Traffix Group

Traffic Impact Assessment

Proposed Service Station Redevelopment 2038 Wanneroo Road, Neerabup (WA)

Prepared for United Petroleum Pty Ltd

February, 2020

G27403R-01C

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Document Control

Our Reference: G27403R-01C

Issue No.	Туре	Date	Prepared By	Approved By
А	Initial Issue	29/11/19	Daniel Milder	Jodie Place
В	Final Issue	11/12/19	Daniel Milder	Jodie Place
С	Amended Plan	05/02/20	Daniel Milder	Jodie Place

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1. Introduction

Traffix Group has been engaged by United Petroleum Pty Ltd to undertake a traffic impact assessment for a proposed service station redevelopment at 2038 Wanneroo Road, Neerabup (WA).

This report provides a traffic assessment of the parking and traffic issues associated with the proposed development.

2. Existing Conditions

2.1. Site Locality

The subject site is located on the east side of Wanneroo Road, approximately 300m south of Hester Avenue in Neerabup Western Australia, as shown in Figure 1 below.



Figure 1: Locality Map

The subject site is occupied by an existing United service station which takes vehicle access via three crossovers to the existing service road. The northern crossover allows for entry

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movements, the central crossover allows for egress movements only (trucks excepted) and the southern crossover allows for unrestricted movements.

The site has an area of 4,047m² and a frontage to Wanneroo Road service road of approximately 62m.

An aerial photograph of the subject site is presented at Figures 2 below.



Figure 2: Aerial Photograph (August, 2019)



2.2. Land Use

The subject site is located within the General Rural Zone under the Cow District Planning Scheme as presented at Figure 3 below.

Surrounding land uses include general rural to the east of Wanneroo Road and Neerabup National Park, bound by the Mitchell Freeway to the west of Wanneroo Road.



Figure 3: Land Use Zoning Map



2.3. Road Network

Wanneroo Road is a State Arterial Road and Primary Regional Road Zone aligned in a northsouth direction between Old Yanchep Road in the North (where it continues as Indian Ocean Drive) and London Street in the south (where it continues as Charles Street).

In the vicinity of the subject site Wanneroo Road is constructed with a divided carriageway comprising two through traffic lanes in each direction with a wide central median. Dedicated turning lanes are provided for left and right turn movements where there are significant land uses and breaks in the median and outer separators.

A service road is located on the east side of Wanneroo Road which serves to provide vehicle access to a number of industrial land uses including the subject site.

Signage is provided directly opposite the existing southern crossover which advises of alternate access to Wanneroo Road via the break in the outer separator south of the site.

A posted speed limit of 80km/h applies to the main carriageway and the default speed limit of 50km/h applies to the service road.

2.4. Existing Traffic Volume

Traffix Group has sourced traffic volume data from Mainroads Western Australia's online trafficmap database which shows an average daily traffic volume of 12,846 vehicles per day (6,397 northbound and 6,449 southbound).

The data also shows AM and PM peak hour traffic volumes along Wanneroo Road of 1,167 vehicles (353 northbound and 814 southbound) and 1,178 vehicles (767 northbound and 411 southbound) respectively.

3. Proposal

The application is for a redevelopment of the existing service station to accommodate four double sided petrol dispensers, three double sided dissel dispensers and a single sided dispenser along the northern boundary in addition to a new 335m convenience store.

A total of 22 parking spaces are proposed on the site comprising eight standard 90 degree parking spaces, one DDA space, an air and water space and 12 spaces adjacent to the dispensers.

A copy of the proposed development plan, prepared by Hodge Collard Preston Architects (dated October, 2019), is attached at Appendix B.



4. Car Parking Assessment

4.1. Statutory Car Parking Requirement

Table 2 of Clause 4.14 of the Planning Scheme sets out the statutory requirements for car parking.

A summary of the statutory car parking requirement is presented at Table 1.

Table 1: Statutory Car Parking Requirement

Use	Measure/No.	Rate	Requirement
Service Station	316m ²	5 spaces per service bay plus 7 spaces per 100m ² non service bay NLA.	22 spaces

The proposed development has a statutory car parking requirement for 22 spaces. The Planning Scheme specifies that "up to 50% of non-service and non-seated bays may be located in refuelling positions".

The provision of 22 car parking spaces meets the statutory requirement although, we note that more than 50% of spaces are located in refuelling positions.

It is our opinion that the distribution of 22 parking spaces will meet the likely parking demand for the use. Given the experience of the operator and experience with similar sites near to the subject site, the provision of 22 spaces in this arrangement will be more than sufficient for this use.¹

4.2. Car Parking Layout

The proposed car parking layout and access arrangements have been checked against the relevant requirements of the Australian Standards (AS/NZS 2890.1:2004 and AS/NZS 2890.6:2009). The following is noted:

- All parking spaces have a minimum headroom clearance of 2.2m.
- All car spaces are provided in accordance with the minimum requirement set out at Figure 2.2 of AS/NZS 2890.1:2004 for short term, high turnover parking spaces, i.e. 2.6m wide, 5.4m long with an access aisle that is wider than 6.6m.
- A space that is DDA compliant in accordance with AS/NZS 2890.6:2009 is provided onsite, i.e. headroom of 2.5m above the parking and shared space.
- The site layout allows for all vehicles to enter and exit in a forwards direction.

¹ In the event that additional car parking (not in refueling positions) were required, there is sufficient paved area along the site's northern boundary to line mark two staff parking spaces without impacting on the movement of vehicles throughout the site.

• Swept path diagrams have been prepared, attached at Appendix C which show the largest vehicles expect to use the site (27.5m B-Double trucks) entering and exiting via the arterial road network.

We are satisfied that the layout of the access and carparking adheres to the requirements of the Australian Standard and importantly, will work well.

5. Traffic Assessment

5.1. Traffic Generation

The RTA Guide to Traffic Generating Developments (2002) (RTA Guide) sets out traffic generation rates based on survey data collected in New South Wales for a range of land uses. This guide is referred to in the Austroads Guide which is used by other State Authorities, and is generally regarded as the standard for metropolitan development characteristics.

The RTA Guide sets out the following formula for calculating traffic generation for service stations and ancillary convenience stores:

Evening peak hour vehicle trips = 0.66A(F)

Where A(F) is the gross floor area of the convenience store (excluding restaurant/seating areas).

The service kiosk is measured to be 316m², and accordingly the service station is expected to generate in the order of 209 vehicle movements in the PM peak hour.

The service station traffic is primarily expected to be from passing trade.

We note that the existing traffic accessing the site will also form part of the new traffic for this development.



5.2. Traffic Distribution

Having regard to the locality of the site, the intersection arrangements on Wanneroo Road and typical driver behaviour regarding service stations, we are of the view that traffic to/from the subject site will be distributed as follows:

- 50% in,
- 50% out,
- 85% left-IN/left-OUT
- 15% right-IN/right-OUT

We would expect the same distribution to occur during both peak periods.

We expect that vehicle movements to and from the subject site will generally be in accordance with the below assumptions:

- Entering traffic will travel through the opening in the outer separator directly in front of the subject site.
- Passenger vehicles exiting northbound and southbound will to travel through the opening directly in front of the subject site
- Commercial vehicles exiting northbound will exit at the outer separator in front of the site and commercial vehicles exiting southbound will travel through the opening in the outer separator to the south of the site, via the service road.

It has been assumed that right-OUT movements from the site will store within the centre median before completing the turn.



5.3. Traffic Impact

The proposed development may generate up to 209 movements to the subject site in the peak periods.

Significantly, a proportion of the traffic which may be generated forms part of the existing service station traffic.

We anticipate that there will be negligible new traffic to the road network during commuter peak periods as a result of the proposed development.

For the purpose of a robust analysis, all traffic to and from the site has been modelled as new traffic to the road network.

A SIDRA assessment of the proposed ingress and egress arrangements have been undertaken and the key outputs are summarised in Tables 2 below.

Table 2: SIDRA Outputs – AM & PM Peak Periods

l ea/Movement	AM Peak			PM Peak					
	DoS	Ave Delay	95th %ile Queue	DoS	Ave Delay	95th %ile Queue			
Stage 1 (Minor Road)									
South: Wanneroo Roa	ad								
Right	0.069	17.3 sec	1.5m	0.034	9.7 sec	0.8m			
East: Service Road O	pening								
Left	0.143	7.6 sec	3.7m	0.107	5.8 sec	2.9m			
Through	0.076	18.5 sec	1.8m	0.035	9.0 sec	0.9m			
North: Wanneroo Roa	ad								
Left	0.054	5.6 sec	0.0m	0.054	5.6 sec	0.0m			
Through	0.233	0.0 sec	0.0m	0.118	0.0 sec	0.0m			
Stage 2 (Median)									
South: Wanneroo Roa	ad								
Through	0.101	0.0 sec	0.0m	0.20	0.0 sec	0.0m			
East: Median Storage	9								
Right 0.017		1.1 sec	0.3m	0.027	3.4 sec	0.1m			
TOTAL AVERAGE DEL RIGHT OUT	_AY -	19.6 sec	-	-	12.4 sec	-			

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For unsignalised intersections, degrees of saturation less than 0.8 are considered to represent good operating conditions.

The analysis shows that all movements have a degree of saturation less than 0.8 and relatively minor delays which is consistent with good intersection operation.

A copy of the detailed SIDRA output is attached at Appendix C.

5.4. Road Access Arrangements

Wanneroo Road has been constructed with a divided carriageway and 'seagull' intersection treatments at regular intervals along the highway to provide access to side roads and properties that front the service road. No change is proposed to the site's access arrangements or their operation and the existing intersection treatments will allow for continued access as per the existing conditions.

6. Waste Collection/Loading

Deliveries

The proposal includes a small loading area along the northern edge of the proposed convenience store. This area is 3.52m wide and in the order of 16m long which is sufficient for vehicles up to a 12.5m HRV including a space at the rear of the vehicle for the loading to occur. Significantly, the Australian Standard AS/NZS 2890.2-2002 specifies that a loading bay should be 2.5m wide and 12.5m long and accordingly, the proposed loading bay exceeds this requirement and is more than sufficient for the use.

Refuelling

The service station will have the capacity to be accept fuel deliveries from vehicles up to and including 27.5m B-double trucks.

Traffix Group has prepared swept path diagrams, attached at Appendix B, which demonstrate forward entry and exit movements to the 'fill point'.

We note that when the tanker is delivering fuel, access to the truck canopy will be temporarily stopped. Accordingly, we recommend that fuel deliveries occur, outside of peak operating periods.



7. Conclusion

Having undertaken a traffic impact assessment for the proposed service station redevelopment at 2038 Wanneroo Road, Neerabup, we are of the opinion that:

- a) the proposed development has a statutory car parking requirement for 22 car spaces (up to 50% may be in a refuelling position) as set out at Table 2 of Clause 4.14 of the Wanneroo Planning Scheme,
- b) the provision of 22 parking spaces including 12 refuelling positions is sufficient to meet the demands for the use and if additional standard car parking were required, a further two spaces could be line marked along the site's northern boundary,
- c) car parking is provided in accordance with the relevant standards set out in AS/NZS 2890.1:2004 and AS/NZS 2890.6:2009 and importantly will work well,
- d) the site will not generate any significant additional traffic to the road network as the any new movements to/from the site are expected to be from passing trade,
- e) there will be no adverse impacts to the operation of the road network as a result of the redevelopment of the site,
- f) no change is proposed in the operation of the site and the existing intersection treatments will allow for continued access as per the existing conditions,
- g) a dedicated loading zone is provided adjacent to the northern boundary of the proposed convenience shop to accommodate deliveries and waste collection,
- h) fuel deliveries are able to be undertaken with the tanker stopped wholly within the site, however we recommend that fuel deliveries occur outside of peak times, and
- i) there are no traffic engineering reasons why a planning permit for the proposed service station refurbishment at 2038 Wanneroo Road, Neerabup, should be not be granted.





Appendix A

Proposed Development Plan

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Appendix B

Swept Path Diagrams

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COMPLY WITH AS 2890.6 Į۲ EXISTING SLIP ROAD WANNEROO ROAD



27403-03.dwg

А

TEL: (03) 9822-2888

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B-DOUBLE ENTRY VIA DECELERATION LANE ON MAIN CARRIAGEWAY



<u>0 2</u> 0	SHEET NO.: 01/04	JOB NO.: 27403

B-DOUBLE ENTRY FROM MAIN CARRIAGEWAY, EXIT VIA BREAK IN OUTER SEPARATOR TO THE SOUTH





2038 1/		DESIGNED BY:	GENERAL NOTES:	REVISION DATE	REVISION NOTES	REV.
	21 JAN 2020	D. MILDER				
		CHECKED BY:				
	21 JAN 2020	J. PLACE				
MELBOURNE VICTORIA 3000	ISSUE:	FILE NAME:]			
TEL: (03) 9822-2888 SCALE: 0 1 1:1500 (A3)	А	27403-03.dwg	1			

SHEET NO .: 02/04

JOB NO.: 27403

B-DOUBLE ENTRY VIA SERVICE ROAD



А

TEL: (03) 9822-2888



SHEET NO .: 03/04 JOB NO.: 27403 B-DOUBLE EGRESS VIA OUT SEPARATOR BREAK AT SITE FRONTAGE





REV.	REVISION NOTES	REVISION DATE	GENERAL NOTES:	DESIGNED BY:					
				D. MILDER	21 JAN 2020	Traffing Charles	2030 WAININL		INADUF (VVA)
				CHECKED BY:		Iramx Group	27.5m B-DOl	UBLE DESIGN VEHICLE S	SWEPT PATHS
				J. PLACE	21 JAN 2020		PROF	POSED SERVICE STA	ATION
				FILE NAME:	ISSUE:	MELBOURNE VICTORIA 3000			
				27403-03.dwg	А	TEL : (03) 9822-2888	SCALE: 0 15 30 1:1500 (A3)	SHEET NO.: 04/04	JOB NO.: 27403
				P					ļ



Appendix C

SIDRA Output

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1 [AM Peak - Stop 3-way Stage 1 (Minor Road) L]

♦ Network: N101 [AM Peak]

Staged crossing Stage 1 (Minor Road) at three-way intersection with 5-lane major road. Major road turn lane is treated as a full-length lane. Site Category: (None)

Stop (Two-Way)

Move	Movement Performance - Vehicles													
Mov Turn Demand Flows Arrival Flows		Flows	Deg. Satn	Average Delay	Level of Service	95% Bac Queue	k of e	Prop. Queued	Effective Stop	Aver. No.	Averag e			
		Total veh/h	HV %	Total veh/h	HV %	v/c	sec		Vehicles Dis	stance m		Rate	Cycles	Speed km/h
South	n: Wan	neroo Road			,,,	110	000		Voli					
12	R2	18	3.0	18	3.0	0.069	17.3	LOS C	0.2	1.5	0.76	0.90	0.76	38.0
Appro	bach	18	3.0	18	3.0	0.069	17.3	NA	0.2	1.5	0.76	0.90	0.76	38.0
East:	Servic	e Road Acc	es											
1	L2	99	3.0	99	3.0	0.143	7.6	LOS A	0.5	3.7	0.50	0.96	0.50	47.4
2	T1	18	3.0	18	3.0	0.076	18.5	LOS C	0.3	1.8	0.79	1.00	0.79	5.0
Appro	bach	117	3.0	117	3.0	0.143	9.3	LOS A	0.5	3.7	0.54	0.97	0.54	44.2
North	: Wanr	neroo Road												
4	L2	99	3.0	99	3.0	0.054	5.6	LOS A	0.0	0.0	0.00	0.58	0.00	49.7
5	T1	857	9.3	857	9.3	0.233	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Appro	bach	956	8.6	956	8.6	0.233	0.6	NA	0.0	0.0	0.00	0.06	0.00	59.3
All Ve	hicles	1091	8.0	1091	8.0	0.233	1.8	NA	0.5	3.7	0.07	0.17	0.07	57.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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V Site: 2 [AM Peak - Stop 3-way Stage 2 (Median) L]

♦ Network: N101 [AM Peak]

Staged crossing Stage 2 (Median) at three-way intersection with 5-lane major road. Give-way behaviour assumed at Stage 2. Site Category: (None) Giveway / Yield (Two-Way)

Move	Movement Performance - Vehicles													
Mov ID	Turn	Demand F	lows	Arrival	Flows	Deg. Satn	Average Delay	Level of Service	95% B Que	ack of eue	Prop. Queued	Effective Stop	Aver. No.	Averag e
		Total	ΗV	Total	ΗV				Vehicles	Distance		Rate	Cycles \$	Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South	n: Wan	neroo Roac	1											
11	T1	372	9.3	372	9.3	0.101	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Appro	bach	372	9.3	372	9.3	0.101	0.0	NA	0.0	0.0	0.00	0.00	0.00	60.0
East:	Media	n Storage A	Area											
3	R2	18	3.0	18	3.0	0.017	1.1	LOS A	0.1	0.3	0.35	0.22	0.35	49.7
Appro	bach	18	3.0	18	3.0	0.017	1.1	LOS A	0.1	0.3	0.35	0.22	0.35	49.7
All Ve	hicles	389	9.0	389	9.0	0.101	0.1	NA	0.1	0.3	0.02	0.01	0.02	59.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab). Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Site: 1 [PM Peak - Stop 3-way Stage 1 (Minor Road) L - Copy]

Staged crossing Stage 1 (Minor Road) at three-way intersection with 5-lane major road. Major road turn lane is treated

as a full-length lane. Site Category: (None)

Stop (Two-Way)

Move	Movement Performance - Vehicles													
Mov ID	Turn	n Demand Flows Arrival Flows		Flows	Deg. Satn	Average Delay	Level of Service	95% Bac Queue	k of ∋	Prop. Queued	Effective Stop	Aver. No.	Averag e	
		Total veh/h	HV %	Total veh/h	HV %	v/c	sec		Vehicles Di veh	stance m		Rate	Cycles	Speed km/h
South	: Wan	neroo Road												
12	R2	18	3.0	18	3.0	0.034	9.7	LOS A	0.1	0.8	0.51	0.72	0.51	44.8
Appro	bach	18	3.0	18	3.0	0.034	9.7	NA	0.1	0.8	0.51	0.72	0.51	44.8
East:	Servic	e Road Acc	es											
1	L2	99	3.0	99	3.0	0.107	5.8	LOS A	0.4	2.9	0.34	0.90	0.34	49.3
2	T1	18	3.0	18	3.0	0.035	9.0	LOS A	0.1	0.9	0.55	0.92	0.55	9.7
Appro	bach	117	3.0	117	3.0	0.107	6.3	LOS A	0.4	2.9	0.37	0.90	0.37	47.6
North	: Wanr	neroo Road												
4	L2	99	3.0	99	3.0	0.054	5.6	LOS A	0.0	0.0	0.00	0.58	0.00	49.7
5	T1	433	9.3	433	9.3	0.118	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Appro	bach	532	8.1	532	8.1	0.118	1.0	NA	0.0	0.0	0.00	0.11	0.00	58.7
All Ve	hicles	666	7.1	666	7.1	0.118	2.2	NA	0.4	2.9	0.08	0.26	0.08	57.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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V Site: 2 [PM Peak - Stop 3-way Stage 2 (Median) L - Copy]

Staged crossing Stage 2 (Median) at three-way intersection with 5-lane major road. Give-way behaviour assumed at Stage 2. Site Category: (None) Giveway / Yield (Two-Way)

Move	Movement Performance - Vehicles													
Mov ID	Turn	Demand F	lows	Arrival	Flows	Deg. Satn	Average Delay	Level of Service	95% B Que	ack of eue	Prop. Queued	Effective Stop	Aver. No.	Averag e
		Total veh/h	HV %	Total veh/h	HV %	v/c	sec		Vehicles veh	Distance m		Rate	Cycles	Speed km/h
South	: Wan	neroo Road	ł											
11	T1	807	9.3	807	9.3	0.220	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Appro	bach	807	9.3	807	9.3	0.220	0.0	NA	0.0	0.0	0.00	0.00	0.00	60.0
East:	Media	n Storage A	Area											
3	R2	18	3.0	18	3.0	0.027	3.4	LOS A	0.1	0.5	0.54	0.48	0.54	47.1
Appro	bach	18	3.0	18	3.0	0.027	3.4	LOS A	0.1	0.5	0.54	0.48	0.54	47.1
All Ve	hicles	825	9.2	825	9.2	0.220	0.1	NA	0.1	0.5	0.01	0.01	0.01	59.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab). Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

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HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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