Appendix **One** – Riley Consulting

Traffic Technical Note – Lot 1

DPS

# PRECINCT A - COOLBELUP HOTEL
# LOCAL STRUCTURE PLAN TRAFFIC REPORT

October 2012

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| | | | |
|---|---|---|---|
| Issued on | 05-11-2012 | Amendment | Date |
| Version | V2 | | |
| Reference | | | |

## CHECKLIST

| Item | Status | Comments/Proposals |
|---|---|---|
| **Summary** | **Y** | Refer executive summary |
| **Introduction/Background** | Y | |
| **Structure plan proposal** | Y | |
| regional context | Y | |
| proposed land uses | Y | |
| table of land uses and quantities | | |
| major attractors/generators | y | |
| specific issues | y | |
| **Existing situation** | | |
| existing land uses within structure plan | y | |
| existing land uses within 800 metres of structure plan area | Y | |
| existing road network within structure plan area | Y | |
| existing pedestrian/cycle networks within structure plan area | N/A | |
| existing public transport services within structure plan area | N/A | |
| existing road network within 2 (or 5) km of structure plan area | Y | |
| traffic flows on roads within structure plan area (PM and/or AM peak hours) | Y | |
| traffic flows on roads within 2 (or 5) km of structure plan area (AM and/or PM peak hours) | Y | PM peak reviewed |
| existing pedestrian/cycle networks within 800m of structure plan area | Y | |
| existing public transport services within 800m of structure plan area | Y | |
| **Proposed internal transport networks** | | |
| changes/additions to existing road network or proposed new road network | N/A | |
| road reservation widths | Y | |
| road cross-sections & speed limits | N/A | |
| intersection controls | N/A | |
| pedestrian/cycle networks and crossing facilities | N/A | |
| public transport routes | N/A | |

| | | |
|---|---|---|
| **Changes to external transport networks** | | |
| road network | N/A | |
| intersection controls | | |
| pedestrian/cycle networks and crossing facilities | Y | |
| public transport services | Y | |
| **Integration with surrounding area** | | |
| trip attractors/generators within 800 metres | N/A | |
| proposed changes to land uses within 800 metres | Y | None anticipated |
| travel desire lines from structure plan to these attractors/generators | N/A | Existing development |
| adequacy of external transport networks | Y | |
| deficiencies in external transport networks | Y | |
| remedial measures to address deficiencies | N/A | |
| **Analysis of internal transport networks** | | |
| assessment year(s) and time period(s) | | No growth n traffic in the locality |
| structure plan generated traffic | Y | |
| extraneous (through) traffic | N/A | |
| design traffic flows (ie. total traffic) | N/A | |
| road cross-sections | N/A | |
| intersection controls | Y | |
| access strategy | Y | |
| pedestrian / cycle networks | N/A | |
| safe routes to schools | V | |
| pedestrian permeability & efficiency | Y | |
| access to public transport | Y | |
| **Analysis of external transport networks** | | |
| extent of analysis | N/A | Indicative reductions to existing land uses |
| base flows for assessment year(s) | Y | |
| total traffic flows | Y | |
| road cross-sections | Y | |
| intersection layouts & controls | Y | |
| pedestrian/cycle networks | Y | |
| **Conclusions** | Y | Refer executive summary |

**CONTENTS**

## 1.0 EXECUTIVE SUMMARY

This report has been prepared to support the local structure plan for the redevelopment of Precinct A of the Coolbellup town centre. Precinct A comprises of the Coolbellup Hotel and motel, which under the structure plan, will be a separate developable area with connectivity for pedestrians and cyclists only. The pertinent findings of this report are:

- Precinct A, the subject site, has separate vehicle access to the remainder of the Coolbellup structure plan land parcels. Precinct A can therefore be considered in isolation to Precincts B and C. It is understood that Precincts B and C are not currently intended for redevelopment and thus, traffic flows associated with those land parcels will not change in the foreseeable future.

- The subject land parcel is currently occupied by a tavern, known locally as the Coolbellup Hotel, a motel and bottleshop. Based on recognised trip generation source documents, it is estimated that the present land uses have the ability to generate about 2,254 vehicle movements per day.

- Based on recognised source documents, the redevelopment of the Coolbellup Hotel to provide residential apartments and some commercial tenancies is expected to generate 1,659 vehicle movements per day. The future traffic generation of the site can therefore be seen to be less than current land uses. The peak periods of traffic movement would be compatible with the surrounding residential land uses.

- With the expectation that the subject land will generate less traffic than present land uses, there will be no demonstrable impacts to the operation of the local road network, in terms of the daily traffic movements. From a peak period perspective, the proposed development will remove late night traffic and may improve residential amenity.

## 2.0 THE SITE AND SURROUNDING ROAD NETWORK

Riley Consulting has been commissioned through Development Planning Strategies (DPS) to review the traffic movements associated with parcel A of the Coolbellup Town Centre Structure Plan. Figure 1 shows the location of the subject land.

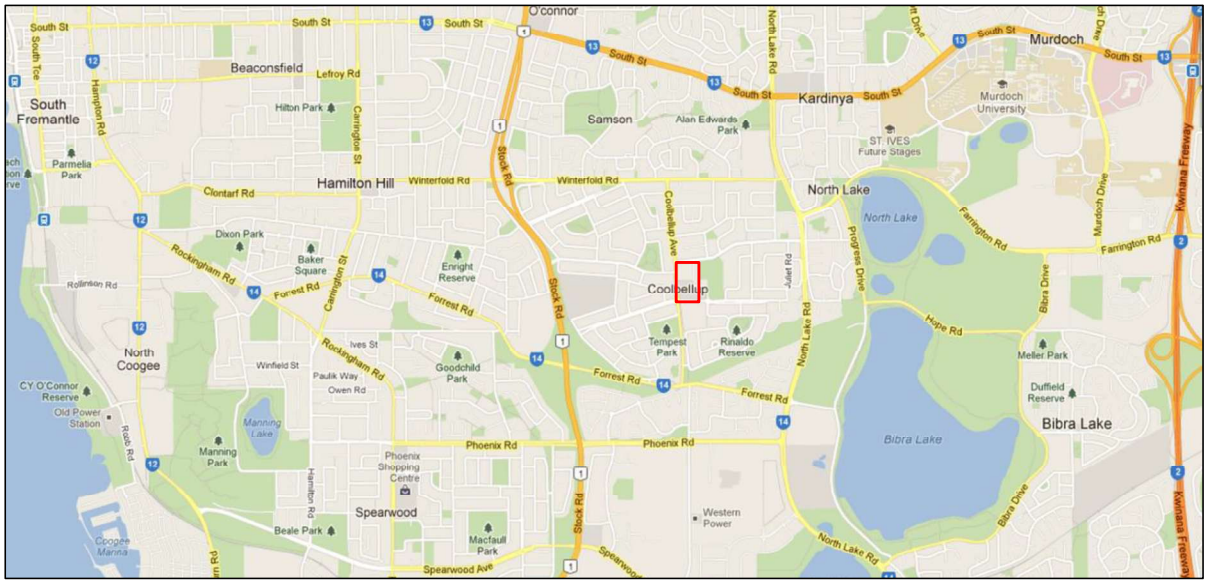


**Figure 1 Location of Coolbellup Town Centre**

### THE LOCAL ROAD NETWORK

The site is bounded by Waverley Road to the north and Coolbellup Avenue to the west.

#### Coolbellup Avenue

Coolbellup Avenue is classified as a local distributor road in the Main Roads *Functional Road Hierarchy* and would be considered as a neighbourhood connector under the *Liveable Neighbourhood*s planning guidelines. Traffic data from 1999 indicated a daily volume of 4,805 vehicles per day (vpd).

A peak hour count taken in October 2012 at the roundabout controlling Coolbellup Avenue / Waverley Road indicates 411 vehicles using the northern arm of the roundabout during the PM peak period. It is commonly recognised that on local roads the peak period equates to about 10% of the daily movement. On this basis Coolbellup Avenue north of Waverly Road would be expected to carry about 4,100 vehicles per day. It can be seen that the data shown by the 1999 count is perhaps higher than current flows.

South of Waverly Road the peak hour count indicates about 5,000 vehicles per day.

The traffic flows fit well with the classification of neighbourhood connector. Coolbellup Avenue is constructed with a single carriageway (7.2m standard) with a minor widening between Waverley Road and Cordelia Avenue to provide medians.

**Waverley Road**

Waverley Road is also a local distributor road in the Main Roads *Functional Road Hierarchy* and would be considered as a neighbourhood connector under the *Liveable Neighbourhood*s planning guidelines. Traffic data from 1999 indicated 2,897vpd.

A peak hour count taken in October 2012 at the roundabout controlling Coolbellup Avenue / Waverley Road indicates 218 vehicles using this arm of the roundabout during the PM peak period. On this basis, Waverley Road east of Coolbellup Avenue would be expected to carry about 2,200 vehicles per day.

Adjacent to the site, Waverley Road is constructed as a single carriageway road with a red asphalt median. A roundabout controls its intersection with Coolbellup Avenue. A crest occurs to the east of the subject land.

**Counsel Road**

Counsel Road is classified as a local distributor road in the Main Roads *Functional Road Hierarchy* and would be considered as a neighbourhood connector under the *Liveable Neighbourhoods* planning guidelines. It provides access to Stock Road at its western end. Traffic data from 2007 indicates 3,004 vpd. It is expected that this traffic flow has been recorded at the western end of Counsel Road and includes traffic accessing Stock Road. Further east it would be expected that traffic flows reduce significantly.

Figure 2 reproduces an extract of the Coolbellup Town Centre Structure Plan (refer to Development Planning Strategies for the Structure Plan).

The structure plan for Coolbellup town centre indicates that north-south connectivity through the structure plan area will be restricted to non-vehicular traffic (pedestrians and cyclists). No vehicular link is proposed so that each precinct identified as A, B and C will operate independently. Typically a structure plan would require that all land parcels be considered, but in this instance land parcel A, the Coolbellup Hotel land parcel, can be considered in isolation to land uses to the south as there is no traffic connectivity.

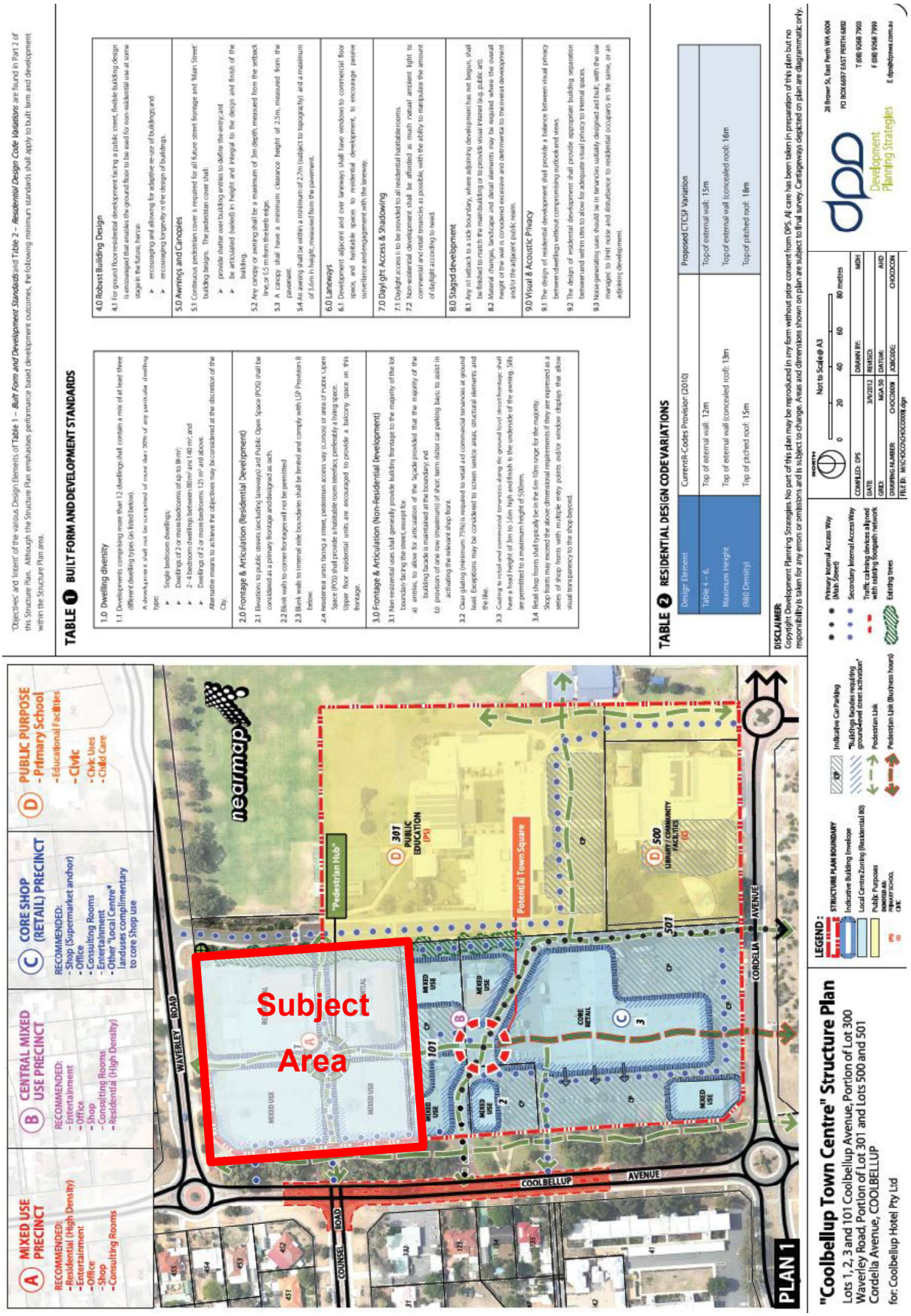


TABLE 1 BUILT FORM AND DEVELOPMENT STANDARDS

'Objectives' and 'Intent' of the various Design Elements of Table 1 – *Built Form and Development Standards* and Table 2 – *Residential Design Code Variations* are found in Part 2 of this Structure Plan. Although the Structure Plan emphasises performance based development outcomes, the following minimum standards shall apply to built form and development within the Structure Plan area.

**1.0 Dwelling diversity**

1.1 Developments comprising more than 12 dwellings shall contain a mix of at least three different dwelling types (as listed below).

A development shall not be comprised of more than 50% of any particular dwelling type:

- Single bedroom dwellings;
- Dwellings of 2 or more bedrooms of up to 89 m²;
- 2 - 4 bedroom dwellings between 80 m² and 140 m²; and
- Dwellings of 2 or more bedrooms 125 m² and above.

Alternative means to achieve the objectives may be considered at the discretion of the City.

**2.0 Frontage & Articulation (Residential Development)**

2.1 Elevations to public streets (excluding laneways) and Public Open Space (POS) shall be considered as a primary frontage and designed as such.

2.2 Blank walls to corner frontages will not be permitted

2.3 Blank walls to internal side boundaries shall be limited and comply with LSP Provision 8 below.

2.4 Residential units facing a street, pedestrian access way (Lanes) or area of public Open Space (POS) shall provide a habitable room interface, preferably a living space. Upper floor residential units are encouraged to provide a balcony space on this frontage.

**3.0 Frontage & Articulation (Non-Residential Development)**

3.1 Non-residential uses shall generally provide building frontage to the majority of the lot boundary facing the street, except for:

a) entries, to allow for articulation of the façade provided that the majority of the building facade is maintained at the boundary; and

b) provision of one row (maximum) of short term visitor car parking bays to assist in activating the relevant shop front.

3.2 Clear glazing (minimum 75%) is required to retail and commercial tenancies at ground level. Exceptions may be considered to screen service areas, structural elements and the like.

3.3 Glazing to retail and commercial tenancies along the ground level street frontage shall have a head height of 3m to 3.6m high and finish to the underside of the awning. Sills are permitted to a maximum height of 500mm.

3.4 Retail shop fronts shall typically be in the 6m-10m range for the majority. Shop fronts may exceed the above dimensional requirements if they are expressed as a series of shop fronts with multiple entry points and/or window displays that allow visual transparency to the shop beyond.

**4.0 Robust Building Design**

4.1 For ground floor residential development facing a public street, flexible building design is encouraged that enables the ground floor to be used for non-residential use at some stage in the future, hence:

- encouraging and allowing for adaptive re-use of buildings; and
- encouraging longevity in the design of buildings.

**5.0 Awnings and Canopies**

5.1 Continuous pedestrian cover is required for all future street frontage and 'Main Street' building designs. The pedestrian cover shall:

- provide shelter over building entries to define the entry; and
- be articulated (varied) in height and integral to the design and finish of the building.

5.2 Any canopy or awning shall be a maximum of 3m depth, measured from the setback line, or 0.5 m from the kerb edge.

5.3 A canopy shall have a minimum clearance height of 2.5m, measured from the pavement.

5.4 An awning shall be within a minimum of 2.7m (subject to topography) and a maximum of 3.6m in height, measured from the pavement.

**6.0 Laneways**

6.1 Development adjacent and over laneways shall have windows to commercial floor space, and habitable spaces to residential development, to encourage passive surveillance and engagement with the laneway.

**7.0 Daylight Access & Shadowing**

7.1 Daylight access is to be provided to all residential habitable rooms.

7.2 Non-residential development shall be afforded as much natural ambient light to commercial and retail tenancies as possible, with the ability to manipulate the amount of daylight according to need.

**8.0 Staged development**

8.1 Any nil setback to a side boundary, where adjoining developments not begun, shall be finished to match the main building or to provide visual interest (e.g. public art).

8.2 Material changes, landscape and detail elements may be required where the overall height of the wall is considered excessive and detrimental to the overall development and/or the adjacent public realm.

**9.0 Visual & Acoustic Privacy**

9.1 The design of residential development shall provide a balance between visual privacy between dwellings without compromising outlook and views.

9.2 The design of residential development shall provide appropriate building separation between and within sites to allow for adequate visual privacy to internal spaces.

9.3 Noise-generating uses should be in tenancies suitably designed and built, with the use managed to limit noise and disturbance to residential occupiers in the same, or an adjoining development.

TABLE 2 RESIDENTIAL DESIGN CODE VARIATIONS

| Design Element | Current R-Codes Provision (2010) | Proposed CTCSP Variation |
|---|---|---|
| Table 4 – 6. | Top of external wall: 12m | Top of external wall: 15m |
| Maximum Height | Top of external wall (concealed roof): 13m | Top of external wall (concealed roof): 16m |
| R80 Density) | Top of pitched roof: 15m | Top of pitched roof: 18m |



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**Figure 2** **Coolbellup Town Centre Structure Plan** (Refer DPS for detail)

## 3.0 TRAFFIC GENERATION AND DISTRIBUTION

The site is presently occupied by the Coolbellup Hotel / motel and an existing shopping centre to the south. The tavern has historically provided live music.

The development of the Coolbellup Local Structure Plan area will occur as 3 precincts, with the development of Precinct A being currently proposed. At this time there are no known development proposals for Precincts B and C. Advice from the planning team suggests that the development of Precincts B and C will be long term and may ultimately require multi-level parking to provide any expansion of retail uses; unless a suitable balance between floor space expansion and car parking can be achieved at grade. On this basis the development of Precincts B and C is considered restrained and unlikely to result in a significant change to current operations. On this basis, the development of Precinct A is considered.

The existing building floor area is 1,797m$^2$. A bottleshop of about 400m$^2$ lies to the north and the tavern area occupies approximately 1,397m$^2$. The motel comprises of 4 single bed rooms, 4 twin bed rooms and a caretakers house (2 bedrooms)

No traffic data is available to determine the current traffic movements associated with the tavern and motel land uses. However, it is obvious by the development proposal that these land uses are no longer financially viable. To assess the future impact of development it is pertinent to consider the traffic generation of extant permissions and compare them to future proposals.

Reference to the Director General of Transport South Australia, *Guide to Traffic Generating Developments* indicates that a tavern can be expected to generate about 110 trips per 100m$^2$ floor area[1]. This is the only Australian reference document for this land use. Based on the current tavern floor area of 1,397m$^2$ up to 1,536 vehicle movement per day could be expected.

Reference to *Nearmap* indicates that a total of 170 parking bays are provided for the tavern. On the basis that most taverns provide 20% standing area and 50% as seating (the remainder being bar, kitchen areas, toilets etc) then the level of parking would indicate a tavern floor area of about 850m$^2$. Applying the trip rate gives a daily traffic generation of (850/100 x 110) 935 vehicle movements per day.

[1] Restaurant trips rates are 60 / 100m$^2$ (RTA)

***The tavern would be expected to generate 935 vehicle movements per day.***

If live bands play regularly, it can be expected that the traffic attraction would be higher.

No source data is available for bottle shops, but a recent survey of the BWS at the Como hotel[2] indicated approximately 100 customers during the Friday and Saturday peak periods. A trip rate of 1.81 trips per customer was recorded, suggesting 180 trips in the peak periods. The peak equates to 14% of the daily attraction, suggesting a possible 1,292 vehicle movements per day. The traffic generation to a Dan Murphy's store is significantly higher with a peak attraction of up to 250 customers.

***The bottleshop would be expected to generate 1,292 trips per day.***

The RTA *Guide to Traffic Generating Developments* shows a trip rate of 3 trips per unit for motel uses. With a total of 8 rooms the motel can be expected to generate 24 vehicle movements per day. The caretakers unit would also generate a similar level of trips.

***The motel would generate 27 vehicle movements per day.***

***Summary of Existing Traffic Generation of Precinct A***

Based on recognised trip generation source documents, the current land uses submitted as an application today would be expected to generate:

- Tavern 935 trips per day
- Bottle shop 500 trips per day 1,292 trips per day
- Motel 27 trips per day

It can be expected therefore, that the present use of the site would have the potential to generate 2,254 vehicle movements per day. It would be expected that traffic associated with the tavern will often occur after 7pm with a peak discharge between 11pm and 12am. It would be expected that the present land uses may have a significant impact upon the local residential community.

***Current land uses can generate 2,254 vehicle movements per day.***

[2] BWS at the Como hotel is a small bottleshop

**Other Precincts**

To the south of Precinct A there is a shopping centre of about 5,000m$^2$ and reference to the Director General of Transport South Australia, *Guide to Traffic Generating Developments* indicates a trip rate of about 112 trips per 100m$^2$ can be expected. The southern land areas can be expected to generate (5,000/100 x 112) 5,600 movements per day.

***The shopping centre can be expected to generate 5,600 vehicle movements per day.***

**THE PROPOSED DEVELOPMENT**

Advice from the planners has identified that there are presently no redevelopment intentions to the south of Precinct A. The structure plan shows the potential for a new road passing through Precincts B and C, but a single isolated access to Precinct A. Land in Precincts B and C is outside of the control of the Precinct A land owner and the structure plan shows no vehicular connectivity between Precinct A and Precincts B and C.

It is considered unlikely that Precincts B and C will be redeveloped in the near future and it is inappropriate for one land owner to make assumptions on the development of third party land, unless the developments have some intersection. As stated, Precinct A has no vehicular connectivity to Precincts B and C and can therefore be considered in isolation. The traffic assessment prepared for Precinct A should be used by Council or the other precinct land owners when considering the impacts of the future development of Precincts B and C.

**Precinct A**

At the time of writing this review the design of the development is being concluded, however, it is anticipated that the maximum level of development will comprise of:

- 148 dwellings comprising: 67 x 1 bed units; 74 x 2 bed units and 7 x 3 bed units
- 812m$^2$ commercial tenancies

Residential apartments generate less traffic than houses and reference to the *RTA Guide to Traffic Generating Development* suggests trip rates of:

- Up to 2 bedrooms 5 trips per day per dwelling
- 3 or more bedrooms unit 6.5 trips per day per dwelling

Applying these trip rates to the expected yield indicates that residential land uses on the site could generate (67+74@ 5 + 7 @6.5) 750 vehicle movements per day.

***Residential land uses are expected to generate 750 trips per day.***

The commercial land uses would be expected to be a mixture of shops and office based tenancies, but for the purpose of this assessment shop uses will be assumed. A trip rate for the commercial activity in the precinct has already been defined at 112 trips per 100m$^2$, although it can be expected that with a mixed-use development the actual trip rate will be far lower. The commercial land uses would generate a maximum of (812/100 x 112) 909 trips per day.

As shops are provided to the south of the site, it would be expected that the proposed development would attract, for example, real estate agent offices and other less intense retail opportunities, including a local cafe.

***Commercial land uses would generate a maximum of 909 trips per day.***

Combining the generation of the two land uses, it is expected that the site will generate (750 + 909) 1,659 vehicle movements per day.

***Redevelopment of Precinct A can be expected to generate up to 1,659 trips per day.***

It is shown that the proposed redevelopment of the Coolbellup Hotel (Precinct A) can be expected to result in less traffic than current land uses would generate if operating in a commercially viable manner. Based on recognised trip generation source documents, if the current land uses were operating to their full extent, they would be expected to generate 2,254 trips per day.

***Based on recognised trip generation source documents, the proposed redevelopment will reduce traffic associated with the site by about 595 movements per day.***

Further, the impact of residential traffic will be significantly more palatable than the traffic generation of a tavern.

**Traffic Distribution**

Figure 1 shows that Coolbellup has limited accessibility to the regional road network. Traffic will exit the locality either from Coolbellup Road (north / south) or Waverley Road / Counsel Road (east / west). Based on the evening peak hour traffic movements recorded at the Coolbellup Avenue / Waverley Road intersection, it is expected that traffic associated with Precinct A would be distributed:

- North 35%
- East 20%
- South 30%
- West 15%

Figure 3 shows the expected changes to local traffic movements as a result of the proposed development of Precinct A. From a daily traffic flow perspective, the current land uses would be considered to generate higher movements and thus no significant impacts will be experienced.

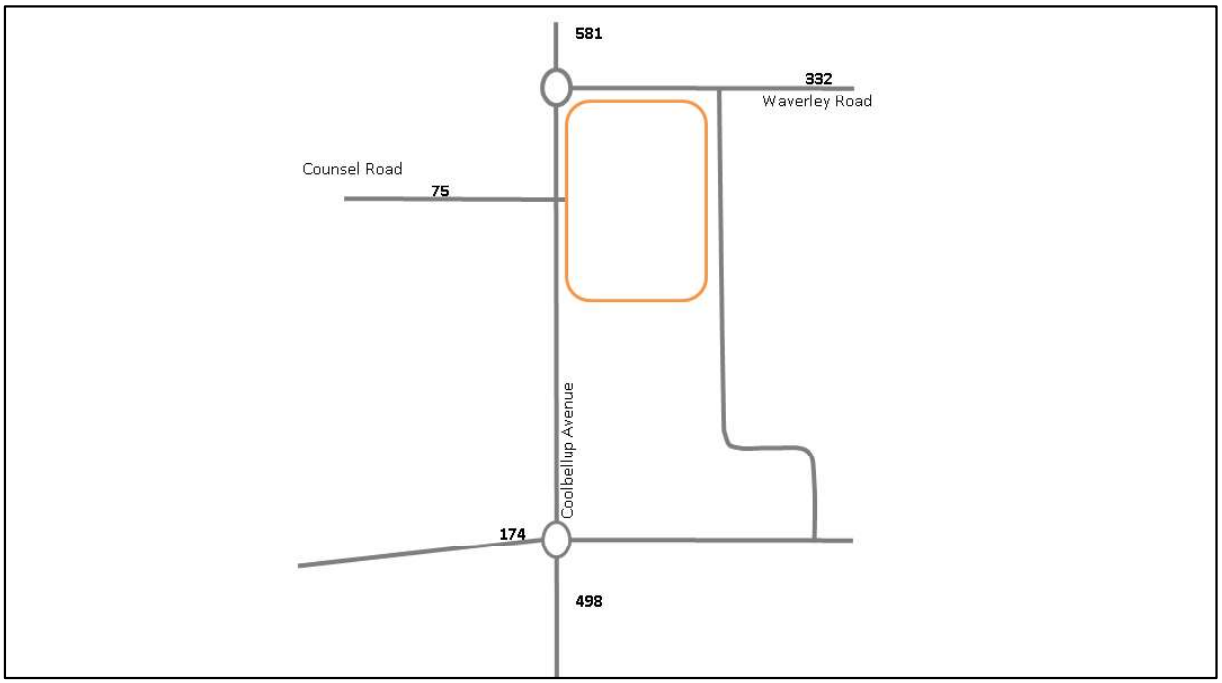


**Figure 3 Precinct A Traffic Generation**

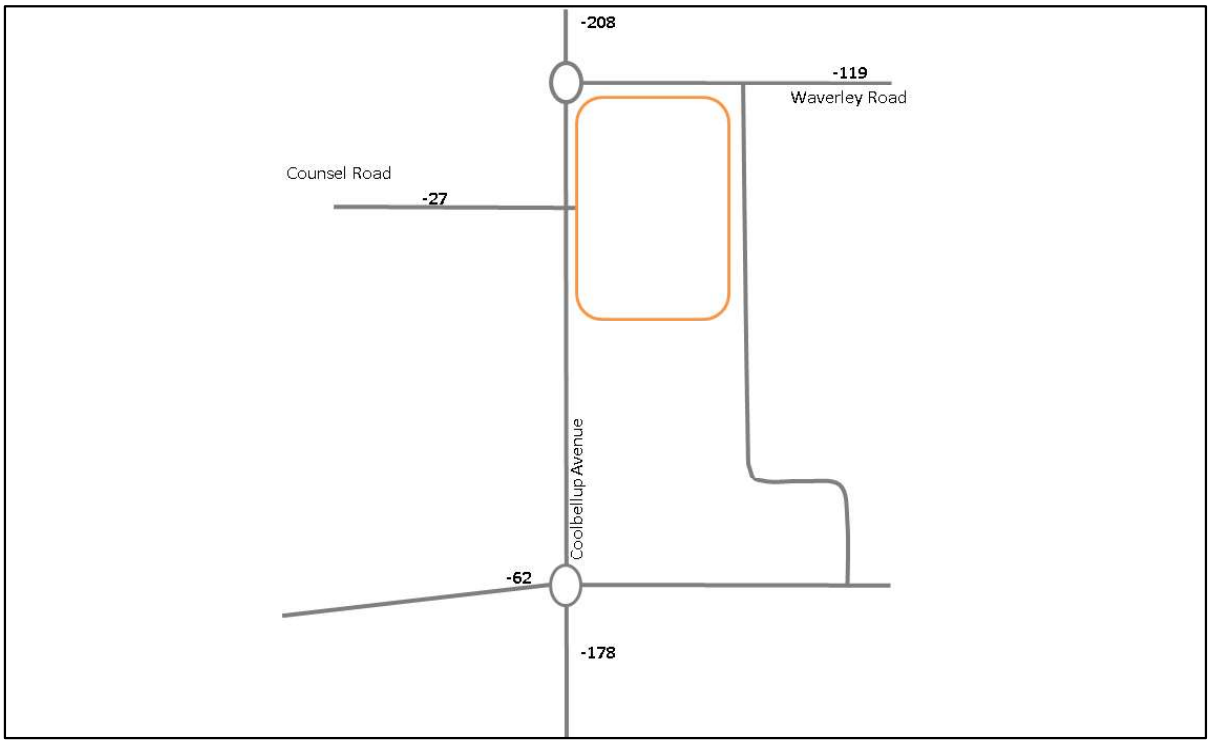


**Figure 4 Land Use Changes to Daily Traffic Flows (Precinct A)**

## 4.0 TRAFFIC IMPACT

Based on recognised trip generation source documents and a conservative estimate of the current land uses, it is anticipated that the proposed redevelopment of Precinct A (Coolbellup Hotel) will result in less traffic demand than the current land uses could generate if operating fully.

Reference to the WAPC Transport Assessment Guidelines for Developments (Section 2 Structure Plans) states:

> *As a general guide, an increase in traffic of less than 10% would not normally be likely to have a material impact, but increases over 10% may and further assessment may be warranted.*

In terms of the current structure plan area, precinct A can be expected to reduce the traffic generating potential by 595 movements per day, or a reduction of 26% to the current traffic generating potential of extant permissions. When considered in regard to the structure plan area, the potential reduction equates to 7.5%.

***Redevelopment of Precinct A will reduce the traffic generating potential of the Coolbellup Town Centre Structure Plan area by 7.5%.***

The current land uses of Precinct A may be generating less traffic than shown by recognised trip generation source documents. However, undertaking an assessment based on current traffic attraction is not valid as the current land uses have the right to trade to their maximum potential.

If the redevelopment of Precinct A is considered as new to the local road network, then the impacts shown in Table 1 can be expected. Table 1 uses the Levels of Service shown in Appendix A, which are based on Austroads.

**Table 1 Impacts to Daily Levels of Service (Precinct A all new)**

| Road | Volume | Los | Future Volume | LoS |
|---|---|---|---|---|
| Coolbellup Avenue north | 4,805 | C | 5,386 | C |
| Waverley Avenue | 2,897 | B | 3,229 | B |
| Coolbellup Avenue south | 5,000 | C | 5,498 | C |
| Counsel Road | 3,004 | B | 3,079 | B |

It can be seen from table 1, that even if precinct A is considered as a green field development, the impact the local road network will be of no great significance.

***There is no requirement for traffic management measures to be provided to the external road network as a result of the proposed development of Precinct A.***

**Local Intersection impact**

As discussed, a peak hour count has been undertaken of the Coolbellup Avenue / Waverley Road intersection. Analysis using Sidra is undertaken assuming all traffic associated with the proposed development of Precinct A is new to the local road network. Table 2 shows the movement summary and indicates that excellent Levels of Service can be expected assuming that all traffic associated with the redevelopment of Precinct A is new to the road network.

**Table 2 Sidra Analysis of Coolbellup Avenue / Waverley Road**

**MOVEMENT SUMMARY** — **Site: Coolbellup / Waverley PM Peak**

Coolbellup Avenue / Waverley Road
PM Peak Full Development of Precinct A
Roundabout

**Movement Performance - Vehicles**

| Mov ID | Turn | Demand Flow | HV | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue Vehicles | 95% Back of Queue Distance | Prop. Queued | Effective Stop Rate | Average Speed |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | veh/h | % | v/c | sec | | veh | m | | per veh | km/h |
| South: Coolbellup Ave South | | | | | | | | | | | |
| 2 | T | 207 | 0.0 | 0.180 | 4.6 | LOS A | 1.4 | 10.0 | 0.17 | 0.37 | 52.0 |
| 3 | R | 65 | 0.0 | 0.180 | 11.4 | LOS A | 1.4 | 10.0 | 0.17 | 0.83 | 46.5 |
| Approach | | 273 | 0.0 | 0.180 | 6.2 | LOS A | 1.4 | 10.0 | 0.17 | 0.48 | 50.5 |
| East: Waverley Road | | | | | | | | | | | |
| 4 | L | 99 | 0.0 | 0.112 | 6.6 | LOS A | 0.8 | 5.5 | 0.38 | 0.51 | 49.3 |
| 6 | R | 36 | 0.0 | 0.112 | 12.1 | LOS A | 0.8 | 5.5 | 0.38 | 0.72 | 45.8 |
| Approach | | 135 | 0.0 | 0.112 | 8.0 | LOS A | 0.8 | 5.5 | 0.38 | 0.57 | 48.2 |
| North: Coolbellup Ave North | | | | | | | | | | | |
| 7 | L | 51 | 0.0 | 0.163 | 5.9 | LOS A | 1.2 | 8.4 | 0.22 | 0.50 | 50.7 |
| 8 | T | 181 | 0.0 | 0.163 | 4.8 | LOS A | 1.2 | 8.4 | 0.22 | 0.40 | 51.6 |
| Approach | | 232 | 0.0 | 0.163 | 5.0 | LOS A | 1.2 | 8.4 | 0.22 | 0.42 | 51.4 |
| All Vehicles | | 639 | 0.0 | 0.180 | 6.2 | LOS A | 1.4 | 10.0 | 0.23 | 0.48 | 50.3 |

Level of Service (Aver. Int. Delay): LOS A. Based on average delay for all vehicle movements. LOS Method: Delay (RTA NSW).
Level of Service (Worst Movement): LOS A. LOS Method for individual vehicle movements: Delay (RTA NSW).
Approach LOS values are based on the worst delay for any vehicle movement.

***The redevelopment of Precinct A is expected to have no significant impacts to the operation of the local road network.***

## 5.0 ACCESS

Figure 5 shows the indicative LSP prepared by Epcad. Two points of access are shown to be taken to Coolbellup Avenue and are notated A and B. Connectivity is provided to Precincts B and C as indicated by the structure plan. However, the future connectivity of this access is subject to developer intentions of Precincts B and C. From a traffic perspective, there is minimal attraction for Precinct A traffic to access Precincts B and C.

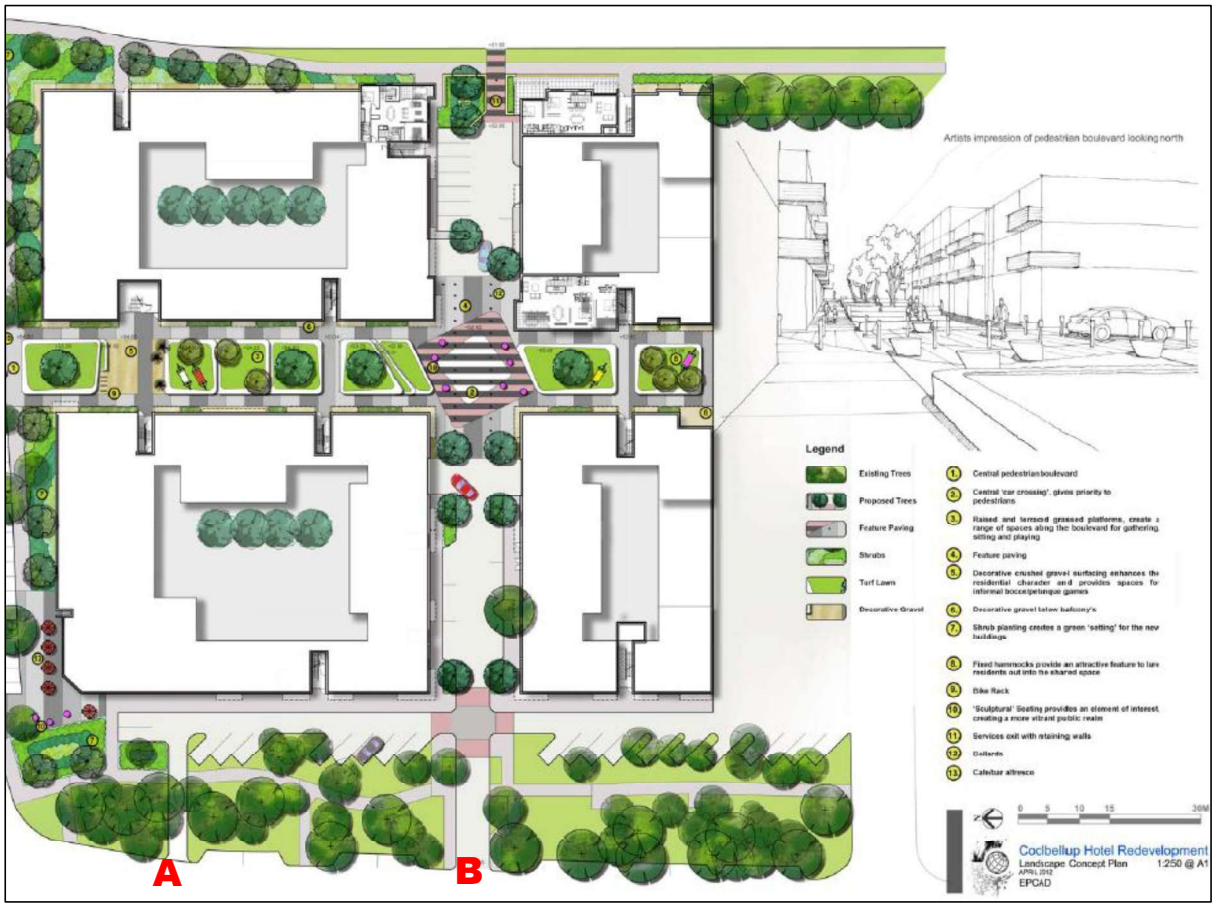


**Figure 5 Precinct A Local Structure Plan (Epcad)**

Access A is shown to provide an exit for the frontage access road which will operate as one-way northbound, to service local parking opportunity and activate the Coolbellup Avenue street frontage. The use of this access is expected to be very low with perhaps a few vehicles each hour. Access to Coolbellup Avenue will be restricted to left-out only and the exit can be expected to operate with uninterrupted flow conditions.

Access B is the primary access for the proposed development and is shown to be located opposite Counsel Road. The proposed access will create a four-way access and will require control by a roundabout. The separation of about 80 metres to the roundabout at Waverley

Road is acceptable. Reference to Table 2 shows a current traffic flow through the Waverley Road roundabout of 639 vehicles in the evening peak. The development of Precinct A could add an additional 166 vehicles to the current peak flow (note that the site is currently attracting some traffic) and a peak flow of about 800 vehicles could occur. Reference to Austroads Table 5.5 indicates that a single lane roundabout can be expected to have capacity to cater for 2,600 vehicles per hour.

**Table 5.5 — Typical Limits of Intersection Capacity (vph)**

(Four way intersection with equal demand for all movements

| Approach Width | Type of Control | | |
|---|---|---|---|
| | No signals (a) | Round-about(b) | Signals(c). |
| 1 lane | 1500 | 2600 | 1500 |
| 2 lanes | 1500 | 4560 | 3000 |
| 3 lanes | 1500 | 6000 | 4500 |
| 4 lanes | 1500 | na. | 6000 |

Notes:
(a) Based on practical absorption capacities of unsignalised intersections.
(b) Based on gap acceptance criteria.
(c) Based on four split phases (120s cycle).

Based on the analysis of the Coolbellup Avenue / Waverley Road roundabout, it can be expected that good Levels of Service will be provided at the proposed site access roundabout.

At the time of a development application the operation of the proposed access will need analysis using Sidra to determine the proposed Levels of Service. Current traffic data and accurate development intentions

## 6.0 THE INTERNAL ROAD NETWORK

The local structure plan area is currently developed with much of the land area designated as car park. Figure 2 shows the structure plan area and indicates that no through traffic routes are to be provided between Precinct A and Precincts B and C. A local access road fronting Coolbellup Avenue is shown that provides connectivity for car parking.

It is anticipated that the development of Precinct A could generate up to 1,659 vehicle movements per day. The total forecast flow is within the levels of a local access street under *Liveable Neighbourhoods*. A road pavement of 6 metres would be appropriate for these streets.

On street car parking bays will need to conform to current Australian Standards, although the use of off-street car parking standards would be appropriate where no through traffic movement is provided.

Should Precinct A be developed to provide public streets, a minimum road reservation of 14.2 metres is recommended to accord with the principles of *Liveable Neighbourhoods.*

**Service Access**

The submission of a development application should consider in detail how service vehicles will access the Precinct. However, accesses to the adjacent road network will be capable to cater for all expected vehicle types. It is anticipated that primary service vehicle access will operate in a one-way manner through the site from Coolbellup Avenue to the eastern north-south road adjacent to the school.

## 7.0 PARKING

Parking for the proposed land uses will be required to be provided in accordance with current local government town planning scheme provisions and the R-codes. This is a matter to be dealt with at the time of development.

**Parking Strategy**

The redevelopment of Coolbellup local centre to provide a mixed-use development will require careful planning of the car parking to ensure that car parks are not hidden. Parking for residential developments can be provided within basements car parks as well as commercial employee parking. However, it is recommended that all visitor/customer parking be provided on-street. This will provide greater accessibility to parking and will increase security for the precinct. Developments such as cafes should be provided with shared parking areas to encourage cross-visitation between land uses. The parking requirements should also be cognisant of the reduced parking demand as a result of the mixed-use development (noting that a high proportion of café customers will already be within walking distance).

**Parking to Waverly Road**

Due to the crest on Waverley Road, it is recommended that only parallel parking is provided to this street. Detail assessment of the parking proposed at the time of a DA may achieve some form of angled parking; however such parking is strongly advised to be fully compliant with the requirements of AS2890.

## 8.0 PEDESTRIANS, CYCLISTS AND PUBLIC TRANSPORT

Local streets are currently provided with footpaths to an acceptable standard.

Internally all streets should be provided with a footpath to both sides. A wider footpath is recommended where retail / commercial land uses are expected. Where cafes may occur, a wide footway with street trees is recommended.

Figure 6 shows the local cycle network and indicates that excellent cycle accessibility is already provided to Coolbellup local centre. No additional on-street cycle facilities would be required. The development should consider the use of bicycle parking facilities on-street. Development should provide cycle facilities in accordance with local plans.

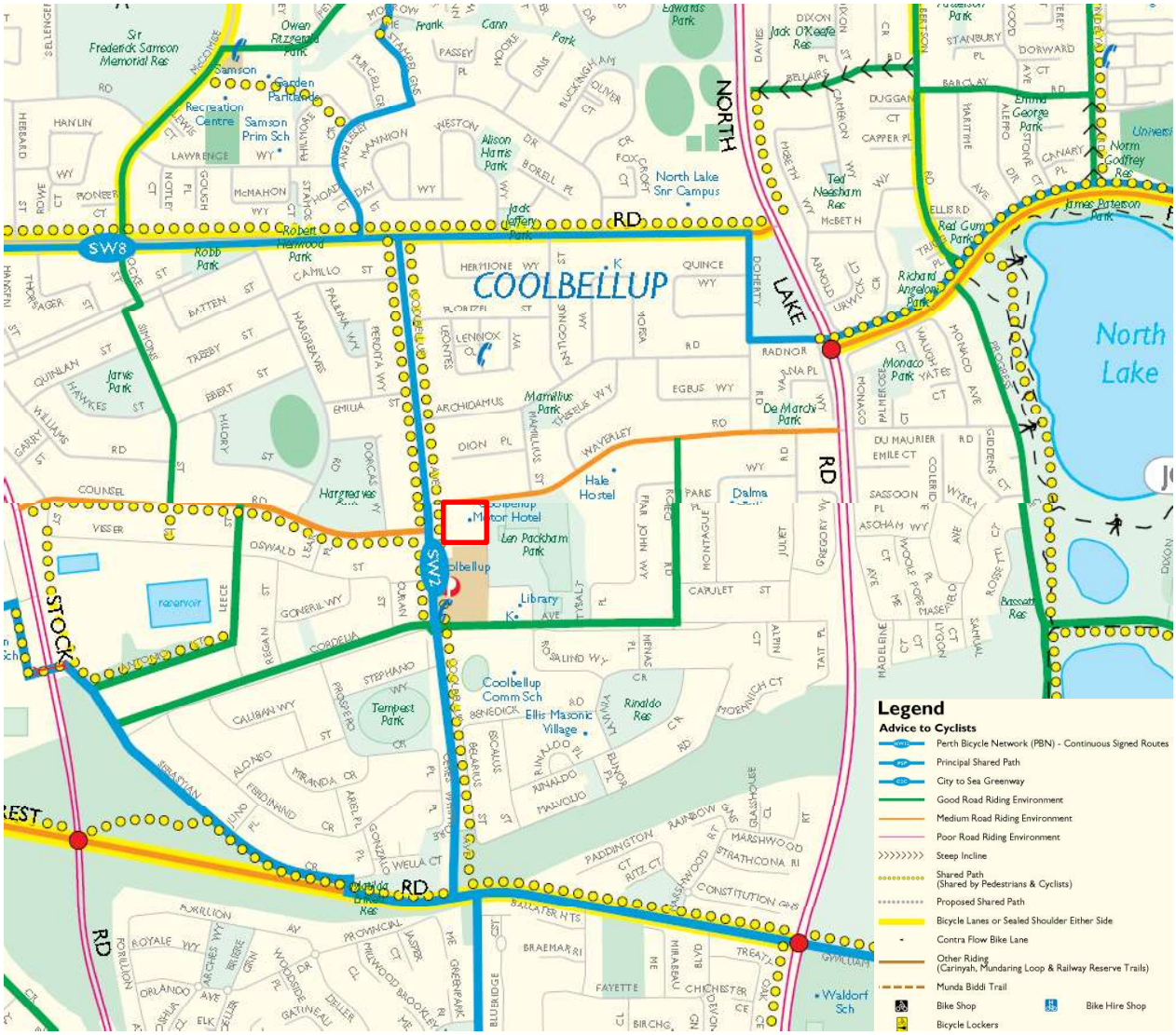


**Figure 6 Local Cycle Infrastructure**

The precinct is well served by public transport with at least one bus every 15 minutes during the peak periods. Figure 7 shows the current local bus services. Services are provided between Murdoch railway station and Fremantle.

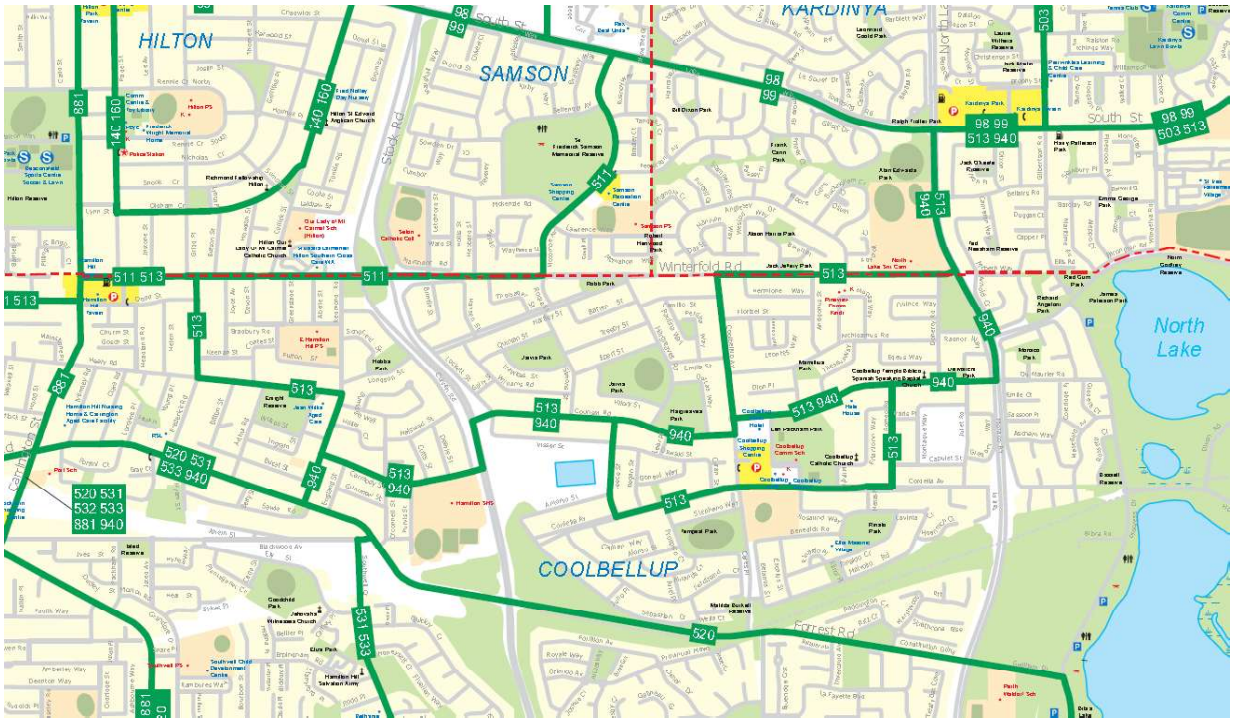


**Figure 7 Local Bus Services**

## APPENDIX A

| LOS | Single Carriageway[1] | 2-Lane Boulevard[2] | Dual Carriageway (4-Lanes)[3] | Dual Carriageway (4-lane Clearway)[3] |
|---|---|---|---|---|
| A | 2,400vpd | 2,600vpd | 24,000vpd | 27,000vpd |
| B | 4,800vpd | 5,300vpd | 28,000vpd | 31,500vpd |
| C | 7,900vpd | 8,700vpd | 32,000vpd | 36,000vpd |
| D | 13,500vpd | 15,000vpd | 36,000vpd | 40,500vpd |
| E | 22,900vpd | 25,200vpd[4] | 40,000vpd | 45,000vpd |
| F | >22,900vpd | >25,200vpd[4] | >40,000vpd | >45,000vpd |

[1] Based on Table 3.9 Austroads - Guide to Traffic Engineering Practice Part 2

[2] Based on single carriageway +10% (supported by Table 3.1 Austroads - Guide to Traffic Engineering Practice Part 3) – Boulevard or division by medians.

[3] Based on RRR Table 3.5 - mid-block service flow rates (SF.) for urban arterial roads with interrupted flow. Using 60/40 peak split.

[4] Note James Street Guildford passes 28,000vpd.