PSA CONSULTING

Silverweir Poultry Farm

Traffic Impact Assessment

13 June 2024

Baiada

LAND USE PLANNING | DEVELOPMENT APPROVALS | TRANSPORT PLANNING | TRAFFIC ENGINEERING | PROGAM MANAGEMENT | INFRASTRUCTURE

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REVISION HISTORY

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LIST OF ACRONYMS

ASD	Approach Sight Distance
AUL	Auxiliary Left Turn
BAL	Basic Left Turn
BAR	Basit Right Turn
CHR	Channelised Right Turn
DCP	Development Control Plan
MGSD	Minimum Gap Sight Distance
NSW	New South Wales
PSA	PSA Consulting
SISD	Safe Intersection Sight Distance
TfNSW	Transport for New South Wales
TIA	Traffic Impact Assessment
TRC	Tamworth Regional Council

1. INTRODUCTION

PSA Consulting (PSA) has been engaged by Baiada Properties Pty Limited to undertake a Traffic Impact Assessment (TIA) to accompany a development application for the proposed poultry farm development on 448 Appleby Lane, Appleby NSW which is located on Lot 18 and 19 of DP 95993. The development involves the construction of a 16 shed broiler farm containing 60,000 birds per shed equating to 960,000 birds as well as associated facilities and infrastructure. Full development plans are provided in Appendix 1. Figure 1 shows the site locality.

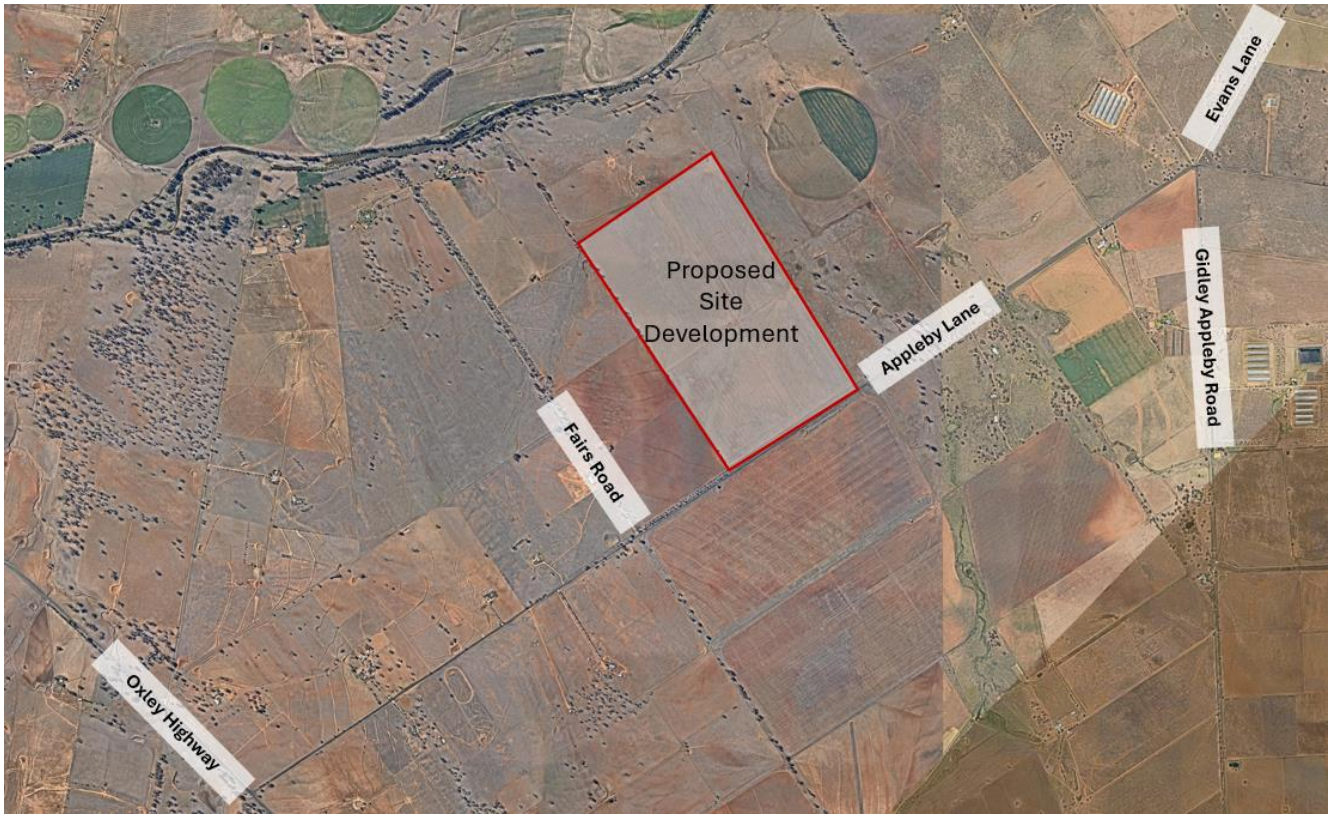


Figure 1: Site Locality Plan (Source: Nearmap, PSA Consulting)

The site has an area of approximately 350ha and is situated approximately 16km northwest of Tamworth NSW. The property is located within Tamworth Regional Council (TRC) area and therefore traffic advice will be in accordance with the Tamworth Development Control Plan (DCP) 2010.Figure 2 illustrates the locality of the site to the town of Tamworth.

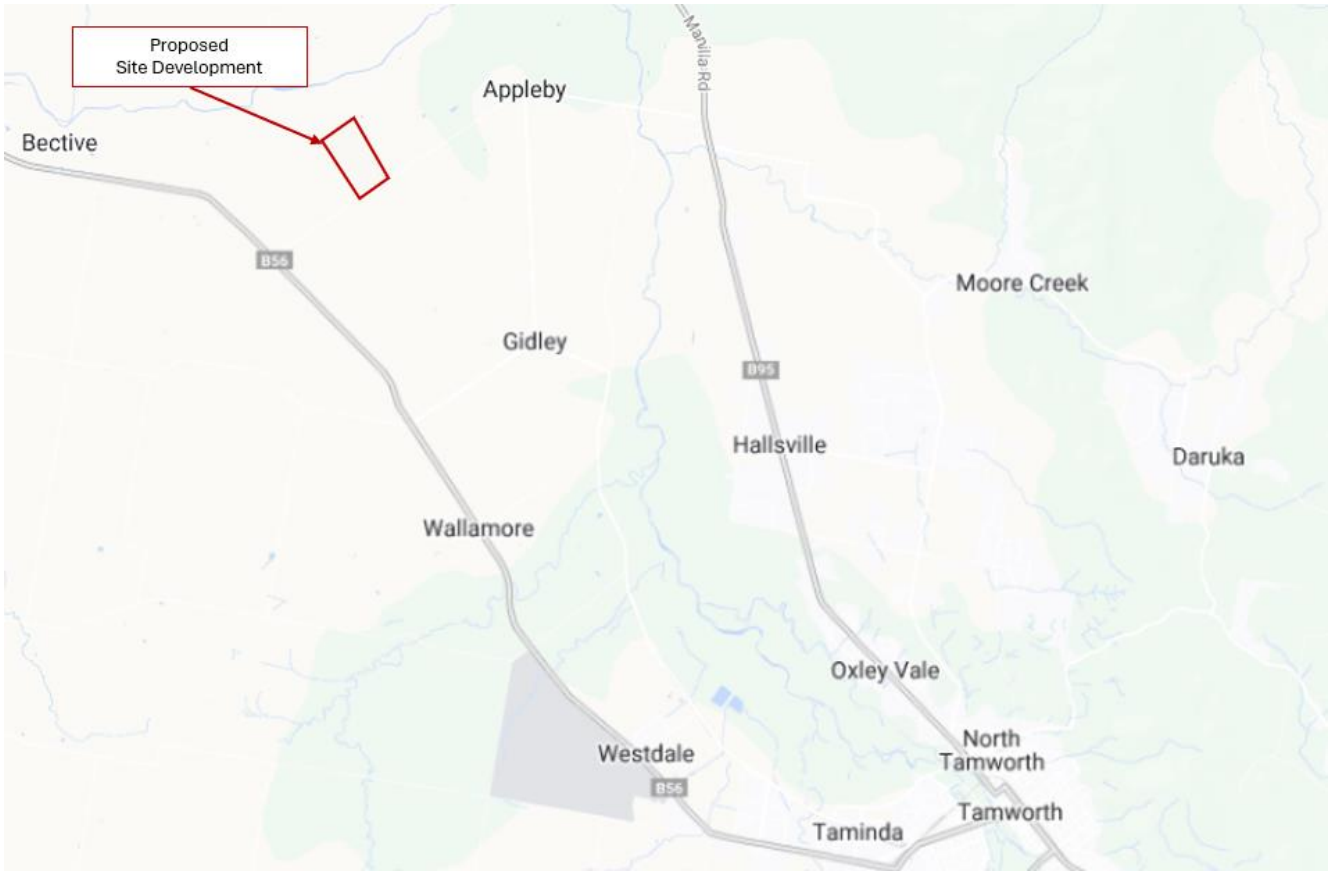


Figure 2: Wider Site Locality (Source: TfNSW, PSA Consulting)

1.1 REPORT STRUCTURE

This report addresses the relevant requirements of TRC and includes the following sections:

- Existing Conditions;
- Development Profile;
- Impact Assessment; and
- Site access and Onsite Parking Requirements

2. EXISTING CONDITIONS

2.1 ROAD NETWORK

The poultry farm is located at Lot 18 and Lot 19 DP 95993 which 448 Appleby Lane, Appleby. The surrounding road network is highlighted in Figure 3. This includes Wallamore Road and Oxley Highway.

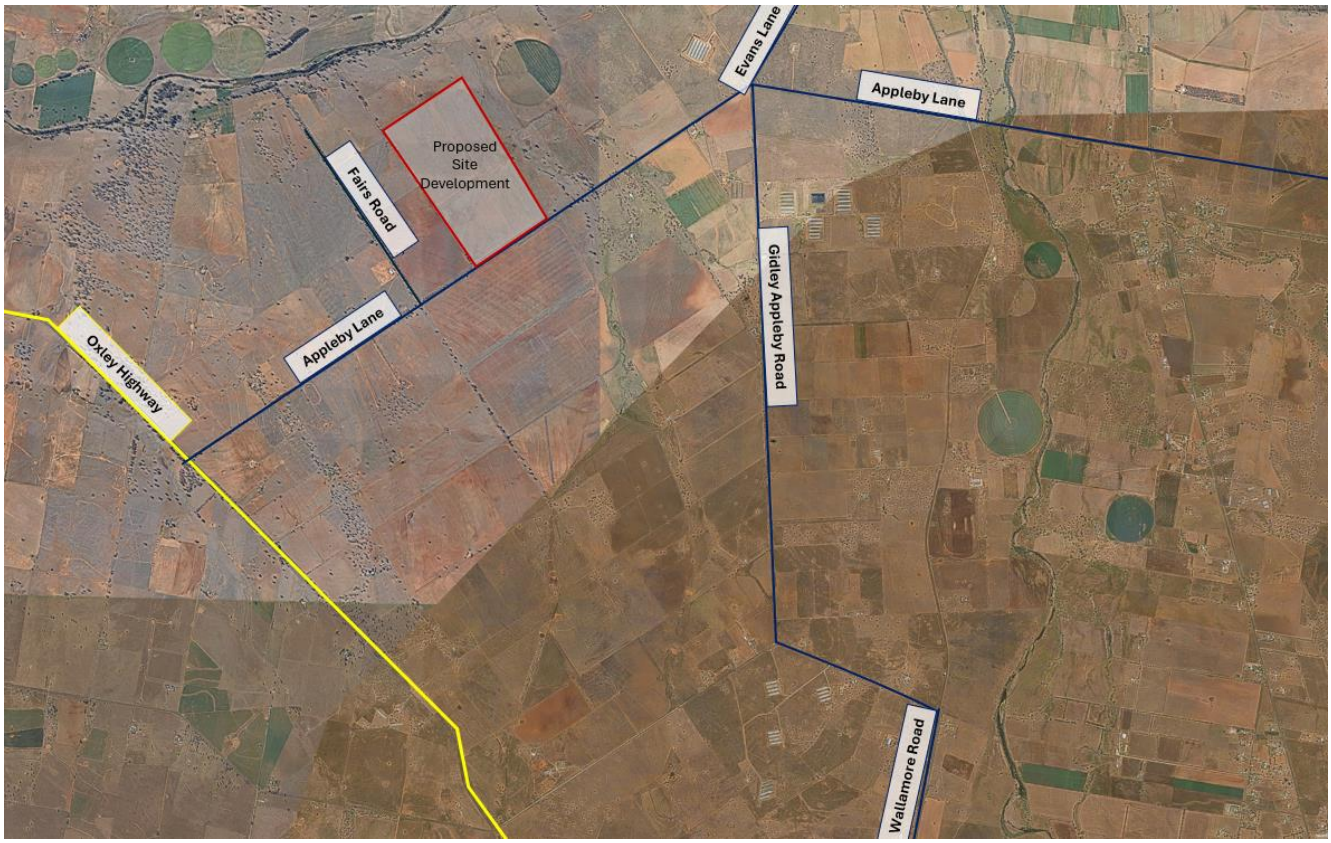


Figure 3: Surrounding Road Network (Source: Nearmap, PSA Consulting)

The proposed development will primarily be accessed via Appleby Lane which adjoins the property with heavy vehicles accessing the site via Wallamore Road and / or Oxley Highway. Table 1 summarises the surrounding road network characteristics outlined by the Transport for New South Wales (TfNSW).

Table 1: Surrounding Road Network - Road Characteristics (Source: TfNSW, PSA Consulting)

Road Name	Jurisdiction	Classification / Hierarchy	Cross Section / Geometry	Posted Speed Limit
Appleby Lane	Council-Controlled	Local Road	Divided carriageway, Two-lane, two-way, Sealed	100km/hr
Wallamore Road	Council Controlled	Local Road	Divided carriageway, Two-lane, two-way, Sealed	100km/hr
Oxley Highway	State-Controlled	Highway	Undivided carriageway, Two-lane, two-way, Sealed	100km/hr

2.1.1 Freight Network

The surrounding road network mostly includes B-Double routes as well as approved routes with travel conditions. These roads have been illustrated in Figure 4.

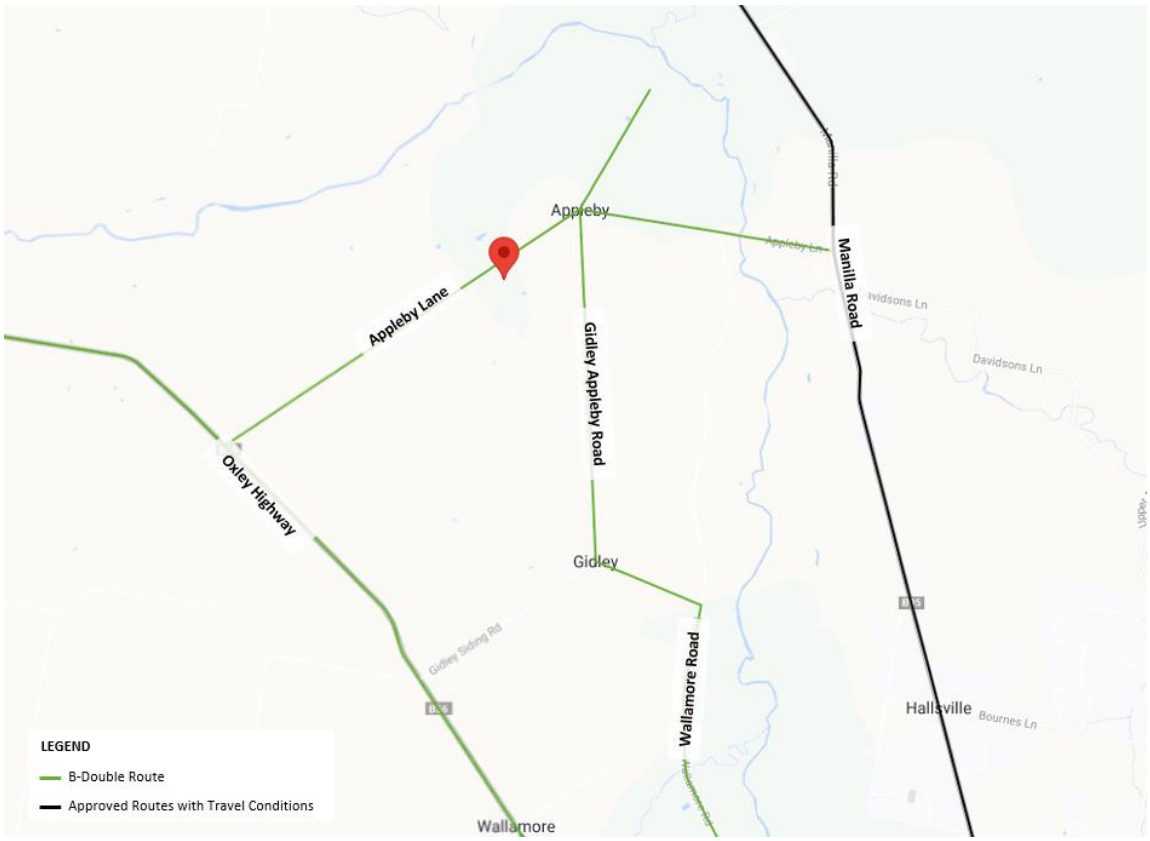


Figure 4: Heavy Vehicle Haulage Route (Source: TfNSW, PSA Consulting)

Based on Figure 4, it is seen that B-Double routes are along Oxley Highway, Gidley Appleby Road and Wallamore Road. For this assessment, it is assumed that trips generated from the development will utilise Oxley Highway as the primary route for vehicles travelling to and from the site due to the accessibility for vehicles travelling north and south.

2.2 EXISTING SITE

The proposed development site is located at Lot 18 & Lot 19 Appleby Lane and is currently vacant rural property.

2.3 EXISTING TRAFFIC VOLUMES

Based on the heavy vehicle haulage routes in Section 2.1.1, it has been assumed that all heavy vehicles accessing the site will utilise Oxley Highway for movements to and from the site. Traffic counts have been sourced from the Traffic Volume Viewer from the Transport of NSW during 18th January, 2024 at approximately 1.1 km from the Oxley Highway / Appleby Lane intersection for both southbound and northbound directions for light and heavy vehicle classification as shown in Table 2.

Table 2: Oxley Highway Traffic Volumes (Source: TfNSW)

Oxley Highway	Light Vehicle	Heavy Vehicle

AM Peak		
Northbound	345	87
Southbound	320	167
PM Peak		
Northbound	399	131
Southbound	388	79

Given the small amount of existing development along Appleby Lane, it is assumed that 0.5% of the traffic travelling north and south are entering and exiting Appleby Lane for a conservative assumption.as there is a decrease in traffic counts established south of Oxley Highway approximately 9km from the Oxley Highway / Appleby Lane intersection. This is assumed because Oxley Highway is a B-double and state-controlled route which can be assumed to be a primary route for vehicles accessing Appleby Lane. Figure 5 and Figure 6 illustrates the background traffic in the AM and PM peak hour respectively.

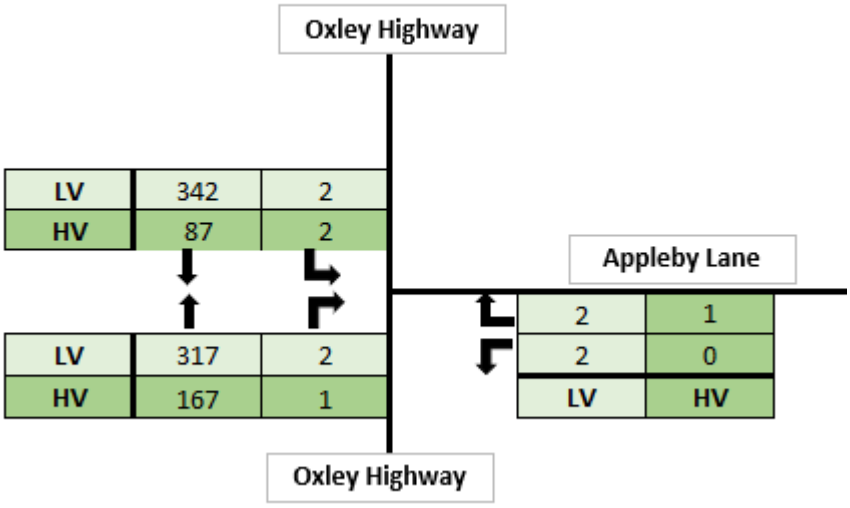


Figure 5: 2024 Background AM Peak - Oxley Highway / Appleby Lane

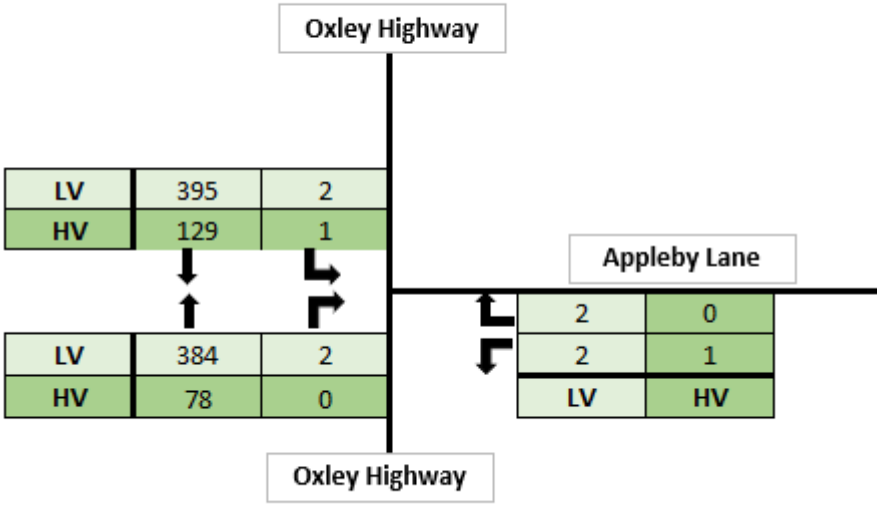


Figure 6: 2024 Background PM Peak - Oxley Highway / Appleby Lane

3. DEVELOPMENT PROFILE

The proposed site involves the construction of a 16 shed broiler farm which will contain 60,000 birds per shed equating to a total of 960,000 birds as well as associated facilities and infrastructure. The proposed development will run over lot 18 & 19 (DP 95993). Additionally, ancillary buildings including two manager residences and staff amenities will be constructed on site. A site layout of the proposed development is shown in Figure 7. Full development plans are provided in Appendix 1.

Figure 7: Proposed Site Layout (Source: Baiada)

As shown in the plan, the primary site access will be from Appleby Lane via a new driveway and access road with all heavy and light vehicles accessing the site from this location. It is expected that the development will be open for operation in 2026. During operation of the farm, six full-time staff will work at the development. Contract staff will also be used for assistance. Based on knowledge of peak operations through previous poultry farm assessments conducted by PSA the anticipated additional staff that will be occasionally required on site are proposed to include:

- Ten additional staff on-site approximately 30 days per year to assist with collection and clean out
- Five additional staff on-site approximately 30 days per year to assist with shed set up, placement and vaccination of birds

4. IMPACT ASSESSMENT

4.1 ASSESSMENT PARAMETERS

It is a requirement when analysing traffic impacts to adopt a 10-year design horizon from the year of opening / full operation of the proposed development. The following development parameters have been adopted for the purpose of the assessment:

- Existing traffic count: 2024
- Year of operation: 2026
- 10-year horizon: 2036

4.2 TRAFFIC GENERATION AND DISTRIBUTION

Traffic generated by the development has been obtained from Baiada. **Table 3** provides a summary of traffic generation associated with the proposed farm. As shown, it is anticipated that the proposed poultry farm will generate approximately 4700 heavy vehicle trips per year, averaging approximately 14 heavy vehicle trips per day (7 incoming / 7 outgoing) and 12 light vehicle trips (6 incoming / 6 outgoing). While a majority of the heavy vehicles will typically occur during the day, bird collections does occur at night. During the night time collection, the heavy vehicles could be up to a maximum of 38 trips (19 incoming / 19 outgoing) on a peak collection night. It is noted that the surrounding traffic on Oxley Highway would be significantly reduced during this night time period.

Table 3: Traffic Generation

GENERATION	VEHICLE TYPE	Trucks / Cycle	Trips / Cycle (Trucks x 2)	Trips / Year (5.2 Cycles)
HEAVY VEHICLES				
Chick Placement	Large Rigid	13	26	135
Bedding Material	B-Double	21	42	216
Feed Deliveries	B-Double	169	338	1758
Bird Collection	B-Double	151	302	1568
Mortality Collection	Small Rigid	50	100	520
Floor Litter Collection	B-Double	34	68	352
Gas Deliveries	Semi-Trailer	16	31	162
			906 / Cycle	**4711 / Year 14 / Day**
LIGHT VEHICLES				
Staff Vehicles	Farm Staff Cars	6 Cars / Day		**4380 / Year 12 / Day**

Therefore, expected traffic during operation consists of 12 light vehicle and 14 heavy vehicles per day, both entering and exiting. An estimate of the proportion of traffic entering and exiting the development during the identified peak hours of 9:00-10:00am and 4:00-5:00pm for the AM and PM peak hour respectively is shown in Table 4, which assumes that very few staff vehicles would enter in the peak period.

Table 4: Estimated Trip Distribution (% Split) (Source: PSA Consulting)

Vehicle Type	AM Peak		PM Peak	
	IN %	OUT %	IN %	OUT %
Light Vehicles	90%	10%	10%	90%

Heavy Vehicles	90%	10%	10%	90%

Table 5 outlines the number of vehicles entering and exiting the site during the AM and PM peak hours.

Table 5: Estimated Traffic Generation (Source: PSA Consulting)

Vehicle Type	AM Peak		PM Peak	
	Entering Development	Exiting Development	Entering Development	Exiting Development
Light Vehicles	2	0	0	4
Heavy Vehicles	2	0	0	2

4.3 DEVELOPMENT TRAFFIC TURNING VOLUMES

The development generated traffic volumes are further distributed at the Oxley Highway with the assumed split based on historic traffic data as shown in Table 6.

Table 6: Oxley Highway Vehicle Directional Split (Source: TfNSW)

Direction	AM Peak	PM Peak
Northbound	47%	53%
Southbound	53%	47%

The assumed development traffic movements of light and heavy vehicles have been calculated and presented in Figure 8 and Figure 9 for the AM and PM peak hour respectively.

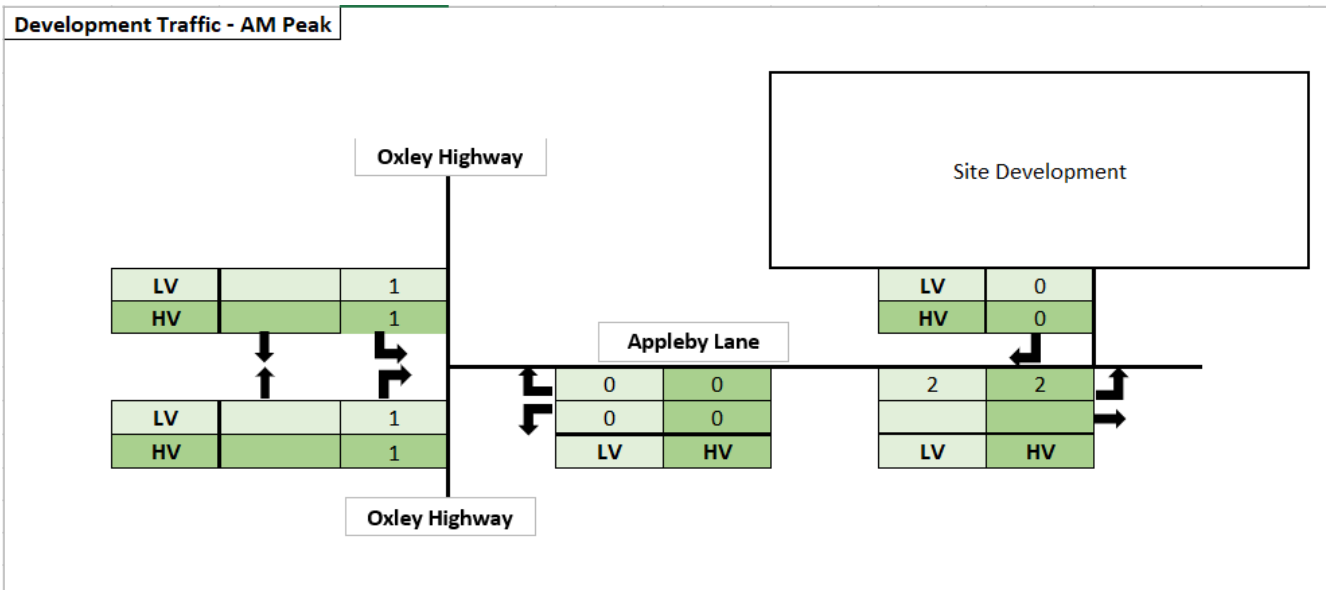


Figure 8: Development Traffic Movement - AM Peak (Source: PSA)

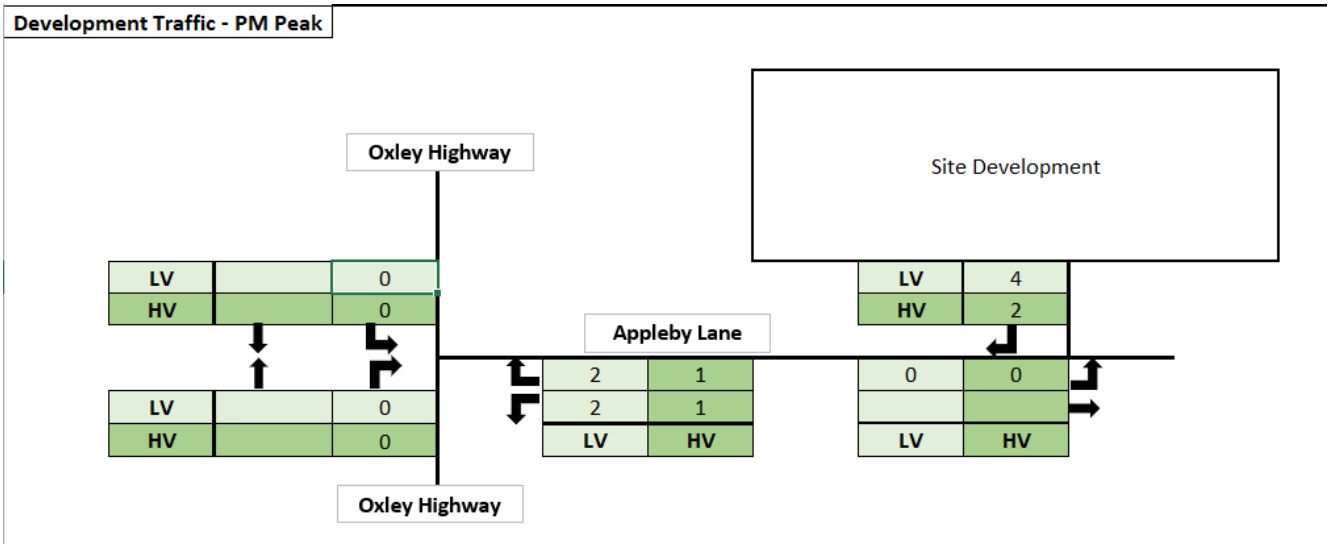


Figure 9: Development Traffic Movement - PM Peak (Source: PSA)

4.4 IMPACT ASSESSMENT

The calculated background traffic for 2026 and the development traffic provide the design traffic generated from the site as shown in shown in Figure 10 and Figure 11.

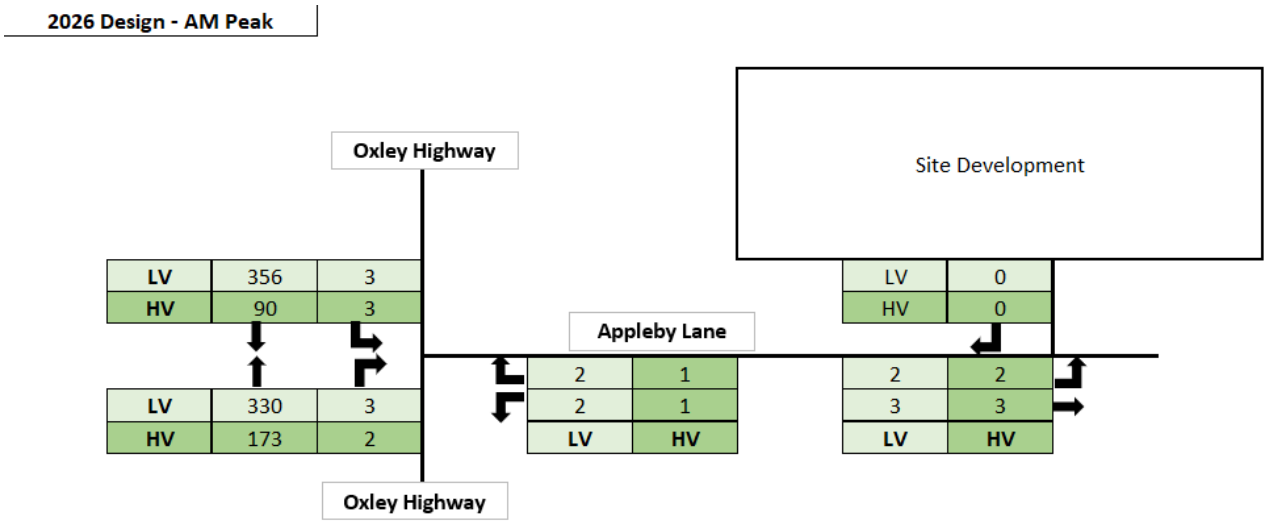


Figure 10: 2026 Design Traffic - AM Peak (Source: PSA)

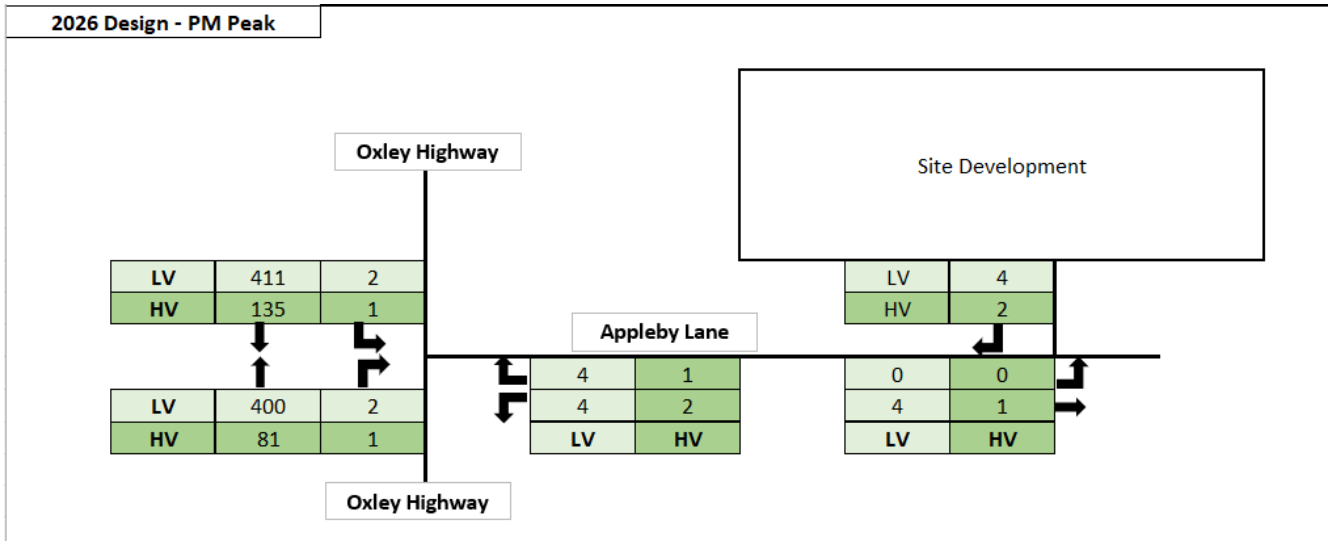


Figure 11: 2026 Design Traffic - PM Peak (Source: PSA)

The calculated background traffic for 2036 and the development traffic provide the design traffic generated from the site as shown in shown in Figure 12 and Figure 13.

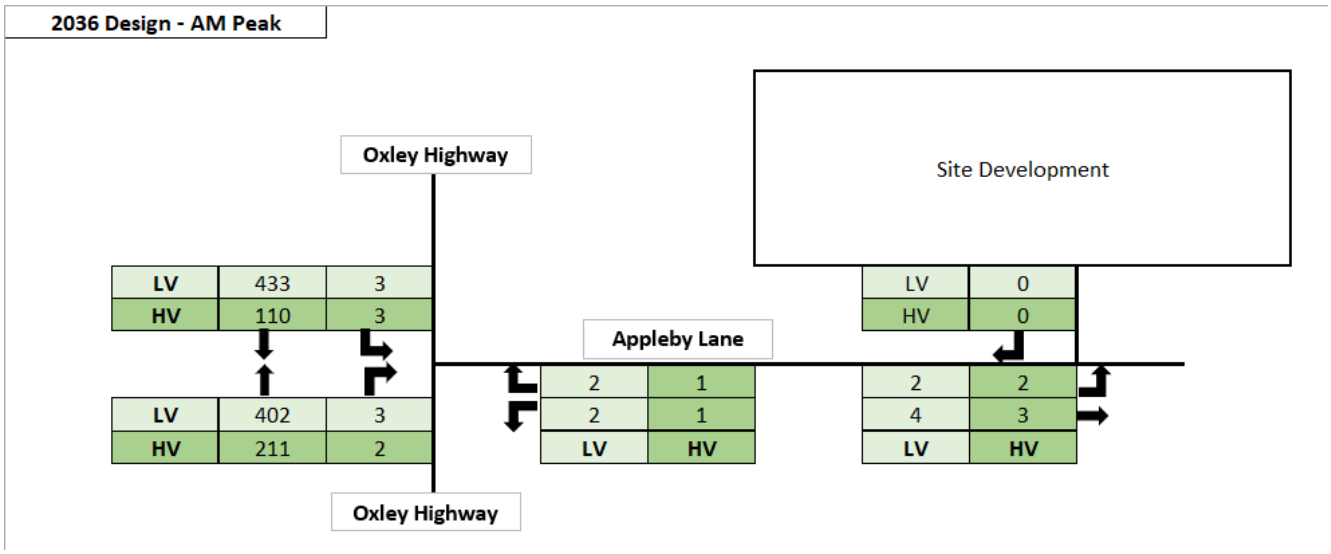


Figure 12: 2036 Design Traffic - AM Peak (Source: PSA)

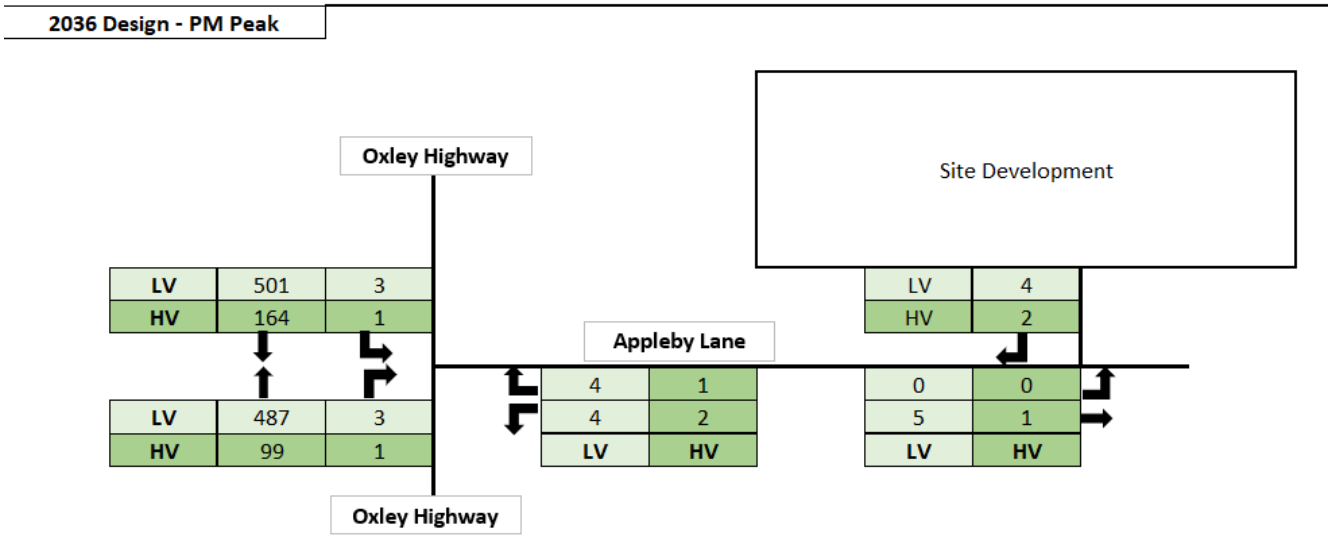


Figure 13: 2036 Design Traffic - PM Peak (Source: PSA)

Austroads Guide to Traffic Management Part 3: Traffic Study and Analysis Methods (2009) lists the intersection capacity – uninterrupted flow conditions for a range of traffic volumes for unsignalised intersections. This is shown in Table 7.

Table 7: Source: Uninterrupted Flow Conditions (Source: Austroads)

Major Road Types	Major Road Flow (vph)[2]	Minor Road Flow (vph)[3]
Two-Lane	400	250
	500	200
	650	100
Four Lane	1000	100
	1500	50
	2000	25

Note:

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

3. Minor road design volumes include through and turning movements

Figure 12 and Figure 13 show that it is unnecessary to carry out intersection analysis when combinations of major and minor road volumes are less than those outlined in Table 7.

4.4.1 Crash History

The vehicle crash history within the vicinity of the development was sourced from the TfNSW LGA view crashes map which occurred within a 5-year period (2019-2024) from this report as shown in Figure 14.

Figure 14: Surrounding Development Crash Locations (Source: TfNSW)

The crash locations identified in Figure 14 have been further analysed by the characteristics of the crashes included in Table 8. This is considered a high crash rate for the low volumes of vehicles using this part of the road network. The multiple occurrences of rear-end crashes along with the off-road crashes and head-on crashes indicate a need for any development generated traffic to be suitable contained within appropriate turning provisions, including ensuring sufficient sight distance is provided at accesses.

The crashes within the grey cells include the crashes that occurred on Manilla Road, which is not proposed to form part of the route for vehicles generated by the development.

Table 8: Surrounding Crash Data Locations Characteristics (Source: TfNSW)

Year	Crash ID	Degree of Crash	Description	Number Injured	Number Killed
2019	1213285	Moderate Injury	Head On	1	-
2020	1222966	Serious Injury	Rear End	2	-
2020	1223092	Serious injury	Rear End	2	-
2019	1221082	Moderate Injury	Off road to right	1	-
2022	1312006	Moderate Injury	On road out of control	2	-
2022	1306409	Non-casualty (towaway)	Right rear	-	-
2022	1304908	Fatal	Off road right to object	-	1

2020	1238102	Serious Injury	On road-out of control	-	-
2019	1204714	Minor/Other Injury	Off road right to object	2	-
2019	1212045	Non-casualty (towaway)	On road-out of control	-	-
2021	1270645	Serious Injury	Off road to left	1	-
2020	1242416	Serious Injury	Right near	1	-
2019	1198479	Fatal	Head On	1	2

5. SITE ACCESS AND ON-SITE PARKING

5.1 TURN WARRANTS ASSESSMENT

A turn warrants assessment has been undertaken to determine the requirements (or otherwise) for the installation of additional turning lanes at the Appleby Lane / Site Access and Oxley Highway / Appleby Lane intersection.

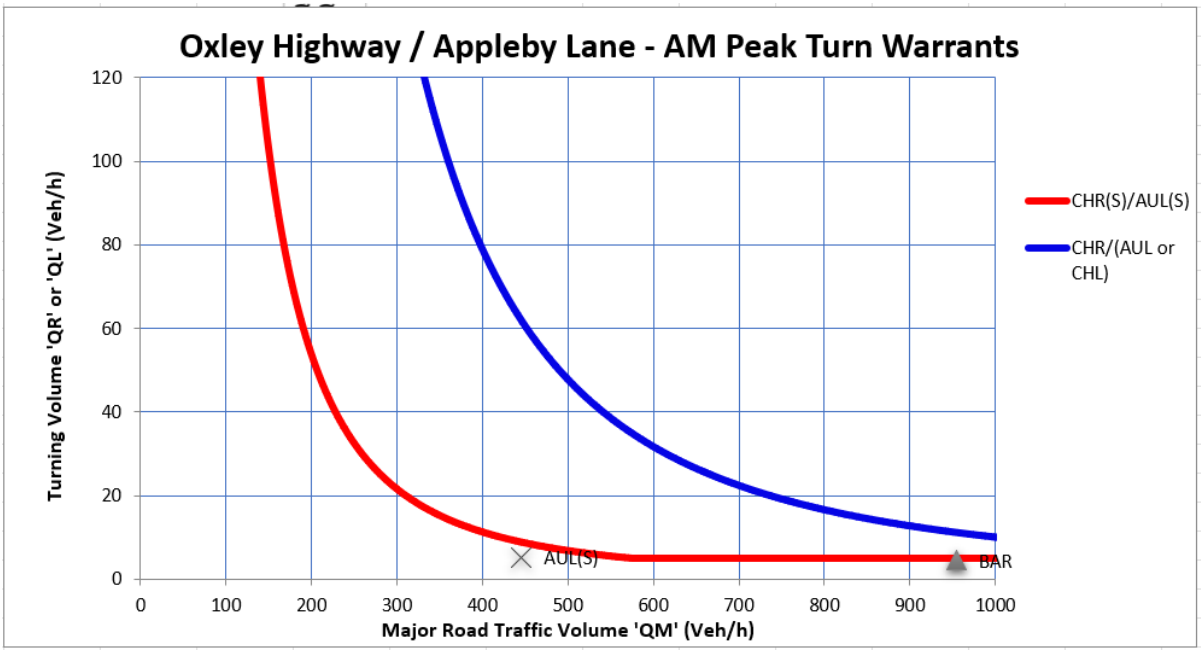


Figure 15: Turn Warrant Assessment - Oxley Highway / Appleby Lane - 2026 Design AM Peak (Source: Austroads, PSA)

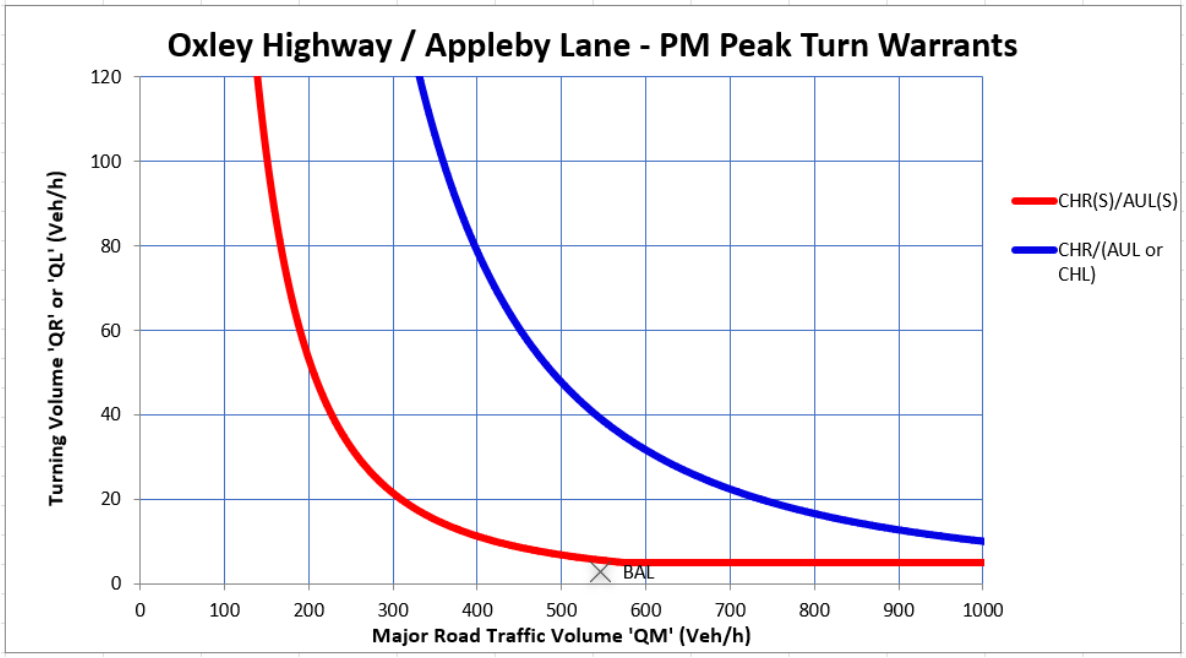


Figure 16: Turn Warrant Assessment - Oxley Highway / Appleby Lane - 2026 Design PM Peak (Source: Austroads, PSA)

Based on Figure 15 and Figure 16 it is seen that the traffic volumes travelling from Oxley Highway / Appleby Lane intersection will trigger the requirement of a Basic Left Turn (BAL) and a Basic Right Turn (BAR) treatment based on

the volumes entering Appleby Lane. Therefore, the current intersection arrangement of Oxley Highway / Appleby Lane is deemed adequate and no mitigation measures is deemed necessary.

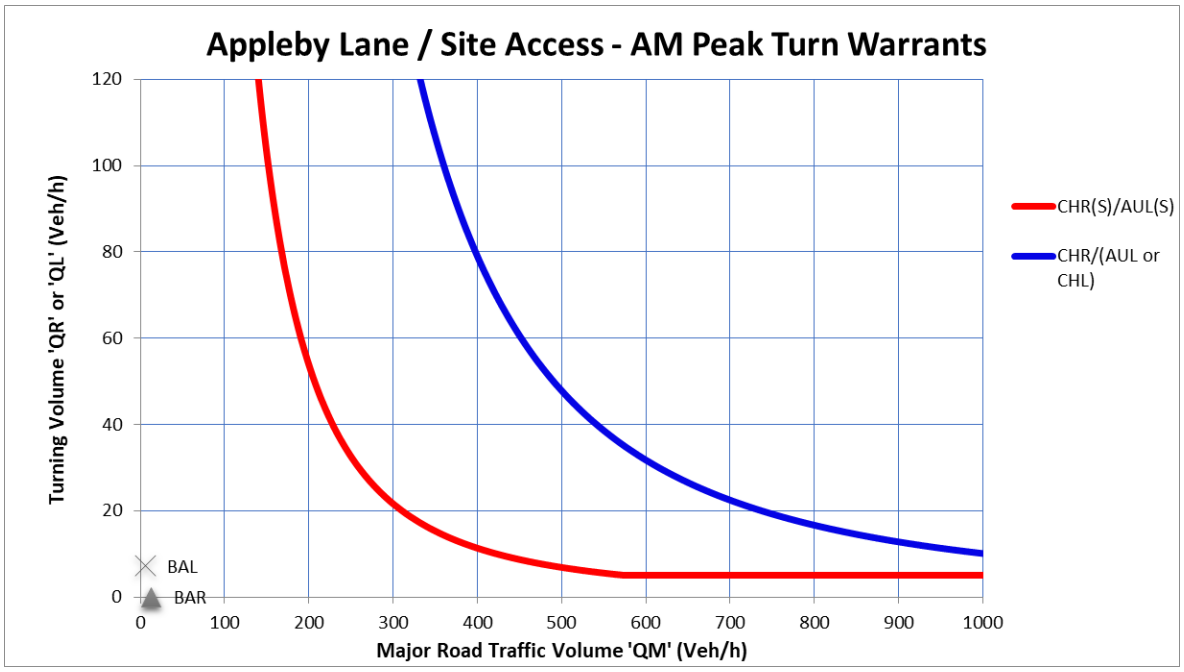


Figure 17: Turn Warrant Assessment - Appleby Lane / Site Access- 2026 Design AM Peak (Source: Austroads, PSA)

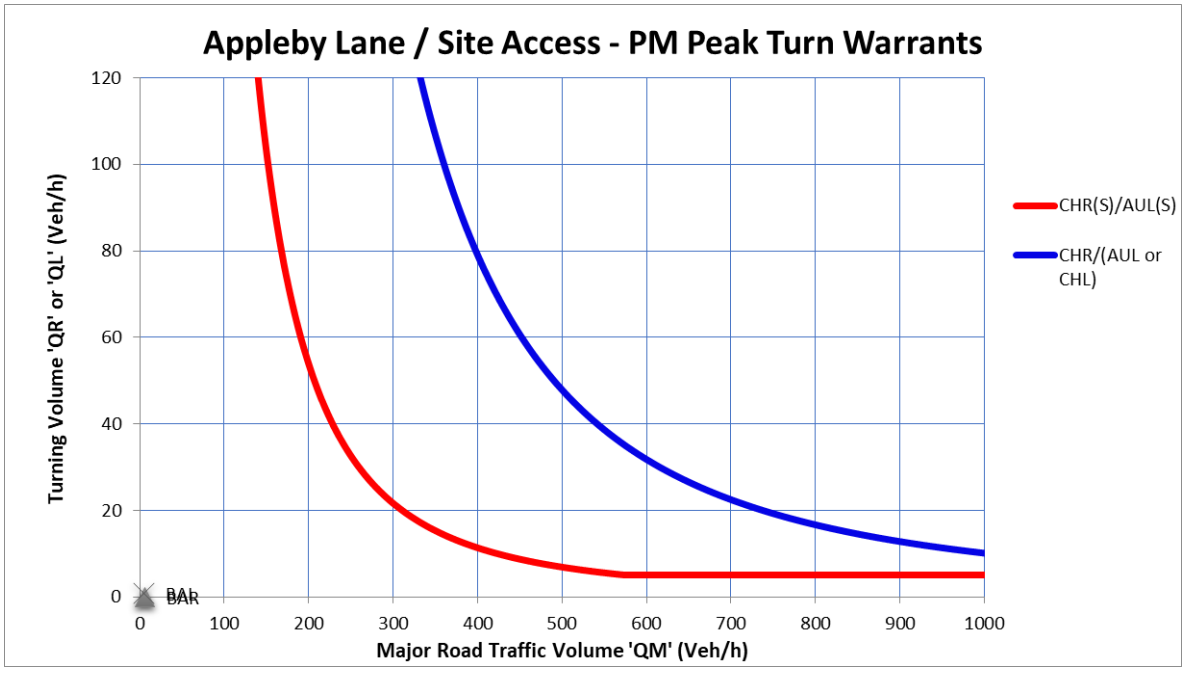
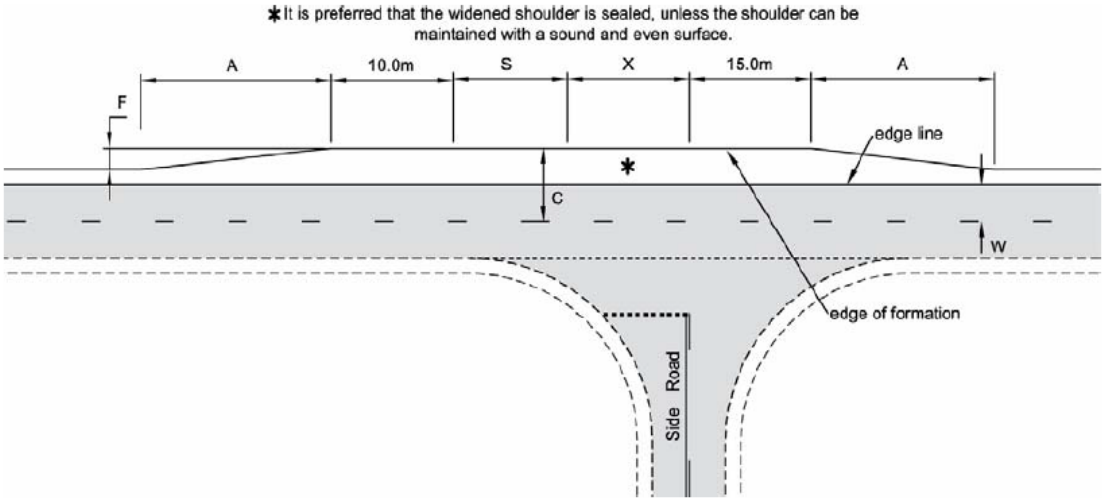


Figure 18: Turn Warrant Assessment - Appleby Lane / Site Access- 2026 Design PM Peak (Source: Austroads, PSA)

Figure 17 and Figure 18 represent the required turn treatments along Appleby Lane / Site Access intersection. Based on these figures, it is seen that the traffic volumes will trigger a BAL and BAR treatment at Appleby Lane / Site Access intersection to allow vehicles to manoeuvre into the site safely based on the speed and traffic volumes. Figure 19 and Figure 20 illustrates the design layout for Basic Right (BAR) and Basic Left (BAL) turn treatments.



W= Nominal through lane width (m) (including widening for curves). Width to be continuous through the intersection.

C = On straights - 6.5m minimum
- 7.0m minimum for Type 1 & Type 2 Road Trains

On curves - widths as above + curve widening (based on widening for the design turning vehicle plus widening for the design through vehicle)

$$A = \frac{0.5 \times V \times F}{3.6}$$

Increase length A on tighter curves. Where the design through vehicle is larger than or equal to a 19m semi-trailer, the minimum speed used to calculate A is 80km/h.

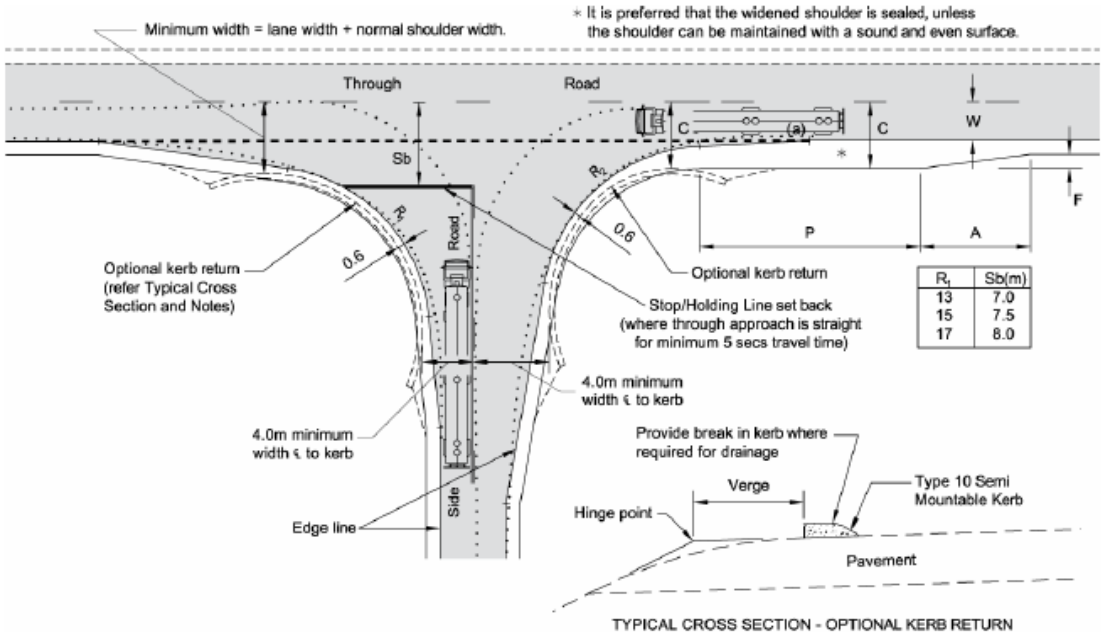
V = Design speed of major road approach (km/h)

F = Formation/carriageway widening (m)

S = Storage length to cater for one design turning vehicle (m) (minimum length 12.5m)

X = Distance based on design vehicle turning path, typically 10 - 15m

Figure 19: BAR Design Layout on Rural Road (Source: Austroads)



Design Speed of Major Road Approach (km/h)	Minimum Length of Parallel Widened Shoulder P (m) (1)
50	0
60	5
70	10
80	15
90	20
100	25
110	35
120	45
(1) Adjust for grade using the 'Correction to Grade' table in Figure 13.42.	

W = Nominal through lane width (m) (including widening for curves)

C = On straights - 6.0m minimum
On curves - 6.0m plus curve widening (based on widening for the design turning vehicle plus widening for the design through vehicle)

$$A = \frac{0.33 \times V \times F}{3.6}$$

V = Design speed of major road approach (km/h)

F = Formation/carriageway widening (m)

Note: Refer to Appendix 13E for dimensions of BAL layouts to suit various articulated vehicles

Figure 20: BAL Design Layout on Rural Road (Source: Austroads)

5.2 PROPOSED DEVELOPMENT SITE ACCESS

Access to the site will occur at a proposed all-movements priority-controlled T-intersection with Appleby Lane

5.3 DESKTOP SIGHT DISTANCE ASSSESSMENT

A desktop safe sight distance assessment has been undertaken for Appleby Lane / Site Access intersection whereby Appleby Lane has a posted speed limit of 100km/hr and therefore the sight distance requirements are for a 110km/hr design speed. The requirements for a design speed of 110km/hr have been highlighted in Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections and are shown in Table 9.

Table 9: Appleby Lane / Site Access – Sight Distance Requirements (Source: Austroads)

Scenario	ASD[a]	SISD[b]	MGSD[c]
Appleby Lane Posted Speed: 100km/h Design Speed: 110km/h	193m	285m	153m

[a] Approach Sight Distance – Minimum sight distance required from Site access to the Appleby Lane intersection
[b] Safe Intersection Sight Distance – Minimum sight distance required from Appleby Lane to the intersection
[c] Minimum Gap Sight Distance – Minimum sight distance required at the intersection from the Site access to see vehicles on Appleby Lane

Sight distance trianges have been created using the SISD lengths speciifed in Table 9 and are shown in Figure 21.

Figure 21: Appleby Lane / Site Access - Sight Distance Triangles (Source: Nearmap, PSA Consulting)

Sight distance views have been provided in Figure 22 and Figure 23 for the west view and east view respectively.

Figure 22: Sight Distance West View at Site Access (Source: Google Streetview)

Figure 23: Sight Distance East View at Site Access (Source: Google Streetview)

Based on Figure 22 and Figure 23, it is seen that there is sufficient sight distance in both the east and west on Appleby Road and therefore no mitigations is necessary for the sight view.

5.4 ON-SITE PARKING AND SERVICING REQUIREMENTS

The Tamworth Development Control Plan (DCP) establishes guidelines for on-site parking in connection with various development projects. Specifically minimum on-site parking rates which outline the car parking requirements based on the land use. The proposed development is defined as a poultry farm (agriculture) however, since there are no parking rates associated with these uses, the parking rates for industry has been used for this assessment. Table 10 outlines the required car parking spaces necessary based on the development.

Table 10: Car Parking Requirements (Source: Tamworth DCP)

Land Use	Parking	Comments
Industry	1 space per 75m GFA Or 1 space per 2 employees (whichever is greater)	This requirement may increase when retailing is permitted on-site, or the office space component is in excess of 20% of the floor area. On-site truck parking spaces should be provided for each vehicle present at any one time excluding those vehicles in loading docks. Under no circumstances is the parking or trucks on public roads acceptable.

As the main workers area of the farm has a GFA of approximately 425m^2, 10 car parks would be required to adhere to the DCP. Therefore, there is sufficient car parking spaces on the site for parking and manoeuvring. Since the development site plan contains 10 car parking spaces.

Furthermore, Table 10 states that on-site truck parking spaces should be provided for each vehicle present at any one time and under no circumstances should parking of trucks be acceptable on public roads.

5.5 SWEPT PATH ASSESSMENT

Swept path analysis has been undertaken for the proposed Site Access along Appleby Lane to examine the ability for vehicle to manoeuvre in and out as well as around the site. AutoCAD and AutoTurn was used to provide these swept paths for the operational accessibility for the following vehicles:

- Semi-trailer
- B- Double
- A-Double
- B99 and B85 (For Staff)

6. CONCLUSION

PSA Consulting has been engaged by Baida Properties Pty Limited to undertake a Traffic Impact Assessment (TIA) to accompany a development application for the proposed poultry farm on 448 Appleby Lane, Appleby NSW. A summary of the findings of the TIA is as follows:

- The proposed development involves the constriction of 16 shed broiler farms containing 60 000 birds per shed which equates to a total of 960 000 birds along the facilities and infrastructure.
- The site has an area of approximately 350ha of land and is situated 16km northwest of Tamworth NSW
- The development is located on Appleby Lane which bisects the property and heavy vehicles will gain access via Wallamore Road and / or Oxley Highway
- It is assumed that heavy vehicles will utilise Oxley Highway for movements to and from the site
- Traffic volumes along Oxley Highway have been established by TfNSW and it has been assumed that 0.5% of these volumes will travel to and from Appleby Lane
- The traffic generated by the development will consist of an average of 12 light vehicles and 14 per day with the assumption that a portion of these trips will occur during the peak hour.
- 2 light vehicles will enter in the site during the AM peak hour and 4 light vehicles will exit the site during the PM peak hour.
- 2 heavy vehicles will enter in the site during the AM peak hour and 2 heavy vehicles will exit the site during the PM peak hour.
- A detailed impact assessment was not undertaken due to the traffic generated by the proposed development not anticipating adverse or significant impacts to the existing road network
- The assessment demonstrated that no works are required at the Appleby Lane / Oxley Highway intersection as a Basic Left Turn treatment and Basic Right Turn treatment in accordance with Austroads Guide to Road Design are sufficient to cater for the development trip generation
- It is recommended that the access to the site is designed from Appleby Lane as a Basic Right Turn and Basic Left Turn treatment in accordance with Austroads Guide to Road Design

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