

LANDCORP
LOT 503 FLYNN DRIVE, NEERABUP

PROPOSED QUARRY

TRAFFIC STATEMENT

August 2018



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1. EXECUTIVE SUMMARY

- 1.1. Riley Consulting has been commissioned by Landcorp to consider the traffic and transport impacts of proposed quarrying activities on Lot 503, Flynn Drive, Neerabup. The key findings of the traffic review are:
 - 1.1.1. The site is adjacent to exiting quarrying activity (which has an anticipated life of 3 to 5 years) and is expected to operate as a continuation of present day operations. However, for the purpose of assessing the potential impacts to the surrounding road network it is assumed that both operations would run concurrently.
 - 1.1.2. The local road network is presently used by quarry load out and extraction vehicles and constructed to appropriate standards.
 - 1.1.3. It is calculated that under normal operation of the proposed quarry, 300 truck movements per day could occur. During the morning peak hour approximately 10% of the daily demand is anticipated, or 30 truck movements.
 - 1.1.4. Assessment of the potential traffic increase indicates that the local road network has ample capacity to accommodate the increase in truck movements. Based on WAPC guidelines the proposal would have no material traffic impact.
 - 1.1.5. Assessment of the access indicates uninterrupted flow conditions will prevail and minimal delays would be expected. Visibility in accordance with Austroads standards is provided.
 - 1.1.6. From a traffic engineering perspective, the local road network is adequate and capable of accommodating the forecast increase in truck movements.

2. CHECKLIST

Item	Comments/Proposals
Proposed development	
proposed land uses	Quarry
existing land uses	Quarry
context with surrounds	In developing industrial area surrounded by extraction operations
Vehicular access and parking	
access arrangements	Via Flynn Drive
public, private, disabled parking set down / pick up	N/A
Service vehicles	
access arrangements	N/A
rubbish collection and emergency vehicle access	N/A
Hours of operation (non-residential only)	Expected 06:00 – 18:00 6 days per week
Traffic volumes	
daily or peak traffic volumes	300 movements per day
type of vehicles (eg cars, trucks)	Up to RAV 4 permitted
Traffic management on frontage streets	None required
Public transport access	
nearest bus stops/train stations	N/A
pedestrian/cycle links to bus stops/train station	N/A
Pedestrian access/facilities	
existing pedestrian facilities within the development (if any)	N/A
proposed pedestrian facilities within development	N/A
existing pedestrian facilities on surrounding roads	N/A
proposals to improve pedestrian access	N/A
Cycle access/facilities	
existing cycle facilities within the development (if any)	N/A
proposed cycle facilities within development	N/A
existing cycle facilities on surrounding roads	N/A
proposals to improve cycle access	N/A
Site specific issues	None identified
Safety issues	None identified

3. THE LOCAL ROAD NETWORK

- 3.1. The subject site is located on Lot 503 Flynn Drive, Neerabup in the City of Wanneroo. Neerabup is an expanding industrial area to the north of the Perth metropolitan area, It is well located to access the primary regional road network including Wanneroo Road and Neaves Road.
- 3.2. Figure 1 shows the location of the subject site and Figure 2 shows an aerial image of the site.

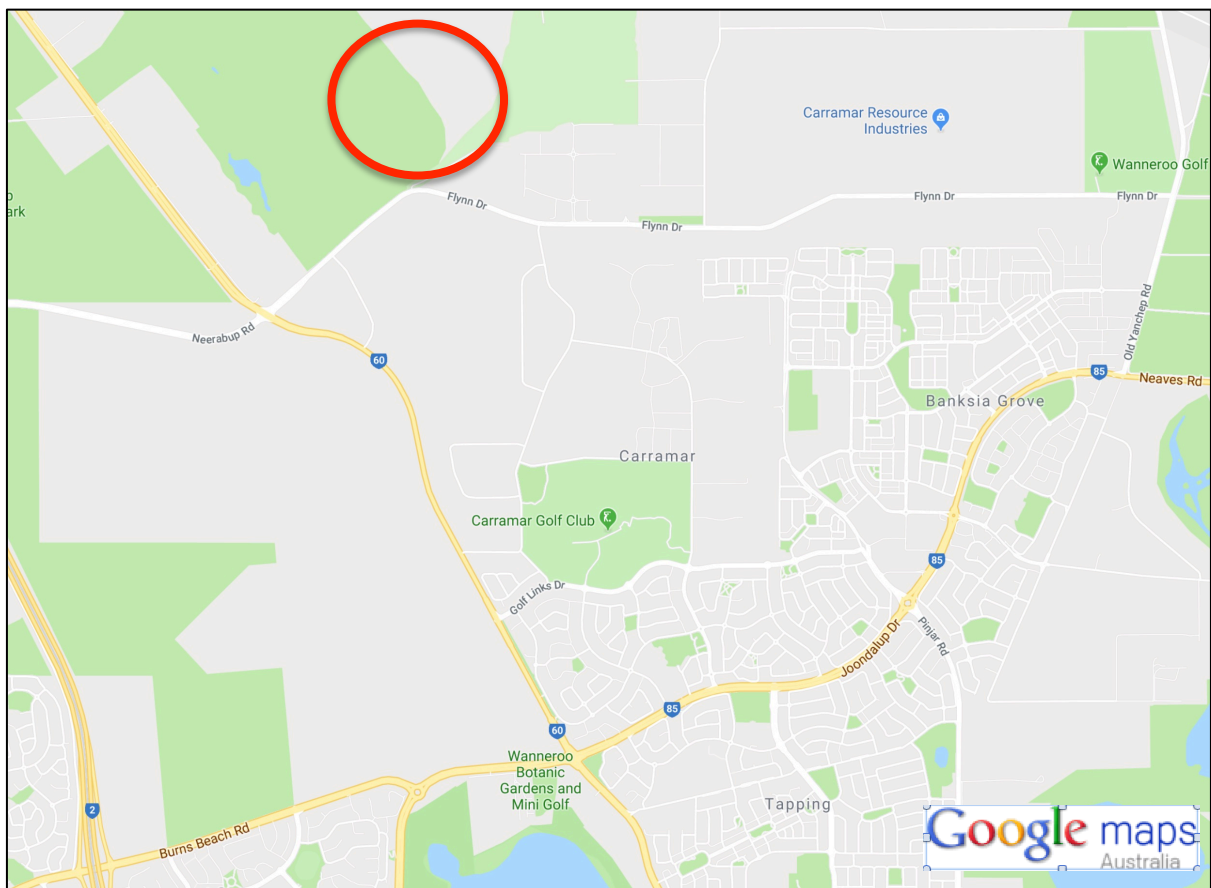


Figure 1 Subject Site Location



Figure 2 Aerial Imagery

- 3.3. Flynn Drive is classified as a regional distributor road in the Main Roads *Functional Road Hierarchy*. It is constructed with a single pavement of approximately 9 metres. Flynn Drive is also included on the Restricted Access vehicle Network 4, which permits vehicles up to 26 metre in length.
- 3.4. Traffic data from the Main Roads web page indicates Flynn Drive carries 1,473 vehicles per day (vpd) recorded in 2014/15. The data is attached at Appendix A and indicates 39.9% of vehicles are trucks. However, 98% of vehicles are as-of-right (19m or less) and just 2% of vehicles are large trucks.
- 3.5. Reference to Scats traffic data from the traffic signals at Wanneroo Road indicates a daily demand of 4,696vpd east of Wanneroo Road. No truck data is available, but it can be concluded that as industrial development has progressed significantly, the majority of the traffic increase will be cars. However, the same proportion of truck is applied to the Scats data as recorded in 2015.

- 3.6. Table 1 provides a summary of the peak traffic movements with trucks shown in brackets.

Table 1 Flynn Drive Peak Hour Traffic Demands

Direction	East	West
AM Peak (8am-9am)	194 (78)	150 (69)
PM Peak (5pm-6pm)	89 (16)	231 (35)

- 3.7. Wanneroo Road is classified as a primary distributor in the Main Roads *Functional Road Hierarchy*. It is constructed with a single pavement of about 8 metres south of Flynn Drive and a dual pavement with four traffic lanes to the north.
- 3.8. Traffic signals control the intersection at Flynn Drive / Neerabup Road. Neerabup Road provides access to the Mitchell Freeway.
- 3.9. Traffic data from the Main Roads web page indicates Wanneroo Road carries 25,166vpd (2015) north of Flynn Drive and 23,068vpd ((2014) south of Flynn Drive.
- 3.10. From a capacity perspective, reference to Appendix B indicates Wanneroo Road is operating at Level of Service A north of Flynn Drive and Level of Service F south of Flynn Drive.
- 3.11. Old Yanchep Road is classified as a regional distributor road in the Main Roads *Functional Road Hierarchy*. It is constructed with a single pavement of about 8 metres south of Flynn Drive and provides connectivity to Neaves Road.
- 3.12. Traffic data from the Main Roads web page indicates Old Yanchep Road carries 3,739vpd (2016) south of Flynn Drive. 16% of vehicles are recorded as trucks.
- 3.13. Neaves Road is classified as a regional distributor road in the Main Roads *Functional Road Hierarchy*. It is constructed with a single pavement of about 8 metres east of Old Yanchep Road.
- 3.14. Traffic data from the Main Roads web page indicates Neaves Road carries 6,163vpd (2015) east of Old Yanchep Road. 13.9% of vehicles are recorded as trucks.
- 3.15. Joondalup Drive is classified as a district distributor road type A in the Main Roads *Functional Road Hierarchy*. It is constructed with a single pavement widening to a single lane boulevard. Ultimately Joondalup Drive will be provided as a four lane divided road.

- 3.16. Traffic data from the Main Roads web page indicates Joondalup Drive carries 8.376vpd (2016) west of Old Yanchep Road. 16.1% of vehicles are recorded as trucks.

4. PROPOSED DEVELOPMENT

- 4.1. The land holding is adjacent to an existing quarry that is nearing the end of production. The proposal seeks to extract some 700,000 tonnes of product per annum. Typically the product is crushed limestone product used in road construction and limited sand product used in development construction.

5. DAILY TRAFFIC VOLUMES AND VEHICLE TYPES

- 5.1. There are no recognised trip generation sources applicable to the extraction industry and the forecast level of traffic movement will need to be calculated. However, the existing quarry has a similar level of production and generates 300 vehicle movements per day. Advice from the operator indicates that 80% of vehicles are 19 metre semi trailers, 15% rigid and 5% large trucks.
- 5.2. It is expected that the proposed quarry on Lot 503 will continue to supply local industry at the same rate as existing operations and in theory, no actual traffic increase would occur. This is because the market for the product is limited to the 700,000t / annum based on records spanning back over 30 years of quarrying operations. It is considered therefore that opening the second quarry on Lot 503 would not increase the market take up of the extracted resource..
- 5.3. However, to provide an assessment of the maximum traffic impact, it is assumed that both operations will operate concurrently.
- 5.4. On this basis it can be expected that the proposed quarry would generate an additional 300 vehicle movements per day, comprising of 46 rigid truck movements, 240 19m truck movements and 14 large truck movements
- 5.5. Reference to the MRWA traffic data indicates that the proportion of daily truck movements is 8% between 7am-8am, 10% between 8am-9am, 3% between 4pm-5m and 2% between 5pm-6pm. It can be seen that the biggest impact will occur during the morning peak.
- 5.6. Based on the peak proportion of truck movements, it is anticipated that the proposed quarry could result on 30 truck movements between 8am and 9am, of which 4 movements would be rigid trucks, 24 movements would be 19m trucks and 1 movement may be a large truck.

- 5.7. Based on the local road network it would be anticipated that 70% of vehicles would access Wanneroo Road and the regional road network.

6. TRAFFIC IMPACTS

- 6.1. Reference to the WAPC *Transport Assessment Guidelines for Developments* states that:

As a general guide, an increase in traffic of less than 10% of capacity would not normally be likely to have a material impact on any particular section of road, but increases over 10% may. All sections of road with an increase greater than 10% of capacity should therefore be included in the analysis.

For ease of assessment, an increase of 100 vehicles per hour for any lane can be considered as equating to 10% of capacity.

- 6.2. The forecast increase of 30 truck movements in the peak hour is significantly below the threshold of 100 vehicles and on this basis the WAPC guidelines would consider the proposed quarry operations to have no material impact.
- 6.3. Table 2 considers the daily traffic impacts.

Table 2 Daily Traffic Impacts

Road	Volume	Capacity*	Increase	%
Flynn Drive east	1,473	13,500	+100vpd	<1%
Flynn Drive west	4,696	13,500	+300vpd	2.2%
Old Yanchep Road	3,739	13,500	+100vpd	<1%
Neaves Road	6,163	13,500	+100vpd	<1%
Wanneroo Road north	23,068	40,500	+75vpd	<1%
Wanneroo Road south	25,166	13,500	+50vpd	<1%
Neerabup Road	No data	40,500	+100vpd	<1%

*Based on maintaining Level of Service D

- 6.4. It is acknowledged that trucks are larger slower vehicles than private cars and when considering road impacts the Passenger Car Equivalent (PCE)¹ is commonly used. Trucks used by quarry operations would have a PCE value of 2.0 for a rigid truck, 2.5 for a 19 metre articulated truck and 3.5 for a large truck.

¹ Also known as Passenger Car Units (PCU's)

Based on the proportions of trucks anticipated, the peak hour increase could be the equivalent of up to 81 cars.

- 6.5. With up to 70% heading to Wanneroo Road, the maximum PCE increase to any traffic lane would be the equivalent of 28 cars. When considering the Austroads mid block capacity of a traffic lane at 900 vehicles per hour, an increase of 28 cars equates to 3.1% and would be considered to have no material traffic impact.

7. VEHICLE ACCESS

- 7.1. All vehicles will access the quarry from Flynn Drive using an appropriately designed treatment. However, it is anticipated that the quarry extension will utilise the existing quarry access road shown in Figure 3.
- 7.2. Visibility at the access is in excess of 180 metres in both directions and accords with the requirements of Austroads for the posted 80kph posted speed.
- 7.3. As indicated, if the two extraction operations run concurrently, then the existing 300 vehicle movements per day will effectively double at the access. With 10% of trips during the 8am to 9am peak hour, 60 truck movements can be anticipated.
- 7.4. Existing traffic data suggests that 60% of trucks would access the site and 40% would depart between 8am and 9am.



Figure 3 Access to Flynn Drive

- 7.5. Therefore, of the 60 forecast vehicle movements (30 existing + 30 new) 36 will enter the site and 24 will exit the site.
- 7.6. Table 1 indicates that Flynn Drive currently carries 344 vehicles between 8am-9am and 24 vehicles would be trying to enter this traffic stream.
- 7.7. Reference to Appendix C shows Austroads table 4.1, which identifies intersection operation where uninterrupted flow conditions can be anticipated. Austroads advises that under uninterrupted flow conditions, no further assessment is warranted (a Level of Service A would occur). With 24 vehicles accessing a flow of 344 vehicles, uninterrupted flow conditions would prevail. On this basis the access can be expected to operate with excellent Levels of Service with minimal delay.
- 7.8. If PCE values are applied, then the access would discharge the equivalent of 45 cars and Flynn Drive would be passing the equivalent of 491 cars. Reference to Appendix C indicates that uninterrupted flow conditions would prevail.
- 7.9. It is concluded that the proposed quarrying activities operating concurrently with existing operations will have no adverse impact to the local road network.

8. TRAFFIC MANAGEMENT OF FRONTAGE STREETS

- 8.1. Flynn Drive is an existing road passing low traffic flows, but a higher level of truck movements. As identified, the visibility approaching the quarry access meets Austroads requirements for roads operating at 80kph. Advance warning signs of trucks entering Flynn Drive are provided.

9. PARKING

- 9.1. All parking for the quarry is to be provided on-site. Parking is to be located in accordance with health and safety requirements applying to the site.
- 9.2. The site is not open to the public and therefore all on-site parking is for employees. Visitors will require approval to enter the site.

10. PARKING MANAGEMENT

- 10.1. No parking management is required over and above safe site work practices.

11. PROVISION FOR SERVICE VEHICLES

- 11.1. Service vehicles are not expected to attend the site without prior authorisation. Access to Flynn Drive is via an existing site access intersection designed to accommodate quarry vehicles.

12. HOURS OF OPERATION

- 12.1. The site can be expected to operate 6 days per week from 6am to 6pm.
- 12.2. As a remote location, noise impacts will not be an issue so there may be no constraint upon the hours of operation.

13. PUBLIC TRANSPORT ACCESS

- 13.1. There are no bus services within an acceptable walking distance to the subject site.
- 13.2. The quarry does not require public transport access.

14. PEDESTRIAN ACCESS

- 14.1. The quarry is in a remote location and not easily accessible to pedestrians.

15. CYCLE ACCESS

- 15.1. There are no bicycle facilities provided to the surrounding road network. It is unlikely that quarry personnel would cycle to work.

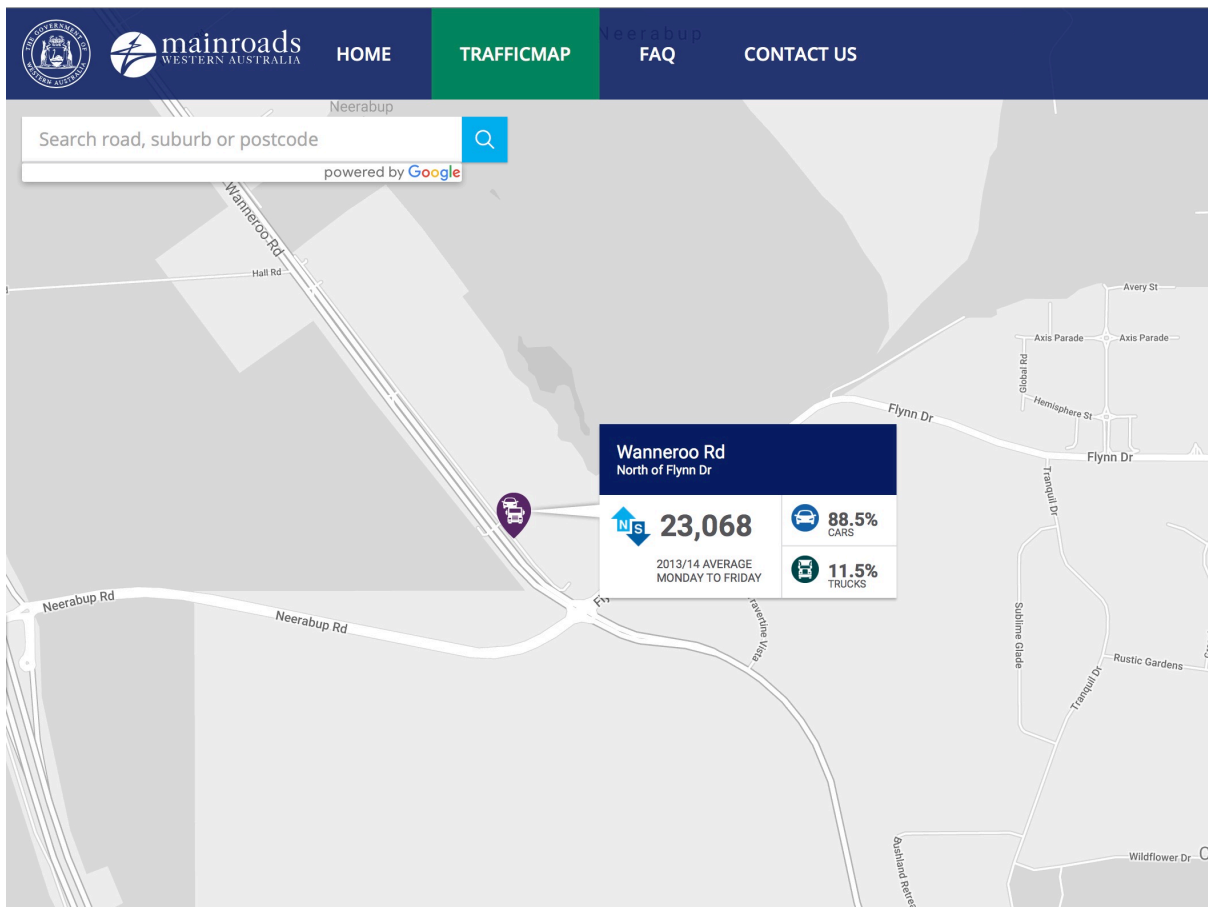
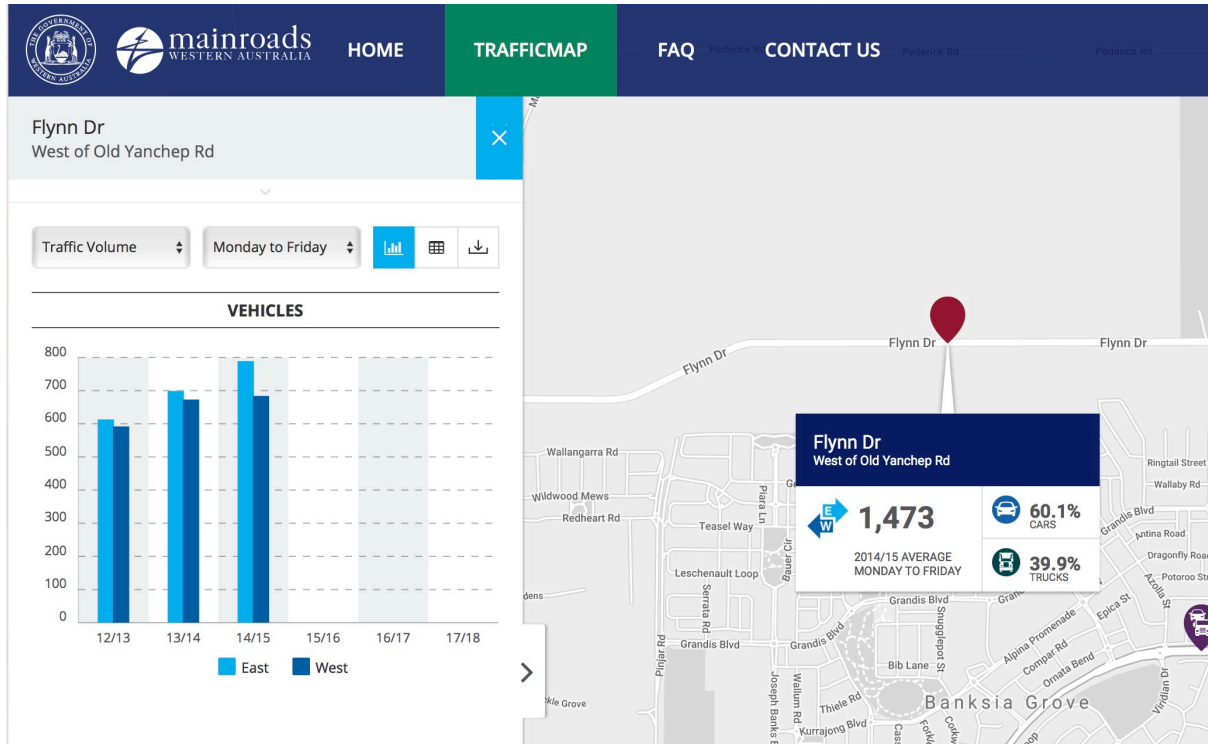
16. SITE SPECIFIC ISSUES

- 16.1. There are no site-specific issues arising from this assessment.

17. SAFETY ISSUES

- 17.1. The traffic assessment has not identified any road safety issues as a result of the proposed development.

APPENDIX A MRWA Traffic Data



mainroads WESTERN AUSTRALIA

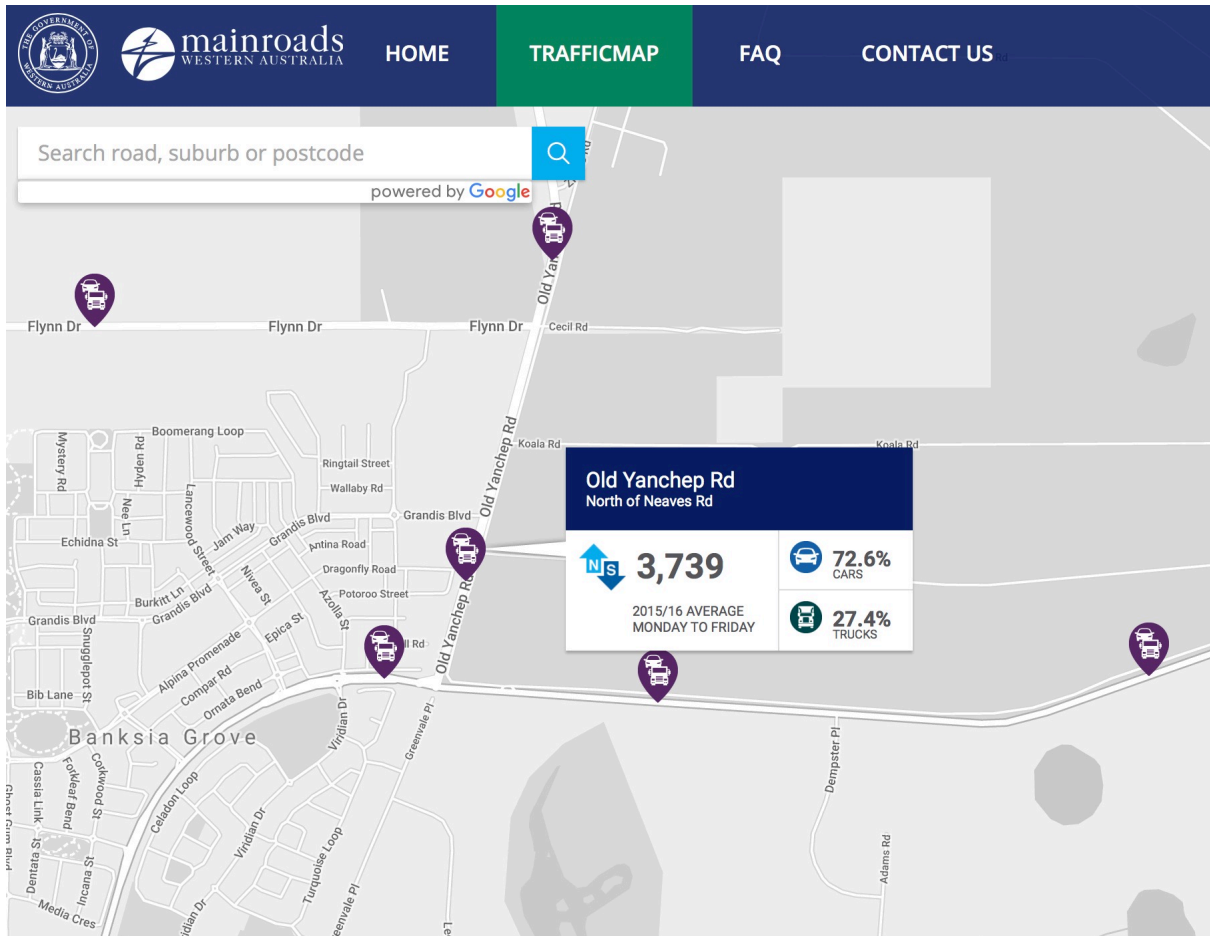
HOME TRAFFICMAP FAQ CONTACT US

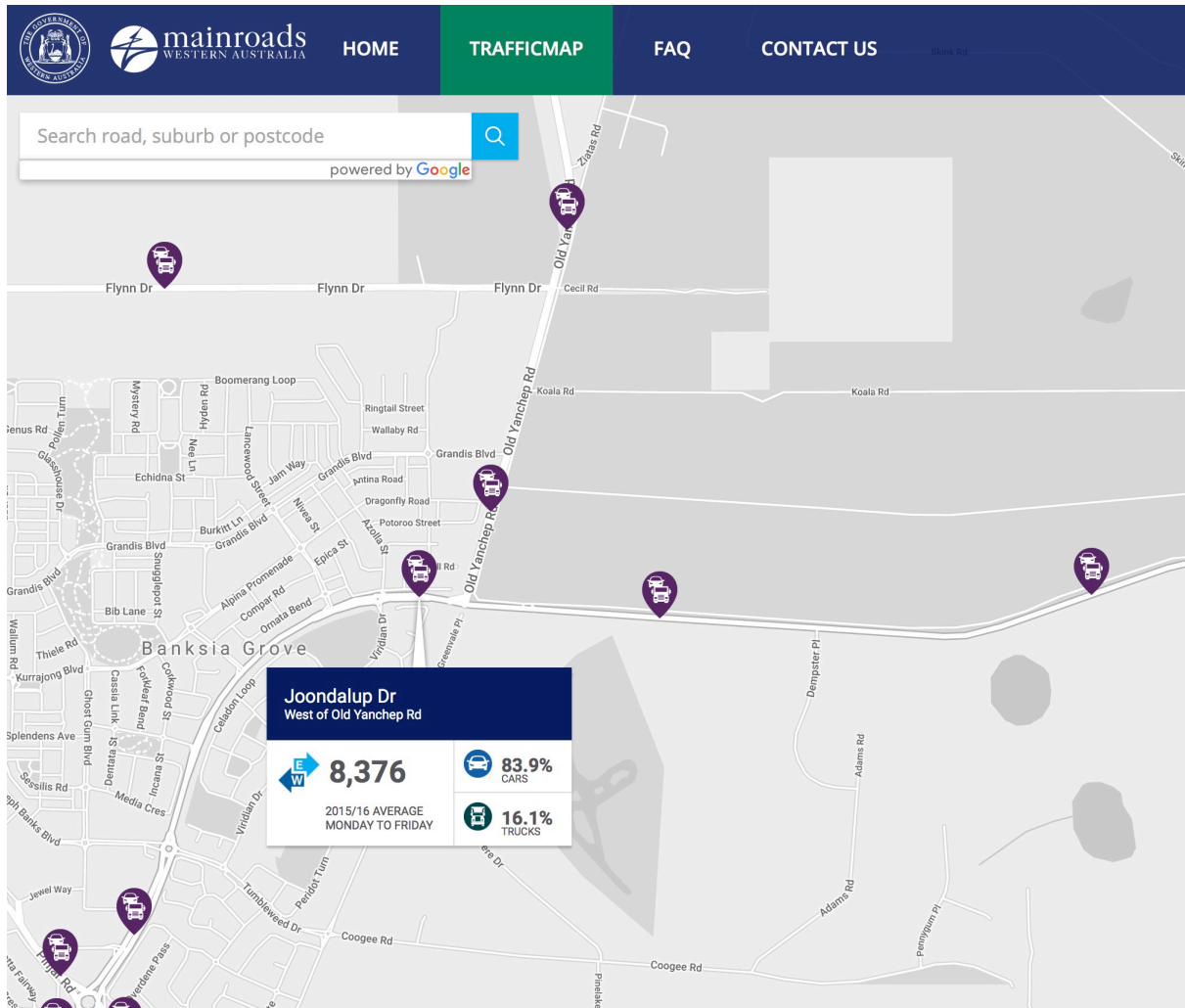
Search road, suburb or postcode

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Wanneroo Rd
North of Joondalup Dr

25,166	85.4% CARS
2015/16 AVERAGE MONDAY TO FRIDAY	14.6% TRUCKS





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Neaves Rd East of Old Yanchep Rd	
6,163	86.1% CARS
2014/15 AVERAGE MONDAY TO FRIDAY	13.9% TRUCKS

APPENDIX B LEVELS OF SERVICE BY ROAD TYPE

LOS	Single Carriageway ¹	2-Lane Boulevard ²	Dual Carriageway (4-Lanes) ³	Dual Carriageway (4-lane Clearway) ³
A	2,400vpd	2,600vpd	24,000vpd	27,000vpd
B	4,800vpd	5,300vpd	28,000vpd	31,500vpd
C	7,900vpd	8,700vpd	32,000vpd	36,000vpd
D	13,500vpd	15,000vpd	36,000vpd	40,500vpd
E	22,900vpd	25,200vpd ⁴	40,000vpd	45,000vpd
F	>22,900vpd	>25,200vpd ⁴	>40,000vpd	>45,000vpd

¹ Based on Table 3.9 Austroads - Guide to Traffic Engineering Practice Part 2

² Based on single carriageway +10% (supported by Table 3.1 Austroads - Guide to Traffic Engineering Practice Part 3) – Boulevard or division by medians.

³ Based on RRR Table 3.5 - mid-block service flow rates (SF.) for urban arterial roads with interrupted flow. Using 60/40 peak split.

⁴ Note James Street Guildford passes 28,000vpd.

Austroads Table 3.4: Typical mid-block service flow rates

Type of facility	Level of service (vehicles per hour/lane)				
	A	B	C	D	E
Median or inner lane					
divided road	600	700	800	900	1,000
undivided road	540	630	720	810	900
Outer or kerb lane flow					
adjacent parking lane	540	630	720	810	900
clearway conditions	540	630	720	810	900
occasional parked vehicles	360	420	480	540	600

APPENDIX C AUSTRROADS TABLE 4.1

Table 4.1 — Intersection Capacity - Uninterrupted Flow Conditions

Major Road Type ¹	Major Road Flow (vph) ²	Minor Road Flow (vph) ³
Two-lane	400	250
	500	200
	650	100
Four-lane	1000	100
	1500	50
	2000	25

Notes:

1. Major road is through road (i.e. has priority).
2. Major road design volumes include through and turning movements.
3. Minor road design volumes include through and turning volumes.