# Traffic Impact Assessment

For

Rezoning of Lot 1 & Part Lot 2
DP 258008

Wheelers Lane Mitchell Hwy Dubbo

February 2012

**de Groot & Benson Pty Ltd**

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## Wheelers Lane Mitchell Hwy Dubbo

February 2012

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# 1 TRAFFIC AND PARKING IMPACT STATEMENT

## 1.1 Introduction

### 1.1.1 General

This report provides a traffic impact assessment for the rezoning of two (2) parcels of land being Lot 1 DP 258008 and part Lot 2 DP 258008. These parcels of land are currently zoned RE1 Public Recreation. The subject land is situated between both Wheelers Lane and Mitchell Hwy Dubbo and borders the Orana Mall Shopping Centre carpark. This traffic impact assessment is generated by a proposal to rezone the subject land from RE1 Public Recreation to B2 Local Centre. Orana Mall is zoned B2 Local Centre.

### 1.1.2 Description

The subject land has recently been redeveloped into carparking areas. This has created 244 carparking spaces for public use accessible via Mitchell Hwy, Wheelers Lane and Orana Mall car park. Prior to this the land was unoccupied open space.

The combined size of the two (2) allotments is 8,788sq.m. Lot 1 is 1,900sq.m and contains 50 carparking spaces and Part Lot 2 is 6,888sq.m with 194 carparking spaces.

The southern boundary of Lot 2 is open space and Mitchell Highway. This open space is proposed to remain RE1 Public Recreation. The western boundary of the subject land is open space and Wheelers Lane. The open space is also proposed to remain RE1 Public Recreation.

The northern boundary of Lot 1 is an adjoining commercial property being a medical centre. The northern boundary of Lot 2 and the western boundary of Lot 1 is the carpark for Orana Mall Shopping Centre.

### 1.1.3 Scope of Report

The scope of this report is to assess the impact of traffic and parking on potential land use in the event the land is rezoned from RE1 Public Recreation to B2 Local Centre.

The traffic impact assessment must consider impacts from the proposed alterations to the vehicular entrance location, pedestrian entrance location and the proposed rezoning.

This traffic impact assessment is structured as follows;

- Section 1.2 considers the public road network
- Section 1.3 considers traffic generation and volumes generated by the potential developments on rezoned land
- Section 1.4 considers the impact of additional traffic on the public road network
- Section 1.5 considers the impact of additional traffic on access arrangements

- Section 1.6 considers the pedestrian network and accessibility
- Section 1.7 considers parking provisions for potential developments
- Section 1.8 concludes the traffic impact assessment and provides recommendations

### 1.1.4 Key Objectives

The objective of this report is to provide a traffic impact assessment on the application to rezone the public land in question. The key issues that are presented with this objective can be summarized as follows:

- Assess the traffic generation for the existing condition.
- Assess the traffic generation for the B2 Local Centre rezoning case.
- Compare and comment on the potential rezone implications for the short, medium and long term periods.
- Assess the impacts from the proposed alteration to the vehicular entrance location
- Assess the impacts from the proposed alteration to the pedestrian entrance location

### 1.1.5 References

The following standards, guidelines and documents were used in preparing this report;

1. Dubbo City Council - Standards for Off Street Parking of Motor Vehicles
2. RTA Guide to Traffic Generating Developments 2002
3. Transport NSW – Integrating Land Use and Transport 2001
4. AS2890.1 Parking Code - Off Street Parking
5. De Groot & Benson – Statement of Environmental Effects DA for Orana Mall 2010

## 1.2 The public road network at Lot 1 & Part Lot 2 DP 258008

The subject land is bounded by public roads and open space, and by neighbouring properties being the Orana Mall Shopping centre. The road network is an urban road network.

The southern boundary is open space and Mitchell Highway, a state highway therefore a classified road. The open space between the road and the subject land is proposed to remain RE1 Public Recreation.

The western boundary is open land and Wheelers Lane, an arterial road. Wheelers Lane and Mitchell Highway intersect at a large roundabout. The open land between Wheelers Lane and the subject land is proposed to remain RE1 Public Recreation.

Wheelers Lane has an entry/exit point into Orana Mall that crosses the subject land. To the east of Lot 2 lies an entry/exit point for Orana Mall traffic off Mitchell Hwy.

Each of the roads and their estimated capacity is described in some detail below.

### 1.2.1 Traffic counts on public roads

Dubbo City Council has supplied the following traffic data;

*Traffic data as requested on per council's database.*

*Wheelers Lane: Oak to Birch Ave (these figures may not be reliable)*
*Southbound - 7257vpd ( 2007)*
*Northbound - 4710vpd ( 2007)*

*Mitchell Hwy : Wheelers to Windsor Pde link road to Hwy - 7877vpd ( 2007)*

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### 1.2.2 Mitchell Highway

This is a divided carriageway highway with a single property access, comprising a left in/left out arrangement to Orana Mall with a deceleration lane. Across Lot 2 frontage the highway has 2 lanes 3.5m wide eastbound with kerb and gutter between Wheelers Lane and the Orana Mall access, and one lane westbound with a gravel verge becoming 2 lanes for approximately 100 metres on the approach to the roundabout. There is no access to Orana Mall from westbound lane. Mitchell Highway has motorway designation across the frontage of Lot 2. The road is flat and has a capacity of 1900 vph per lane, ie 3800 vph, and is signposted with a speed limit of 60 km/hr. Photo 1.1 shows Mitchell Highway at the south west corner of Lot 2.

Parking does not appear to be restricted, although no parking has been observed on the northern side and some trucks have been observed to park on the southern side road verge. A bus stops on the southern side of the highway, opposite Orana Mall.

AADT traffic volumes on Mitchell Highway is 7877 in 2008 in the road section adjacent to Orana Mall (total two way). The peak hour traffic is estimated at 15% being 1181. Mitchell Highway has LOS 'A'.

No roadwork improvements are understood to be currently scheduled or proposed for Mitchell Highway in the vicinity of the subject land.

Photo 1.1: view of Mitchell Highway passing Orana Mall (on left side of photo)

### 1.2.3 Wheelers Lane

Wheelers Lane is an urban arterial road of 4 lane divided carriageway standard with 3.5 m lanes and some cycleway capacity. Wheelers Lane provides a left in/left out access arrangement to Orana Mall for general traffic and a left out exit driveway for service vehicle traffic from the northern side of Orana Mall. The left in movement benefits from a deceleration lane. The road has good sight distance, is sealed and has kerb and gutter to each carriageway, and has a posted speed of 60 km/hr. A bus stop facility is available on eastern side of Wheelers Lane just before the Mitchell Highway roundabout. Photo 1.2 shows Wheelers Lane looking North from the roundabout in the south west corner of the subject land.

Council traffic counts indicate traffic AADT is;
Wheelers Lane: Oak to Birch Ave (*these figures may not be reliable*)
Southbound - 7257vpd ( 2007)
Northbound - 4710vpd ( 2007)

The southbound lanes provide access to and from Orana Mall. With six property access along the road, relatively low down grades, the southbound road capacity is estimated to be 1430 vph for LOS 'B" whilst the peak hour traffic is likely to be 12% of the AADT, or 870 vph. Generally an interrupted flow arterial road of 2 lanes divided each way can have a flow capacity up to 1900 vph, so an estimate of 1430 vph capacity is conservative. Consequently Wheelers Lane is considered to have LOS 'A'.

Photo 1.2: Wheelers Lane looking north (subject land on right side of photo)

### 1.2.4 Mitchell Highway – Wheelers Lane Intersection

This intersection is a large roundabout. Observed performance under traffic is satisfactory. Council has requested analysis of this intersection. A traffic count was carried out one week prior to Christmas 2009 and the analysis of the roundabout confirmed the overall performance of the roundabout to be level of service 'B'. A significant queue develops in peak periods on the inside lane making a right turn from Wheelers Lane to Cobra Street (Mitchell Hwy west of Wheelers Lane).

### 1.2.5 Existing Traffic Composition and Flows

A count across the various accesses to Orana Mall was carried out by RTA in April-May 2005 and determined 394,474 trips, with the daily average of 14,088 trips. Conversion to passenger car equivalents yield an average daily traffic of 14,540 approximately, distributed across the then existing access points as shown on figure 1.3.2. Vehicle counts are not available since 2005, however customer counts at entry doors indicate a reduction in customer flow of 2.1%.

The access arrangements are such that traffic is encouraged to use the Mitchell Highway for entry to Orana Mall and exit via Wheelers Lane, then use the roundabout at Mitchell Hwy-Wheelers Lane for decision on direction of traffic flow. The traffic count revealed that 43% of inbound Orana Mall traffic enters via Mitchell Highway and 50% of outbound traffic exits via Wheelers Lane. Only 4% of traffic leaves the site via Mitchell Highway, as that exit is not conducive for multi directional decision making via the public road network.

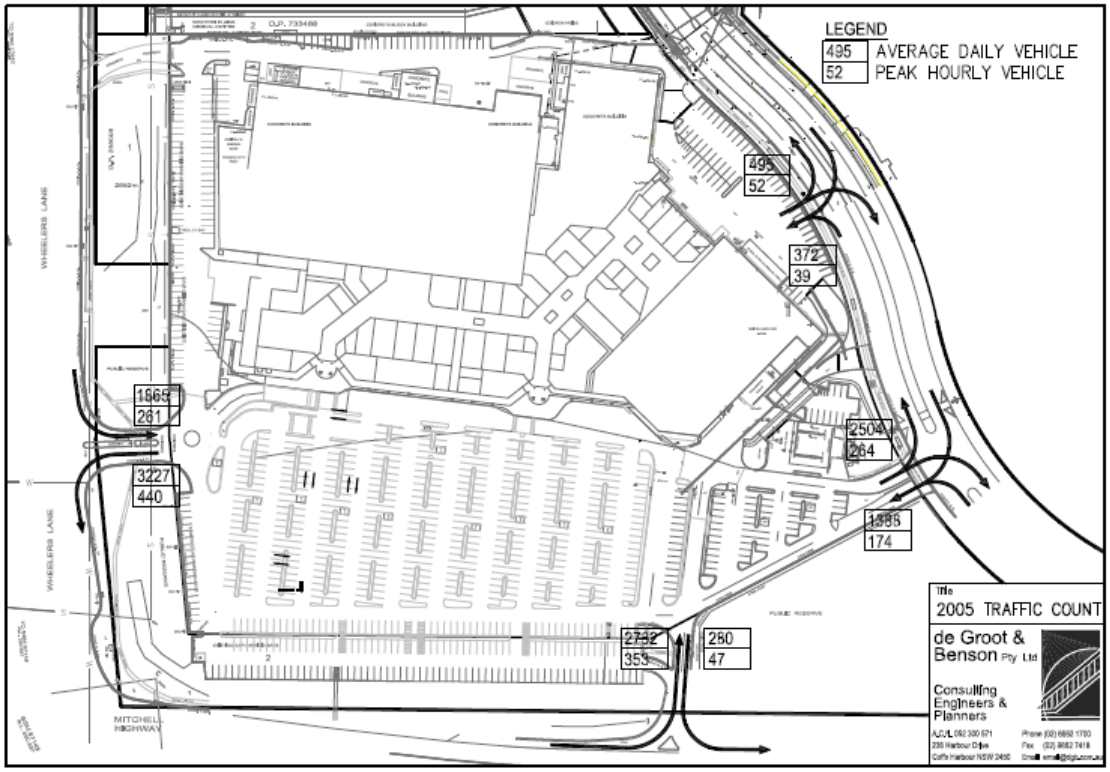



Figure 1.2.5 traffic distribution across access points (2005 traffic survey)

### 1.2.6 Traffic Safety

According to historical data supplied by Council and RTA, the road safety statistics in Dubbo have been decreasing significantly since 1996. There are no scheduled roadworks to be undertaken on this road network in the near future.

## 1.3 Traffic volumes for potential developments

The proposal is to rezone the subject land. The rezoning proposal brings to light three (3) possible scenarios that may impact the associated road network. These options are discussed in detail within the traffic impact assessment report and are as follows;

1. Zoning of the land remains as RE1 Public Recreation.
2. B2 Local Centre zoning is granted and the subject land is consolidated with adjacent land.
3. B2 Local Centre zoning is granted and the subject land remains as a standalone property.

### 1.3.1 RE1 Zoning

Although there are no traffic generating developments within the subject land a playspace is situated to the east of Lot 2. Parking for this playspace is provided within the subject land. This generates a small traffic load onto the subject land removed from the Orana Mall traffic load.

Data for this facility is not documented but observations of similar sized regional playspaces indicate the AADT is of the order of 80 vehicles per day with a peak trip generation of 12 vehicles per hour. This is considered very minimal to the capacity of the existing road network and need not be elaborated. The traffic generating data for the playspace will be included in further calculations.

### 1.3.2 B2 Consolidated Land

On the basis that the rezoning proposal is granted and the subject land is consolidated with Orana Mall, the traffic impact will be similar to Section 1.3.1. The additional traffic load from any traffic generating development situated on the subject land in the future will be subject to a future traffic impact assessment associated with such development proposal. In the event that the land is developed only for carparking( as it essentially exists now) then there is no further impact beyond that assessed as part of the Orana Mall traffic impact assessment for DA 2009/502 (summarized below).

#### 1.3.2.1 Traffic generation for proposed Orana Mall development (DA 2009/502)

Orana Mall has been assessed for traffic generation using the RTA Guide to Traffic Generating Developments (2002). The additional retail area is specialty shops, and a generalised area rate is not appropriate, hence the rate of 107 trips per 1000m$^2$ GLFA is used.

| Development | daily average generation | evening peak hourly traffic |
|---|---|---|
| existing 20,070 m$^2$ GLFA | 12,644 | 1505 |
| additional 3606 m$^2$ GLFA | 2,001 | 386 |
| Total | 14,645 | 1891 |

#### 1.3.2.2 Distribution of additional AADT traffic to access points for DA 2009/502

Additional daily traffic of 1505 represents in and out trips. These trips have been redistributed across the access points in proportion to measured traffic flows discussed in Section 1.2.5.

Table 1.3.2.2a Inbound AADT Flows

| Access point | inbound flow vpd (2005) | Additional inbound flow | Predicted inbound flow |
|---|---|---|---|
| Mitchell Highway | 2782 | 434 | 3216 |
| Wheelers Lane main access | 1865 | 291 | 2156 |

These distributions are added to the figures in Figure 1.2.5 to predict the outbound traffic for Orana mall as tabled below;

Table 1.3.2.2b Outbound AADT Flows

| Access point | outbound flow vpd (2005) | Additional outbound flow redistributed | Predicted outbound flow vpd |
|---|---|---|---|
| Mitchell Highway | 430 | 66 | 496 |
| Wheelers Lane main access | 3282 | 505 | 3787 |

### 1.3.2.3 Distribution of additional peak hourly traffic to access points

Additional daily traffic of 386 represents in and out trips. These trips have been redistributed across the access points in proportion to measured traffic flows discussed in Section 1.2.5.

Table 1.3.2.3a Inbound Peak Flows

| Access point | inbound flow vph (2005) | Additional inbound flow | Predicted inbound flow |
|---|---|---|---|
| Mitchell Highway | 353 | 84 | 437 |
| Wheelers Lane main access | 261 | 56 | 317 |

These distributions are added to the figures in Figure 1.2.5 to predict the outbound traffic for Orana mall as tabled below;

Table 1.3.2.3b Outbound Peak Flows

| Access point | outbound flow vph (2005) | Additional outbound flow redistributed | Predicted outbound flow vph |
|---|---|---|---|
| Mitchell Highway | 47 | 24 | 71 |
| Wheelers Lane main access | 440 | 118 | 558 |

### 1.3.2.4 Mitchell Highway

Additional traffic of 500 vpd represents a 6% increase in traffic on the Mitchell Highway. This is well within the environmental capacity of the road and the level of service will not change

### 1.3.2.5 Wheelers Lane

The additional traffic of 802 vpd predicted for Orana mall is expected to increase the southbound daily traffic from 7257 vpd to 8059 vpd, some 11% daily. Peak hour traffic is estimated at 15% to be 1209 vph, which is less than the calculated 1430 vph capacity for LOS 'B', hence the level of service for Wheelers Lane is predicted to not change from the current LOS 'A'.

### 1.3.3 B2 Separate Entity Land

For the scenario where B2 Local Centre zoning is granted and the subject land remains a separate title to the adjacent B2 zoned land, a permitted development could potentially be constructed on the subject land. This would impose an additional traffic volume onto the existing road network in addition to the Orana Mall expansion figures in Ref 5. This scenario is often referred to as "long term" within this report.

From the list of council permitted developments for the subject land the following list shows the feasible options which could be constructed in the long term;

- Medical Centre
- Childcare Centre
- Takeaway or Drive-thru Store
- Information Centre
- Commercial Premises
- Restaurant

Any of the above developments (or a combination of) could be situated within the subject land and generate additional traffic to the existing road network. Required parking provisions and the building footprint of the development would consume current parking spaces within the parcels of land. The following sections of this report analyse possible scenarios for the subject land.

The following Table 1.3.3 compares required provisions for parking between Dubbo City Council and RTA. Traffic generation is determined by "RTA Guide to Traffic Generating Developments" to predict volumes and data regarding existing traffic volumes.

Table 1.3.3:

| **Permitted Development** | RTA Provisions for Parking | Dubbo City Council Provisions for Parking | RTA Traffic Generation Rates | |
|---|---|---|---|---|
| | | | Peak *vph* | AADT *vpd* |
| **Takeaway Food & Drive-thru** | 1 per 2 int seats, or 1 per 3 int/ext seats + 5-12 spaces for queuing | 1 per 2 int seats, or 1 per 3 int/ext seats + 5-12 spaces for queuing | 120 | 600 |
| **Child Care** | 1 per 4 Children | 1 per 4 Children, or 1 per staff plus 1 per 10 Children | 0.8 per Child | - |
| **Medical** | 3 per surgery room | 3 per surgery room plus 1 per staff, or 1 per 25m2 GFA | *48* | *207* |
| **Liquor Drive Thru** | 1 per 8m2 GFA + 5-12 spaces for queuing | 1 per 8m2 GFA + 5-12 spaces for queuing | *120* | *600* |

| | | | | |
|---|---|---|---|---|
| **Restaurant** | 15 per 100m2, or 1 per 3 seats | 1 per 6.5m2 GFA | 5 per 100m2 GFA | 60 per 100m2 GFA |

**Figures in italics have been calculated from basic observations of similar regional developments and predicted general behaviour patterns.*
*# No data could be found for Tourist Information centres.*

### 1.3.4 Mitchell Highway

Part Lot 2 DP 258008 is significantly larger than Lot 1 but it is quite narrow (18m wide) and both ends of the current carpark appear unviable as areas to develop. This is partly due to size, access and functionality. For this purpose it could be envisaged that a permitted development be situated within the middle portion of the lot, adjacent Mitchell Hwy. Table 1.3.3 highlights the traffic data associated with a KFC type development being constructed on the subject land.

Table 1.3.4

| Permitted Development | Area (m2) | Length (m) | Width (m) | Required Parking Provision | Parking spaces consumed by Building Footprint | RE 1 Remaining Parking Spaces | Peak Trips | AADT Trips |
|---|---|---|---|---|---|---|---|---|
| KFC with Drive-thru | 620 | 35 | 18 | 12 | 30 | 202 | 120 | 600 |

The size is based on GFA's of similarly located KFC Drive-thru restaurants. The floor area will consume approximately 30 parking spaces and provision of 12 carparks is required. This development type will generate 120 vph in peak demand and approximately 600 vpd. Approximately 54% of the trips will be undertaken on Mitchell Hwy. Exit patterns show that Wheelers lane will inherit a large portion of the balance of trips.

### 1.3.5 Wheelers Lane

It is conceivable that within the boundaries of Lot 1 DP 258008 certain commercial developments could be constructed. The size of Lot 1 restricts the constructability of some potential developments due to both the operational floor space needed and required parking provisions. Commercial position would also be a factor in the type of development situated in Lot 1.

For the purpose of this exercise a Childcare centre was chosen as a possible development that could be placed on Lot 1 and the traffic data is highlighted in Table 1.3.4.

Table 1.3.5

| Permitted Development | Area (m2) | Length (m) | Width (m) | Required Parking Provision | Parking spaces consumed by | RE 1 Remaining Parking Spaces | Peak Trips | AADT Trips |
|---|---|---|---|---|---|---|---|---|

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Building Footprint | | | |
| Childcare Centre | 750 | 42 | 18 | 8 | 32 | 204 | 24 | *120* |

The size is calculated from similar regional childcare facilities as a sq.m rate per child. The floor area will consume approximately 32 parking spaces and provision of 8 carparks is required. This development type will generate 24 vph in peak demand and approximately 120 vpd. It is plausible to assume all trips occur on Wheelers Lane for this permitted development type. Wheelers lane will also inherit approximately 30% of the trips generated from the Lot 2 permitted development.

### 1.3.6 Distribution of additional daily traffic to access points

From the data provided in Figure 1.3.2 the inbound and outbound daily traffic for both the short and long term scenarios are represented below. The current AADT inbound flow data is taken from Figure 1.2.5. Additional flow for the short term is purely generated from the playspace. The newly predicted short term inbound flow is used as the starting figure for long term traffic.

Table 1.3.6.1 Short Term AADT Inbound Traffic

| **Access Point** | **Inbound Flow vpd** | **Additional Inbound Flow vpd** | **Predicted Inbound Flow vpd** |
|---|---|---|---|
| **Mitchell Hwy** | 3216 | 40 | 3256 |
| **Wheelers Lane** | 2156 | 0 | 2156 |

The long term additional figures below are from Sections 1.3.6 & 1.3.7. The additional figures represent trips generated from the permitted developments likely to be located within the subject land and their respective traffic flows imposed onto the access points of the public road network. This is typical for both inbound and outbound AADT flow.

Table 1.3.6.2 Long Term AADT Inbound Traffic

| **Access Point** | **Inbound Flow vpd** | **Additional Inbound Flow vpd** | **Predicted Inbound Flow vpd** |
|---|---|---|---|
| **Mitchell Hwy** | 3256 | 300 | 3556 |
| **Wheelers Lane** | 2156 | 60 | 2216 |

Due to the road network around the subject land and the exit pattern of Orana Mall patrons the outbound traffic data has been redistributed for the various access points as follows;

Table 1.3.6.3 Outbound AADT Traffic Flow Distribution

| **Access point** | **outbound flow vpd** | **%age** |
|---|---|---|
| Mitchell Highway | 250 | 4% |
| Windsor Parade | 2504 | 42% |
| Wheelers Lane | 3227 | 54% |

Hence the outbound AADT traffic from Orana Mall through the subject land is distributed to the various access points (using Table 1.3.5.3) as tabled below;

Table 1.3.6.4 Short Term AADT Outbound Traffic

| Access Point | Outbound Flow vpd | Additional Outbound Flow vpd | Predicted Outbound Flow vpd |
|---|---|---|---|
| **Mitchell Hwy** | 496 | 2 | 498 |
| **Wheelers Lane** | 3787 | 22 | 3809 |

Table 1.3.6.5 Long Term AADT Outbound Traffic

| Access Point | Outbound Flow vpd | Additional Outbound Flow vpd | Predicted Outbound Flow vpd |
|---|---|---|---|
| **Mitchell Hwy** | 498 | 12 | 510 |
| **Wheelers Lane** | 3809 | 222 | 4031 |

### 1.3.7 Distribution of additional peak hourly traffic to access points

From the data provided in Figure 1.3.2 the inbound and outbound peak traffic for both the short and long term scenarios are represented below. The current peak inbound flow data is taken from Figure 1.3.2. Additional flow for the short term is purely generated from the playspace. The newly predicted short term inbound flow is used as the starting figure for long term peak traffic.

Table 1.3.7.1 Short Term Peak Inbound Traffic

| Access Point | Inbound Flow vph | Additional Inbound Flow vph | Predicted Inbound Flow vph |
|---|---|---|---|
| **Mitchell Hwy** | 437 | 6 | 443 |
| **Wheelers Lane** | 317 | 0 | 317 |

The long term additional figures below are from Sections 1.3.3 & 1.3.4. The additional figures represent trips generated from the permitted developments likely to be located within the subject land and their respective traffic flows imposed onto the access points of the public road network. This is typical for both inbound and outbound peak flow.

Table 1.3.7.2 Long Term Peak Inbound Traffic

| Access Point | Inbound Flow vph | Additional Inbound Flow vph | Predicted Inbound Flow vph |
|---|---|---|---|
| **Mitchell Hwy** | 443 | 60 | 503 |
| **Wheelers Lane** | 317 | 12 | 329 |

Due to the road network around the subject land and the exit pattern of Orana Mall patrons the outbound traffic data has been redistributed for the various access points as follows;

Table 1.3.7.3 Outbound Peak Traffic Flow Distribution

| Access point | outbound flow vph | %age |
|---|---|---|
| Mitchell Highway | 47 | 6% |
| Windsor Parade | 264 | 35% |
| Wheelers Lane | 440 | 59% |

Hence the outbound peak traffic from Orana Mall through the subject land is distributed to the various access points (using Table 1.3.6.3) as tabled below;

Table 1.3.7.4 Short Term Peak Outbound Traffic

| Access Point | Outbound Flow vph | Additional Outbound Flow vph | Predicted Outbound Flow vph |
|---|---|---|---|
| **Mitchell Hwy** | 71 | 1 | 72 |
| **Wheelers Lane** | 558 | 7 | 565 |

Table 1.3.7.5 Long Term Peak Outbound Traffic

| Access Point | Outbound Flow vph | Additional Outbound Flow vph | Predicted Outbound Flow vph |
|---|---|---|---|
| **Mitchell Hwy** | 72 | 7 | 79 |
| **Wheelers Lane** | 565 | 47 | 612 |

## 1.4 Impact of additional traffic on public road network

The additional traffic generated by a permitted development will impose additional load on the public road network. This section considers the impact of the additional traffic from the data provided in Section 1.3. Short term traffic data is negligible as this section relates to the subject land being a separate entity.

### 1.4.1 Mitchell Highway

By combining the long term flow rates from Sections 1.3.5 & 1.3.6 for inbound and outbound travel, an additional load on the public roadway Mitchell Hwy can be calculated. Table 1.4.1 below compares current, predicted and capacity traffic flows for Mitchell Hwy.

Table 1.4.1 Long Term Traffic – Mitchell Hwy

| | Current Traffic | Additional Traffic | Predicted Traffic | Capacity |
|---|---|---|---|---|
| AADT (vpd) | 7877 | 4066 | 11943 | ? |
| Peak (vph) | 1181 | 582 | 1763 | 3800 |

Additional traffic of 4066 vpd represents a 51.6% increase in traffic on the Mitchell Highway. A 49% increase in peak traffic is anticipated. These increases are within the environmental capacity of the road and the level of service will not change.

### 1.4.2 Wheelers Lane

By combining the additional long term flow rates from Sections 1.3.5 & 1.3.6 for inbound and outbound travel, an additional load on the public roadway Wheelers Lane can be calculated. Table 1.4.2 below compares current, predicted and capacity traffic flows for Wheelers Lane.

Table 1.4.2 Long Term Traffic – Wheelers Lane

| | Current Traffic | Additional Traffic | Predicted Traffic | Capacity |
|---|---|---|---|---|
| AADT (vpd) | 7257 | 6247 | 13504 | ? |
| Peak (vph) | 870 | 941 | 1811 | 1430 |

The additional traffic for the Childcare facility, the exit traffic from the development on Lot 2 and the expansion of Orana Mall is expected to increase the southbound daily traffic from 7257 vpd to 13504 vpd, some 86% daily.

Peak hour traffic is estimated to be 941 vph additional to the current 870 vph which equates to a predicted peak hour volume of 1811 vph. This is more than the calculated 1430 vph capacity for LOS 'A', hence the level of service for Wheelers Lane is predicted to change from the current LOS 'A' to LOS 'B'.

### 1.4.3 Conclusion

The public road network has sufficient capacity to accommodate the additional predicted traffic generated by the rezoning of Lot 1 & part Lot 2 DP 258008 without adverse impact on the current level of service of the road network.

No works are warranted to improve the capacity of the public road network as a consequence of traffic loads generated by the rezoning proposal.

## 1.5 Impact of additional traffic on Orana Mall access arrangements

This section models the performance of the existing access arrangements for the 2 principle customer accesses for the additional traffic at Wheelers Lane and Mitchell Hwy.

### 1.5.1 Mitchell Highway access

This access is a left in/left out arrangement with a 3.5m lane each direction, in the form of an intersection with a tapered deceleration lane on the entry leg and a splitter island. The intersection is shown in photo 9.

Photo 9: Part Lot 2 (Orana Mall) access arrangement at Mitchell Highway

For the purpose of checking the access as an intersection, the flow on Mitchell Parade in the peak hour has been assumed to be 2/3 eastbound and 1/3 westbound, and peak hourly traffic is taken as 15% of AADT count. AA SIDRA modelling of the intersection using 2005 flows and with predicted flows were modelled to estimate any changes in intersection performance, and the results are given below.

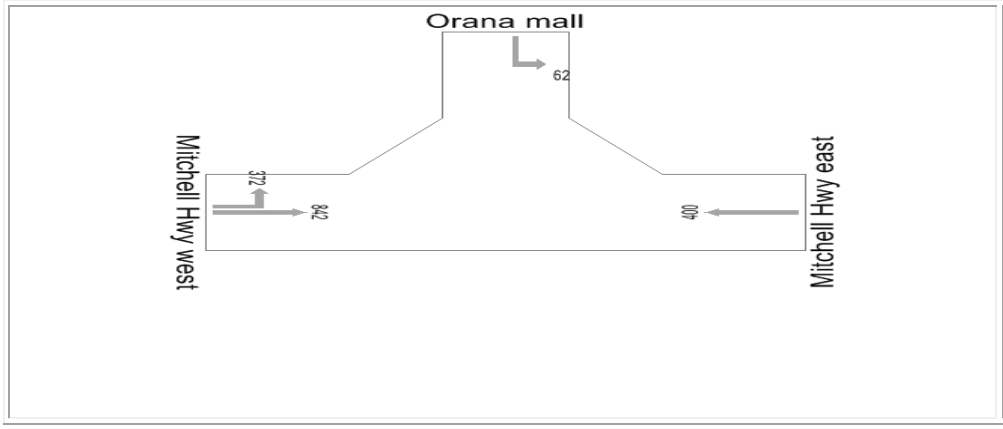
The modelling demonstrates no change in the level of service in all legs of the intersection, with a queue increase from 5m to 8m within Orana Mall and no delay increase on Mitchell Highway. The intersection is adequate for the additional traffic load and does not require modifications.

#### 1.5.1.1 Mitchell Hwy peak hourly prior to development

SIDRA INTERSECTION

Demand Flows - Total

**Mitchell Hwy peak hourly prior to development**




Intersection Type
Give-way

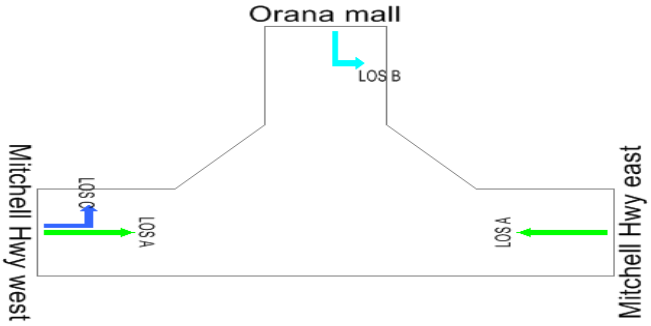
No color code in this display

Movement Summary

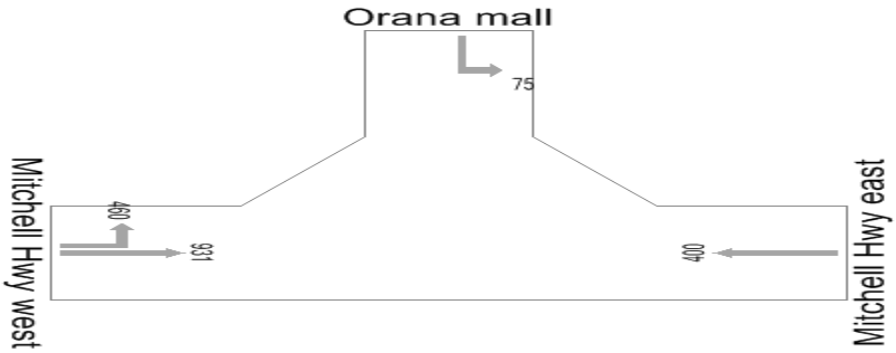
**Give-way**

Vehicle Movements

| Mov ID | Turn | Dem Flow (veh/h) | %HV | Deg Satn (v/c) | of Aver Delay (sec) | Level Service | of 95% Back of Queue (m) | Prop. Queued | Eff. Rate | Stop | Aver Speed (km/h) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Mitchell Hwy east** | | | | | | | | | | | |
| 5 | T | 400 | 3.0 | 0.174 | 0.0 | LOS A | 0 | 0.00 | 0.00 | | 60.0 |
| **Approach** | | **400** | **3.0** | **0.174** | **0.0** | **LOS A** | | **0.00** | **0.00** | | **60.0** |
| **Orana mall** | | | | | | | | | | | |
| 7 | L | 62 | 1.6 | 0.175 | 10.5 | LOS B | 5 | 0.74 | 0.82 | | 17.4 |
| **Approach** | | **62** | **1.6** | **0.175** | **10.5** | **LOS B** | **5** | **0.74** | **0.82** | | **17.4** |
| **Mitchell Hwy west** | | | | | | | | | | | |
| 10 | L | 372 | 0.0 | 0.200 | 15.7 | LOS C | 0 | 0.00 | 0.83 | | 39.2 |
| 11 | T | 842 | 3.0 | 0.367 | 0.0 | LOS A | 0 | 0.00 | 0.00 | | 60.0 |
| **Approach** | | **1214** | **2.1** | **0.367** | **4.8** | **LOS A** | | **0.00** | **0.25** | | **53.3** |
| **All Vehicles** | | **1676** | **2.3** | **0.367** | **3.9** | **Not Applicable** | **5** | **0.03** | **0.21** | | **54.0** |



### 1.5.1.2 Mitchell Hwy peak hourly consolidated development

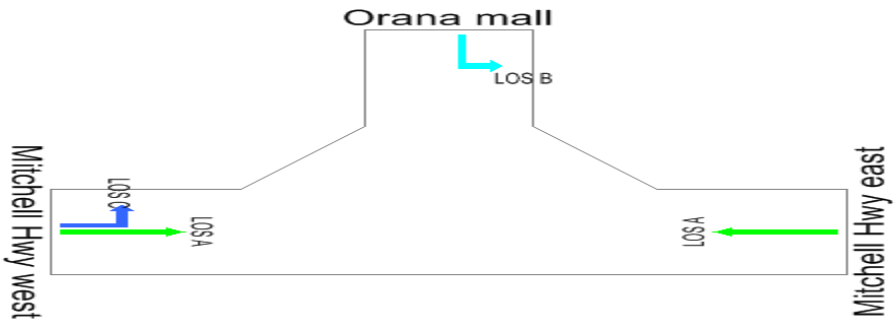



Movement Summary

**Give-way**

Vehicle Movements

| Mov ID | Turn | Dem Flow (veh/h) | %HV | Deg Satn (v/c) | of Aver Delay (sec) | Level Service | of 95% Back of Queue (m) | Prop. Queued | Eff. Rate | Stop | Aver Speed (km/h) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Mitchell Hwy east** | | | | | | | | | | | |
| 5 | T | 400 | 3.0 | 0.174 | 0.0 | LOS A | 0 | 0.00 | 0.00 | | 60.0 |
| **Approach** | | **400** | **3.0** | **0.174** | **0.0** | **LOS A** | | **0.00** | **0.00** | | **60.0** |
| **Orana mall** | | | | | | | | | | | |
| 7 | L | 75 | 1.3 | 0.257 | 14.2 | LOS B | 8 | 0.81 | 0.95 | | 15.6 |
| **Approach** | | **75** | **1.3** | **0.257** | **14.2** | **LOS B** | **8** | **0.81** | **0.95** | | **15.6** |
| **Mitchell Hwy west** | | | | | | | | | | | |
| 10 | L | 460 | 0.0 | 0.248 | 15.7 | LOS C | 0 | 0.00 | 0.83 | | 39.2 |
| 11 | T | 931 | 3.0 | 0.406 | 0.0 | LOS A | 0 | 0.00 | 0.00 | | 60.0 |
| **Approach** | | **1391** | **2.0** | **0.406** | **5.2** | **LOS A** | | **0.00** | **0.27** | | **52.8** |
| **All Vehicles** | | **1866** | **2.2** | **0.406** | **4.4** | **Not Applicable** | **8** | **0.03** | **0.24** | | **52.9** |




### 1.5.1.3 Mitchell Hwy peak hourly separate entity development

**MOVEMENT SUMMARY**

**Site: Mitchell Hwy separate entity develop peak hour**

Orana Mall access points
Mitchell Hwy peak hourly
Giveway / Yield (Two-Way)

**Movement Performance - Vehicles**

| Mov ID | Turn | Demand Flow veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | 95% Back of Queue Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|
| East: Mitchell Hwy east | | | | | | | | | | | |
| 5 | T | 400 | 3.0 | 0.174 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.00 | 60.0 |
| Approach | | 400 | 3.0 | 0.174 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.00 | 60.0 |
| North: Orana mall | | | | | | | | | | | |
| 7 | L | 83 | 1.0 | 0.299 | 15.6 | LOS B | 1.4 | 9.6 | 0.83 | 1.00 | 15.0 |
| Approach | | 83 | 1.0 | 0.299 | 15.6 | LOS B | 1.4 | 9.6 | 0.83 | 1.00 | 15.0 |
| West: Mitchell Hwy west | | | | | | | | | | | |
| 10 | L | 529 | 0.0 | 0.285 | 15.7 | LOS B | 0.0 | 0.0 | 0.00 | 0.83 | 39.2 |
| 11 | T | 931 | 3.0 | 0.405 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.00 | 60.0 |
| Approach | | 1460 | 1.9 | 0.405 | 5.7 | LOS B | 0.0 | 0.0 | 0.00 | 0.30 | 52.1 |
| All Vehicles | | 1943 | 2.1 | 0.405 | 4.9 | NA | 1.4 | 9.6 | 0.04 | 0.27 | 52.1 |

LOS (Aver. Int. Delay): NA. The average intersection delay is not a good LOS measure for two-way sign control due to zero delays associated with major road movements.
Level of Service (Worst Movement): LOS B. LOS Method for individual vehicle movements: Delay (RTA NSW).
Approach LOS values are based on the worst delay for any vehicle movement.

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SIDRA INTERSECTION 4.0.19.1104
Project: S:\08\08004 Orana Mall Retail Expansion\WP\traffic\04244 Mitchell hwy TIA.SIP
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SIDRA INTERSECTION

## 1.5.2 Wheelers Lane

The main access at Wheelers Lane is in the form of a separated left in and left out driveway constructed as an intersection, and is shown in photo 10. A single 4m wide entry lane and two 3.3m average exit lanes reflect the traffic flows where the recorded 'out' traffic is 73% greater than the 'in' traffic, and the entry lane benefits from a flared kerb line on Wheelers Parade.

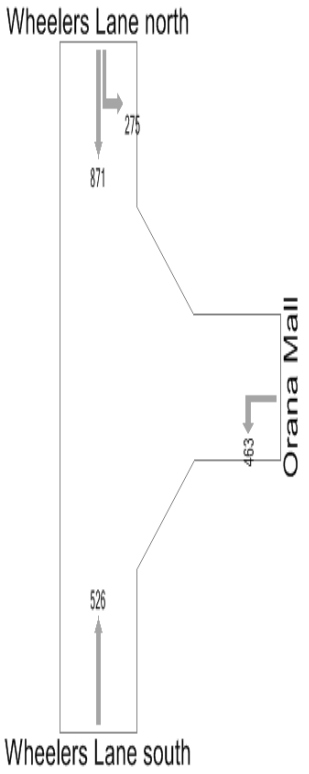
Photo 10: Lot1 (Orana Mall) main access at Wheelers Lane

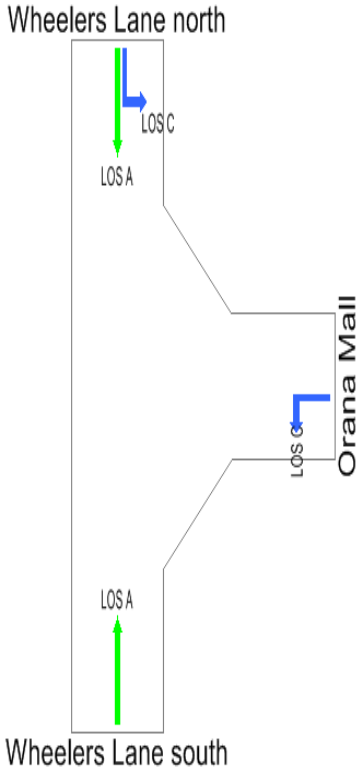
For the purpose of checking the access as an intersection, the southbound flow on Wheelers Lane in the peak hour has been assumed to be 15% of AADT count. AA SIDRA modelling of the intersection using 2005 flows and with predicted flows were modelled to estimate any changes in intersection performance, and the results are given below.

The modelling predicts that Wheelers Lane will continue to function with no change of Level of Service due to traffic generated by the proposed development, however the queue on the internal Orana Mall road system will grow from 17m to 59m and average delay on internal roads will increase from 17 sec to 28 sec. Existing queues are observed to be between the hold line and the internal roundabout, confirming the model predictions for existing conditions. Further modelling of the internal roundabout was undertaken and is reported in Appendix I of Ref 5. That modelling demonstrates that it is more effective to maintain the traffic arrangement generally as proposed rather than to modify exit arrangements from Orana Mall.

There is ample capacity for queuing within the internal road system and drivers will have opportunity to redistribute to other exit points if traffic performance becomes uncomfortable. The intersection is not recommended to be altered as a consequence of the proposal. A sensitivity analysis of 5% growth in all traffic at the intersection indicated no change in LOS on Wheelers Lane and increasing queues internal on the site. Traffic growth can occur up to 40% above generated traffic before queues extend onto the public road.

#### 1.5.2.1 Wheelers Lane access peak hourly flows prior to development



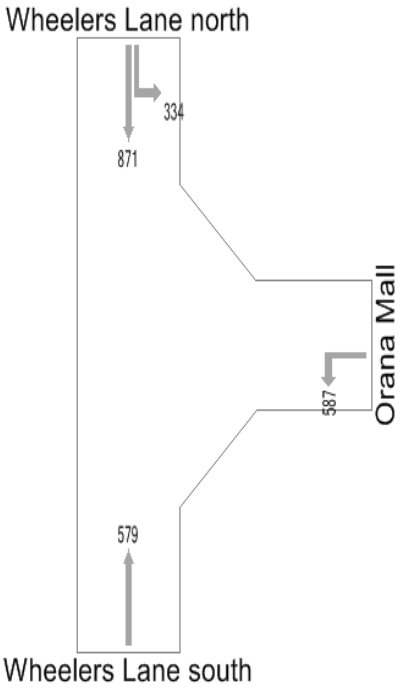



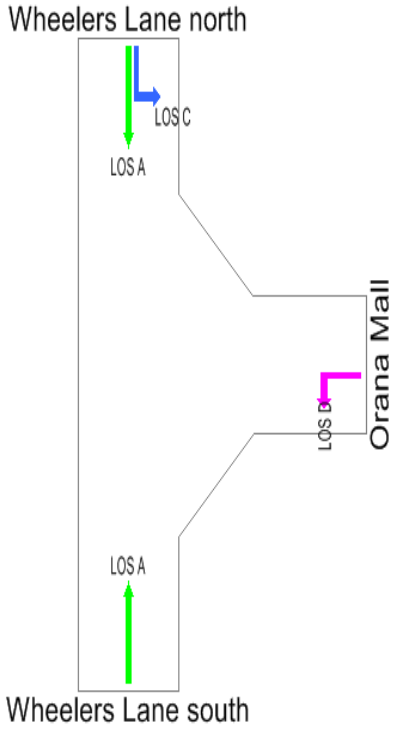

Movement Summary
Wheelers Lane access
**Give-way**

Vehicle Movements

| Mov ID | Turn | Dem Flow (veh/h) | %HV | Deg Satn (v/c) | of Aver Delay (sec) | Level Service | of 95% Back of Queue (m) | Prop. Queued | Eff. Rate | Stop | Aver Speed (km/h) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Wheelers Lane south** | | | | | | | | | | | |
| 2 | T | 526 | 2.1 | 0.137 | 0.0 | LOS A | 0 | 0.00 | 0.00 | | 60.0 |
| **Approach** | | **527** | **2.1** | **0.137** | **0.0** | **LOS A** | | **0.00** | **0.00** | | **60.0** |
| **Orana Mall** | | | | | | | | | | | |
| 4 | L | 463 | 0.0 | 0.634 | 17.4 | LOS C | 31 | 0.86 | 1.51 | | 14.3 |
| **Approach** | | **463** | **0.0** | **0.634** | **17.4** | **LOS C** | **31** | **0.86** | **1.51** | | **14.3** |
| **Wheelers Lane north** | | | | | | | | | | | |
| 7 | L | 275 | 0.0 | 0.148 | 15.7 | LOS C | 0 | 0.00 | 0.83 | | 49.1 |
| 8 | T | 871 | 2.0 | 0.226 | 0.0 | LOS A | 0 | 0.00 | 0.00 | | 60.0 |
| **Approach** | | **1145** | **1.5** | **0.226** | **3.8** | **LOS A** | | **0.00** | **0.20** | | **57.3** |
| **All Vehicles** | | **2135** | **1.3** | **0.634** | **5.8** | **Not Applicable** | **31** | **0.19** | **0.43** | | **46.0** |

### 1.5.2.2 Wheelers Lane access peak hourly flows consolidated development




Movement Summary
Wheelers Lane access
**Give-way**

Vehicle Movements

| Mov ID | Turn | Dem Flow (veh/h) | %HV | Deg Satn (v/c) | of Aver Delay (sec) | Level Service | of 95% Back of Queue (m) | Prop. Queued | Eff. Rate | Stop | Aver Speed (km/h) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Wheelers Lane south** | | | | | | | | | | | |
| 2 | T | 579 | 2.1 | 0.150 | 0.0 | LOS A | 0 | 0.00 | 0.00 | | 60.0 |
| **Approach** | | **579** | **2.1** | **0.150** | **0.0** | **LOS A** | | **0.00** | **0.00** | | **60.0** |
| **Orana Mall** | | | | | | | | | | | |
| 4 | L | 587 | 0.0 | 0.839 | 28.9 | LOS D | 59 | 0.94 | 2.53 | | 11.0 |
| **Approach** | | **587** | **0.0** | **0.838** | **28.9** | **LOS D** | **59** | **0.94** | **2.53** | | **11.0** |
| **Wheelers Lane north** | | | | | | | | | | | |
| 7 | L | 334 | 0.0 | 0.180 | 15.7 | LOS C | 0 | 0.00 | 0.83 | | 49.1 |
| 8 | T | 871 | 2.0 | 0.226 | 0.0 | LOS A | 0 | 0.00 | 0.00 | | 60.0 |
| **Approach** | | **1204** | **1.4** | **0.226** | **4.4** | **LOS A** | | **0.00** | **0.23** | | **56.9** |
| **All Vehicles** | | **2370** | **1.2** | **0.839** | **9.4** | **Not Applicable** | **59** | **0.23** | **0.74** | | **40.4** |

### 1.5.2.3 Wheelers Lane access peak hourly flows separate entity development

**MOVEMENT SUMMARY** — **Site: Wheelers Lane separate entity develop peak hour**

Orana Mall access points
Wheelers Lane peak hourly
Giveway / Yield (Two-Way)

**Movement Performance - Vehicles**

| Mov ID | Turn | Demand Flow veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | 95% Back of Queue Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Wheelers Lane South | | | | | | | | | | | |
| 5 | T | 580 | 2.1 | 0.251 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.00 | 60.0 |
| Approach | | 580 | 2.1 | 0.251 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.00 | 60.0 |
| East: Orana Mall | | | | | | | | | | | |
| 7 | L | 644 | 0.0 | 0.934 | 48.0 | LOS D | 14.1 | 98.7 | 0.97 | 4.06 | 8.0 |
| Approach | | 644 | 0.0 | 0.933 | 48.0 | LOS D | 14.1 | 98.7 | 0.97 | 4.06 | 8.0 |
| North: Wheelers Lane North | | | | | | | | | | | |
| 10 | L | 346 | 0.0 | 0.186 | 15.7 | LOS B | 0.0 | 0.0 | 0.00 | 0.83 | 39.2 |
| 11 | T | 874 | 2.1 | 0.379 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.00 | 60.0 |
| Approach | | 1220 | 1.5 | 0.378 | 4.5 | LOS B | 0.0 | 0.0 | 0.00 | 0.24 | 53.8 |
| All Vehicles | | 2444 | 1.2 | 0.934 | 14.9 | NA | 14.1 | 98.7 | 0.26 | 1.19 | 32.2 |

LOS (Aver. Int. Delay): NA. The average intersection delay is not a good LOS measure for two-way sign control due to zero delays associated with major road movements.
Level of Service (Worst Movement): LOS D. LOS Method for individual vehicle movements: Delay (RTA NSW).
Approach LOS values are based on the worst delay for any vehicle movement.

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SIDRA INTERSECTION 4.0.19.1104
Project: S:\08\08004 Orana Mall Retail Expansion\WP\traffic\04244 Mitchell hwy TIA.SIP
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### 1.5.3 Conclusion

From the intersection analysis of peak hourly flows, the LOS of the public road network was found to be unchanged. This was evident across the three (3) different scenarios of the rezoning proposal; existing, consolidated and separate entity developments. The only noticeable changes occurred on Wheelers Lane North with 0.1 sec increase in delay and an increase in queue length on the private land. Both Mitchell Hwy and Wheelers Lane traffic flow was not compromised by any affect associated with the rezoning proposal.

## 1.6 Pedestrian network and access to Orana Mall

Lots 1 & Part Lot 2 are bounded by public roads (Wheelers Lane & Mitchell Hwy) along with open space to the south and west. Orana Mall Carpark borders the eastern boundary of Lot 1 and the northern boundary of Lot 2. The northern boundary of Lot 1 adjoins a commercial development. The public roads and open space have a network of pedestrian paths and cycleways in place as well as connections to Orana Mall. The largest pedestrian flow is across Windsor Parade, associated with the retirement village.

### 1.6.1 Accessibility

The catchment is accessible by both public transport and cycling. The rezoning proposal is not expected to have any significant impact on accessibility. Any potential changes to the vehicular

access points of Orana Mall from either Wheelers Lane or Mitchell Hwy would have no foreseen impact on accessibility.

A Public Reserve remains between the boundaries of the subject land and the public roadways (Mitchell Hwy and Wheelers Lane). The footpath and cycleway are located within this reserve and no impact on the functionality of the access way's can be foreseen from the rezoning process.

### 1.6.2 Public path network and connections to Orana Mall

The public path network and connections in place comprises;

- Concrete footpath for the full frontage at Wheelers Lane
- Two defined crossing points of Wheelers Lane within the site frontage via refuges
- Connection from Wheelers Lane to Orana Mall near the main site access
- Pedestrian footpath turning from Wheelers Lane to the Mitchell Highway crossing point
- Access via concrete path across the open space along Mitchell Highway, to the Council carpark on the subject land, through the carpark and to Orana Mall boundary

## 1.7 Car Parking Provisions for Potential Developments

### 1.7.1 Lot 1 DP 258008

From Section 1.3.4 with the addition of a permitted development the carpark spaces in Lot 1 would be reduced by 40 spaces. This in turn would reduce the overall parking capacity from 244 down to 204. Dubbo City Council has prescribed a minimum 148 parking spaces be provided on the subject land as indicated in Ref 5. The reduced capacity still satisfies this requirement.

### 1.7.2 Lot 2 DP 258008 (Part of)

From Section 1.3.4 with the addition of a permitted development the carpark spaces in Lot 2 would be reduced by 42 spaces. This in turn would reduce the overall parking capacity from 244 down to 202. Dubbo City Council has prescribed a minimum 148 parking spaces be provided on the subject land as indicated in Ref 5. The reduced capacity still satisfies this requirement.

A combination of two (2) permitted developments across the subject land would still satisfy the Dubbo City Council DCVP requirement for allotted parking spaces on the subject land.

### 1.7.3 Playspace Parking Provision

Provision of parking for the playspace is currently provided within the public carparking situated on part Lot 2 DP 258008.

If the subject land was rezoned B2 Local Centre and consolidated with Orana Mall then the parking for the playspace would remain unchanged. Ample parking spaces (including accessible spaces) are located in close proximity to the playspace and there appears to be no reason for this to change as a consequence of the proposal.

Should the subject land be rezoned to B2 Local Centre and remain as a separate title then provision for parking must be maintained. Section 1.3.1 estimated a peak traffic generation of 12 vehicles per hour. This trip generation indicates a minimum 6 car parking spaces would be needed. A conservative figure would be provision for 12 car spaces and this appears to be easily accommodated in the eastern portion of part Lot 2. The eastern section of part Lot 2 contains 33 car parking spaces.

The eastern area does not seem viable to situate a permitted development due to vehicle manoeuvrability, existing provision of accessible parking spaces and limited area (floor space) constrained by vehicle access points to the subject land.

### 1.7.4 Parking layouts

Parking is mostly standard 90 degree parking, with very limited parallel parking. Long vehicles such as caravans and trailers have ready access to parallel parking in the south-west corner of the subject land, so that there is the easiest possible manoeuvring for the long vehicles and the least impact on standard customer parking areas.

### 1.7.5 Parents with prams parking spaces

There is no specification as to the requirement for these spaces, however several spaces are provided at both Orana Mall access points at Wheelers Lane and Mitchell Hwy, adjoining accessible parking spaces.

## 1.8 Rezoning and Development Assessment

This section makes specific reference to Transport NSW and Dept of Urban Affairs and Planning's policy document on "Integrating Land Use and Transport", 2001 (Ref 3). This policy applies to retail developments of which are adjacent the subject land and potentially be consolidated with.

### 1.8.1 Zone Objectives

The objectives of the Dubbo City Council's strategy for B2 Local Centre zones and the policy framework above (Ref 3) are almost parallel. The rezoning proposal is in line with the policy (Ref 3) as it;

- encourages single multi-purpose trips
- does not reduce public transport
- does not impede walk and cycle transport modes
- promotes greater access to established infrastructure and facilities

The above factors have the opportunity to reduce traffic load and trip generation. Although the proposal will increase traffic load, the local road network can accommodate this increase. The proposal has the potential outcome to ensure further developments are in the right location and not removed from the subject urban centre.

Acquisition of the land by Orana Mall indicates further investment in the existing development with no apparent loss to any relevant stakeholder of the subject land.

Community investment is protected as is the adjacent major urban centre. The rezoning proposal promotes investor confidence in the B2 zoned area and has the opportunity to foster competition and growth in the urban centre.

### 1.8.2 Location

Situated adjacent Orana Mall, the subject land forms part of an existing cluster of retail outlets. The subject land is easily accessible by public transport, cycling and walking. This will help minimise the demand for travel and the reliance on car use. It has been shown throughout this traffic impact assessment that neither of the above elements will be jeopardised from the rezoning proposal. The proposal promotes a net community benefit to no detriment of the public road network or public/private investment in the local centre.

## 1.9 Conclusion and recommendations for traffic management

The subject land and the converging road network has been analysed for current and potential traffic generating flows associated with the rezoning proposal.

For the current condition and the short term rezoning condition the impact of the traffic flow from the subject land to the associated road network is considered negligible.

If the subject land is rezoned to B2 Local Centre the potential permitted developments would impose peak and AADT traffic flows well within the capacity of the supporting road network. It can be concluded that the rezoning from RE1 Public Recreation to B2 Local Centre would have no significant impact to the existing road network.