

TRAFFIC IMPACT STATEMENT AND ENDORSEMENT

PROJECT: Community Land Revocation - Allotment 202 Armstrong Road, Victor Harbor

DRAWINGS / ATTACHMENTS: Refer to Appendix A

COUNCIL: City of Victor Harbor

ROAD AUTHORITY: City of Victor Harbor

LOCATION: Allotment 202 Armstrong Road, Victor Harbor

BACKGROUND

HDS Australia Pty Ltd has been requested by the City of Victor Harbor to undertake an assessment of the traffic impacts to support a Code Amendment relating to land located at Allotment 202 Armstrong Road, Victor Harbor.

This traffic impact statement only addresses the existing site access to Armstrong Road, the proposed site access to Ewen Terrace and the existing unsignalised T-intersections of George Main Road/Ewen Terrace and Armstrong Road/Crozier Road.

Site Location

The subject site is situated opposite the Encounter Bay Football Club and is bounded by a creek at its eastern frontage, Armstrong Road at its northern frontage, commercial and residential uses at its western and southern frontages.

An aerial view of the subject site with context of the wider road network is provided at Figure 1.

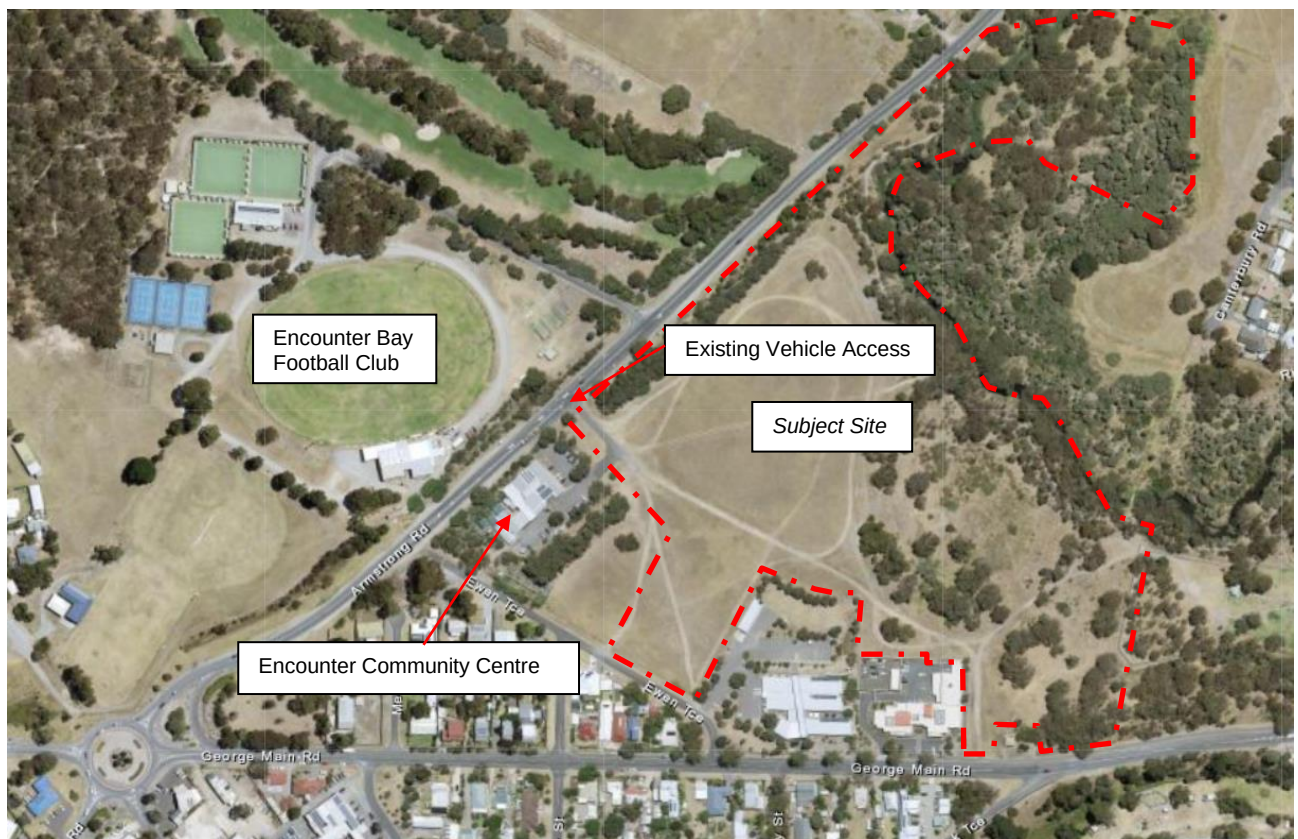


Figure 1 – Site Location (Google Maps, 2024)

Existing Road Network

George Main Road (Route B37) is an arterial road connecting the city centre of Victor Harbor (to the east) to Yankalilla and Cape Jervis (to the west). The road is under the care and control of the Department for Infrastructure and Transport (DIT). George Main Road has a posted speed limit of 60km/h and the road cross section typically consists of a single traffic lane in each direction, with marked on-street parking lanes on both sides.

Armstrong Road (part of the Victor Harbor Ring Route) is a local District Council Sub-Arterial Road which functions as a high-speed bypass route around the outskirts of Victor Harbor. The road is under the care and control of the City of Victor Harbor (Council). Armstrong Road has a posted speed limit of 60km/h near the site (however has a posted speed limit of 100km/h throughout most of its length including at the Crozier Road intersection), and the road cross section typically consists of a single traffic lane in each direction with no provision of on-street parking. There is an existing vehicle access to The Encounter Community Centre from Armstrong Road which includes an auxiliary left turn lane.

Crozier Road is a collector road which connects the city centre of Victor Harbor to the ring road (Armstrong Road). The road is under the care and control of Council. Crozier Road has a posted speed limit of 50km/h and the road cross section near the Armstrong Road intersection consists of a single traffic lane in each direction with no provision of on-street parking.

Ewen Terrace is a local access road which provides access to the TAFE from George Main Road at its southern terminus. The road is under the care and control of Council and does not have a posted speed limit (i.e. operating at the default 50km/h urban speed limit). There is no road connection to Armstrong Road to the north. The road caters for two-way traffic movements and allows for on-street parking.

PROPOSAL

The proposed development intends to include a recreation facility, a food and beverage tenancy (assumed to be a restaurant) and a childcare centre (with the capacity to hold up to 120 patrons) with future expansions of the recreation facility and the food and beverage tenancy.

The following table includes the indicative land uses for the proposed development which have been obtained by the indicative concept plan and information provided by Council or the developer.

Table 1 – Proposed Indicative Development Schedule

Land Use	Initial Development	Future Expansion	Total
Recreation Facility	6,650 sqm	3,950 sqm	10,600 sqm
Food and Beverage	1,500 sqm	1,500 sqm	3,000 sqm
Childcare Centre	2,115 sqm	Nil	2,115 sqm

The proposed development intends to retain the existing access from Armstrong Road to The Encounter Community Centre with modifications. This will be the primary access to/from the subject site.

A secondary vehicle access is proposed to the site from Ewen Terrace from its southern frontage.

The proposal includes the provision of approximately 476 car parking spaces.

IMPACTS

This section discusses the traffic impacts of the proposed development.

Baseline Traffic Volumes

Traffic volume data for George Main Road is publicly available from the Location SA website, which indicates an AADT of 3,800 vehicles per day including 250 commercial vehicles (6.6%) between Bay Road and Armstrong Road (base year 2021). The peak hour volume is not available but is assumed to be 10% of the AADT (380 vehicles per hour) based on guidance from Austroads Guide to Traffic Management Part 6 Section 3.3.6.

Traffic volume data for Ewen Terrace was collected using a MetroCount traffic survey unit in June 2024 adjacent to George Main Road. The data indicates very low volumes but for the purposes of our analysis, we will conservatively round up to assume 20 vehicles per hour (10 inbound and 10 outbound movements) on Ewen Terrace during all peak periods. We will presume that the traffic is split evenly in the eastbound/westbound directions at the George Main Road intersection.

Traffic volume data for Armstrong Road was collected using a MetroCount traffic survey unit in February 2021 adjacent to Crozier Road. Based on the data, Armstrong Road has an estimated AADT of 7,593 vehicles per day, a weekday peak hour of 900 vehicles and 800 vehicles in the AM and PM peaks respectively and a Saturday midday peak hour of 600 vehicles. For the purposes of our analysis, we will presume that 10% of the total peak hour volumes on Armstrong Road would be attributed to traffic turning into and out of Crozier Road.

Data from the Australian Bureau of Statistics (ABS) indicate an average population growth rate of 1.82% over the last 5 years within the City of Victor Harbor LGA. Based on this a growth rate of 2% per annum had been applied on the existing traffic volumes to predict the anticipated traffic volumes on the existing road network in 10 years (2034), to be used in the traffic impact assessment.

The above volumes will be the existing baseline traffic volumes for our assessment.

Traffic Generation

For the purposes of this assessment, we will assess the traffic impacts of the weekday AM and PM peaks and the Saturday midday peak.

Recreation Centre

The RTA Guide to Traffic Generating Developments Ver 2.2 does not have traffic generation rates for recreation centres. Therefore, the traffic generation for the recreation centre is assessed using a first principles approach based on the indicative car parking provisions.

The concept plan includes the provision of 476 car parking spaces. This is consistent with the Plan SA Planning and Design Code Version 2024.9 which specifies a rate of 4.5 car spaces per 100m² of total floor area for indoor recreation facilities. When applying this rate, the resultant requirement for a 10,600m² recreation facility is 477 car parking spaces.

Based on our review of the activity profiles of recreation centres of similar size and nature we have presumed the following:

- 40% of the available car parking spaces for the recreation centre would turnover during the weekday AM peak hour;
- 80% of car parking spaces would turnover during the weekday PM peak hour;
- 100% of car parking spaces would turnover during the Saturday midday peak hour (i.e. full capacity); and
- Each utilised parking space is assumed to generate 1 entry and 1 exit movement per turnover period (the average turnover period is assumed to be 2 hours which equates to 0.5 entry movements and 0.5 exit movements per hour per utilised parking space).

Based on the above assumptions, the recreation centre is predicted to generate up to:

- 191 vehicle movements during the weekday AM peak hour;
- 382 vehicle movements during the weekday PM peak hour; and
- 477 vehicle movements during the Saturday midday peak hour.

Food and Beverage Tenancy

For the purposes of this assessment, we have presumed that the food and beverage tenancy will operate as a restaurant.

Traffic generation rates have been obtained from the RTA Guide to Traffic Generating Developments Ver 2.2. Based on these rates, on the presumption the food and beverage tenancy would operate as a restaurant the guideline suggests a weekday PM peak hour trip generation of 5 vehicle movements per 100 square metres of gross floor area.

For the purposes of this assessment, we will adopt the above RTA rate for the weekday PM and Saturday midday peak hours and 50% of the RTA rates for the weekday AM peak hour.

The proposal includes some 3,000 square metres of food and beverage use.

Application of the above rate to the proposed floor area projects a total of:

- 75 vehicle movements during the weekday AM peak;
- 150 vehicle movements during the weekday PM peak; and
- 150 vehicle movements during the Saturday midday peak.

Childcare Centre

Childcare centres historically operate outside of the weekday AM and PM peak hours. To be conservative, we have included the traffic generated by the childcare centre within our assessment for the weekday AM and PM peak hours.

Case study data of childcare centres of similar size and nature typically include a traffic generation of 0.7-0.8 vehicle movements per children during the weekday AM and PM peak hours.

The proposal includes up to 120 patrons, accordingly, we expect a traffic generation of 96 movements associated with the childcare during the weekday AM and PM peak hours.

We have presumed that the childcare centre will not be operational during weekends.

Summary of Traffic Generation

A summary of the traffic generated by the proposed development during the weekday AM, weekday PM and Saturday midday peak hours are presented in the following table.

Table 2 – Total predicted traffic generation for the weekday AM peak, weekday PM, Saturday midday peak hours

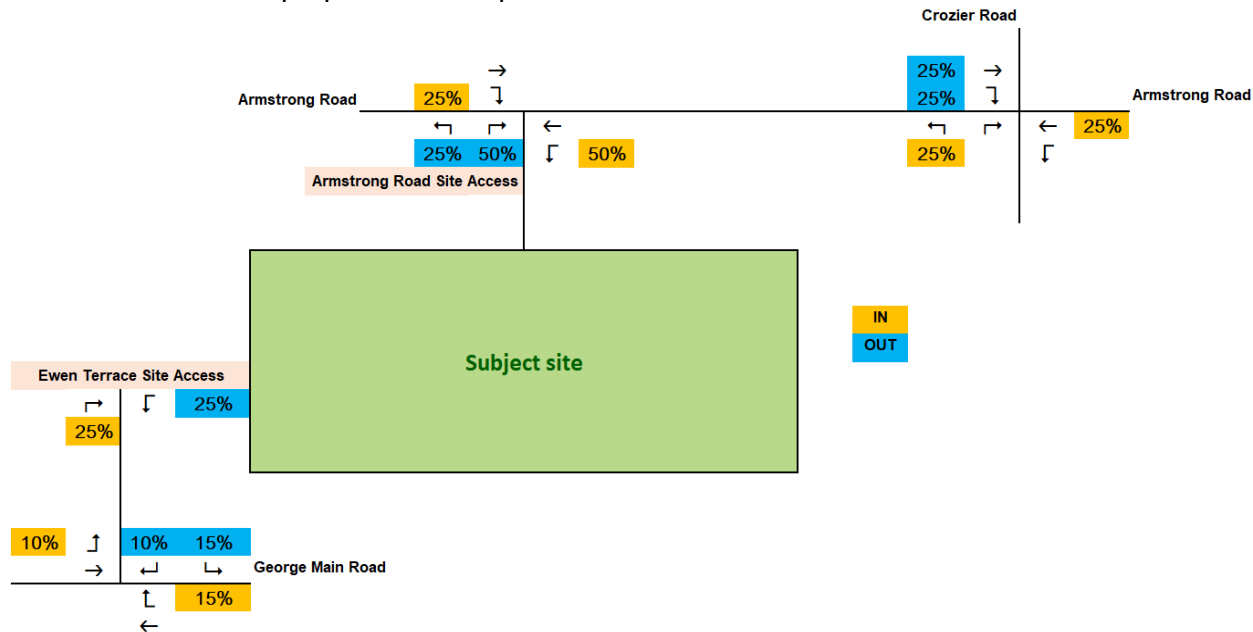
Land Use	Weekday AM Peak Hour	Weekday PM Peak Hour	Saturday Midday Peak Hour
Recreation Centre	191 movements	382 movements	477 movements
Food and Beverage	75 movements	150 movements	150 movements
Childcare Centre	96 movements	96 movements	Nil
Total	362 movements	628 movements	627 movements

Traffic Distribution and Assignment

Based on our review of the wider catchment of the site, and by having regard of the existing traffic volumes along Armstrong Road and George Main Road, travel routes to/from the proposed development, the following traffic distribution assumptions have been made:

- 75% of total traffic will enter/exit the site using the Armstrong Road access points, and will be split as:
 - 25% to/from the west via the Armstrong Road and George Main Road and Mill Road roundabout;
 - 25% to/from the east as through traffic on Armstrong Road; and
 - 25% to/from the east via the Armstrong Road and Crozier Road intersection.
- 25% of total traffic will enter/exit the site using the Ewen Terrace access, and will be split as:
 - 15% to/from the east (via George Main Road); and
 - 10% to/from the west (via George Main Road).
- 50/50 split of entry/exit movements for all proposed uses.

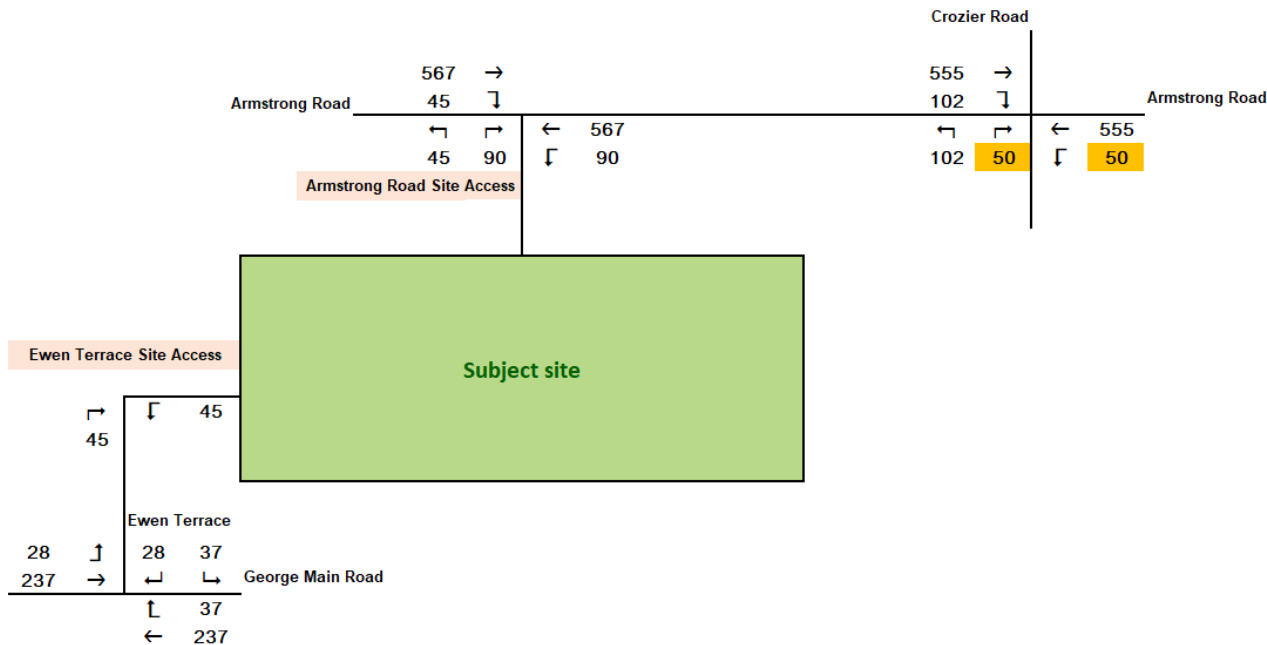
Based on these assumptions, the following figure has been prepared to illustrate the traffic distributions to/from the proposed development.



Post Development Traffic Volumes

The post development traffic volumes by superimposing the existing baseline traffic volumes (for 2034) and the site generated traffic volumes for the weekday AM, weekday PM and Saturday midday peak periods are presented Figure 3 to Figure 5, respectively.

A nominal value of 50 vehicle movements have been assumed for the right turn movements from Crozier Road onto Armstrong Road and the left turn movements from Armstrong Road to Crozier Road.



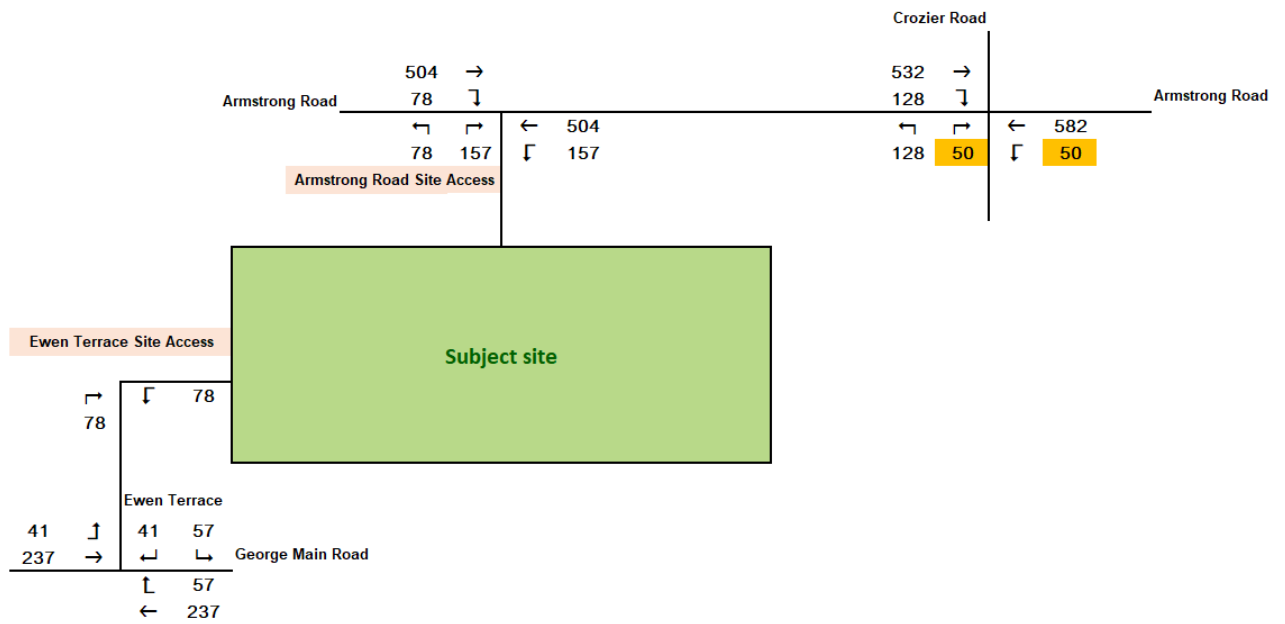


Figure 4 – Post Development Traffic (Weekday PM Peak)

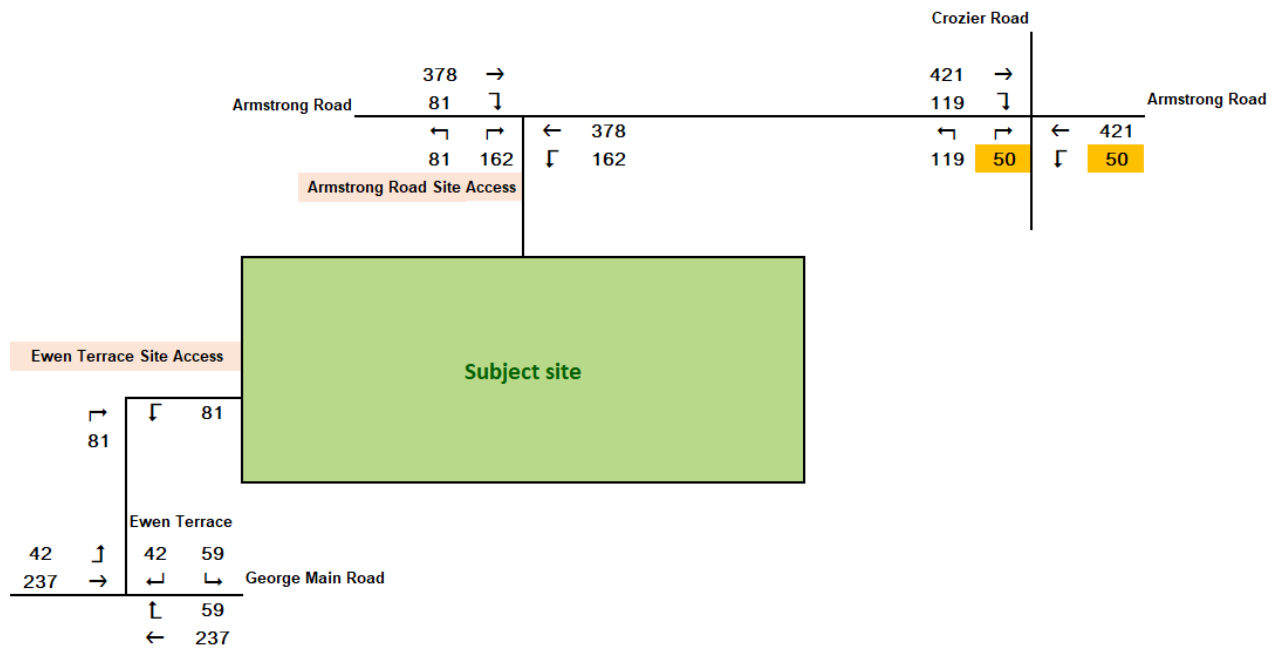


Figure 5 – Post Development Traffic (Saturday Midday Peak)

OUTCOME

Assessment of Turn Warrants

The first step of determining an appropriate access provision is to assess the turn warrants based on the *Austrroads Guide to Traffic Management Part 6: Intersections, Interchanges and Crossings Management* (Austrroads 2020).

Figure 3.25 at Section 3.3.6 of that document provides guidance on the preferred minimum turning treatments for major roads at unsignalised intersections. Note that Figure 3.25(a) of the Austrroads Guide is applicable for the Armstrong Road / Crozier Road intersection as it has a design speed $\geq 100\text{km/h}$; whereas Figure 3.25(c) is applicable to the other intersections / accesses which has a design speed $\leq 70\text{km/h}$.

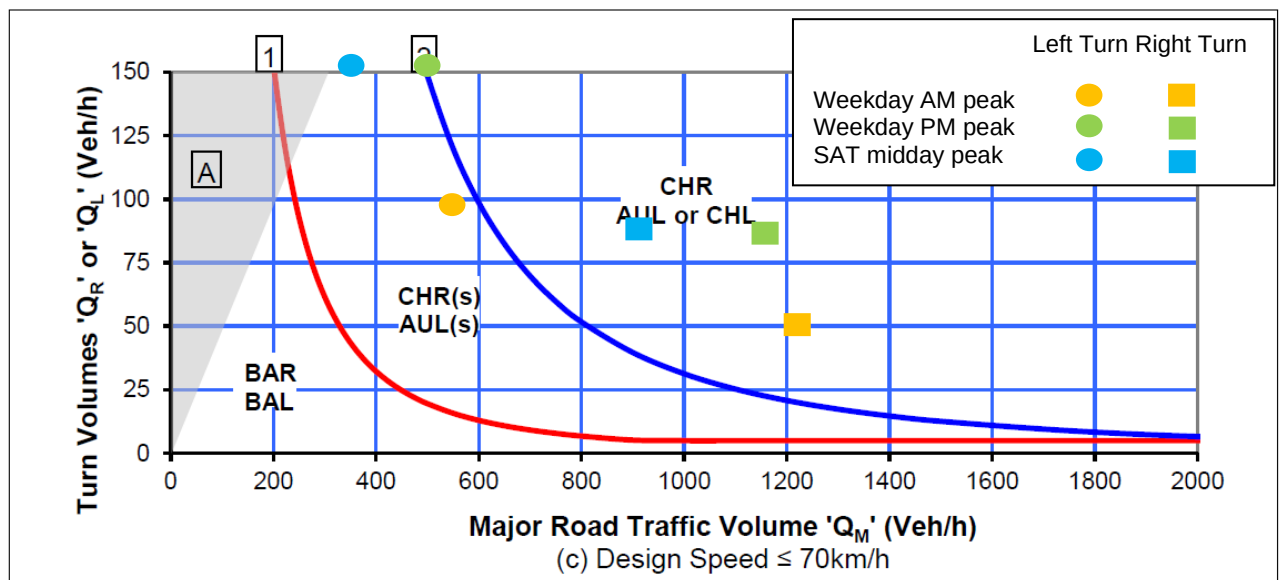
The warrant for a left-turn treatment is a function of the one-way through movement along the major road in the same direction as the left turn lane ($Q_M = Q_{T2}$) and the left turn movement (Q_L).

For intersections without a slip lane, the warrant for a right-turn treatment is a function of the through movements in both directions plus the left turn movement ($Q_M = Q_{T1} + Q_{T2} + Q_L$) and the right-turn movement (Q_R).

Armstrong Road Site Access

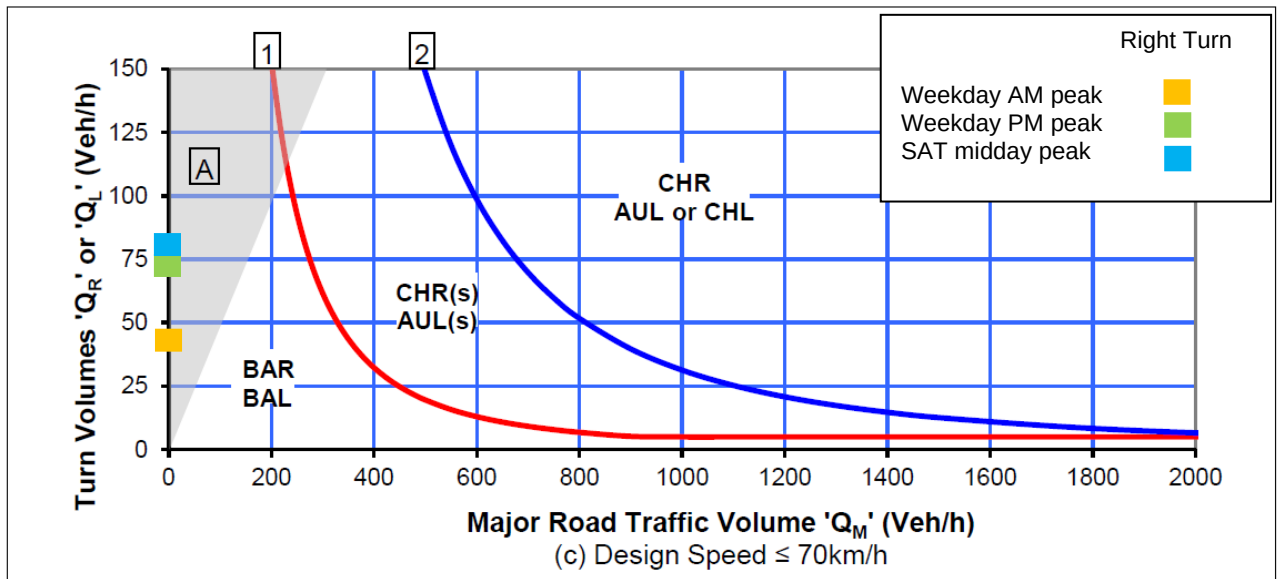
The existing vehicle access to Armstrong Road will be the primary access route into and out of the proposed development. Based on the high volumes of traffic expected to turn right into the development during the afternoon peak hour, a full length channelised right turn treatment (CHR) is warranted at this location and a full auxiliary left turn lane (AUL) treatment is marginally warranted based on traffic volumes during the weekday PM peak period.

The existing access to Armstrong Road already includes a full auxiliary left turn lane which is considered appropriate to cater for the predicted traffic generated by the proposed development.



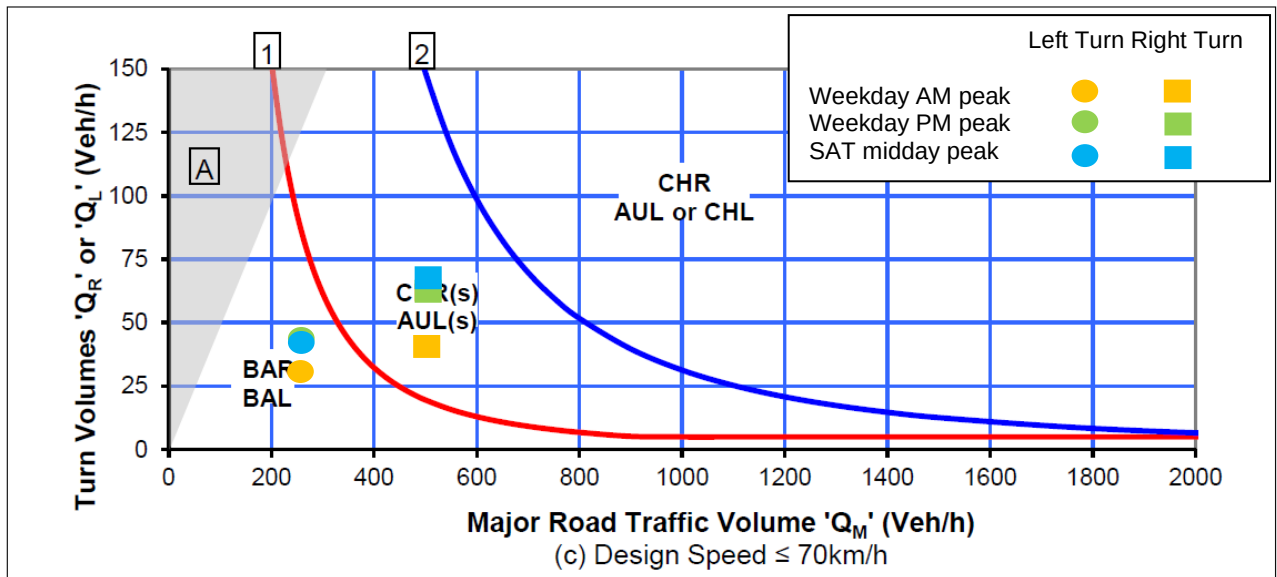
Ewen Terrace Site Access

The expected traffic volumes at the Ewen Terrace site access are too low to warrant any higher order intersection treatments. The minimum requirement for a basic left and basic right (BAL / BAR) treatment is considered adequate for this access.



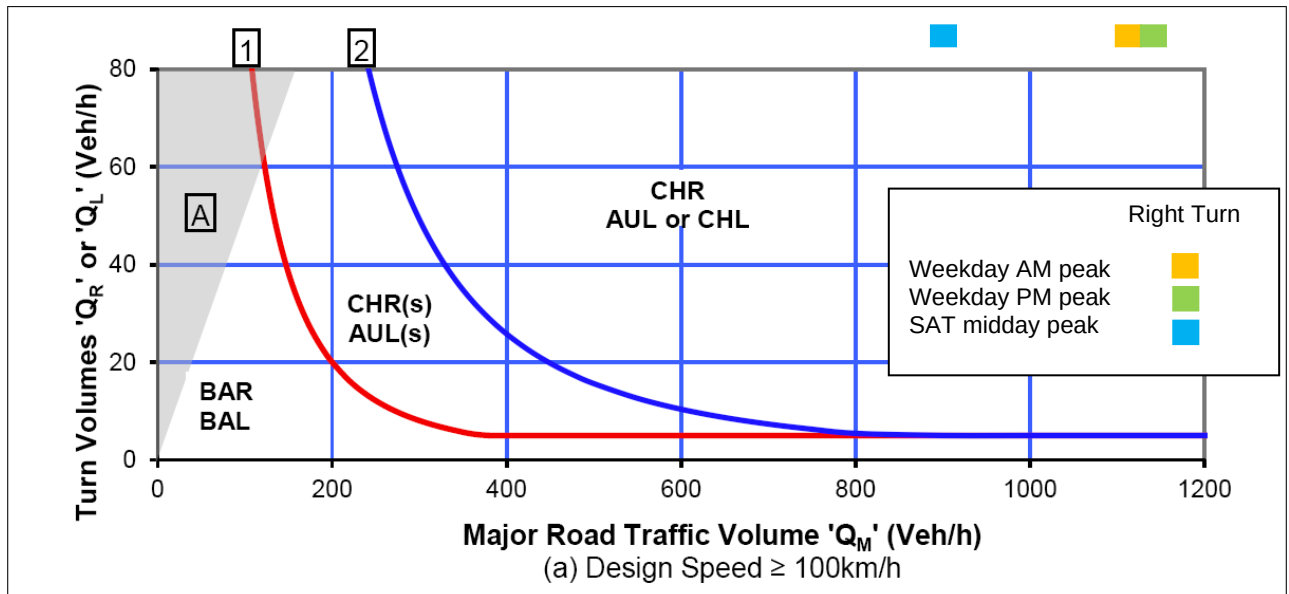
George Main Road and Ewen Terrace Intersection

Based on the anticipated traffic volumes a short right turn auxiliary lane CHR(s) is warranted for this intersection following the proposed development. Note that the existing traffic volumes at the intersection do not warrant a higher-order right turn treatment other than the minimum requirement for a BAR treatment. For the left turn movement, the minimum requirement of a BAL treatment is considered to be adequate.



Armstrong Road and Crozier Road Intersection

This intersection features an existing AUR treatment (note AUR treatments are not preferred due to their poor safety performance). Based on the existing high traffic volumes at this location a CHR treatment is warranted at this intersection regardless of the development.



Conclusions and Key Findings

A review has been undertaken of the traffic generated by the proposed development at the subject location and based on our analysis, the key mitigation measures that are required are listed below:

- A fully channelised right turn lane (CHR) at the Armstrong Road proposed site access is warranted to facilitate north-eastbound right turn movements from Armstrong Road into the development;
- A fully channelised right turn lane (CHR) at the Armstrong Road and Crozier Road intersection is warranted to facilitate the northbound right turn movement from Armstrong Road onto Crozier Road (note that the CHR treatment is already warranted based on the existing traffic volumes regardless of the proposed development);
- A short auxiliary right turn lane (CHR(s)) is warranted at the George Main Road and Ewen Terrace intersection due to the additional turning volumes generated by the development (the CHR(S) treatment is not warranted based on the existing volumes);
- The minimum requirement for a basic left (BAL) treatment is considered adequate for the George Main Road / Ewen Terrace intersection;
- The minimum requirement for a basic left and basic right (BAL / BAR) treatment is considered adequate for the Ewen Terrace site access; and
- We consider the existing auxiliary left turn lane at the site access from Armstrong Road to be adequate (however it is noted that the auxiliary lane has been incorrectly line marked with lane lines rather than continuity lines).

CONSULTATION

Provide details of any consultation, and any agreed decisions on the proposal that have occurred, including when and with whom. Consultation may include:

- ☐ DIT – Network Management Services
- ☐ DIT – Public Transport Operations and Planning
- ☐ Adjacent Council: Enter name of Council(s) and details of consultation if applicable
- ☐ Residents
- ☐ Commercial business
- ☐ SAPOL
- ☐ Emergency services
- ☐ any other stakeholders as required

ENDORSEMENT

In accordance with the Minister for Transport and Infrastructure's *Instrument of General Approval and Delegation to Council*, this Traffic Impact Statement has been prepared by a person the Council deems to be an experienced traffic engineering practitioner and endorsed by a person authorised by Council.

PREPARED BY: (Experienced Traffic Engineering Practitioner) Signed:	Name: Zidong Wang	Date: 05/07/2024
	Position: Civil and Transport Engineer	
ENDORSED: (Person authorised by Council) Signed:	Name:	Date:
	Position:	

NOTE: If this proposal only contains devices that meet Council's *Instrument*, approval from the Commissioner of Highways is **not** required. Otherwise continue below.

APPROVAL FROM THE COMMISSIONER OF HIGHWAYS or authorised delegate is required for devices not conforming to the requirements of, or used in accordance with, the Australian Standards or DIT's *Code of Technical Requirements* ('the Code'), or for devices listed in Appendix A of the Code as requiring a separate approval.

Applications for approval shall be addressed to:

Attention: *[see below for appropriate area to address application to]*

Department for Infrastructure and Transport
GPO Box 1533
Adelaide SA 5001
Email: DIT.EnquiriesAdministrator@sa.gov.au

and must include this traffic impact statement, any plans and relevant supporting documentation.

NOTE:

For **speed limit approvals**, address application:

Attention: Network Management Services – Traffic Investigations

For **non-standard traffic control device approvals**, address application:

Attention: Network Management Services – Traffic Integrity

APPROVAL FROM COMMISSIONER OF HIGHWAYS (or authorised delegate) – DIT USE ONLY		
TECHNICAL ENDORSEMENT (Recognised Traffic Engineering Practitioner) Signed:	Name:	Date:
	Position:	
APPROVED (Authorised delegate in accordance with OI 18.3) Signed:	Name:	Date:
	Position:	
File No:	KNet Ref:	

CONDITIONS

(Additional conditions may be added to this list)

Approval to install, alter or remove those traffic control devices listed as requiring separate approval from the Commissioner of Highways that are proposed in this traffic impact statement and its attachments is granted subject to the following:

- Devices shall be installed, altered or removed in accordance with the *Manual of Legal Responsibilities and Technical Requirements for Traffic Control Devices* where there is no conflict with this traffic impact statement and its attachments, and the conditions of this approval, and
- Devices shall be installed by a council employee or contractor with experience in the placement of traffic control devices, and
- Council must keep records of the times and dates the devices are installed, altered, or removed, and
- For speed limit and end speed limit signs, the Department will notify the Commissioner of Police of the approval before signs are installed, altered, or removed, and
- For speed limit and end speed limit signs, the temporary 'Speed Limit Changed' (T1-SA109) sign shall accompany the new speed limit for a period of up to 2 months, in accordance with the *Speed Limit Guideline for South Australia*, and
- For speed limit and end speed limit signs, Council must notify the Commissioner of Police of the date of installation, alteration or removal within 20 working days of installation, alteration or removal.

For treatments under Council's *Instrument of General Approval* which include a speed limit as part of the standard installation (wombat crossings, koala crossings, emu crossings and school zones on Council roads), Council must notify the Commissioner of Police within 20 working days of the approval and date of installation.

Appendix A

Concept Plan

The Precinct Victor Harbor Leasing Plan

Type	Built Form	Future Expansion
Recreation	6650m ²	500m ² + 750m ² + 750m ² + 650m ² + 1300m ²
F & B	1500m ²	1500m ²
Childcare	2115m ²	

Carparks - 476

