Coffs Harbour Hospital Expansion
SSD Application No.8981

Health Infrastructure

Transport and Accessibility Impact Assessment

May 2018

SECAsolution

Coffs Harbour Hospital Expansion

Transport and Accessibility Impact Assessment

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1. Introduction

1.1 Background

Seca Solution Pty Ltd has been commissioned by NSW Health Infrastructure to prepare a traffic, access and parking assessment for the proposed Coffs Harbour Hospital Expansion. The Coffs Harbour Hospital Expansion will include work to expand and reconfigure inpatient and ambulatory care services providing enhanced services, facilities and care to patients. The Project will include enhancements to existing surgical services and operating theatres and a new short stay surgical unit and improvement of the surgical bed base. Ambulatory care and community health services will also be enhanced.

Roadworks associated with the Coffs Harbour Hospital Expansion will include a relocated access road including new access arrangements to the adjacent private medical centre, new and relocated parking facilities and relocated bus and pedestrian facilities.

As part of the project, Seca Solution have collected current traffic data at the key locations and have observed the traffic operations in the locality of the site during peak periods.

1.2 Scope of Report

The scope of this report is to review the external traffic movements associated with the proposed development and to review the parking demands. The report provides advice on access issues and green travel opportunities.

1.3 Issues and Objectives of the study

The issues relative to the proposal are:

- Assess impact on the local road network due to the additional traffic flows;
- Assess the impact of the additional parking generated by the proposed development;
- Review the access arrangements for the development;
- Review the service arrangement for the development; and
- Assess any other transport impacts associated with the development.

The objective of the report is to document the impacts of the proposed development and provide advice on any infrastructure work required as part of the development.

1.4 Planning Context

In preparing this document, the following guides and publications were used:

- RTA Guide to Traffic Generating Developments, Version 2.2 Dated October 2002;
- RMS TDT 2013/04 “Update Traffic surveys August 2013”.
- Coffs Harbour City Council Development Control Plan
- Australian / New Zealand Standard – Parking Facilities Part 1: off-street car parking (AS2890.1:2004);

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1.5 Authority Requirements

COFFS HARBOUR HOSPITAL EXPANSION - SEARS ANALYSIS	
Transport for NSW	SECA Report 9 March 2018
Accurate details of the current daily and peak hour vehicle, public transport, pedestrian and cycle movement and existing traffic and transport facilities provided on the road network located adjacent to the proposed development.	Section 2.4 Existing Situation Section 2.5.1 Peak Hour Flows. AM and PM traffic surveys at Pacific Hwy / Isles Drive.
An assessment of the operation of existing and future transport networks including the bus network and their ability to accommodate the forecast number of trips to and from the development.	Section 2.5.6 Current Road Network Operation: Sidra modelling conducted for Pacific Hwy / Isles Drive, 2017 AM and PM peaks and 4.4.2 1.1.1 Peak Hour Impacts on Intersections. (Did not include bus network).
Details of estimated total daily and peak hour trips generated by the proposal, including vehicle, public transport, pedestrian and bicycle trips.	4.1 Traffic generation: Sidra modelling for Pacific Hwy / Isles Drive, 2012 and 2026 (did not include public transport, pedestrians or cyclists).
The adequacy of public transport, pedestrian and bicycle networks and infrastructure to meet the likely future demand of the proposed development.	4.5 Public Transport
The impact of the proposed development on existing and future public transport infrastructure within the vicinity of the site and identify measures to integrate the development with the transport network.	4.5 Public Transport
Details of any upgrading or road improvement works required to accommodate the proposed development.	Capacity for Road Network to Accommodate Future Development: With changes to the phasing of the signalised intersection of the Pacific Highway and Isles Drive the 2021 and 2026 future growth scenarios, the traffic associated traffic demands can be accommodated within the existing road network. The impact has been assessed allowing for all development to access via this intersection.
Details of travel demand management measures to encourage sustainable travel	Section 5.

The impact of trips generated by the development 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.	Sec 4.4.1 Impact on daily Traffic Flows: With changes to the phasing of the signalised intersection of the Pacific Highway and Isles Drive the 2021 and 2026 future growth scenarios, the traffic associated traffic demands can be accommodated within the existing road network. The impact has been assessed allowing for all development to access via this intersection.
The proposed active transport access arrangements and connections to public transport services.	4.5 Public Transport and Section 5.
The proposed access arrangements, including car and bus pick-up/drop- off facilities, and measures to mitigate any associated traffic impacts and impacts on public transport, pedestrian and bicycle networks, including pedestrian crossings and refuges and speed control devices and zones.	3.2 Access
Measures to maintain road and personal safety in line with Crime Prevention through Environmental Design principles.	4.3 Impact on Road Safety
The proposed car and bicycle parking provision, including end-of-trip facilities, which must be taken into consideration of the availability of public transport and the requirements of Council's relevant parking codes and Australian Standards.	Car Parking Analysis
Proposed bicycle parking facilities in secure, convenient, accessible areas close to main entries incorporating lighting and passive surveillance.	Details of bicycle facilities will be incorporated into the detailed design stage of the proposed development. As the existing vehicle parking is adequate to accommodate the future demand it is anticipated that the existing bicycle parking is also sufficient. Sec 3.4.7 and Sec 5
Details of the proposed number of car parking spaces and compliance with appropriate parking codes and justify the level of car parking provided on-site.	3.4 Parking: the parking analysis included an assessment of the proposed parking supply in relation to Council DCP requirements. However, there have been changes to the proposed parking layouts since the report was prepared. Proposed development maintains an appropriate level of parking based on the assessment,
Details of emergency vehicle access arrangements.	Plans include ambulance parking bays and access to the ED drop off. Swept path for a suitable ambulance has been undertaken to assess the ED drop off area (Appendix C).
An assessment of road and pedestrian safety adjacent to the proposed development and the details of required road safety measures.	4.3 Impact on Road Safety

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Service vehicle access, delivery and loading arrangements and estimated service vehicle movements (including vehicle type and the likely arrival and departure times).	3.3.4 Service Area Layout
In relation to construction traffic:	
Assessment of cumulative impacts associated with other construction activities.	Section 6. Construction Activities
An assessment of road safety at key intersections and locations subject to heavy vehicle construction traffic movements and high pedestrian activity.	6.3.2 Existing traffic conditions
Details of construction program detailing the anticipated construction duration and highlighting significant and milestone stages and events during the construction process.	6.1.2 Timing
Details of anticipated peak hour and daily construction vehicle movements to and from the site.	6.2 Traffic Management Assessment
Details of access arrangements of construction vehicles, construction workers to and from the site, emergency vehicles and service vehicle.	6.2 Traffic Management Assessment
Details of temporary cycling and pedestrian access during construction.	6.3.3 Pedestrians and Cyclists
Details of proposed construction vehicle access arrangements at all stages of construction.	6.2 Traffic Management Assessment
Traffic and transport impacts during construction, including cumulative impacts associated with other construction activities, 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 (which must include vehicle routes, number of trucks, hours of operation, access arrangements and traffic control measures for all demolition/construction activities).	6.2 Traffic Management Assessment
Roads and Maritime Services	
The total impact of existing and proposed development on the surrounding road network with consideration for a 10 year horizon.	Section 2.5.6 Current Road Network Operation: Sidra modelling conducted for Pacific Hwy / Isles Drive, 2017 AM and PM peaks and 4.4.2 Peak Hour Impacts on Intersections.
The volume and distribution of peak hourly trips generated by the proposed development.	4.1 Traffic generation: Sidra modelling for Pacific Hwy / Isles Drive, 2012 and 2026

Intersection analysis of peak hourly impacts on the Pacific Highway & Isles Drive intersection.	4.1 Traffic generation: Sidra modelling for Pacific Hwy / Isles Drive, 2012 and 2026
Concept plans of all proposed improvements to frontage roads and affected intersections.	Appendix A Site Plan
Any proposed changes to vehicular access, car parking and servicing arrangements.	As above
Any proposed improvements to external connectivity for active and public transport modes.	4.5 Public Transport and Section 5
Measures to address the impact of project construction on the surrounding road network.	6.3.4 General Traffic Control Considerations

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2. Existing Situation

2.1 Site Description and Proposed Activity

The subject site is the Coffs Harbour Health Campus adjacent to the Pacific Highway, Coffs Harbour.

The proposed Coffs Harbour Hospital Expansion will increase the number of beds and treatment spaces from 319 to 440.

2.2 Site Location

The site is located off the Pacific Highway, Coffs Harbour as shown below in Figure 2-1.

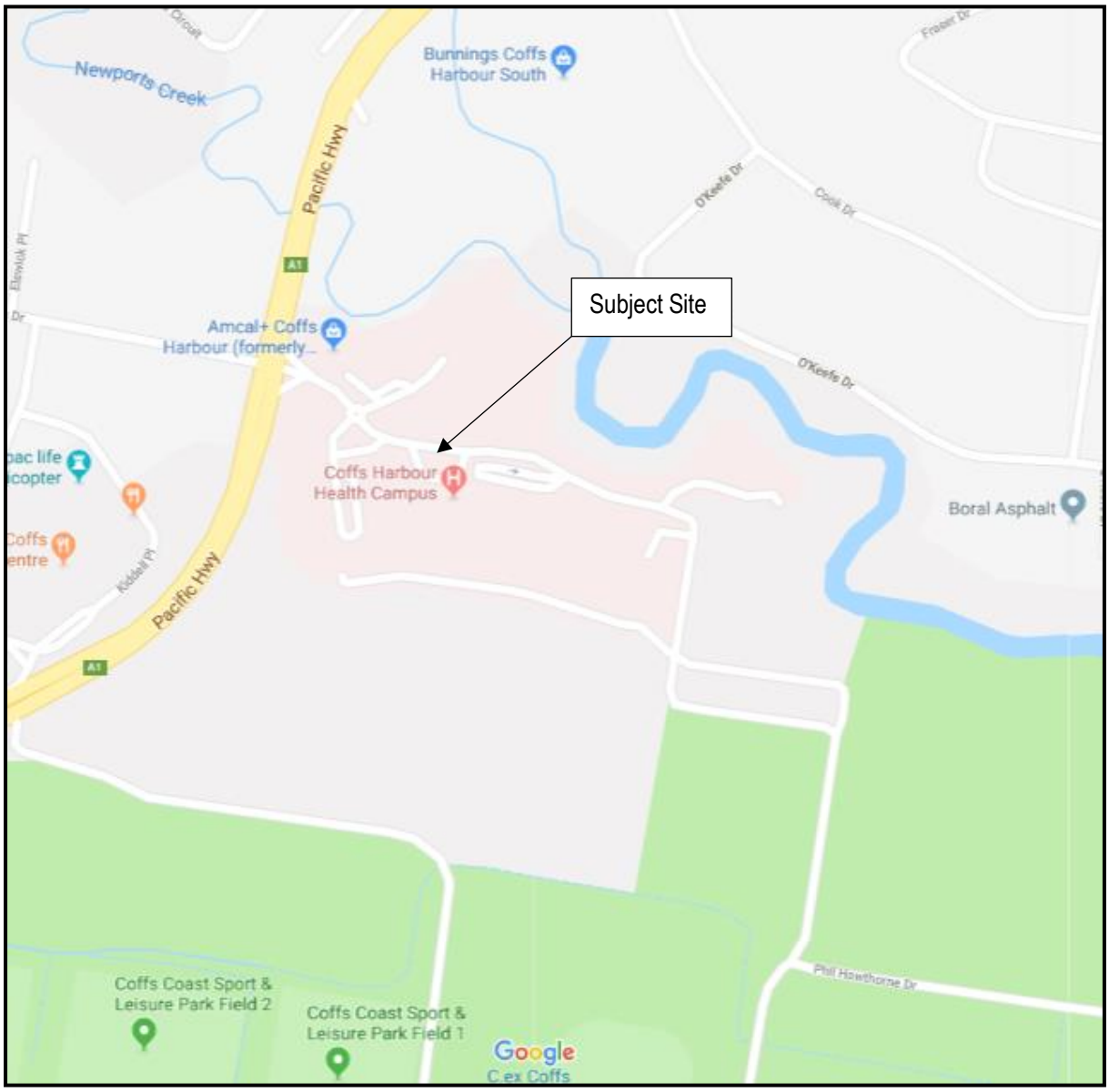

Figure 2-1 - Site Location (Source: Google maps)

2.2.1 Zoning and Adjacent Land Use

Land uses in proximity to the Coffs Harbour Health Campus include Newports Creek (which adjoins the campus to the north), Coffs Coast Sport and Leisure Park (to the south), Coffs Harbour Education campus (to the south-west), Isles Industrial Park (to the west) and the Coffs Harbour Industrial Park (to the north). The surrounding area

is characterised by a mixed-use urban landscape of health services facilities, industrial estates, vegetated lands and open space and recreation. *(Source: NSW Health Infrastructure).*

2.3 Site Access

The main access to and from the Coffs Harbour Health Campus is off the Pacific Highway opposite Isles Drive. This intersection is under traffic signal control with dedicated right turn lanes in both directions on the Highway. Left turn slip lanes are also provided for access to and from the Health Campus. Pedestrian crossing facilities are provided on all approaches to this intersection except for the Highway southbound approach.

A secondary access is also available from the Pacific Highway via Stadium Drive and Phil Hawthorne Drive. These accesses will be retained as part of the expansion project.

2.4 Existing Traffic Conditions

2.4.1 Road Hierarchy

2.4.1.1 Pacific Highway

The main arterial road through Coffs Harbour past the Coffs Harbour Health Campus is the Pacific Highway. It is part of the state road network under the care and control of Roads and Maritime Services (RMS) and forms the western boundary of the site. The Pacific Highway provides two lanes of travel in each direction separated by a narrow concrete median. At major intersections auxiliary lanes are provided to cater for left and right turning movements.

Pedestrians are catered for with concrete footpaths on both sides of the Highway and sealed shoulders provide space for cyclists. Street lights provide a high level of illumination for night time safety.

Traffic surveys conducted by Seca Solution at the Pacific Highway / Isles Drive intersection indicate that the Pacific Highway carries up to 2,900 vehicles per hour during peak flow periods. According to RMS traffic surveys peak hour volumes represent about 10% of daily volumes. This being the case, the Pacific Highway would carry around 30,000 vehicles per day past the access to the Coffs Harbour Health Campus.

2.4.1.2 Stadium Drive

Stadium Drive is a collector road that generally runs east-west providing a connection between the Pacific Highway and Hogbin Drive – a major north / south collector road linking Sawtell and Coffs Harbour. It forms the southern boundary of Coffs Harbour's major sporting precinct which is situated directly south of the Coffs Harbour Health Campus.

Stadium Drive has a two-lane rural road formation with 3.5 metre wide travel lanes and 2 metre wide shoulders. At several locations the pavement has been widened to provide dedicated right turn lanes into side streets and, in some cases, left turn deceleration lanes.

Stadium Drive connects with the Pacific Highway in the west and Hogbin Drive in the east via 2 lane roundabouts. All the intermediate intersections are under default give-way control.

2.4.1.3 Phil Hawthorne Drive

Phil Hawthorne Drive is a 7 metre wide local road that provides a north / south access to sporting fields and other leisure activities within the sporting precinct. It connects with Stadium Drive about 275 metres west of Hogbin Drive via a T-intersection. A dedicated right turn lane and a left turn deceleration lane are provided on Stadium Drive to facilitate turns at this intersection. About 385 metres north of Stadium Drive an access road branches off Phil Hawthorne Drive providing access to the Coffs Harbour Health Campus southern carpark and Coffs Harbour Health Campus buildings.

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2.4.2 Roadworks and Traffic Management Plans

Discussion with Coffs Harbour City Council indicate that there are no proposed road upgrades in the immediate vicinity of the site. An additional lane has been provided at the roundabout intersection of Hogbin Drive and Stadium Drive to provide additional capacity.

Future development is proposed for the North Boambee Valley with access proposed off North Boambee Road. This additional development will be focussed north of the site, however, it may have some impact by increasing flows along the Pacific Highway within the vicinity of the site. This has been allowed for within the background growth included for the Pacific Highway.

Consultation has been undertaken with RMS regarding the Coffs Harbour bypass upgrade and the following information is provided:

- This new road will join into the Pacific Highway south of the Englands Road roundabout and travel west through North Boambee Valley. A review of the application for SEARS states that traffic volumes on the Pacific Highway through the Coffs Harbour CBD in 2015, were recorded to be about 32,000 vehicles per day. About 9.3 per cent of these vehicles are heavy vehicles. The current level of service (LOS) in the Coffs Harbour CBD section is D/E during peak times;
- This bypass will see significant numbers of these vehicles being removed from the existing corridor into which the hospital connects;
- In July 2015, the NSW Government pledged $200 million towards construction of the bypass subject to a final business case and agreeing funding from the Australian Government. In May 2018 the Federal Government announced that $971 million will be allocated to the construction of the Coffs Harbour Pacific Highway Bypass;
- The EIS shall be finalised early to mid 2018 with the project approval expected by 2019;
- Once funding is available it will take up to 5 years to construct. On that basis, the earliest completion could be 2025.

2.4.3 Pedestrian and Cycling Facilities

Pedestrian footpaths are provided along both sides of the Pacific Highway in the vicinity of the site. A footpath connection is also provided along the southern side of the access road into the Health Campus that provides pedestrian access to the main entrance of the hospital. Pedestrian crossings are provided across the access road between the northern carpark and the hospital entrance ensuring that pedestrian movements can be safely managed and controlled. These pedestrian crossings include drop kerbs to cater for wheel chair users as well as prams etc.

Cyclists are catered for by sealed shoulders along both sides of the Pacific Highway and Stadium Drive. There are several regional and local cycle routes identified in this location such as the Pacific Highway Cycle Link which runs north along the Highway from Toormina, along Stadium Drive to Hogbin Drive and the Hogbin Drive Cycleway between Sawtell and Coffs Harbour. (See the Sawtell Cycleway map below).

Figure 2-2 Sawtell Cycleway Map (Source: Coffs Harbour City Council)

2.5 Traffic Flows

2.5.1 Peak Hour Flows

As part of the project work, Seca Solution collected traffic data at the signalised intersection of the Pacific Highway and Isles Drive during a typical morning and afternoon peak period during the school term on Tuesday 27th June 2017, between 7.30 and 9.30 AM and 3.30 to 6.00 PM.

The summary of these traffic surveys is provided below.

Figure 2-3 Peak Hour Traffic Flows

Street	Peak period	Direction flow	Direction flow	Two-way flow
Pacific Hwy (north approach)	AM peak	1,490 northbound	1,254 southbound	2,744
	PM peak	1,415 northbound	1,531 southbound	2,946
Pacific Hwy (south approach)	AM peak	1,278 northbound	826 southbound	2,104
	PM peak	899 northbound	1,339 southbound	2,238
Isles Drive	AM peak	330 eastbound	299 westbound	629
	PM peak	464 eastbound	231 westbound	695
Health Campus Access	AM peak	336 eastbound	119 westbound	455
	PM peak	198 eastbound	289 westbound	487

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It is noted that all of the results show that the afternoon peak period has higher levels of traffic demand.

The RMS Guide to Traffic Generating Developments provides the following advice regarding road capacity applicable to the Pacific Highway as a 4-lane divided carriageway:

- 1900 vehicles per direction, giving 3,800 vehicles per hour two way.

For Isles Drive and the Health Campus access, as 2 lane carriageways the road capacity is given as:

- 900 vehicles per direction, giving 1,800 vehicles per hour two-way.

The traffic data collected for the project shows that the roads in the vicinity of the subject site are all well within capacity. This is reflective of site observations that traffic flows well in the locality, with the only delays created by the traffic signals.

2.5.2 Daily Traffic Flows

The RMS Guide to Traffic Generating Developments indicates that peak hour flows typically represent 10% of the daily traffic flows, and using the above data this would indicate the following daily traffic flows in this location:

- Pacific Highway north of the Health Campus: 30,000 vehicles per day;
- Pacific Highway south of the Health Campus: 22,000 vehicles per day;
- Isles Drive: 7,000 vehicles per day
- Health Campus access: 5,000 vehicles per day

2.5.3 Daily Traffic Flow Distribution

The daily traffic volumes are reasonably balanced in all directions, with the above data indicating a bias in movements northbound along the Pacific Highway in the morning peak period and the reverse in the afternoon. Traffic volumes on the Health Campus access demonstrate a higher eastbound (inwards) movement in the morning peak with the reverse occurring in the afternoon.

2.5.4 Vehicle Speeds

No speed surveys were completed as part of the study work. The Coffs Harbour Health Campus access, however, has a 15km/h posted speed limit and observations indicate that there is a general compliance with this low speed environment.

2.5.5 Heavy Vehicle Flows

The traffic surveys conducted at the Pacific highway / Isles Drive intersection recorded a reasonably high proportion of heavy vehicles on the road network. Heavy vehicles accounted for around 16% of the total volumes along the Pacific Highway and over 30% on Isles Drive as it provides access to and from an extensive industrial area. Heavy vehicles to and from the Health Campus made up 10% of the total vehicle volumes, however, a large proportion of these are buses.

2.5.6 Current Road Network Operation

Observations on site during the peak periods shows that traffic movements in the vicinity of the site generally operate well. Delays to traffic on the side roads are associated with the length of green time provided for through movements on the Pacific Highway. This is consistent with its role as a major arterial road.

Sidra modelling has been undertaken to assess the current road network operation.

- Phasing based on site observations allowing for 140 second cycle time.
- 1.8% annual growth along the Pacific Highway (based on AADT data for the Pacific Highway approximately 1km south of Stadium Drive).

- Sidra modelling indicates that there are currently delays for vehicles turning out of the side roads (including through movements) during both the morning and evening peak. These delays are inherent to the signal phasing and are consistent with observations on site. There is minimal queuing associated with these movements.
- Modelling also indicates delays and queuing for right turn movements into these side roads during both the morning and evening peak. It is noted however that variable phasing observed on site may see these movements operate more efficiently than the modelling indicates (leading right turns, trailing right turns etc).
- During the morning peak there can be significant queuing on the Pacific Highway (northbound), consistent with observations.

Although the Sidra intersection modelling indicates that the Level of Service (LoS) on these movements are unacceptable due to these delays, in practice these delays are acceptable as they are unavoidable due to the length of cycle time required to provide for the through movements associated with the Pacific Highway. The sheltered right turn lanes appear adequate to accommodate the existing demands, not creating queues that impact on the through lane.

Table 2-1 -2017 Intersection Operation – Pacific Highway / Isles Drive / Health Campus (AM/PM)

Approach	Level of Service	Average Delay (seconds)	95% Back of Queue (metres)
Pacific Highway South	D / C	50.9 / 42.3	334.0 / 200.7
Coffs Harbour Hospital	E / E	59.1 / 65.1	28.3 / 74.6
Pacific Highway North	B / B	25.5 / 21.4	159.6 / 233.1
Isles Drive	D / C	44.2 / 37.7	92.7 / 115.2
Overall	**C / C**	**39.8 / 33.7**	**334.0 / 233.1**

2.5.7 Traffic Safety and Accident History

The roads in the vicinity of the subject site are well laid out, with good forward visibility to the traffic signals on all approaches. The traffic signals safely manage all turning traffic movements as well as pedestrian movements. It is considered that the road network in the vicinity of the site provides a safe overall layout and ensures that there are no road safety concerns.

A review of crash data provided by RMS (Appendix B) for the five-year period from October 2011 to September 2016 shows 9 crashes were recorded at the Pacific Highway / Isles Drive / Health Campus intersection

- 6 of these crashes were rear-end crashes (the predominant crash type at most signalised intersections);
- 2 crashes involved opposing movements turning at the intersection;
- 6 of the crashes occurred in the late afternoon or early evening;
- 1 crash involved a pedestrian;
- There have been no fatalities during this period.

This data indicates that this intersection is operating at a high level of safety particularly considering the high volume of traffic at this location.

2.6 Parking Supply and Demand

2.6.1 On-street Parking Provision

Internal roadways through the hospital precinct make no provision for on-street parking and parking is permitted in marked bays only. There is no further on-street parking available within the immediate proximity to the hospital. To the west of the campus the industrial estate provides opportunities for on-street parking with no timed parking in place. Council has recently marked on-street parking to ensure vehicles are parked appropriately and do not impact on driveways.

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2.6.2 Off-Street Parking Provision

The campus provides for a mixture of parking opportunities throughout the site as shown in Figure 2.3

Figure 2-3 Parking zones per survey (Appendix D)

2.6.2.1 Unmarked parking behind the hospital

There is a restricted access, staff only roadway that runs behind the rear of the hospital. From observation, the verge along this road is utilised for parking throughout the day. Throughout the day this area is heavily utilised, and from Nearmap aerial images it has been determined that there is space for a maximum of approximately 100 vehicles. Previous parking assessments have quantified parking demands in this area at 96 cars at 2pm which is consistent with recent observations.

2.6.2.2 Use of unmarked parking

There is a gravel section which drivers utilise for parking, located in the region behind zone D, adjacent to this gravel section cars park on the grass verge between zones C and D (shown in Table 1 as X and Y).

There is no explicit sign in this area that prohibits parking, however it is stipulated that parking is permitted in allocated spaces only throughout the hospital precinct.

From the survey results 14 cars were observed to park in unmarked spaces on the grass verge area while up to 19 cars were observed to park in the unmarked gravel area

2.6.3 Parking Demand and Utilisation

A parking beat survey was undertaken on Tuesday 27th June 2017 with a morning count taken at 7am followed by hourly counts throughout the day from 9:30am – 2:30pm.

Surveys were undertaken to determine the parking demands of the existing on-site parking as well as any on street and public parking within the locality. The counts included general access parking for patients and visitors, along with restricted access staff parking and patient only parking areas. Tuesday was chosen to represent the typical weekday parking demand for this facility.

The surveys (Appendix D) show that the existing parking areas within the Coffs Harbour Health Campus are well-used throughout the day, with a consistent parking demand evident. However, there were still between 306 – 368 vacant spaces available throughout the day between 9:30 and 2:30, with no discernible peak demand being observed during any particular hour of the day.

The entire car park is controlled by gated access points where a time-stamped ticket is obtained. There is a small section of 1 hour parking available, located in zone A, where a ticket is not needed.

- Turnover for parking in zone A was quite regular, this section is utilised for patient and visitor parking. Most of the parking is designated as 6-hour parking, with limited (25) all-day patient/visitor parking spaces also available.
- Parking in zone B areas is limited to 2-hour parking, with unlimited parking only available for on-call specialists (4 spaces).
- Parking in zone C is restricted to NCCI (North Coast Cancer Institute) patient and visitor parking only.
- Parking in zone D and zone E is also restricted to NCCI use only
- Parking utilisation in zone F remained similar throughout the day, this section is designated all day staff parking.
- Parking in zone G is restricted to holders of a pass to gain access through the boom gates. Included in this area is a section restricted to evening staff only controlled by a permit, as a result of this parking type demand in this section peaked in the period between 12:30pm and 2:30pm (for shift change at 2pm).
- There were an additional 8 spaces available for on-call specialists in this area, along with 5 spaces available for motorcycles.
- From observation, there was always at least one accessible space vacant for all parking areas of the precinct. Zone F had no accessible parking due to its isolated location

2.6.4 Short term Set down or pick up areas

There is a short-term set down only area provided at the front entrance to the hospital sufficient for 4 vehicles. There are also 10 short-term parking spaces provided outside the Emergency Department.

2.7 Public Transport

2.7.1 Rail Station Locations

Coffs Harbour railway station is located 6km from the Health Campus, a 10 minute drive via the Pacific Highway and Harbour Drive.

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2.7.2 Bus Routes and Associated Facilities

There is a single bus stop on the subject site, located in close proximity to the main entrance of the hospital. This bus stop provides seating and shelter.

Bus services are provided by Sawtell Coaches with regular services between the Health Campus and Coffs Harbour CBD and surrounding areas. These include bus routes 362 and 363 from Coffs Harbour to Sawtell.

Additional services are provided by Busways, with routes 360 and 360M servicing Coffs Harbour Hospital.

- 360 – Park Beach Plaza - Park Av via Highway Selected trips operate to/from Coffs Harbour Base Hospital
- 360M – Coffs Harbour to Macksville

There are further community transport services provided for people in need. The Health Transport Unit based at Port Macquarie Health Campus provides non-emergency health related transport (NEHRT) for disadvantaged members of the community who need to attend medical appointments at Mid North Coast and Northern New South Wales Local Health facilities. The Health Transport Unit (HTU) provides transport assistance for eligible clients that meet NEHRT criteria, which includes no access to private vehicle use and inability to use public transport.

2.7.3 Rail and Bus Service Frequencies

Sawtell Coaches bus routes run frequently throughout the day Monday to Friday from 6:37am to 9:12pm, with services every 30 minutes on average in the peaks and every 1 hour throughout the day. These services also run on weekends and public holidays with less frequency.

Busways route 360:

- Monday to Friday: Minimal services entering the hospital site with 3 daily services from Coffs Harbour Hospital to Park Beach Plaza, with 5 return services entering the hospital site
- Saturday: 1 service from Coffs Harbour Hospital to Park Beach Plaza (11:54am), with 2 return services (12:07pm and 5:07pm)

Busways route 360M:

- Monday to Friday: 6 daily services from Macksville to Coffs Harbour between 7:31am and 5:10pm, with 5 return services entering the hospital site between 10:07am and 4:07pm.
- Saturday: 1 morning and 1 afternoon service in each direction

Coffs Harbour Train Station is part of the North Coast Line which provides services from Sydney to Brisbane, through a number of regional areas. There are 3 daily services through Coffs Harbour in each direction.

2.8 Pedestrian Network

Pedestrian footpaths are provided along both sides of the Pacific Highway in the vicinity of the site. A footpath connection is also provided along the southern side of the access road into the Coffs Harbour Health Campus that provides pedestrian access to the main entrance of the hospital. Pedestrian crossings are provided across the access road between the northern carpark and the hospital entrance ensuring that pedestrian movements can be safely managed and controlled. These pedestrian crossings include drop kerbs to cater for wheel chair users as well as prams etc.

2.9 Other Proposed Developments

Coffs Harbour City Council currently has a Local Growth Management Strategy (LGMS) which provides for a planned release of land within the Coffs Harbour Local Government Area (LGA) to 2031.

This Strategy is currently being revised and updated so details are not available at this time, however, as the areas surrounding the Health Campus are largely fully developed it is unlikely that there will be any significant developments that will impact on traffic growth on the road network near the Campus. The Education Precinct

including Southern Cross University and Coffs Harbour TAFE, located at the intersection of Stadium Drive and Hogbin Drive south-east of the Health Campus, has the potential for future expansion which may see increased traffic volumes on the local road network. However, any future expansion would be subject to assessment as part of the approval process.

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3. Proposed Development

3.1 The Development

The Coffs Harbour Hospital Expansion will include work to expand and reconfigure inpatient and ambulatory care services providing enhanced services, facilities and care to patients. The Project will include enhancements to existing surgical services and operating theatres and a new short stay surgical unit and improvement of the surgical bed base. Ambulatory care and community health services will also be enhanced. Details of the proposed Coffs Harbour Hospital Expansion are provided in the table below.

Service Stream		Current Beds	CSP Proposed 2020/21	CSP Proposed 2026/27	Built Scope
Medical		40	60	66	66
MAPU		8	8	8	8
Overnight Surgical		42	46	50	50
ICU/HDU		10	16	16	16
Coronary Care		10	12	14	14
Coronary Angiograms		4	4	6	6
Stroke		4	4	6	6
Maternity		20	20	20	20
SCN		6	8	8	8
Paediatrics		16	16	16	16
Mental Health Acute		30	30	30	30
Total Acute Overnight		**190**	**224**	**240**	**240**
Rehabilitation		20	24	24	24
GEM		0	15	15	15
Mental Health Rehabilitation		20	20	20	20
Total Overnight		**230**	**283**	**299**	**299**
Same Day Surgery		10	20	20	20
Extended Short Stay Surgical 23 hour		6	9	12	12
Emergency		19	26	31	31
EMU		10	10	10	10
Renal Dialysis		10	18	24	18
Chemotherapy		14	18	20	14

Total Same Day Treatment Spaces	**69**	**101**	**117**	**105**
Total Bed and Treatment Spaces	**319**	**416**	**452**	**440**
Operating Theatres	4	7	7	5
Vascular Interventional Suite	0	1	1	1
Procedure Rooms	1	2	2	2
Operating Theatre recovery spaces	10	16	20	20
Labour Delivery Suites	4	4	4	4
Bassinetts	28	28	28	28
Transit Lounge	6	12	12	12

CHHC Staffing Impact (Extract from CHHC Financial Impact Statement V5.0, dated November 2017)

Staffing FTE will increase in line with the changes to service provision, models of care and in response to projected with total FTE projected to increase by 132 in 2021/22 compared to the total FTE in 2017/18 (actual). The FTE will increase a further to an accumulative increase of 333 FTE Total from 2021/22 to 2026/27 when all new services are expected to be fully operational. These staffing increases are in line with projected activity and budget growth. Actual staffing levels for future years will be subject to the Service Level Agreement negotiations with the MoH based on the funding principles applied in the relevant year, and which may not align with those outlined in this report

Table 5.1 - staffing impacts

Option 3	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27
Total FTE	871.48	865.65	865.65	865.65	865.65	998.00	1,032.93	1,072.50	1,105.04	1,137.28	1,198.21
Additional FTE per annum			0.00	0.00	0.00	132.34	34.93	39.57	32.54	32.25	60.93
Additional FTE per annum (cumulative)			0.00	0.00	0.00	132.34	167.27	206.84	239.38	271.63	332.56

3.1.1 Phasing and Timing

Indicative timeframes for the construction of the new Clinical Services building are:

- First quarter 2019 commence construction;
- Fourth quarter 2020 complete construction;
- First quarter 2021 operational.

Indicative timeframes for the refurbishment of parts of the existing hospital building and areas to realign services are:

- Second quarter 2021 commence refurbishment;
- Third quarter 2021 complete refurbishment;
- Fourth quarter 2021 operational.

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3.1.2 Selection of appropriate design vehicles for access and circulation requirements

Preparation for the construction of the new Clinical Services Building and the refurbishment of parts of the existing hospital building to realign services roles, which is the subject of SSD Application No.8981, will include the following roadworks (earthworks, pavement works, kerb & gutter and pathways):

- The construction of a new western carpark on the site of the existing helipad to accommodate 93 relocated parking spaces;
- An extension to the existing carpark immediately east of the hospital to accommodate 25 relocated parking spaces;
- The western access road between the roundabout and the loading dock area; and
- A tank refuelling hammerhead road to the east of the site.

A separate external works package is also being undertaken at Coffs Harbour Health Campus under a separate planning approval process which will include the following roadworks (earthworks, pavement works, kerb & gutter and pathways):

- A reconfigured access road including new access arrangements to the adjacent private medical centre,
- Reconfigured existing parking facilities;
- New relocated bus and pedestrian facilities.

The reconfigured access, parking and servicing arrangements will need to accommodate vehicles up to the size of a 12.5 metre single unit truck and a 12.5 metre bus, a 10.8 metre waste collection vehicle as well as a Bariatric Ambulance measuring 7 metres in length and standard light vehicles.

The circulation through the site for each of these vehicles has been assessed against AS2890 Parking Facilities (AS 2890) and Autoturn simulations have been completed to ensure that vehicles can safely and appropriately travel through the site, access their destinations and exit in a forward direction as per AS2890 and Council requirements.

3.2 Access

3.2.1 Access Location

The external works package being undertaken at Coffs Harbour Health Campus under a separate planning approval process will retain the existing access road from the Pacific Highway up to the existing internal roundabout within the Coffs Harbour Health Campus. East of the roundabout the access road will be reconfigured to the north towards the adjacent private medical centre and over a portion of the existing northern public carpark to link up with the existing north / south internal road. A reconfigured access will be provided to the private medical centre.

The reconfigured access road will have a wide median separating the eastbound and westbound lanes that will provide a U-turn facility for access to the proposed short-term parking in front of the new hospital main entry. It will also provide up to eight 15 minute parking spaces at the new main entry to the hospital, 3 new drop-off only spaces in front of the new emergency department, a bus stop facility, pedestrian crossings and new boom gates for entry to and exit from the public carpark. New relocated ambulance bays will be provided at the western side of the existing emergency department.

3.2.2 Service Vehicle Access

Service vehicles will enter the site using the existing access road from the Pacific Highway. The existing loading dock on the western side of the Hospital will be retained in the new development.

3.2.3 Queuing at entrances

Sidra modelling indicates that there are currently delays for vehicles turning out of the Coffs Harbour Health Campus (including through movements) during both the morning and evening peak. These delays are inherent to the signal phasing and are consistent with observations on site. There is minimal queuing associated with these

movements. The additional traffic generated by the proposed expansion is not expected to increase significantly this queuing.

3.2.4 Access to Public Transport

The pedestrian crossing adjacent the new Clinical Services Building will facilitate safe pedestrian access to the relocated bus stop located in the wide median separating the eastbound and westbound lanes of the reconfigured access road.

3.3 Circulation

3.3.1 Pattern of circulation

The pattern of circulation will remain generally the same as the existing arrangements, with a u-turn facility provided for access to the short-term parking at the front of the new Clinical Services building.

3.3.2 Internal Road width

The reconfigured access road will provide two travel lanes in each direction to ensure sufficient capacity and reduce the likelihood of queuing at the main entrance. The eastbound and westbound lanes will be separated by a wide median that will provide a U-turn facility for access to the short-term parking at the new Clinical Services building.

3.3.3 Internal Bus Movements

Buses will enter the Coffs Harbour Health Campus vis the existing access road from the Pacific Highway and will access the relocated bus stop facility that will be provided within a wide median separating the eastbound and westbound traffic flows.

3.3.4 Service Area Layout

The existing loading dock on the western side of the Hospital will be retained in the new development.

3.4 Parking

3.4.1 Proposed Supply

The external works package being undertaken at Coffs Harbour Health Campus under a separate planning approval process anticipates the need to relocate 118 parking spaces associated with the footprint of the Hospital extensions and the construction of a reconfigured access road into the site. These parking spaces will be relocated in an extension of the existing carpark adjacent to the main entrance (25 spaces) and a new western carpark on the site of the existing helipad (93 spaces, including 8 accessible spaces). These relocated parking spaces will be provided under SSD Application No.8981.

3.4.2 Parking provision per State Government policy

The RMS Guide provides a rate for parking at Private Hospitals but not for public hospitals.

Peak parking accumulation (PPA)

PPA = -26.52 + 1.18*(no. beds)

3.4.3 Council code and local parking policies and plans

The parking requirements for hospitals based on the Coffs Harbour DCP is 1 parking space for 2 beds.

3.4.4 Parking Layout

The site layout will allow for the safe parking of vehicles within the site. The internal parking spaces have been designed in accordance with AS2890 and the internal circulating aisles allow for two-way movements with a minimum width of 5.8 metres.

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Dimensions used for parking are those required under AS2890. For 90° angle parking the following dimensions are required for a Class 3 facility:

- 2.6 x 5.4 metre parking spaces
- 5.8 metre parking aisle widths
- 5.5 metre circulation roadways
- Blind aisles (dead end aisles) must extend 1 metre past the last parking space

Accessible parking spaces:

- 2.4 x 5.4 metre space with a 2.4 x 5.4 metre shared space.

3.4.5 Projected demand

The construction of the new Clinical Services Building and the refurbishment of parts of the existing hospital building (SSD Application No.8981) will increase the number of beds at Coffs Harbour Health Campus from 319 to 440, an increase of 121 beds. This increased capacity requires a review of the existing parking to determine the capacity to cater for further parking associated with this future demand.

The parking requirements for hospitals based on the Coffs Harbour DCP is 1 parking space for 2 beds.

Applying the DCP rate to the proposed increase of 121 beds sees a requirement for an additional 61 parking spaces.

The RMS Guide also provides a rate for parking at Private Hospitals of:

Peak parking accumulation (PPA) for the proposed addition of 121 beds:

PPA = -26.52 + 1.18*(no. beds) = 117 spaces.

Thus, the number of parking spaces required to satisfy the future parking demand is 61 to 117 spaces.

The parking surveys conducted on the site show that the existing parking areas within the Coffs Harbour Health Campus are well-used throughout the day, with a consistent parking demand evident. However, there were still between 306 – 368 vacant spaces available throughout the day between 9:30 and 2:30, with no discernible peak demand being observed during any particular hour of the day.

A review of the existing parking situation therefore demonstrates that these future parking demands can be accommodated within the existing parking supply and no additional parking spaces will be required.

3.4.6 Service Vehicle Parking

The largest service vehicle will be a 12.5 metre single unit truck associated with deliveries to the Hospital. The existing loading dock on the western side of the Hospital will be retained.

3.4.7 Pedestrian and Bicycle Facilities

Pedestrian footpaths are provided along both sides of the Pacific Highway in the vicinity of the site. A footpath connection is also provided along the southern side of the access road into the Coffs Harbour Health Campus that provides pedestrian access to the main entrance of the hospital. Pedestrian crossings are provided across the access road between the northern carpark and the hospital entrance ensuring that pedestrian movements can be safely managed and controlled. These pedestrian crossings include drop kerbs to cater for wheel chair users as well as people with prams.

Existing bicycle storage facilities consist of a secure bicycle cage located adjacent to the staff carpark behind the external main plant room. There is currently space for 12 bicycles but there is potential to add more racks into this cage in the future. The site also currently provides a bicycle rack for 11 bicycles directly across the access road from the main entrance to the hospital. This facility will be relocated within the Coffs Harbour Hospital Campus

Showers are available for staff members choosing to walk or ride to work.

The existing bicycle racks and storage is considered adequate as there is no proposed change to the overall parking supply and bicycle parking is usually linked to the vehicle parking supply. The DCP makes no provision for bicycle parking.

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4. Transportation Analysis

4.1 Traffic Generation

Traffic generation for this assessment has been calculated at the appropriate rate for hospitals in the RTA Guide to Traffic Generating Developments which states *"The best indicator of peak traffic generation or peak vehicle trips (PVT) was found to be a combination of the number of beds (B) and the number of staff per weekday day shift (ASDS). If the average number of staff per weekday day shift (ASDS) is unknown or unavailable the number of beds (B) alone was found to be a good indicator of peak traffic generation or peak vehicle trips (PVT)."*

Based on the above parameters the additional traffic that could be generated by the proposed expansion can be calculated as follows:

Number of beds only:

Year 2021 – 97 additional beds.

Peak period traffic generation = -22.07 + 1.04 x no. of beds = -22.07 + (1.04 x 97) = 79 trips

Year 2026 – 133 additional beds.

Peak period traffic generation = -22.07 + 1.04 x no. of beds = -22.07 + (1.04 x 133) = 116 trips

Built Scope – 121 additional beds.

Peak period traffic generation = -22.07 + 1.04 x no. of beds = -22.07 + (1.04 x 121) = 104 trips

Number of Beds + Staff:

Year 2021 – 97 additional beds + 133 additional staff (average staff per weekday shift estimated at 80).

Peak period traffic generation = -14.69 + 0.69 beds + 0.31 staff = -14.69 + (0.69 x 97) + (0.31 x 80) = 77 trips

Year 2026 – 133 additional beds = 333 additional staff (average staff per weekday shift estimated at 200).

Peak period traffic generation = -14.69 + 0.69 beds + 0.31 staff = -14.69 + (0.69 x 133) + (0.31 x 200) = 140 trips

Built Scope – 121 additional beds = 333 additional staff (average staff per weekday shift estimated at 200).

Peak period traffic generation = -14.69 + 0.69 beds + 0.31 staff = -14.69 + (0.69 x 121) + (0.31 x 200) = 131 trips

No growth has been allowed for associated with other users within the Health Precinct. Future expansion or the inclusion of new users within the campus shall be subject to individual assessments as part of the development process.

The additional traffic demands created by the Coffs Harbour Hospital Expansion will see increased demands for vehicles turning into or out of the campus at either the signalised intersection of Pacific Highway and Isles Drive or from the south of the Campus along Phil Hawthorne Drive and Stadium Drive.

To provide a robust assessment future traffic distribution has been assumed consistent with the existing situation with no allowance for staff who may park to the south of the site and approach or depart along Stadium Drive.

There will also be ongoing increases in demands for through movements along the Pacific Highway due to growth along this road corridor.

Two scenarios have been considered in the modelling which are based on Table 1 shown above:

- 2021 design year – Allowing for 97 additional beds and 133 additional staff plus growth on the Pacific Highway;
- 2026 design year – Allowing for 133 additional beds and 333 additional staff plus growth on the Pacific Highway (worst-case scenario).

4.1.1 Daily and Seasonal Factors

Minimal seasonal variation is expected, with weekday flows being typically greater than weekend flows.

4.1.2 Pedestrian Movements

The pedestrian movements within the Coffs Harbour Health Campus will be catered for by the high standard of pedestrian facilities including concrete footpaths and pedestrian crossings linking the various carparks to the main buildings. Externally, concrete footpaths are provided on both sides of the Pacific Highway. The Isles Drive intersection is controlled by traffic signals which incorporate pedestrian phases.

4.2 Traffic Distribution and Assignment

4.2.1 Hourly Distribution of Trips

For the purposes of this assessment, it is considered that the trips generated by the project will be distributed in the same proportions as the existing traffic.

4.2.2 Origin / Destinations Assignment

The assignment of traffic to the surrounding road network is assumed to be consistent with the existing demands for vehicles turning into and out of the Hospital. Minimal growth anticipated off Isles Drive which is a fully-developed industrial area.

Following distribution applied to both AM and PM peak periods:

- 70% origin/destination to the north
- 30% origin/destination to the south

In the morning, approximately 75% of traffic is inbound with the rest outbound. In the evening, approximately 60% outbound with the rest inbound.

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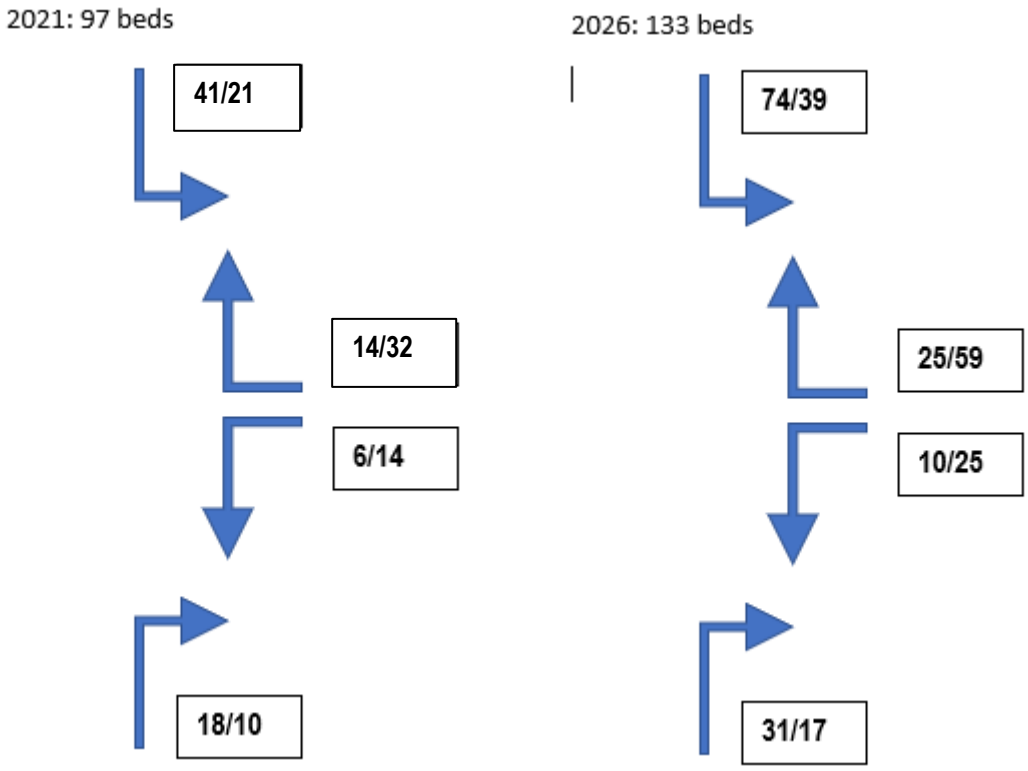

4.3 Impact on Road Safety

It is considered that the additional traffic volumes associated with the project will have a minimal impact upon traffic safety. The key intersection at the Pacific Highway is controlled by traffic signals, which ensure safety is maximised for both road users and pedestrians, with the control of tuning movements and pedestrian movements at all times.

The access road into the Health Campus is signposted at 15km/h which creates a low speed environment for all road users. Pedestrians are well catered for with concrete footpaths and pedestrian crossings at all key locations providing safe connections between the car parks and the main buildings.

The traffic data collected as part of this project demonstrates that the main access routes are currently carrying traffic flows well within their capacity ensuring that the additional traffic will not have an adverse impact upon the road capacity or safety in this location.

4.4 Impact of Generated Traffic

4.4.1 Impact on Daily Traffic Flows

The additional peak hour traffic that will be generated at full development in 2026 is estimated to be 140 trips (70 inward and 70 outward) which equates to approximately 1,400 trips per day. The Health Campus access road will be the most impacted by this additional traffic, however, it is currently carrying around 5,000 vehicles per day and operating well within its capacity. The additional traffic is therefore considered to have a minor impact on daily traffic flows.

The additional 1400 daily trips will also have no impact on the Pacific Highway as it is currently carrying approximately 30,000 vehicles per day.

4.4.2 Peak Hour Impacts on Intersections

The intersection of the Pacific Highway with Isles Drive and the Coffs Harbour Health Campus has been modelled using *Sidra Intersection 7* to assess its current and future operation allowing for the proposed expansion of Coffs Harbour Hospital. Three scenarios have been considered including:

- Existing 2017 Operation - refer Section 2.5.6 above;
- 2021 Design Year - Allowing for expansion of the hospital to provide 97 additional beds, 133 additional staff and 1.8% per annum growth along the Pacific Highway.
- 2026 Design Year - Allowing for expansion of the hospital to provide 133 additional beds, 333 additional staff and 1.8% per annum growth along the Pacific Highway.

The results of this assessment for the future design years are presented below.

Table 4-1 -Sidra Results - 2021 Design Year - Intersection of Pacific Highway / Isles Drive / Coffs Harbour Hospital

Approach	Level of Service	Average Delay (seconds)	95% Back of Queue (metres)
Pacific Highway South	E / D	57.0 / 43.0	389.5 / 202.7
Coffs Harbour Hospital	E / E	59.6 / 63.8	33.2 / 85.7
Pacific Highway North	B / B	26.3 / 21.2	165.0 / 230.0
Isles Drive	D / C	46.7 / 37.7	94.3 / 115.2
Overall	**D / C**	**43.1 / 34.0**	**389.5 / 230.0**

Table 4-2 -Sidra Results - 2026 Design Year - Intersection of Pacific Highway / Isles Drive / Coffs Harbour Hospital

Approach	Level of Service	Average Delay (seconds)	95% Back of Queue (metres)
Pacific Highway South	E / D	59.5 / 43.1	437.0 / 204.1
Coffs Harbour Hospital	E / E	63.3 / 67.4	38.4 / 99.7
Pacific Highway North	B / B	24.6 / 20.3	165.9 / 227.6
Isles Drive	D / C	47.5 / 37.5	99.5 / 115.2
Overall	**D / C**	**43.7 / 4.3**	**437.0 / 227.6**

The results above demonstrate that:

- Vehicles exiting the hospital will have a negligible impact on the operation of the signalised intersection, with the increased traffic seeing only very minor increases in delays and queuing on the eastern approach.
- Vehicles turning left into the site will also have a negligible impact on the intersection due to the provision of the left slip lane (unsignalised) into the campus.
- The major impact on this intersection will be the increased demand for vehicles travelling north along the Pacific Highway during the morning peak hour, together with the increased demands for vehicles turning right into the site. Queues associated with this right turn exceed the capacity of the right turn lane into the hospital.

Consideration was given to opportunities to mitigate the impact of these additional demands for right turns. The critical constraint for the existing intersection is the increased through traffic volumes on the Pacific Highway

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associated with ongoing growth in the Coffs Harbour area. A long green phase is required to accommodate these demands, which creates extended delays for turns into and out of the side roads.

Increasing the length of the sheltered right turns lanes on the Pacific Highway to accommodate these queues was modelled however does not provide a significant improvement to the overall operation of the intersection.

The above results have allowed for minor changes to the typical phase times, to reflect the additional green time required for the critical movements. No changes were applied to the overall cycle time of 140 seconds.

With these minor adjustments, the above results demonstrate that the intersection can continue to operate to its current standard with only minor increases in the typical delays and queuing on most movements (for both 2021 and 2026 design scenarios). Discussion with the Coffs Harbour traffic engineer confirmed that the RMS does review and modify the signal phasing through the corridor in an effort to optimise signal performance.

It should be noted that the above assessment has allowed for all traffic associated with the proposed expansion to enter the Hospital Precinct via the signalised intersection on the Pacific Highway.

A traffic assessment prepared by GeoLink (2014) for the development of two new staff car parking facilities located in the southern part of the Hospital Precinct, indicated that approximately 40% of staff would access this parking area off Stadium Drive, potentially reducing the demands through the signalised intersection at Isles Drive. These reduced demands, particularly for the right turn off the Pacific Highway into the health precinct, could see some improvements to the overall operation of the traffic signals compared to the above results.

4.4.2.1 Southern Traffic – Phil Hawthorne Drive and Stadium Drive

A traffic assessment was prepared by GeoLink (2014) to support the Stage 1 and Stage 2 car park developments.

Findings from this assessment, as they relate to the masterplan are:

- New access via Phil Hawthorne Drive and Stadium Drive are likely to reduce traffic movements at main intersection (Pacific Highway / Isles Drive) and increase movements at Phil Hawthorne Drive / Stadium Drive intersection. As discussed above no provision has been made for this reduction in the above assessment.
- SIDRA modelling determined that the Phil Hawthorne Drive / Stadium Drive intersection has sufficient capacity to accommodate likely increases in traffic movements associated with **Stage 1** of the carpark development. This development is now complete and operational with the construction of 462 car parks.
- Modelling suggests that the implementation of **Stage 2** car park by 2030 and background growth in the traffic demands along Stadium Drive will see the performance of the key right hand turn from Phil Hawthorne Drive onto Stadium Drive potentially drop to LoS F during the PM peak.
- The TIA determined no other impediments to the road network as a result of the proposal.
- All service vehicles are required to enter via the main intersection.

Discussions with Council indicate that Stadium Drive forms part of a local bypass (Hogbin Drive) for commuters to avoid the traffic signals along the Pacific Highway corridor. Queues form where vehicles rejoin the Pacific Highway at Englands Road and are required to give way to traffic from the north. Gaps however form from the upstream signals at Isles Drive enabling these vehicles to join the through traffic flows.

4.4.3 Impact of Construction Traffic

The impact of construction traffic has been considered below in Chapter 5 with the provision of a Draft Construction Traffic Management Plan. This plan shall be refined in conjunction with the contractor as part of the Construction Certification for the proposed development.

4.4.4 Background traffic and other developments

The Sidra analysis above has included a 1.8% per annum growth in background traffic along the Pacific Highway to cater for other developments in the Coffs Harbour area.

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5. Sustainable Travel Opportunities

5.1 Background on Workplace and Sustainable Travel

Supporting active travel, making it easier for employees and visitors to get to and from the workplace and to reduce dependence on private vehicles and parking space is recognised as a positive endeavour for both the environment and participants' health.

Active Workplaces are identified by the Premier's Council for Active Living NSW (PCAL) as a means by which workplace health and wellbeing can be promoted and supported. Investing in workplace health promotion (such as physical activity programs) has the potential to increase economic return for employers through enhanced worker productivity, reduced absenteeism and improved corporate image. (PANORG (2009) *Evidence module: Workplace physical activity and nutrition interventions.)*

Active Travel in the workplace can deliver efficiencies, savings and benefits to an organisation, its operation and its employees. Promotion of 'sustainable' travel choices such as walking, cycling, using public transport and car-sharing, as well as reducing the need to travel by encouraging the use of video-conferencing and remote working can all contribute to an active workplace.

5.2 Spheres of Influence

The areas which may be influenced by the promotion and support of active travel include:

- Reduction in parking demand, its associated cost of provision and in turn the cost to employees for parking usage.
- Reduction in private motor vehicle travel by individuals, the impact on the road network and associated environmental costs and costs to the employee.
- Increased walking, cycling and public transport use and its resulting increase in physical exercise and health benefits.
- Parking policy, covering parking pricing and supply.

With regards to the Coffs Harbour Hospital Expansion the primary spheres of influence are:

- Bus Travel – ensure all existing public transport users continue to be public transport users and that new staff and attendees to the hospital who are open to using public transport are supported in this choice.
- Car Pooling - reduce number of individual private car drivers by encouraging car pooling, both to and from work.
- Ensure staff who indicate that they are prepared to walk or cycle are supported in this choice.
- Parking policy – ensure it supports alternative transport options.
- Tele-conferencing and remote work opportunities for meetings etc
- Non-peak period servicing for services and contractors wherever possible.

5.3 Opportunities to reduce commuter car dependency

5.3.1 Public transport

The opportunity to encourage bus patronage must be supported, ensuring all people who are open to bus travel have sufficient relevant information supporting this as a positive experience. This can be done by directing attendees to public transport and by including the Transport for NSW Trip Planner link on relevant Coffs Harbour hospital web sites. The web site can also provide some general information on those routes that access the hospital and show how convenient bus travel is to connect with the hospital.

At the hospital suitable signage should be installed directing people to the bus stop along with a display of bus timetables and routes.

The Trip Planner app can also be included on the staff intranet for convenient use.

The hospital has an opportunity to liaise with the local bus provider to enable the travel demands for staff and visitors to the hospital to be taken into consideration in the planning for routes and services. This liaison should also take into consideration travel demands for other users within the campus to maximise services.

5.3.1.1 Options for improving services

It is considered that the development will not require the provision of any upgrade of public transport as the existing buses provide a regular service between Sawtell and Coffs Harbour. Signage and access to up to date bus information is important to support bus travel by both staff and visitors.

5.3.1.2 Pedestrian Access to Bus Stops

Pedestrian access to the bus stop within the Health Campus is provided by a pedestrian crossing on the main access road. No additional works are required except to ensure suitable signage is provided.

5.3.2 Car Pooling

Formal carpooling programs are effectively run by various organisations throughout NSW and can provide a practical alternative to being a single commuter, driving daily. Given the location of residential areas across the Coffs Harbour district there may be opportunities through either formal or less formal means to promote carpooling on a regular or semi-regular basis. This willingness to carpool could be encouraged through the instigation of preferred parking for carpooling vehicles.

Informal carpooling can be promoted throughout the workplace through staff newsletters, email intranet enquiries etc.

5.3.3 Staff who are open to using bicycles and being pedestrians

Opportunity to increase the cycling numbers could be investigated. New staff can be buddied up with existing staff who cycle to gain confidence and create social cohesion. Staff may also consider cycling for part of their week through the promotion of appropriate cycle routes and familiarity with end of ride facilities. Information for staff can be included in induction packs.

Transport for NSW has developed a Cycleway Finder, a purpose-built bicycle trip planner, with cyclists able to nominate their route preferences. http://www.rms.nsw.gov.au/maps/cycleway_finder

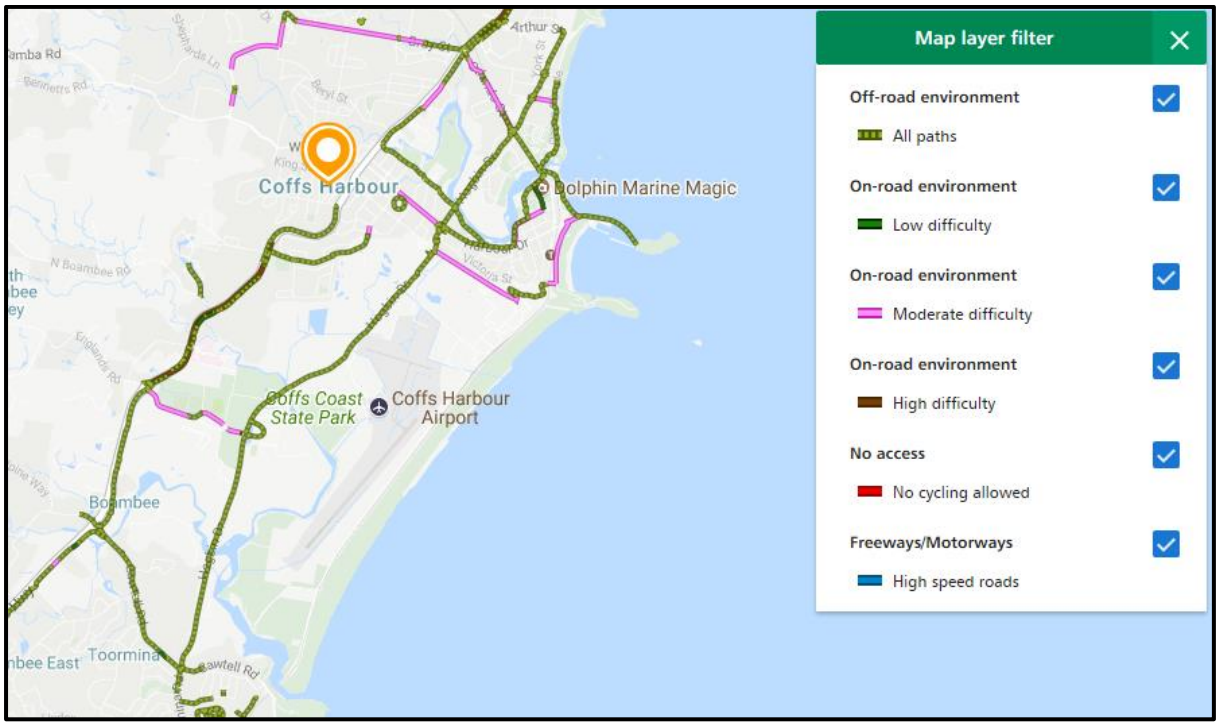

Figure 5-1 Cycleway Finder demonstrating cycle routes in Coffs Harbour and surrounds

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The hospital, although centrally located, is not close to the main residential areas of Coffs Harbour (< 3kms) and so the option for staff to walk to work is limited.

The site does however have good connections to existing pedestrian and cyclist facilities and does not generate the requirement for any additional works. The relocation of existing bike storage and the inclusion of suitable secure bike storage for staff shall continue to support riding as an option to the hospital.

Promotion of cycling to work by staff can be encouraged through staff newsletters and Ride to Work days.

5.3.4 Tele-conferencing and remote work opportunities

The use of tele-conferencing and remote access to the workplace reduces the need for staff to travel to and from the hospital to be part of such meetings. Given that Coffs Harbour Hospital supports a broad district this strategy shall see reduced reliance on staff needing to undertake workplace based trips.

5.3.5 Parking Policy

If staff take advantage of active travel options even one day a week it provides a 20% improvement in vehicle travel with the resulting environmental and health impacts. The choice not to drive one day per week should be encouraged however staff will often feel that where paid parking is weekly they have paid for the parking so should use it. Paid parking policies that do not penalise staff for part time use highly desirable.

6. Construction Activities

6.1 Methodology

The Coffs Harbour Hospital Expansion will include work to expand and reconfigure inpatient and ambulatory care services providing enhanced services, facilities and care to patients. The Project will include enhancements to existing surgical services and operating theatres and a new short stay surgical unit and improvement of the surgical bed base. Ambulatory care and community health services will also be enhanced.

Preparation for the construction of the new Clinical Services Building and the refurbishment of parts of the existing hospital building to realign services roles, which is the subject of SSD Application No.8981, will include the following roadworks (earthworks, pavement works, kerb & gutter and pathways):

- The construction of a new western carpark on the site of the existing helipad to accommodate 93 relocated parking spaces;
- An extension to the existing carpark immediately east of the hospital to accommodate 25 relocated parking spaces;
- The western access road between the roundabout and the loading dock area; and
- A tank refuelling hammerhead road to the east of the site.

A separate external works package is also being undertaken at Coffs Harbour Health Campus under a separate planning approval process which will include the following roadworks (earthworks, pavement works, kerb & gutter and pathways):

- A new reconfigured access road east of the existing western roundabout including new access arrangements to the adjacent private medical centre;
- Reconfigured existing parking facilities; and
- New relocated bus and pedestrian facilities.

A site office will be located within the site with parking for construction staff vehicles and machinery as well as a materials storage area.

6.1.1 Timing

The construction on site is due to commence during the first quarter 2019 and be completed by the end of 2020. At the completion of construction of the new facilities work will commence on the refurbishment of parts of the existing hospital during the second quarter 2021 with completion due by the end of 2021.

6.1.2 Working Hours

Demolition and Construction hours would be between 7:00am and 6:00pm Monday to Friday and 7.00 AM to 5.00 PM on a Saturday.

No demolition or construction work is to be carried out on a Sunday or public holiday. No demolition or construction work contributing to unacceptable noise levels or major deliveries are scheduled outside of the weekdays in line with EPA Guidelines.

Work may be undertaken outside these hours where the following occurs:

- The delivery of fill or material may occur outside these hours if required by the Police or other authorities.
- Council providing permission for working out of hours;
- It is required in an emergency to avoid loss of life, damage to property and / or to prevent environmental harm;
- The work is approved from the Construction Noise and Vibration Management Plan;

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- Residents likely to be affected by the works are notified of the timing and duration of these works at least 48 hours prior to the commencement of the works.

6.1.3 Construction staff numbers

Indicative demand levels will be up to a maximum of 30 staff with 10 during the demolition work based on site. All construction staff vehicles will be parked on-site within an allocated parking area.

6.2 Traffic Management Assessment

All construction traffic will travel to and from the site along the Pacific Highway and access the site via the existing main entry road opposite Isles Drive. The Pacific Highway provides access to the wider road network for delivery of construction materials and the disposal of waste from the site.

Due to the nature of the work the indicative number of trucks through the day could be 20 over an average working day. The type of vehicles accessing the site will include:

- Articulated vehicles for delivery of heavy plant and equipment;
- Heavy and medium rigid trucks for construction material delivery;
- Heavy rigid tankers for fuel delivery for compacting and excavation machinery;
- Rigid trucks for removal of excavated material;
- Mobile cranes;
- Fixed cranes;
- Piling Rigs;
- Concrete delivery trucks and concrete pumps; and
- Light vehicles, including workers' private vehicles.

Vehicular and pedestrian access to the Hospital will be maintained at all times but there will be no public access within the site of the construction works with a fence provided to prevent unauthorised access.

The number of heavy vehicles associated with the construction work is low and it is considered that the movement of vehicles in and out of the site for construction works can safely occur with minimal delays to traffic and in a safe manner. No limitation on truck access times is considered appropriate for the project.

There will be minimal impact upon public transport services with no diversions required. The existing bus stops within the site will need to be relocated to work within the various stages of construction.

There will be minimal impact for emergency vehicles and delivery vehicles with no diversions required for normal work days. Pedestrians with be diverted to avoid passing directly across the site.

Traffic routes in and out of the site will be along the arterial road network which will experience minimal impacts due to the works.

6.3 Traffic Control Plan

6.3.1 General

This TCP has been prepared to meet the requirements of the RTA Traffic Control at Work Sites Manual 2010 Edition. The plan covers the access requirements to the site and the safe passage of vehicles in and out of the subject site via the Pacific Highway and the existing main entry road and for passing traffic in this location during the construction works.

At all times the requirements of the Roads and Traffic Authority's Traffic Control at Work Sites Manual must be adhered to. Please refer to this Manual for traffic control matters not listed in this report.

Note that the RTA has been renamed Roads and Maritime Services (RMS), however the documents described herein have still retained the RTA as the author.

6.3.2 Existing traffic conditions

- Traffic volumes on the Pacific Highway through the Coffs Harbour CBD in 2015, were recorded to be about 32,000 vehicles per day. About 9.3 per cent of these vehicles are heavy vehicles. The current level of service (LOS) in the Coffs Harbour CBD section is D/E during peak times;
- Peak AM and PM period traffic volumes on the Hospital access road are in the order of 470 vehicles per hour two-way adjacent to site. This indicates approximately 4,000 to 5,000 vehicles per day. The posted speed limit is 15km/h.

6.3.3 Cyclists and Pedestrians

There are existing footpaths for pedestrians into the site that will be clear of the construction site. Pedestrian access to the Hospital buildings will be maintained at all times during construction.

Cyclists accessing the hospital precinct currently share the road space with all other vehicles. This arrangement will continue during the construction period and after construction is completed. The 15km/h speed limit provides a slow speed environment which allows cyclists to access the hospital with relative safety.

6.3.4 General Traffic Control Considerations

The factors that have been considered in preparing this TCP are:

- During the construction, all construction vehicle movements will enter and exit the site along the Pacific Highway and the Hospital access road;
- Parking will be available on site for construction staff in an allocated parking area. This will be managed as part of the overall site management and reinforced during the tool box meetings;
- Loading / unloading and deliveries will be completed within the construction site;
- The 15km/h speed zone will be retained along the Hospital access road for the duration of the construction works;
- Pedestrian and cyclist considerations – there is no change to the existing situation for cyclists. Pedestrians will be able to use the existing footpaths into the Hospital precinct on the opposite side of the road from the subject site to avoid the site frontage:
- The construction site will be fenced off with access only to authorised personnel;
- The long-term construction time for the completion of the works; and
- Safety of road users and site personnel.

The RTA Traffic Control at Worksites 2010 manual recommends safety barriers are considered if:

- The location will continue to be a work area for longer than two weeks. (Applicable)
- Traffic speeds are likely to be greater than 80 km/hr. (Not applicable)
- AADT exceeds 5000 vehicles for traffic lane nearest the works. (Not Applicable)

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- The work area is less than 3 metres clear of traffic on straights (less on tight curves) (Applicable)
- Personnel do not have other protection, such as operating plant. (Not Applicable)

The construction on site is indicatively due to commence during the first quarter 2019 and be completed by the end of 2020. At the completion of construction of the new facilities work will commence on the refurbishment of parts of the existing hospital during the second quarter 2021 with completion due by the end of 2021.

The location and nature of the work will **NOT** require safety barrier to be installed.

The local speed zone limit of 15 km/hr is considered acceptable as the construction works are all contained within the site.

6.3.5 Traffic Control – Signage and Line Marking

A Traffic Control Plan (TCP) providing work site definition will need to be prepared by the construction contractor. Temporary signage required as part of the works is included due to the nature of the passing traffic and the location and nature of the works.

All signs shall be placed on the road and made secure against wind and shall be covered when not in use and removed outside of working hours. The signs shall be uncovered before any trucks access the site. This can be co-ordinated between the truck driver and the site manager via mobile phone as required.

A copy of the relevant TCP must be on site at all times during the demolition and construction work.

6.3.6 Daily Checklist

In accordance with the Roads and Traffic Authority of New South Wales Traffic Control at Worksites Manual, the site foreman / manager should complete a daily traffic control checklist and this checklist should be filed for future reference. The Proforma Checklist is provided in Appendix E of the Traffic Control at Worksites Manual.

6.4 Contractors Contact Details

Project Manager: TBA

Mobile: TBA

E-mail: TBA

6.5 TCP Approval

The TCP will be submitted to the road authority for review and approval.

Details for lodging this TCP and the Construction Traffic Management Plan are:

Coffs Harbour City Council

Corner of Coffs and Castle Streets

Coffs Harbour NSW 2450

Phone: (02) 6648 4000

Email: coffs.council@chcc.nsw.gov.au

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7. Summary and Recommendations

7.1 Summary

Seca Solution Pty Ltd has been commissioned by NSW Health Infrastructure to prepare a traffic, access and parking assessment for the proposed Coffs Harbour Hospital Expansion. The Coffs Harbour Hospital Expansion will include work to expand and reconfigure inpatient and ambulatory care services providing enhanced services, facilities and care to patients. The Project will include enhancements to existing surgical services and operating theatres and a new short stay surgical unit and improvement of the surgical bed base. Ambulatory care and community health services will also be enhanced.

Roadworks associated with the redevelopment will include a new access road including new access arrangements to the adjacent private medical centre, new parking facilities and new bus and pedestrian facilities.

The main access to and from the Health Campus is off the Pacific Highway opposite Isles Drive. This intersection is under traffic signal control with dedicated right turn lanes in both directions on the Highway. Left turn slip lanes are also provided for access to and from the Health Campus. Pedestrian crossing facilities are provided on all approaches to this intersection except for the Highway southbound approach.

A secondary access is also available from the Pacific Highway via Stadium Drive and Phil Hawthorne Drive. These accesses will be retained.

Preparation for the construction of the new Clinical Services Building and the refurbishment of parts of the existing hospital building to realign services roles, which is the subject of SSD Application No.8981, will include the following roadworks (earthworks, pavement works, kerb & gutter and pathways):

- The construction of a new western carpark on the site of the existing helipad to accommodate 93 relocated parking spaces;
- An extension to the existing carpark immediately east of the hospital to accommodate 25 relocated parking spaces;
- The western access road between the roundabout and the loading dock area; and
- A tank refuelling hammerhead road to the east of the site.

A separate external works package is also being undertaken at Coffs Harbour Health Campus under a separate planning approval process which will include the following roadworks (earthworks, pavement works, kerb & gutter and pathways):

- A new reconfigured access road including new access arrangements to the adjacent private medical centre;
- Reconfigured existing parking facilities; and
- New relocated bus and pedestrian facilities.

The reconfigured access road will have a wide median separating the eastbound and westbound lanes that will provide a U-turn facility for access to the proposed short-term parking in front of the new hospital main entry. It will also provide up to eight 15-minute parking spaces at the new main entry to the hospital, 3 new drop-off only spaces in front of the new emergency department, a bus stop facility, pedestrian crossings and new boom gates for entry to and exit from the public carpark. New relocated ambulance bays will be provided at the western side of the existing emergency department.

Should the Pacific Highway be upgraded to bypass Coffs Harbour there will be considerable spare capacity to accommodate the demands associated with growth associated with the proposed development. The earliest this could happen, assuming full funding is available would be 2025 which would coincide with the long-term design horizon for the masterplan.

Regardless, with changes to the phasing of the signalised intersection of the Pacific Highway and Isles Drive the traffic demands associated with 2021 and 2026 future growth scenarios, can be accommodated within the existing road network. The impact has been assessed allowing for development to access via this intersection although it is recognised that traffic will also use the southern approach to access the staff car park and hospital.

The southern access via Stadium Drive and Phil Hawthorne Drive has been demonstrated to operate at an acceptable LoS to 2025 with spare capacity to accommodate the traffic associated with an additional 352 space car park by 2030, which will be the subject of a future development proposal. This existing access has been assumed to accommodate 40% of staff movements plus outpatients and visitors. Use of this access shall provide relief for traffic demands associated with the main entry, enabling the signalised intersection to operate without significantly impacting upon the intersection performance

The separate external works package being undertaken at Coffs Harbour Health Campus under a separate planning approval process anticipates the need to relocate between 100 and 120 parking spaces associated with the footprint of the new development. These parking spaces will be relocated in an extension of the existing carpark adjacent to the main entrance (25 spaces) and a new western carpark on the site of the existing helipad (93 spaces, including 8 accessible spaces). These relocated parking spaces will be provided under SSD Application No.8981.

The number of parking spaces required to satisfy the future parking demand is:

- Medium Scenario 49-88 spaces
- Long term Scenario 67-131 spaces.

The parking surveys conducted on the site show that the existing parking areas within the Health Campus are well-used throughout the day, with a consistent parking demand evident. However, there were still between 306 – 368 vacant spaces available throughout the day between 9:30 and 2:30, with no discernible peak demand being observed during any particular hour of the day.

A review of the existing parking situation therefore demonstrates that these future parking demands can be accommodated within the existing parking supply and no additional parking spaces will be required.

7.2 Recommendations

The overall conclusion from the investigations is that traffic, parking and access arrangements for the development proposal are satisfactory and that there is no traffic or parking impediments to the development.

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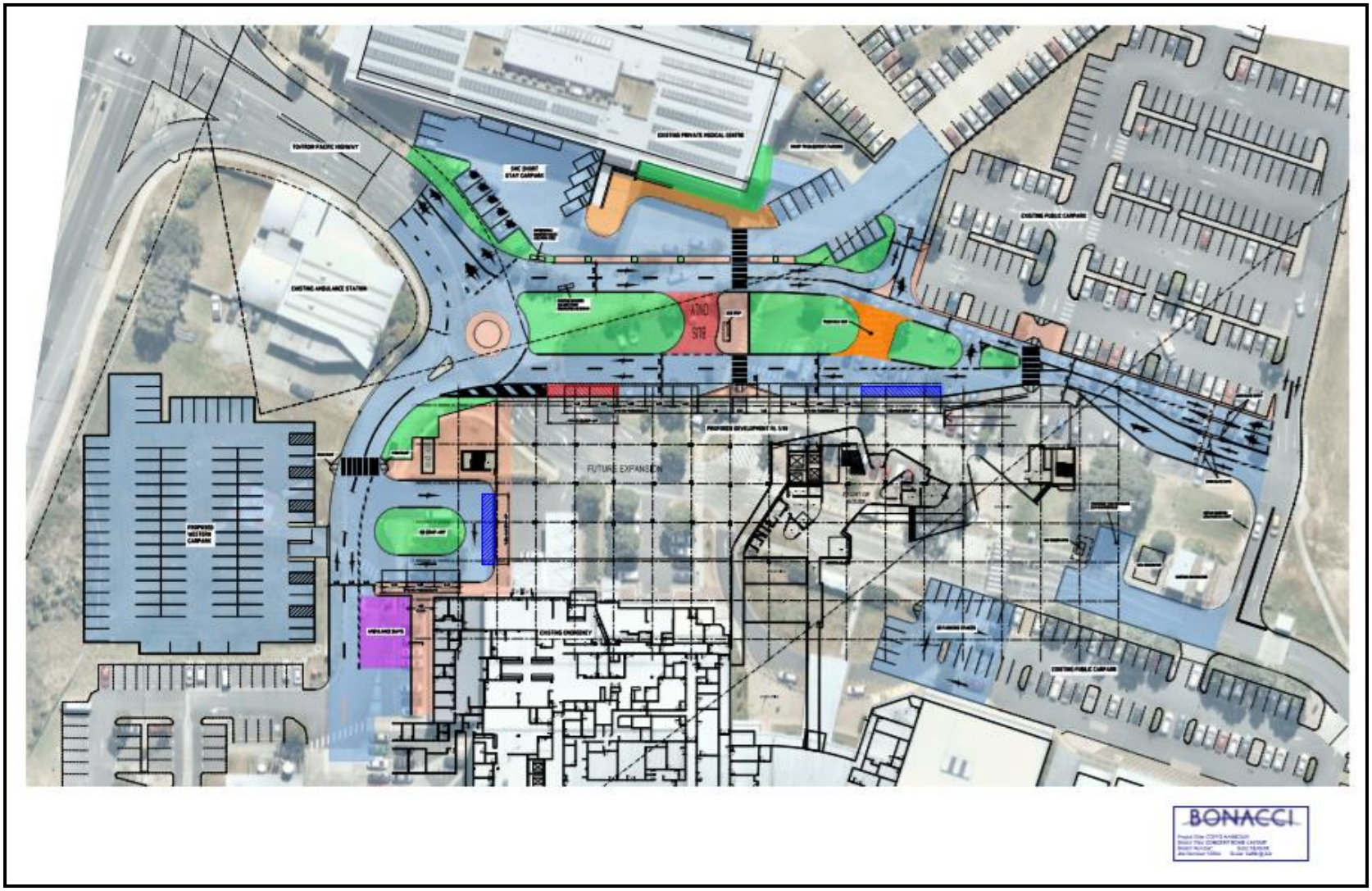
Appendix A Site Plan



Appendix B Accident Data

Summary Crash Report

Transport for NSW

# Crash Type		
Car Crash	34	89.5%
Light Truck Crash	4	10.5%
Rigid Truck Crash	3	7.9%
Articulated Truck Crash	4	10.5%
*Heavy Truck Crash	(7)	(18.4%)
Bus Crash	0	0.0%
"Heavy Vehicle Crash	(7)	(18.4%)
Emergency Vehicle Crash	0	0.0%
Motorcycle Crash	4	10.5%
Pedal Cycle Crash	3	7.9%
Pedestrian Crash	2	5.3%

* Rigid or Artic. Truck " Heavy Truck or Heavy Bus
# These categories are NOT mutually exclusive

Location Type		
*Intersection	31	81.6%
Non Intersection	7	18.4%

* Up to 10 metres from an intersection

Collision Type		
Single Vehicle	11	28.9%
Multi Vehicle	27	71.1%

Road Classification		
Freeway/Motorway	0	0.0%
State Highway	37	97.4%
Other Classified Road	0	0.0%
Unclassified Road	1	2.6%

Contributing Factors		
Speeding	5	13.2%
Fatigue	1	2.6%

Weather		
Fine	25	65.8%
Rain	8	21.1%
Overcast	5	13.2%
Fog or mist	0	0.0%
Other	0	0.0%

Road Surface Condition		
Wet	11	28.9%
Dry	27	71.1%
Snow or Ice	0	0.0%

Natural Lighting		
Dawn	1	2.6%
Daylight	26	68.4%
Dusk	1	2.6%
Darkness	10	26.3%

Crash Movement		
Intersection, adjacent approaches	3	7.9%
Head-on (not overtaking)	1	2.6%
Opposing vehicles; turning	2	5.3%
U-turn	0	0.0%
Rear-end	15	39.5%
Lane change	2	5.3%
Parallel lanes; turning	1	2.6%
Vehicle leaving driveway	0	0.0%
Overtaking; same direction	0	0.0%
Hit parked vehicle	0	0.0%
Hit railway train	0	0.0%
Hit pedestrian	1	2.6%
Permanent obstruction on road	0	0.0%
Hit animal	0	0.0%
Off road, on straight	3	7.9%
Off road on straight, hit object	4	10.5%
Out of control on straight	0	0.0%
Off road, on curve	3	7.9%
Off road on curve, hit object	0	0.0%
Out of control on curve	1	2.6%
Other crash type	2	5.3%

Speed Limit					
40 km/h or less	0	0.0%	80 km/h zone	0	0.0%
50 km/h zone	1	2.6%	90 km/h zone	0	0.0%
60 km/h zone	37	97.4%	100 km/h zone	0	0.0%
70 km/h zone	0	0.0%	110 km/h zone	0	0.0%

~ 07:30-09:30 or 14:30-17:00 on school days	~ 40km/h or less		~ School Travel Time involvement		
	0	0.0%		7	18.4%

Day of the Week												
Monday	4	10.5%	Wednesday	8	21.1%	Friday	8	21.1%	Sunday	6	15.8%	WEEKEND	10	26.3%
Tuesday	5	13.2%	Thursday	3	7.9%	Saturday	4	10.5%	WEEKDAY	28	73.7%			

#Holiday Periods																
New Year	0	0.0%	Easter	0	0.0%	Queen's BD	0	0.0%	Christmas	0	0.0%	Easter SH	2	5.3%	Sept./Oct. SH	3	7.9%
Aust. Day	0	0.0%	Anzac Day	0	0.0%	Labour Day	2	5.3%	January SH	4	10.5%	June/July SH	1	2.6%	December SH	0	0.0%

CRASHES	38	
Fatal	1	2.6%
Serious Inj.	2	5.3%
Moderate Inj.	8	21.1%
Minor/Other Inj.	6	15.8%
Uncategorised Inj.	0	0.0%
Non-casualty	21	55.3%

Self Reported Crash	9	23.68%

Time Group		% of Day	
00:01 - 02:59	1	2.6%	12.5%
03:00 - 04:59	1	2.6%	8.3%
05:00 - 05:59	0	0.0%	4.2%
06:00 - 06:59	1	2.6%	4.2%
07:00 - 07:59	4	10.5%	4.2%
08:00 - 08:59	2	5.3%	4.2%
09:00 - 09:59	0	0.0%	4.2%
10:00 - 10:59	5	13.2%	4.2%
11:00 - 11:59	3	7.9%	4.2%
12:00 - 12:59	1	2.6%	4.2%
13:00 - 13:59	0	0.0%	4.2%
14:00 - 14:59	1	2.6%	4.2%
15:00 - 15:59	2	5.3%	4.2%
16:00 - 16:59	7	18.4%	4.2%
17:00 - 17:59	2	5.3%	4.2%
18:00 - 18:59	0	0.0%	4.2%
19:00 - 19:59	3	7.9%	4.2%
20:00 - 21:59	2	5.3%	8.3%
22:00 - 24:00	3	7.9%	8.3%

Street Lighting Off/Nil			% of Dark
2	of	10	in Dark 20.0%

CASUALTIES	21	
Killed	1	4.8%
Seriously Inj.	2	9.5%
Moderately Inj.	9	42.9%
Minor/Other Inj.	9	42.9%
Uncategorised Inj.	0	0.0%
^ Unrestrained	0	0.0%

^ Belt fitted but not worn, No restraint fitted to position OR No helmet worn

Crashes		Casualties
5	2016	5
10	2015	5
6	2014	2
8	2013	2
7	2012	5
2	2011	2

McLean Periods		% Week	
A	6	15.8%	17.9%
B	2	5.3%	7.1%
C	7	18.4%	17.9%
D	0	0.0%	3.5%
E	3	7.9%	3.6%
F	8	21.1%	10.7%
G	4	10.5%	7.1%
H	3	7.9%	7.1%
I	2	5.3%	12.5%
J	3	7.9%	10.7%

Session dataset Coffs Harbour LGA all crashes for 01 Oct 2011 to 30 Sep 2016. Pacific Highway Coffs Harbour Englands Road to Isles Drive

Note: Crash self reporting, including self reported injuries began Oct 2014. Trends from 2014 are expected to vary from previous yrs. More unknowns are expected in self reported data. Reporting yrs 1996-2004 and 2017 onwards contain uncategorised inj crashes.

Percentages are percentages of all crashes. Unknown values for each category are not shown on this report.

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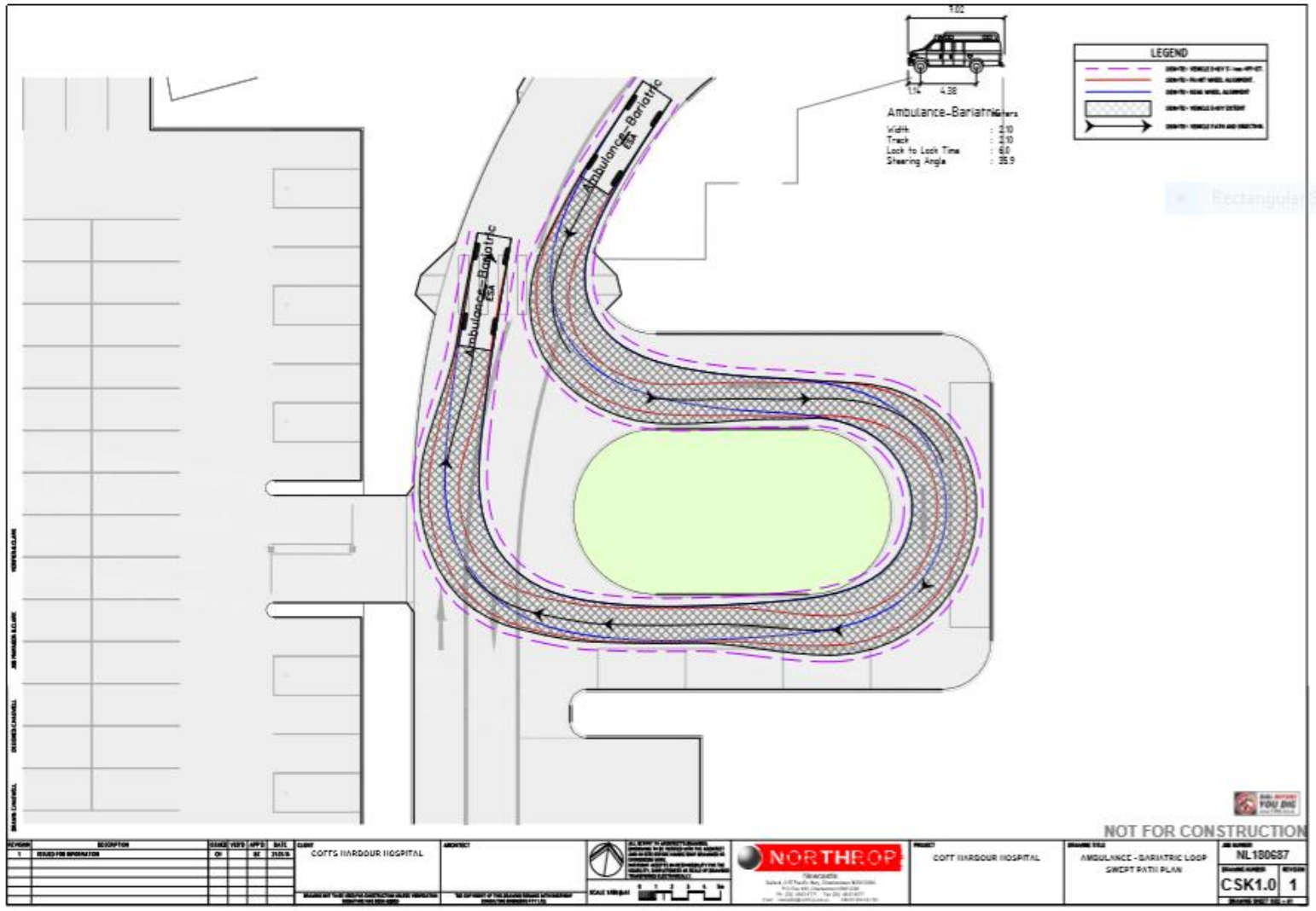
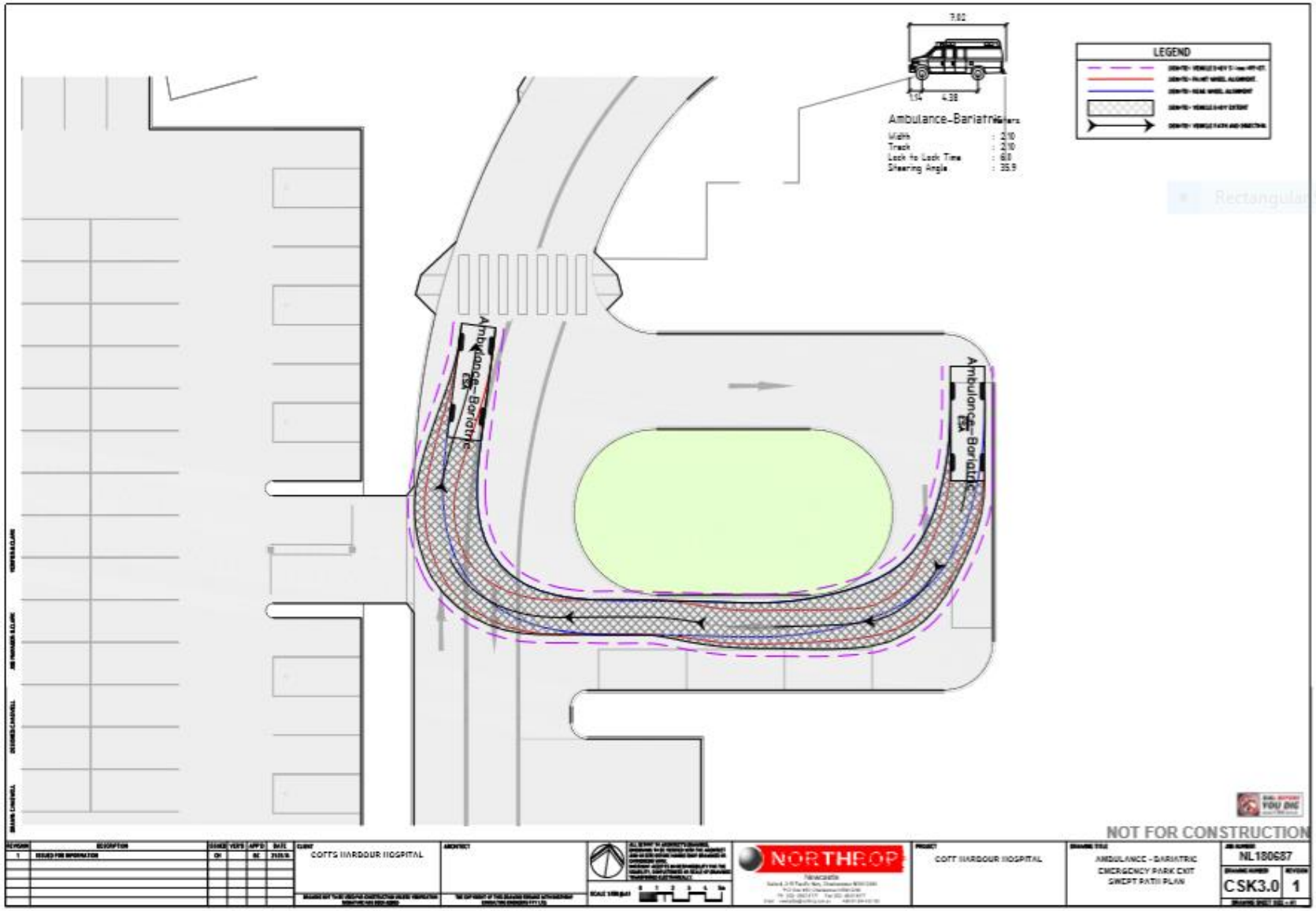
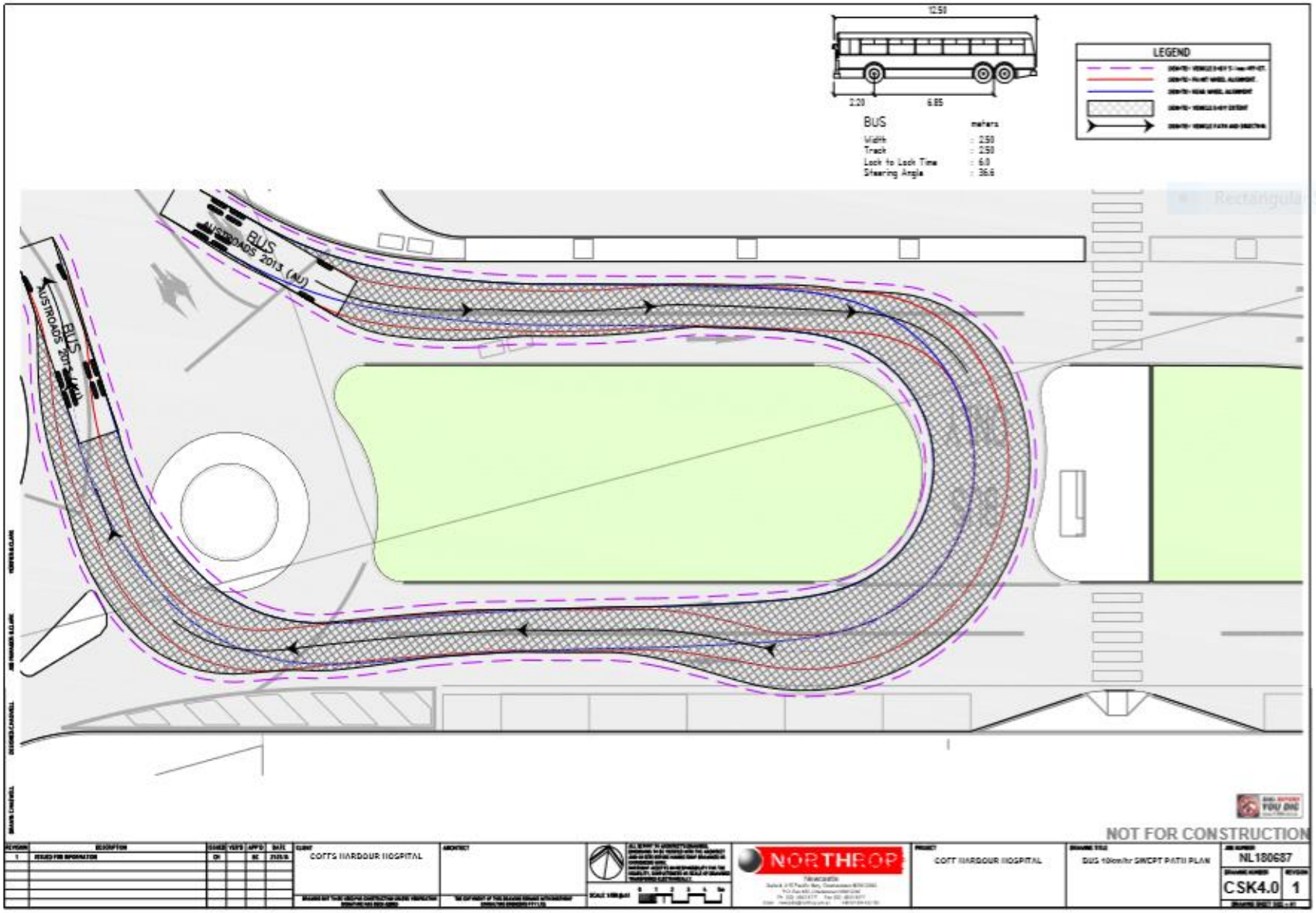
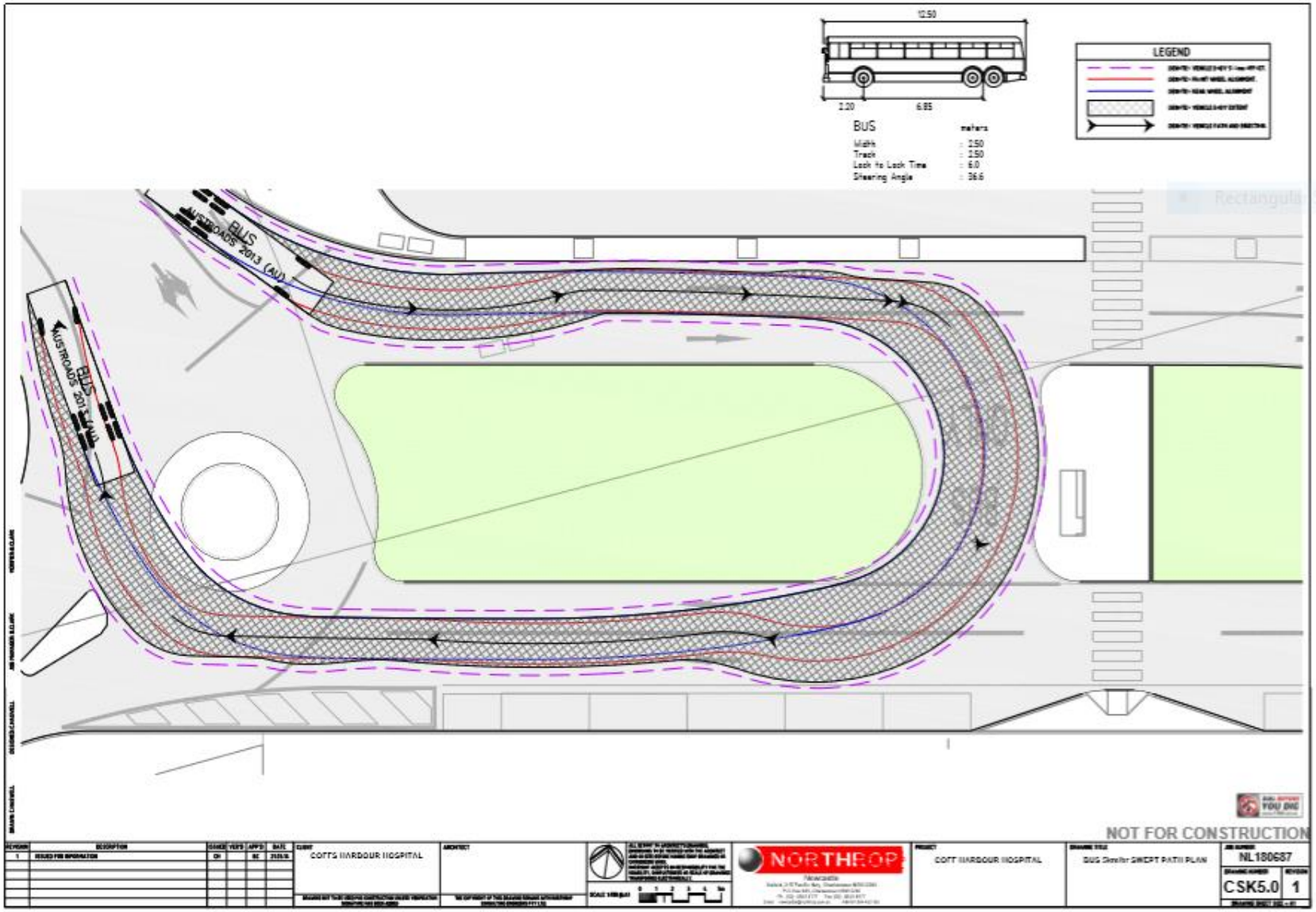
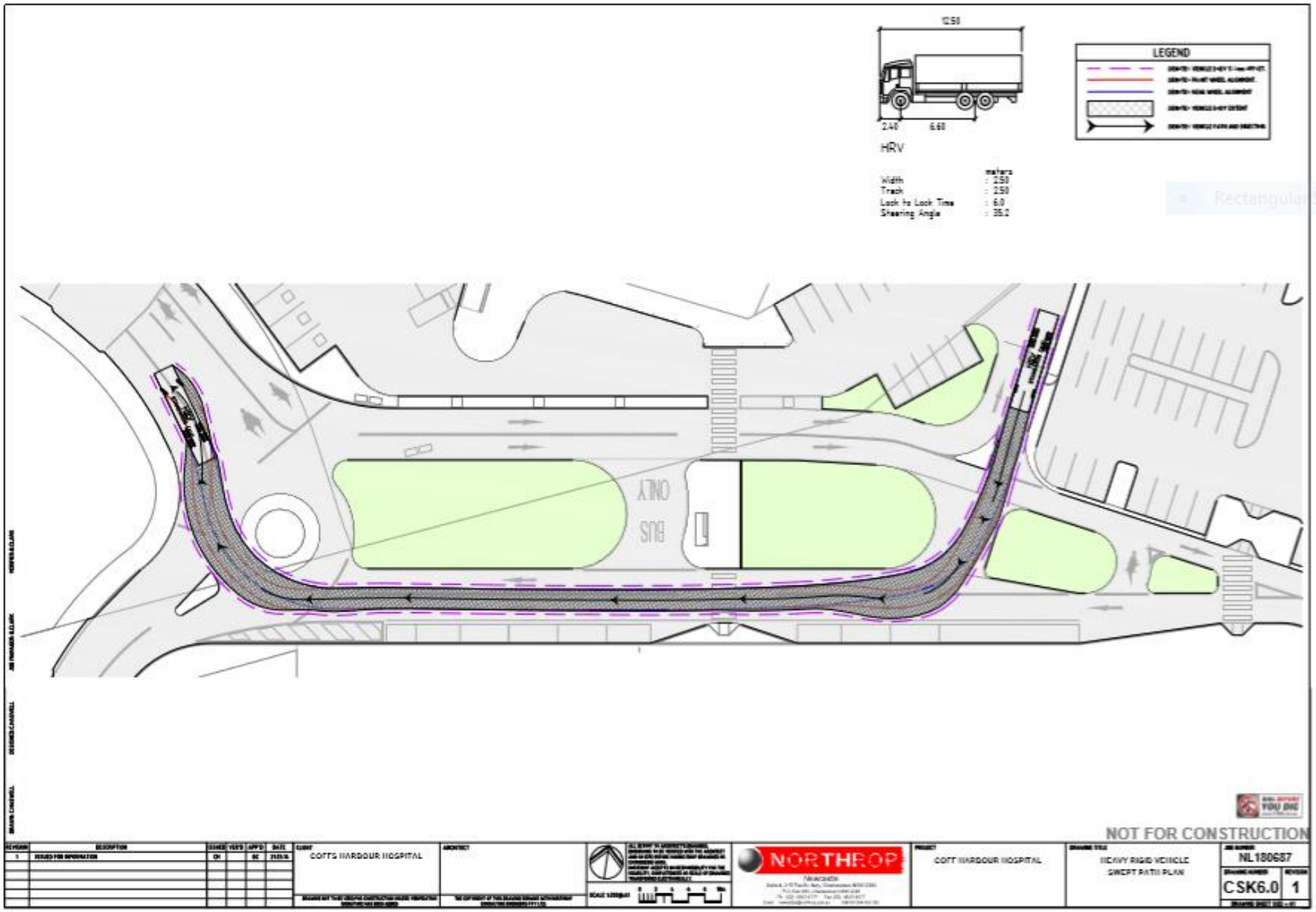
Appendix C Autoturn Simulations




LEGEND
Ambulance-Bariatric
Width : 2.10
Track : 2.10
Lock to Lock Time : 6.0
Steering Angle : 35.9
Ambulance-Bariatric
Ambulance-Bariatric
NOT FOR CONSTRUCTION
COFFS HARBOUR HOSPITAL
NORTHROP
COFF HARBOUR HOSPITAL
AMBULANCE - BARIATRIC EMERGENCY PARK EXIT SWEPT PATH PLAN
NL180687
CSK3.0
1


LEGEND
BUS
Width : 2.50
Track : 2.50
Lock to Lock Time : 6.0
Steering Angle : 36.6
NOT FOR CONSTRUCTION
COFFS HARBOUR HOSPITAL
NORTHROP
COFFS HARBOUR HOSPITAL
NL180687
CSK4.0
1


12.50
2.20
6.85
BUS
metres
Width : 2.50
Track : 2.50
Lock to Lock Time : 6.0
Steering Angle : 36.6
LEGEND
BUS
AUSTROADS 2013 (AU)
BUS
AUSTROADS 2013 (AU)
NOT FOR CONSTRUCTION
COFFS HARBOUR HOSPITAL
NORTHROP
COFFS HARBOUR HOSPITAL
BUS Design SWEPT PATH PLAN
NL180687
CSK5.0
1


12.50
2.40
6.60
HRV
LEGEND
Width : 2.50
Track : 2.50
Lock to Lock Time : 6.0
Steering Angle : 35.2
BUS ONLY
NOT FOR CONSTRUCTION
COFFS HARBOUR HOSPITAL
NORTHROP
COFF HARBOUR HOSPITAL
HEAVY RIGID VEHICLE SWEPT PATH PLAN
NL180687
CSK6.0
1

Appendix D Parking Beat Survey

Number of occupied parking spaces per zone with total vacant spaces

(Total Supply Parking)	Zone A	Zone B	Zone C[1]	Zone D[1]	Zone E[1]	Zone F	Zone G	Total Parked Vehicles	Total Vacant Spaces	Total Parking Occupied (%)	Total Parking Vacant (%)
	(314)	(79)	(38)	(88)	(53)	(465)	(96)	(1133)	(1133)		
7am	26	25	0	15	22	126	43	257	876	22.7	77.3
9:30am	104	64	16	78	50	415	38	765	368	67.5	32.5
10:30am	139	76	21	78	49	424	37	824	309	72.7	27.3
11:30am	144	65	26	73	49	423	45	825	308	72.8	27.2
12:30pm	137	58	20	71	49	414	67	816	317	72.0	28.0
1:30pm	127	66	16	71	49	403	91	823	310	72.6	27.4
2:30pm	145	74	13	72	47	396	80	827	306	73.0	27.0

(Total Supply Parking)	Zone X (Gravel Area)	Zone Y (Grass Verge)	External Carpark[2]
	(NA)	(NA)	(127)
7am	0	0	6
9:30am	0	14	97
10:30am	16	14	94
11:30am	17	14	101
12:30pm	18	13	82
1:30pm	19	13	93
2:30pm	16	13	85

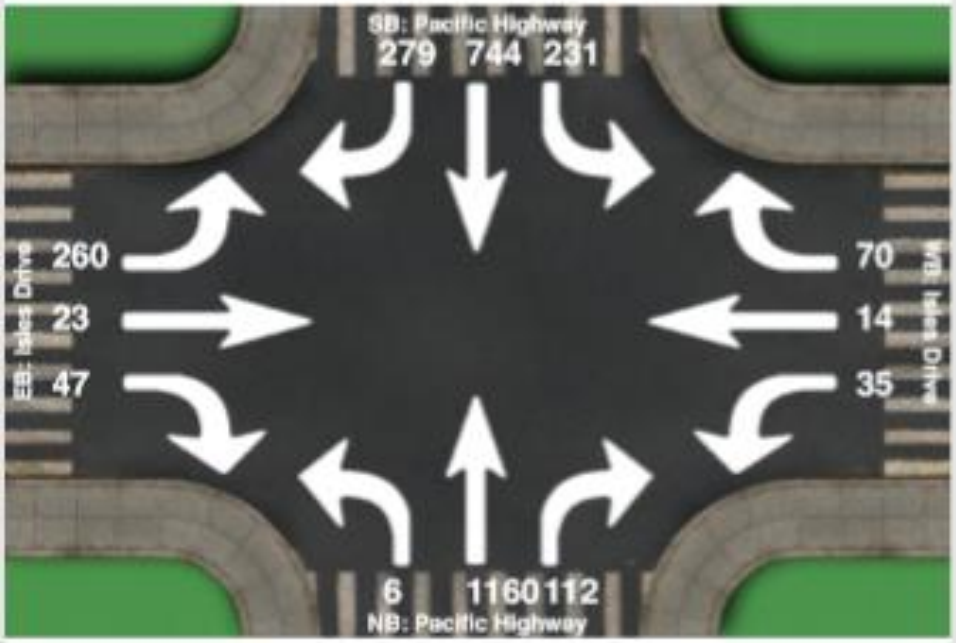
[1] Coffs Harbour Cancer Institute

[2] External car park refers to Specialist Medical Centre parking.

Appendix E Traffic Data

Intersection Peak Hour

Location: Pacific Highway at Isles Drive, Coffs Harbour
GPS Coordinates:
Date: 2017-06-27
Day of week: Tuesday
Weather: Clear
Analyst: TN



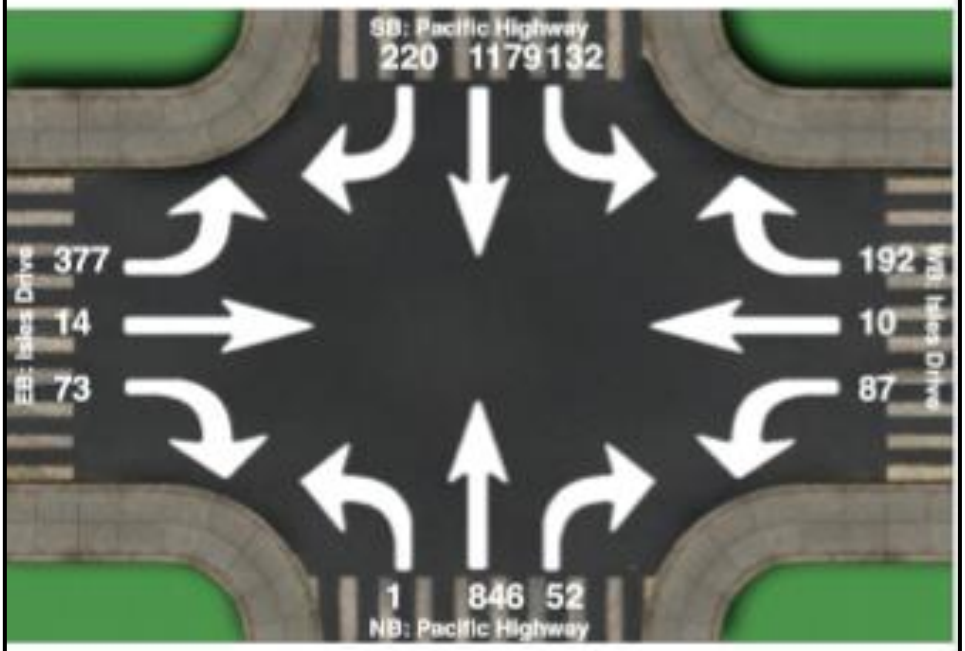
Intersection Peak Hour

07:45 - 08:45

	Southbound			Westbound			Northbound			Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Vehicle Total	231	744	279	35	14	70	6	1160	112	260	23	47	2981
Factor	0.88	0.74	0.74	0.80	0.70	0.85	0.50	0.91	0.68	0.93	0.52	0.78	0.91
Approach Factor	0.86			0.85			0.90			0.90			

Intersection Peak Hour

Location: Pacific Highway at Isles Drive, Coffs Harbour
GPS Coordinates:
Date: 2017-06-27
Day of week: Tuesday
Weather: Clear
Analyst: TN



Intersection Peak Hour

15:30 - 16:30

	Southbound			Westbound			Northbound			Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Volume Total	132	1179	220	87	10	192	1	846	52	377	14	73	3185
Factor	0.85	0.91	0.87	0.81	0.62	0.91	0.25	0.91	0.81	0.87	0.58	0.79	0.97
Approach Factor	0.95			0.90			0.90			0.87			

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Appendix F SIDRA Analysis

Interpreting SIDRA Results:

1-Level of Service (LoS)

LoS	Traffic Signals and Roundabouts	Give Way and Stop Signs
A	Good	Good
B	Good, with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	Satisfactory	Satisfactory, but requires accident study
D	Operating near capacity	Near capacity and requires accident study
E	At capacity, excessive delay: roundabout requires other control method	At capacity, requires other control mode
F	Unsatisfactory, requires other control mode or additional capacity	Unsatisfactory, requires other control mode

2-Average Vehicle Delay (AVD)

The AVD is a measure of operational performance of an intersection relating to its LoS. The average delay should be taken as a guide only for an average intersection. Longer delays may be tolerated at some intersections where delays are expected by motorists (e.g. those in inner city areas or major arterial roads).

LoS	Average Delay / Vehicle (secs)	Traffic Signals and Roundabouts	Give Way and Stop Signs
A	Less than 15	Good operation	Good operation
B	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	28 to 42	Satisfactory	Satisfactory but accident study required
D	42 to 56	Operating near capacity	Near capacity, accident study required
E	56 to 70	At capacity, excessive delays: roundabout requires other control mode	At capacity; requires other control mode
F	Exceeding 70	Unsatisfactory, requires additional capacity	Unsatisfactory, requires other control mode

3-Degree of Saturation (D/S)

The D/S of an intersection is usually taken as the highest ratio of traffic volumes on an approach to an intersection compared with the theoretical capacity and is a measure of the utilisation of available green time. For intersections controlled by traffic signals, both queues and delays increase rapidly as DS approaches 1.0. An intersection operates satisfactorily when its D/S is kept below 0.75. When D/S exceeds 0.9, queues are expected.

MOVEMENT SUMMARY

Site: 101 [Int. Pacific Hwy / Isles Dr - 2017 Flows (AM)]

Pacific Highway, Isles Drive, Coffs Harbour Hospital
Existing Situation 2017 AM Flows
Signals - Fixed Time Isolated Cycle Time = 140 seconds (User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Pacific Highway											
1	L2	6	50.0	0.012	32.7	LOS C	0.3	2.5	0.62	0.65	33.9
2	T1	1221	8.1	0.875	48.8	LOS D	44.6	334.0	0.96	0.95	33.3
3	R2	118	0.9	0.649	73.7	LOS F	8.1	57.0	1.00	0.81	19.4
Approach		1345	7.7	0.875	50.9	LOS D	44.6	334.0	0.96	0.94	32.1
East: Coffs Harbour Hospital											
4	L2	37	0.0	0.226	58.0	LOS E	4.0	28.3	0.91	0.73	22.5
5	T1	15	0.0	0.226	55.1	LOS D	4.0	28.3	0.91	0.73	16.9
6	R2	74	4.3	0.226	60.5	LOS E	4.0	28.3	0.92	0.74	21.5
Approach		125	2.5	0.226	59.1	LOS E	4.0	28.3	0.92	0.74	21.3
North: Pacific Highway											
7	L2	243	0.0	0.133	5.6	LOS A	0.0	0.0	0.00	0.53	49.7
8	T1	783	11.7	0.535	20.7	LOS B	20.7	159.6	0.65	0.57	44.8
9	R2	294	9.7	0.899	54.6	LOS D	15.1	114.8	1.00	0.97	27.2
Approach		1320	9.1	0.899	25.5	LOS B	20.7	159.6	0.61	0.65	40.1
West: Isles Drive											
10	L2	274	18.5	0.584	33.0	LOS C	11.4	92.7	0.91	0.82	33.3
11	T1	24	13.0	0.859	83.8	LOS F	5.7	44.4	1.00	0.95	12.5
12	R2	49	14.9	0.859	87.0	LOS F	5.7	44.4	1.00	0.95	21.0
Approach		347	17.6	0.859	44.2	LOS D	11.4	92.7	0.93	0.85	29.0
All Vehicles		3138	9.2	0.899	39.8	LOS C	44.6	334.0	0.81	0.80	34.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Quality Traffic Advice

MOVEMENT SUMMARY

Site: 101 [Int. Pacific Hwy / Isles Dr - 2017 Flows (PM)]

Pacific Highway, Isles Drive, Coffs Harbour Hospital
Existing Situation 2017 PM Flows
Signals - Fixed Time Isolated Cycle Time = 140 seconds (User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Pacific Highway											
1	L2	1	0.0	0.002	34.9	LOS C	0.0	0.3	0.65	0.60	33.3
2	T1	891	9.0	0.685	39.7	LOS C	26.6	200.7	0.90	0.79	36.3
3	R2	55	1.9	0.708	83.8	LOS F	4.0	28.7	1.00	0.81	17.8
Approach		946	8.6	0.708	42.3	LOS C	26.6	200.7	0.90	0.79	35.1
East: Coffs Harbour Hospital											
4	L2	92	2.3	0.598	63.8	LOS E	10.5	74.6	0.98	0.81	21.1
5	T1	11	0.0	0.598	60.9	LOS E	10.5	74.6	0.98	0.81	15.7
6	R2	202	0.5	0.598	65.9	LOS E	10.5	74.6	0.99	0.81	20.5
Approach		304	1.0	0.598	65.1	LOS E	10.5	74.6	0.99	0.81	20.5
North: Pacific Highway											
7	L2	139	2.3	0.077	5.6	LOS A	0.0	0.0	0.00	0.53	49.7
8	T1	1241	9.2	0.701	19.9	LOS B	30.9	233.1	0.69	0.63	45.3
9	R2	232	8.6	0.628	39.3	LOS C	9.5	71.4	0.96	0.84	31.7
Approach		1612	8.5	0.701	21.4	LOS B	30.9	233.1	0.67	0.65	43.2
West: Isles Drive											
10	L2	397	3.7	0.653	29.1	LOS C	16.0	115.2	0.91	0.83	35.1
11	T1	15	0.0	0.649	72.6	LOS F	6.4	47.1	1.00	0.81	13.7
12	R2	77	6.8	0.649	75.8	LOS F	6.4	47.1	1.00	0.81	22.8
Approach		488	4.1	0.653	37.7	LOS C	16.0	115.2	0.92	0.83	31.6
All Vehicles		3351	7.2	0.708	33.7	LOS C	30.9	233.1	0.80	0.73	36.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: 101 [Int. Pacific Hwy / Isles Dr - 2026 (AM)]

Pacific Highway, Isles Drive, Coffs Harbour Hospital
2026 Design Year
140 second cycle with adjusted phase times
Signals - Fixed Time Isolated Cycle Time = 140 seconds (User-Given Phase Times)
Design Life Analysis (Final Year): Results for 9 years

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Pacific Highway											
1	L2	6	50.0	0.011	29.0	LOS C	0.2	2.4	0.58	0.64	35.4
2	T1	1419	8.1	0.926	56.8	LOS E 11	58.4	437.0	0.97	1.03	31.1
3	R2	151	0.7	0.891	86.2	LOS F 11	11.6	81.7	1.00	0.97	17.4
Approach		1576	7.6	0.926	59.5	LOS E 11	58.4	437.0	0.97	1.02	29.7
East: Coffs Harbour Hospital											
4	L2	47	0.0	0.340	62.0	LOS E 11	5.4	38.4	0.94	0.76	21.6
5	T1	15	0.0	0.340	59.1	LOS E 11	5.4	38.4	0.94	0.76	16.1
6	R2	100	3.2	0.340	64.5	LOS E 11	5.4	38.4	0.95	0.76	20.7
Approach		162	1.9	0.340	63.3	LOS E 11	5.4	38.4	0.95	0.76	20.6
North: Pacific Highway											
7	L2	321	0.0	0.176	5.6	LOS A	0.0	0.0	0.00	0.53	49.7
8	T1	910	11.7	0.578	17.7	LOS B	21.5	165.9	0.61	0.54	46.5
9	R2	294	9.7	0.934	66.6	LOS E 11	17.3	131.2	1.00	1.03	24.5
Approach		1525	8.8	0.934	24.6	LOS B	21.5	165.9	0.56	0.63	40.5
West: Isles Drive											
10	L2	274	18.5	0.599	37.1	LOS C	12.3	99.5	0.92	0.85	31.8
11	T1	24	13.0	0.859	83.8	LOS F 11	5.7	44.4	1.00	0.95	12.5
12	R2	49	14.9	0.859	87.0	LOS F 11	5.7	44.4	1.00	0.95	21.0
Approach		347	17.6	0.859	47.5	LOS D 11	12.3	99.5	0.94	0.87	28.1
All Vehicles		3610	8.8	0.934	43.7	LOS D 11	58.4	437.0	0.79	0.83	32.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

11 Level of Service is worse than the Level of Service Target specified in the Parameter Settings dialog.

Organisation: SECA SOLUTION | Processed: Friday, 9 March 2018 4:12:20 PM
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Quality Traffic Advice

MOVEMENT SUMMARY

Site: 101 [Int. Pacific Hwy / Isles Dr - 2026 (AM) - Increased Short Lanes]

Pacific Highway, Isles Drive, Coffs Harbour Hospital
2026 Design Year
140 second cycle with adjusted phase times
Signals - Fixed Time Isolated Cycle Time = 140 seconds (User-Given Phase Times)
Design Life Analysis (Final Year): Results for 9 years

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Pacific Highway											
1	L2	6	50.0	0.011	29.0	LOS C	0.2	2.4	0.58	0.64	35.4
2	T1	1419	8.1	0.914	53.0	LOS D 11	55.6	416.1	0.97	1.01	32.1
3	R2	151	0.7	0.891	86.2	LOS F 11	11.6	81.7	1.00	0.97	17.4
Approach		1576	7.6	0.914	56.1	LOS D 11	55.6	416.1	0.97	1.00	30.6
East: Coffs Harbour Hospital											
4	L2	47	0.0	0.340	62.0	LOS E 11	5.4	38.4	0.94	0.76	21.6
5	T1	15	0.0	0.340	59.1	LOS E 11	5.4	38.4	0.94	0.76	16.1
6	R2	100	3.2	0.340	64.5	LOS E 11	5.4	38.4	0.95	0.76	20.7
Approach		162	1.9	0.340	63.3	LOS E 11	5.4	38.4	0.95	0.76	20.6
North: Pacific Highway											
7	L2	321	0.0	0.176	5.6	LOS A	0.0	0.0	0.00	0.53	49.7
8	T1	910	11.7	0.578	17.7	LOS B	21.5	165.9	0.61	0.54	46.5
9	R2	294	9.7	0.934	66.6	LOS E 11	17.3	131.2	1.00	1.03	24.5
Approach		1525	8.8	0.934	24.6	LOS B	21.5	165.9	0.56	0.63	40.5
West: Isles Drive											
10	L2	274	18.5	0.599	37.1	LOS C	12.3	99.5	0.92	0.85	31.8
11	T1	24	13.0	0.859	83.8	LOS F 11	5.7	44.4	1.00	0.95	12.5
12	R2	49	14.9	0.859	87.0	LOS F 11	5.7	44.4	1.00	0.95	21.0
Approach		347	17.6	0.859	47.5	LOS D 11	12.3	99.5	0.94	0.87	28.1
All Vehicles		3610	8.8	0.934	42.3	LOS C	55.6	416.1	0.79	0.82	33.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

11 Level of Service is worse than the Level of Service Target specified in the Parameter Settings dialog.

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MOVEMENT SUMMARY

Site: 101 [Int. Pacific Hwy / Isles Dr - 2026 (PM)]

Pacific Highway, Isles Drive, Coffs Harbour Hospital
2026 Design Year
140 second cycle with adjusted phase times
Signals - Fixed Time Isolated Cycle Time = 140 seconds (User-Given Phase Times)
Design Life Analysis (Final Year): Results for 9 years

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Pacific Highway											
1	L2	1	0.0	0.002	34.9	LOS C	0.0	0.3	0.65	0.60	33.3
2	T1	891	9.0	0.693	39.7	LOS C	27.1	204.1	0.90	0.79	36.3
3	R2	73	1.4	0.803	84.8	LOS F 11	5.4	38.5	1.00	0.88	17.6
Approach		964	8.4	0.803	43.1	LOS D 11	27.1	204.1	0.91	0.80	34.7
East: Coffs Harbour Hospital											
4	L2	118	1.8	0.733	66.1	LOS E 11	14.1	99.7	1.00	0.87	20.6
5	T1	11	0.0	0.733	63.2	LOS E 11	14.1	99.7	1.00	0.87	15.3
6	R2	264	0.4	0.733	68.1	LOS E 11	14.1	99.7	1.00	0.87	20.1
Approach		393	0.8	0.733	67.4	LOS E 11	14.1	99.7	1.00	0.87	20.1
North: Pacific Highway											
7	L2	180	1.8	0.100	5.6	LOS A	0.0	0.0	0.00	0.53	49.7
8	T1	1241	9.2	0.711	19.8	LOS B	30.1	227.6	0.69	0.62	45.3
9	R2	232	8.6	0.607	34.4	LOS C	8.5	63.9	0.95	0.82	33.5
Approach		1653	8.3	0.711	20.3	LOS B	30.1	227.6	0.65	0.64	43.7
West: Isles Drive											
10	L2	397	3.7	0.640	28.8	LOS C	16.0	115.2	0.90	0.83	35.2
11	T1	15	0.0	0.649	72.6	LOS F 11	6.4	47.1	1.00	0.81	13.7
12	R2	77	6.8	0.649	75.8	LOS F 11	6.4	47.1	1.00	0.81	22.8
Approach		488	4.1	0.649	37.5	LOS C	16.0	115.2	0.92	0.83	31.7
All Vehicles		3498	6.9	0.803	34.3	LOS C	30.1	227.6	0.80	0.74	36.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

11 Level of Service is worse than the Level of Service Target specified in the Parameter Settings dialog.

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