	Section 2	Vacant cleared land
proposed land use	Section 2	Service Station/ Roadhouse
context with surrounds	Section 1	Figures 2, 4 & 6
Vehicular access and parking		
access arrangements	Section 3	Figure 6
public, private, disabled parking set down/pick up	Section 3	Appendix A
Service vehicles (non-residential)		
access arrangements	Section 4	Figure 7
on/off-site loading facilities	Section 4	Figure 7
Service vehicles (residential)		
rubbish collection and emergency vehicle access		
Hours of operation (non-residential only)	Section 5	24 hrs/ day, 7 days/ week
Traffic volumes		
daily or peak traffic volumes	Section 7	Daily and Peak Hour
type of vehicles (for example, cars, trucks)	Section 7	Light (Cars), Heavy and Road Trucks
Traffic management on frontage streets	Sections 7 & 8	Photographs 2 to 4 and Figure 16
Public transport access	NA	Rural Location with no services
nearest bus/train routes		
nearest bus stops/train stations		
pedestrian/cycle links to bus stops/ train station		

ITEM	PROVIDED	COMMENTS/PROPOSALS
Pedestrian access/ facilities	NA	Rural Location with no ped network facilities
existing pedestrian facilities within the development (if any)		
proposed pedestrian facilities within development		
existing pedestrian facilities on surrounding roads		
proposals to improve pedestrian access		
Cycle access/facilities	NA	Rural Location with no cycle network facilities
existing cycle facilities within the development (if any)		
proposed cycle facilities within development		
existing cycle facilities on surrounding roads		
proposals to improve cycle access		
Site specific issues	Section 8	Added/ merge lanes at Service Station Entry
Safety issues		
identify issues	Section 9	Crash record with added/ merge lanes
remedial measures	Section 9	Review lane markings with MRWA to determine possibility of designated right turn lane

Proponent's name

Company Date

Transport assessor's name *David Wilkins*

Company *i3 consultants WA* Date *16/11/17*