

Lot 601 Brockman Street, Gingin Proposed Commercial Development

TRANSPORT IMPACT ASSESSMENT



Prepared for: Westerly Developments Pty Ltd

October 2023

Lot 601 Brockman Street, Gingin

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1 Introduction

This Transport Impact Assessment has been prepared by Urbii on behalf of Westerly Developments Pty Ltd with regards to the proposed commercial development, located at Lot 601 Brockman Street, Gingin.

The subject site is situated on the northern side of Weld Street, as shown in Figure 1. A commercial development is proposed on a portion of the site, near the Gingin Community Resource Centre and Shire of Gingin offices. The remaining portion of land is subject to future planning. The commercial development is the subject if this TIA.

The aim of this Transport Impact Assessment (TIA) is to assess the impact of the proposal on the existing transport network. The TIA was prepared in accordance with the WAPC *Transport Assessment Guidelines* 2016.



Figure 1: Subject site

2 Existing situation

2.1 Existing site use, access and parking

The site is mostly cleared land with fencing (Figure 2). There is an existing unsealed access connecting to Weld Street opposite the Shire of Gingin works depot (Figure 3).



Figure 2: Existing site



Figure 3: Existing vehicle access

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The site is surrounded by a mix of community and commercial land uses, refer to Figure 4 for a context plan showing surrounding land use. Granville Park is located nearby to the south. The Shire of Gingin office, Australia Post and other services are located nearby along Brockman Street.



Figure 4: Location context plan

2.2 Surrounding road network and traffic management on roads

Information from online mapping services, Main Roads WA, Local Government, and site visits was collected to assess the existing traffic management on frontage roads.

2.2.1 Weld Street

Weld Street near the subject site is an approximately 7m wide, two-lane sealed road. The road features a painted centreline and has unsealed shoulders. No path for walking or cycling is presently provided adjacent to the development site (Figure 5). Further to the east there are paths provided near the Shire of Gingin office.

Weld Street is classified as a *Regional Distributor* road in the Main Roads WA road hierarchy (Figure 8). The speed limit is 50km/h around the Town Centre and changes to 80km/h at the western end of the subject site (Figure 9). Regional Distributor roads are the responsibility of Local Government and are typically for linking significant destinations and designed for efficient movement of people and goods between and within regions (Figure 10).

It is recommended that the Shire of Gingin liaise with MRWA speed zoning branch to extend the existing 50km/h speed zone further west past the subject site.



Figure 5: Weld Street adjacent to the subject site



2.2.2 Brockman Street

Brockman Street near the subject site is an approximately 16m wide, two-lane undivided road. On-street parking is provided along both sides of the road (Figure 6). A path for walking and cycling is provided along the eastern side of the road.

Brockman Street is classified as an *Access road* in the Main Roads WA road hierarchy (Figure 8) and operates under a speed limit of 50km/h (Figure 9). Access roads are the responsibility of Local Government and are typically for the provision of vehicle access to abutting properties (Figure 10).



Figure 6: Brockman Street (looking north)

2.2.3 Lily King Place

Lily King Place near the subject site is an approximately 6-8m wide, two-lane undivided road. A path for walking and cycling is provided along the southern side of the road. A 10km/h speed zone sign is installed at the intersection of Lily King Place with Brockman Street (Figure 7).



Figure 7: Lily King Place



Figure 8: Main Roads WA road hierarchy plan

Source: Main Roads WA Road Information Mapping System (RIM)



Figure 9: Main Roads WA road speed zoning plan

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Source: Main Roads WA Road Information Mapping System (RIM)

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	ROAD HIERARCHY FOR WESTERN AUSTRALIA ROAD TYPES AND CRITERIA (see Note 1)						
С	RITERIA	PRIMARY DISTRIBUTOR (PD) (see Note 2)	DISTRICT DISTRIBUTOR A (DA)	DISTRICT DISTRIBUTOR B (DB)	REGIONAL DISTRIBUTOR (RD)	LOCAL DISTRIBUTOR (LD)	ACCESS ROAD (A)
P	Primary Criteria						
1.	Location (see Note 3)	All of WA incl. BUA	Only Built Up Area.	Only Built Up Area.	Only Non Built Up Area. (see Note 4)	All of WA incl. BUA	All of WA incl. BUA
2.	Responsibility	Main Roads Western Australia.	Local Government.	Local Government.	Local Government.	Local Government.	Local Government.
3.	Degree of Connectivity	High. Connects to other Primary and Distributor roads.	High. Connects to Primary and/or other Distributor roads.	High. Connects to Primary and/or other Distributor roads.	High. Connects to Primary and/or other Distributor roads.	Medium. Minor Network Role Connects to Distributors and Access Roads.	Low. Provides mainly for property access.
4.	Predominant Purpose	Movement of inter regional and/or cross town/city traffic, e.g. freeways, highways and main roads.	High capacity traffic movements between industrial, commercial and residential areas.	Reduced capacity but high traffic volumes travelling between industrial, commercial and residential areas.	Roads linking significant destinations and designed for efficient movement of people and goods between and within regions.	Movement of traffic within local areas and connect access roads to higher order Distributors.	Provision of vehicle access to abutting properties
S	econdary Criteria						
5.	Indicative Traffic Volume (AADT)	In accordance with Classification Assessment Guidelines.	Above 8 000 vpd	Above 6 000 vpd.	Greater than 100 vpd	Built Up Area - Maximum desirable volume 6 000 vpd. Non Built Up Area - up to 100 vpd.	Built Up Area - Maximum desirable volume 3 000 vpd. Non Built Up Area - up to 75 vpd.
6.	Recommended Operating Speed	60 – 110 km/h (depending on design characteristics).	60 – 80 km/h.	60 – 70 km/h.	50 – 110 km/h (depending on design characteristics).	Built Up Area 50 - 60 km/h (desired speed) Non Built Up Area 60 - 110 km/h (depending on design characteristics).	Built Up Area 50 km/h (desired speed). Non Built Up Area 50 – 110 km/h (depending on design characteristics).
7.	Heavy Vehicles permitted	Yes.	Yes.	Yes.	Yes.	Yes, but preferably only to service properties.	Only to service properties.
8.	Intersection treatments	Controlled with appropriate measures e.g. high speed traffic management, signing, line marking, grade separation.	Controlled with appropriate measures e.g. traffic signals.	Controlled with appropriate Local Area Traffic Management.	Controlled with measures such as signing and line marking of intersections.	Controlled with minor Local Area Traffic Management or measures such as signing.	Self controlling with minor measures.
9.	Frontage Access	None on Controlled Access Roads. On other routes, preferably none, but limited access is acceptable to service individual properties.	Prefer not to have residential access. Limited commercial access, generally via service roads.	Residential and commercial access due to its historic status Prefer to limit when and where possible.	Prefer not to have property access. Limited commercial access, generally via lesser roads.	Yes, for property and commercial access due to its historic status. Prefer to limit whenever possible. Side entry is preferred.	Yes.
1(D. Pedestrians	Preferably none. Crossing should be controlled where possible.	With positive measures for control and safety e.g. pedestrian signals.	With appropriate measures for control and safety e.g. median/islands refuges.	Measures for control and safety such as careful siteing of school bus stops and rest areas.	Yes, with minor safety measures where necessary.	Yes.
1	1. Buses	Yes.	Yes.	Yes.	Yes.	Yes.	If necessary (see Note 5)
1	2. On-Road Parking	No (emergency parking on shoulders only).	Generally no. Clearways where necessary.	Not preferred. Clearways where necessary.	No – emergency parking on shoulders – encourage parking in off road rest areas where possible.	Built Up Area – yes, where sufficient width and sight distance allow safe passing. Non Built Up Area – no. Emergency parking on shoulders.	Yes, where sufficient width and sight distance allow safe passing.
1	3. Signs & Linemarking	Centrelines, speed signs, guide and service signs to highway standard.	Centrelines, speed signs, guide and service signs.	Centrelines, speed signs, guide and service signs.	Centrelines, speed signs and guide signs.	Speed and guide signs.	Urban areas – generally not applicable. Rural areas - Guide signs.
14	4. Rest Areas/Parking Bays	In accordance with Main Roads' Roadside Stopping Places Policy.	Not Applicable.	Not Applicable.	Parking Bays/Rest Areas. Desired at 60km spacing.	Not Applicable.	Not Applicable.

Figure 10: Road types and criteria for Western Australia

Source: Main Roads Western Australia D10#10992

As detailed in Figure 11, there is a full-movement T-intersection provided at Weld Street and Brockman Street. Lily King Place forms a 4-way intersection with Brockman Street and Constable Street.

Reference was made to Australian Standard AS1742.2 - *Manual of uniform traffic control devices Part 2: Traffic control devices for general use*, for guidance on appropriate intersection controls (Figure 12). Give Way signs and hold line marking should be installed on the approaches of Lily King Place and Constable Street, at the intersection with Brockman Street.

It is recommended that the Shire of Gingin liaise with MRWA to obtain approval for Give Way signage and Linemarking at the existing 4-way intersection.



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Figure 11: Key local intersections

2.5 CONTROL BY GIVE WAY AND STOP SIGNS

2.5.1 General

GIVE WAY signs and STOP signs are used to control traffic at intersections other than those controlled by means of roundabouts or traffic signals, by allocating priority to traffic on one of the intersecting roads.

These signs are provided as follows:

- (a) GIVE WAY signs shall be provided at all intersections with four or more legs.
- (b) GIVE WAY signs shall be provided at any three-way intersection where the layout is such that it is not clear how or whether the T-intersection rule would operate, for example, at a Y-intersection.
- (c) GIVE WAY signs should be used for road safety reasons at unsignalized T-intersections where the continuing road (i.e. the bar of the T) is an arterial or subarterial road, urban or rural.
- (d) STOP signs shall be provided instead of GIVE WAY signs on any controlled approach where intersection sight distance is substandard as determined in accordance with Clause 2.5.4. STOP signs shall not be used where intersection sight distance is adequate for GIVE WAY signs.

In all other cases, GIVE WAY signs are not required if the T-intersection rule operates satisfactorily and there is no requirement for STOP signs due to reduced intersection sight distance.

Figure 12: Intersection control by give way and stop signs

Source: Extracted from AS1742.2

2.3 Existing traffic volumes on roads and major intersections

Traffic volume and speed data obtained from Main Roads WA indicates Weld Street carried average weekday traffic flows of around 2,300 vehicles per day (North of Mooliabeenee Rd) in 2021. The weekday peak hours occur at around 8am to 9am and between 4pm to 5pm, as detailed in Figure 13.



Figure 13: Weekday traffic profile (Weld Street North of Mooliabeenee Rd)

Traffic data obtained from Main Roads WA for the local road network is summarised in Table 1.

Table 1: Existing traffic volume and speed on local roads

Road	Location	Daily traffic	85 th percentile speed
Weld St	North of Mooliabeenee Rd	2,342 vpd	49.5 km/h
Weld St	West of Brockman St	793 vpd	78.1 km/h

To establish existing base traffic flows at nearby intersections, a manual traffic survey was undertaken at the intersection of Weld Street and Brockman Street. The survey was undertaken in August 2023 between 8am and 9am in the morning and 4pm and 5pm in the afternoon.

The base peak hour traffic flows derived for analysis are detailed in Section 7.2 of this report.

2.4 Existing operation of surrounding intersections

The operation of existing intersections is documented in Section 7.5 of this report.





2.5 Heavy vehicles

The roads near the subject site form part of RAV Network 1 which permits 19m semi-trailers to travel on these roads under general access, or "as of right" status. General access vehicles may operate state-wide provided they are:

- not a road train or b-double;
- within regulation axle mass limits;
- 19 metres or less in combination length (or a maximum 12.5 metres for rigid vehicles);
- total combination mass less than 42.5 tonnes;
- width less than 2.5 metres (excluding mirrors and lights); and
- height less than 4.3 metres.

2.6 Public transport access

There are no local public transport options serving the subject site. There are bus stops on Weld Street in front of the Shire offices (Figure 14). These stops are for the TransWA regional coach which stops at Gingin once per day in each direction (Figure 15).



Figure 14: Closest bus stops serving the proposed development

Perth to Kalbarri via Eneabba Perth to Geraldton via Eneabba

N1

	0-0	Cost			0.0.00	000
	8/9	GPE1			GPE2	860
From Perth	Mon Wed Fri	Tue Thur Sat	From Kalbarri/Geraldton		Mon to Sat	Tue Thur Sat
_	AM	AM				AM
East Perth Terminal & De	p 8:30	8:30	Kalbarri (Motor Hotel)	Dep		7:10
Midland Station (Stand No. 1) De	p 8:55	8:55	Northampton (Lions bus shelter)	Dep		8:25
Bullsbrook (bus stop) De	p 9:17	9:17	Geraldton (Railway Station)	Arr	AM	9:15
Gingin (Shire Office) De	p 9:46	9:46		Dep	8:30	9:30
Cataby (Liberty Roadhouse) 💻 🕹 Ar	r 10:43	10:43	Cape Burney turnoff (1km)*	Dep	8.40	9:35
			Greenough (town site)	Dep	8:50	9:50
De	p 11:15	11:15	Dongara (Visitor Centre)	Dep	9:20	10:20
Badgingarra (information bay) De	p 11:46	11:46	Port Denison (Point Leander Drive)	Dep	9:25	
	PM	PM	Eneabba (Roadhouse)	Dep	10:22	
Jurien Bay turnoff/Brand Highway (38km)* De	p 12:00	12:00	Warradarge (Roadhouse)	Arr	10:45	
Warradarge (Roadhouse) De	p 12:14	12:14				<
Eneabba (Roadhouse) 🔹 De	p 12:37	12:37		Dep	11:15	2
Port Denison (Point Leander Drive) & De	p 1:34	1:34	Jurien Bay turnoff/Brand Highway (38km)*	Dep	11:29	00
Dongara (Visitor Centre) De	p 1:39	1:39	Badgingarra (information bay)	Dep	11:45	ž
Greenough (town site) De	p 2:09	2:09			PM	<
Cape Burney turnoff (1km)* De	p 2.19	2.19	Cataby (Liberty Roadhouse)	Dep	12:15	>
Geraldton (Railway Station) Ar	r 2:30	2:30	Gingin (Shire Office)	Dep	1:11	
De	p 2:40		Bullsbrook (bus stop)	Dep	1:40	
Northampton (Lions bus shelter) De	p 3:22		Midland Station (Stand No. 1)	Dep	2:02	PM
Kalbarri (Motor Hotel) Ar	r 4:55		East Perth Terminal	Arr	2:30	4:45

💻 Comfort stop

& Wheelchair accessible toilet facilities available *(km) kilometres from townsite

Road coach services will only divert to Dongara, Eneabba or Gingin if advance bookings are made.

Amendments may apply on public holidays and during school holidays. Road coaches will only stop at other authorised stopping points if pre-booked. Passengers are advised be ready to board 15 minutes prior to departure.

Figure 15: TransWA coach timetable

2.7 Pedestrian access

Information from online mapping services, Main Roads WA, Local Government, and site visits was collected to assess the pedestrian access for the proposed development.

Footpaths are provided on portions of Weld Street, Brockman Street and Lily King Place in the locality.

Kerb ramps are provided at some intersections to promote improved access for wheelchairs, prams and bicycles.







2.8 Bicycle access

The Shire of Gingin Trail Map (see Figure 16) shows the existing cycling infrastructure in the locality. There are no dedicated cycling facilities. People cycling may use footpaths where they are provided or will have to cycle on the road to and from the site.



Figure 16: Shire of Gingin Trail Map

2.9 Crash data and safety

The five-year crash history in the vicinity of the site was obtained from Main Roads WA. As detailed in Figure 17, 1 crash was recorded in the immediate locality in the last five years. This crash involved a vehicle colliding with a person crossing Brockman Street and resulted in minor property damage only. The detailed crash history is presented in Table 2.



Figure 17: 5-year crash map in the locality (2018-2022)

Source: MRWA crash mapping tool





Table 2: 5-year crash history in the locality (2018-2022)

Severity	No.	%
Fatal	0	0
Hospital	0	0
Medical	0	0
PDO Major	0	0
PDO Minor	1	100.00
Veer	No	0/
Teal	NO.	/0
2021	1	100.00
Nature	No.	%
Head On	0	0
Hit Animal	0	0
Hit Object	0	0
Hit Pedestrian	1	100.00
Non Collision	0	0
Not Known	0	0
Rear End	0	0
Right Angle	0	0
Right Turn Thru	0	0
Sideswipe Opposite Dirn	0	0
Sideswipe Same Dirn	0	0

Light	No.	%
Dark - Street Lights Not Provided	0	0
Dark - Street Lights Off	0	0
Dark - Street Lights On	0	0
Dawn Or Dusk	0	0
Daylight	1	100.00
Not Known	0	0
Conditions	No.	%
Dry	1	100.00
Dry Not Known	1 0	100.00 0
Dry Not Known Wet	1 0 0	100.00 0 0
Dry Not Known Wet	1 0 0	100.00 0 0
Dry Not Known Wet Alignment	1 0 0 No.	100.00 0 0 %
Dry Not Known Wet Alignment Curve	1 0 0 No. 0	100.00 0 0 % 0
Dry Not Known Wet Alignment Curve Not Known	1 0 0 No. 0 0	100.00 0 % 0 0 0
Dry Not Known Wet Alignment Curve Not Known Straight	1 0 0 No. 0 0 1	100.00 0 % 0 0 0 100.00
Dry Not Known Wet Alignment Curve Not Known Straight	1 0 0 No. 0 0 1	100.00 0 % 0 0 0 100.00

3 Development proposal

A commercial development is proposed for the subject site, which will include complementary uses as detailed in Table 3. The proposed development will deliver a total Gross Floor Area of around 2,100m². Some minor variations in floor area may take place as further plan amendments are made.

Table 3: Proposed uses

Land use	Gross Floor Area (m2)
T1 - Supermarket	1200
T2 - Café	150
T3 - Hair	80
T4 - Pizza	90
T5 - Butcher	100
T6 - Liquor	250
T7 - Post Office	214
Total	2084

The proposed development plans are included in Appendix A.

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4 Vehicle access

The proposed vehicular access arrangements have been reviewed for efficient and safe traffic circulation.

The proposed access arrangements are shown in Figure 18. Two crossovers are proposed one Weld Street which will accommodate full-movement, two-way flows for general traffic. A service road will connect to Lily King Place, which will provide one-way access for service, delivery and waste collection vehicles. Staff will also be permitted to enter from Lily King Place.



Figure 18: Proposed vehicle access

Some suggested traffic management signage and linemarking has been prepared by Urbii and is included in the swept path diagrams presented in Appendix C.

5 Changes to surrounding transport networks

Based on public information available to Urbii, there are limited changes to the local transport network expected in the next ten years.

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6 Integration with surrounding area

The proposed development integrates well with the surrounding area. There could be further complementary development in the Town Centre in future which will be subject to a separate development application.

7 Traffic assessment

7.1 Assessment period

Two time periods are considered in the traffic assessment:

- Weekday AM peak hour: 8am to 9am.
- Weekday PM peak hour: 4pm to 5pm.

The analysis was undertaken for the following scenarios:

• 10yr post-development situation (assumed to be 2036 with development traffic included).

7.2 Existing traffic flows

To establish existing base traffic flows at nearby intersections, a manual traffic survey was undertaken at the intersection of Weld Street and Brockman Street. The survey was undertaken in August 2023 between 8am and 9am in the morning and 4pm and 5pm in the afternoon.

The existing traffic flows are presented in Figure 19.



Figure 19: Surveyed existing traffic flows – weekday AM and PM peak hours



7.3 Traffic generation

The traffic volume that will be generated by the proposed development has been estimated using trip generation rates derived with reference to the following sources:

- RTA NSW Guide to traffic generating developments;
- RTA NSW Technical direction TDT 2013/4A; and,
- RTA NSW *Trip Generation and Parking Demand Surveys of Shopping Centre* Analysis Report, September 2011.

The trip generation rates adopted are detailed in Table 4. *Shopping Centres* in the RTA guide include a wide range of land uses integrated in one centre, this includes supermarkets, slow and fast trade retail, food and beverage, medical and other offices. Therefore, the trip rate for *Shopping Centre* is appropriate for the proposed development.

Table 4: Adopted trip rates for traffic generation

Land use	Trip rate source	Daily rate	AM Peak Hour	PM Peak Hour	IN	OUT
Shopping Centre (0 - 20,000m2)	RTA NSW	61 trips per 100m2	Assume 50% of PM Peak	6.7 trips per 100m2	50%	50%

The estimated traffic generation of the proposed development is detailed in Table 5. The proposed development is estimated to generate a total of 1,281 vehicles per day (vpd), 70 vehicles per hour (vph) and 140 vph in the weekday AM and PM peak hours respectively. The net increase in traffic is **+1,025vpd**, **+56vph** (AM peak) and **+112vph** (PM peak).

These trips include both inbound and outbound vehicle movements. It is anticipated that most of the vehicle types would be small passenger cars and compact SUVs.

Surveys presented in the RTA Shopping Centre Analysis Report recorded an average passing trade rate of 46%. However, as the subject site is in a regional townsite with low traffic on Weld Street, a lower passing trade proportion of 20% was adopted in the analysis.

Table 5: Daily and peak hour traffic generation

Dovelopment Troffie	GLFA	Daily	AM	РМ	AM	Peak	PM Peak		
	(m2)	Trips	Peak	Peak	IN	OUT	IN	OUT	
Primary Trips (80%)	-	1025	56	112	28	28	56	56	
Passing Trade (20%)	-	256	14	28	7	7	14	14	
Total Trips	2100	1281	70	140	35	35	70	70	

The traffic analysis is very conservative as the trip rates applied are for urban shopping centres with a higher population density.

7.4 Trip distribution and assignment

The trip distribution for passing trade was assumed to be 57% left-in/left-out on Weld Street and 43% right-in-/right-out on Weld Street. The distribution of passing trade development traffic is presented in Figure 20.



Figure 20: Proposed development passing trade distribution

The distribution of primary trips was assumed with reference to existing turning movements at nearby intersections. The distribution of primary development trips is presented in Figure 21.



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Figure 21: Proposed development primary trips distribution

The total development traffic is presented in Figure 22.

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7.4.1 10-year post development forecasting

The Shire of Gingin had an average growth rate of 1.6% per annum in the estimated resident population from 2007 to 2022 (Figure 23).



Figure 23: Annual change in resident population

Shire of Gingin 2007 to 2022

This TIA conservatively adopts a <u>compounded</u> traffic growth rate of 2% per annum. Applying this rate for traffic growing from the assessment years of 2023 to 2036 will result in a 29% increase in background traffic volumes.

The total 2036 post development traffic volumes are detailed in Figure 24.



Figure 24: 2036 forecast traffic flows (including development traffic)





7.5 Analysis of intersections and development access

Capacity analysis of intersections was undertaken using the SIDRA 9 computer software package. SIDRA 9 is an intersection modelling tool commonly used by traffic engineers for all types of intersections.

Three intersections were analysed as following:

- Weld St / Brockman St (2036 AM & PM peak hours).
- Site crossover 1 / Weld St (2036 AM & PM peak hours).
- Site crossover 2 / Weld St (2036 AM & PM peak hours).

Overall, the SIDRA results indicate that the proposed development will have minimal impact on the road network. All traffic movements are expected to operate at level of service A with minimal delays and queuing.

Detailed SIDRA outputs for each intersection are provided in Appendix B.

7.6 Impact on surrounding roads

The WAPC Transport Impact Assessment Guidelines for Developments (2016) provides the following guidance on the assessment of traffic impacts:

"As a general guide, an increase in traffic of less than 10 percent of capacity would not normally be likely to have a material impact on any particular section of road but increases over 10 percent may. All sections of road with an increase greater than 10 percent 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 around 10 percent of capacity. Therefore, any section of road where development traffic would increase flows by more than 100 vehicles per hour for any lane should be included in the analysis."

The proposed development will not increase traffic flows on any roads adjacent to the site by the quoted WAPC threshold of +100vph to warrant further analysis. Therefore, the impact on the surrounding road network is minor.

7.7 Impact on neighbouring areas

The traffic generated by the proposed development is not expected to significantly affect surrounding areas and the proposed land uses are in line with planning for the local area. Therefore, there is not expected to be any impact on neighbouring areas that would require any further consideration.

7.8 Traffic noise and vibration

It requires a doubling of traffic volumes on a road to produce a perceptible 3dB (A) increase in road noise. The proposed development will not increase traffic volumes or noise on surrounding roads anywhere near this level to result in any perceptible increase in noise.





8 Parking

8.1 Parking supply

A total of 56 formal car parking bays are proposed for the development. This includes two bays allocated for ACROD parking. Seven bays will be reserved for the exclusive use of staff at the rear of the building. Staff will also be permitted to park informally behind the building, providing an approximate extra 18 parking spaces.

Three caravan or car and trailer parking spaces are also proposed onsite. The total parking capacity onsite is 77 bays.

8.2 Parking requirements

Advice provided by the project Town Planner indicates that the applicable planning scheme requires a total of 80 bays, as detailed in Table 6. This results in an 'on-paper' shortfall of 3 bays. The development is in the town centre, with community, retail, medical, office and civic uses all within two minutes walking distance of the site. Therefore, there will be some reciprocal activity with people visiting or working in the area walking to and from the site. As a conservative estimate, if 5% of visits are from nearby walkable locations, then the parking requirement will be 76 bays. Additionally, there is on-street parking on Brockman Street which may be used by people visiting the town centre for a multi-purpose trip. In consideration of these factors, the parking shortfall is minor and can be supported.

Table 6: Planning scheme parking requirements

Proposed Land Use	Parking Requiremer	nt	Number of Bays Required
Shop	1 bay per 20sqm of	NLA	71 bays
 Supermarket (774sqm excl back of house) Post Office (214sqm) Liquor (250sqm) Butcher (100sqm) Hair (80sqm) 			
Restaurant • Cafe (148sqm)	1 bay per 4 accommodated	persons	6 bays (based on 24 people at any one time)
Fast Food OutletPizza (88sqm)	1 bay per 4 accommodated	persons	3 bays (based on 12 people at any one time)
Tota	Bays Required 80	bays	
Tota	Bays Provided 77	bays	

Source: Dynamic Planning and Developments

9 Provision for service vehicles

The proposed development provides one large loading bay for supermarket deliveries at the rear of the building. A second smaller loading bay is provided for the shared use by other tenancies.

A bin storage and waste collection yard are provided behind the supermarket and is designed to accommodate large 11m front loader waste trucks.

Swept path analysis has been undertaken for the following design vehicles:

- AS2890.2 19m Articulated Vehicle (AV).
- AS2890.2 8.8m Medium Rigid Vehicle (MRV).
- 11m front loader waste truck.
- Car towing larger luxury caravan.

Swept path analysis confirms satisfactory service vehicle movements and is presented in Appendix C. Service vehicles are able to enter and exit the site in forward gear.

Larger service vehicles such as the 19m AV will use the full width of the road carriageway to turn left from Brockman Street into Lily King Place. Liveable Neighbourhoods permits the full use of road pavement at intersections between access streets:

"....for turns between neighbourhood connector or access street and an access street, the design heavy rigid vehicle (turning path radius 12.5 m), using any part of the pavement...."

Due to the low traffic volume and speed, and access street designation of the roads, turning movements of service trucks are not required to be lane correct at the intersection of Brockman Street and Lily King Place.



10 Public transport assessment

The limited public transport services and low density population over a large catchment area means that most people will drive to the site.

11 Walking assessment

The WAPC Transport Impact Assessment Guidelines for Developments (2016) provide warrants for installing pedestrian priority crossing facilities. This is based on the volume of traffic as the key factor determining if pedestrians can safely cross a road. The guidelines recommend pedestrian priority crossing facilities be considered once the peak hour traffic exceeds the volumes detailed in Table 7.

The traffic volumes in this table are based on a maximum delay of 45 seconds for pedestrians, equivalent to Level of Service E. Traffic volumes on the road network adjacent to the site are below the threshold for safe pedestrian crossing. Therefore, the pedestrian crossing level of service is satisfactory on the adjacent road network.

Table 7: Traffic volume thresholds for pedestrian crossings

Road cross-section	Maximum traffic volumes providing safe pedestrian gap
2-lane undivided	1,100 vehicles per hour
2-lane divided (with refuge)	2,800 vehicles per hour
4-lane undivided*	700 vehicles per hour
4-lane divided (with refuge)*	1,600 vehicles per hour

The proposed development provides a footpath which connects from Lily King Place to the main building entrance, allowing people to walk from Brockman Street to the development.



12 Cycling assessment

12.1 Bicycle parking and end of trip facilities

A total of 6 bicycle parking spaces are provided for the development near the main building entry, to encourage active transport for staff and customers.

13 Conclusion

This Transport Impact Assessment has been prepared by Urbii on behalf of Westerly Developments Pty Ltd with regards to the proposed commercial development, located at Lot 601 Brockman Street, Gingin.

The subject site is situated on the northern side of Weld Street. A commercial development is proposed on a portion of the site, near the Gingin Community Resource Centre and Shire of Gingin offices. The remaining portion of land is subject to future planning. The commercial development is the subject if this TIA.

The site promotes good connectivity with the existing and planned road, cycling and pedestrian network.

The traffic analysis undertaken in this report shows that the traffic generation of the proposed development can be accommodated by the surrounding roads and intersections. The proposed car parking supply is expected to meet the needs of the proposed development.

It is recommended that the Shire of Gingin liaise with MRWA speed zoning branch to extend the existing 50km/h speed zone further west past the subject site.

It is recommended that the Shire of Gingin liaise with MRWA to obtain approval for Give Way signage and Linemarking at the existing 4-way intersection.

It is concluded that the findings of this Transport Impact Assessment are supportive of the proposed development.



Appendices

Appendix A: Proposed development plans



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Appendix B: SIDRA analysis outputs

SIDRA outputs are presented in the form of Degree of Saturation, Level of Service, Average Delay and 95% Queue. These characteristics are defined as follows:

- Degree of Saturation (DoS): is the ratio of the arrival traffic flow to the capacity of the approach during the same period. The Degree of Saturation ranges from close to zero for varied traffic flow up to one for saturated flow or capacity.
- Level of Service (LoS): is the qualitative measure describing operational conditions within a traffic stream and the perception by motorists and/or passengers. In general, there are 6 levels of service, designated from A to F, with Level of Service A representing the best operating condition (i.e. free flow) and Level of Service F the worst (i.e. forced or breakdown flow).
- Average Delay: is the average of all travel time delays for vehicles through the intersection.
- 95% Queue: is the queue length below which 95% of all observed queue lengths fall.





Analysis Outputs – Movement Summary Tables

MOVEMENT SUMMARY

V Site: 101 [Weld St / Brockman St - 2036 AM PD (Site Folder: General)]

U23.092 - Lot 601 Brockman Street, Gingin Site Category: (None) Give-Way (Two-Way)

Vehicle	Vehicle Movement Performance													
Mov ID	Tum	INPUT V([Total veh/h	DLUMES HV] %	DEMAND [Total veh/h	FLOWS HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK ([Veh. veh	DF QUEUE Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: We	ld St													
5	T1	32	12.0	34	12.0	0.090	0.2	LOS A	0.4	3.4	0.18	0.39	0.18	47.3
6	R2	109	12.0	115	12.0	0.090	4.9	LOS A	0.4	3.4	0.18	0.39	0.18	46.6
Approact	h	141	12.0	148	12.0	0.090	3.8	NA	0.4	3.4	0.18	0.39	0.18	46.8
North: Br	ockman	St												
7	L2	101	12.0	106	12.0	0.100	4.8	LOS A	0.4	3.1	0.12	0.51	0.12	46.2
9	R2	27	12.0	28	12.0	0.100	5.6	LOS A	0.4	3.1	0.12	0.51	0.12	46.2
Approact	h	128	12.0	135	12.0	0.100	5.0	LOS A	0.4	3.1	0.12	0.51	0.12	46.2
West: We	eld St													
10	L2	24	12.0	25	12.0	0.035	4.7	LOS A	0.0	0.0	0.00	0.20	0.00	48.2
11	T1	40	12.0	42	12.0	0.035	0.0	LOS A	0.0	0.0	0.00	0.20	0.00	48.8
Approact	h	64	12.0	67	12.0	0.035	1.8	NA	0.0	0.0	0.00	0.20	0.00	48.6
All Vehic	les	333	12.0	351	12.0	0.100	3.9	NA	0.4	3.4	0.12	0.40	0.12	46.9

MOVEMENT SUMMARY

V Site: 101 [Weld St / Brockman St - 2036 PM PD (Site Folder: General)] U23.092 - Lot 601 Brockman Street, Gingin

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

Vehicle	e Mover	nent Perfo	rmance											
Mov ID	Turn	INPUT V [Total veh/h	OLUMES HV] %	DEMAND [Total veh/h	FLOWS HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK [Veh. veh	OF QUEUE Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: W	eld St													
5	T1	64	12.0	67	12.0	0.110	0.4	LOS A	0.5	4.2	0.23	0.32	0.23	47.5
6	R2	109	12.0	115	12.0	0.110	5.1	LOS A	0.5	4.2	0.23	0.32	0.23	46.9
Approa	ch	173	12.0	182	12.0	0.110	3.3	NA	0.5	4.2	0.23	0.32	0.23	47.1
North: E	Brockman	St												
7	L2	94	12.0	99	12.0	0.127	4.9	LOS A	0.5	3.8	0.16	0.52	0.16	46.1
9	R2	52	12.0	55	12.0	0.127	6.0	LOS A	0.5	3.8	0.16	0.52	0.16	46.1
Approa	ch	146	12.0	154	12.0	0.127	5.3	LOS A	0.5	3.8	0.16	0.52	0.16	46.1
West: V	Veld St													
10	L2	43	12.0	45	12.0	0.056	4.7	LOS A	0.0	0.0	0.00	0.23	0.00	48.0
11	T1	59	12.0	62	12.0	0.056	0.0	LOS A	0.0	0.0	0.00	0.23	0.00	48.7
Approa	ch	102	12.0	107	12.0	0.056	2.0	NA	0.0	0.0	0.00	0.23	0.00	48.4
All Vehi	cles	421	12.0	443	12.0	0.127	3.7	NA	0.5	4.2	0.15	0.37	0.15	47.1

MOVEMENT SUMMARY

▽ Site: 201 [Weld St / Crossover 1 - 2036 AM PD (Site Folder: General)]

U23.092 - Lot 601 Brockman Street, Gingin Site Category: (None) Give-Way (Two-Way)

Vehicle	Vehicle Movement Performance													
Mov ID	Turn	INPUT V([Total veh/h	DLUMES HV] %	DEMAND [Total veh/h	FLOWS HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK ([Veh. veh	OF QUEUE Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: We	eld St													
5	T1	37	25.0	39	25.0	0.030	0.0	LOS A	0.1	0.6	0.07	0.14	0.07	48.9
6	R2	12	2.0	13	2.0	0.030	4.7	LOS A	0.1	0.6	0.07	0.14	0.07	47.9
Approac	h	49	19.4	52	19.4	0.030	1.2	NA	0.1	0.6	0.07	0.14	0.07	48.7
North: C	rossover	1												
7	L2	16	2.0	17	2.0	0.013	4.7	LOS A	0.0	0.3	0.12	0.50	0.12	46.3
9	R2	2	2.0	2	2.0	0.013	4.9	LOS A	0.0	0.3	0.12	0.50	0.12	45.9
Approac	h	18	2.0	19	2.0	0.013	4.7	LOS A	0.0	0.3	0.12	0.50	0.12	46.3
West: W	eld St													
10	L2	6	2.0	6	2.0	0.027	4.6	LOS A	0.0	0.0	0.00	0.07	0.00	48.9
11	T1	38	25.0	40	25.0	0.027	0.0	LOS A	0.0	0.0	0.00	0.07	0.00	49.5
Approac	h	44	21.9	46	21.9	0.027	0.6	NA	0.0	0.0	0.00	0.07	0.00	49.4
All Vehic	les	111	17.5	117	17.5	0.030	1.5	NA	0.1	0.6	0.05	0.17	0.05	48.5

MOVEMENT SUMMARY

V Site: 201 [Weld St / Crossover 1 - 2036 PM PD (Site Folder: General)]

U23.092 - Lot 601 Brockman Street, Gingin Site Category: (None) Give-Way (Two-Way)

Vehicle	Vehicle Movement Performance													
Mov ID	Tum	INPUT V([Total veh/h	DLUMES HV] %	DEMAND [Total veh/h	FLOWS HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK [Veh. veh	OF QUEUE Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: W	eld St													
5	T1	73	25.0	77	25.0	0.059	0.1	LOS A	0.1	1.1	0.09	0.13	0.09	48.9
6	R2	23	2.0	24	2.0	0.059	4.8	LOS A	0.1	1.1	0.09	0.13	0.09	47.9
Approad	:h	96	19.5	101	19.5	0.059	1.2	NA	0.1	1.1	0.09	0.13	0.09	48.6
North: C	rossove	r 1												
7	L2	31	2.0	33	2.0	0.026	4.7	LOS A	0.1	0.7	0.14	0.50	0.14	46.3
9	R2	5	2.0	5	2.0	0.026	5.2	LOS A	0.1	0.7	0.14	0.50	0.14	45.8
Approad	:h	36	2.0	38	2.0	0.026	4.8	LOS A	0.1	0.7	0.14	0.50	0.14	46.2
West: W	/eld St													
10	L2	13	2.0	14	2.0	0.039	4.6	LOS A	0.0	0.0	0.00	0.11	0.00	48.7
11	T1	51	25.0	54	25.0	0.039	0.0	LOS A	0.0	0.0	0.00	0.11	0.00	49.2
Approad	:h	64	20.3	67	20.3	0.039	0.9	NA	0.0	0.0	0.00	0.11	0.00	49.1
All Vehic	les	196	16.6	206	16.6	0.059	1.8	NA	0.1	1.1	0.07	0.19	0.07	48.3

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MOVEMENT SUMMARY

▽ Site: 201 [Weld St / Crossover 2 - 2036 AM PD (Site Folder: General)]

U23.092 - Lot 601 Brockman Street, Gingin Site Category: (None) Give-Way (Two-Way)

Vehicle	Vehicle Movement Performance													
Mov ID	Turn	INPUT V [Total veh/h	DLUMES HV] %	DEMAND [Total veh/h	FLOWS HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK [Veh. veh	OF QUEUE Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: We	eld St													
5	T1	44	25.0	46	25.0	0.036	0.1	LOS A	0.1	0.7	0.08	0.14	0.08	48.8
6	R2	15	2.0	16	2.0	0.036	4.8	LOS A	0.1	0.7	0.08	0.14	0.08	47.9
Approac	h	59	19.2	62	19.2	0.036	1.3	NA	0.1	0.7	0.08	0.14	0.08	48.6
North: C	rossover	2												
7	L2	12	2.0	13	2.0	0.013	4.7	LOS A	0.0	0.3	0.14	0.51	0.14	46.3
9	R2	5	2.0	5	2.0	0.013	5.0	LOS A	0.0	0.3	0.14	0.51	0.14	45.8
Approac	h	17	2.0	18	2.0	0.013	4.8	LOS A	0.0	0.3	0.14	0.51	0.14	46.1
West: W	eld St													
10	L2	2	2.0	2	2.0	0.033	4.6	LOS A	0.0	0.0	0.00	0.02	0.00	49.3
11	T1	52	25.0	55	25.0	0.033	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	49.8
Approac	h	54	24.1	57	24.1	0.033	0.2	NA	0.0	0.0	0.00	0.02	0.00	49.8
All Vehic	les	130	19.0	137	19.0	0.036	1.3	NA	0.1	0.7	0.06	0.14	0.06	48.7

MOVEMENT SUMMARY

V Site: 201 [Weld St / Crossover 2 - 2036 PM PD (Site Folder: General)]

U23.092 - Lot 601 Brockman Street, Gingin Site Category: (None) Give-Way (Two-Way)

Vehicle	Vehicle Movement Performance													
Mov ID	Tum	INPUT V [Total veh/h	DLUMES HV] %	DEMAND [Total veh/h	FLOWS HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK [Veh. veh	OF QUEUE Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: W	eld St													
5	T1	86	25.0	91	25.0	0.072	0.1	LOS A	0.2	1.5	0.11	0.14	0.11	48.8
6	R2	30	2.0	32	2.0	0.072	4.9	LOS A	0.2	1.5	0.11	0.14	0.11	47.8
Approad	ch	116	19.1	122	19.1	0.072	1.3	NA	0.2	1.5	0.11	0.14	0.11	48.5
North: C	rossove	r 2												
7	L2	24	2.0	25	2.0	0.027	4.8	LOS A	0.1	0.7	0.18	0.52	0.18	46.2
9	R2	10	2.0	11	2.0	0.027	5.4	LOS A	0.1	0.7	0.18	0.52	0.18	45.7
Approad	ch	34	2.0	36	2.0	0.027	5.0	LOS A	0.1	0.7	0.18	0.52	0.18	46.0
West: W	/eld St													
10	L2	4	2.0	4	2.0	0.051	4.6	LOS A	0.0	0.0	0.00	0.03	0.00	49.3
11	T1	78	25.0	82	25.0	0.051	0.0	LOS A	0.0	0.0	0.00	0.03	0.00	49.8
Approad	ch	82	23.9	86	23.9	0.051	0.2	NA	0.0	0.0	0.00	0.03	0.00	49.8
All Vehic	cles	232	18.3	244	18.3	0.072	1.5	NA	0.2	1.5	0.08	0.16	0.08	48.6

Appendix C: Swept path diagrams

Swept path diagrams are included in this section of the report. Different coloured lines are employed to represent the various envelopes of the vehicle swept path, as described below:

Cyan	represents the wheel path of the vehicle
Green	represents the vehicle body envelope
Blue	represents a buffer 300mm/500mm line, offset from the vehicle swept path

The swept path diagrams are also provided separately in high-quality, A3 PDF format.







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