Traffic

TaylorThomsonWhitting

# Lismore Hospital Stage 3B Works and Multi-Storey Car Park

# Traffic and Parking Report

## for Health Infrastructure

9 January 2015

TTW Job No: 121204UTA

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## Revision Register

| Rev | Date | Prepared By | Approved By | Remarks |
|---|---|---|---|---|
| 1 | 7/11/14 | KT | PY | Draft - For Review |
| 2 | 13/11/14 | KT | PY | Revised |
| 3 | 20/11/14 | KT | PY | Revised |
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Prepared by:
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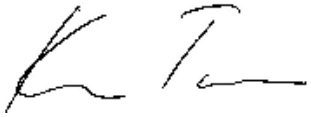

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## EXECUTIVE SUMMARY

This report provides a review assessment of the proposed car park and Stage 3B redevelopment at Lismore Base Hospital. As part of the overall masterplan for the site, it is proposed to construct as part of the Stage 3B hospital works:

- Fit out for the Peri-Operative level (operating theatres)
- The continuation of the podium to include Central Sterile Services Department (CSSD) and Maternity.
- Surgical and Medical Inpatient Units and Paediatrics Unit.
- The addition of a helipad over the plant and associated trauma lifts to access the helipad on the roof.
- The L3 Loading dock with new entrance from Little Uralba Street servicing the new development.
- Pharmacy and Front of House Services
- Imaging adjacent to the emergency department

Nearby the current hospital site, it is proposed to construct a Multi-storey car park located between Uralba Street and Dalziell Street.

This is a complementary report to Traffic and Parking Report (July 2013, TTW) which was prepared as part of a master plan and future redevelopment of the Hospital.

Currently, the car parking provision for the Hospital consists of some 930 spaces (including 630 on street and 304 off street). This level of car parking meets the existing demand of the Hospital with some burden on parking activities along streets near the Hospital site.

The proposal included the introduction of a car park at between Uralba Street and Dalziell Street (east of the University Centre). Stage 1 of the car park is proposed to have 270 spaces (244 spaces in a multi-storey car park and 26 spaces in the adjoining the at grade car parking area). The future Stage 2 of the car park will remove the at grade parking area and construct an additional multi-story car park increasing the total to 562 parking spaces (including Stage 1). This is based on current architectural drawings, which will be further refined, however it is estimated that the current proposed parking number will only change by ± 10%, which will have minimal impact on the current analysis outlined in this report.

The level of car parking provision will have a significant impact in reducing the car parking activities along the streets near the Hospital while improving parking facility for the users and patrons of the Hospital.

The level of Hospital's activities will remain similar to that detailed in the previous Traffic and Parking Report (July 2013, TTW) and therefore no adverse impact will be experienced on street and intersection operation of the road system surrounding the Hospital.

The impact of intersection analysis associated with the new carpark has also been examined and indicate that the street and intersection will operate satisfactorily.

# 1.0 INTRODUCTION

## 1.1 Background

This traffic and parking report has been prepared to review, assess and comment on the Stage 3B redevelopment of Lismore Base Hospital (LBH).

This report has been developed based on discussions and advice from team members (including health Infrastructure and the Local Health Network), previous traffic reports reviewed, previous experience of similar regional hospitals and a set of assumptions as outlined in this report.

The Stage 3B plans permits the redevelopment of the site consisting of a number of buildings and a carpark.

The main concerns of this study relate to the provision of adequate and appropriate parking facilities and vehicle access to and from the Hospital site.

It should be noted that a previous Traffic and Parking Report for the redevelopment of the Hospital has addressed the main traffic and parking issues associated with the Hospital's activities. Therefore, the Traffic and Parking Study dated July 2103 (TTW) provides the basis of this report. Refer to **Appendix B**

## 1.2 The Study Area

As part of the overall masterplan for the site, it is proposed to construct as part of Stage 3B works:

- Fit out for the Peri-Operative level (operating theatres)
- The continuation of the podium to include Central Sterile Services Department (CSSD) and Maternity.
- Surgical and Medical Inpatient Units and Paediatrics Unit.
- The addition of a helipad over the plant and associated trauma lifts to access the helipad on the roof.
- The L3 Loading dock with new entrance from Little Uralba Street servicing the new development.
- Pharmacy and Front of House Services
- Imaging adjacent to the emergency department

In addition, there is to be a new Multi-storey car park located between Uralba Street and Dalziell Street (east of the University Centre). Stage 1 of the car park is proposed to have 270 spaces (244 spaces in a multi-storey car park and 26 spaces in the adjoining the at grade car parking area). The future Stage 2 of the car park will remove the at grade parking area and construct an additional multi-story car park increasing the total to 562 parking spaces (including Stage 1). This is based on current architectural drawings, which will be further refined, however it is estimated that the current proposed parking number will only change by ± 10%, which will have minimal impact on the current analysis outlined in this report.

The car park is proposed to have an entry/exit facility along Uralba Street and exit only on Dalziell Street.

Intersection analysis was undertaken at the critical nearby intersections:

- Hunter Street/Uralba Street roundabout
- Dibbs Street/Uralba Street roundabout


**Figure 1**: Site Plan
(Source: www.nearmap.com.au)

### 1.3 Scope of the Report

The report is divided into four sections:

- Section 1 includes background and aim of the study.
- Section 2 covers the existing conditions.
- Section 3 covers the proposed redevelopment of the Hospital.
- Section 4 provides a summary and conclusions

## 2.0 EXISTING CONDITIONS

### 2.1 Access and Street System

The main access routes to the Hospital are via Hunter and Uralba Streets. Uralba Street is a major route providing access to the Lismore Town Centre with traffic volumes of nominally 700-800 vehicles per hour (vph) each way.

Hunter Street is a local road and provides immediate access to the Hospital Campus with traffic volumes of 200 vph during the peak periods.

Dibbs Street is a local road with traffic volumes of approximately 70 vph during the peak periods.

The intersection of Hunter and Uralba Street is controlled with a roundabout. The intersection of Dibbs and Uralba Streets is controlled with a roundabout. Both intersections currently operate at a satisfactory level of service.

Fermoy Avenue and Weaver Street also provide access to the eastern side of the Hospital Site.

## 2.2 Car Parking

Currently, a total of some 934 car parking spaces are provided for the Hospital use comprising 304 off street and 630 on street.

The Traffic and Parking Report (July 2013, TTW) provides a detailed assessment of car parking demand for the Hospital. On this basis, the proposed parking strategy as shown below will address the existing parking needs associated with the Hospital's activities and also meet its future needs. Car parking demands for various scenarios are shown in **Table 2.1** below.

**Table 2.1 - Lismore Hospital Parking Demand and Population Scenarios**

**(Source: Traffic and Parking Report, July 2013)**

| Phase | Staff | No of Spaces | Outpatients | No of Spaces | Visitors | No of Spaces | Total Spaces |
|---|---|---|---|---|---|---|---|
| **Existing** | 850 | **650** | 550/day | **120** | 50 | **50** | **820** |
| **Phase 3A** | 956 | **730** | 650/day | **140** | 60 | **60** | **930** |

The above car parking supply and demand scenarios indicate that the current on and off street car parking supply meets the existing (Stage 3A) car parking demand of the Hospital.

## 2.3 Active and Public Transport

Bus Routes 661, 681, 682 and 684 provide services to and from the Hospital. The frequencies of these services are generally limited to one per hour with the exception of the morning peak hour when 2 services occur.

It should be noted that the pick-up and set down activities (i.e. buses) take place along Hunter Street. No formal bus stop on Hunter Street is required as the current "Hail and Ride" system of operation will continue to be used. This has been consulted with relevant authorities and they have indicated their consensus and approval.

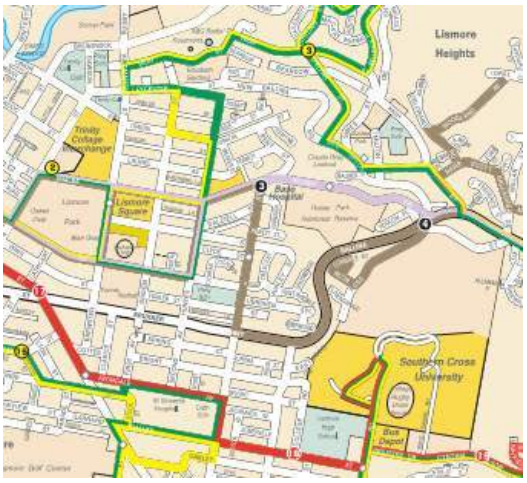



**Figure 2 - Bus Routes**

Pedestrian footpaths are provided along the streets adjacent to the Hospital. A pedestrian crossing facility (marked foot crossing) is available along Uralba Street, opposite the main entry to the Hospital.

Due to the hilly nature of the area, limited bicycle activities have been observed.

## 3.0 HOSPITAL CONCEPT MASTERPLAN

### 3.1 Proposed Hospital Redevelopment

As part of the overall masterplan for the site, it is proposed to construct as part of Stage 3B works

- Fit out for the Peri-Operative level (operating theatres)
- The continuation of the podium to include Central Sterile Services Department (CSSD) and Maternity.
- Surgical and Medical Inpatient Units and Paediatrics Unit.
- The addition of a helipad over the plant and associated trauma lifts to access the helipad on the roof.
- The L3 Loading dock with new entrance from Little Uralba Street servicing the new development.
- Pharmacy and Front of House Services
- Imaging adjacent to the emergency department

In addition, there is to be a Multi-storey car park located between Uralba Street and Dalziell Street.

As a result of the Stage 3B works, the following additional staff and visitor numbers are anticipated

**Table 3.1 - Lismore Hospital Proposed Staffing and Visitor Numbers Stage 3B**

| Area | Projected Increase patient/staffing (per day) | Area | Projected Increase patient/staffing (per day) |
|---|---|---|---|
| **Inpatient unit** | | **Outpatients** | |
| Acute Inpatients | 21 | Stage 3B1 increase | 98 |
| Visitors Acute Inpatients | 28 | Stage 3B2 increase | 44 |
| **Staffing** | | Moving Community Health | 185 |
| Stage 3B1 | 37 | | |
| Stage 3B2 | 15 | | |
| Refurbished Zone | 12 | | |
| Moving Community Health | 69 | | |

The impact of Stage 3A of the Hospital, has been assessed per Traffic and Parking Report (July 2013, TTW). The traffic implication of the Hospital redevelopment on intersections operation has been assessed and shown in the Appendix, indicating very little impact of level of service and performances of the street and intersection system.

It is noted that part of Stage 3B works it is proposed to included the construction of multi-storey car park, located between Uralba Street and Dalziell Street.

The proposal includes the introduction of a car park at between Uralba Street and Dalziell Street (east of the University Centre). Stage 1 of the car park is proposed to have 270 spaces (244 spaces in a multi-storey car park and 26 spaces in the adjoining the at grade car parking area). The future Stage 2 of the car park will remove the at grade parking area and construct an additional multi-story car park increasing the total to 562 parking spaces (including Stage 1). This is based on current architectural drawings, which will be further refined, however it is estimated that the current proposed parking number will only change by ± 10%, which will have minimal impact on the current analysis outlined in this report.

This will assist in reducing the street parking demand on the surrounding streets surrounding the Hospital.

## 3.2 Parking

In addition to the hospital works the proposed multi-storey car park proposed will be located at south of Uralba Street, east of University Centre with access off Uralba and Dalziell Streets. The access off to Uralba Street is provided for left in/left out movements while the access off Dalziell Street is for exit only. To provide the access/exit point off Uralba Street, there will be a loss of 8 existing kerb side parking spaces along the southern kerb. This equates less than 1% of the existing parking within the vicinity of the hospital and will be compensated with the additional parking provided with the multi-storey car park.

As discussed in **Section 2.2**, the current parking supply for the Hospital (on and off street) meets its current parking demand. Therefore, the introduction of a car parking area with capacity of 562 spaces (at the completion of Stage 2) will improve the parking situation for the Hospital users and its patrons and will also reduce the impact of car parking activities along the streets surrounding the Hospital's campus.

**Table 3.1 - Lismore Hospital Parking Demand and Population Scenarios**

| Phase | Staff | No of Spaces | Outpatients | No of Spaces | Visitors | No of Spaces | Total Spaces |
|---|---|---|---|---|---|---|---|
| **Existing** | 850 | **650** | 550/day | **120** | 50 | **50** | **820** |
| **Phase 3A** | 956 | **730** | 650/day | **140** | 60 | **60** | **930** |
| **Phase 3B** | 1089 | **833** | 977/day | **177** | 70 | **70** | **1080** |

Therefore car parking situation will comprise:

- Existing: 934 spaces (304 off street + 630 on street)
- Stage 3B with Stage 1 Carpark complete: 1,196 spaces (934 existing – 8 street parking + 270 new car park)
- Stage 3B with Stage 1 and 2 Carpark completed: 1,488 spaces (934 existing – 8

street parking + 562 new car park)

Accordingly, the above parking provision will meet the parking requirements associated with Stage 3B with car parking demand of 1080 spaces.

## 3.3 Traffic Impact of the Development

Currently, the street system and intersections surrounding the LBH are operating in a satisfactory manner in terms of road and intersection capacity, and will continue to operate satisfactorily as part of future Hospital's redevelopment (see Traffic and Parking Report July 2013, TTW).

As part of this study, further assessment of the proposed car park and its impact on adjacent intersections have been carried out during the AM and PM peak periods. Intersection analysed include:

- Hunter Street/Uralba Street roundabout
- Dibbs Street/Uralba Street roundabout

A summary of the results are shown in **Table 3.2** with details of the SIDRA analysis in **Appendix A**. The results indicate that these intersections will continue to operate at a satisfactory level of service.

The existing volumes were based upon previous traffic data obtained in 2012 for the Hunter Street/Uralba Street intersection, while existing volumes for the Dibbs Street/Uralba Street intersection was based on 2007 data and increased by 10% for a growth factor. A list of assumptions and background information is outlined in **Appendix A**. These included:

- Car park access is via Uralba Street and exit via Uralba and Dalziell Street as outlined in the architectural drawings
- Vehicles arriving from the west will utilise the Dibbs Street Roundabout (u-turn) to access the Uralba Street entrance (the central median restricts the right tuning into the car park)
- Vehicles departing to the west will utilise the Uralba Street exit (most of the car park has a shorter internal travel distance to the Uralba Street exit).
- Vehicles departing to the east will utilise the Dalziell Street exit and turn right at the Dibbs Street roundabout onto Uralba Street (the central median on Uralba Street restricts the right tuning out of the car park)

*Note: Directional signage could assist is guiding vehicles to utilise appropriate exits*


**Figure 3**: Vehicle Approach and Departure Routes
(Source: www.nearmap.com.au)

For an estimated worse case scenario, the proposed peak hour traffic volumes generated from the car park were based on a turnover of 75%-85% during the peak hour (ie 236 vehicle trips for Stage 1 and 424 vehicle trips for Stage 1 and 2 combined).

**Table 3.2 – SIDRA Analysis Summary**

| Location | Intersection Level of Service (LoS) | | | | | |
|---|---|---|---|---|---|---|
| | Existing | | Post Stage 1 Car Park Development | | Post Stage 1 and 2 Car Park Development | |
| | AM Peak | PM Peak | AM Peak | PM Peak | AM Peak | PM Peak |
| Hunter Street/ Uralba Street roundabout | A | A | A | A | A | A |
| Dibbs Street/ Uralba Street roundabout | A | A | A* | A | A+ | A |

Note:

DoS = Degree of Saturation

* LoS B on Dibbs Street approach

+ LoS C on Dibbs Street approach

It is noted that the intersections overall operated with a Level of Service “A” pre and post construction of the car park, with the Dibbs Street approach delay increasing but still within satisfactory limits to RMS intersection Level of Service guidelines.

# 4.0 LOADING DOCK ACCESS

## 4.1 Hunter Street Loading Dock

There is no proposed changes to the existing Hunter Street Loading Dock facility

## 4.2 Little Uralba Street Loading Dock

A new loading dock access is proposed off Little Uralba Street to facilitate access for vehicles up to 12.5m in length.

Little Uralba Street is currently a one way road northbound with variable width being nominally 3.2m wide. It currently provides access to 7 residential properties along the eastern kerbline.

Access to the loading dock to Level 3 of the hospital will be via Uralba Street, north into Little Uralba Street and will utilise adjoining land (3 adjoining residential properties) as shown in the civil drawings and depicted in **Figure 4.** A turning area will be provided within the adjoining properties to allow a forward exit onto Little Uralba Street towards Uralba Street. The existing road width permits one way traffic movement. Consequently, it will be necessary to implement traffic management procedures at the entrance into Little Uralba Street to control vehicle access to and from the loading dock. It is considered that traffic lights or similar will be utilised to control the access into the Little Uralba Street and exit from the loading dock, which could incorporate a vehicle activation area within the loading dock.

The installation of the turning area prevents through access along Little Uralba Street. Consequently it is proposed to have Little Uralba Street two way from both the south and north entry points.

From the south access Little Uralba Street will provide access to the loading dock and one residential property. It is anticipated that this section of road would have very low traffic volume from the residential property. The loading dock is anticipated to facilitate approximately 20 vehicles per day. There is low probability of opposing traffic movement occurring. Waste collection for this property could occur from Uralba Street, thus not requiring waste collection vehicles to enter Little Uralba Street. As noted above traffic management procedures (eg traffic lights) will be implemented to control access and egress into Little Uralba Street.

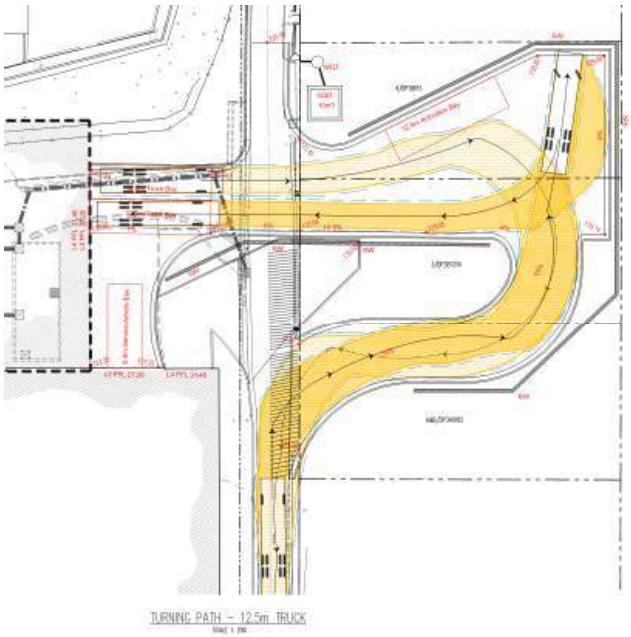



**Figure 4**: 12.5m Truck Turning Path

From the north Little Uralba Street will provide access to 3 residential properties. It is anticipated that this section of road would have very low traffic volume with the probability of opposing traffic movement occurring also being low (average of 7.4 daily vehicle trips per dwelling based on RMS Guide To Traffic Generating Developments Update Traffic Surveys TD 2013/04). Consideration could be given, if require, modification of driveways areas to provide a passing location. Given the existing road widths and boundary locations, passing areas would be restricted.

Consideration needs to be given to providing access for waste collection to these properties. This could include provision within the loading dock turning area to allow access for Council waste vehicles to turn around and return along Little Uralba Street. Alternatively, the waste collection vehicle may reverse southbound along Little Uralba Street for waste collection or a common collection point could be made at the intersection of Little Uralba Street/Fermoy Avenue.

Final arrangements are subject to consultation with Council based on the existing relationship.

The closure of thoroughfare along Little Uralba Street will have to be referred to emergency Services (eg Fire, Ambulance, Police) in addition to Council and RMS for approval.

### 4.3 Little Uralba Street Mortuary Loading Dock

The existing mortuary loading dock to Level 4 is proposed to be slightly modified to allow for the access into the proposed Level 3 loading dock facility below.

The mortuary loading dock will facilitate a hearse/stretch limousine (up to 7.47m in length) or bariatric ambulance (6.95m in length) to enter Little Uralba Street from Uralba Street. The vehicle will reverse into the dock area before exiting in a forward direction onto Little Uralba Street and Uralba Street. This will need to be co-ordained with traffic management associated with the hospital loading dock on level 3 due to the current width of Little Uralba Street.


**Figure 5**: Mortuary Loading Dock Turning Paths

## 5.0 CONSTRUCTION ACCESS

A detailed Construction Traffic Management Plan (CTMP) will be prepared prior to commencement of works. Provision for pedestrian and cyclist access will be made as part of the CTMP.

Access to the worksites for construction vehicles will be designated routes and will utilise major road network (such as Uralba Street, Dawson Street and Rotary Drive) where possible to minimise impact to local streets.

Construction of the car park will be in two stages as outlined in **Section 1.2**.

## 6.0 TRANSPORT MANAGEMENT STRATEGY

The Transport Management Strategy will remain unchanged as outlined in Stage 3A Traffic and Parking Report July 2013, TTW, refer to **Appendix B**.

## 7.0 RESPONSE TO SECRETARY'S ENVIRONMENTAL ASSESSMENT REQUIREMENTS (SEARS)

A list of Secretary's Environmental Assessment Requirements (SEARs) dated 19 December 2014 is addressed as outlined below.

| **Relevant Director General's Requirement** | **Detailed Description of Requirement** | **Response** |
|---|---|---|
| **2. Strategic Policies and Guidelines** | Address the relevant planning provisions, goals and strategic planning objectives in the following:<br>• NSW 2021;<br>• Far North Coast Regional Strategy;<br>• Northern Rivers Regional Transport Plan 2013;<br>• Northern Rivers Regional Plan 2013-2016. | The study has been carried out with consideration to relevant guidelines and planning documents including:<br><br>RMS's Guide to Traffic Generating Developments, AUSTROADS and state, regional and Lismore Council's planning documents.<br><br>Northern Rivers Regional Transport Plan 2013 has identified Lismore Base Hospital as one of the key destinations with the Lismore area. The Plan has earmarked the area for improved public transport services and better accessibility as part of its short and long term planning, while also given consideration to private vehicle use. The proposal for the Hospital redevelopment is also framed within such strategies and complementary to Plan. |
| **5. Transport, Parking and Access** | The existing and proposed pedestrian and cycle movements within the vicinity of the site | The hospital master plan is in accordance with general requirements for safe and efficient movements of soft traffic within the campus. |

| Relevant Director General's Requirement | Detailed Description of Requirement | Response |
|---|---|---|
| | An estimate of the total daily and peak hour trips generated by the proposal, including vehicle, public transport, pedestrian and cycle trips | Section 3 and 4.2 of Traffic Report outlines the anticipated traffic impact assessment as a result of the Stage 3B, new car park facility and loading dock. The assessment included a SIDRA analysis on two intersections (Hunter/Uralba Street and Dibbs/Uralba Street) with traffic associated with the proposed new car park. |
| | The adequacy of public transport to meet the likely future demand of the proposed development | Section 2.3 of this report outlines the public transport within the vicinity of the site. There are several bus routes operating within the vicinity of the hospital with connects to the CBD. |
| | Measures to promote travel choices that support the achievement of State targets, such as a location-specific sustainable travel plan | Section 6 of this report refers to original report where all these points have been addressed. |
| | The daily and peak vehicle movements impact on nearby intersections, with consideration of the cumulative impacts from other approved developments in the vicinity, and the need/associated funding for upgrading or road improvement works (if required) | Section 3.3 of this report outlines the anticipated traffic impact assessment on nearby intersections including SIDRA analysis (Hunter/Uralba Street and Dibbs/Uralba Street). The analysis indicated the intersections will continue to operate within acceptable limits. |
| | The proposed access arrangements, including for emergency vehicles, and measures to mitigate any associated traffic impacts and impacts on public transport, pedestrian and cycle networks | Section 4.0 of this report outlines specific consideration and consultation requirement for the provision of emergency access for the closure of Little Uralba Street. The master plan for the site overall has considered these elements. |
| | Demonstrate adequate pedestrian links between the hospital site and the car park site have been provided | Current pedestrian crossing along Uralba Street provides such facility. This is similar to other institutions such as RPA (Missenden Rd) or Wollongong Hospital. It should be noted that currently most parking activities are occurring along streets. Therefore, minimal increase in pedestrian activities would be generated but a safer and uniform pattern would emerge instead of current scattered movements along the street. |

| Relevant Director General's Requirement | Detailed Description of Requirement | Response |
|---|---|---|
| | Proposed car parking provision, including consideration of the availability of public transport and the requirements of the relevant parking codes and Australian Standards | Sections 3.1 and 3.2 of this report outlines the anticipated parking demand with consideration to potential transport patronage. |
| | Service vehicle access, delivery and loading arrangements and estimated service vehicle movements (including vehicle type and the likely arrival and departure times) | Section 4.0 of this report discusses the proposed loading dock and delivery arrangement from Little Uralba Street. |
| | Traffic and transport impacts during construction and how these impacts will be mitigated for any associated traffic, pedestrian, cyclists, parking and public transport, including the preparation of a draft Construction Traffic Management Plan to demonstrate the proposed management of the impact | Section 5 of this report outlines the need for a detailed Construction Traffic Management Plan to be developed prior to construction. The plan will incorporate vehicle, cycle and pedestrian activity. Access to the worksite will aim to utilise the major road networks where possible to minimise impact on the local streets |

In addition to the SEARs, Council has provided the following comments in letter dated 12 December 2014. The following comments are addressed below.

| Council Comment | Response |
|---|---|
| 2. Council recognises the constrained nature of the site and is pleased that Health Infrastructure has configured the building in such that the main loading areas are off the side road, Little Uralba Street. This ensures the traffic carrying capacity of the surrounding main roads is not compromised. To allow Little Uralba Street to function as the main loading area for the hospital, parts of the road will have to be closed. Council supports this, but will require that the residents adjoining the north retain serviceable road access to their residences. Council also requires that Health Infrastructure negotiates the purchase of the lot located on the north eastern corner of the intersection of Little Uralba Street and Uralba Street. Failure to purchase this lot will make delivery truck movements into and out of Little Uralba Street very difficult and possibly unreasonable impacts, and will also adversely impact on the level of service that is provided by Uralba Street. | It is noted that Health Infrastructure has had consultations with the landholder of the lot in question. Should the lot not be available, it will be necessary to implement traffic management procedures at the entrance into Little Uralba Street to control vehicle access to and from the loading dock. It is considered that traffic lights or similar will be utilised to control the access into the Little Uralba Street and exit from the loading dock, which could incorporate a vehicle activation area within the loading dock. Initial advice provided by Health Infrastructure indicates the loading dock is anticipated to generally have a low traffic movements of approximately 20 vehicles per day. |

| Council Comment | Response |
|---|---|
| 3. The application lodged anticipates a 500 space car park to be built in two stages. The first stage is currently proposed for immediate construction, but the application is silent in regard to the "triggers" that would be used to determine when the second stage would need to be constructed. Council is concerned that the first stage of the car park that has been proposed has been sized to accommodate Stage 3A and this application for Stage 3B may require the construction of the second stage of the car park to ensure that the on street car parking does not return to its previous poor and congested nature. Council would like the application to propose criteria by which the need for the timing of the second stage of the car park can be determined | This will be addressed by Health Infrastructure as part of the site evaluation and determination of sufficient demand being generated for such a facility along with a satisfactory business case. |
| 4. The new car park that is to be constructed on the southern side of Uralba Street will significantly increase the number of pedestrians crossing Uralba Street, on the pedestrian crossing, between the car park and the hospital. As Uralba Street is a major artery into and out of the CBD from the east this increase in usage of the pedestrian crossing is likely to lead to a decrease in the levels of service of this road. It is anticipated that a position will be reached where it is no longer satisfactory to direct pedestrians traffic to the hospital via a pedestrian crossing and maintain reasonable traffic flow. The next level of service will be the installation of pedestrian traffic lights followed by a high level overpass. Council would like to see the application propose conceptual detail on options available when the street level pedestrian crossing is no longer acceptable and when and how alternatives are contemplated and facilitated at the initial design stage, with clear criteria for implementation to be required, rather than retrofitted afterthought. Once again clear definitive trigger points should be identified plus plans provided that show how the car park and hospital is designed to provide for a future pedestrian overpass at the relevant trigger point. Council would prefer that a conservative approach is taken when the overpass is put in ie preferably when B1 is being completed. | Current pedestrian crossing along Uralba Street provides such facility between the car park and the hospital. This is similar to other institutions such as RPA (Missenden Rd) or Wollongong Hospital.<br><br>It should be noted that currently most parking activities are occurring along streets. Therefore, minimal increase pedestrian activities would be generated but a safer and uniform pattern would emerge instead of the current scattered movements along the street. This will result in more efficient and safer pedestrian movements. |

| Council Comment | Response |
|---|---|
| 5. Fundamental to the success of the proposed parking station and corresponding reduction in on-street car parking is the introduction and enforcement of a Car Parking Management Strategy. This strategy must include local resident parking proposals which are acceptable to residents and enforceable by council. It also need to be understood that Council has limited resources, and any proposal will need to be developed in consultation with Council staff to ensure the required outcomes are achievable in relation to capital expenses to establish and to a lesser extent, recurrent operating costs that will be incurred. A consultative approach will ensure Council is not unreasonably burdened financially. Council therefore, asks that a Car Parking Management Strategy be prepared and provided as part of this application. | A Health Precinct Workshop held in November 2012 discussed future development within the Hospital Precinct and its surrounds (refer to Stage 3A Traffic and Parking Report July 2013, TTW).<br><br>During the proceedings, various parking and traffic management options were discussed, which included support for increasing on-street parking, a multi-storey carpark and traffic calming measures in Uralba Street. Workshop participants, which included Council staff, hospital staff and representatives, as well as local residents and businesses and were generally in support of the hospital redevelopment and anticipated improvement initiatives.<br><br>As a result of this workshop, the current proposal of the multi-storey car park has been developed, to address the anticipated parking demands, hospital staff and community and business considerations.<br><br>A Car Parking Management Strategy (to include both street and off street parking areas) could be developed to improve the current parking amenity for residents and hospital users. |

## 8.0 CONCLUSION

The proposal included the introduction of a car park at between Uralba Street and Dalziell Street (east of the University Centre). Stage 1 of the car park is proposed to have 270 spaces (244 spaces in a multi-storey car park and 26 spaces in the adjoining the at grade car parking area). The future Stage 2 of the car park will remove the at grade parking area and construct an additional multi-story car park increasing the total to 562 parking spaces (including Stage 1). This is based on current architectural drawings, which will be further refined, however it is estimated that the current proposed parking number will only change by ± 10%, which will have minimal impact on the current analysis outlined in this report.

The 562 car parking spaces within the multi-storey car park will provide additional car parking opportunity for the Hospital's patrons and reduce the parking demand on the surrounding street network.

The parking provision of some 1196 spaces at the completion of Stage 1 multi-story car park will meet the parking requirements associated with estimated car parking demand stage 3B of 1080 spaces. Stage 2 car multi-storey car park will provide a total of 1,488 spaces.

It has been estimated that a maximum of about 60 additional vehicles during a peak hour could be generated by the proposed redevelopment of the Hospital as a result of staff and outpatients numbers. This level of vehicular traffic would have a minimal impact on the road system considering various approach routes to the site.

It has been estimated that the proposed new car park could potentially generate some 236 vehicle trips during a peak hour during Stage 1 and 424 vehicle trips at the completion of Stage 2 (based on an anticipated worse case estimated of 75%-85% turn over during peak periods). Intersection analysis of nearby intersections indicates the intersections will continue to operate at a satisfactory Level of Service within satisfactory limits to RMS intersection Level of Service guidelines.

The main access to the Hospital will remain per its masterplan, with an introduction of left in/left out access off Uralba Street and exit on Dalziell Street to the proposed carpark.

The proposed loading dock off Little Uralba Street requires closure of thoroughfare along Little Uralba Street. This will require consultation with emergency services authorities (eg Fire, Ambulance, Police) in addition to Council and RMS for approval. Council consultation needs to be undertaken to address waste truck access arrangements and access to residential properties.

All roads associated with the Hospital site have a satisfactory level of service and will continue to have a similar level of service once the Stage 3B development is completed.

The level of vehicular traffic will be low and the road network will continue to have satisfactory operational characteristics.

The access and car park layout should be in accordance with the Roads and Maritime Services Guidelines, the Australian Standard and Council's Code.

The proposed development will aim to improve the safety and efficiency for vehicular traffic and pedestrian movements within the Study Area.

# APPENDIX A: SIDRA ANALYSIS –MULTI-STOREY CAR PARK

# Lismore Hospital Stage 3B:

# Multi-Storey Car Park SIDRA Analysis

**Table of Contents**

**Page**

## Revision Register

| Rev | Date | Prepared By | Remarks |
|---|---|---|---|
| 1 | 15/10/14 | STC | |
| 2 | 17/10/14 | STC | Stages 1 and 2 combined added |
| 3 | 20/11/14 | STC | Combined as Stage 3B |
| 4 | 5/12/14 | STC | Revised Parking Numbers |

H:\2012\121204\Traffic\SIDRA\141205_Lismore Hospital Stage 3B-Stage 1 and 2 Car park SIDRA Analysis Summary.doc

## 1.0 SITE CONDITIONS

### 1.1 Assumptions/Background Information

The following is a list of information and assumptions to anticipated generate traffic movements

***General***

- Existing intersection traffic counts were base on previous information
    - Hunter Street/Uralba Street based on 2012 counts
    - Dibbs Street/Uralba Street based on 2007 counts + 10% growth
- Assume 50%/50% of traffic will arrive and depart from the east/west respectively
- Car park access is via Uralba Street and exit via Uralba and Dalziell Street
- Vehicles arriving from the west will utilise the Dibbs Street Roundabout (u-turn) to access the Uralba Street entrance
- Vehicles departing to the west will utilise the Uralba Street exit
- Vehicles departing to the east will utilise the Dalziell Street exit and turn right at the Dibbs Street roundabout onto Uralba Street

***Stage 1 Car Park***

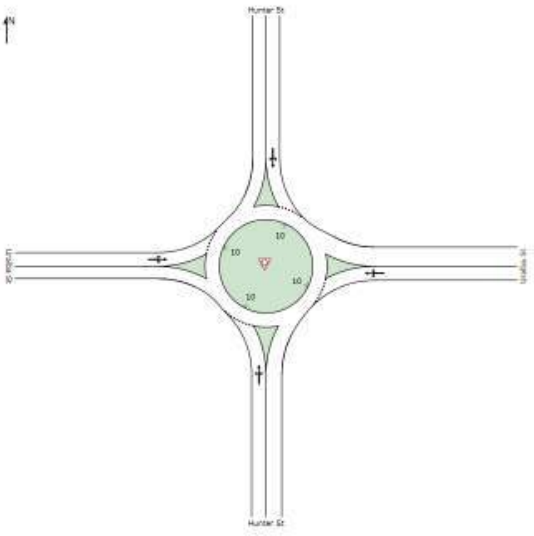
- Multi-Storey Car Park Stage 1 capacity = 270 spaces (244 Multi-storey and 26 at grade)
- Estimated peak hour car park traffic generation: approx 75-85% turn over = 236 vehicle trips/hour
- AM Peak
    - 70% will arrive into the car park (166 veh/hr)
    - 30% will depart the car park (70 veh/hr)
- PM Peak
    - 30% will arrive into the car park (70veh/hr)
    - 70% will depart the car park (166 veh/hr)

***Stages 1 and 2 Car Park***

- Multi-Storey Car Park Stage 1 and 2 capacity = 562 spaces
- Estimated peak hour car park traffic generation: approx 75-85% turn over = 424 vehicle trips/hour
- AM Peak
    - 70% will arrive into the car park (296 veh/hr)
    - 30% will depart the car park (128 veh/hr)
- PM Peak
    - 30% will arrive into the car park (128 veh/hr)
    - 70% will depart the car park (296 veh/hr)

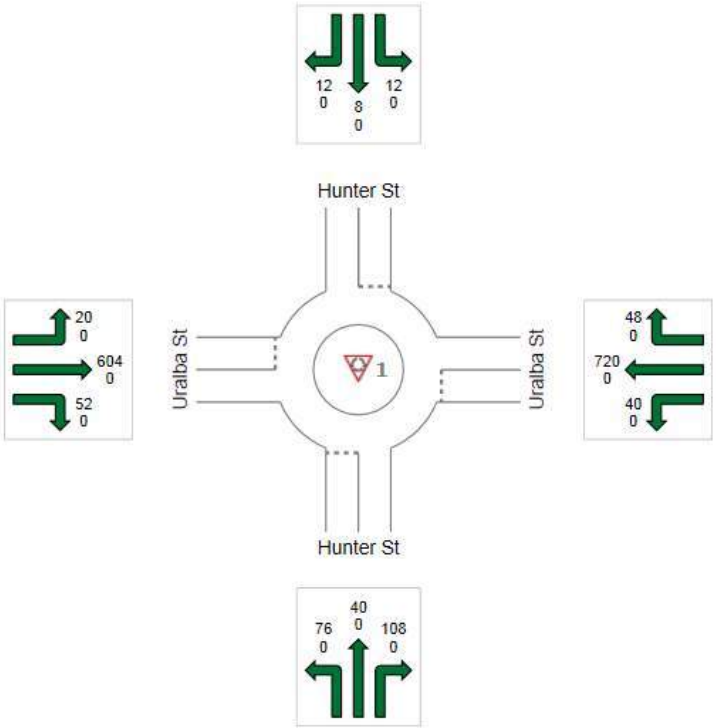

**Site Plan**

## 2.0 HUNTER STREET / URALBA STREET INTERSECTION




### 2.1 Existing Pre Car Park Traffic Analysis (2012): AM Peak

#### 2.1.1 Existing Volumes



### 2.1.2 Lane Summary

# LANE SUMMARY

## Site: Hunter and Uralba Street Intersection - AM Peak: Existing (2012)

Hunter and Uralba Street Intersection - AM Peak: Existing (2012)

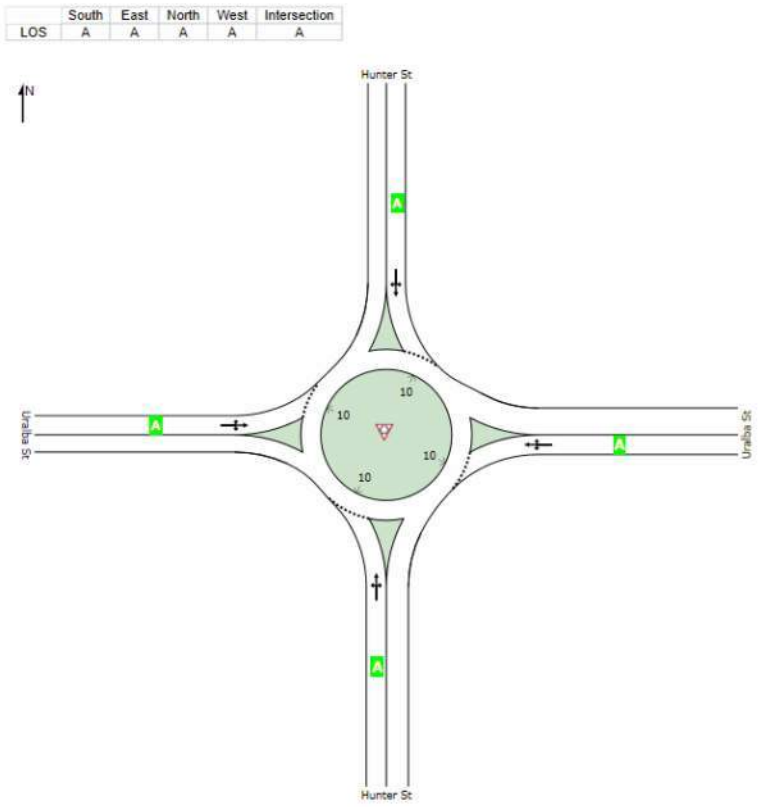
Roundabout

**Lane Use and Performance**

| | Demand Flows | | Cap. | Deg. Satn | Lane Util. | Average Delay | Level of Service | 95% Back of Queue | | Lane Config | Lane Length | Cap. Adj. | Prob. Block. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total | HV | | | | | | Veh | Dist | | | | |
| | veh/h | % | veh/h | v/c | % | sec | | | m | | m | % | % |
| South: Hunter St | | | | | | | | | | | | | |
| Lane 1[d] | 224 | 0.0 | 682 | 0.329 | 100 | 10.2 | LOS A | 1.9 | 13.2 | Full | 150 | 0.0 | 0.0 |
| Approach | 224 | 0.0 | | 0.329 | | 10.2 | LOS A | 1.9 | 13.2 | | | | |
| East: Uralba St | | | | | | | | | | | | | |
| Lane 1[d] | 808 | 0.0 | 1375 | 0.587 | 100 | 4.3 | LOS A | 4.8 | 33.8 | Full | 290 | 0.0 | 0.0 |
| Approach | 808 | 0.0 | | 0.587 | | 4.3 | LOS A | 4.8 | 33.8 | | | | |
| North: Hunter St | | | | | | | | | | | | | |
| Lane 1[d] | 32 | 0.0 | 609 | 0.053 | 100 | 9.2 | LOS A | 0.3 | 1.9 | Full | 130 | 0.0 | 0.0 |
| Approach | 32 | 0.0 | | 0.053 | | 9.2 | LOS A | 0.3 | 1.9 | | | | |
| West: Uralba St | | | | | | | | | | | | | |
| Lane 1[d] | 676 | 0.0 | 1178 | 0.574 | 100 | 5.1 | LOS A | 4.5 | 31.3 | Full | 200 | 0.0 | 0.0 |
| Approach | 676 | 0.0 | | 0.574 | | 5.1 | LOS A | 4.5 | 31.3 | | | | |
| Intersection | 1740 | 0.0 | | 0.587 | | 5.5 | LOS A | 4.8 | 33.8 | | | | |

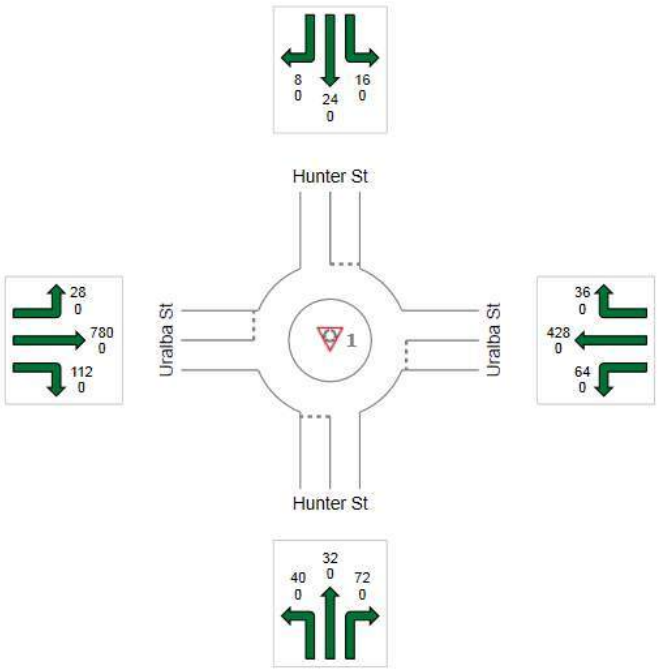
d Dominant lane on roundabout approach

### 2.1.3 Level of Service Summary



## 2.2 Existing Pre Car Park Traffic Analysis (2012): PM Peak

### 2.2.1 Proposed Volumes




### 2.2.2 Lane Summary

# LANE SUMMARY

## Site: Hunter and Uralba Street Intersection - PM Peak: Existing (2012)

Hunter and Uralba Street Intersection - PM Peak: Existing (2012)

Roundabout

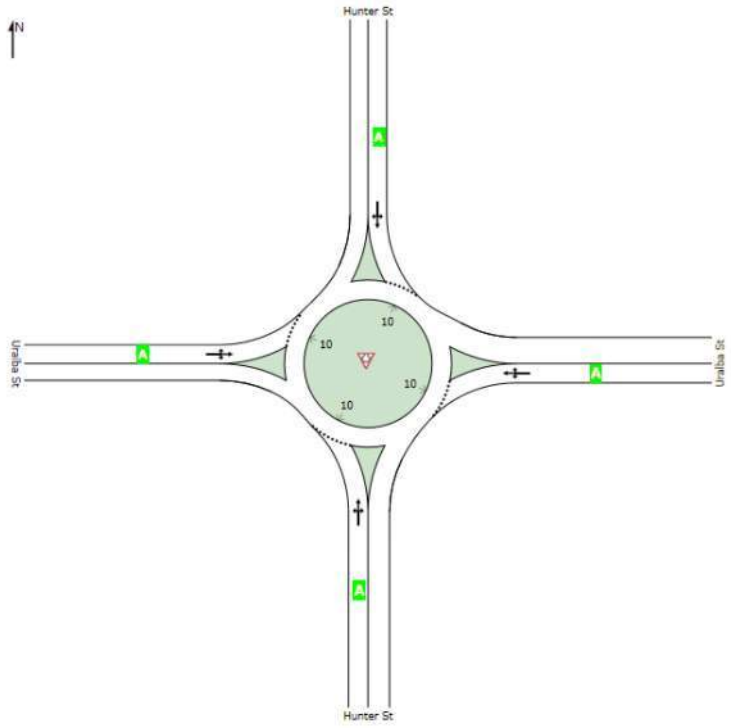
**Lane Use and Performance**

| | Demand Flows | | Cap. | Deg. Satn | Lane Util. | Average Delay | Level of Service | 95% Back of Queue | | Lane Config | Lane Length | Cap. Adj. | Prob. Block. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total | HV | | | | | | Veh | Dist | | | | |
| | veh/h | % | veh/h | v/c | % | sec | | | m | | m | % | % |
| South: Hunter St | | | | | | | | | | | | | |
| Lane 1d | 144 | 0.0 | 875 | 0.165 | 100 | 7.4 | LOS A | 0.8 | 5.5 | Full | 150 | 0.0 | 0.0 |
| Approach | 144 | 0.0 | | 0.165 | | 7.4 | LOS A | 0.8 | 5.5 | | | | |
| East: Uralba St | | | | | | | | | | | | | |
| Lane 1d | 528 | 0.0 | 1202 | 0.439 | 100 | 4.6 | LOS A | 2.8 | 19.5 | Full | 290 | 0.0 | 0.0 |
| Approach | 528 | 0.0 | | 0.439 | | 4.6 | LOS A | 2.8 | 19.5 | | | | |
| North: Hunter St | | | | | | | | | | | | | |
| Lane 1d | 48 | 0.0 | 471 | 0.102 | 100 | 11.1 | LOS A | 0.6 | 4.1 | Full | 130 | 0.0 | 0.0 |
| Approach | 48 | 0.0 | | 0.102 | | 11.1 | LOS A | 0.6 | 4.1 | | | | |
| West: Uralba St | | | | | | | | | | | | | |
| Lane 1d | 920 | 0.0 | 1291 | 0.713 | 100 | 5.2 | LOS A | 7.1 | 49.8 | Full | 200 | 0.0 | 0.0 |
| Approach | 920 | 0.0 | | 0.713 | | 5.2 | LOS A | 7.1 | 49.8 | | | | |
| Intersection | 1640 | 0.0 | | 0.713 | | 5.4 | LOS A | 7.1 | 49.8 | | | | |

d Dominant lane on roundabout approach

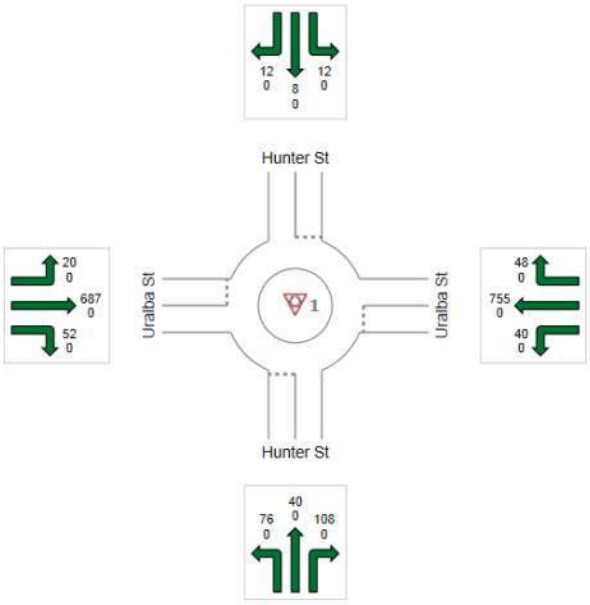
### 2.2.3 Level of Service Summary

| | South | East | North | West | Intersection |
|---|---|---|---|---|---|
| LOS | A | A | A | A | A |




## 2.3 Stage 1 Post Car Park Development Traffic Analysis: AM Peak

### 2.3.1 Proposed Volumes



### 2.3.2 Lane Summary

# LANE SUMMARY

## Site: Hunter and Uralba Street Intersection - AM Peak: Post Car Park Development (Stage 1)

Hunter and Uralba Street Intersection - AM Peak: Post Car Park Development (Stage 1)

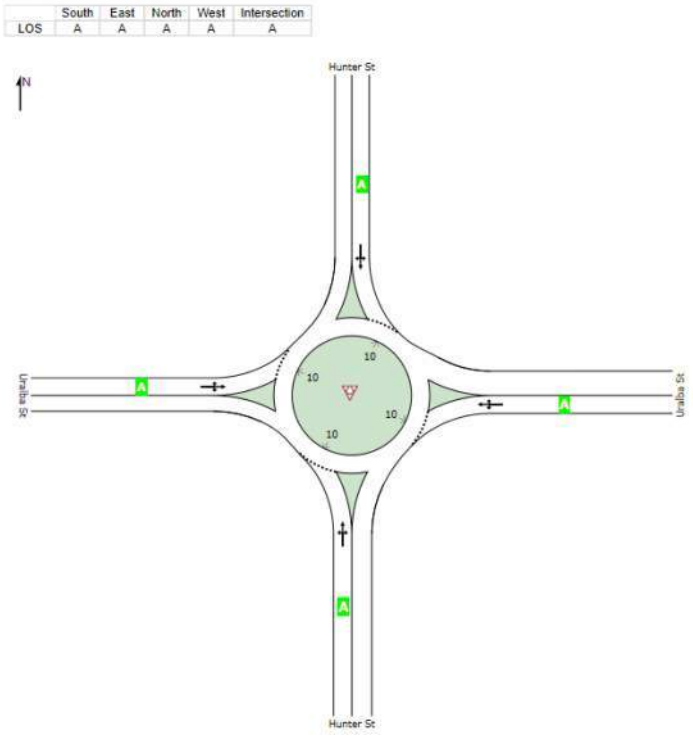
Roundabout

**Lane Use and Performance**

| | Demand Flows | | Cap. | Deg. Satn | Lane Util. | Average Delay | Level of Service | 95% Back of Queue | | Lane Config | Lane Length | Cap. Adj. | Prob. Block. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total | HV | | | | | | Veh | Dist | | | | |
| | veh/h | % | veh/h | v/c | % | sec | | | m | | m | % | % |
| South: Hunter St | | | | | | | | | | | | | |
| Lane 1d | 224 | 0.0 | 655 | 0.342 | 100 | 10.6 | LOS A | 2.0 | 14.0 | Full | 150 | 0.0 | 0.0 |
| Approach | 224 | 0.0 | | 0.342 | | 10.6 | LOS A | 2.0 | 14.0 | | | | |
| East: Uralba St | | | | | | | | | | | | | |
| Lane 1d | 843 | 0.0 | 1378 | 0.612 | 100 | 4.3 | LOS A | 5.3 | 37.3 | Full | 290 | 0.0 | 0.0 |
| Approach | 843 | 0.0 | | 0.612 | | 4.3 | LOS A | 5.3 | 37.3 | | | | |
| North: Hunter St | | | | | | | | | | | | | |
| Lane 1d | 32 | 0.0 | 545 | 0.059 | 100 | 10.1 | LOS A | 0.3 | 2.2 | Full | 130 | 0.0 | 0.0 |
| Approach | 32 | 0.0 | | 0.059 | | 10.1 | LOS A | 0.3 | 2.2 | | | | |
| West: Uralba St | | | | | | | | | | | | | |
| Lane 1d | 759 | 0.0 | 1185 | 0.640 | 100 | 5.3 | LOS A | 5.5 | 38.7 | Full | 200 | 0.0 | 0.0 |
| Approach | 759 | 0.0 | | 0.640 | | 5.3 | LOS A | 5.5 | 38.7 | | | | |
| Intersection | 1858 | 0.0 | | 0.640 | | 5.5 | LOS A | 5.5 | 38.7 | | | | |

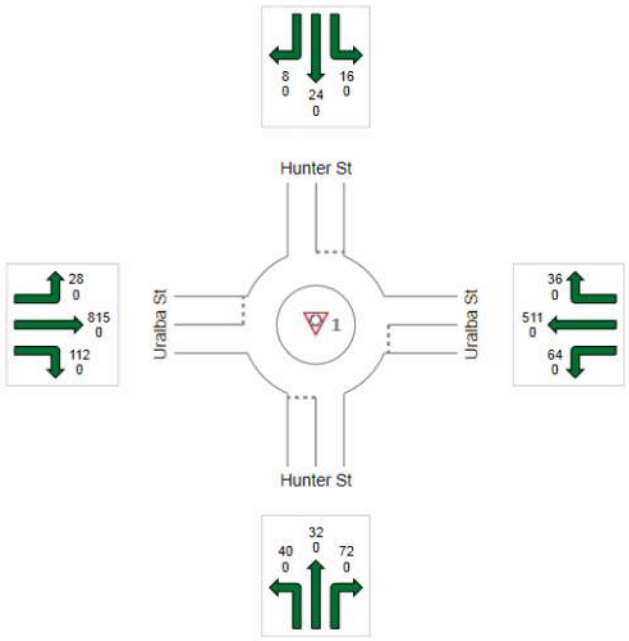
d Dominant lane on roundabout approach

### 2.3.3 Level of Service Summary



## 2.4 Stage 1 Post Car Park Development Traffic Analysis: PM Peak

### 2.4.1 Proposed Volumes




### 2.4.2 Lane Summary

# LANE SUMMARY

## Site: Hunter and Uralba Street Intersection - PM Peak: Post Car Park Development (Stage 1)

Hunter and Uralba Street Intersection - PM Peak: Post Car Park Development (Stage 1)

Roundabout

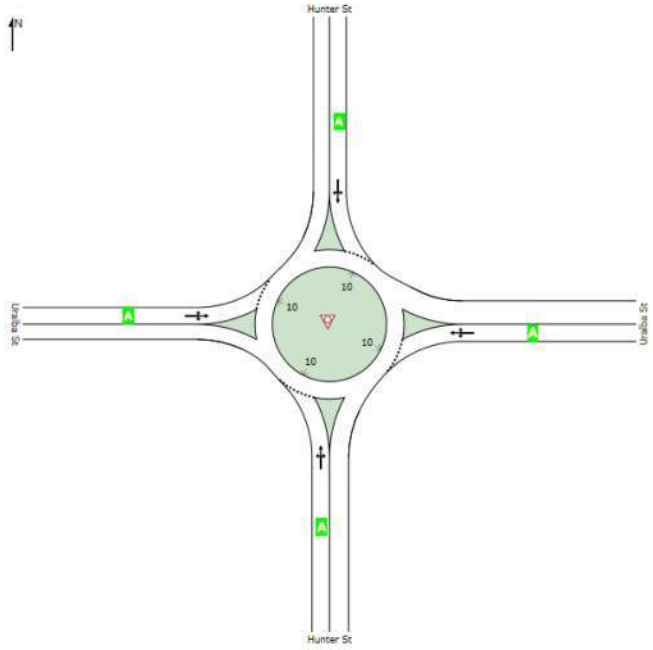
**Lane Use and Performance**

| | Demand Flows | | Cap. | Deg. Satn | Lane Util. | Average Delay | Level of Service | 95% Back of Queue | | Lane Config | Lane Length | Cap. Adj. | Prob. Block. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total | HV | | | | | | Veh | Dist | | | | |
| | veh/h | % | veh/h | v/c | % | sec | | | m | | m | % | % |
| South: Hunter St | | | | | | | | | | | | | |
| Lane 1d | 144 | 0.0 | 815 | 0.177 | 100 | 8.0 | LOS A | 0.9 | 6.2 | Full | 150 | 0.0 | 0.0 |
| Approach | 144 | 0.0 | | 0.177 | | 8.0 | LOS A | 0.9 | 6.2 | | | | |
| East: Uralba St | | | | | | | | | | | | | |
| Lane 1d | 611 | 0.0 | 1213 | 0.504 | 100 | 4.7 | LOS A | 3.5 | 24.5 | Full | 290 | 0.0 | 0.0 |
| Approach | 611 | 0.0 | | 0.504 | | 4.7 | LOS A | 3.5 | 24.5 | | | | |
| North: Hunter St | | | | | | | | | | | | | |
| Lane 1d | 48 | 0.0 | 442 | 0.109 | 100 | 11.7 | LOS A | 0.6 | 4.4 | Full | 130 | 0.0 | 0.0 |
| Approach | 48 | 0.0 | | 0.109 | | 11.7 | LOS A | 0.6 | 4.4 | | | | |
| West: Uralba St | | | | | | | | | | | | | |
| Lane 1d | 955 | 0.0 | 1292 | 0.739 | 100 | 5.3 | LOS A | 7.9 | 55.2 | Full | 200 | 0.0 | 0.0 |
| Approach | 955 | 0.0 | | 0.739 | | 5.3 | LOS A | 7.9 | 55.2 | | | | |
| Intersection | 1758 | 0.0 | | 0.739 | | 5.5 | LOS A | 7.9 | 55.2 | | | | |

d Dominant lane on roundabout approach

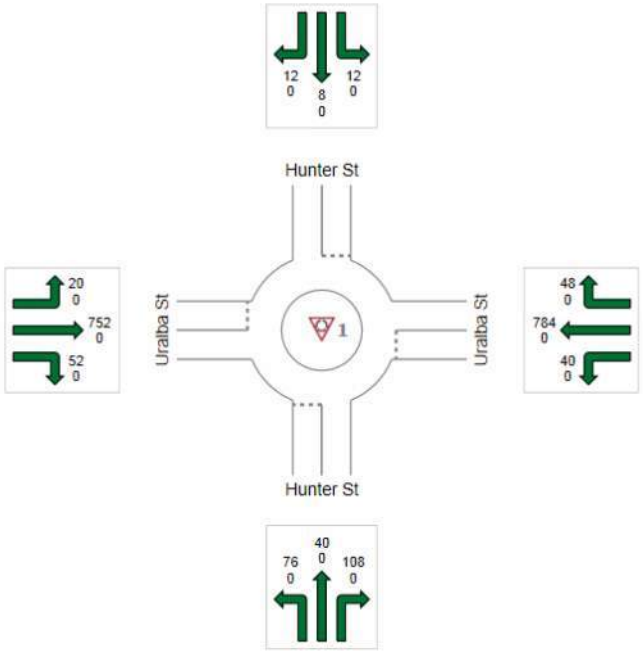
### 2.4.3 Level of Service Summary

| | South | East | North | West | Intersection |
|---|---|---|---|---|---|
| LOS | A | A | A | A | A |




## 2.5 Stage 1 and 2 Post Car Park Development Traffic Analysis: AM Peak

### 2.5.1 Proposed Volumes



### 2.5.2 Lane Summary

# LANE SUMMARY

## Site: Hunter and Uralba Street Intersection - AM Peak: Post Car Park Development (Stage 1 and 2)

Hunter and Uralba Street Intersection - AM Peak: Post Car Park Development (Stage 1 and 2)

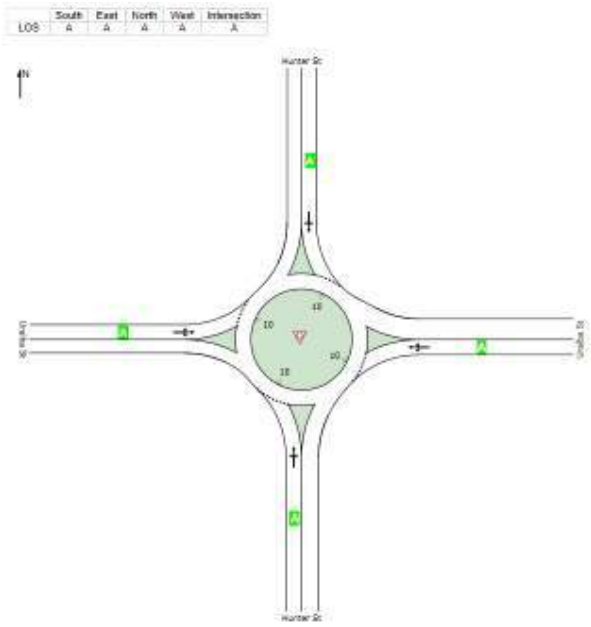
Roundabout

**Lane Use and Performance**

| | Demand Flows | | Cap. | Deg. Satn | Lane Util. | Average Delay | Level of Service | 95% Back of Queue | | Lane Config | Lane Length | Cap. Adj. | Prob. Block. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total | HV | | | | | | Veh | Dist | | | | |
| | veh/h | % | veh/h | v/c | % | sec | | | m | | m | % | % |
| South: Hunter St | | | | | | | | | | | | | |
| Lane 1[d] | 224 | 0.0 | 633 | 0.354 | 100 | 10.9 | LOS A | 2.1 | 14.7 | Full | 150 | 0.0 | 0.0 |
| Approach | 224 | 0.0 | | 0.354 | | 10.9 | LOS A | 2.1 | 14.7 | | | | |
| East: Uralba St | | | | | | | | | | | | | |
| Lane 1[d] | 872 | 0.0 | 1380 | 0.632 | 100 | 4.3 | LOS A | 5.8 | 40.5 | Full | 290 | 0.0 | 0.0 |
| Approach | 872 | 0.0 | | 0.632 | | 4.3 | LOS A | 5.8 | 40.5 | | | | |
| North: Hunter St | | | | | | | | | | | | | |
| Lane 1[d] | 32 | 0.0 | 494 | 0.065 | 100 | 10.9 | LOS A | 0.4 | 2.5 | Full | 130 | 0.0 | 0.0 |
| Approach | 32 | 0.0 | | 0.065 | | 10.9 | LOS A | 0.4 | 2.5 | | | | |
| West: Uralba St | | | | | | | | | | | | | |
| Lane 1[d] | 824 | 0.0 | 1191 | 0.692 | 100 | 5.6 | LOS A | 6.8 | 47.4 | Full | 200 | 0.0 | 0.0 |
| Approach | 824 | 0.0 | | 0.692 | | 5.6 | LOS A | 6.8 | 47.4 | | | | |
| Intersection | 1952 | 0.0 | | 0.692 | | 5.7 | LOS A | 6.8 | 47.4 | | | | |

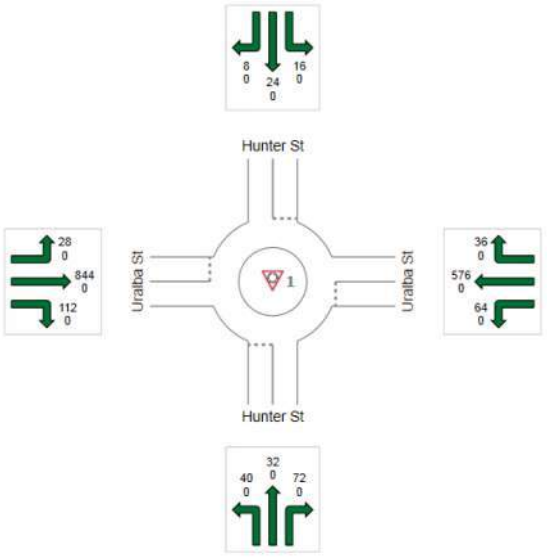
d Dominant lane on roundabout approach

### 2.5.3 Level of Service Summary



## 2.6 Stage 1 and 2 Post Car Park Development Traffic Analysis: PM Peak

### 2.6.1 Proposed Volumes




### 2.6.2 Lane Summary

# LANE SUMMARY

## Site: Hunter and Uralba Street Intersection - PM Peak: Post Car Park Development (Stage 1 and 2)

Hunter and Uralba Street Intersection - PM Peak: Post Car Park Development (Stage 1 and 2)

Roundabout

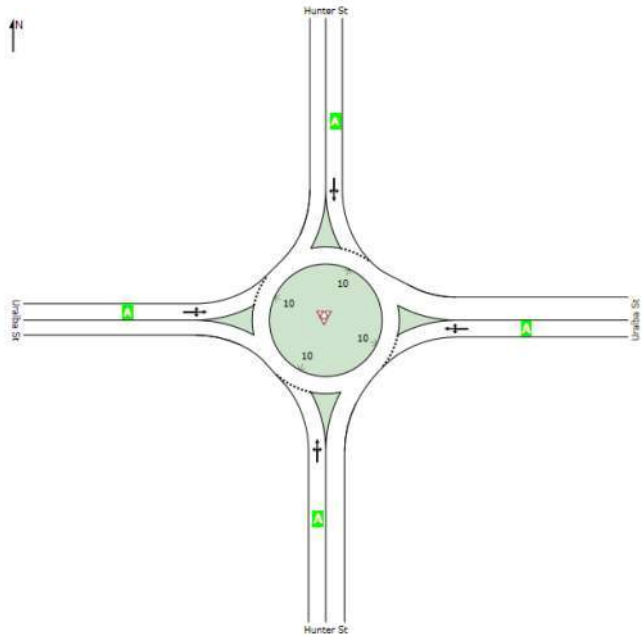
**Lane Use and Performance**

| | Demand Flows | | Cap. | Deg. Satn | Lane Util. | Average Delay | Level of Service | 95% Back of Queue | | Lane Config | Lane Length | Cap. Adj. | Prob. Block. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total | HV | | | | | | Veh | Dist | | | | |
| | veh/h | % | veh/h | v/c | % | sec | | | m | | m | % | % |
| South: Hunter St | | | | | | | | | | | | | |
| Lane 1d | 144 | 0.0 | 766 | 0.188 | 100 | 8.4 | LOS A | 1.0 | 6.8 | Full | 150 | 0.0 | 0.0 |
| Approach | 144 | 0.0 | | 0.188 | | 8.4 | LOS A | 1.0 | 6.8 | | | | |
| East: Uralba St | | | | | | | | | | | | | |
| Lane 1d | 676 | 0.0 | 1220 | 0.554 | 100 | 4.7 | LOS A | 4.2 | 29.2 | Full | 290 | 0.0 | 0.0 |
| Approach | 676 | 0.0 | | 0.554 | | 4.7 | LOS A | 4.2 | 29.2 | | | | |
| North: Hunter St | | | | | | | | | | | | | |
| Lane 1d | 48 | 0.0 | 418 | 0.115 | 100 | 12.2 | LOS A | 0.7 | 4.8 | Full | 130 | 0.0 | 0.0 |
| Approach | 48 | 0.0 | | 0.115 | | 12.2 | LOS A | 0.7 | 4.8 | | | | |
| West: Uralba St | | | | | | | | | | | | | |
| Lane 1d | 984 | 0.0 | 1293 | 0.761 | 100 | 5.3 | LOS A | 8.6 | 60.2 | Full | 200 | 0.0 | 0.0 |
| Approach | 984 | 0.0 | | 0.761 | | 5.3 | LOS A | 8.6 | 60.2 | | | | |
| Intersection | 1852 | 0.0 | | 0.761 | | 5.5 | LOS A | 8.6 | 60.2 | | | | |

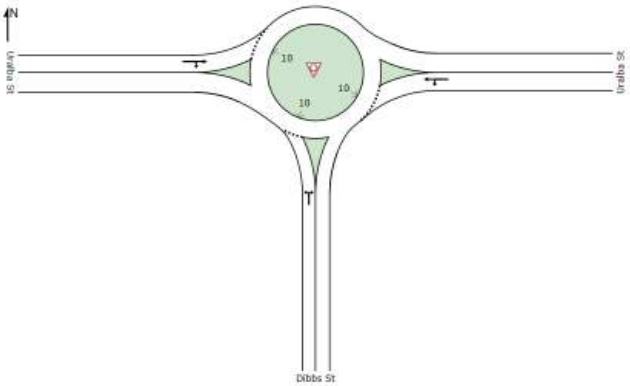
d Dominant lane on roundabout approach

### 2.6.3 Level of Service Summary

| | South | East | North | West | Intersection |
|---|---|---|---|---|---|
| LOS | A | A | A | A | A |

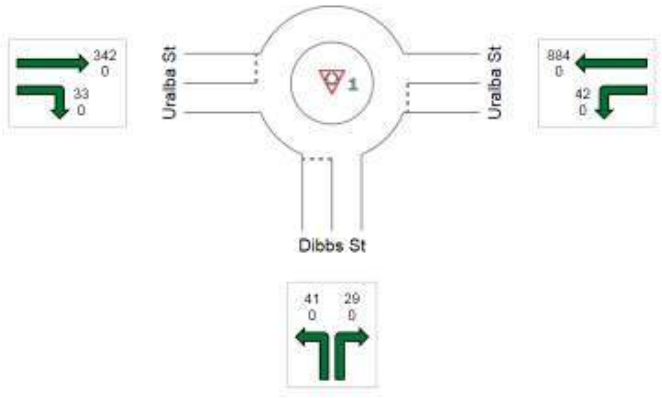



## 3.0 DIBBS STREET / URALBA STREET INTERSECTION



## 3.1 Existing Pre Car Park Traffic Analysis (2007+10%): AM Peak

### 3.1.1 Existing Volumes




### 3.1.2 Lane Summary

# LANE SUMMARY

**Site: Dibbs and Uralba Street Intersection - AM Peak: Existing (2004+10% GF)**

Dibbs and Uralba Street Intersection - AM Peak: Existing (2012)

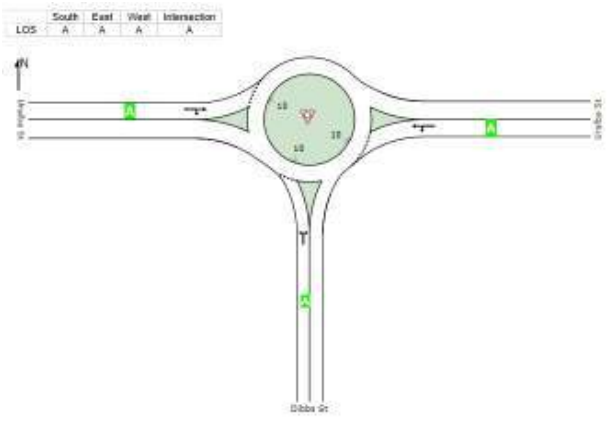
Roundabout

**Lane Use and Performance**

| | Demand Flows | | Cap. | Deg. Satn | Lane Util. | Average Delay | Level of Service | 95% Back of Queue | | Lane Config | Lane Length | Cap. Adj. | Prob. Block. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total | HV | | | | | | Veh | Dist | | | | |
| | veh/h | % | veh/h | v/c | % | sec | | | m | | m | % | % |
| South: Dibbs St | | | | | | | | | | | | | |
| Lane 1d | 70 | 0.0 | 516 | 0.136 | 100 | 12.5 | LOS A | 0.8 | 5.5 | Full | 55 | 0.0 | 0.0 |
| Approach | 70 | 0.0 | | 0.136 | | 12.5 | LOS A | 0.8 | 5.5 | | | | |
| East: Uralba St | | | | | | | | | | | | | |
| Lane 1d | 926 | 0.0 | 1480 | 0.626 | 100 | 3.8 | LOS A | 5.0 | 34.7 | Full | 500 | 0.0 | 0.0 |
| Approach | 926 | 0.0 | | 0.626 | | 3.8 | LOS A | 5.0 | 34.7 | | | | |
| West: Uralba St | | | | | | | | | | | | | |
| Lane 1d | 375 | 0.0 | 1478 | 0.254 | 100 | 4.0 | LOS A | 1.5 | 10.8 | Full | 290 | 0.0 | 0.0 |
| Approach | 375 | 0.0 | | 0.254 | | 4.0 | LOS A | 1.5 | 10.8 | | | | |
| Intersection | 1371 | 0.0 | | 0.626 | | 4.3 | LOS A | 5.0 | 34.7 | | | | |

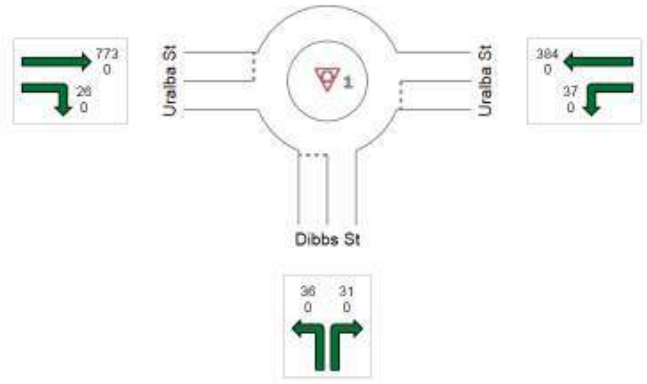
d Dominant lane on roundabout approach

### 3.1.3 Level of Service Summary



## 3.2 Existing Pre Car Park Traffic Analysis (2007+10%): PM Peak

### 3.2.1 Existing Volumes




### 3.2.2 Lane Summary

# LANE SUMMARY

## Site: Dibbs and Uralba Street Intersection - PM Peak: Existing (2004+10% GF)

Dibbs and Uralba Street Intersection - PM Peak: Existing (2012)

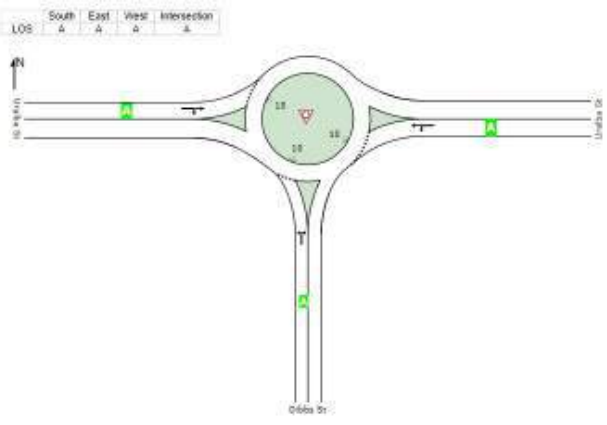
Roundabout

**Lane Use and Performance**

| | Demand Flows | | Cap. | Deg. Satn | Lane Util. | Average Delay | Level of Service | 95% Back of Queue | | Lane Config | Lane Length | Cap. Adj. | Prob. Block. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total | HV | | | | | | Veh | Dist | | | | |
| | veh/h | % | veh/h | v/c | % | sec | | | m | | m | % | % |
| South: Dibbs St | | | | | | | | | | | | | |
| Lane 1d | 67 | 0.0 | 835 | 0.080 | 100 | 7.2 | LOS A | 0.4 | 2.9 | Full | 55 | 0.0 | 0.0 |
| Approach | 67 | 0.0 | | 0.080 | | 7.2 | LOS A | 0.4 | 2.9 | | | | |
| East: Uralba St | | | | | | | | | | | | | |
| Lane 1d | 421 | 0.0 | 1435 | 0.293 | 100 | 3.7 | LOS A | 1.4 | 9.9 | Full | 500 | 0.0 | 0.0 |
| Approach | 421 | 0.0 | | 0.293 | | 3.7 | LOS A | 1.4 | 9.9 | | | | |
| West: Uralba St | | | | | | | | | | | | | |
| Lane 1d | 799 | 0.0 | 1539 | 0.519 | 100 | 3.8 | LOS A | 4.1 | 29.0 | Full | 290 | 0.0 | 0.0 |
| Approach | 799 | 0.0 | | 0.519 | | 3.8 | LOS A | 4.1 | 29.0 | | | | |
| Intersection | 1287 | 0.0 | | 0.519 | | 4.0 | LOS A | 4.1 | 29.0 | | | | |

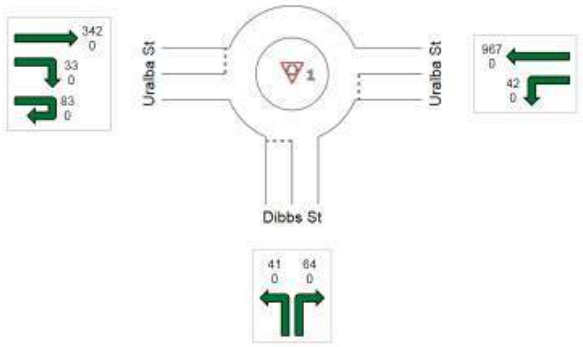
d Dominant lane on roundabout approach

### 3.2.3 Level of Service Summary



## 3.3 Stage 1 Post Car Park Development Traffic Analysis: AM Peak

### 3.3.1 Proposed Volumes




### 3.3.2 Lane Summary

# LANE SUMMARY

## Site: Dibbs and Uralba Street Intersection - AM Peak: Post Car Park Development (Stage 1)

Dibbs and Uralba Street Intersection - AM Peak: Post Car Park Development (Stage 1)

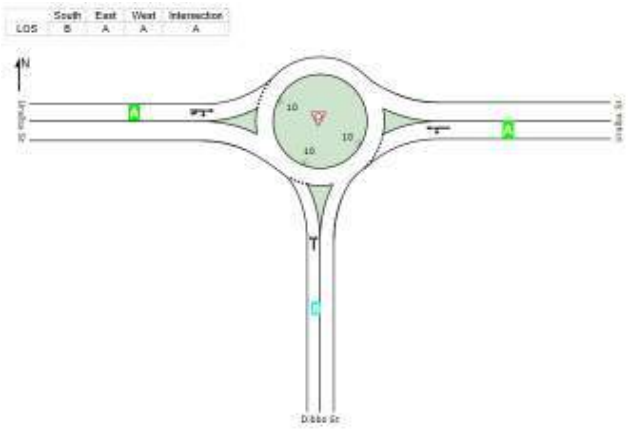
Roundabout

**Lane Use and Performance**

| | Demand Flows | | Cap. | Deg. Satn | Lane Util. | Average Delay | Level of Service | 95% Back of Queue | | Lane Config | Lane Length | Cap. Adj. | Prob. Block. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total | HV | | | | | | Veh | Dist | | | | |
| | veh/h | % | veh/h | v/c | % | sec | | | m | | m | % | % |
| South: Dibbs St | | | | | | | | | | | | | |
| Lane 1d | 105 | 0.0 | 361 | 0.291 | 100 | 16.9 | LOS B | 1.9 | 13.4 | Full | 55 | 0.0 | 0.0 |
| Approach | 105 | 0.0 | | 0.291 | | 16.9 | LOS B | 1.9 | 13.4 | | | | |
| East: Uralba St | | | | | | | | | | | | | |
| Lane 1d | 1009 | 0.0 | 1283 | 0.786 | 100 | 4.8 | LOS A | 8.8 | 61.6 | Full | 500 | 0.0 | 0.0 |
| Approach | 1009 | 0.0 | | 0.786 | | 4.8 | LOS A | 8.8 | 61.6 | | | | |
| West: Uralba St | | | | | | | | | | | | | |
| Lane 1d | 458 | 0.0 | 1376 | 0.333 | 100 | 4.9 | LOS A | 2.2 | 15.7 | Full | 290 | 0.0 | 0.0 |
| Approach | 458 | 0.0 | | 0.333 | | 4.9 | LOS A | 2.2 | 15.7 | | | | |
| Intersection | 1572 | 0.0 | | 0.786 | | 5.7 | LOS A | 8.8 | 61.6 | | | | |

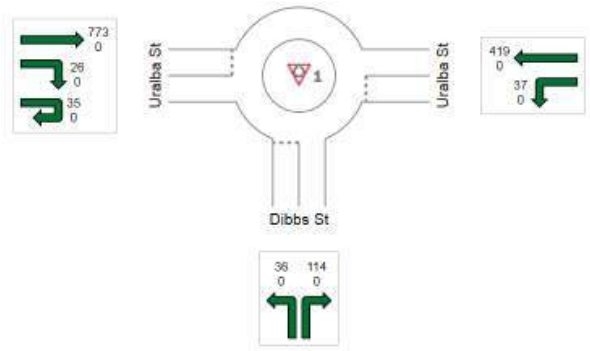
d Dominant lane on roundabout approach

### 3.3.3 Level of Service Summary



## 3.4 Stage 1 Post Car Park Development Traffic Analysis: PM Peak

### 3.4.1 Proposed Volumes




### 3.4.2 Lane Summary

# LANE SUMMARY

## Site: Dibbs and Uralba Street Intersection - PM Peak: Post Car Park Development (Stage 1)

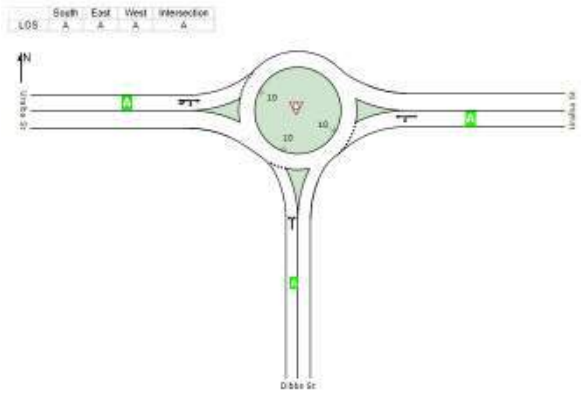
Dibbs and Uralba Street Intersection - PM Peak: Post Car Park Development (Stage 1)
Roundabout

**Lane Use and Performance**

| | Demand Flows | | Cap. | Deg. Satn | Lane Util. | Average Delay | Level of Service | 95% Back of Queue | | Lane Config | Lane Length | Cap. Adj. | Prob. Block. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total | HV | | | | | | Veh | Dist | | | | |
| | veh/h | % | veh/h | v/c | % | sec | | | m | | m | % | % |
| South: Dibbs St | | | | | | | | | | | | | |
| Lane 1d | 150 | 0.0 | 777 | 0.193 | 100 | 9.0 | LOS A | 1.1 | 7.6 | Full | 55 | 0.0 | 0.0 |
| Approach | 150 | 0.0 | | 0.193 | | 9.0 | LOS A | 1.1 | 7.6 | | | | |
| East: Uralba St | | | | | | | | | | | | | |
| Lane 1d | 456 | 0.0 | 1316 | 0.347 | 100 | 3.9 | LOS A | 1.9 | 13.6 | Full | 500 | 0.0 | 0.0 |
| Approach | 456 | 0.0 | | 0.347 | | 3.9 | LOS A | 1.9 | 13.6 | | | | |
| West: Uralba St | | | | | | | | | | | | | |
| Lane 1d | 834 | 0.0 | 1331 | 0.627 | 100 | 4.7 | LOS A | 5.7 | 39.7 | Full | 290 | 0.0 | 0.0 |
| Approach | 834 | 0.0 | | 0.627 | | 4.7 | LOS A | 5.7 | 39.7 | | | | |
| Intersection | 1440 | 0.0 | | 0.627 | | 4.9 | LOS A | 5.7 | 39.7 | | | | |

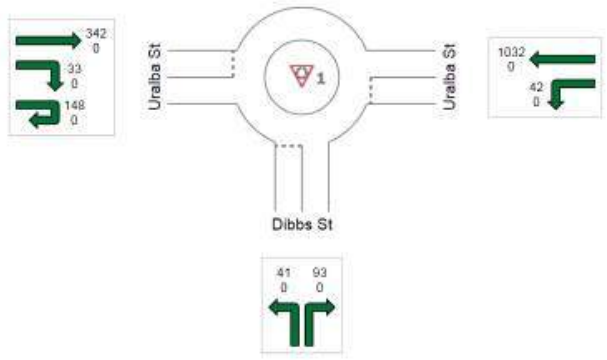
d Dominant lane on roundabout approach

### 3.4.3 Level of Service Summary



## 3.5 Stage 1 and 2 Post Car Park Development Traffic Analysis: AM Peak

### 3.5.1 Proposed Volumes




### 3.5.2 Lane Summary

# LANE SUMMARY

## Site: Dibbs and Uralba Street Intersection - AM Peak: Post Car Park Development (Stage 1 and 2)

Dibbs and Uralba Street Intersection - AM Peak: Post Car Park Development (Stage 1 and 2)

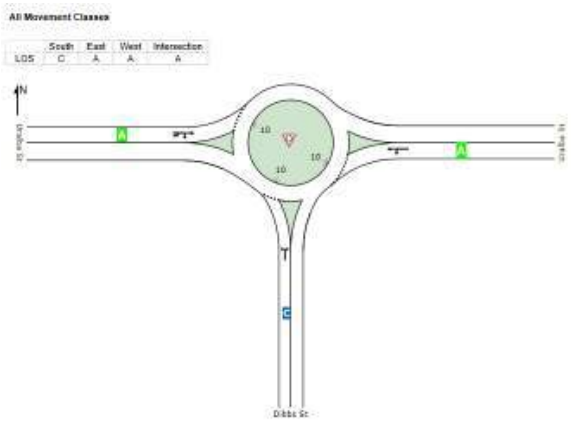
Roundabout

**Lane Use and Performance**

| | Demand Flows | | Cap. | Deg. Satn | Lane Util. | Average Delay | Level of Service | 95% Back of Queue | | Lane Config | Lane Length | Cap. Adj. | Prob. Block. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total | HV | | | | | | Veh | Dist | | | | |
| | veh/h | % | veh/h | v/c | % | sec | | | m | | m | % | % |
| South: Dibbs St | | | | | | | | | | | | | |
| Lane 1d | 134 | 0.0 | 241 | 0.557 | 100 | 33.4 | LOS C | 4.7 | 32.7 | Full | 55 | 0.0 | 0.0 |
| Approach | 134 | 0.0 | | 0.557 | | 33.4 | LOS C | 4.7 | 32.7 | | | | |
| East: Uralba St | | | | | | | | | | | | | |
| Lane 1d | 1074 | 0.0 | 1187 | 0.905 | 100 | 9.7 | LOS A | 18.7 | 130.9 | Full | 500 | 0.0 | 0.0 |
| Approach | 1074 | 0.0 | | 0.905 | | 9.7 | LOS A | 18.7 | 130.9 | | | | |
| West: Uralba St | | | | | | | | | | | | | |
| Lane 1d | 523 | 0.0 | 1317 | 0.397 | 100 | 5.5 | LOS A | 2.9 | 20.1 | Full | 290 | 0.0 | 0.0 |
| Approach | 523 | 0.0 | | 0.397 | | 5.5 | LOS A | 2.9 | 20.1 | | | | |
| Intersection | 1731 | 0.0 | | 0.905 | | 10.3 | LOS A | 18.7 | 130.9 | | | | |

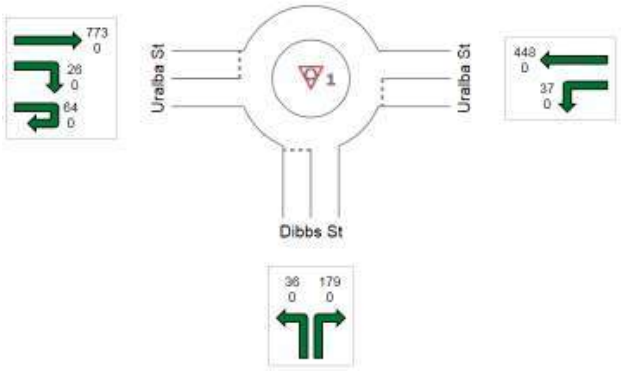
d Dominant lane on roundabout approach

### 3.5.3 Level of Service Summary



## 3.6 Stage 1 and 2 Post Car Park Development Traffic Analysis: PM Peak

### 3.6.1 Proposed Volumes




### 3.6.2 Lane Summary

# LANE SUMMARY

## Site: Dibbs and Uralba Street Intersection - PM Peak: Post Car Park Development (Stage 1 and 2)

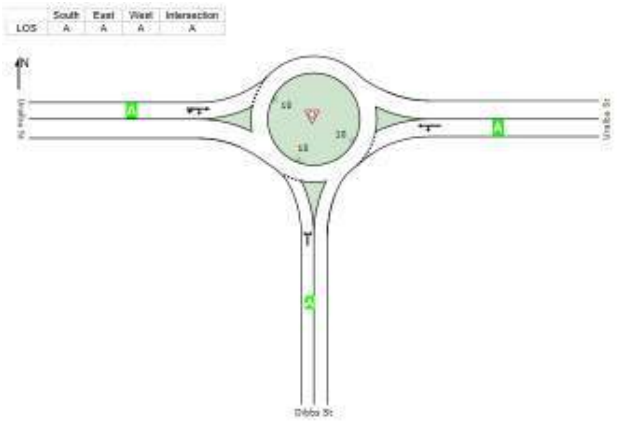
Dibbs and Uralba Street Intersection - PM Peak: Post Car Park Development (Stage 1 and 2)
Roundabout

**Lane Use and Performance**

| | Demand Flows | | Cap. | Deg. Satn | Lane Util. | Average Delay | Level of Service | 95% Back of Queue | | Lane Config | Lane Length | Cap. Adj. | Prob. Block. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total | HV | | | | | | Veh | Dist | | | | |
| | veh/h | % | veh/h | v/c | % | sec | | | m | | m | % | % |
| South: Dibbs St | | | | | | | | | | | | | |
| Lane 1d | 215 | 0.0 | 732 | 0.294 | 100 | 10.0 | LOS A | 1.8 | 12.4 | Full | 55 | 0.0 | 0.0 |
| Approach | 215 | 0.0 | | 0.294 | | 10.0 | LOS A | 1.8 | 12.4 | | | | |
| East: Uralba St | | | | | | | | | | | | | |
| Lane 1d | 485 | 0.0 | 1249 | 0.388 | 100 | 4.0 | LOS A | 2.4 | 16.7 | Full | 500 | 0.0 | 0.0 |
| Approach | 485 | 0.0 | | 0.388 | | 4.0 | LOS A | 2.4 | 16.7 | | | | |
| West: Uralba St | | | | | | | | | | | | | |
| Lane 1d | 863 | 0.0 | 1228 | 0.703 | 100 | 5.5 | LOS A | 7.0 | 48.7 | Full | 290 | 0.0 | 0.0 |
| Approach | 863 | 0.0 | | 0.703 | | 5.5 | LOS A | 7.0 | 48.7 | | | | |
| Intersection | 1563 | 0.0 | | 0.703 | | 5.6 | LOS A | 7.0 | 48.7 | | | | |

d Dominant lane on roundabout approach

### 3.6.3 Level of Service Summary



# APPENDIX B: TRAFFIC AND PARKING REPORT (JULY 2013, TTW)

TaylorThomsonWhitting

# Lismore Base Hospital
# Stage 3A Redevelopment SSD
# Traffic and Parking Assessment

## for
## NSW Health Infrastructure

25 July 2013

TTW Job No: 121204UTA

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**APPENDICES:**

# 1. EXECUTIVE SUMMARY

This traffic and parking report focuses on the overall aspects of access, traffic and parking within and around the site. This report covers Stage 3A Redevelopment of the Hospital any reference to works beyond Stage 3A is conceptual only and has been provided for planning purposes only.

## 1.1 Parking

Currently, a total of some 245 parking spaces are available within the Hospital Campus with a further 56 spaces outside the campus accommodating for fleet cars at Gaggin Lane. Over 649 on street parking spaces also are available in the vicinity of the Hospital (within 350m radius). Most on street parking spaces are unrestricted whilst Uralba Street provides some short term parking along its length including pay parking. As part of the enabling works to clear the site, some parking has been relocated. These works have been dealt with under a separate approval and are reflected in the existing parking space numbers contained in this report.

An observation of parking activities showed a high utility of over 90% occupancy rate of parking spaces within the campus and on street.

The existing parking demand for the site is in order of 820 spaces. This is based on 90% car use among hospital's patrons (based on survey questionnaire; July 2012) and an average stay of 2 hours for outpatients and 1 hour for visitors during a peak hour.

In addition to the above some, 50 additional spaces are required for fleet vehicles.

A review of parking demand and supply for the site has revealed a number of options for car parking provision as part of the Hospital redevelopment. Table 1 illustrates car parking requirements for various population scenarios as part of the redevelopment program.

**Table 1 - Lismore Hospital Population Scenarios (persons and spaces)**

| Stage | Staff | No of Spaces | Outpatients | No of Spaces | Visitors | No of Spaces | Total | Increase |
|---|---|---|---|---|---|---|---|---|
| **Existing** | 850 | **650** | 550/day | **120** | 50 | **50** | **820** | **0** |
| **Stage 3A** | 956 | **730** | 650/day | **140** | 60 | **60** | **930** | **110** |

*Note: population data are based on draft FIS, and LBH Redevelopment Service Statement, 2011*

## 1.2 Access

The main access routes to the Hospital are via Hunter and Uralba Streets. Uralba Street is a major route providing access to the Lismore Town Centre with traffic volumes of over nominally 700 vehicles per hour (vph) each way.

Hunter Street, is a local road and provides immediate access to the Hospital Campus with traffic volumes of 200 vph during the peak periods.

The intersection of Hunter and Uralba Street is controlled with a roundabout and currently operates at a good level of service. The above streets also operate within their capacity while

Uralba Street is subject to constant vehicular traffic activities due to its strategic location.

Fermoy Avenue and Weaver Street also provide access to the eastern side of the Hospital Site.

The main access points to the Hospital's car parking areas and its campus are from Hunter Street while other routes such as Uralba Street and its side streets provide access to various locations within the Hospital site. The emergency access to the site is off Uralba Street.

All access points except for the existing mortuary access from Uralba Street will remain with the proposed new development.

Improved access points proposed include;

- Emergency access will be moved to the east along Uralba Street to align with the new emergency department.
- The former emergency access will be converted to a drop-off area for the Community Health refurbishment in Block C.
- A patient drop-off area will be added along the front entry between the proposed Community Health drop-off area and the emergency access.
- Access to the proposed mortuary at Level 4 from Little Uralba Street.

### 1.3 Transport

Bus Routes 661, 681, 682 and 684 provide services to and from the Hospital. The frequencies of these services are generally limited to one per hour with the exception of the morning peak hour when 2 services occur. A survey questionnaire of staff was carried out as part of the study and its results showed a car use of over 92% (as car driver) among staff.

### 1.4 Traffic Impact

Considering the level of spare capacity along the streets surrounding the Hospital site, it is anticipated that these routes will continue to operate satisfactorily once the project is completed.

At a meeting with Council, it was understood that at this stage there is a general support for the redevelopment of the Hospital. Council believe consideration should be given to promoting higher use of public transport among the users of the Hospital.

## 2. INTRODUCTION

As part of the proposed Lismore Base Hospital redevelopment, Taylor Thomson Whitting have been engaged by Health Infrastructure to advise on traffic and parking demand aspects of the project.

This report relates to Stage 3A of the proposed redevelopment.

### 2.1 The Site

The redevelopment site area includes the southeast corner of the Hospital campus. The Hospital campus is located at the north-east corner of Uralba and Hunter Streets as shown in Figure 1.

The Lismore Base Hospital campus comprises of over 13 individual buildings. This report addresses an overview of the site and redevelopment proposal as shown on architectural drawings.

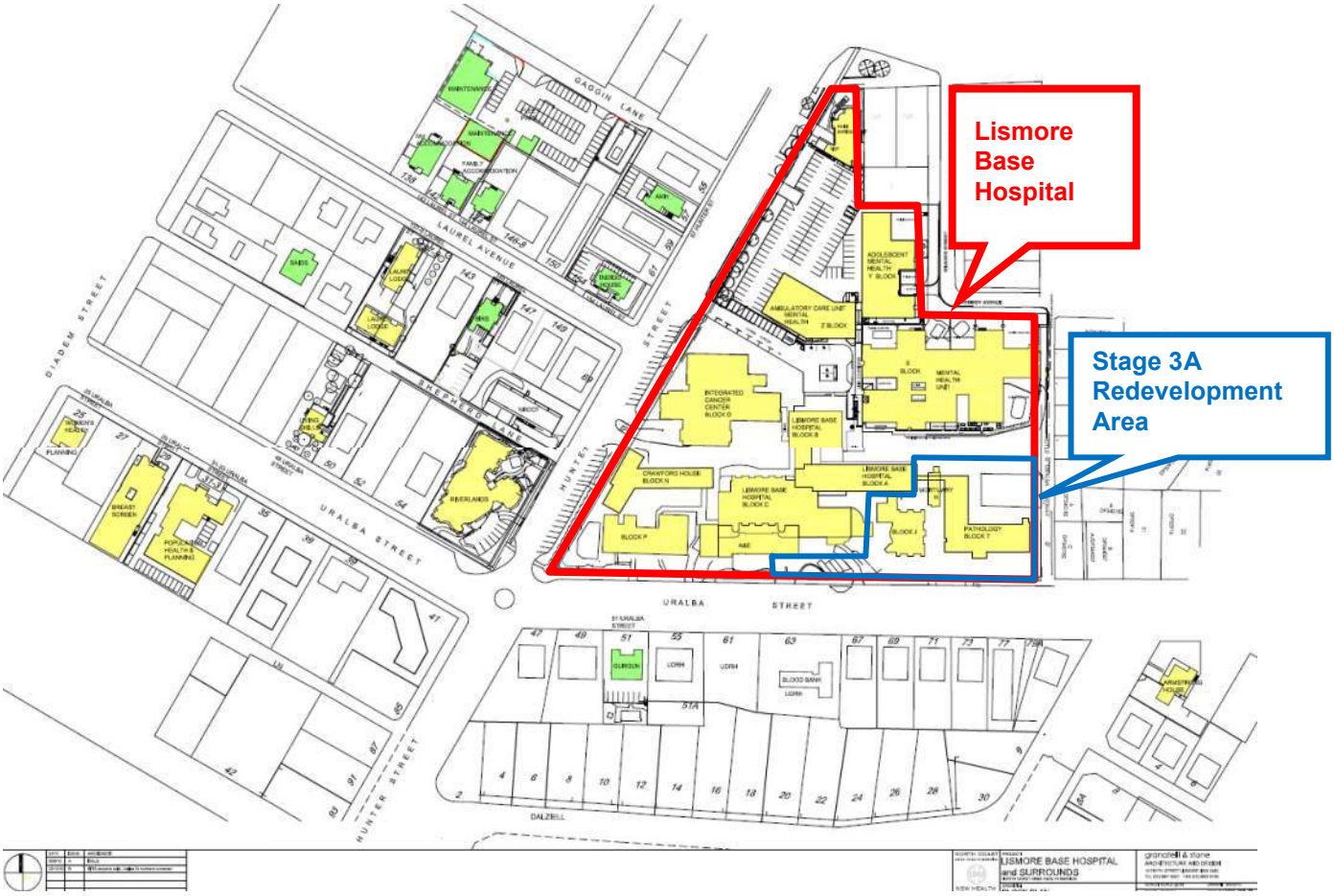



**Figure 1 – Hospital Site**

### 2.2 Study Approach

The purpose of this report is to provide information in terms of access, traffic and parking for Lismore Base Hospital Stage 3A Redevelopment proposal. An overall plan for the proposal is shown as part of the architectural drawings.

The study has been carried out on the basis of relevant guidelines and standards such as the RMS's Guide to Traffic Generating Developments, AUSTROADS and state, regional and Lismore Council's planning documents, these include State Plan 2021, *State Environmental Planning Policy (Infrastructure)* and Lismore *Council Development Control Plan* and Council's relevant materials.

Further, documents from reports related to the study area and similar studies (based on our previous assessment of some 30 Hospital and health related facilities in NSW and ACT) have also been utilised.

The following traffic and parking related surveys have been carried out as part of the study process:

- Parking Surveys of on street car parking occupancies
- Car parking occupancy survey of the Hospital carparks
- Intersection traffic counts
- Traffic volume and speed data along streets near the Hospital
- Questionnaire surveys of staff on travel mode and car parking activities.

Further to the above, consultations with relevant authorities and bodies have been undertaken during the study process. Liaison with Lismore Council has been maintained throughout the project and correspondences have been made on certain aspects of traffic and parking management measures.

## 3. EXISTING SITUATION

### 3.1 Hospital Population

The current key characteristics of the Hospital comprises of (based on NSW Health Services Data, 2009 and staff numbers provided by the Hospital):

- Accommodation for 267 inpatient beds.
- 136,854 outpatients annually
- A total of some 850 staff

### 3.2 Parking Situation

Currently, a total of some 245 parking spaces are available within the Hospital Campus with a further 56 spaces outside the campus accommodating for fleet cars at Gaggin Lane. Over 649 on street parking spaces also are available in the vicinity of the Hospital (within 350m radius). Most on street parking spaces are unrestricted whilst Uralba Street provides some short term parking along its length including pay parking.

An observation of parking activities showed a high utility of over 90% occupancy rate of parking spaces within the campus and on street.

The existing parking demand for the site is in order of 820 spaces. This is based on 90% car use among hospital's patrons (based on survey questionnaire; July 2012) and an average stay of 2 hours for outpatients and 1 hour for visitors during a peak hour.

In addition to the above, some 50-70 additional spaces are required for fleet cars and special uses.

The above parking demand corresponds to the existing use of the Hospital's parking spaces available for Hospital use (off and on street).

**Existing Parking Demand**

Staff Parking Demand: 90% drive car and taking into account shift works, etc.: **650** spaces (for a typical 850 staff head counts at one time and 15% absentees (i.e. holidays, seminars and sick leave).

Outpatients Parking Demand: 85% of 550 per day with 2 hrs stay: **120** spaces

Visitors Parking Demand: 2 visits per bed with 1 hour stay during peak: **50** spaces

**Total Parking Demand: 820 spaces**

In addition to the above, approximately 56 fleet vehicles are maintained at an offsite location on Gaggin Lane.

**Existing Parking supply**

On site within the campus: 245 spaces

Surrounding on street: 649 spaces (see Table 2 below)

**Total Parking Supply: 894 spaces**

In addition to the above the following parking spaces are available for various uses:

Gaggin Lane off Street – Fleet cars: **56** spaces

Currently, there is no major control for access to parking areas within the campus with exception of the Mental Health parking area (38 spaces) which has swipe card for access.

**Table 1 On Street Car Parking Supply**

| Street | Parking Spaces |
|---|---|
| Uralba : 86+65 (between Bent-Diadem) | 151 |
| Hunter: 122+72 (bet. McKenzie-Jubilee) | 194 |
| Laurel (between Hunter-Diadem) | 77 |
| Gaggin (between Hunter-Diadem) | 10 |
| Weaver | 19 |
| Orion | 40 |
| Fermoy | 40 |
| Dibbs | 50 |
| Dalziell | 70 |
| **Total** | **649** |

Note: based on inventory survey of on street parking spaces and previously approved enabling works parking relocation

**Parking Use**

A parking survey of the area during its peak parking period indicated a car occupancy rate of over 97% within the campus and 90% along the streets. Some parking vacancy about 3 – 5 spaces have been observed along streets with time restrictions and pay parking. A further vacancy (about 10% of total on street) of some 40 and 50 was also observed along Orion, Dibbs and Dalziell Streets.

### 3.3 Access

The main access routes to the Hospital are via Hunter and Uralba Streets. Uralba Street is a major route providing access to the Lismore Town Centre with traffic volumes of nominally 700 vehicles per hour (vph) each way.

Hunter Street, is a local road and provides immediate access to the Hospital Campus with traffic volumes of **200** vph during the peak periods.

The intersection of Hunter and Uralba Street is controlled with a roundabout and currently operates at a good level of service. The above streets also operate within their capacity while Uralba Street is subject to constant vehicular traffic activities due to its strategic location.

Fermoy Avenue and Weaver Street also provide access to the eastern side of the Hospital Site.

The main access points to the Hospital's car parking areas and its campus is from Hunter Street while other routes such as Uralba Street and its side streets provide access to various locations within the Hospital site. The emergency access to the site is off Uralba Street.

Improved access points proposed include;

- Emergency access will be moved to the east along Uralba Street to align with the new emergency department.
- The former emergency access will be converted to a drop-off area for the Community Health refurbishment in Block C.
- A patient drop-off area will be added along the front entry between the proposed Community Health drop-off area and the emergency access.
- Access to the proposed mortuary at Level 4 from Little Uralba Street.

### 3.4 Transport

Bus Routes 661, 681, 682 and 684 provide services to and from the Hospital. The time tables are shown in Appendix A. The frequencies of these services are generally limited to one per hour with the exception of the morning peak hour when 2 services occur.

It should be noted that the pick-up and set down activities (i.e. buses) take place along Hunter Street. No formal bus stop on Hunter Street is required as the current "Hail and Ride" system of operation will continue to be used. The above measure has been consulted with relevant authorities and they have indicated their consensus and approval.


**Figure 2 - Bus Routes**

Pedestrian footpaths are provided along the streets adjacent or near to the Hospital. A

pedestrian crossing facility (marked foot crossing) is available along Uralba Street, opposite the main entry to the Hospital.

Due to the hilly nature of the area, limited bicycle activities have been observed.

### 3.5 Travel Mode

As part of the study process, a survey questionnaire was distributed among staff to seek their feedback on transport and parking issues within the campus. A total of 443 completed survey questionnaires have been received. These have been coded and analysed and their results are discussed below.

The results of survey showed that over 92% of workers surveyed travel to Lismore Base Hospital as the driver of a car and about 4 % travel as a car passenger while 2% use bicycle or walk to work.

| Category Code | Corresponding Travel Method | Number of persons | Percent |
|---|---|---|---|
| **A** | Drivers | 407 | 92.4% |
| **B** | Passengers | 17 | 3.8% |
| **C** | Bus | 0 | 0.00% |
| **D** | Taxi | 2 | 0.4% |
| **E** | Motorcycle | 6 | 1.3% |
| **F** | Bicycle | 2 | 0.4% |
| **G** | Walk | 8 | 1.7% |
| **H** | Other | 0 | 0.0% |

**Table 2 Staff Travel Mode** (based on survey questionnaire)

Of the survey respondents who gave information about where they park their car, about 67% indicated that they use on the street parking surrounding the Hospital while 33% park in a car park as part of the Hospital.

| Category | Number | Percentage |
|---|---|---|
| **Street** | 271 | 67.4% |
| **Car park** | 131 | 32.6% |
| **Total** | 402 | 100% |

**Table 3 Staff Car Parking Locations**

The average number of people travelling in a car was reported at **1.08** persons per car.

The survey questionnaires were distributed to all the departments. Table 4 shows the categories of staff who responded to the questionnaire.

| Staff Distribution | | |
|---|---|---|
| **Occupation** | Number | Percentage |
| **Nurse** | 161 | 37.62% |
| **Technical** | 62 | 14.49% |
| **Admin** | 124 | 28.97% |
| **Medical** | 56 | 13.08% |
| **Domestic** | 25 | 5.84% |

**Table 4 Staff Responding to Survey**

Staff members were asked to indicate their start/finish times of their shifts. The following figure shows staff arrival and departure patterns.

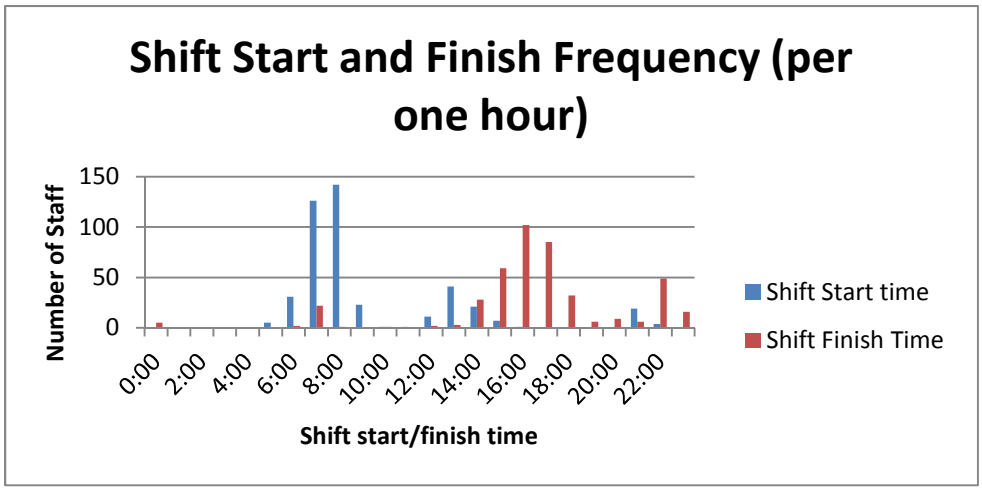


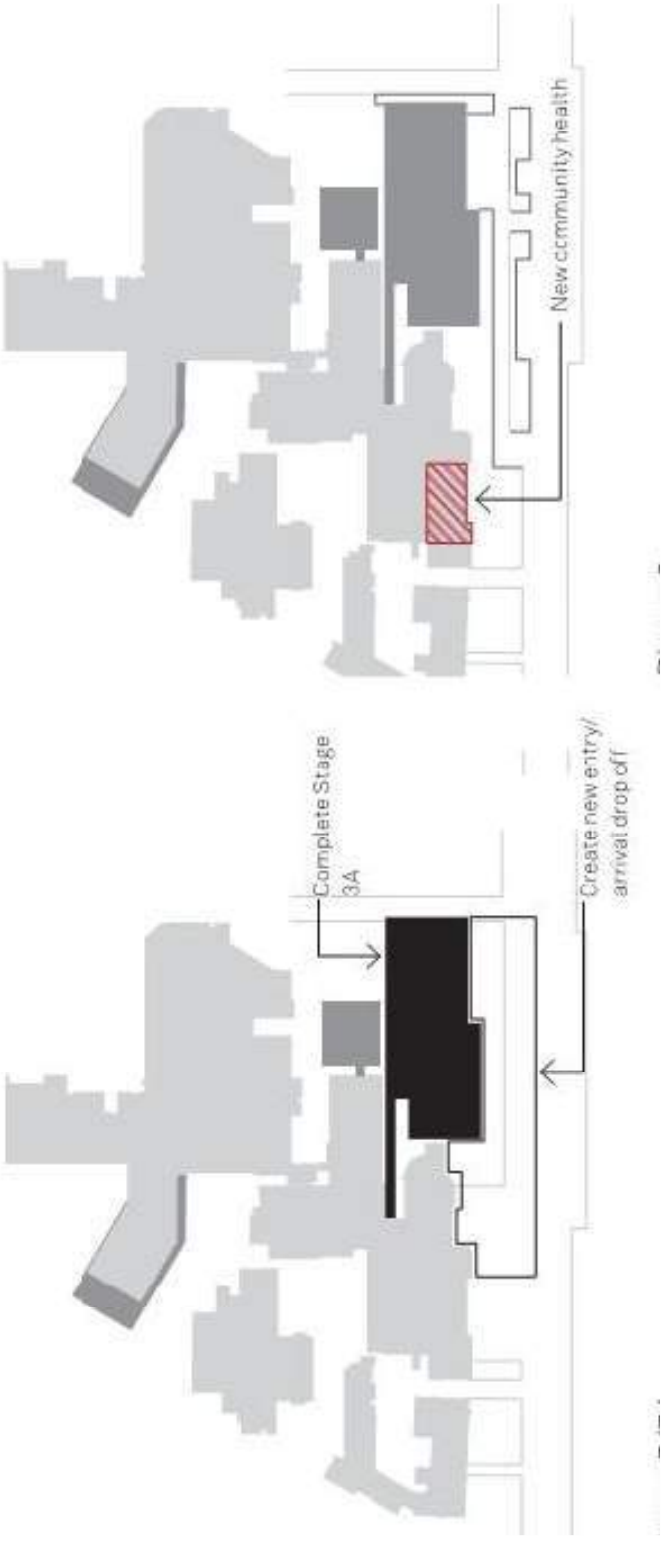

**Figure 3 Staff Arrival and Departure**

# 4. PROPOSED DEVELOPMENT

## 4.1 Proposal

This report addresses traffic and parking implications of the redevelopment proposal as shown on the architectural drawings.

**Stage 3A**



## 4.2 Parking

The parking requirements for the proposal will be determined subject to the level of future staff and activities of the Hospital.

The proposed parking strategy as shown below will address the existing parking needs associated with the Hospital's activities and also meet its future needs. Car parking demands for various scenarios are shown in Table 5 below. The assessments are similar to assumptions and methodology as shown in Section 3.2.

**Table 5 - Lismore Hospital Parking Demand and Population Scenarios**

**(persons and spaces)**

| Phase | Staff | No of Spaces | Outpatients | No of Spaces | Visitors | No of Spaces | Total Spaces |
|---|---|---|---|---|---|---|---|
| **Existing** | 850 | **650** | 550/day | **120** | 50 | **50** | **820** |
| **Phase 3A** | 956 | **730** | 650/day | **140** | 60 | **60** | **930** |

*Note: Staff population data are based on an employment spread sheet supplied by the Hospital Management for the existing staff number and draft FIS data for Phase 3A.*
*Hospital outpatients' number for the existing situation is based on the above documents and 2009 NSW Health Services Data (previously known as yellow/pink book). The ultimate future outpatients number for Phase 3A is based on estimated activities of the Hospital and comparison to other hospitals with similar number of staff e.g. Hornsby Hospital having 217,243 outpatients a year with staff (FTE) of 1116.*

*The number of outpatients for Phase 3A is based on additional Community and Health occasions of 5188 per annum (equivalent to 20 per day), additional 9 chairs for renal dialysis and proportional activities of various departments based on 106 additional staff as identified in draft FIS.*

### Parking Demand Methodology

The Lismore Council Development Control Plan recommends the use of RMS Guide for car parking requirements of the Hospitals. The RMS Guide requires parking assessment will be carried out per site specifics.

Accordingly, the methodology used for parking demand projections is similar to the previous studies that have been prepared for various Hospitals (e.g. Wagga Wagga, Wollongong, Port Macquarie, Campbelltown, Tamworth and Concord Hospitals) and has been developed during the last 15 years (considering that there are certain similarities/patterns in operation of hospitals). It should be noted that due to the nature of activities, parking demand fluctuates. Estimations are based during peak parking time activities and some numbers have been rounded up.

### Existing Parking Demand

Staff Parking Demand: 90% drive car and taking into account shift works, etc.: **650** spaces (for a typical 850 staff head counts at one time and 15% absentees (i.e. holidays, seminars and sick leave.)

Outpatients Parking Demand: 85% of 550 per day with 2 hrs stay: 117 say **120** spaces

Visitors Parking Demand: 2 visits per bed with 1 hour stay during peak: **50** spaces

**Total Parking Demand: 820 spaces**

Note: A rate of 85% car drive has been used for outpatients and visitors based on community profile of Lismore area (2011 Census Data) showing 82% car use and comparison to other regional hospitals.

**Final Parking Demand (Stage 3A)**

Staff Parking Demand: 90% drive car and taking into account shift works, etc. and 15% absentees (i.e. holidays, seminars and sick leave.)

Staff Parking: 956 staff x0.90 car usex0.85 on site = say **730** car parking spaces

Outpatients Parking Demand: 85% of 650 per day with 2 hrs stay (650/4): say **140** spaces

Visitors Parking Demand: 2 visits per bed with 1 hour stay during peak (about 10% of total visitors 267 bed x 2 visitors = 543 visitors per day divide by 10-12 visiting hours during a day: about **50** spaces

Visitors including professional, official visits, etc. = 10

**Total Visitors** = 50+10 = **60**

**Total Parking Demand: 930 spaces**

The above number does not include fleet vehicles which currently park at the hospital facility on Gaggin Lane.

### 4.2.1 Parking Strategy

Stage 3A

In discussions with Health Infrastructure, the additional parking demand associated with the Stage 3A re-development, will be subject to a separate development approval. The works for more parking will be aimed to be carried out prior to the opening of Stage 3A.

## 4.3 Access

It is generally supported that clear access points for different users will provide a safe and efficient operation of traffic flow from and to the Hospital. Therefore, separation of visitors and outpatients from staff entry and exit would be desirable. A better use of side streets which carry a lower level of vehicular traffic is also encouraged. The more use of Uralba Street and its interaction with the current high traffic volumes would be challenging unless a major change in characteristics of Uralba Street is implemented. Council and the RMS have suggested that a change in the speed environment of Uralba Street be adopted and that a 40km/h High Pedestrian Activity area be implemented. This will ensure a safer pedestrian environment as well as minimise vehicular conflicts along the street adjacent to the Hospital site.

As part of the improvement works to the Hospital's front entry at Uralba Street, modifications will be made to the Uralba Street footpath / road alignment. The re-alignment will provide additional area to the Hospital drop off whilst still maintaining the current two way traffic flow along Uralba Street. The re-alignment works will significantly improve the functionality of the Accident and Emergency drop off in Uralba Street and improve pedestrian accessibility. Some loss of car parking spaces will result from the footpath adjustment but it is proposed to increase on street parking by re-arranging the current parking spaces along Uralba between Hunter Street and Dibbs Street.

Improved access points proposed include;

- Emergency access will be moved to the east along Uralba Street to align with the new emergency department.
- The former emergency access will be converted to a drop-off area for the Community Health refurbishment in Block C.
- A patient drop-off area will be added along the front entry between the proposed Community Health drop-off area and the emergency access.
- Access to the proposed mortuary at Level 4 from Little Uralba Street.

The access arrangements to the site and its loading areas have been demonstrated by turning paths and are included in Appendix E of this report.

Figure SKC070 in Appendix F shows the location of the improved access points.

The new improvements have rationalized and clearly identify access to the Hospital frontage for both vehicle and pedestrian traffic. Patients will have a designated drop off lane.

The designated drop off zone on Uralba was discussed at the Lismore Health Precinct Design Workshop held 21 – 23 November 2012. It was considered to be essential to assist in traffic flow near and around the site. Currently there is a limited designated area for a drop off area which forces visitors to utilise the street system.

The bus zones are maintained close to the Hospital entry with improved pedestrian crossings on Uralba Street.-

The driveway in front of emergency is exclusive for ambulance vehicles. This allows ambulance vehicles unimpeded access to the emergency department from the east.

The existing ambulance area will be retained for patient transport services in close proximity to the main entry.

The above-mentioned changes will enhance the Lismore Base Hospital front entry function, assist in the traffic management and improve pedestrian safety.

## 4.4 Impact

### 4.4.1 Street System Operation

The term “level of service” for **road capacity** has been defined by AUSTROADS as:

> *A qualitative measure describing operational conditions within a traffic stream and their perception by motorists and or passengers. A level of service definition generally describes these conditions in terms of factors such as speed and travel time, freedom to manoeuvre, traffic interruptions, comfort, convenience and safety. In general there are six levels of service designated from A to F, with level of service A representing the best operating conditions (i.e. free flow) and level of service F the worst (i.e. forced or breakdown flow).*

One-way hourly volumes for urban roads during peak hours and recommended level of service are shown in **Table 6.**

**Table 6 Urban Road Peak Hour Flows per Direction**

| Level of Service | One Lane (veh/hr) | Two Lanes (veh/hr) |
|---|---|---|
| A | 200 | 900 |
| B | 380 | 1400 |
| C | 600 | 1800 |
| D | 900 | 2200 |
| E | 1400 | 2800 |

*Source: RMS Guide 2002*

### 4.4.2 Assessment

The traffic generation for the Hospital as part of its Stage 3A redevelopment plans would be in order of 560 vehicles during a peak hour period (in comparison to its existing 500 vph). This is based on assumption of 90% car use and allowing for 85% of staff attendance which 50-60% will arrive or depart during a peak hour while outpatients' activities will take place during an 8-10 hour period. This is demonstrated below per population scenarios (see Table 5):

Existing vehicular trip generation during a peak hour:

Staff: 850 staff x 0.85 on site attendance x 0.90 drive car x (50-60% arrival or departure of staff, as not all arrive or depart during one hour peak period) = 360 vph

Outpatients: 550 outpatients x 0.85 = 480 trips per day; equivalent to say 50 per hour; assuming average stay of 2 hour including in and out movements = 100 vph (worst case scenario)

Visitors/others: 40 vph (low level of activity during peak hour period)

Total: 500 vph

Stage 3A vehicular trip generation during a peak hour:

Staff: 956 staff x 0.85 on site attendance x 0.90 drive car x (50-60% arrival or departure of staff as not all arrive or depart in one hour peak period) = 400 vph

Outpatients: 550 x 0.85 = 480 trips per day stay equivalent to say 50 per hour; assuming average stay of 2 hour including in and out = 110 vph (worst case scenario)

Visitors/others: 50 vph (low level of activity during peak hour period)

Total: 560 vph

Considering the above traffic generation analysis for the Hospital, it is evident that the Stage 3A redevelopment of the Hospital would have a minimal impact on the street system and its intersections operation. The additional 60 vph translates to 1 vehicle per minute which in traffic engineering terms would have a minimal impact.

However, in order to ascertain that the road network surrounding the Hospital will continue to operate at a satisfactory level of service, the impact of a fully developed hospital has been considered.

On the basis of the above approach, the vehicular traffic generation for the ultimate

development of the Hospital (including future stages planned beyond the Stage 3A development proposal) would be in the order of some 800 vehicles during a one hour peak period. This additional 300 vph (i.e. 500vph for the existing vs 800vph for ultimate scenario) has been utilised in assessment of road network and intersections operation.

Considering the level of spare capacity along the streets surrounding the Hospital site, it is clear that these routes will continue to operate satisfactorily once the project is completed. Table 6 provides such information on Level of Service (LoS) and road capacity.

The impact of additional vehicular traffic on the intersections near the Hospital has also been analysed using SIDRA modelling. Vehicular intersection counts at major intersections near the Hospital Site have been carried out and the results are shown in Appendix D.

Appendix D provides SIDRA analysis of the intersections for the existing and future situations, indicating that major intersections of Uralba Street with Hunter and Diadem Streets will continue to operate at a good level of service.

## 4.5 Accessibility

The study area is well serviced by walkway and pedestrian footpaths and facilities along the streets surrounding the Hospital. Lismore Council is considering the implementation of a 40km/h High Pedestrian Activity area along the full frontage of Hunter Street and Uralba Street adjacent to the Hospital. If implemented, the reduced speed environment would result in improved pedestrian safety within the area.

The accessibility of on street parking areas to the Hospital is shown in Appendix C, indicating the walking distances to the Hospital site.

Introduction of bicycle parking at various locations within the Hospital Campus will also provide additional amenities for the users of the Hospital and would promote active transport particularly among the Hospital's staff. Promotion of higher use of public transport or car pool among staff should also be included as part of transport strategy for the Hospital.

Bicycle routes based on Lismore Council's Bike Plan are shown in Appendix B while Bus Routes are shown in Appendix A. This provides a transport nexus for the existing Hospital Campus and the proposed redevelopment site. It also promotes more choice of travel modes for users of the Hospital.

## 4.6 Consultations

On the 20th of November, Lismore Council hosted a three day Health Precinct Workshop to discuss future development within the Hospital Precinct. During the proceedings, various parking and traffic management options were discussed. These included support for increasing on-street parking, a multi-storey carpark and traffic calming measures in Uralba Street. Workshop participants, which included Council staff, hospital staff and representatives, as well as local residents and businesses, were generally in support of the hospital redevelopment and anticipated improvement initiatives.

Further to the above, continuous correspondences meetings and discussions with Council have been carried out on a number of occasions regarding various transport and traffic issues as well as proposed measures and traffic and parking management schemes associated with the redevelopment of the Hospital.

These consultations resulted in development of a consensus measures and strategies for the Hospital and its environs. The main issues included:

- Provision of car parking
- Access to the Hospital and circulation
- On street parking arrangement along Uralba and Hunter Streets
- Traffic Management Measures such as possible 40km/h High Pedestrian Activity Area along Hunter and Uralba Streets adjacent to the Hospital
- The re-alignment of Uralba Street

Consultation had not directly been made with Transport for New South Wales (TFNSW) as it is not deemed necessary. Consultation has been made with Council which refers matters to the Roads and Maritime Services and TFNSW. No issues are foreseen, however, should any arise, then a meeting would be arranged to resolve them.

### 4.7 Construction Access

A detailed Construction Traffic Management Plan (CTMP) will be prepared prior to commencement of works. Provision for pedestrian and cyclist access will be made as part of the CTMP. It is anticipated that some 30 vehicular trips associated with construction staff would occur during each AM and PM peak periods.

Access to the worksites for construction vehicles will be via the following routes (refer **Figure 4**). The Primary access/exit will be from Uralba Street.

***To/From the South/West***

Access for construction vehicles from the south/west will be via:

- Bruxner Highway
- Left onto Dawson Street
- Right onto Uralba Street
- Site (or left into Little Uralba Street into site)
- Right onto Uralba Street
- Left onto Dawson
- Right onto Bruxner highway

***To/From the East***

Access for construction vehicles from the north/east will be via:

- Bruxner Highway
- Right onto Rotary Drive
- Straight onto Uralba Street
- Site (or right into Little Uralba Street into site)
- Left onto Uralba Street
- Straight onto Rotary Drive
- Left onto Bruxner Highway

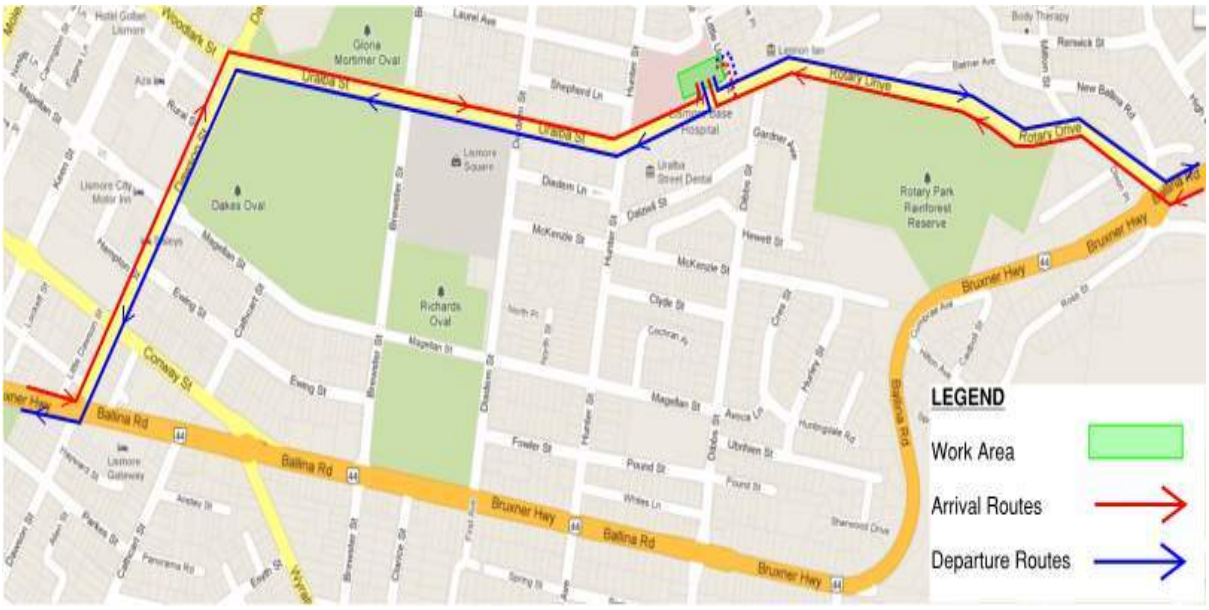



**Figure 4: Construction Vehicle Routes**
(Source: www.google.com.au)

### *Construction Workers Parking Arrangements*

Health Infrastructure have advised that construction workers parking will be located off the hospital site within walking distance, in a dedicated parking area. Workers will be instructed not to park in Hunter and Uralba Streets.

Site employees will be directed to make use of car pooling and public transport options where possible as part of being inducted into the site upon works commencement.

### *Pedestrian Access*

The public domain on the northern side of Uralba Street is proposed to be upgraded as part of the proposed works. During the upgrade, pedestrians will be directed onto the roadway (parking area) around the works area. Appropriate signage and safety barrier systems as required will be installed to ensure public safety.

Public pedestrian access to the main hospital entrance will be via alternative entrances within the hospital buildings. Appropriate way finding signage will be erected to provide direction the hospital reception area.

# 5. TRANSPORT MANAGEMENT STRATEGY

As stated earlier (Section 2.2) a number of planning documents provide guidelines and strategies for future development of the region in order to achieve their targets. Some of their related key objectives include:

- *Providing upgrade and expanded health services (NSW State Plan 2021)*
- *Increasing the patronage of the transport services (NSW State Plan 2021)*

The above mentioned document (i.e. NSW State Plan) also state related factors such as "land use changes should be planned to take advantage of new and existing public transport infrastructure, not to reduce car use, but to increase the viability of the public transport services" and "it is also important to enhance the public transport experience by providing awnings and shelters at bus stops, appropriate lighting levels to ensure safety, a high standard of information delivery, and access for all levels of mobility."

Accordingly, in line with such objectives a number of strategies are included as part of the project and/or recommended in order to achieve such goals to improve the liveability, quality of life and sustainable transport for the region and its community. For example, the higher use of public and active transport will not only create a healthier environment but will also improve the road safety and character of the built environment.

Further, decreased use of the car, particularly by the Hospital's staff, will reduce the need for construction of carparks and their associated costs. This means freeing funds for other activities and needs.

As part of the proposed redevelopment plan for the Hospital, bicycle racks are be placed at appropriate locations within the Campus. The current and proposed pedestrian footpaths/walkways and facilities for cyclist together with *Health Promotions* will provide better amenity and information for the users of the Hospital and hence reduce car dependency.

It is vital to take into account the future level of population increase within the region and to provide solutions that are complementary to State, regional and local transport plans. Therefore, following measures are put forward for consideration and implementation in order to achieve the desired goals and targets as outlined above and detailed in relevant planning documents:

- Preparation of Travel Plan for the Hospital.
- Preparation of Transport Access Guide for the Hospital.
- Provision of incentive schemes among staff e.g. subsidised bus tickets.
- Negotiation with bus agencies for provision of frequent bus services with faster and more direct destinations e.g. shuttle bus between city centre/shopping areas and the Hospital.
- Establishment of a waiting list for parking space for new Hospital staff. This means that any new staff will not have a parking space until one becomes available.
- Introduction of parking fees for new Hospital staff, possibly combined with provision of subsidised public transport tickets.
- Provision of better, safer (in terms of route alignment as well as security) bicycle and pedestrian routes. This measure should be devised in consultation with Council and other authorities.
- Promotion of the merits of walking and bicycle riding in order to encourage staff living near the Hospital to leave their cars at home.
- Provision of bicycle parking within the campus.
- Provision of safer and higher quality bus shelters or waiting areas.

## 6. RESPONSE TO DIRECTOR GENERAL'S REQUIREMENTS

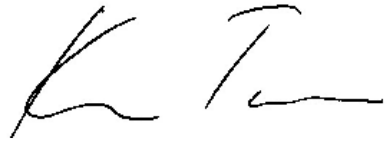
Following is a summary of civil engineering responses to the relevant Director General's Requirements for SSD 13_5816;

| Relevant Director General's Requirement | Detailed Description of Requirement | Response |
|---|---|---|
| **2. Policies and Guidelines** | Address the relevant planning provisions, goals and strategic planning objectives in the following:<br>· NSW 2021<br>· NSW Bike Plan<br>· Planning Guidelines for Walking and Cycling<br>· Lismore Development Control Plan, where relevant<br>· Lismore Regional City Plan 2005, where relevant<br>· Lismore Urban Strategy 2005, where relevant<br>· Lismore Floodplain Management Plan 2002, where relevant. | The study has been carried out with consideration to relevant guidelines and planning documents including:<br>RMS's Guide to Traffic Generating Developments, AUSTROADS and state, regional and Lismore Council's planning documents.<br>Discussions with Council have also been carried out during the study process. |
| **7. Transport and Accessibility (construction and operation)** | Construction:<br>· Detail access arrangements at all stages of construction and measures to mitigate any associated traffic, pedestrian or cycleway impacts.<br>· Provide details regarding car parking arrangements during construction, including the displacement of visitor and patient car parking. Alternative off-site arrangements should be made for staff and construction workers.<br><br>Operation:<br>· Detail how the development has taken into consideration travel choices, and how the development contributes to the achievement of transport objectives contained in NSW 2021.<br>· Assess the implications of the proposed development for non-car travel modes (including public transport use, walking and cycling), including the potential for implementing a location-specific sustainable travel plan (eg 'Travelsmart' or other travel behavioural change initiatives), and the provision of facilities to increase non-car | A comprehensive Construction Management Plan will be prepared prior to the commencement of works. Construction access routes will be in line with Council and RMS's requirements. All vehicular movements to and from the site will be in forward direction. Parking arrangements have also been outlined in Section 4.7 under Construction Access.<br><br>Section 5 provides transport management strategy for the Hospital and puts forward a number of measures to improve active and public transport among the Hospital patrons.<br>Sections 3.4 and 3.5 provide an evaluation of bus services near the Hospital as well as assessment of staff travel modes.<br>Proposed changes to bus stop and traffic management have been in consultation with Council and their approval.<br>Section 4.5 and its relevant Appendices (A, B and E) provide an evaluation of |

| | | |
|---|---|---|
| | mode share for travel to and from the site. This will entail an assessment of the accessibility of the site by public transport.<br><br>· Provide details of the proposed daily and peak vehicle movements likely to be generated by the proposed development, including the impact on nearby intersections, local and state roads, and the need/associated funding for upgrading or road improvement works (if required). This is to include an analysis of the likely impact of the proposal on traffic flow and parking along sections of Uralba Street and Hunter Street directly adjacent to the hospital campus. AUSTROADS standards should be adopted for any necessary upgrading of the surrounding road network.<br><br>· Detail the proposed access and parking provisions associated with the proposed development, including compliance with any parking codes and compliance with the relevant Australian Standards (ie: turn paths, sight distance requirements, aisle widths, etc). A 'Parking Management Plan' and 'Travel Plan' shall be prepared for the hospital where parking for the proposal is proposed at an off-site location.<br>· Detail the proposed service vehicle movements (including vehicle types and the likely arrival and departure times).<br>*Relevant Policies and Guidelines:*<br><br>· *Guide to Traffic Generating Development* | accessibility to/from the Hospital, including measures to improve walking and cycling to the site.<br><br>Sections 4.2, 4.3 and 4.4 provide an assessment of traffic and parking requirements associated with the redevelopment of Hospital.<br><br>As part of this assessment, appropriate traffic and parking measures, particularly along Uralba and Hunter Streets have been recommended as the result of consultation and correspondence with Council and relevant bodies.<br><br>All proposals are in accordance with AUSTROADS and relevant guidelines. |
| **Consultation** | During the preparation of the EIS, you must consult with the relevant local, State or Commonwealth Government authorities, service providers, community groups and affected landowners. In particular you must consult with:<br>· Lismore City Council;<br>· Roads and Maritime Services;<br>· Office of Environment and Heritage<br>· Environmental Protection Agency; and | During the study process, continuous consultations with Council and relevant bodies have been undertaken,<br><br>These include a 3 day workshop (Charrette) and meetings with Council representatives as well as correspondence. Section 4.6 provides consultation process. |

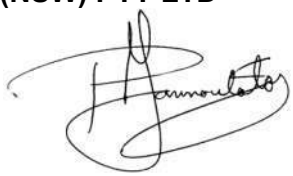
| | | |
|---|---|---|
| | · Transport for NSW.<br>The EIS must describe the consultation process and the issues raised, and identify where the design of the development has been amended in response to these issues. Where amendments have not been made to address an issue, a short explanation should be provided. | |

Prepared by:
**URAP - TAYLOR THOMSON WHITTING (NSW) PTY LTD**



**KAM TARA**
**Director**

Authorised by:
**TAYLOR THOMSON WHITTING (NSW) PTY LTD**



**PAUL YANNOULATOS**
**Technical Director**

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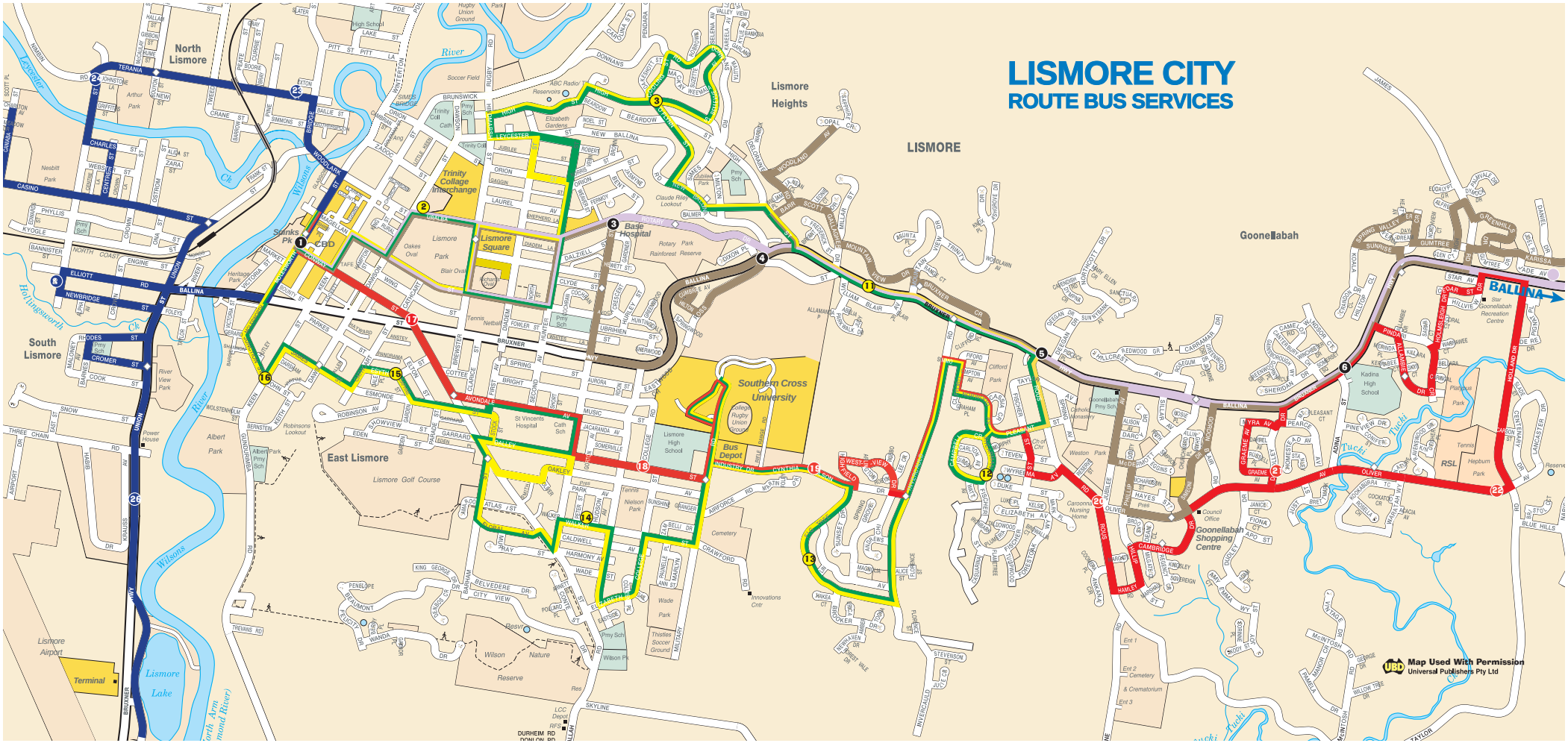
# APPENDIX A

**Bus Routes and Time Tables**




## KEY

| | | |
|---|---|---|
| | Lismore Circle No. 1 | Route 681 |
| | Lismore Circle No. 2 | Route 682 |
| | North - South | Route 683 |
| | Goonellabah (James Rd) | Route 684 |
| | Goonellabah | Route 685 |
| | Regatta Estate | Route 661 |
| ◇ | End of Section | |

## NOTES

Hail and Ride convenience at safe locations.

Passengers may travel on all school services.

Discount and Concession Fares, Children/ NSW Pensioners/Unemployed Card/ Studients - 50%. Concession card must be shown on boarding.

One child only 4 yrs and under free per each adult fare paid (not occupying a seat).

Some services are fully wheelchair accessible (refer to timetable). Periodic maintenance may affect availability, please check prior to journey.

Northern Rivers BUSLINES

| | | | |
|---|---|---|---|
| Lismore Circle No. 1 | 681 | Goonellabah (James Rd) | 684 |
| Lismore Circle No. 2 | 682 | Goonellabah | 685 |
| North - South | 683 | Regatta Estate | 661 |


76 Military Rd Lismore NSW 2480
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Ph: 02 6626 1499
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Email: info@nrbuslines.com.au
Web: www.nrbuslines.com.au

## LISMORE CIRCLE ROUTE 681

| | | MONDAY TO FRIDAY | | | | | | SATURDAY | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | ♿ | ♿ | ♿ | ♿ | ♿ | ♿ | ♿ | ♿ | ♿ |
| 1 | Lismore CBD (Spinks Pk) | 7.35 | 8.30 | 10.30 | **12.30** | **2.30** | **4.30** | 7.25 | 8.50 | 11.25 |
| | Lismore Square | 7.42 | 8.37 | 10.37 | **12.37** | **2.37** | **4.37** | 7.32 | 8.57 | 11.32 |
| 3 | **Base Hospital (Hunter St)** | 7.44 | 8.39 | 10.39 | **12.39** | **2.39** | **4.39** | 7.34 | 8.59 | 11.34 |
| 3 | Cooling St/Donnans Rd | 7.48 | 8.43 | 10.43 | **12.43** | **2.43** | **4.43** | 7.38 | 9.03 | 11.38 |
| 3 | O'Flynn St | 7.50 | 8.45 | 10.45 | **12.45** | **2.45** | **4.45** | 7.40 | 9.05 | 11.40 |
| 11 | Renwick St/High St | 7.52 | 8.47 | 10.47 | **12.47** | **2.47** | **4.47** | 7.42 | 9.07 | 11.42 |
| 11 | Gallager Dv (Hwy) | 7.54 | 8.49 | 10.49 | **12.49** | **2.49** | **4.49** | 7.44 | 9.09 | 11.44 |
| 12 | Rous Road Shops-Pleasant St Stop | 7.57 | 8.52 | 10.52 | **12.52** | **2.52** | **4.52** | 7.47 | 9.12 | 11.47 |
| 12 | Shearman Dr/Campbell Cres | 7.59 | 8.54 | 10.54 | **12.54** | **2.54** | **4.54** | 7.49 | 9.14 | 11.49 |
| 13 | Invercauld Rd/Figtree Dr | 8.04 | 8.59 | 10.59 | **12.59** | **2.59** | **4.59** | 7.54 | 9.19 | 11.54 |
| 13 | **Southern Cross Uni** | 8.10 | 9.05 | 11.05 | **1.05** | **3.05** | **5.05** | 8.00 | 9.25 | **12.00** |
| 14 | Walker St/Dibbs St | 8.15 | 9.10 | 11.10 | **1.10** | **3.10** | **5.10** | 8.05 | 9.30 | **12.05** |
| 15 | **St Vincents Hosp/Avondale Av** | 8.20 | 9.15 | 11.15 | **1.15** | **3.15** | **5.15** | 8.10 | 9.35 | **12.10** |
| 16 | Keen St/Junction St | 8.27 | 9.22 | 11.22 | **1.22** | **3.22** | **5.22** | 8.17 | 9.42 | **12.17** |
| 1 | Lismore CBD (Spinks Pk) | 8.30 | 9.25 | 11.25 | **1.25** | **3.25** | **5.25** | 8.20 | 9.45 | **12.20** |

## CITY - UNIVERSITY

Quick Reference Timetable

MONDAY TO FRIDAY

| | Dep. Spinks Park | Route No. |
|---|---|---|
| | 7.30 | 685 |
| | 8.40 | 685 |
| ♿ | 9.25 | 682 |
| | 10.25 | 685 |
| ♿ | 11.25 | 682 |
| ♿ | 11.30 | 685 |
| | 1.25 | 682/685 |
| | 3.25 | 682/685 |
| | 4.25 | 685 |
| ♿ | 5.25 | 682 |
| | 5.35 | 685 |

## GOONELLABAH (JAMES RD) ROUTE 684

| | | MONDAY TO FRIDAY | | | | | | SATURDAY | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | ♿ | ♿ | | ♿ | ♿ | | ♿ | ♿ | ♿ |
| 1 | Lismore CBD (Spinks Pk) | | | 10.40 | **12.40** | **2.40** | **5.10** | | 9.50 | **12.20** |
| | Lismore Square | | | 10.45 | **12.45** | **2.45** | **5.15** | | 9.55 | **12.25** |
| 3 | **Base Hospital (Uralba St)** | | | 10.46 | **12.46** | **2.46** | **5.16** | | 9.56 | **12.26** |
| 4 | Ross St | | | 10.50 | **12.50** | **2.50** | **5.20** | | 10.00 | **12.30** |
| 4 | Woodlands Av | | | 10.53 | **12.53** | **2.53** | **5.23** | | 10.03 | **12.33** |
| 4 | Mountain View Dr | | | 10.58 | **12.58** | **2.58** | **5.28** | | 10.08 | **12.38** |
| 5 | Rous Rd Roundabout | | | 11.00 | **1.00** | **3.00** | **5.30** | | 10.10 | **12.40** |
| 6 | **Goonellabah Shop Complex** | | | 11.04 | **1.04** | **3.04** | **5.34** ● | 8.04 | 10.14 | **12.44** |
| 7 | Spring Valley Dr | 7.16 | 9.06 | 11.08 | **1.08** | **3.08** | **5.36** ● | 8.16 | 10.18 | **12.48** |
| 7 | Green Hills Av | 7.18 | 9.08 | 11.10 | **1.10** | **3.10** | **5.38** ● | 8.18 | 10.20 | **12.50** |
| 7 | Marguerite Crt | 7.22 | 9.12 | 11.14 | **1.14** | **3.14** | **5.42** ● | 8.22 | 10.24 | **12.54** |
| 6 | **Goonellabah Shop Complex** | 7.26 | 9.18 | 11.20 | **1.20** | **3.18** | **5.46** ● | 8.26 | 10.30 | **1.00** |
| 4 | Mountain View Dr | 7.30 | 9.22 | - | - | | | 8.30 | - | - |
| 4 | Woodlands Av | 7.32 | 9.27 | - | - | | | 8.32 | - | - |
| 4 | Ross St | 7.34 | 9.32 | 11.29 | **1.29** | | | 8.34 | 10.39 | **1.09** |
| 3 | **Base Hospital (Uralba St)** | 7.42 | 9.40 | 11.33 | **1.33** | | | 8.42 | 10.43 | **1.13** |
| | Lismore Square | 7.43 | 9.42 | 11.35 | **1.35** | | | 8.43 | 10.45 | **1.15** |
| 1 | Lismore CBD (Spinks Pk) | 7.50 | 9.50 | 11.40 | **1.40** | | | 8.50 | 10.50 | **1.20** |

## LISMORE CIRCLE ROUTE 682

| | | MONDAY TO FRIDAY | | | | | SATURDAY | |
|---|---|---|---|---|---|---|---|---|
| | | ♿ | ♿ | ♿ | ♿ | ♿ | ♿ | ♿ |
| 1 | Lismore CBD (Spinks Pk) | 9.25 | 11.25 | **1.25** | **3.25** | **5.25** | 9.45 | **12.50** |
| 16 | Keen St/Junction St | 9.30 | 11.30 | **1.30** | **3.30** | **5.30** | 9.50 | **12.55** |
| 15 | **St Vincents Hosp/Dalley St** | 9.33 | 11.33 | **1.33** | **3.33** | **5.33** | 9.53 | **12.58** |
| 14 | Walker St/Dibbs St | 9.36 | 11.36 | **1.36** | **3.36** | **5.36** | 9.56 | **1.01** |
| 13 | **Southern Cross Uni** | 9.45 | 11.45 | **1.45** | **3.45** | **5.45** | 10.05 | **1.10** |
| 13 | Invercauld Rd/Figtree Dr | 9.50 | 11.50 | **1.50** | **3.50** | **5.50** | 10.10 | **1.15** |
| 12 | Shearman Dr/Campbell Cres | 9.54 | 11.54 | **1.54** | **3.54** | **5.54** | 10.14 | **1.19** |
| 12 | Rous Road Shops-Rous Rd Stop | 10.00 | **12.00** | **2.00** | **4.00** | **6.00** | 10.20 | **1.25** |
| 11 | William Blair Av/HWY | 7.37 | 10.03 | **12.03** | **2.03** | **4.03** | **6.03** | 10.23 | **1.28** |
| 11 | Renwick St/High St | 7.38 | 10.05 | **12.05** | **2.05** | **4.05** | **6.05** | 10.25 | **1.30** |
| 3 | O'Flynn St | 7.40 | 10.08 | **12.08** | **2.08** | **4.08** | **6.08** | 10.28 | **1.33** |
| 3 | Cooling St/Donnans Rd | 7.42 | 10.13 | **12.13** | **2.13** | **4.13** | **6.13** | 10.33 | **1.38** |
| 3 | **Base Hospital (Hunter St)** | 7.46 | 10.17 | **12.17** | **2.17** | **4.17** | **6.17** | 10.37 | **1.42** |
| | Lismore Square | 7.47 | 10.19 | **12.19** | **2.19** | **4.19** | **6.19** | 10.39 | **1.44** |
| 2 | Lismore Central | 7.53 | 10.25 | **12.25** | **2.25** | **4.25** | **6.25** | 10.45 | **1.50** |
| 1 | Lismore CBD (Spinks Pk) | 7.55 | 10.30 | **12.30** | **2.30** | **4.30** | **6.30** | 10.50 | **1.55** |

## UNIVERSITY - CITY

Quick Reference Timetable

MONDAY TO FRIDAY

| | Dep. SCU | Route No. |
|---|---|---|
| ♿ | 8.10 | 681 |
| | 8.20 | 685 |
| ♿ | 9.05 | 681 |
| | 9.35 | 685 |
| | 10.21 | 685 |
| ♿ | 11.05 | 681 |
| ♿ | 12.24 | 685 |
| ♿ | 1.05 | 681 |
| | 1.47 | 685 |
| | 2.21 | 685 |
| ♿ | 3.05 | 681 |
| | 4.21 | 685 |
| ♿ | 5.05 | 681 |
| | 5.21 | 685 |
| | 6.27 | 685 |

## GOONELLABAH ROUTE 685

| | | MONDAY TO FRIDAY | | | | | | | | | SATURDAY | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | ♿ | | | | | | ♿ | ♿ | ♿ |
| 1 | Lismore CBD (Spinks Pk) | 7.30 | 8.40 | 9.25 | 10.25 | 11.30 | | **1.25** | **3.25** | **4.25** | **5.35** | 8.50 | 11.20 | **1.20** |
| | Lismore Central | 7.31 | 8.41 | 9.26 | 10.26 | 11.31 | | **1.26** | **3.26** | **4.26** | **5.36** | 8.51 | 11.21 | **1.21** |
| 18 | **St Vincents Hosp/Avondale Rd** | 7.36 | 8.47 | 9.32 | 10.32 | 11.40 | | **1.32** | **3.32** | **4.32** | **5.42** | 8.57 | 11.27 | **1.27** |
| 19 | **Southern Cross Uni** | 7.40 | 8.55 | 9.40 | 10.35 | 11.45 | | **1.40** | **3.40** | **4.40** | **5.50** | 9.03 | 11.33 | **1.33** |
| 19 | Invercauld Rd/Cynthia Wilson Dr | 7.44 | 9.00 | 9.44 | | 11.50 | | **1.44** | **3.44** | **4.44** | **5.54** | 9.05 | 11.35 | **1.35** |
| 20 | Wyreema Av/Rous Rd | 7.46 | 9.03 | 9.47 | | 11.54 | | **1.47** | **3.47** | **4.47** | **5.57** | 9.08 | 11.38 | **1.38** |
| 21 | **Lismore Council Chambers** | 7.49 | 9.06 | 9.52 | | 11.57 | | **1.52** | **3.52** | **4.52** | **6.02** | 9.11 | 11.43 | **1.41** |
| 22 | RSL Sports Club | 7.50 | 9.08 | 9.55 | | **12.00** | | **1.55** | **3.55** | **4.55** | **6.05** | 9.15 | 11.45 | **1.45** |
| 22 | Holland St/Ballina Rd | 7.55 | 9.12 | 9.58 | | **12.03** | | **1.58** | **3.58** | **4.58** | **6.08** | 9.18 | 11.48 | **1.48** |
| | | INWARD BOUND TO CITY | | | | | | | | | | | | |
| 22 | Holland St/Ballina Rd | 7.55 | 9.13 | 9.58 | | **12.03** | | **1.58** | **3.58** | **4.58** | **6.08** | 9.18 | 11.48 | **1.48** |
| 22 | Hillview Dr/Holmsleigh Dr | 7.58 | 9.15 | 10.00 | | **12.05** | | **2.00** | **4.00** | **5.00** | **6.09** | 9.19 | 11.49 | **1.49** |
| 21 | D A Olley Dr | 8.02 | 9.20 | 10.05 | | **12.08** | | **2.05** | **4.05** | **5.05** | **6.13** | 9.23 | 11.53 | **1.53** |
| 21 | **Lismore Council Chambers** | 8.04 | 9.22 | 10.08 | | **12.11** | | **2.08** | **4.08** | **5.08** | **6.17** | 9.25 | 11.55 | **1.55** |
| 20 | Wyreema Av/Rous Rd | 8.10 | 9.27 | 10.12 | | **12.14** | | **2.12** | **4.12** | **5.12** | **6.21** | 9.28 | 11.58 | **1.58** |
| 19 | Invercauld Rd/Cynthia Wilson Dr | 8.16 | 9.31 | 10.18 | | **12.20** | | **2.18** | **4.18** | **5.18** | **6.25** | 9.31 | **12.01** | **2.01** |
| 19 | **Southern Cross Uni** | 8.20 | 9.35 | 10.21 | | **12.24** | **1.47** | **2.21** | **4.21** | **5.21** | **6.27** ● | 9.33 | **12.03** | **2.03** |
| 18 | **St Vincents Hosp/Avondale Rd** | 8.26 | 9.40 | 10.27 | | **12.27** | **1.53** | **2.27** | **4.27** | **5.27** | **6.33** ● | 9.37 | **12.07** | **2.07** |
| 1 | Lismore CBD (Spinks Pk) | 8.35 | 9.50 | 10.33 | | **12.35** | **2.00** | **2.33** | **4.33** | **5.33** | **6.43** ● | 9.45 | **12.15** | **2.15** |

## NORTH - SOUTH ROUTE 683

| | | MONDAY TO FRIDAY | | | | | | SATURDAY | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | ♿ | | | | ♿ | ♿ |
| 1 | Lismore CBD | 7.25 | 9.05 | 10.55 | **12.55** | **3.55** | **5.05** | 8.20 | **12.20** |
| 24 | McCauley St/Terania St | 7.29 | 9.09 | 10.59 | **12.59** | **3.59** | **5.09** | 8.24 | **12.24** |
| 24 | Centre St/Casino St | 7.32 | 9.12 | 11.02 | **1.02** | **4.02** | **5.12** | 8.27 | **12.27** |
| 24 | Hanlon St/Casino St | 7.35 | 9.15 | 11.05 | **1.05** | **4.05** | **5.15** | 8.30 | **12.30** |
| 24 | Charlton Av/Caniaba St | 7.37 | 9.17 | 11.07 | **1.07** | **4.07** | **5.17** | 8.32 | **12.32** |
| 25 | Lismore Railway Station | 7.40 | 9.20 | 11.10 | **1.10** | **4.10** | **5.20** | 8.35 | **12.35** |
| 26 | Lismore Lake | 7.45 | 9.25 | 11.15 | **1.15** | **4.15** | **5.25** | 8.40 | **12.40** |
| | | INWARD BOUND TO CITY | | | | | | | |
| 26 | Lismore Lake | 7.45 | 9.25 | 11.15 | **1.15** | **4.15** | **5.25** | 8.40 | **12.40** |
| 25 | Cromer St/Barnes St | 7.49 | 9.29 | 11.19 | **1.19** | **4.19** | **5.29** | 8.44 | **12.44** |
| 25 | Newbridge St/Wilson St | 7.52 | 9.32 | 11.22 | **1.22** | **4.22** | **5.32** | 8.47 | **12.47** |
| 1 | Lismore CBD (Spinks Pk) | 7.55 | 9.35 | 11.25 | **1.25** | **4.25** | **5.35** | 8.50 | **12.50** |

## REGATTA ESTATE ROUTE 661

Cont. to Wollongbar Alstonville Ballina

| | | MONDAY TO FRIDAY | | | | | | | | SATURDAY |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | ♿ | | ♿ | | ♿ | | |
| 1 | Lismore CBD (Spinks Pk) | 7.15 | 7.55▲ | 8.35 | 10.15 | **12.20** | **2.00** | **3.30** | **5.15** | **4.00** |
| | Lismore Square | 7.20 | 8.00▲ | 8.45 | 10.20 | **12.25** | **2.05** | **3.35** | **5.20** | **4.05** |
| 3 | **Base Hospital (Uralba St)** | 7.21 | 8.01▲ | 8.46 | 10.21 | **12.26** | **2.06** | **3.36** | **5.21** | **4.07** |
| 4 | Gallager Dv (Hwy) | 7.23 | 8.03▲ | 8.48 | 10.23 | **12.28** | **2.08** | **3.38** | **5.23** | **4.09** |
| 5 | Rous Rd Roundabout | 7.25 | 8.05▲ | 8.50 | 10.25 | **12.30** | **2.10** | **3.40** | **5.25** | **4.11** |
| 6 | Kadina St Roundabout | 7.28 | 8.07▲ | 8.52 | 10.27 | **12.32** | **2.12** | **3.42** | **5.27** | **4.13** |
| 7 | James Rd | 7.30 | 8.09▲ | 8.54 | 10.29 | **12.34** | **2.14** | **3.44** | **5.29** | **4.15** |
| 7 | Regatta Estate (Highway) | 7.31 | 8.10▲ | 8.55 | 10.30 | **12.35** | **2.15** | **3.45** | **5.30** | **4.16** |
| | | INWARD BOUND TO CITY | | | | | | | | |
| | | | | | ♿ | ♿ | | | | |
| 7 | Regatta Estate (Highway) | 7.30 | 8.15 | 10.05 | 11.52 | **1.57** | **3.05** | **3.58▲** | **4.35** | |
| 7 | Goonellabah 2LM | 7.31 | 8.16 | 10.06 | 11.53 | **1.58** | **3.06** | **4.00▲** | **4.36** | **5.15** |
| 6 | Kadina St Roundabout | 7.33 | 8.17 | 10.08 | 11.54 | **1.59** | **3.08** | **4.06▲** | **4.38** | **5.17** |
| 5 | Rous Rd Roundabout | 7.35 | 8.20 | 10.10 | 11.58 | **2.03** | **3.10** | **4.08▲** | **4.40** | **5.20** |
| 4 | William Blair Av/Hwy | 7.37 | 8.22 | 10.12 | **12.00** | **2.04** | **3.12** | **4.10▲** | **4.42** | **5.22** |
| 3 | **Base Hospital (Uralba St)** | 7.46 | 8.25 | 10.14 | **12.02** | **2.06** | **3.14** | **4.12▲** | **4.44** | **5.24** |
| | Lismore Square | 7.47 | 8.28 | 10.15 | **12.05** | **2.09** | **3.15** | **4.15▲** | **4.45** | **5.25** |
| 2 | Lismore Central | 7.53 | 8.33 | 10.19 | **12.09** | **2.14** | **3.19** | **4.19▲** | **4.49** | **5.29** |
| 1 | Lismore CBD (Spinks Pk) | 7.55 | 8.35 | 10.20 | **12.10** | **2.15** | **3.20** | **4.20▲** | **4.50** | **5.30** |

Hail and Ride convenience at safe locations. Passengers may travel on all school services.

Concession Fares, Children/NSW Pensioners/Unemployed Card/Students. Concession card must be shown on boarding.

▲ *School Days only* ● *On request* - *No Service* *670/675 also service Lismore Lake* **BOLD** *print times = PM Services*

♿ Routes marked are generally serviced by a fully wheelchair accessible bus. Periodic maintenance may affect availability, please check with the office prior to journey.

# APPENDIX B

**Bicycle Routes**

## PEDESTRIAN AND CYCLE 'GREEN CIRCUIT'

Pedestrian and cycle paths may be designed to improve the quality of access and remove issues associated with the topography of the precinct. Opportunities are available to explore pedestrian and cycleway connectivity extending from the Hospital through Laurel Avenue and the Recreation Grounds to Zadoc Street, linking to the Lismore CBD and looping back via Magellan Street forming a 'green circuit' (Fig.3-3). This pedestrian and cycle circuit builds on the Lismore CBD Master Plan (Fig. 3-2) and extends the vision of creating a 'liveable spine' along Magellan Street to form a loop improving the linkages between Lismore CBD, Lismore Park, Lismore Square, the Health Precinct and Hospital.

## PEDESTRIAN CROSSING ON URALBA STREET

In the event a parking station is developed upon the University Centre for Rural Health land across from the Hospital (southern side of Uralba Street), pedestrian connectivity between the Hospital and the parking station will need detailed investigation. It should not adversely impact on the traffic flow on Uralba Street. This may necessitate a pelican crossing or an overhead access ramp. A tunnel crossing is less favoured due to CPTED issues, however given the tunnel will solely connect the Hospital to the car park, appropriate CPTED measures (lighting, surveillance CCTV & land use activation) may overcome concerns.

## Recommendations

- → In designing the Stage 3A development, Health Infrastructure should preserve the current arterial road function. This approach should also be extended through to future master planning for Lismore Base Hospital.
- → In order to facilitate improved traffic flow on Uralba Street Lismore City Council should review load capacity for Uralba Street.
- → Lismore City Council is to explore a pedestrian and cycle route from the Health Precinct to the Lismore CBD. The pedestrian and cycle network would traverse through the existing Recreational Fields north of Uralba Street and require appropriate CPTED treatments.
- → Lismore City Council is to consult with public transport service providers in relation to the Health Precinct and serviceability requirements.

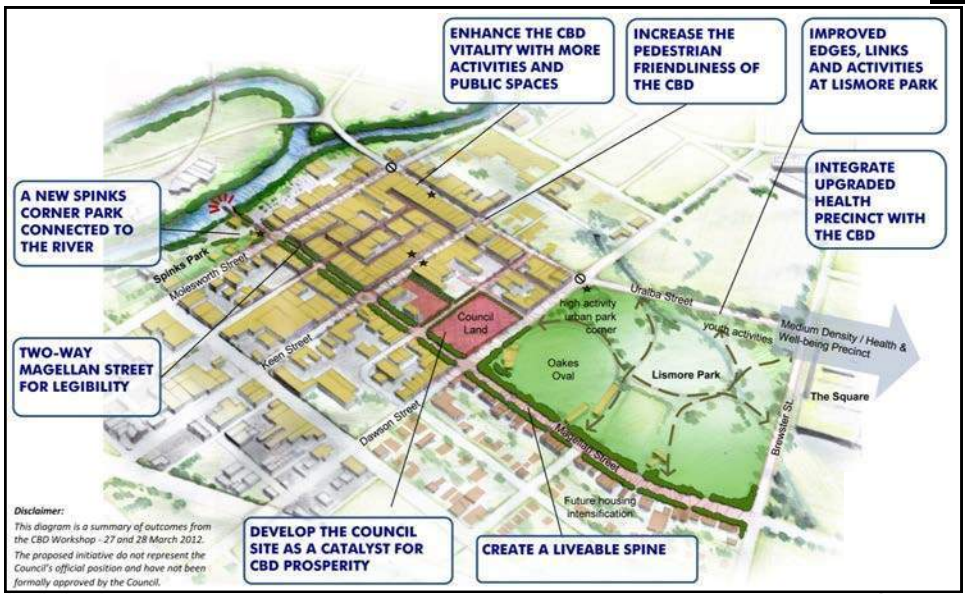


FIG. 3-2: Lismore CBD Master Plan.

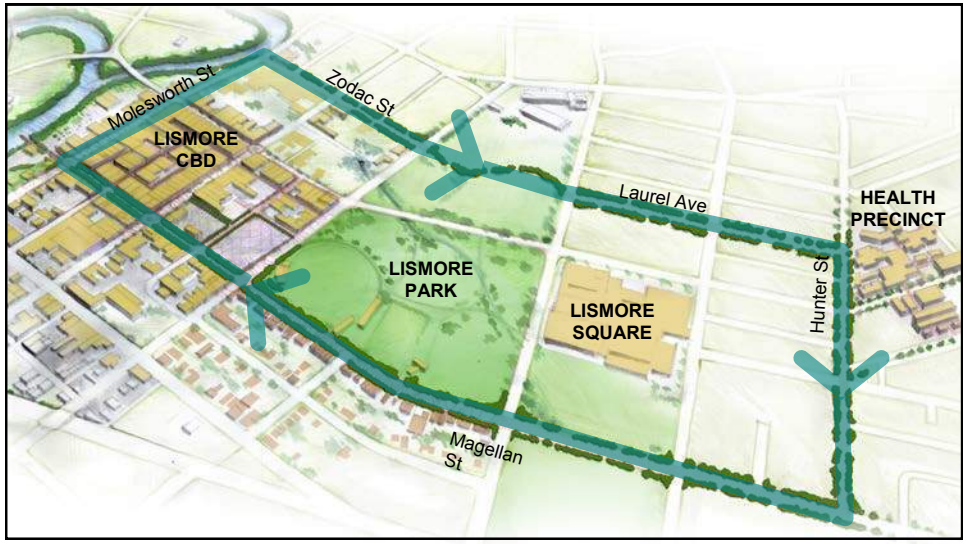


FIG. 3-3: Pedestrian and cycle 'green circuit' opportunity.

# APPENDIX C

**Parking Accessibility**


FileName: SKC019.dwg - USER: wwtye - Plot File Created: Nov 27, 2012 - 1:34pm

PRELIMINARY

A1 0 1 2 3 4 5 6 7 8 9 10

| Rev | Description | Eng | Draft | Date |
|---|---|---|---|---|
| P1 | PRELIMINARY | HS | WW | 22.11.12 |

Architect
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Project
LISMORE BASE HOSPITAL
RE-DEVELOPMENT

Sheet Subject
WALKING DISTANCE TO
ON-STREET CAR PARKING

Scale : A1 1:1000
Drawn WW
Authorised
Job No 121204
Drawing No SKC019
Revision P1
Plot File Created: Nov 27, 2012 - 1:34pm