Proposed Code Amendment

19-29 Glynburn Road, Glynde
Transport Impact Assessment

GTAconsultants now Stantec

Proposed Code Amendment

19-29 Glynburn Road, Glynde
Transport Impact Assessment

Client: ALDI Stores

on 02/08/2021

Reference: S207960

Issue #: B

Quality Record

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1. INTRODUCTION

01

1.1. Background

A Code Amendment is currently being sought for land at 19-29 Glynburn Road, Glynde.

GTA Consultants was commissioned to provide a transport impact assessment of the Code Amendment.

1.2. Purpose of this Report

This report sets out an assessment of the anticipated transport implications arising from the proposed Code Amendment, including consideration of the following:

1. existing traffic and parking conditions surrounding the site;
2. parking demand likely to be generated by the proposed Code Amendment;
3. application of suitable car parking rates for future envisaged land uses;
4. traffic generation characteristics of the development envisaged in association with the proposed re-zoning;
5. potential access arrangements for the site, and
6. transport impact of the development that could be anticipated on the surrounding road network following the code amendment and subsequent site development.

1.3. References

In preparing this report, reference has been made to the following:

- Planning & Design Code, South Australia;
- Australian Standard/ New Zealand Standard, Parking Facilities, Part 1: Off-Street Car Parking AS/NZS 2890.1:2004;
- Australian Standard, Parking Facilities, Part 2: Off-Street Commercial Vehicle Facilities AS 2890.2:2018;
- Australian Standard / New Zealand Standard, Parking Facilities, Part 6: Off-Street Parking for People with Disabilities AS/NZS 2890.6:2009;
- traffic and car parking surveys undertaken by GTA now Stantec as referenced in the context of this report;
- various technical data as referenced in this report;
- an inspection of the site and its surrounds, and
- other documents as nominated.

2. PROPOSED CODE AMENDMENT

02

2.1. Affected Area

The 'Affected Area' is located on land at 19-29 Glynburn Road, Glynde with a site area of approximately 7,423 square metres. The affected area has a frontage of approximately 110 metres to Glynburn Road and 40 metres to Lewis Road.

The Planning & Design Code currently shows the land use zones for the Affected Area as 'Housing Diversity Neighbourhood Zone' and 'Suburban Employment Zone'. The Code Amendment proposes to rezone this land to the 'Suburban Activity Centre Zone'.

2.2. Existing Use

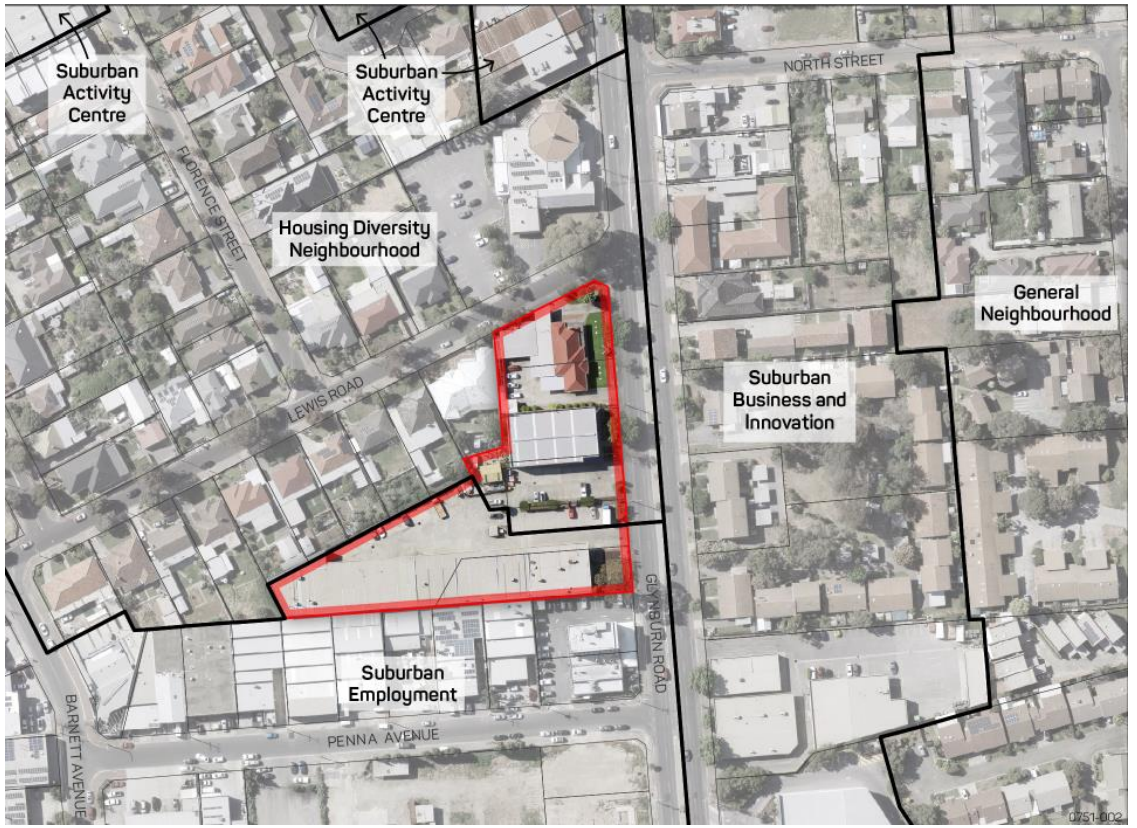
The affected area comprises commercial, showroom and trade use over approximately 2,900 sq.m of floor space. There is currently off-street car parking with three access points to Glynburn Road and two access points to Lewis Road.

2.3. Assessment

This assessment will consider the traffic and parking impacts based on a retail floor area of 2,000 sq.m with associated parking and access to Glynburn Road and

Lewis Road. This provides an example of a high traffic generating use for the site.

Figure 2.1: Affected Area



3. EXISTING CONDITIONS

03

3.1. Adjacent Roads

3.1.1. Glynburn Road

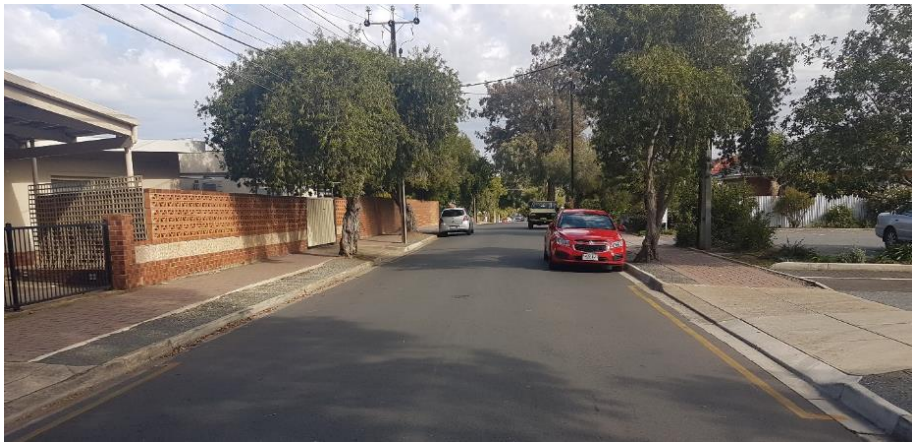
Glynburn Road is an arterial road managed by the Department for Infrastructure and Transport (DIT). It comprises dual carriageways aligned in a north-south direction and with two traffic lanes in each direction separated by a raised central median approximately 2.9 metres wide, within a road reserve approximately 24.5 metres wide adjacent the site. The northbound and southbound carriageway widths are 8.0 metres and 7.9 metres wide respectively (inclusive of the bicycle lanes). Figure 3.1 shows Glynburn Road adjacent the site.

Figure 3.1: Glynburn Road – View to north (site on left)

Kerbside parking is generally permitted on both sides of the road outside of clearway times when bicycle lanes are in operation (7:00am – 9:00am & 4:00pm – 6:00pm, Monday to Friday). Glynburn Road has a posted speed limit of 60km/h and carries approximately 22,100 vehicles per day[1].

3.1.2. Lewis Road

Figure 3.2: Lewis Road – View to south-west (site on left)



Lewis Road is a local road managed by the Norwood, Payneham and St Peters Council and is aligned in a south-west to north-east direction, forming a T-junction with Glynburn Road. It is a single carriageway two-way road configured with one lane in each direction. Figure 3.2 shows Lewis Road adjacent the site.

[1] Sourced from Location SA, which is based on DPTI counts undertaken for Glynburn Road in 2016.

The carriageway width is 6.8 (approx.) and is set within a 12.4 metre wide road reserve. Un-restricted kerbside parking is generally permitted on both sides of the street.

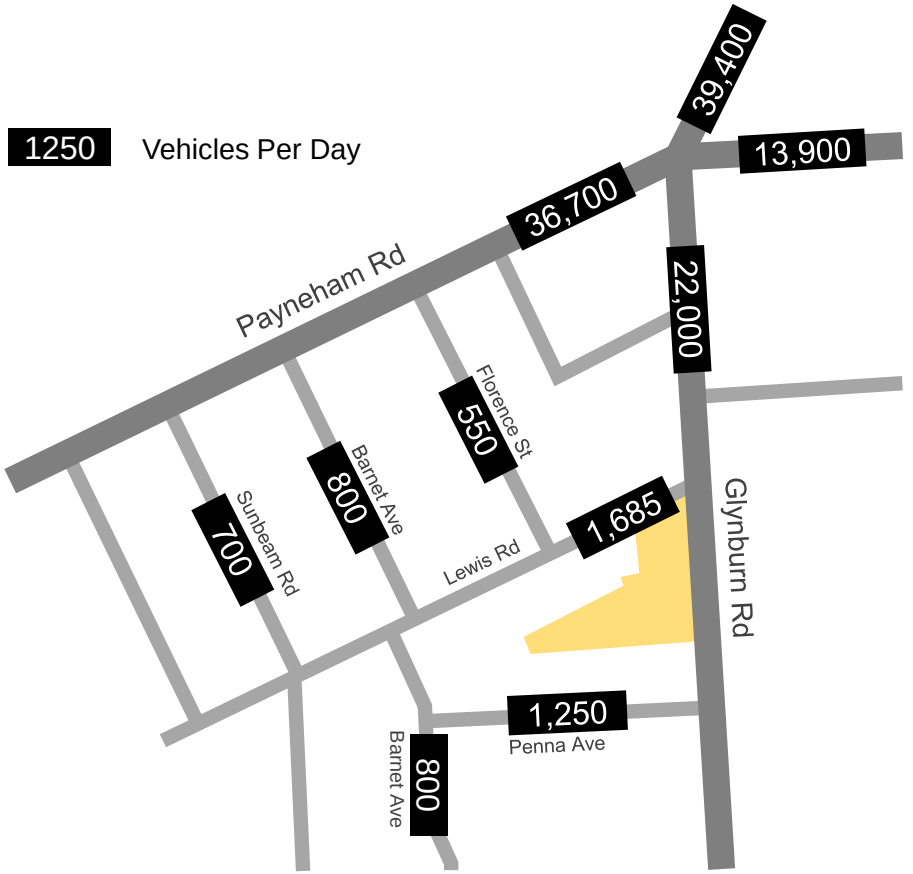
Lewis Road has an urban default speed limit of 50km/h and carries approximately 1,685 vehicles per day.[2]

3.2. Surrounding Network

Traffic volumes from the adjacent road network have been obtained from Department for Infrastructure and Transport, City of Norwood Payneham and St Peters and other traffic studies in the area. These are shown in Figure 3.3.

Traffic volumes on the surrounding local road network are very low with typically less than 1,000 vehicles per day on most roads, except Lewis Road being higher.

Figure 3.3 Existing daily traffic volumes



[2] Based on traffic data provided by City of Norwood Payneham and St Peters.

3.3. Traffic Volumes

A turning movement survey was undertaken for the following:

- Glynburn Road / Lewis Road Intersection;
- The two northern residential access points at 44 Glynburn Road, Hectorville (opposite the site);
- The three existing access points located between 21 – 29 Glynburn Road, Glynde.

The surveys were conducted during the Thursday PM Peak Hour on 15 October 2020 between 3:00pm – 6:00pm and Saturday on 17 October 2020 between 10:00am and 1:00pm. The peak hour volumes occurred at the following times:

- Thursday – 4:45pm – 5:45pm
- Saturday – 11:45am – 12:45pm

The traffic volumes for the Thursday PM and Saturday Peak Hour are shown in Figure 3.4 and Figure 3.5, respectively.

Figure 3.4: Existing Thursday PM Peak Hour Traffic Volumes

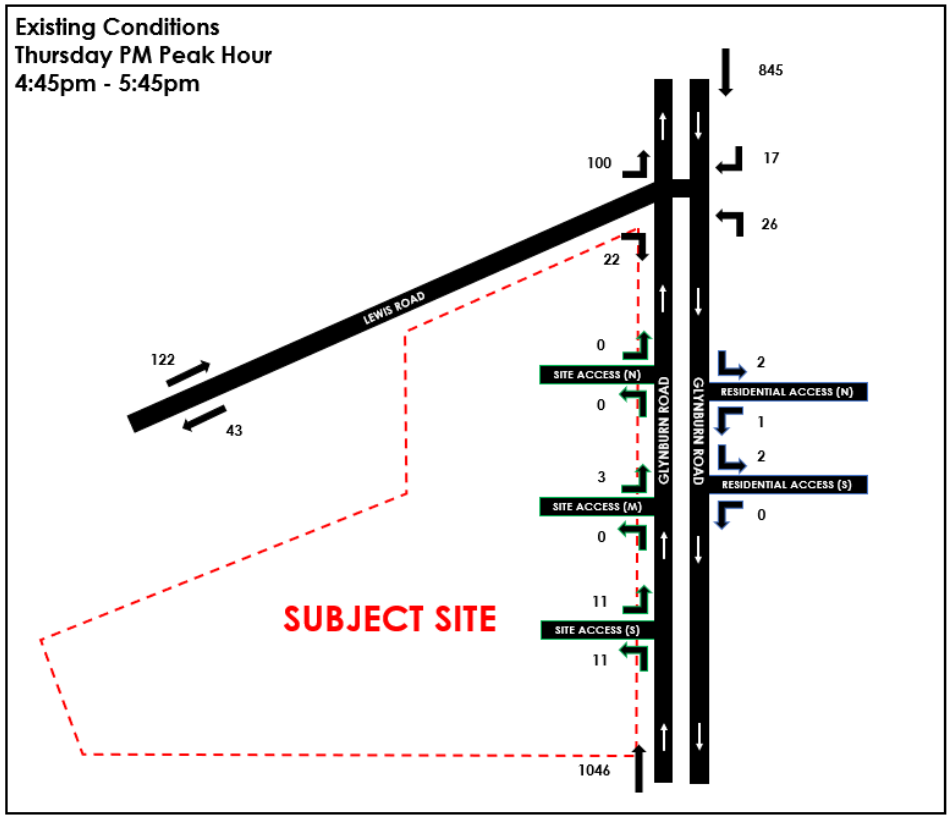
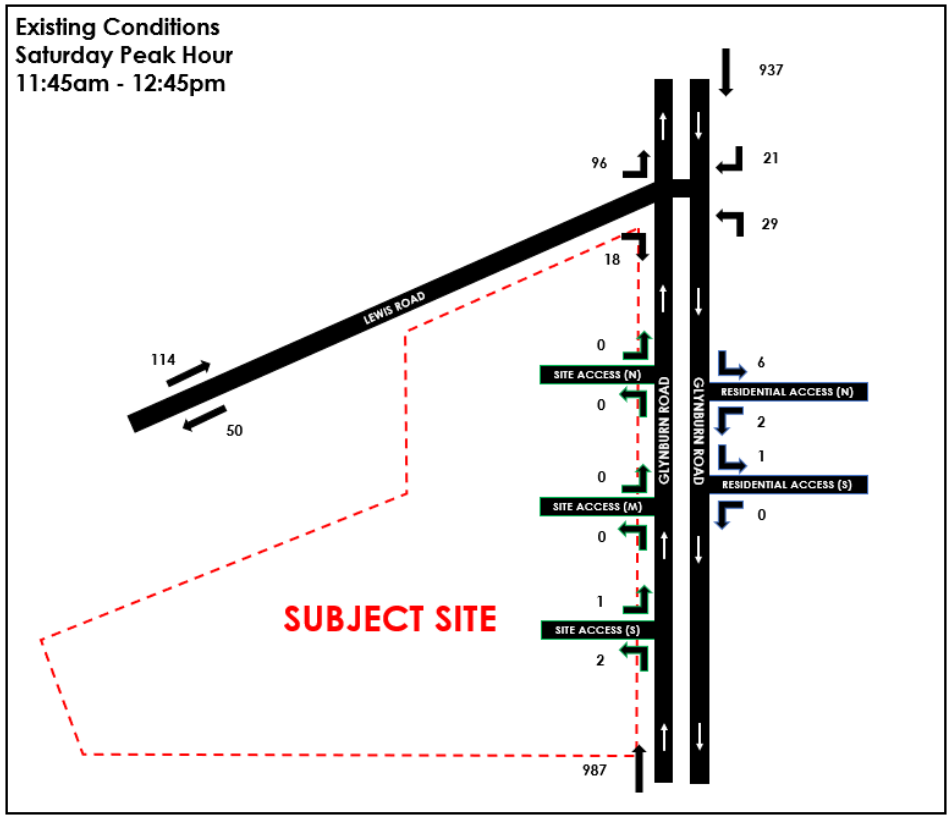


Figure 3.5: Existing Saturday Peak Hour Traffic Volumes



Based on the traffic surveys, the traffic volumes for the residential accesses were very low, with less than 10 movements combined during both respective peak periods. The existing site access volumes between 21 – 29 Glynburn Road were also relatively low with only 25 and 3 movemnents during the Thursday PM and Saturday peak periods respectively

3.4. Gap Observations

A gap analysis survey was conducted adjacent the existing central site access on Thursday 15 October 2020 and Saturday 17 October 2020.

The purpose of the gap analysis survey was to confirm the maximum number of vehicles that were able to perform either a left turn out, right turn out or a right turn in to/from Lewis Road and the intended site access, based on observed gaps in the traffic along Glynburn Road. The gap analysis survey was conducted to reflect the AM and PM peak hours. The methodology used to calculate the theoretical maximum number of gaps available was as follows:

- For *right turn out* movements - gaps of 7 seconds for the initial critical gap for a single vehicle to turn right out, and a follow up headway of 4 seconds.
- For *left turn out* and *right turn in* movements - gaps of 5 seconds for the initial critical gap for a single vehicle to turn left out or right in, with a follow up headway of 3 seconds.

This assessment utilises the SIDRA Intersection Gap Acceptance Parameters outlined within the "Traffic Modelling Guidelines – SIDRA Intersection 7" prepared by DIT. Table 3.1 considers the maximum number of vehicles which are able to perform either a left turn out, right turn out or right turn in, based on the critical gap and follow up headways.

Table 3.1: Theoretical Maximum Vehicle Capacity

	Right Turn Out	Left Turn Out, Right Turn w
Glynburn Road – Thurs PM Peak	44 vehicles	241 vehicles
Glynburn Road – Sat Peak	29 vehicles	297 vehicles

The site observations found the number of opportunities to turn right out of Glynburn Road was limited during the Thursday PM and Saturday peak hours, with a maximum of 44 and 29 vehicles respectively. There were a considerable number of opportunities to turn left out of or right in from Glynburn Road, with up to 241 and 297 vehicles during the Thursday PM and Saturday peak hours respectively.

The gap analysis results were used to assist in developing the base case SIDRA Intersection model and formulate the findings and conclusions from the modelling analysis.

3.4.1. Queue Length Observations

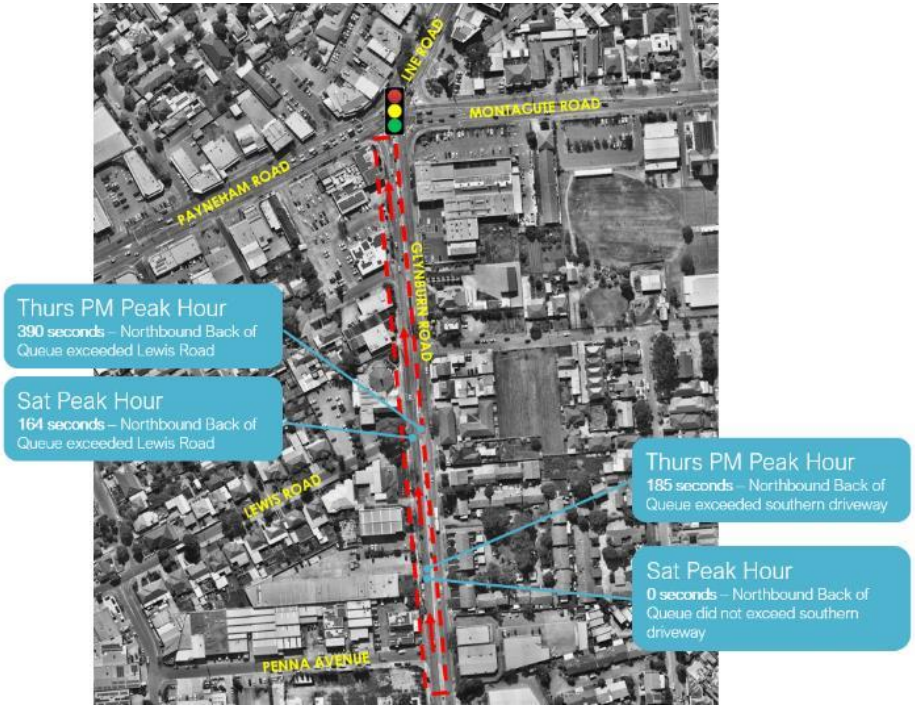
Glynburn Road Northbound Back of Queue

Queue length surveys were conducted along Glynburn Road, given the close proximity to the Glynburn Road / Payneham Road / Montacute Road / Lower North East (LNE) Road signalised intersection. Back of queue surveys on the Glynburn Road south approach (northbound movement) was commissioned through HDS Australia as follows:

- Thursday – 15 October 2020 (3:00pm – 6:00pm)
- Saturday – 17 October 2020 (10:00am – 1:00pm)

The survey identified the extent of time where the back of queue extended past both Lewis Road and the southern driveway access, with the purpose of understanding driver behaviour and courtesy gaps at these locations. Figure 3.6 has been prepared, which considers the duration where the back of queue exceeds Lewis Road and the southern driveway crossover over both respective peak hours which was 4:45pm – 5:45pm on Thursday and 11:45am – 12:45pm on Saturday.

Figure 3.6: Glynburn Road Northbound Back of Queue



Based on general observations by staff onsite:

- On Thursday, the northbound back of queue exceeded Lewis Road for approximately 6.5 minutes and the southern driveway just longer than 3 minutes.
- On Saturday, the northbound back of queue exceeded Lewis Road for just longer than 2.5 minutes. The back of queue wasn't observed to reach the southern driveway during the peak hour
- When vehicles queued past Lewis Road, drivers typically allowed gaps in the road, which enabled vehicles to enter and exit Lewis Road. This is shown in Figure 3.7.

- Vehicles typically didn't leave gaps adjacent the southern driveway (as there is no median opening which would help to prompt drivers in similar situations).

Figure 3.7: Example of Courtesy Gap at Glynburn Rd / Lewis Rd

Glynburn Road / Lewis Road Intersection

General back of queue observations were conducted for the Lewis Road and Glynburn Road Intersection. The maximum observed queue lengths are detailed in Table 3.2.

Table 3.2: Maximum Queue Length (vehicles)

Intersection	Periods	Left and Right Out	Right Turn In
Glynburn Road / Lewis Road	Thursday PM Peak	7	2
	Saturday Peak	4	1

While the maximum back of queue observed was 7 vehicles for the Thursday PM Peak, the typical queue was generally lower.

3.5. Glynburn Rd/Lewis Rd Intersection

The operation of the Glynburn Road/Lewis Road intersection has been assessed using SIDRA *INTERSECTION*[3], a computer based modelling package which calculates intersection performance. The commonly used measure of intersection performance is referred to as the *Degree of Saturation (DOS)*. The DOS represents the flow-to-capacity ratio for the most critical movement on each leg of the intersection.

Table 3.3 presents a summary of the existing operation of the intersection during the Thursday PM Peak Hour. The results during the Saturday PM Peak Hour are displayed in Table 3.4.

[3] Program used under license from Akcelik & Associates Pty Ltd.

Table 3.3: Glynburn Rd/Lewis Rd – Thursday Peak – Existing

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Glynburn Road (South)												
1b	L3	27	0.0	0.294	6.5	LOS A	0.0	0.0	0.00	0.03	0.00	58.5
2	T1	1101	0.8	0.294	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	59.8
Approach		1128	0.7	0.294	0.2	NA	0.0	0.0	0.00	0.02	0.00	59.7
North: Glynburn Road (N)												
8	T1	889	1.1	0.232	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
9a	R1	18	0.0	0.042	11.9	LOS B	0.1	0.9	0.73	0.87	0.73	46.1
Approach		907	1.0	0.232	0.3	NA	0.1	0.9	0.01	0.02	0.01	59.6
SouthWest: Lewis Road												
30a	L1	105	0.0	0.602	19.9	LOS C	2.9	20.0	0.80	1.15	1.47	35.5
32b	R3	23	0.0	0.602	98.4	LOS F	2.9	20.0	0.80	1.15	1.47	35.4
Approach		128	0.0	0.602	34.0	LOS D	2.9	20.0	0.80	1.15	1.47	35.5
All Vehicles		2164	0.8	0.602	2.2	NA	2.9	20.0	0.05	0.08	0.09	57.4

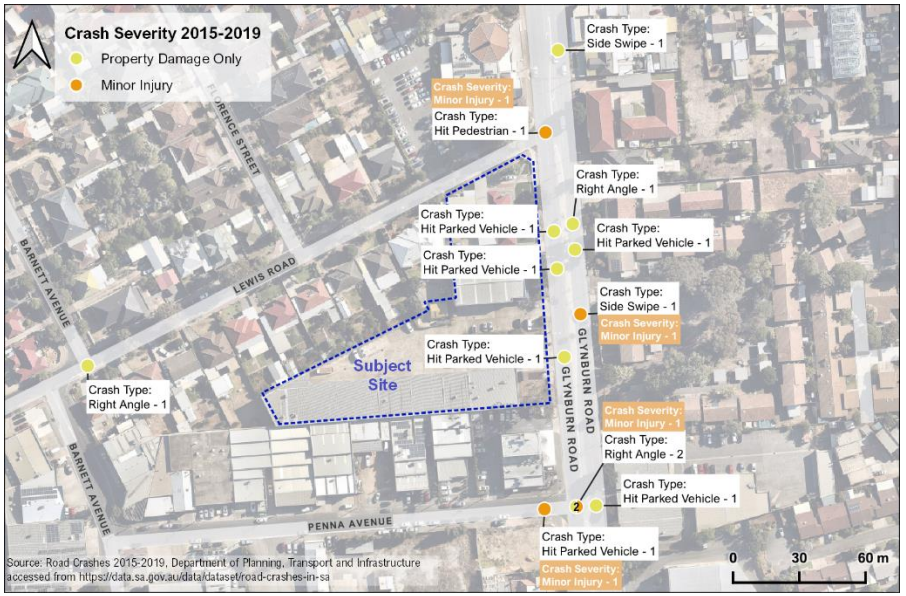
Table 3.4: Glynburn Rd/Lewis Rd – Saturday Peak – Existing

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Glynburn Road (South)												
1b	L3	31	0.0	0.279	6.5	LOS A	0.0	0.0	0.00	0.04	0.00	58.4
2	T1	1039	0.8	0.279	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	59.8
Approach		1069	0.8	0.279	0.2	NA	0.0	0.0	0.00	0.02	0.00	59.7
North: Glynburn Road (N)												
8	T1	986	0.6	0.257	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
9a	R1	22	0.0	0.048	11.2	LOS B	0.1	1.0	0.71	0.86	0.71	46.5
Approach		1008	0.6	0.257	0.3	NA	0.1	1.0	0.02	0.02	0.02	59.6
SouthWest: Lewis Road												
30a	L1	100	1.1	0.507	14.5	LOS B	2.2	15.6	0.76	1.06	1.23	38.1
32b	R3	19	0.0	0.507	92.5	LOS F	2.2	15.6	0.76	1.06	1.23	38.0
Approach		119	0.9	0.507	26.9	LOS D	2.2	15.6	0.76	1.06	1.23	38.1
All Vehicles		2197	0.7	0.507	1.7	NA	2.2	15.6	0.05	0.08	0.07	57.9

3.6. Crash History

A review of the reported crash history for the roads and intersections adjoining the subject site has been sourced from DIT between 2015 and 2019. A summary of the crash types and severity of crashes for the last available five-year period is presented in Figure 3.8.

Figure 3.8: Crash History 2015-2019

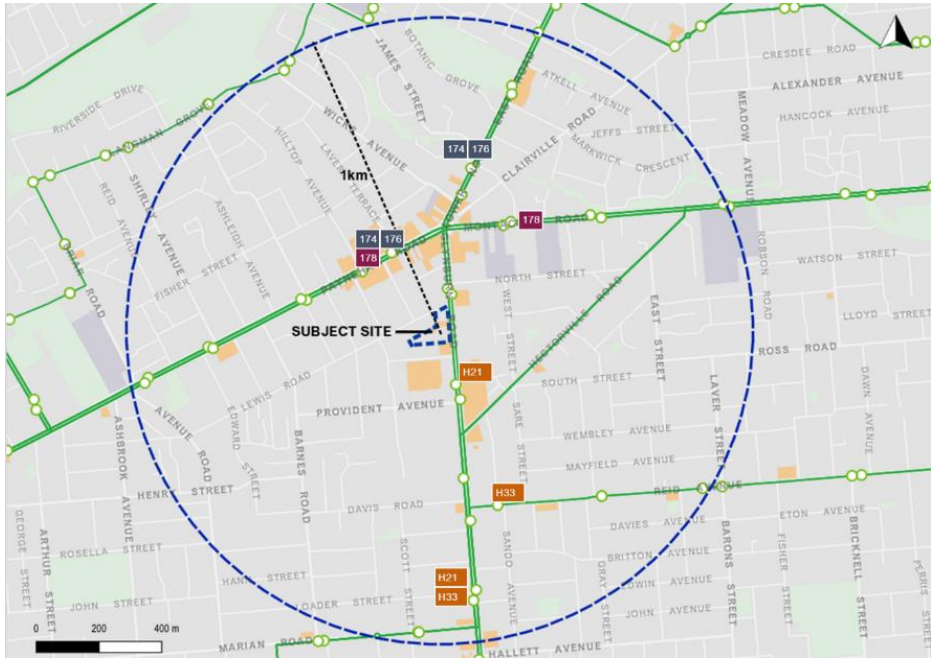


There were no specific issues identified from the crash data, with the number of incidents being low. The predominant type of crash recorded was Hit Parked Vehicle, and appears to be attributed to on-street parking manoeuvres.

3.7. Public Transport

Figure 3.9 shows the subject site in relation to existing public transport routes within its vicinity. Within a 1km radius, bus stops on Glynburn Road provides services H21 (City to Paradise) and H33 (Henley Beach to Rostrevor), bus stops on Payneham Road provides services 174 (City to Paradise),176 (City to Athelstone) and 178 (City to Paradise).

Figure 3.9: Public Transport Map



Based on GTFS, AdelaideMetro

3.8. Pedestrian Infrastructure

There are sealed footpaths located on both sides of Glynburn Road and Lewis Road.

3.9. Cycle Infrastructure

Bicycle lanes operate on Glynburn Road between 7:00am – 9:00am and 4:00pm – 6:00pm, Monday to Friday.

4. CAR PARKING

04

4.1. Parking Requirements

The Planning and Design Code provides parking rates for various uses, including those envisaged in the Suburban Activity Centre Zone.

Based on the assumption of retail with a gross leasable floor area of 2,000sq.m, the P&D Code has parking rates in *Table 1 - General Off-Street Car Parking Requirements* of *Part 4 - General Development Policies - Transport, Access and Parking* which would require parking at a rate as follows:

*"**Shop (no commercial kitchen)** - 5.5 spaces per 100m2 of gross leasable floor area where not located in an integrated complex containing two or more tenancies (and which may comprise more than one building) where facilities for off-street vehicle parking, vehicle loading and unloading, and the storage and collection of refuse are shared".*

This would equate to the provision of 110 parking spaces within the site. Given the area of the site of approximately 7,400sq.m, the remaining site of 5,400sq.m would be capable of providing a suitable level of parking.

Hence, the parking rates provided in the Planning and Design Code would be appropriate for the site subject to consideration of the actual parking demands based on a development application for the specific land use.

5. SUSTAINABLE TRANSPORT INFRASTRUCTURE

05

5.1. Cycling Facilities

The Planning and Design Code provides parking rates for various uses, including those envisaged in the Suburban Activity Centre Zone.

Based on the assumption of retail with a gross leasable floor area of 2,000sq.m, the P&D Code has parking rates in *Table 3 - Off-Street Bicycle Parking Requirements* of *Part 4 - General Development Policies -Transport, Access and Parking* which would require parking at a rate as follows:

*"**Shop** - 1 space for every 300m2 of gross leasable floor area plus 1 space for every 600m2 of gross leasable floor area for customers.".*

This would equate to the provision of 7 bicycle parking spaces for staff and 4 bicycle parking spaces for customers within the site. The area of the site and building envisaged would be capable of providing the parking required by the P&D Code.

The observed rate of parking at retail developments is often much lower than that shown in the P&D Code, however the suggested provision of parking could be provided within the site if required for the proposed land use.

5.2. Walking Facilities

Pedestrian connectivity to the existing footpaths around the site would be possible with a design of the car park layout for any development given the available street frontages.

Pedestrian linkages within the site between parking areas and the development can be provided, and would typically be safe and convenient.

6. ACCESS

06

6.1. Access Points

The size of the affected areas with frontages to both Glynburn Road and Lewis Road would be conducive to access to both roads.

6.1.1. Primary Access - Glynburn Road

A primary access point on Glynburn Road is assumed in this assessment, with provision for all turning movements based on a location sufficiently located to the south of the Lewis Road intersection. An appropriate distance would include distance required for inclusion of a right turn lane within the existing median while achieving appropriate sight distance at an access point. There is approximately 90 metres between Lewis Road and the existing right turn lane to Penna Avenue to the south. This would provide sufficient space for a typical right turn lane within the existing road reserve.

Given the straight alignment of Glynburn Road and the 60km/h speed limit, the sight distance requirements in the P&D Code could be met.

6.1.2. Secondary Access - Lewis Road

A secondary access point on Lewis Road is assumed in this assessment given the frontage available to the site, and access to the Lewis Road/Glynburn Road intersection. The frontage on Lewis Road would enable an access point to be located suitably away from the Glynburn Road intersection.

Given the straight alignment of Lewis Road and the 50km/h speed limit, the sight distance requirements in the P&D Code could be met.

6.1.3. Access Point Design

The access points can be designed to meet the specific vehicle requirements, as specified in the P&D Code, including turn paths for light and heavy vehicles as may be required for the particular land use. In this assessment, a shop use may require heavy vehicles up to 19.0 metre semi-trailer. The provision of a primary access on Glynburn Road would be able to cater for large vehicles of this size if required.

6.2. Heavy Vehicle Requirements

The Planning and Design Code provides Performance Outcomes in Part 4 - General Development Policies for Transport, Access and Parking regarding heavy vehicle movements to and from and within a development site. Key Performance Outcomes are as follows:

PO 1.3 Industrial, commercial and service vehicle movements, loading areas and designated parking spaces are separated from passenger vehicle car parking areas to ensure efficient and safe movement and minimise potential conflict.

PO 1.4 Development is sited and designed so that loading, unloading and turning of all traffic avoids interrupting the operation of and queuing on public roads and pedestrian paths.

DTS/DPF 1.4 All vehicle manoeuvring occurs onsite.

PO 6.6 Loading areas and designated parking spaces for service vehicles are provided within the boundary of the site.

DTS/DPF 6.6 Loading areas and designated parking spaces are wholly located within the site.

Both PO 1.4 and 6.6 have Deemed To Satisfy provisions, and given the size of the site it is anticipated that these can be met. Vehicles up to 19.0 metre semi-trailers would be capable of accessing the site subject to specific design and configuration of the site and access arrangements.

Hence the site would be capable of achieving the desired outcomes and performance outcomes for heavy vehicles accessing the site.

Access for large vehicles should be direct from Glynburn Road given the limitations of the Lewis Road intersection with Glynburn Road for large vehicle turns. Widening of the intersection would be required to achieve regular large vehicle movements at this intersection.

These movements could be provided for with a new access point on Glynburn Road, which can be designed to meet the requirements of large vehicle movements, and not impact the operation of the Lewis Road.

7. TRAFFIC ASSESSMENT

07

7.1. Existing Traffic Demands

The existing site traffic demands of the affected area have been estimated for the peak and daily periods. These are shown in Table 7.1.

Table 7.1: Traffic Generation Estimates for Existing Uses

Use	Size	Daily Trip Rate	Peak Trip Rate	Trips per Day	Trips per Hour
Office	404	10	2	40	8
Showroom	604	17	3	100	18
Warehouse/Trade	1897	4	0.5	76	10
			Total	216	36

It is noted that traffic surveys conducted at the site for the driveways on Glynburn Road identified a total of 19 trips during a weekday PM peak period. This was about half of the estimated peak hour traffic generation. For the purposes of the assessment, the estimated volumes will be used.

Based on the above assessment, the existing site could generate approximately 216 per day and 36 trips per peak hour respectively, on a weekday.

The traffic generation for the weekend would be much less, with most uses not operating on the weekend.

7.2. Predicted Traffic Demands

Traffic generation estimates for the proposed development have been sourced from the Transport for NSW (formerly Roads & Maritimes Services) Guide to Traffic Generating Developments which provides rates for retail uses. These rates are typically applied to developments throughout Australia for traffic assessments.

The TfNSW indicates traffic generation rates of 12.3 and 16.3 trips per 100sq.m of Gross Leasable Floor Space (GLFA) for shopping centres (less than 10,000sq.m in size) on the Thursday PM peak period and Saturday AM peak period respectively.

The anticipated use of the site for the traffic assessment is retail of 2,000 square metres GLFA would equate to 246 and 326 trips per hour during the peak hours on a Thursday and Saturday respectively. The anticipated use of the site could generate approximately 2,400 trips per day.

Hence, the predicted traffic demands would be approximately 210 trips per hour and 2,200 vehicles per day additional to existing volumes in the affected area site.

7.2.1. Distribution and Assignment

The directional distribution and assignment of traffic generated by the proposed development will be influenced by a number of factors, including the:

1. Configuration of the road network in the immediate vicinity of the site
2. Existing operation of intersections providing access between the local and arterial road network;
3. Distribution of households in the vicinity of the site;
4. Likely distribution of employee's residences in relation to the site;
5. Configuration of access points to the site.

Having consideration to the above, for the purposes of estimating vehicle movements, the following directional distributions for entry movements has been assumed per Table 7.2.

Table 7.2: Directional Distribution

Approach	Percentage	
	In	Out
Glynburn Road (N)	25%	30%
Lewis Road (E)	5%	5%
Glynburn Road (S)	20%	15%
TOTAL	**50%**	**50%**

A higher proportion of vehicles were assumed to turn left out instead of right out given the proportion of passing trade on Glynburn Road. This is also not uncommon during peak times on arterial roads when the queue length and delay times for right turns are higher than during inter-peak periods.

Table 7.3: Weekday Traffic Distribution to Adjacent Roads

Road	Distribution	Trips per Day	Trips per Hour
Lewis Road (west)	10%	240	25
Glynburn Road (south)	35%	840	86
Glynburn Road (north)	55%	1,320	135

In addition, the directional split of traffic (i.e. the ratio between the inbound and outbound traffic movements) is assumed to be 50:50.

It should be noted that not all trips generated by the anticipated use would be additional to Glynburn Road as a large proportion of trips would be non-link-diverted trips or “passing trade”.

Notwithstanding the above, if the traffic generated by the site would be additional traffic on Glynburn Road it would constitute less than 6% of the daily traffic on Glynburn Road presently. This additional volume would not be noticeable within the current traffic volumes on Glynburn Road, and would be less than the typical daily variation in traffic volumes on the road network (which can be up to 10% variation).

The traffic impact on Lewis Road would be approximately 240 vehicles per day which could increase the traffic volume of this street from 1,650 vehicle per day to 1,890 vehicle per day.

Whilst Lewis Road provides a minor collector road function, the volume would remain within a residential street amenity levels of 2,000 vehicles per day.

It is noted that the distribution to Lewis Road is considered minor given the available gaps provided on Glynburn Road by queued traffic during peak periods (as discussed in the existing conditions earlier in this report). Traffic access to and from Glynburn Road is less difficult during inter-peak periods when traffic flows are less heavy, as is found on many arterial roads.

The directional distribution of the local road network does not provide any real benefit for drivers using Lewis Road as a cut-through, except for between Glynburn Road and Payneham Road. The distribution of traffic generated by the proposed development is expected to be higher to and from the south on Glynburn Road.

The exception to the level of traffic on Lewis Road will be from a higher than expected number of customers from the existing residential areas to the west of Glynburn Road.

Figure 7.1 and Figure 7.2 has been prepared which considers the additional traffic generated by the site during the Thursday PM and Saturday Peak.

Figure 7.1: Thursday PM Peak – Site Generated Traffic

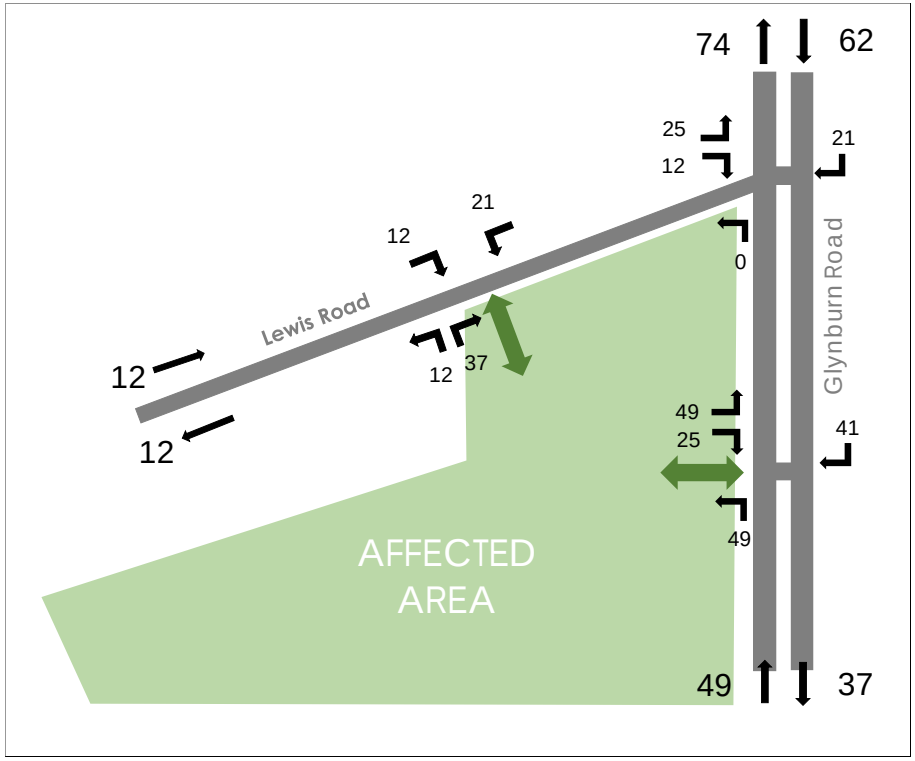
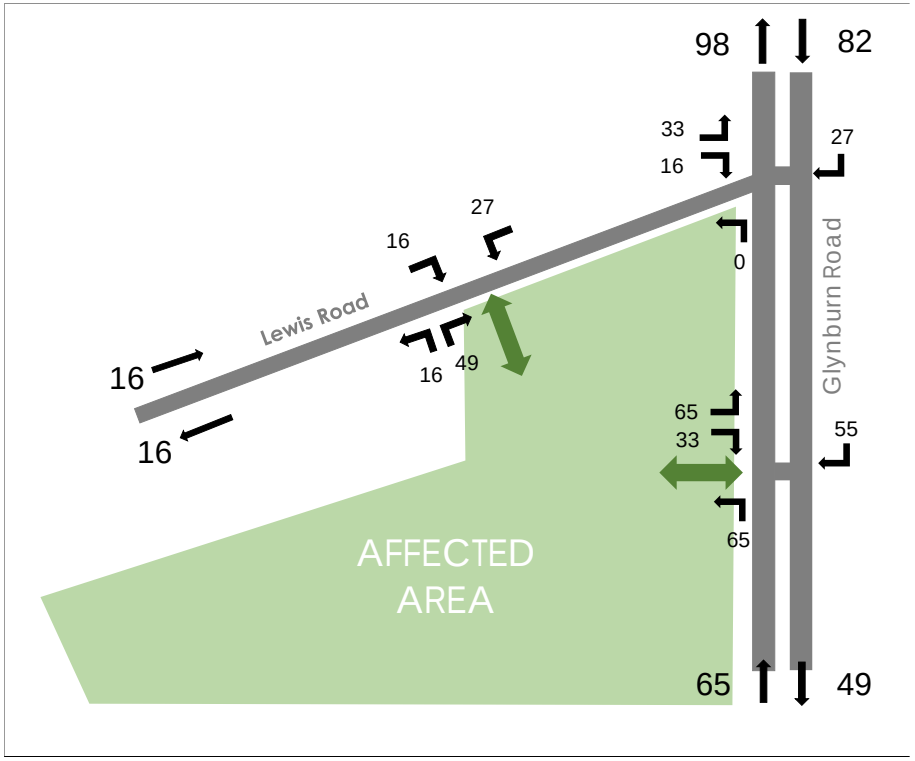


Figure 7.2: Saturday Peak – Site Generated Traffic



7.2.2. Post Development Traffic

Figure 7.3 and Figure 7.4 have been prepared to show the expected traffic distribution from the site post development for both the Thursday PM and Saturday peak periods.

Figure 7.3: Thursday PM Peak – Predicted Traffic

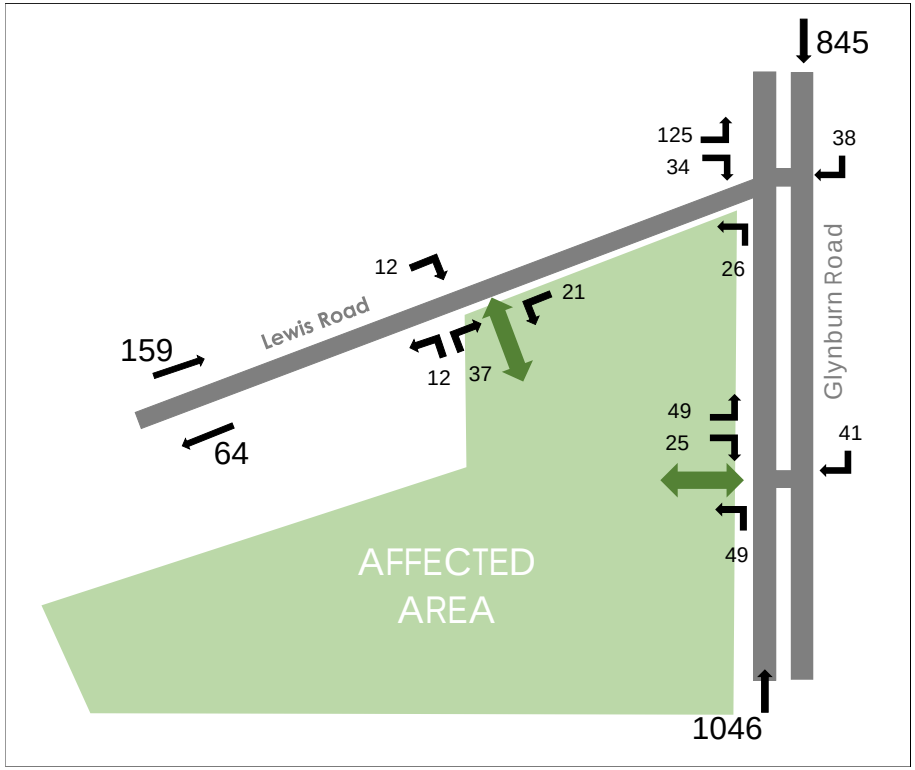
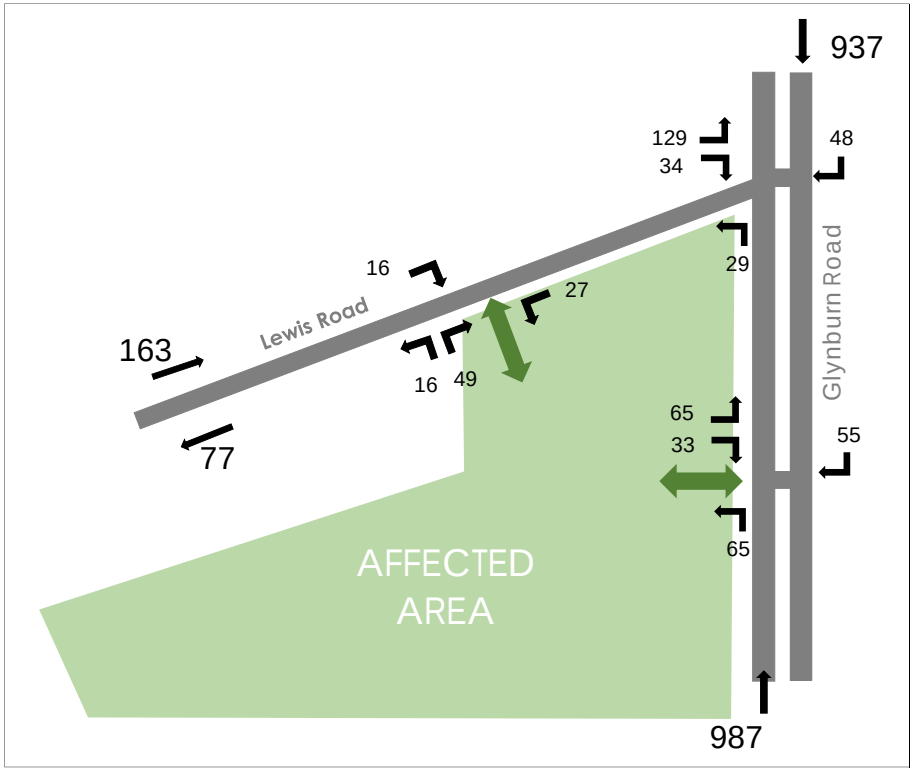


Figure 7.4: Saturday Peak – Predicted Traffic



7.3. Traffic Analysis

The operation of the following intersections has been assessed using SIDRA Intersection under Predicted conditions during the Thursday PM Peak Hour and the Saturday Peak Hour assuming a primary and secondary access to Glynburn Road and Lewis Road respectively.

It is noted that the proposed site access on Glynburn Road has been calibrated to the same operating conditions as the adjacent Lewis Road intersection. Extensive observations and traffic surveys of the Lewis Road intersection have been undertaken (refer earlier in this report) to understand the operating conditions on Glynburn Road and appropriate calibration of the SIDRA models.

A summary of the SIDRA results for the anticipated access points and the existing Lewis Road intersection are discussed in the following sections.

7.3.1. Glynburn Road / Lewis Road Intersection

The SIDRA analysis for the intersection with post-development traffic volumes has calculated the intersection will operate at a Degree of Saturation (DOS) of 0.816 and 0.924, which is based on the right turn movement from Lewis Road. This is an increase from the existing DOS of approximately 0.6 for the intersection during peak periods.

It is noted that the operation of the intersection is likely better than calculated for the existing operation based on observations of traffic movements. The observations identified the queues on Glynburn Road provided gaps in stationary vehicles at the intersection which enabled vehicles from Lewis Road to exit comfortably.

Whilst the 95th percentile queue (that is the worst length queue likely) are shown as up to 65 metres (up to 10 vehicles) on a Saturday, the average queue length is only 26 metres (or 4 vehicles).

The results of the Glynburn Road / Lewis Road Intersection analysis are shown in Table 7.4 and Table 7.5.

Table 7.4: Glynburn Rd/Lewis Rd – Thursday Peak – Predicted

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Glynburn Road (South)												
1b	L3	27	0.0	0.294	6.5	LOS A	0.0	0.0	0.00	0.03	0.00	58.5
2	T1	1101	0.8	0.294	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	59.8
Approach		1128	0.7	0.294	0.2	NA	0.0	0.0	0.00	0.02	0.00	59.7
North: Glynburn Road (N)												
8	T1	784	1.2	0.205	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
9a	R1	40	0.0	0.094	12.2	LOS B	0.3	2.0	0.74	0.88	0.74	46.0
Approach		824	1.1	0.205	0.6	NA	0.3	2.0	0.04	0.04	0.04	59.1
SouthWest: Lewis Road												
30a	L1	132	0.0	0.816	40.7	LOS E	5.8	40.4	0.85	1.51	2.46	29.1
32b	R3	36	0.0	0.816	114.4	LOS F	5.8	40.4	0.85	1.51	2.46	29.0
Approach		167	0.0	0.816	56.5	LOS F	5.8	40.4	0.85	1.51	2.46	29.1
All Vehicles		2120	0.8	0.816	4.8	NA	5.8	40.4	0.08	0.14	0.21	54.9

Table 7.5: Glynburn Rd/Lewis Rd – Saturday Peak – Predicted

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Glynburn Road (South)												
1b	L3	31	0.0	0.279	6.5	LOS A	0.0	0.0	0.00	0.04	0.00	58.4
2	T1	1039	0.8	0.279	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	59.8
Approach		1069	0.8	0.279	0.2	NA	0.0	0.0	0.00	0.02	0.00	59.7
North: Glynburn Road (N)												
8	T1	986	0.6	0.257	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
9a	R1	51	0.0	0.109	11.5	LOS B	0.3	2.3	0.72	0.87	0.72	46.4
Approach		1037	0.6	0.257	0.6	NA	0.3	2.3	0.04	0.04	0.04	59.1
SouthWest: Lewis Road												
30a	L1	136	0.8	0.924	73.7	LOS F	9.2	65.0	0.86	1.94	3.56	22.7
32b	R3	36	0.0	0.924	160.2	LOS F	9.2	65.0	0.86	1.94	3.56	22.7
Approach		172	0.6	0.924	91.7	LOS F	9.2	65.0	0.86	1.94	3.56	22.7
All Vehicles		2278	0.7	0.924	7.3	NA	9.2	65.0	0.08	0.17	0.28	53.0

7.3.2. Glynburn Road / Primary Site Access

The SIDRA analysis for the intersection with post-development traffic volumes has calculated the intersection will operate at a Degree of Saturation (DOS) of 0.569 and 0.777, which is based on the right turn movement from the site. These are well within the practical capacity of the access point as an intersection with minimal impact on Glynburn Road.

It is noted that this access point has been calibrated to the same operating conditions as the Lewis Road intersection given its close proximity.

The 95th percentile queue (that is the worst length queue likely) are shown as up to 18.5 metres (up to 3 vehicles) on a Saturday with the average queue length is 7.5 metres (or 1 vehicles).

A right turn lane for movements directly into the site will operate satisfactorily with queue length of typically less than 1 vehicle, and minimal delays. The analysis indicates the access point would have minimal impact on the operation of Glynburn Road and would operate satisfactorily based on existing operating conditions. The ability to turn right from the site directly to Glynburn Road will minimise the amount of traffic that may desire to use local roads to the west via the secondary access point.

The results of the Glynburn Road / Site Access Intersection analysis are shown in Table 7.6 and Table 7.7.

Table 7.6: Glynburn Rd/Site Access – Thursday Peak – Predicted

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Glynburn Road (S)												
1	L2	52	0.0	0.299	5.6	LOS A	0.0	0.0	0.00	0.05	0.00	57.8
2	T1	1101	0.8	0.299	0.0	LOS A	0.0	0.0	0.00	0.03	0.00	59.7
Approach		1153	0.7	0.299	0.3	NA	0.0	0.0	0.00	0.03	0.00	59.6
North: Glynburn Road (N)												
8	T1	889	1.1	0.232	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
9	R2	43	0.0	0.105	13.7	LOS B	0.3	2.2	0.75	0.90	0.75	27.2
Approach		933	1.0	0.232	0.7	NA	0.3	2.2	0.03	0.04	0.03	56.8
West: Site Access												
10	L2	52	0.0	0.066	2.6	LOS A	0.2	1.6	0.49	0.42	0.49	28.8
12	R2	26	0.0	0.569	121.5	LOS F	1.7	12.0	0.98	1.05	1.23	19.9
Approach		78	0.0	0.569	42.8	LOS E	1.7	12.0	0.66	0.63	0.74	25.0
All Vehicles		2163	0.8	0.569	2.0	NA	1.7	12.0	0.04	0.06	0.04	55.6

Table 7.7: Glynburn Rd/Site Access – Saturday Peak – Predicted

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Glynburn Road (S)												
1	L2	68	0.0	0.288	5.6	LOS A	0.0	0.0	0.00	0.07	0.00	57.7
2	T1	1039	0.8	0.288	0.0	LOS A	0.0	0.0	0.00	0.03	0.00	59.6
Approach		1107	0.8	0.288	0.4	NA	0.0	0.0	0.00	0.04	0.00	59.5
North: Glynburn Road (N)												
8	T1	986	0.6	0.257	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
9	R2	58	0.0	0.132	13.3	LOS B	0.4	2.8	0.74	0.89	0.74	27.3
Approach		1044	0.6	0.257	0.8	NA	0.4	2.8	0.04	0.05	0.04	56.2
West: Site Access												
10	L2	68	0.0	0.083	2.4	LOS A	0.3	2.0	0.47	0.40	0.47	28.8
12	R2	35	0.0	0.777	167.6	LOS F	2.6	18.5	0.99	1.11	1.51	15.9
Approach		103	0.0	0.777	58.0	LOS F	2.6	18.5	0.65	0.64	0.82	22.6
All Vehicles		2255	0.7	0.777	3.2	NA	2.6	18.5	0.05	0.07	0.06	54.0

7.3.3. Lewis Road/Secondary Site Access

The SIDRA analysis for the secondary site access with post-development traffic volumes has calculated it will operate at a Degree of Saturation (DOS) of less than 0.1 for both peak hours. This is expected given the very low volumes on Lewis Road and the volume anticipated to use the secondary access point.

The analysis indicates the access point on Lewis Road will operate with minimal impact on the operation of Lewis Road.

The results of the Glynburn Road / Lewis Road Intersection analysis are shown in Table 7.8 and Table 7.9.

Table 7.8: Lewis Rd/Site Access – Thursday Peak – Predicted

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Site Access												
1b	L3	13	0.0	0.044	0.1	LOS A	0.1	1.0	0.17	0.10	0.17	42.0
3a	R1	38	0.0	0.044	0.9	LOS A	0.1	1.0	0.17	0.10	0.17	21.7
Approach		51	0.0	0.044	0.7	LOS A	0.1	1.0	0.17	0.10	0.17	31.8
NorthEast: Lewis Road (NE)												
24a	L1	22	0.0	0.035	3.0	LOS A	0.0	0.0	0.00	0.17	0.00	34.4
25	T1	45	0.0	0.035	0.0	LOS A	0.0	0.0	0.00	0.17	0.00	48.8
Approach		67	0.0	0.035	1.0	NA	0.0	0.0	0.00	0.17	0.00	47.2
SouthWest: Lewis Road (SW)												
31	T1	153	0.0	0.087	0.0	LOS A	0.1	0.6	0.03	0.05	0.03	49.4
32b	R3	13	0.0	0.087	5.4	LOS A	0.1	0.6	0.03	0.05	0.03	45.7
Approach		165	0.0	0.087	0.4	NA	0.1	0.6	0.03	0.05	0.03	49.0
All Vehicles		283	0.0	0.087	0.6	NA	0.1	1.0	0.05	0.09	0.05	46.5

Table 7.9: Lewis Rd/Site Access – Saturday Peak – Predicted

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Site Access												
1b	L3	17	0.0	0.060	0.1	LOS A	0.2	1.4	0.18	0.11	0.18	42.0
3a	R1	52	0.0	0.060	0.9	LOS A	0.2	1.4	0.18	0.11	0.18	21.6
Approach		68	0.0	0.060	0.7	LOS A	0.2	1.4	0.18	0.11	0.18	31.6
NorthEast: Lewis Road (NE)												
24a	L1	28	0.0	0.042	3.0	LOS A	0.0	0.0	0.00	0.18	0.00	34.2
25	T1	53	0.0	0.042	0.0	LOS A	0.0	0.0	0.00	0.18	0.00	48.7
Approach		81	0.0	0.042	1.1	NA	0.0	0.0	0.00	0.18	0.00	47.0
SouthWest: Lewis Road (SW)												
31	T1	151	0.7	0.089	0.0	LOS A	0.1	0.8	0.04	0.06	0.04	49.1
32b	R3	17	0.0	0.089	5.4	LOS A	0.1	0.8	0.04	0.06	0.04	45.5
Approach		167	0.6	0.089	0.6	NA	0.1	0.8	0.04	0.06	0.04	48.7
All Vehicles		317	0.3	0.089	0.7	NA	0.2	1.4	0.06	0.11	0.06	45.7

7.4. Traffic Impact

The analysis of a retail land use on the affected area has been undertaken in order to demonstrate a high traffic generating use on the site. The assessment has been based on assuming a primary access point on Glynburn Road and secondary access point on Lewis Road.

Assuming a retail floor area of 2,000sq.m, the use would generate approximately 246 and 326 trips per hour during a Thursday PM peak and Saturday peak hour respectively. This would equate to approximately 2,400 trips per day for the retail use.

The impacts identified form this assessment are as follows:

1. The operation of Glynburn Road will not be significantly impacted with no identified increases in delays or queues for through traffic;
2. A primary access point on Glynburn Road will operate satisfactorily based on existing operating conditions on Glynburn Road with no need for traffic controls;
3. The Lewis Road and Glynburn Road intersection will continue to operate similar to existing with regards to queues and delays, based on peak hour operating conditions observed during the course of the study;
4. A secondary access point on Lewis Road will operate well with minimal queues and delays anticipated due to the low traffic volumes on Lewis Road;
5. Most traffic is anticipated to be distributed to and from Glynburn Road, with the operation of a primary access point supporting this assumption.
6. Some traffic will use Lewis Road for local access, and is considered to be up to 10% of the peak and daily traffic volumes. This would equate to approximately 24 to 33 trips per hour during the peak hours, and up to 240 vehicles per day.
7. Traffic volumes on Lewis Road could increase from 1,650 vehicles per day to 1,890 vehicle per day near the site. This would maintain traffic volumes within the desirable local amenity traffic volume of 2,000 vehicles per day.
8. The traffic volumes generated by the site would not be noticeable within the existing arterial road network, including the Payneham Road, Glynburn Road, Lower North East Road and Montacute Road to the north.
9. No works on Glynburn Road or Lewis Road would be required with regards to managing traffic on these roads, except for provision of a right turn lane on Glynburn Road and access point crossovers as required.

Overall, the analysis has found that a high traffic generating use on the site (i.e. a retail shop or supermarket in the order of 2,000 sq.m) based on a shop use, would have a minor impact on the operation of Glynburn Road, and a minor impact on adjacent streets surrounding the site.

7.5. Other Developments

At the time of this assessment, a Bunnings Development (Bulky Goods Outlet) was proposed for a site to the south of Penna Avenue adjacent Glynburn Road. A review of the Development Application traffic assessment identified some matters which have relevance to this Code Amendment analysis:

- The proposed development includes direct access from Glynburn Road, with access on Penna Avenue supported by new traffic signals at the intersection of Penna Avenue and Glynburn Road, and access from Barnet Avenue and Provident Avenue;
- New traffic signals on Glynburn Road were assessed for Thursday PM and Saturday peak periods, with southbound queue lengths on Glynburn Road calculated at 56 and 68 metres respectively;
- Traffic surveys of the local road network identified low volume of cut-through traffic between Payneham Road and Glynburn Road based on peak hour movements;
- Some additional traffic predicted for local roads in the surrounding area, in particular Barnet Avenue to and from Payneham Road.

With regards to impacts of this development on the Affected Area site, assuming the application is ultimately approved and enacted, the following considerations are made:

- Assuming an access point for the affected area is located midway along it's frontage on Glynburn Road, this will be outside of the anticipated longest queue length for the proposed traffic signals at Penna Avenue;
- New traffic signals at Penna Avenue will increase platooning in northbound traffic on Glynburn Road which will improve gaps for traffic using both Lewis Road intersection and also a new access point for the affected area site.
- Preliminary analysis in SIDRA indicates the new traffic signals would reduce the Degree of Saturation of the new access point on a Saturday from 0.777 to 0.529, and queue length in the site from 3 vehicles to 2 vehicles.

If this separate Bunnings application is approved and enacted, the provision of new traffic signals at Penna Avenue on Glynburn Road would have a positive impact on the traffic operation of an access point for the affected area and Lewis Road intersection.

8. CONCLUSION

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CONCLUSION

Based on the analysis and discussions presented within this report, the following conclusions are made:

1. The Code Amendment proposes to rezone land (the Affected Area) located at 19-29 Glynburn Road, Glynde to the 'Suburban Activity Centre Zone'.
2. The Affected Area has a site area of approximately 7,423 square metres with a frontage of approximately 110 metres to Glynburn Road and 40 metres to Lewis Road. It comprises existing commercial, showroom and trade with off-street car parking with three access points to Glynburn Road and two access points to Lewis Road.
3. This assessment considers the traffic and parking impacts based on a retail floor area of 2,000 sq.m with associated parking and access to Glynburn Road and Lewis Road. This represents an example of a high traffic generating use for a site.
4. The site would be capable of providing off-street parking in accordance with the Planning & Design Code, with approximately 110 parking spaces required for a shop of 2,000 sq.m GLFA.
5. Bicycle access and parking could be provided to link to the existing road network, with bicycle lanes on Glynburn Road. There would be space within the site to provide an appropriate level of bicycle parking in consideration of the Planning & Design Code.
6. Pedestrian connectivity to and from the site would be able to link to existing pedestrian paths on the surrounding roads, as well as provide suitable connectivity within any parking area and in consideration of the Planning & Design Code.
7. Access to the site would be assumed with primary access on Glynburn Road and secondary access on Lewis Road. The frontages of the site has sufficient length to enable the access point design to meet the requirements of the Planning & Design Code with regards to vehicle size and volume.
8. A primary access point on Glynburn Road could provide all turning movements to and from Glynburn Road and accommodate heavy vehicle movements.
9. The analysis of a shop use of 2,000 sq.m GLFA would generate up to 246 and 326 trips per hour during the Thursday PM peak hour and Saturday peak hour respectively. This would equate to approximately 2,400 vehicles per day.
10. Traffic surveys and observations of Glynburn Road and Lewis Road have been used to assist in calibrating traffic analysis of the existing intersection and new access points on Glynburn Road.
11. It would be anticipated that the majority of traffic would use a primary access point on Glynburn Road which would operate satisfactorily and relatively efficiently, based on a detailed assessment of each access point in this report. A primary access point to Glynburn Road would reduce the need for vehicles to access Lewis Road or the local street network to the west.
12. It would be anticipated that approximately 10% of traffic for the assessed use would use Lewis Road to the west of the site for local access needs. This would result in Lewis Road increased to approximately 1,890 vehicles per day which would remain within the local road residential amenity threshold of 2,000 vehicles per day.
13. There is adequate capacity in the surrounding road network to cater for the traffic generated by the proposed development, including the arterial road network intersection of Payneham Road, Glynburn Road, Lower North East Road and Montacute Road.

The separate proposal for a Bunnings Development to the south of Penna Avenue would not have a negative impact on this site, as the proposed traffic signals at Penna Avenue would improve access to the site with increased gaps in northbound traffic.

GTAconsultants now Stantec