TRANSPORT IMPACT STATEMENT

Banksia Grove Car Wash

February 2023

Rev A

kctt

HISTORY AND STATUS OF THE DOCUMENT

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1. Executive Summary

Site Context

- The proposed development is located within the Banksia Grove Local Structure Plan No 21A and Banksia Grove District Centre Precinct Plan No.65. The subject development site is a portion of Lot 3801 and has a total site area of 1,531.19m^2. The subject site is currently vacant.
- The proposed land use is a car wash and a dog wash facility.

Technical Findings

- The plans were checked with a B99 Passenger Vehicle (5.2m) and no manoeuvring issues were found. Please refer to the swept path analysis plans enclosed in Appendix 3 for clarity.

- KCTT reviewed the proposed development layout and concluded that dimensions of all car parking bays and aisle width comply with the Australian Standard AS/NZS 2890.1/2004.

- There will be no need for a dedicated service and delivery bay. Delivery is to be organised outside of the development hours of operation. It is expected that waste removal vehicle can operate safely within the road reserve.

Relationship with Policies

- Based on the requirements set out in the DPS No2, the proposed development requires 1 Standard Bay provided on site in addition to service bays and 1 bay provided for Dog Wash. The proposed development plans indicate 2 Auto Service Wash bays, 4 Self Service Wash Bays, 4 Vacuum Bays, 1 Bay for Dog Wash and 1 standard parking bay for staff member, provided on site. Therefore, the car parking provision on site is in line with the requirement.

- Building Code of Australia ACROD Provision – Having in mind the specific character of the proposed land use, KCTT believe the ACROD bay would not be required.

Conclusion

- The proposed development is expected to attract up to 470 vehicular trips per day, 35 vehicular trips in the AM peak and 24 vehicular trips in the PM peak hour. The additional traffic expected to be attracted by the proposed development would be 141 vehicular trips per day, 11 vehicular trips in the AM peak and 7 vehicular trips in the PM peak hour. Having in mind the additional traffic to the surrounding road network would be less than 10 vehicular trips in the peak hour, the impact is considered low as per WAPC Guidelines.

- KCTT believe the surrounding road network has sufficient capacity to accommodate the expected additional traffic. In summary KCTT believe that the proposed development will not have a negative impact on the surrounding road network.

2. Transport Impact Statement

2.1 Location

Lot Number	3801
Street Number	1001
Road Name	Joondalup Drive
Suburb	Banksia Grove
Description of Site	The proposed development is located within the Banksia Grove Local Structure Plan No 21A and Banksia Grove District Centre Precinct Plan No.65. The subject development site is a portion of Lot 3801 and has a total site area of 1,531.19m^2. Currently it is vacant land. The proposed land use is a car wash and a dog wash facility.

2.2 Technical Literature Used

Local Government Authority	City of Wanneroo
Type of Development	Car wash / Dog wash
Are the R-Codes referenced?	NO
Is the NSW RTA Guide to Traffic Generating Developments Version 2.2 October 2002 (referenced to determine trip generation / attraction rates for various land uses) referenced?	YES
Which WAPC Transport Impact Assessment Guideline should be referenced?	Volume 4 - Individual Developments
Are there applicable LGA schemes for this type of development?	YES
If YES, Nominate:	
Name and Number of Scheme	Town Planning Scheme No. 2
Are Austroads documents referenced?	YES
Is the Perth Transport Plan for 3.5 million and Beyond referenced?	NO

2.3 Land Uses

Are there any existing Land Uses	NO

Proposed Land Uses	
Nominate proposed land use type and yield	• Auto Car Wash Bays – 2 bays • Car Wash Bays – 4 bays • Vacuum area – 4 bays • Dog Wash – 1 stall • Ancillary areas
Are the proposed land uses complementary with the surrounding land-uses?	Banksia Grove District Centre Precinct Plan No.65m, Amendment No. 5, prepared in April 2022, indicates Car Wash land use as a Discretionary (D) Uses within Business Precinct.

2.4 Local Road Network Information

How many roads front the subject site?

Name of Roads Fronting Subject Site / Road Classification and Description:

Road Name	**Ungazetted sealed road to the north of the subject site***
Number of Lanes	two way, one lane each direction, undivided
Road Reservation Width	n/a
Road Pavement Width	App.8m
Classification	n/a
Speed Limit	n/a
Bus Route	NO
If YES Nominate Bus Routes	-
On-street parking	NO

Road Name	**Ungazetted sealed lane to the east of the subject site***
Number of Lanes	two way, one lane each direction, undivided
Road Reservation Width	n/a
Road Pavement Width	App.8m
Classification	n/a
Speed Limit	n/a
Bus Route	NO
If YES Nominate Bus Routes	-
On-street parking	YES

Note* - Lot 3801 has been progressively developed over the last decade. Both roads analysed above are in function since December 2014, as it could be seen on historical aerial imagery on Nearmap. However, they are not formally gazetted and there is no information about them available on MRWA.
All geometric information above was collected from the Nearmap.

Based on the character of the surrounding area KCTT assumed the proposed speed limit is 50kph.

Road Name	Pinjar Road
Number of Lanes	two way, one lane per direction, divided
Road Reservation Width	45.0m
Road Pavement Width	6.2m per direction inclusive of bicycle lanes, 3.5m median
Classification	Distributor A
Speed Limit	70kph
Bus Route	YES
If YES Nominate Bus Routes	390
On-street parking	NO

Name of Other Roads within 400m radius of site, or roads likely to take increased traffic due to the development:

Road Name	Joondalup Drive
Number of Lanes	two way, two lanes per direction, divided
Road Reservation Width	65.0m
Road Pavement Width	9.0m per direction inclusive of bicycle lanes, 11.5m median
Classification	Distributor A
Speed Limit	70kph
Bus Route	YES
If YES Nominate Bus Routes	390
On-street parking	NO

2.5 Traffic Volumes

Road Name	Location of Traffic Count	Vehicles Per Day (VPD)	Vehicles per Peak Hour (VPH)				Heavy Vehicle %	Date of Traffic Count	*If older than 3 years multiply with a growth rate*
			AM Peak Time	AM Peak VPH	PM Peak Time	PM Peak VPH	*If HV count is Not Available, are HV likely to be in higher volumes than generally expected?*		
Joondalup Drive	North of Ghost Gum Boulevard *	19,428	08:00	1,485	15:00	1,672	n/a	Feb 2021	–
	South of Ghost Gum Boulevard *	20,091	08:00	1,521	15:00	1,743	n/a	Feb 2021	–
	East of Pinjar Road	17,843	08:00	1,442	14:45	1,619	7.4	2020/ 2021	–
	West of Pinjar Road	19,582	08:00	1,590	14:45	1,721	7.6	2020/ 2021	–
Pinjar Road	North of Joondalup Drive	15,654	08:00	1,538	14:45	1,494	11.7	2020/ 2021	–

Road Name	Location of Traffic Count	Vehicles Per Day (VPD)	Vehicles per Peak Hour (VPH)				Heavy Vehicle %	Date of Traffic Count	*If older than 3 years multiply with a growth rate*
			AM Peak Time	AM Peak VPH	PM Peak Time	PM Peak VPH	*If HV count is Not Available, are HV likely to be in higher volumes than generally expected?*		
	South of Joondalup Drive	22,587	08:00	2,122	15:45	2,090	11.3	2020/ 2021	–

Note – ''n/a'' indicates that Heavy Vehicle are not likely to be in higher volumes than generally expected.

Note - These traffic volumes have been derived from SCATS data obtained through Main Roads for the intersection of Ghost Gum Boulevard & Joondalup Drive. Although SCATS should not be used as a sole source of data, it is a good tool to verify fluctuations in flow. All other data are delivered through MRWA site.*

2.6 Vehicular Crash Information

Is Crash Data Available on Main Roads WA website?	YES
If YES, nominate important survey locations:	
Location 1	Pinjar Road (SLK 4.04-4.47)
Location 2	Intersection of Pinjar Road & Golf Links Drive & Jewel Way
Location 3	Intersection of Pinjar Road & Joondalup Drive
Period of crash data collection	01/01/2017 - 31/12/2021

The following tables shows crash rates and crash densities in Perth Metropolitan area on local roads and state roads for the period from 2017 to 2022, as obtained from Main Roads WA on the 31st May 2022 by email request:

Crash Density and Crash Rate on Metropolitan Local Roads Network only

	All Crashes		Serious Injury Crashes (Fatal+Hospital)	
	Average Annual Crash Density (All Crashes/KM)	Average Annual Crash Rate (All Crashes/MVKT)	Average Annual Crash Density (Ser. Inj. Crashes/KM)	Average Annual Crash Rate (Ser. Inj. Crashes/MVKT)
Metro Local Roads - Midblock	2.51	0.95	0.12	0.05
Metro Local Roads - All	5.23	1.98	0.24	0.09

Note: Based on 5-years data for the period 2017 to 2021.

Crash Density and Crash Rate on Metropolitan State Roads Network only

	All Crashes		Serious Injury Crashes (Fatal+Hospital)	
	Average Annual Crash Density (All Crashes/KM)	Average Annual Crash Rate (All Crashes/MVKT)	Average Annual Crash Density (Ser. Inj. Crashes/KM)	Average Annual Crash Rate (Ser. Inj. Crashes/MVKT)
Metro State Roads - Midblock	20.12	0.37	0.89	0.02
Metro State Roads - All	46.28	0.85	1.80	0.03

Note: Based on 5-years data for the period 2017 to 2021.

Intersection Name	Road Hierarchy	Speed Limit	Crash Statistics			
			No of KSI Crashes	No of Medical	No of PDO	No of PDO

				Attention Crashes	Major Crashes	Minor Crashes
Pinjar Road & Golf Links Drive & Jewel Way	Distributor A / Access Road/ Access Road	70kph / 50kph or State Limit / 50kph or State Limit	0	1	1	1

MR Type	Involving Overtaking	Involving Parking	Involving Animal	Involving Pedestrian	Entering / Leaving Driveway	Other / Unknown
Count	0	0	0	0	0	3

No of MVKT Travelled at Location	App.17,000 VPD * 365 * 5 years * 0.4km = 12.41MVKT
KSI Crash Rate	0 KSI crashes/MVKT
All Crash Rate	3 crashes / 12.41 MVKT = 0.241 crashes/MVKT
Comparison with Crash Density and Crash Rate Statistics	All Crash rate of 0.241 crashes/MVKT is lower than the network average of 0.85 crashes / MVKT.

Intersection Name	Road Hierarchy	Speed Limit	Crash Statistics			
			No of KSI Crashes	No of Medical Attention Crashes	No of PDO Major Crashes	No of PDO Minor Crashes
Pinjar Road & Joondalup Drive	Distributor A / Distributor A	70kph / 70kph	2	16	41	21

MR Type	Involving Overtaking	Involving Parking	Involving Animal	Involving Pedestrian	Entering / Leaving Driveway	Other / Unknown
Count	1	0	0	0	0	79

No of MVKT Travelled at Location	App.25,000 VPD * 365 * 5 years * 0.4km = 18.25MVKT
KSI Crash Rate	2 KSI crashes /18.25 MVKT =0.109 KSI crashes/MVKT
All Crash Rate	80 crashes / 18.25 MVKT = 4.385 crashes/MVKT
Comparison with Crash Density and Crash Rate Statistics	KSI crash rate of 0.109 is higher than the network average of 0.03 KSI crashes per MVKT. All crashes rate of 4.385 is lower than 0.85 crashes per MVKT.

Road Name	SLK	Road Hierarchy	Speed Limit	Crash Statistics			
				No of KSI Crashes	No of Medical Attention Crashes	No of PDO Major Crashes	No of PDO Minor Crashes
Pinjar Road	4.04-4.47	Distributor A	70kph	1	2	4	3

MR Type	Involving Overtaking	Involving Parking	Involving Animal	Involving Pedestrian	Entering / Leaving Driveway	Other / Unknown
Count	1	0	0	0	8	1

No of MVKT Travelled at Location	App.16,000VPD * 365 * 5 years *0.43 km = 12.56 MVKT
KSI Crash Rate	1 KSI crashes / 12.56 MVKT = 0.079 KSI crashes/MVKT
All Crash Rate	10 crashes / 12.56 MVKT = 0.796 crashes/MVKT
Comparison with Crash Density and Crash Rate Statistics	KSI crash rate of 0.079 is higher than the network average of 0.02 KSI crashes per MVKT. All crashes rate of 0.796 is higher than 0.37 crashes per MVKT.

2.6.1 Black Spot Prequalified Locations

In order to identify black spots being the locations noted for a high incidence of crashes involving death and injury, it is important to conduct the crash criteria analysis as shown in the table below. If the below crash criteria are met, there is a way to measure the cost-effectiveness of the proposed treatment. It is called BCR and it ensures that the black spot exhibits a significant number of crashes that are correctable by infrastructure treatment.

Table 3.1: Crash criteria for the State Black Spot Program

Crash Criteria	Highways and Main Roads		Local Roads	
	Metro	Rural	Metro	Rural
Intersection or Mid-block or Short road section (< 3 km)	10 crashes over 5 years	3 crashes over 5 years	5 crashes over 5 years	3 crashes over 5 years
Road length (≥ 3km)	Average of 3 Crashes per km over 5 years	Average of 1 crash per km over 5 years	Average of 2 Crashes per km over 5 years	Average of 1 crash per km over 5 years
Benefit-cost ratio (BCR)	1			

(Main Roads/ WALGA 2004)

Each of the analysed intersections and road section has no or less than 10 KSI crashes over 5 years period, so none of them qualify as Black Spot Locations.

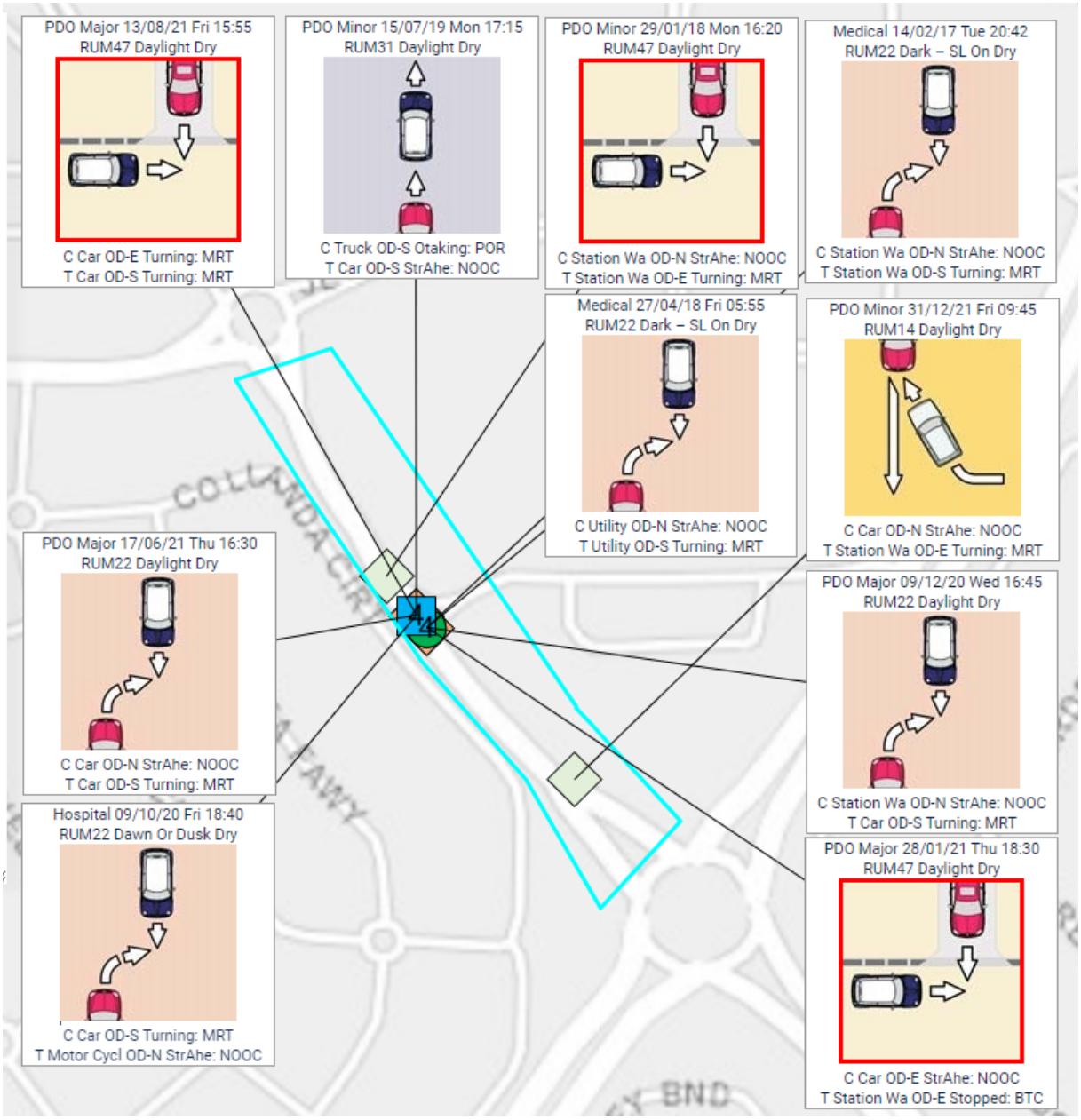
2.6.2 Detailed Crash History for Location 1 - Pinjar Road (SLK 4.04-4.47)

The section of Pinjar Road between the intersections with Golf Links Drive & Jewel Way to the north and Joondalup Drive to the south has 10 crashes recorded over 5-year period, as shown below.

SLK	Date	Day	Time	Severity	Crash No.	Light Cond	MR Nature	RUM	Unit	Unit Type	From Dir	To Dir	Veh/Ped Move
4.13	31/12/2021	Friday	0945	PDO Minor	20216 25654	Daylight	Right Angle	14:Intx: Thru - Right	Colliding	Car	N	S	Straight Ahead: Not Out Of Control
4.13	31/12/2021	Friday	0945	PDO Minor	20216 25654	Daylight	Right Angle	14:Intx: Thru - Right	Target	Station Wagon	E	N	Turning: To Make Right Turn
4.26	09/12/2020	Wednesday	1645	PDO Major	20209 02013	Daylight	Right Turn Thru	22:Opposite Dirn: Thru - Right	Colliding	Station Wagon	N	S	Straight Ahead: Not Out Of Control
4.26	09/12/2020	Wednesday	1645	PDO Major	20209 02013	Daylight	Right Turn Thru	22:Opposite Dirn: Thru - Right	Target	Car	S	E	Turning: To Make Right Turn
4.26	14/02/2017	Tuesday	2042	Medical	20170 02134	Dark - Street Lights On	Right Turn Thru	22:Opposite Dirn: Thru - Right	Colliding	Station Wagon	N	S	Straight Ahead: Not Out Of Control

SLK	Date	Day	Time	Severity	Crash No.	Light Cond	MR Nature	RUM	Unit	Unit Type	From Dir	To Dir	Veh/Ped Move
4.26	14/02/2017	Tuesday	2042	Medical	20170 02134	Dark - Street Lights On	Right Turn Thru	22:Opposite Dirn: Thru - Right	Target	Station Wagon	S	E	Turning: To Make Right Turn
4.26	27/04/2018	Friday	0555	Medical	20181 14043	Dark - Street Lights On	Right Turn Thru	22:Opposite Dirn: Thru - Right	Colliding	Utility	N	S	Straight Ahead: Not Out Of Control
4.26	27/04/2018	Friday	0555	Medical	20181 14043	Dark - Street Lights On	Right Turn Thru	22:Opposite Dirn: Thru - Right	Target	Utility	S	E	Turning: To Make Right Turn
4.26	28/01/2021	Thursday	1830	PDO Major	20210 22486	Daylight	Right Angle	47:Manoeuv: Leaving Driveway	Colliding	Car	E	N	Straight Ahead: Not Out Of Control
4.26	28/01/2021	Thursday	1830	PDO Major	20210 22486	Daylight	Right Angle	47:Manoeuv: Leaving Driveway	Target	Station Wagon	E	N	Stopped: By Traffic Control
4.27	09/10/2020	Friday	1840	Hospital	20208 33763	Dawn Or Dusk	Right Turn Thru	22:Opposite Dirn: Thru - Right	Colliding	Car	S	E	Turning: To Make Right Turn
4.27	09/10/2020	Friday	1840	Hospital	20208 33763	Dawn Or Dusk	Right Turn Thru	22:Opposite Dirn: Thru - Right	Target	Motor Cycle	N	S	Straight Ahead: Not Out Of Control
4.27	13/08/2021	Friday	1555	PDO Major	20213 52772	Daylight	Right Angle	47:Manoeuv: Leaving Driveway	Colliding	Car	E	N	Turning: To Make Right Turn
4.27	13/08/2021	Friday	1555	PDO Major	20213 52772	Daylight	Right Angle	47:Manoeuv: Leaving Driveway	Target	Car	S	E	Turning: To Make Right Turn
4.27	15/07/2019	Monday	1715	PDO Minor	20191 94135	Daylight	Rear End	31:Same Dirn: Same Lane Rear End	Colliding	Truck	S	N	Overtaking: Passing On Right
4.27	15/07/2019	Monday	1715	PDO Minor	20191 94135	Daylight	Rear End	31:Same Dirn: Same Lane Rear End	Target	Car	S	N	Straight Ahead: Not Out Of Control
4.27	17/06/2021	Thursday	1630	PDO Major	20212 72633	Daylight	Right Turn Thru	22:Opposite Dirn: Thru - Right	Colliding	Car	N	S	Straight Ahead: Not Out Of Control

SLK	Date	Day	Time	Severity	Crash No.	Light Cond	MR Nature	RUM	Unit	Unit Type	From Dir	To Dir	Veh/Ped Move
4.27	17/06/2021	Thursday	1630	PDO Major	20212 72633	Daylight	Right Turn Thru	22:Opposite Dirn: Thru - Right	Target	Car	S	E	Turning: To Make Right Turn
4.30	29/01/2018	Monday	1620	PDO Minor	20180 28632	Daylight	Right Angle	47:Manoeuv: Leaving Driveway	Colliding	Station Wagon	N	S	Straight Ahead: Not Out Of Control
4.30	29/01/2018	Monday	1620	PDO Minor	20180 28632	Daylight	Right Angle	47:Manoeuv: Leaving Driveway	Target	Station Wagon	E	N	Turning: To Make Right Turn



2.7 Vehicular Parking

Local Government	City of Wanneroo
Local Government Document Utilised	• Banksia Grove District Centre Activity Centre Plan No.65 Part One Implementation (1 April 2018) • District Planning Scheme No. 2 (Updated to include AMD 197 GG 16/12/2022)

Description of Parking Requirements in accordance with Scheme:

Banksia Grove District Centre Activity Centre Plan No.65 Part One Implementation, states the following:

"Parking provision shall be in accordance with the Scheme, though concessions may be approved where reciprocal use is provided (excluding for residential components, which must provide dedicated bays, in accordance with the R-Codes)."

Table 2 (CLAUSE 4.14) - CAR PARKING STANDARDS within District Planning Scheme No. 2 stipulates the required number of on-site car parking spaces as follows:

- *Car Wash - Nil if incidental to other development on same site otherwise 1.*

Since the DPS No2 does not offer parking rates for Dog Wash, KCTT utilised the rate for Car Wash in order to assess parking requirements.

Vacuum area is considered to be an incidental land use, meaning all traffic using this facility will be coming directly from the Car Wash. Therefore, it has been excluded from calculations.

Calculation of Parking

Land Use	Requirements	Yield	Total Parking
Car Wash	*Nil if incidental to other development on same site otherwise 1*	6 bays	1
Dog Wash	*Nil if incidental to other development on same site otherwise 1*	1 stall	1
		Total Car Parking Requirement	**2**
		Total Volume of Parking Provided by Proponent	**2**

Justification

The proposed development plans indicate 2 Auto Service Wash bays, 4 Self Service Wash Bays, 4 Vacuum Bays, 1 Bay for Dog Wash and 1 standard parking bay for staff member, provided on site.

According to the requirements set out in the DPS No2, proposed development requires 1 Standard Bay provided on site in addition to service bays and 1 bay provided for Dog Wash. Therefore, the car parking provision on site is in line with the requirement.

Circulation area allows vehicles to bypass other vehicles queuing for washing (please refer to Appendix 3)

Have Vehicle Swept Paths been checked for Parking? YES

If YES, provide description of performance:

The plans have been checked with a B99 Passenger Vehicle (5.2m) and no navigation issues were found. Please refer to the swept path analysis plans enclosed in Appendix 3 for clarity.

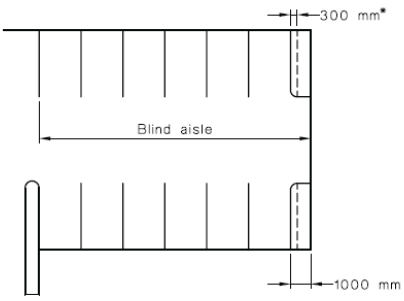
2.8 Compliance with AS2890.1:2004 and AS2890.6

Number of Parking Bays on-site	2
Are Austroads documents referenced? *If YES, Nominate:*	YES • Australian/New Zealand Standard, Parking facilities, Part 1: Off-street car parking - Originated as AS 2890.1—1986.
Proposed development User Class	User Class 1A (Residential, domestic and employee parking) User Class 3 (visitors' parking)

Parking Bay Type	AS2890.1:2004 Off-street car parking AS2890.6 Off-street parking for people with disabilities					
	Parking Bay Length		Parking Bay Width		Aisle Width	
	Required	Proposed	Required	Proposed	Required	Proposed
All bays at 0°	5.9m	6.0m	2.1m+0.3m	2.5m	3.6m	6.0m
All bays at 90° (User Class 3)	5.4m	6.0m	2.6m	2.9m	5.8m	11.0m

Name the other requirements in the AS2890.1:2004 document.

''At blind aisles, the aisle shall be extended a minimum of 1 m beyond the last parking space, as shown in Figure 2.3, and the last parking space widened by at least 300 mm if it is bounded by a wall or fence.
In car parks open to the public, the maximum length of a blind aisle shall be equal to the width of six 90 degree spaces plus 1 m, unless provision is made for cars to turn around at the end and drive out forwards.''



*Additional widening required if there is a wall or fence at the side of the last space, see Clause 2.4.1(b)(ii).

DIMENSIONS IN MILLIMETRES

FIGURE 2.3 BLIND AISLE EXTENSION

KCTT comment:

Single-sided aisles	Parking bay width exceeds the requirements.
Blind aisle	Extension not required
Reversing bay	Not provided

Does the parking area meet the requirements set in AS2890.1:2004?

KCTT reviewed the proposed development layout and concluded that dimensions of all car parking bays and aisle width comply with the Australian Standard AS/NZS 2890.1/2004.

2.9 Bicycle Parking

Local Government	City of Wanneroo
Reference Document Utilised	Town Planning Scheme No 2

Description of Parking Requirements in accordance with Scheme:

The City of Wanneroo Town Planning Scheme No. 2 states the following:

"Local government may require the provision of bicycle parking and end of trip facilities such as showers, change rooms and lockers in commercial developments and other employment centres in accordance with Austroads' Guide to Engineering Practice Part 14: Bicycles." Page 45.

However, the document mentioned in the TPS has been superseded. KCTT have referenced *Austroads Guide to Traffic Management Part 11: Parking* which has no guidance on the number of required parking bays for the proposed land use.

Justification

It is expected that proposed facilities would mostly attract motor vehicles, having in mind the land uses are vehicle oriented. Cycling to the proposed development is highly unlikely so KCTT believe the bicycle parking is not required.

2.10 ACROD Parking

Class of Building	Class 8 - a laboratory, or a building in which a handicraft or process for the production, assembling, altering, repairing, packing, finishing, or **cleaning of goods** or produce is carried on for trade, sale, or gain.
Does this building class require specific provision of ACROD Parking?	NO
Reference Document Utilised	Building Code of Australia

Description of Parking Requirements:

Class 8 — 1 space for every 100 carparking spaces or part thereof.

Parking Requirement in accordance with regulatory documents

Land Use	Requirements	Yield	Total Parking
Proposed development	*1 space for every 100 carparking spaces or part thereof*	Less than 100	1
		Total Volume of ACROD Parking Required	**1**
		Total Volume of ACROD Parking Provided by Proponent	none

Justification

Having in mind the specific character of the proposed land use, KCTT believe the ACROD bay would not be required. Further to this, as there is a requirement for one (1) parking bay in addition to the service bays, the development is below the threshold for provision of ACROD.

2.11 Delivery and Service Vehicles

Guideline Document used as reference	NSW RTA Guide to Traffic Generating Developments

Requirements

Other uses - 1 space per 2,000m2

Parking Requirement in accordance with regulatory documents

Land Use	Minimum Requirements	Yield	Total Parking
	1 space per 2,000m2	≈ 50m^2	1
	Total Volume of Service and Delivery Parking Required		1
	Total Volume of Service and Delivery Parking Provided by Proponent		n/a

Justification

There will be no need for a dedicated service and delivery bay. Delivery is to be organised outside of the development hours of operation. It is expected that waste removal vehicle can operate safely within the road reserve.

2.12 Calculation of Development Generated / Attracted Trips

What are the likely hours of operation?	Open 24 hours
What are the likely peak hours of operation?	08:00 – 09:00 16:00 – 17:00
Do the development generated peaks coincide with existing road network peaks?	YES – both peaks
Guideline Document Used	**Transportation Engineers (ITE) Common Trip Generation Rates (9th edition)**
Rates from above document:	**Automated Car Wash** - PM Peak - 14.12 vehicular trips per KSF^2 (= 15.2 vehicular trips per 100m^2) **Self Service Car Wash -** Daily – 108 vehicular trips per 1 stall /AM Peak – 8 vehicular trips per 1 stall / PM Peak – 5.54 vehicular trips per 1 stall.

Since the relevant guideline documents do not offer rates for Dog Wash, KCTT utilised the 50% of the Car Wash rate in order to assess traffic impact. Furthermore, it is expected that 30% of all Dog Wash traffic would be coming from the Car Wash facilities. Therefore, the rates above have been adjusted to suit these reductions.

In the past, KCTT conducted a small telephone inquiry to dog wash facilities in the area with the purpose of obtaining relevant data. Most of these facilities do not keep thorough record of occupancy throughout the day. However, based on anecdotal evidence, an occupancy of 10-15 dogs per day is considered to be an absolute maximum for the surrounding dog wash facilities. Therefore, the proposed rates used within this report can be considered as worst-case scenario.

Vacuum area is considered to be an incidental land use, meaning all traffic using this facility will be coming directly from the Car Wash. Therefore, it has been excluded from calculations.

Moreover, the proposed land uses are likely derive patronage from passing traffic. Considering the nature of the surrounding land uses (service station, fast food etc.) and the position of the subject site it is expected that 70% of all traffic would be traffic already present on the surrounding road network.

Does the site have existing trip generation / attraction? NO

Land Use Type	Rate above	Yield	Daily Traffic Generation	Peak Hour Traffic Generation	
				AM	PM
Auto Service Car Wash	*Daily – 108 VPD/ 1 stall* *AM Peak – 8 VPH / 1 stall* *PM Peak – 15.2 vehicular trips per 100m²*	2 bays 99m²	216	16	15
Self Service Car Wash	*Daily – 108 VPD/ 1 stall* *AM Peak – 8 VPH / 1 stall* *PM Peak – 5.54 VPH / 1 stall*	4 bays	432	32	22
Dog Wash	*Daily* – 37.8 VPD/ 1 stall* *AM Peak* – 3 VPH / 1 stall* *PM Peak *– 1.9 VPH / 1 stall*	1 stall	38	3	2
	Total traffic (passing + development)		**470**	**35**	**24**
	Passing traffic (70% of total)		**329**	**25**	**17**
	Development traffic (30% of total)		**141**	**11**	**7**

*Note * - These rates include a 50% reduction based on the nature of the land use and an additional 30% reduction based on reciprocity between proposed land uses on site.*

What is the total impact of the new proposed development?

The proposed development is expected to attract up to 470 vehicular trips per day, 35 vehicular trips in the AM peak and 24 vehicular trips in the PM peak hour.

According to WAPC Guidelines developments generating 10-100 vehicular trips in the peak hour have a moderate impact on the road network and warrant a Transport Impact Statement.

However, it is expected that the large percentage of development attracted traffic would be passing traffic, already present on the surrounding road network.

The additional traffic expected to be attracted by the proposed development would be 141 vehicular trips per day, 11 vehicular trips in the AM peak and 7 vehicular trips in the PM peak hour.

Having in mind the additional traffic to the surrounding road network would be less than 10 vehicular trips in the peak hour, the impact is considered low as per WAPC Guidelines.

KCTT believe the surrounding road network has sufficient capacity to accommodate the expected additional traffic.

2.13 Traffic Flow Distribution

How many routes are available for access / egress to the site?

Route 1 / Movement 1	
Provide details for Route No 1	From north via Pinjar Road >> Unnamed Road to the north of the subject site >> Unnamed Road to the east of the subject site >> subject site and reverse
Percentage of Vehicular Movements via Route No 1	15%
Route 2 / Movement 2	
Provide details for Route No 2	From south via Pinjar Road >> Unnamed Road to the north of the subject site >> Unnamed Road to the east of the subject site >> subject site and reverse
Percentage of Vehicular Movements via Route No 2	60%
Route 3 / Movement 1	
Provide details for Route No 1	From north via Joondalup Drive >> Unnamed Road to the north of the subject site >> Unnamed Road to the east of the subject site >> subject site and reverse
Percentage of Vehicular Movements via Route No 1	25%

Note - For a more detailed plans of the estimated vehicular traffic volumes and distribution please refer to the plans provided in Appendix 2.

2.14 Vehicle Crossover Requirements

Are vehicle crossovers required onto existing road networks?	YES
How many existing crossovers?	None
How many proposed crossovers?	1 crossover to ungazetted road to the east of the development site.

If there are greater numbers of new crossovers, than existing, provide justification:

Subject site area is currently undevelopment land so vehicular access was not required.

How close are proposed crossovers to existing intersections?	App.27m from the intersection to the north.
Does this meet existing standards?	YES

Justification

According to AS/NZS 2890.1:2004 Parking facilities Part 1: Off-street car parking the user class of the access point is: User Class 3 - Short-term city and town centre parking,
Proposed crossover serves less than 25 parking bays from a local road, making it a ''Category 1 driveway''

TABLE 3.1
SELECTION OF ACCESS FACILITY CATEGORY

Class of parking facility (see Table 1.1)	Frontage road type	Access facility category				
		Number of parking spaces (Note 1)				
		<25	25 to 100	101 to 300	301 to 600	>600
1,1A	Arterial	1	2	3	4	5
	Local	1	1	2	3	4
2	Arterial	2	2	3	4	5
	Local	1	2	3	4	4
3,3A	Arterial	2	3	4	4	5
	Local	1	2	3	4	4

Therefore, the following requirements from AS/NZS 2890.1:2004 Parking facilities Part 1: Off-street car parking apply:

*"(a) **Driveway Categories 1 and 2:** At unsignalized intersections of sub-arterial, collector or local streets with each other or with an arterial road, access driveways in Categories 1 and 2 (see Table 3.1) shall not be located in the sections of kerb shown by heavy lines in Figure 3.1. **This requirement shall not apply to accesses to domestic driveways in the kerb section opposite the entering road at any intersection including signalized intersections.***

Furthermore, it shall not apply to any access driveway serving a property which would otherwise be denied access due to the physical impossibility of meeting the requirement.

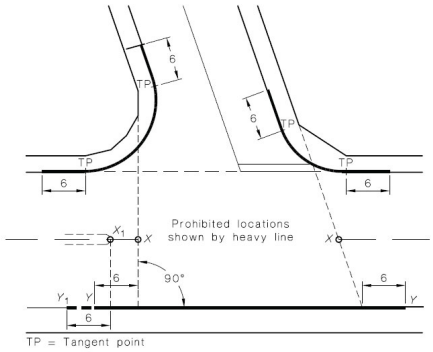
At signalized intersections, the minimum distance from the intersection, measured from the property boundary along both legs, shall be increased as necessary to locate access driveways beyond the influence of normal queue lengths at the intersections. If this is not practicable, it may be necessary to provide-

(i) an arrangement which confines traffic to turning left when either entering or

leaving the car park;

(ii) a signalized driveway with signals coordinated with the intersection signals; or

(iii) other traffic management means of providing for safe and efficient operation of the driveway."



NOTES:
1 Accesses to domestic driveways are excluded from the prohibition in respect of the kerb section marked *Y-Y* (see Clause 3.2.3(a)).
2 The points marked X_1 and X are respectively at the median end on a divided road and at the intersection of the main road centre-line and the extensions of the side road property lines shown as dotted lines, on an undivided road. On a divided road, dimension *Y-Y* extends to Point Y_1.

DIMENSIONS IN METRES

FIGURE 3.1 PROHIBITED LOCATIONS OF ACCESS DRIVEWAYS

As shown on the layout for the proposed development in Appendix 1, the proposed crossover is not located in any of the areas shown by heavy lines and therefore complies with the AS/NZS 2890.1:2004 requirements.

2.15 Public Transport Accessibility

How many bus routes are within 400 metres of the subject site?	Two
How many rail routes are within 800 metres of the subject site?	None

Bus Route	Description	Peak Frequency	Off-Peak Frequency
Route 390	Joondalup Station - Banksia Grove via Tapping	20 minutes	60 minutes
Route 391	Joondalup Station - Banksia Grove via Carramar	20 minutes	60 minutes

Rail Route	Description	Peak Frequency	Off-Peak Frequency
-	-	-	-

Walk Score Rating for Accessibility to Public Transport

35 | Some Transit. A few nearby public transportation options.

Is the development in a Greenfields area? YES

2.16 Pedestrian Infrastructure

Describe existing local pedestrian infrastructure within a 400m radius of the site:

Classification	Road Name
Pedestrian Path	
"Other Shared Path (Shared by Pedestrians and Cyclists)"	Joondalup Drive, Ghost Gum Boulevard, Joseph Banks Boulevard, Golf Links Drive

Does the site have existing pedestrian facilities	NO
Does the site propose to improve pedestrian facilities?	NO

What is the Walk Score Rating?

62 | Somewhat Walkable. Some errands can be accomplished on foot.

2.17 Cyclist Infrastructure

Are there any PBN Routes within an 800m radius of the subject site? YES

If YES, describe:

Classification	Road Name
"Other Shared Path (Shared by Pedestrians and Cyclists)"	Along Joondalup Drive, Ghost Gum Boulevard, Joseph Banks Boulevard, Tumbleweed Drive, Viridian Drive, Parakeelya Road, Pinjar Road, Castledene Way, Edgeworth Circuit, Labianca Vista, Keanefield Drive, Golf Links Drive, Tutquoise Loop, Kurrajong Boulevard, Alpina Promenade, Mistletoe Drive and Elderiana Link, etc.
"Good Road Riding Environment"	Joondalup Drive, Pinjar Road, Joseph Banks Boulevard, Ankuri Pass, Sundowner Meander, etc.
"Bicycle Lanes or Sealed Shoulder Either Side"	Joondalup Drive, Pinjar Road and Joseph Banks Boulevard, etc.

Are there any PBN Routes within a 400m radius of the subject site? YES

If YES, describe:

Classification	Road Name
"Other Shared Path (Shared by Pedestrians and Cyclists)"	Joondalup Drive, Ghost Gum Boulevard, Joseph Banks Boulevard, Golf Links Drive
"Good Road Riding Environment"	Joseph Banks Boulevard, Ankuri Pass, Sundowner Meander, etc
"Bicycle Lanes or Sealed Shoulder Either Side"	Joondalup Drive, Pinjar Road and Joseph Banks Boulevard

Does the site have existing cyclist facilities?	NO
Does the site propose to improve cyclist facilities?	NO

2.18 Site-Specific Issues and Proposed Remedial Measures

How many site-specific issues need to be discussed?

Site-Specific Issue No 1	Traffic impact on the surrounding network
Remedial Measure / Response	The proposed development is expected to attract up to 470 vehicular trips per day, 35 vehicular trips in AM peak and 24 vehicular trips in the PM peak. The proposed layout has the capacity to easily accommodate up to 17 vehicles at any one time (including car wash queuing areas). The impact of anticipated traffic attraction can be classified as moderate, according to WAPC Guidelines. However, given that this entire area is going through a major change, the users of the proposed developments are likely to be pre-existing traffic on the road network from the surrounding roads. Additional traffic attracted by the proposed development would be up to 141 vehicular trips per day, 11 vehicular trips in AM peak and 7 vehicular trips in the PM peak, and it will have high impact on the surrounding road network according to WAPC Guidelines. Therefore, KCTT believe that the surrounding road network (when constructed as planned) will be able cater for the traffic attracted by the proposed development.