



Argyll Estate Precinct Renewal

Traffic and Transport Assessment

NSW Land and Housing Corporation

4 May 2022

➔ The Power of Commitment



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Acknowledgment of Country

We acknowledge Aboriginal and Torres Strait Islander peoples as the Traditional Owners of all lands throughout Australia on which we do business, and we pay our respects to Elders, past, present and emerging.

Contents

1.	Introduction	1
1.1	Overview	1
1.2	Scope of works	2
1.3	Document purpose and structure	2
1.4	Study assumptions and limitations	2
1.5	Disclaimers	3
2.	Existing conditions	4
2.1	Existing land use	4
2.2	Existing road network	4
2.2.1	Road hierarchy	4
	Road classification	4
	Functional hierarchy	5
2.2.2	Road characteristics	6
	Pacific Highway	6
	Bray Street	7
	Joyce Street	8
	Other Roads	9
2.3	Public transport	10
2.3.1	Rail Network	10
2.3.2	Bus Services	11
2.4	Walking and cycling	12
2.5	Travel mode share	13
2.6	Crash review	14
2.7	Traffic	15
2.7.1	Existing traffic conditions	16
2.7.2	Existing intersection performance	19
3.	Description of the proposal	23
4.	Traffic Impact Assessment	26
4.1	Traffic generation	26
4.2	Intersection performance	27
4.3	West Argyll Street and Argyll Street connection	30
4.3.1	Intersection performance with new connection	30
4.3.2	Traffic calming measures	32
	Vertical deflection devices	33
	Horizontal deflection devices	33
4.4	Mode shift	34
5.	Parking requirements	37
	Roads and Maritime parking requirements	37
	DCP parking requirements	37
6.	Summary and conclusion	40
6.1	Overview	40
6.2	Key findings	40
	Existing conditions	40
	Traffic Impact	40

	Parking Assessment	42
6.3	Conclusion	42

Figure index

Figure 1-1	Location of investigation area	1
Figure 2-1	Existing land use	4
Figure 2-2	Existing road network (classification)	5
Figure 2-3	Key roads in proximity to the proposed site	6
Figure 2-4	Pacific Highway	7
Figure 2-5	Bray Street	8
Figure 2-6	Joyce Street	9
Figure 2-7	Rail service near proposal site	10
Figure 2-8	Coffs Harbour Bus Network	11
Figure 2-9	Bust stops within 400- and 800-m walking catchments from site	12
Figure 2-10	Active transport facilities	13
Figure 2-11	Road crash incidents within 800-m radius	14
Figure 2-12	Road crash incidents within 800-m radius (road user movement category)	15
Figure 2-13	Location of traffic volume counts	16
Figure 2-14	Aggregate hourly traffic volume – Weekday AM and PM (2022)	16
Figure 2-15	Intersection traffic volumes – AM Peak (2022)	17
Figure 2-16	Intersection traffic volumes – PM Peak (2022)	18
Figure 2-17	SIDRA intersection network layout	20
Figure 2-18	High-level survey validation	22
Figure 3-1	Investigation area	23
Figure 3-2	Existing and proposed lot sizes and land zoning	23
Figure 3-3	Indicative growth scenario – preferred option	24
Figure 4-1	Existing West Argyll Street and Argyll Street layout	30
Figure 4-2	Potential diversions with West Argyll and Argyll Street connection	31
Figure 4-3	Examples of lane narrowing / kerb extensions	33
Figure 4-4	Examples of one-lane slow points	34
Figure 4-5	Active and public transport improvement strategies	35

Table index

Table 2-1	Pacific Highway key features	7
Table 2-2	Bray Street key features	8
Table 2-3	Joyce Street key features	9
Table 2-4	Train services	10
Table 2-5	Bus services accessible from Proposal site	12
Table 2-6	Mode of travel to work (MTWP, 2016)	13
Table 2-7	Road crash incidents within 800-m radius (degree of crash)	14
Table 2-8	Level of service criteria for intersections	19
Table 2-9	Existing intersection performance (2022 Base Case)	22
Table 3-1	Proposed number of dwellings per site	24

Table 3-2	Proposed number of dwellings – 10-year projection	25
Table 4-1	Prak hour trip generation	26
Table 4-2	Future intersection performance (2027, Year 4)	28
Table 4-3	Future intersection performance (2033, Year 10)	29
Table 4-4	Future intersection performance (2033, Year 10) – connected West Argyll and Argyll Street	32
Table 4-5	Width requirements for pedestrian paths	36
Table 4-6	Width requirements for shared paths	36
Table 5-1	Parking requirements based on RMS Guide to Traffic Generating Developments (2002)	37
Table 5-2	Parking requirements based on Coffs Harbour City Council DCP (2015)	37
Table 5-3	Comparison of parking requirements – North Coast Regional Cities	38

Appendices

Appendix A	Traffic count data
Appendix B	SIDRA results summary

1. Introduction

1.1 Overview

The NSW Land and Housing Corporation (LAHC) is a Public Trading Enterprise within the Department of Planning Industry and Environment (DPIE) cluster.

LAHC owns a 33-hectare social housing estate in the Coffs Harbour local government area (LGA), located south of Bray Street to Argyll Street (including Deborah Close, Maple Street and Argyll Place) and from Frederick Street to Elm Street, referred to as the 'Argyll Estate'. The estate consists of 118 ageing social housing cottages and two vacant land lots owned by LAHC, and an additional 11 social homes owned by Aboriginal Housing Office (AHO). There are approximately 68 privately owned homes interspersed through this area.

LAHC has identified this estate as a priority for renewal which supports the NSW Government's 20-year Economic Vision for Regional NSW policy and Coffs Harbour City Council's Local Growth Management Strategy's Infill Program.

Coffs Harbour City Council (Council) and LAHC have developed a project charter to jointly investigate the potential for this area to be redeveloped for medium density residential development ("the Proposal"). If the area (or parts of the area) is deemed suitable for increased development, an amendment to Coffs Harbour Local Environmental Plan 2013 (LEP) and Coffs Harbour Development Control Plan 2015 (DCP) will be prepared and progressed.

The location of the investigation area ("Proposal site") is shown in Figure 1-1.

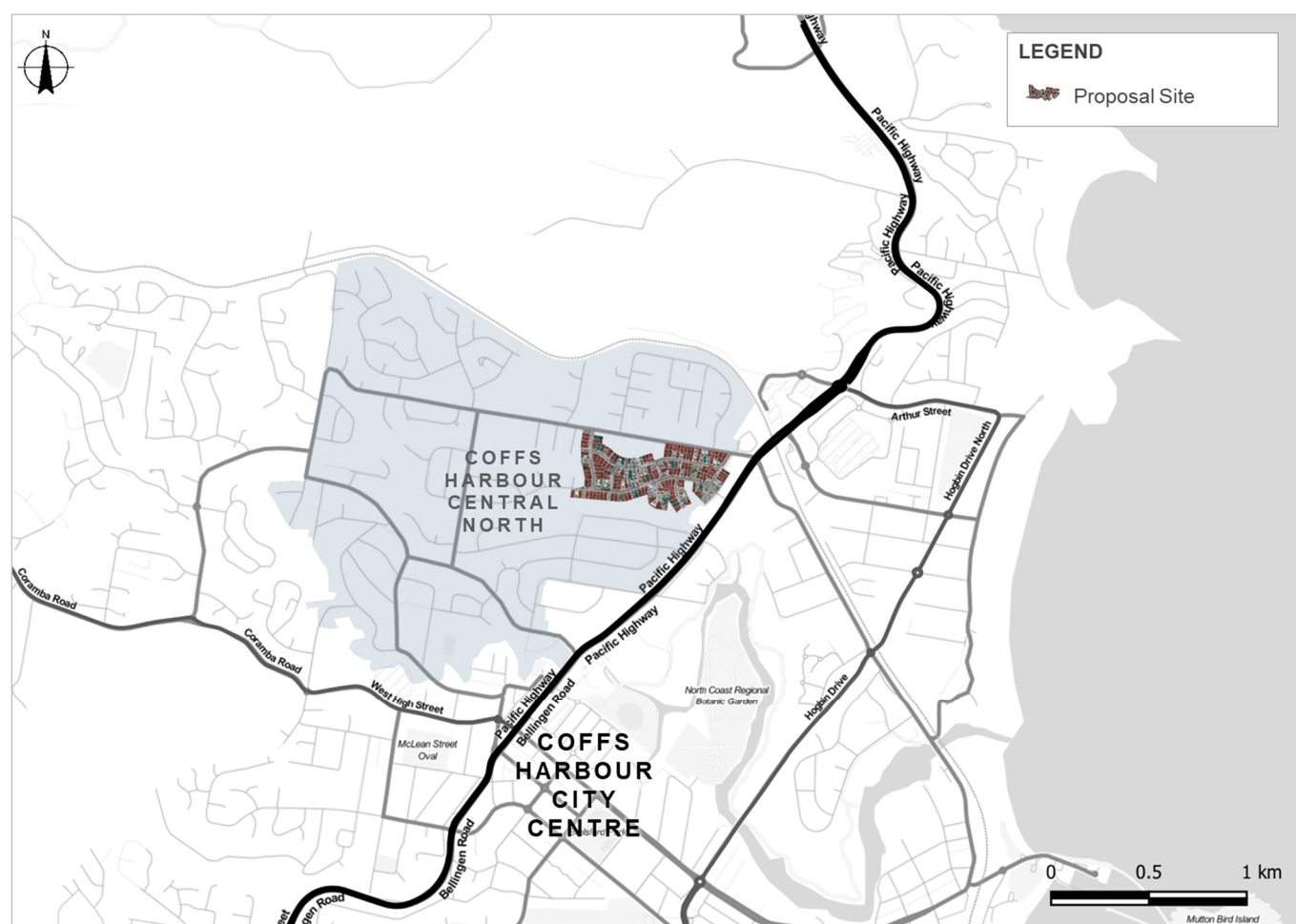


Figure 1-1 Location of investigation area

1.2 Scope of works

GHD Pty Ltd (GHD) has been commissioned by LAHC to conduct the Traffic and Transport Assessment (the Study) to inform the Planning Proposal of the potential redevelopment. The Study includes the following:

- Data gathering and review of available data
- Liaison and discussion with TfNSW, Council, and LAHC to access existing traffic model in the area (from recent studies conducted for Coffs Harbour Bypass Project)
- Assessment of existing and future traffic and transport covering:
 - Vehicle movements and intersection capacity during peak periods
 - Access to public transport, connectivity to walking and cycling networks
 - Parking requirements
- High-level assessment of multi-modal transport to identify potential impacts
- Assessment of cumulative impacts of other approved developments
- Identification of infrastructure and sustainable transport initiatives to offset potential impacts
- Prepare a Traffic and Transport Assessment report for lodgement based on feedback from LAHC, Council and/or DPIE and any other stakeholder engagement activities.

1.3 Document purpose and structure

This report documents findings of the Traffic and Transport Assessment. The remaining sections of this report are structured as follows:

- **Section 2** describes the existing environment, as relevant to the traffic and transport assessment.
- **Section 3** provides a description of the Proposal, including proposed staging and changes in land use.
- **Section 4** provides an estimate of the transportation impacts (i.e. traffic generation) that will likely be generated by the Proposal, and an assessment of the extent of these impacts on existing transportation systems. This section also includes a high-level investigation of the potential connection of West Argyll Street and Argyll Street. Measures to encourage mode shift and enhance walking and cycling connectivity in the area.
- **Section 5** provides an overview of the parking requirements.
- **Section 6** provides a summary of the key findings of the traffic and transport assessment and the principal conclusions for the study.

1.4 Study assumptions and limitations

The following study limitations and key assumptions are applicable to this study:

- Future growth scenario for the Proposal site have been provided by LAHC.
- The preparation of this Traffic and Transport Assessment has relied on the following secondary intersection traffic counts conducted on 10 June 2021 commissioned by TfNSW for the Coffs Harbour Bypass Project:
 - Bray Street / Joyce Street
 - Bray Street / Pacific Highway / Orlando Street
 - Argyll Street / Pacific Highway
- The following annual traffic growth rates have been adopted for the study, based upon the Coffs Harbour Strategic Transport Model (CHSTM) forecasts, as reported in the *Coffs Harbour Bypass Environmental Impact Statement Appendix F Traffic and Transport Assessment (2019)*.
 - 1.1% per annum from until 2024
 - 0.9% per annum from 2024 - 2033
- Future trip generation have been estimated based on trip generation rates from *Roads and Maritime's Guide to Traffic Generating Developments (2002)*.

- Directional traffic distribution of development-generated trips has been assumed to be as follows based on the Institute of Transportation Engineers' Trip Generation (2018) trip rates for low rise residential buildings.
 - Weekday AM peak hour of generator: 20% entering, 80% exiting
 - Weekday PM peak hour of generator: 64% entering, 36% exiting
- Traffic distribution estimates of the generated traffic have been based on high-level assumptions based on existing traffic data.
- No site visit was undertaken. The study was limited to a desktop analysis only.

1.5 Disclaimer

This report: has been prepared by GHD for NSW Land and Housing Corporation and may only be used and relied on by NSW Land and Housing Corporation for the purpose agreed between GHD and NSW Land and Housing Corporation as set out in Section 1.3 of this report.

GHD otherwise disclaims responsibility to any person other than NSW Land and Housing Corporation arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

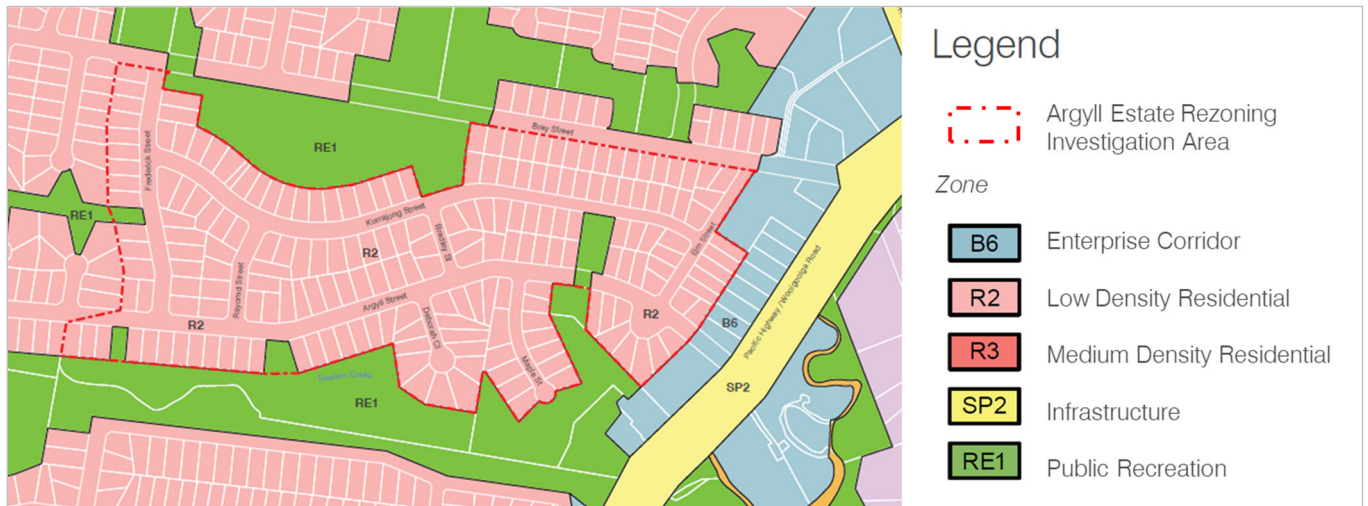
The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report (refer to Section 1.4 Document purpose and structure, Section 3 Description of the proposal, and Section 4 Traffic Impact Assessment of this report). GHD disclaims liability arising from any of the assumptions being incorrect.

2. Existing conditions

2.1 Existing land use

The investigation area is located within the Coffs Harbour Central North district. It is situated in an R2 Low Density Residential zone. A map of the existing land use is presented below, with the indicative site boundary.



Source: Argyll Estate Renewal | Scenario update – Preferred option version 25 March 2022 (architectus); modified by GHD

Figure 2-1 Existing land use

2.2 Existing road network

2.2.1 Road hierarchy

Roads within New South Wales are categorised in the following two ways:

- By classification (ownership).
- By the function that they perform.

Road classification

Roads, as defined by the *Roads Act 1993*, are classified based on their importance to the movement of people and goods within NSW (as a primary means of communication).

The classification of a road allows Transport for New South Wales (TfNSW) to exercise authority of all or part of the road. Classified roads include Main Roads, State Highways, Tourist Roads, Secondary Roads, Tollways, Freeways, and Transitways. For management purposes, TfNSW has three administrative classes of roads:

- **State Roads** – Major arterial links through NSW and within major urban areas. They are the principal traffic-carrying roads and are fully controlled and maintained by TfNSW. State Roads include all Tollways, Freeways and Transitways; and all or part of a Main Road, Tourist Road or State Highway.
- **Regional Roads** – Roads of secondary importance between State Roads and Local Roads which, along with State Roads, provide the main connections to and between smaller towns and perform a sub arterial function in major urban areas. Regional roads are the responsibility of councils for maintenance funding, though TfNSW funds some maintenance based on traffic and infrastructure. Traffic management on Regional Roads is controlled under the delegations to local government from TfNSW. Regional Roads may own all or part of a Main Road, Secondary Road, Tourist Road or State Highway; or other roads as determined by TfNSW.
- **Local Roads** – The remainder of the council-controlled roads, Local Roads are the responsibility of councils for maintenance funding. TfNSW may fund some maintenance and improvements based on specific

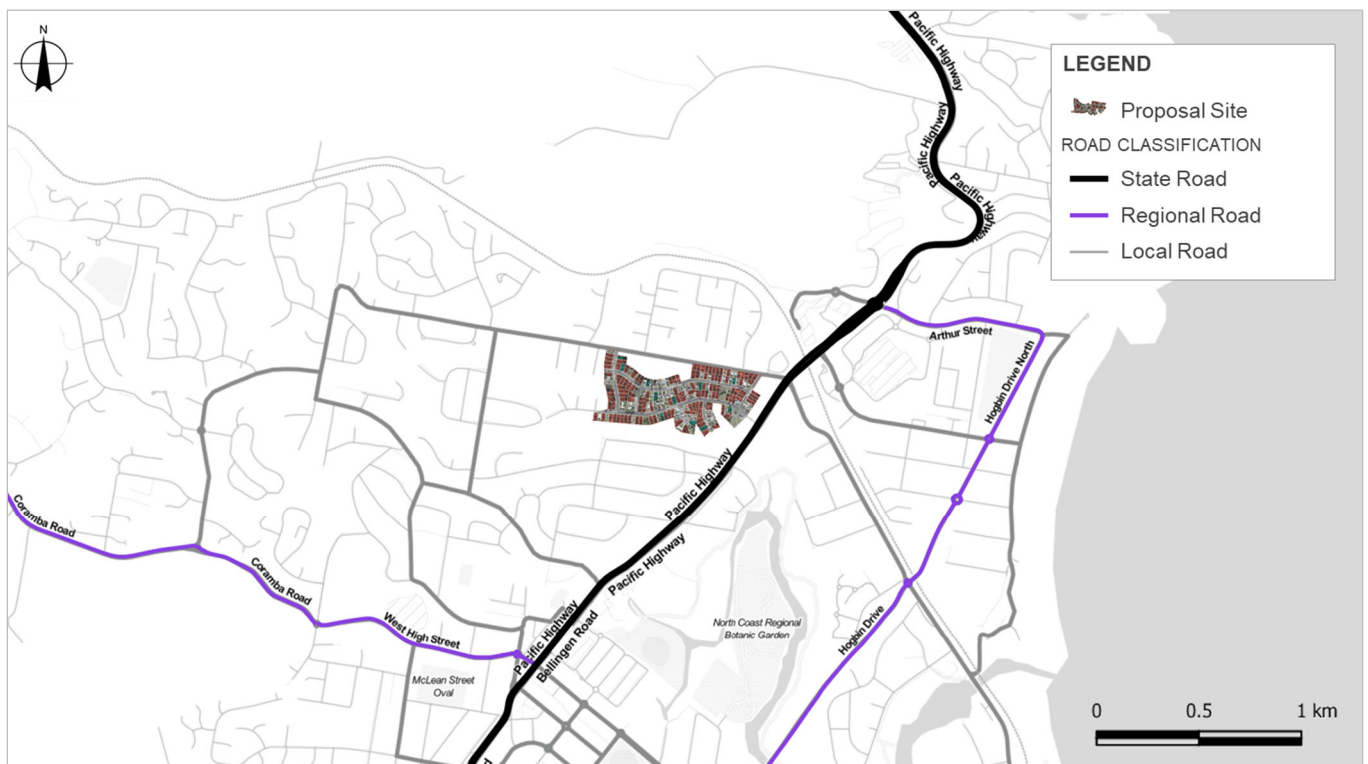
programs (e.g. urban bus routes, road safety programs). Traffic management on Local Roads is controlled under the delegations to local government from TfNSW.

Functional hierarchy

Functional road classification involves the relative balance of the mobility and access functions. TfNSW defines four levels in a typical functional road hierarchy, ranking from high mobility and low accessibility, to high accessibility and low mobility. These road classes are:

- **Arterial Roads** – generally controlled by TfNSW, they typically have no limit in flow and are designed to carry vehicles long distance between regional centres.
- **Sub-Arterial Roads** – can be managed by either TfNSW or local council. Typically, their operating capacity ranges between 10,000 and 20,000 vehicles per day, and their aim is to carry through traffic between specific areas in a sub region or provide connectivity from arterial road routes (regional links).
- **Collector Roads** – provide connectivity between local roads and the arterial road network and typically carry between 2,000 and 10,000 vehicles per day.
- **Local Roads** – provide direct access to properties and the collector road system and typically carry less than 2,000 vehicles per day.

The road hierarchy of the road network in the vicinity of the site is shown in Figure 2-2.



Source: Road classification information from TfNSW Road Network Classifications Map

Figure 2-2 Existing road network (classification)

2.2.2 Road characteristics

The assessment focuses on the roads in proximity to the site as shown in Figure 2-3. The following subsections describe the keys roads in the study area.



Figure 2-3 Key roads in proximity to the proposed site

Pacific Highway

The Pacific Highway (refer to Figure 2-4) is a national highway that spans around 780 km along the east coast of NSW. It runs an approximate north-south alignment and links Sydney in NSW and Brisbane in Queensland and provides primary connectivity across many of NSW's major cities and local government areas, including Coffs Harbour.

The section of the highway in proximity to the project site currently serves approximately 44,000 vehicles per day and has recently been upgraded into a four-lane dual carriageway in 2018.

Another upgrade is currently under way in the form of the 14-kilometre Coffs Harbour Bypass Project. This project will provide a four-lane divided highway that bypasses Coffs Harbour, which will pass through the North Boambee Valley and Roberts Hill ridge. The main objectives of the project are to decrease congestion, reduce travel times and provide safer road conditions on the new and existing road. The NSW Government estimates a reduction of about 12 minutes of travel time for motorists and the removal of about 12,000 vehicles per day from the Coffs Harbour CBD as a result of the bypass.

Key features of Pacific Highway in proximity to the Proposal site are summarised in Table 2-1.



Image Source: Google Street View || Pacific Highway south of Argyll Street, viewed southwards

Figure 2-4 Pacific Highway

Table 2-1 Pacific Highway key features

Feature	Description
Carriageway	Sealed, divided carriageway with two lanes in each direction. Travel widths of approximately seven meters (3.5 meters per lane). With lane markings and shoulders provided on both directions. Additional turning lanes are provided at approaches to intersections.
Parking	Parking not permitted.
Speed Limit	60 km/h
Pedestrian Facilities	Footpaths and pedestrian crossing facilities are provided.
Bicycle Facilities	Off-road shared path is provided along sections of the road in proximity to the proposal site.
Public Transport	Bus stop facilities are present along the length of the road, providing access to local and intercity bus services. (Discussed further in Section 2.3).

Bray Street

Bray Street (shown in Figure 2-5) functions as a collector road that provides the main east-west connection across Coffs Harbour Central North. It is connected to Pacific Highway / Orlando Street at a signal-controlled intersection at its eastern end. To the west, it forms a T-junction with Mackays Road. Key features of Bray Street are summarised in Table 2-2.



Image Source: Google Street View || Bray Street west of Taloumbi Road, view facing east

Figure 2-5 Bray Street

Table 2-2 Bray Street key features

Feature	Description
Carriageway	Sealed carriageway with one lane in each direction, with travel widths of approximately six meters (three meters per lane). With lane markings and wide shoulders provided on both sides of the carriageway.
Parking	Generally, parking not permitted.
Speed Limit	Varies, 40 – 50 km/h
Pedestrian Facilities	Footpaths and shared paths are provided in proximity to the proposal site. Pedestrian crossing facilities are limited to the signalised crossing at the intersection of Bray Street and Pacific Highway; and the pedestrian crossing facility in front of Orara High School.
Bicycle Facilities	On-road cycleways and shared paths are provided along sections of the road in proximity to the proposal site.
Public Transport	Bus stop facilities are present along the length of the road and is served by Routes 367 and 368.

Joyce Street

Joyce Street (shown in Figure 2-6) is a local road situated west of the Proposal site. It provides a north-south connection between Bray Street at its northern terminus and Beryl Street in the south. Key features of Joyce Street are summarised in Table 2-3.



Image Source: Google Street View || View facing northwards, towards intersection with Bray Street

Figure 2-6 Joyce Street

Table 2-3 Joyce Street key features

Feature	Description
Carriageway	Sealed carriageway with one lane in each direction. Carriageway width of approximately 12 m, including on-street parking spaces (travel width approximately six metres, or three metres per direction) With lane markings and wide shoulders provided on both sides of the carriageway.
Parking	On-street parking permitted on both sides of the road.
Speed Limit	40 km/h (school zone)
Pedestrian Facilities	Shared paths are provided on both sides of the road. A pedestrian crossing facility is provided near Tyalla Primary School (located to the west of the Proposal site)
Bicycle Facilities	None provided
Public Transport	No public transport facilities are provided.

Other Roads

Other relevant roads in the vicinity of the project site are listed below. These roads provide local access to the residential estate and have speed limits of 50 km/h.

- **Frederick Street** – Undivided two-lane carriageway that runs an approximate north-south alignment, beginning at Bray Street in the north and terminating at Argyll Street in the south. It has a width of approximately 10 metres and is located at the western portion of the Proposal site.
- **Elm Street** – Undivided two-lane carriageway that runs parallel to Pacific Highway. It has a width of approximately seven metres and provides access to the eastern portions of the Proposal site.
- **Argyll Street** – Undivided two-lane carriageway that serves as the main spine road for Argyll Estate. It is approximately 10 metres wide and provides east-west connectivity and direct access to Pacific Highway.
- **West Argyll Street / Jackson Place** – Undivided two-lane carriageway located to the west of the proposal site, approximately nine metres wide. West Argyll Street shares the same alignment with Argyll Street but is a no through route for traffic movement.

2.3 Public transport

2.3.1 Rail Network

NSW Trainlink's North Coast Line provides rail services in Coffs Harbour. The North Coast Line connects NSW and Queensland, running from Central Station (Sydney) to Roma Street Station (Brisbane, QLD).

Coffs Harbour Station is located near Jetty Beach, around 3.5 kilometers south-east of the site. An overview of the rail network is provided in Figure 2-7 below, while details of available services are summarised in Table 2-4.

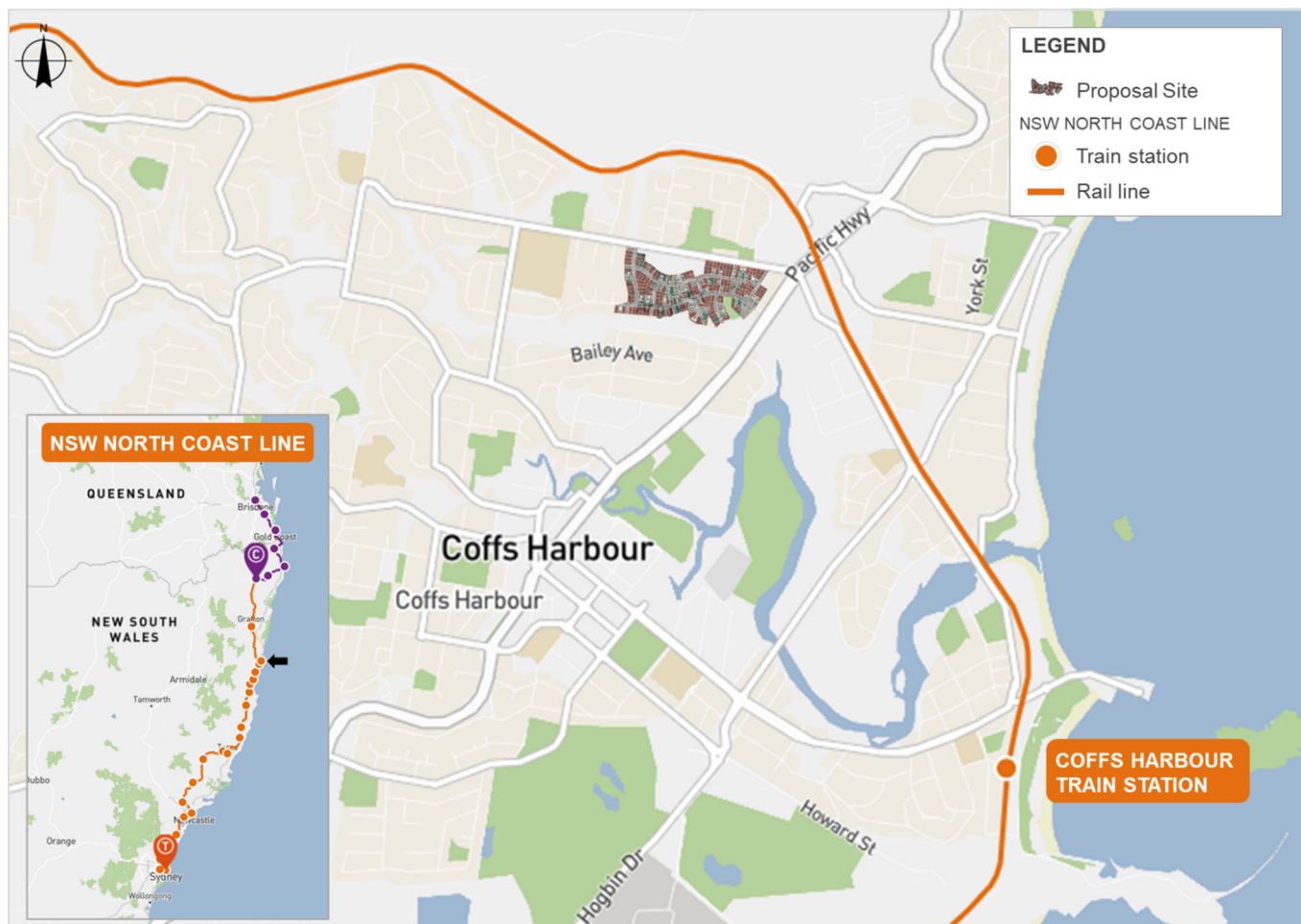


Image Source: TfNSW Trip Planner, modified by GHD

Figure 2-7 Rail service near proposal site

Table 2-4 Train services

Route / Station	Direction	Train Service Frequency (services per day)	
		Monday to Friday	Weekends and Public Holidays
Central to Casino			
Route 31 and 33: Central to Casino	Northbound	10	4
Route 34: Casino to Central	Southbound	5 <i>*Route 32 direct train also available</i>	2 <i>Route 32 direct train also available</i>
Route 32: Brisbane (Roma Street) to Central	Southbound	5 <i>Additional trip service also available via connecting coach and train.</i>	No direct train available during weekends. <i>Only connecting coach and train services are available.</i>

Route / Station	Direction	Train Service Frequency (services per day)	
		Monday to Friday	Weekends and Public Holidays
Central to Grafton and vice versa			
Route 35: Central to Grafton	Northbound	5	2
Route 36: Grafton to Central	Southbound	5	2

Source: Coffs Harbour Station | transportnsw.info

2.3.2 Bus Services

A map of the bus services that serve Coffs Harbour is shown in Figure 2-8. These routes are operated by Busway Group and provides connectivity between Coffs Harbour's suburbs. The routes that serve the Proposal site are listed in Table 2-5, while a map of the 400- and 800-m walking catchments from the Proposal site can be found in Figure 2-9.

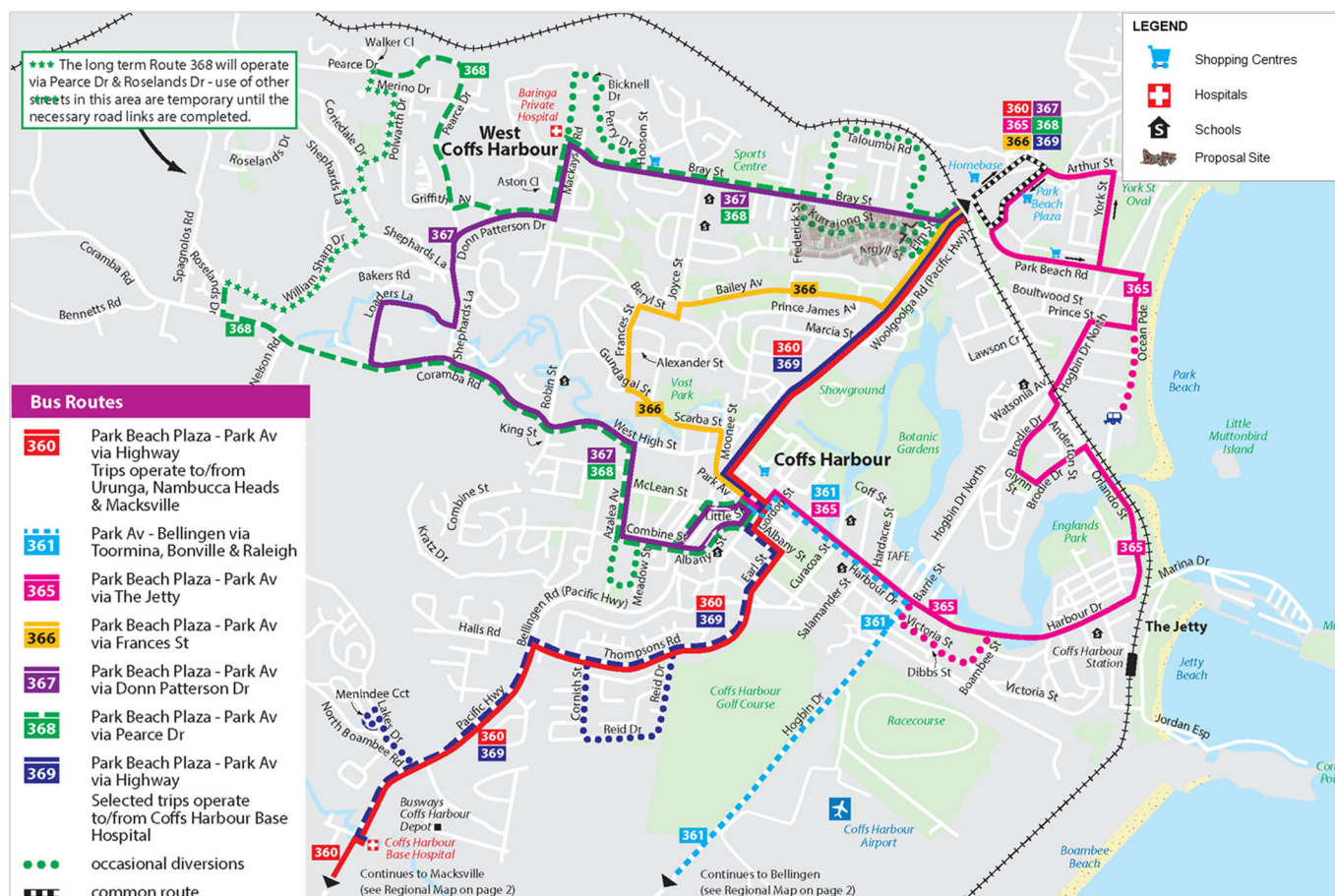


Image Source: *Busways Bus Map - Coffs Harbour Region*

Figure 2-8 Coffs Harbour Bus Network

Table 2-5 *Bus services accessible from Proposal site*

Bus route description	Approximate Distance	Bus Service Frequency		
		Monday to Friday	Saturday	Sunday and Public Holidays
Route 367: Park Beach Plaza - Park Ave via Donn Patterson Drive	within 400m walking catchment	13 trips per day <i>Operates between 7:18 am to 7:57 pm</i>	11 trips per day <i>Operates between 8:25 am to 7:47 pm</i>	5 trips per day <i>Operates between 8:25 am to 5:38 pm</i>
Route 368: Park Beach Plaza - Park Ave via Pearce Drive		5 trips per day <i>Operates between 7:34 am to 5:47 pm</i>	No operations	No operations
Route 360: Park Beach Plaza - Park Ave via Highway	within 800m walking catchment	9 trips per day <i>Operates between 8:19 am to 11:57 pm</i>	4 trips per day <i>Operates between 9:50 am to 11:57 pm</i>	2 trips per day <i>Operates between 9:50 am to 3:08 pm</i>
Route 366: Park Beach Plaza - Park Ave via Frances St		15 trips per day <i>Operates between 7:05 am to 5:50 pm</i>	11 trips per day <i>Operates between 8:50 am to 8:01 pm</i>	5 trips per day <i>Operates between 8:50 am to 5:50 pm</i>
Route 369: Park Beach Plaza - Park Ave via Highway		12 trips per day <i>Operates between 9:20 am to 8:38 pm</i>	3 trips per day <i>Operates between 10:20 am to 8:52 pm</i>	2 trips per day <i>Operates between 1:01 am to 6:35 pm</i>

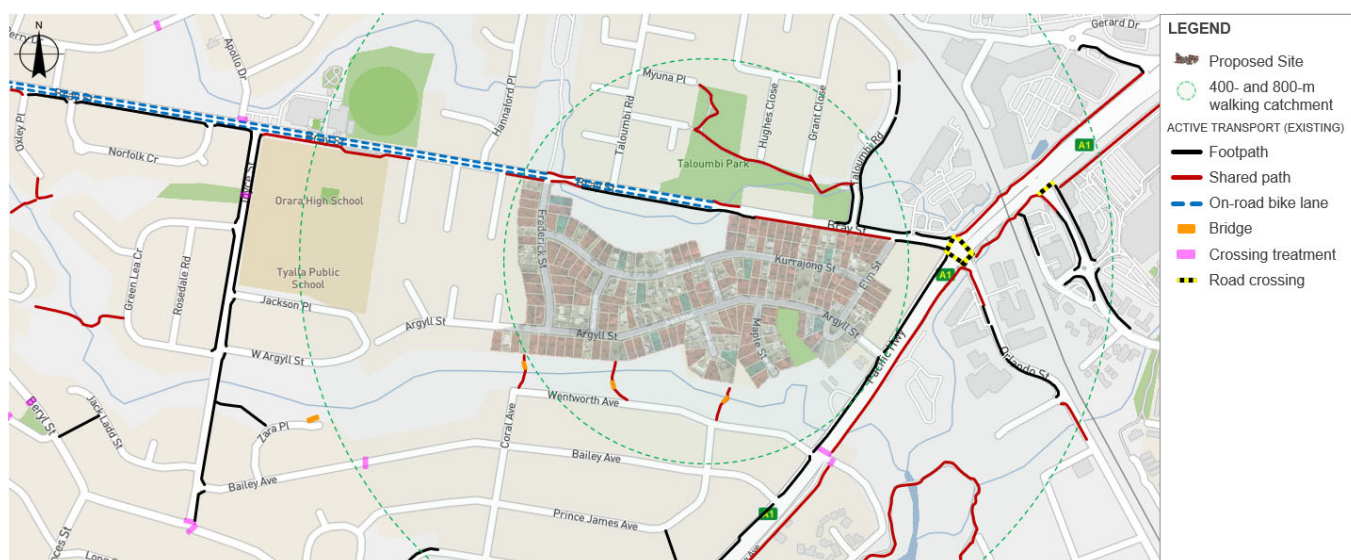


Figure 2-9 *Bust stops within 400- and 800-m walking catchments from site*

As shown, the proposal site has access to a number of bus services within walking distance.

2.4 Walking and cycling

In reviewing the site and its accessibility to public transport opportunities, reference was made to the NSW Planning Guidelines for Walking and Cycling (2004). This document outlines a recommended walkable distance of 400 to 800 metres to public transport and other local amenities. A map of the existing active transport (walking and cycling) facilities in the vicinity of the proposal site is shown in Figure 2-10.



Data from CHCC Active Transport Map; Base map from TfNSW Trip Planner Map; modified by GHD

Figure 2-10 Active transport facilities

As shown, the existing facilities include shared paths and footpaths along roads that serve a collector function. Internal roads within the residential precincts have limited, disconnected, or no dedicated paths for pedestrians. Pedestrian crossing facilities are also noted to be limited within the study area.

2.5 Travel mode share

The Coffs Harbour Local Growth Management Strategy 2020 (LGMS) highlights car reliance as a key challenge in transport and infrastructure for the LGA, based on a Roads and Maritime Services (RMS) study undertaken in 2004.

A review of the employed population's mode of travel to work was conducted to gain a high-level understanding of the existing travel behaviours in the study area. Table 2-6 provides a summary of the mode of travel to work (MTWP) based on the 2016 Census data from the Australian Bureau of Statistics.

The data indicates that 75.6 per cent of the employed population in the Coffs Harbour Central North district travelled to work by car, which is similar to the average for the entire LGA (city) and regional NSW mode share by car. This is noted to be slightly lower than the reported 80 per cent share in the year 2000 (CHCC, as cited in the LGMS). However, the percentage still comprises a significant portion of the travel mode share.

The mode share for travel to work by public transport is only 0.4 per cent, with 4.4 per cent cycling to work, and only 1.3 per cent walking to work. The mode share for public transport, cycling, and walking are noted to be lower for the district, as compared to the city and regional averages.

The recent data show that while there has been improvement in the mode share over the last decade, car dependence is still very much prevalent in the LGA. There is therefore an opportunity to improve mode share by sustainable travel modes, including active transport and by public transport.

Table 2-6 Mode of travel to work (MTWP, 2016)

Mode (Travel to work)	Coffs Harbour Central North	Coffs Harbour City		Regional NSW
		Range	Ave	
Car	75.6%	71.6 - 81.6%	76.3%	73.4%
Public transport	0.4%	0.0 - 1.4%	0.8 %	1.8%
Cycling	4.4%	2.0 - 8.8%	5.2%	5.8%
Walking	1.3%	0.6 - 6.2%	2.9%	3.5%

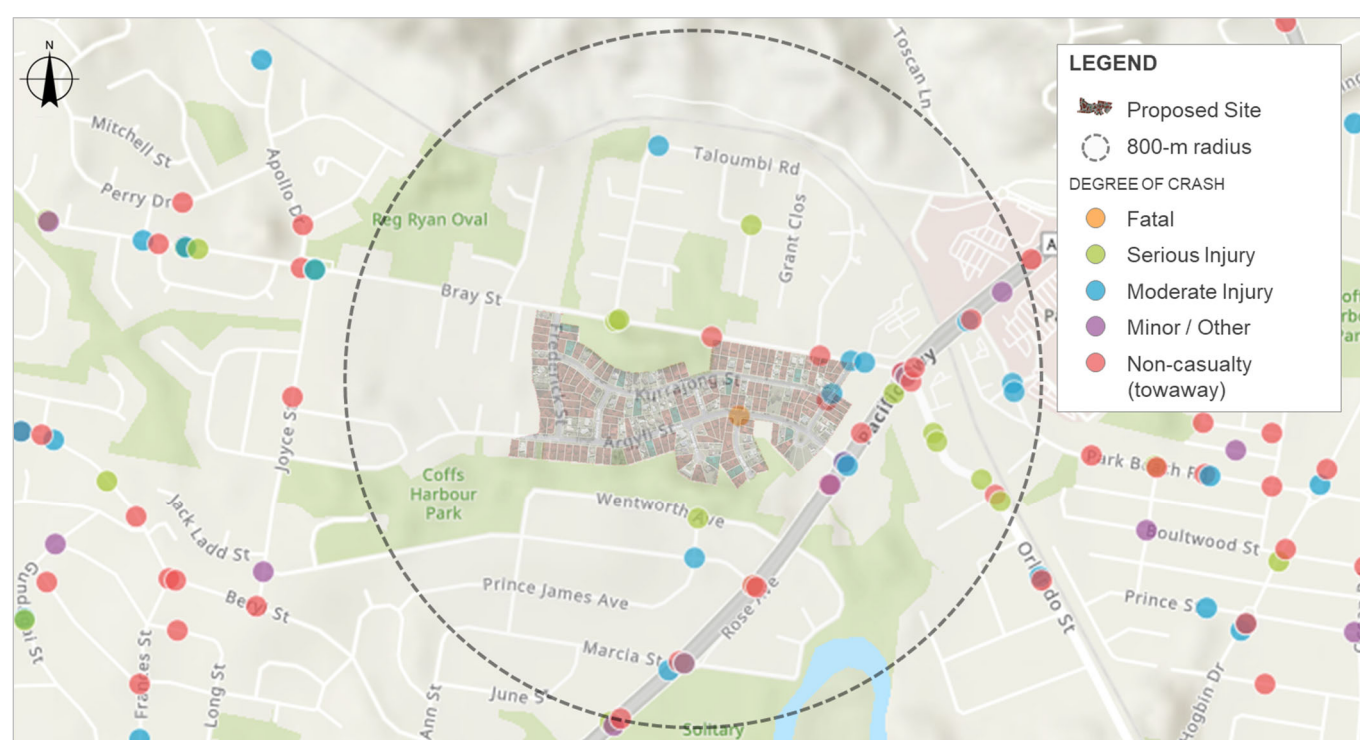
Source: Australian Bureau of Statistics, as reported by atlas.id

2.6 Crash review

Road crash information in proximity to the site was collected from road crash statistics published by NSW Centre for Road Safety. From 2016 to 2020, a total of 49 road crash incidents were recorded within an 800-metre radius from the proposal site, as presented in Table 2-7. The location of the crashes is shown in Figure 2-11.

Table 2-7 Road crash incidents within 800-m radius (degree of crash)

Year	Degree of Crash					Total per year
	Non-casualty (towaway)	Minor/Other Injury	Moderate Injury	Serious Injury	Fatal	
2016	2	1	2	5	1	11
2017	1	1	3	3	-	8
2018	3	-	3	3	-	9
2019	4	2	-	5	-	11
2020	5	1	3	1	-	10
Total	15	5	11	17	1	49



Source: [Crash and Casualty Statistics](#), Centre for Road Safety

Figure 2-11 Road crash incidents within 800-m radius

Seventy-one per cent of the crashes in proximity to the site occurred at intersections. The majority of these crashes were recorded at intersections along the Pacific Highway, suggesting that differences in the speed limit, traffic volumes and driver behaviour on local roads and highways may have contributed to the occurrence of the incidents.

A summary of the crash categories is shown in Figure 2-12. The following information can be drawn from the data:

- The predominant crash type category is *crashes with vehicles coming from the same direction* (19 incidents), followed by *crashes with vehicles coming from the opposing direction* (13 incidents).
- Off-path crashes are also noted to be common, contributing a total of eight incidents.
- Four pedestrian / cyclist crashes were recorded in proximity to the site. Further inspection of the crash details revealed that three of these were far side crashes and one involving a near side crash. All four

incidents led to Serious Injury. These crashes were noted along Bray Street, Pacific Highway, and Orlando Street.

- One fatal crash was recorded along Argyll Street in 2016, which involved an off-carriageway crash into an object. The vehicle was reported to have been travelling at a very high speed on the wrong side of the road before leaving the carriageway and hitting a power pole at dawn¹. No further information was reported regarding the possible cause of the crash.

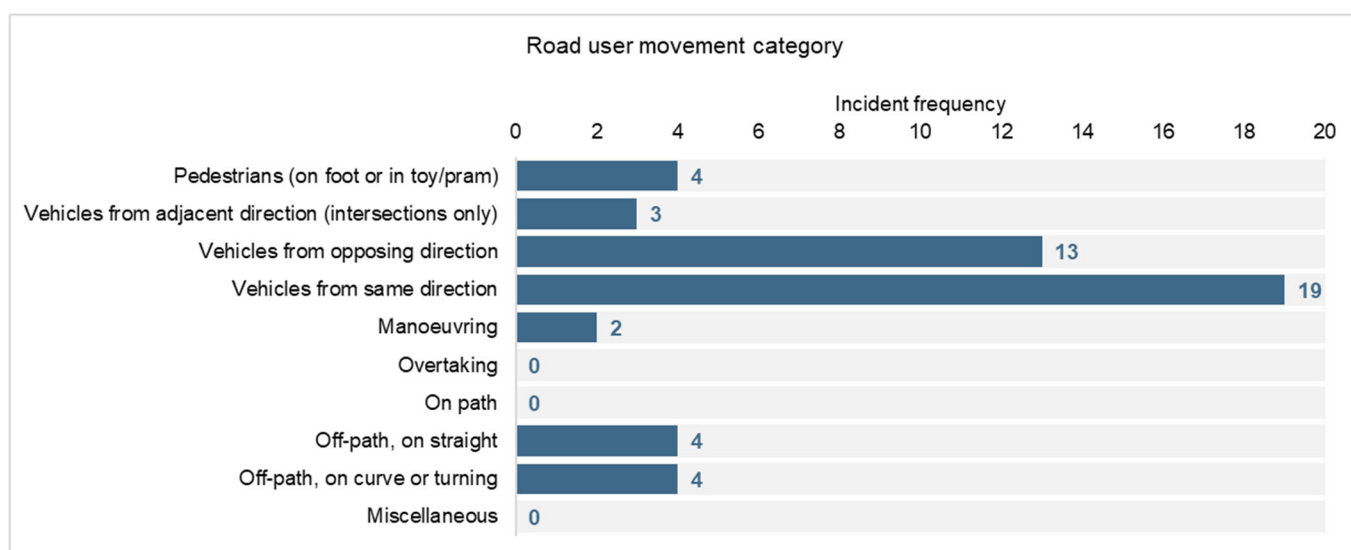


Figure 2-12 Road crash incidents within 800-m radius (road user movement category)

2.7 Traffic

Seven intersections were analysed as part of this study. The location of the intersections is shown in Figure 2-13.

1. Bray Street / Joyce Street
2. Bray Street / Frederick Street
3. Bray Street / Elm Street
4. Pacific Highway / Bray Street / Orlando Street
5. Pacific Highway / Argyll Street
6. Frederick Street / Argyll Street
7. Joyce Street / West Argyll Street

Traffic data for intersections 1, 4, and 5 has been sourced from traffic surveys conducted on 10 June 2021 commissioned by TfNSW as part of the Coffs Harbour Bypass Project. To supplement the available traffic data obtained from secondary sources, GHD engaged Trans Traffic Survey to undertake intersection traffic turning counts at the remaining intersections. The surveys were undertaken at four intersections on 15 March, 2022 (Tuesday) during the following periods:

- Weekday AM peak (3 hours) 06:30 to 09:30
- Weekday PM peak (3 hours) 15:00 to 18:00

¹ Man dies after car hits power pole in suburban street (The Daily Telegraph, 2016)

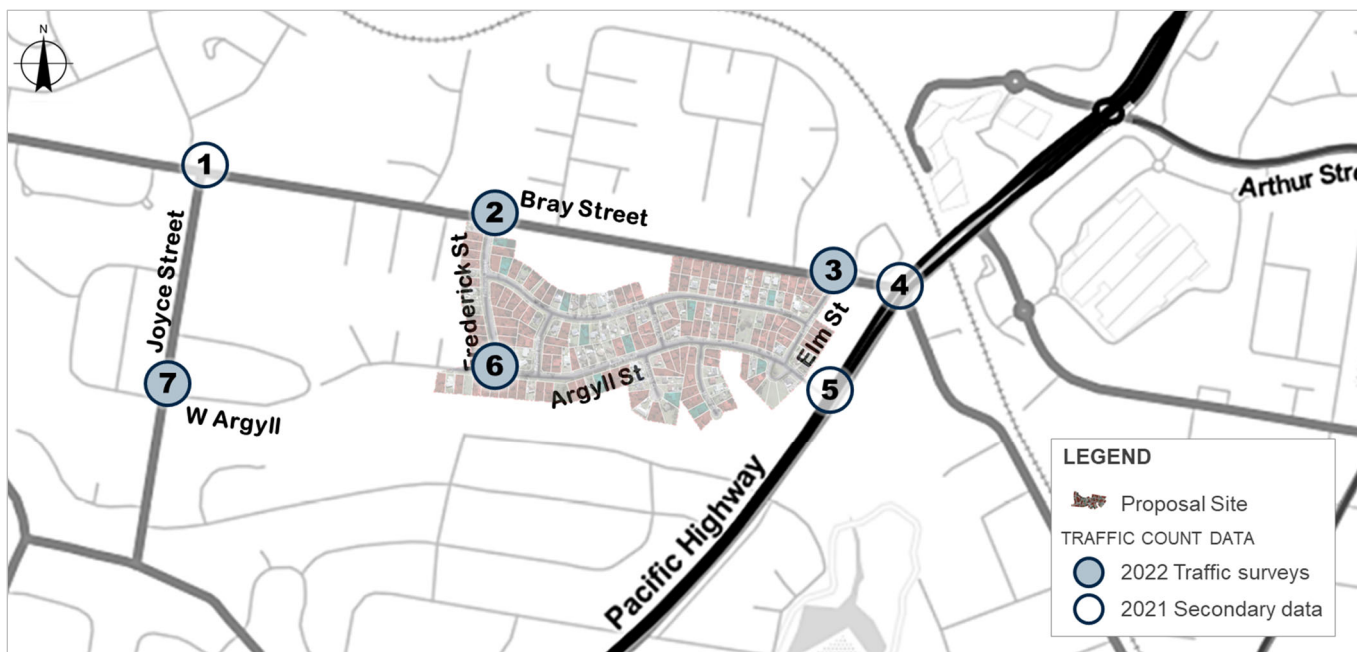


Figure 2-13 Location of traffic survey counts

2.7.1 Existing traffic conditions

An annual growth rate of 1.1 per cent has been applied to 2021 traffic count data to estimate 2022 traffic volume counts. The peak hours for the assessment were determined by taking the aggregate traffic volume of all intersections for each survey period. The time intervals with the highest volume are highlighted in Figure 2-14.

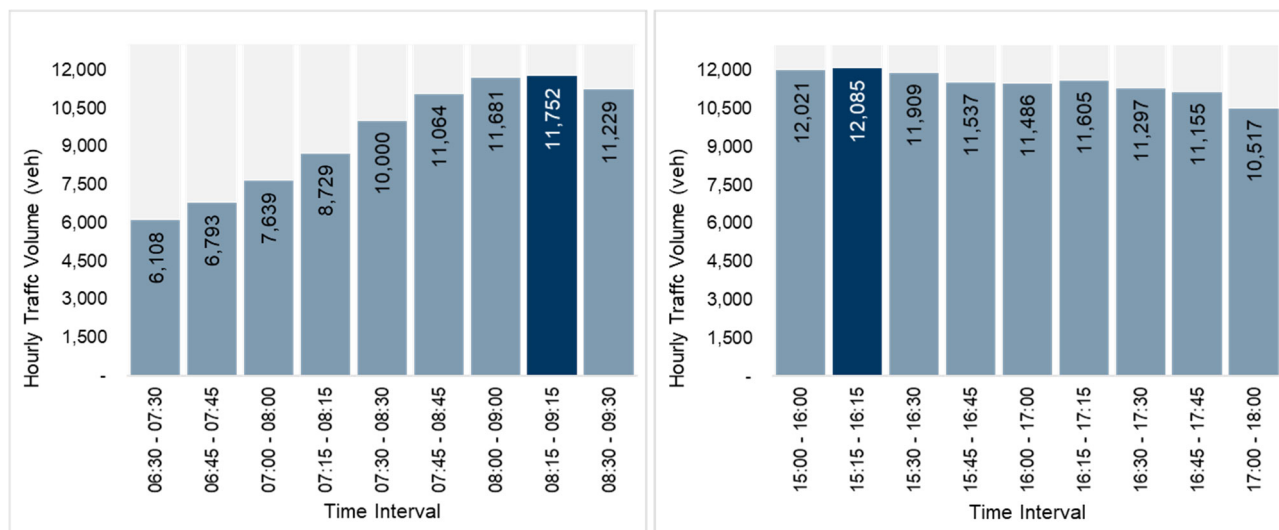


Figure 2-14 Aggregate hourly traffic volume – Weekday AM and PM (2022)

The following peak hours were identified from the results of the survey:

- Weekday AM peak hour 08:15 to 09:15
- Weekday PM peak hour 15:15 to 16:15

The traffic survey data is provided in Appendix A, with a summary of the AM and PM peak hour traffic movements shown from Figure 2-15 and Figure 2-16.

AM Peak **2022**
08:15 - 09:15

INT
Total
HV
LV

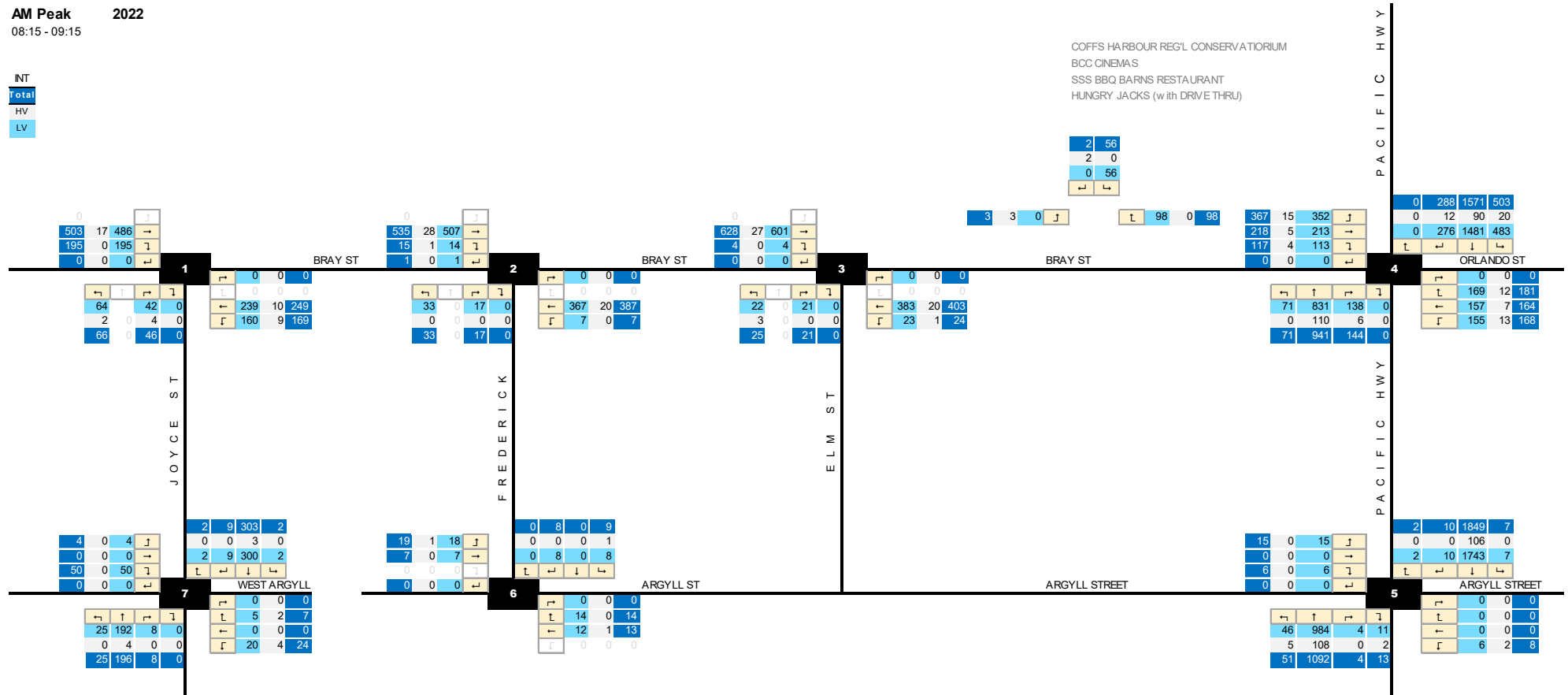


Figure 2-15 **Intersection traffic volumes – AM Peak (2022)**

PM Peak 2022
15:15 - 16:15

INT
Total
HV
LV

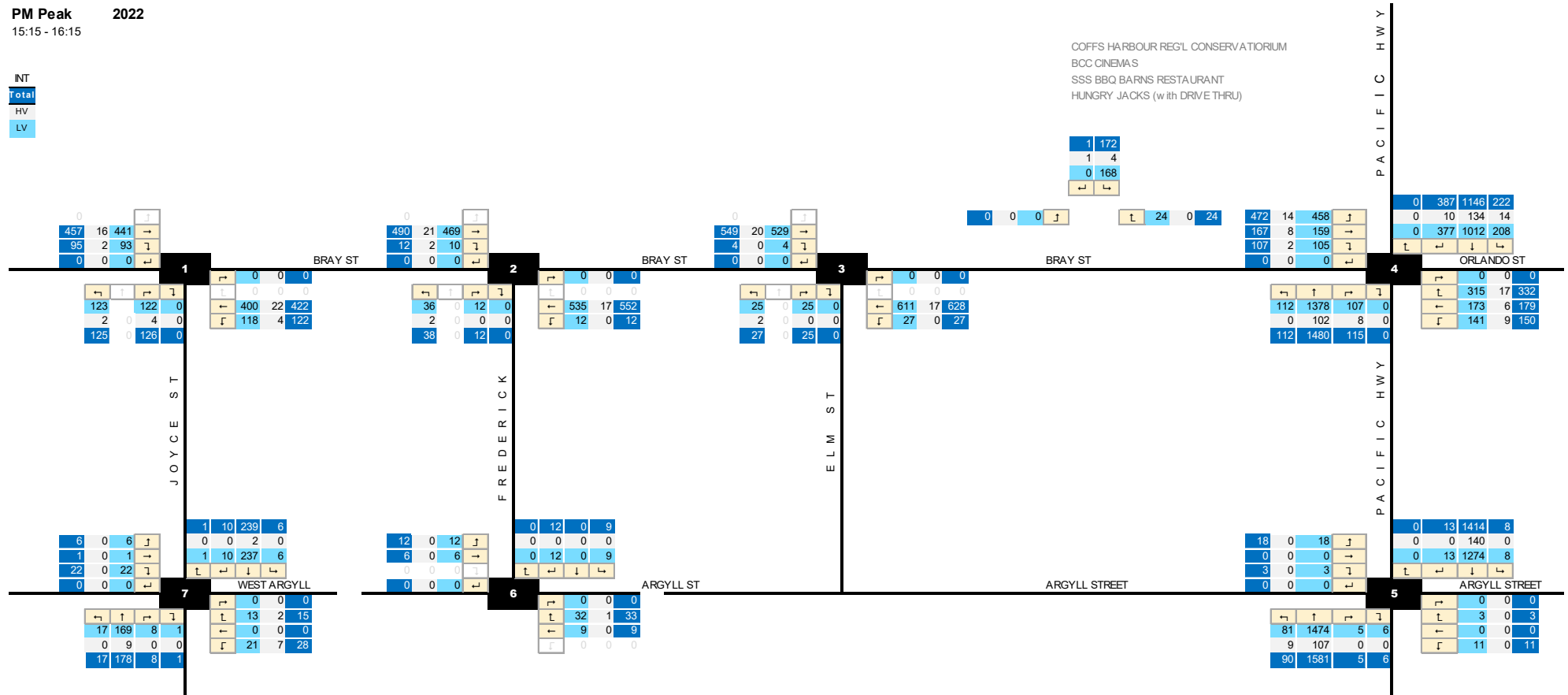


Figure 2-16 Intersection traffic volumes – PM Peak (2022)

2.7.2 Existing intersection performance

The performance of the existing road network is largely dependent on the operating performance of key intersections, which are critical capacity control points on the road network. SIDRA 9 Intersection modelling software was used to assess the proposed peak hour operating performance of intersections on the surrounding road network.

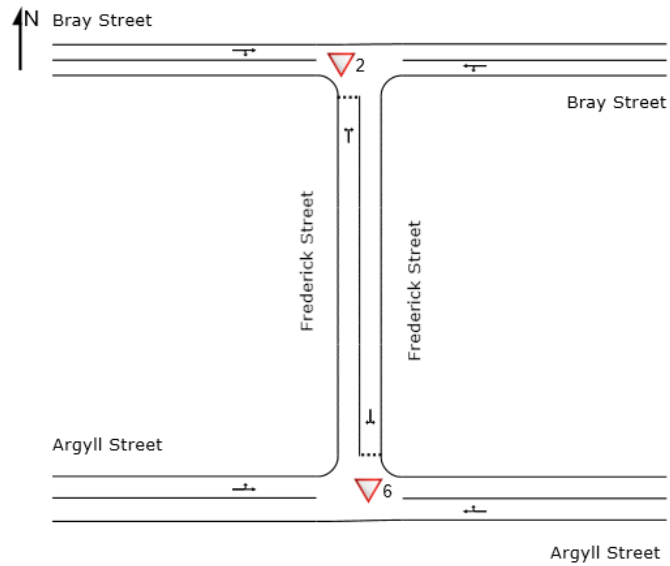
The criteria for evaluating the operational performance of intersections, as provided by the *Guide to Traffic Generating Developments (Roads and Maritime Services, 2002)*, is summarised in Table 2-8. The criteria for evaluating the operational performance of intersections is based on a qualitative measure (i.e. Level of Service), which is applied to each band of average vehicle delay.

Table 2-8 **Level of service criteria for intersections**

Level of Service	Average Delay per Vehicle (seconds / veh)	Traffic signals, Roundabouts	Give Way & Stop Signs
A	< 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays & spare capacity	Acceptable delays & spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Operating near capacity	Near capacity & accident study required
E	57 to 70	At capacity; at signals, incidents will cause excessive delays Roundabouts require other control modes	At capacity, requires another control mode
F	> 70	Over Capacity Unstable operation	Over Capacity Unstable operation

Source: *Guide to Traffic Generating Developments (Roads and Maritime Services 2002)*

The base 2022 traffic models were developed using the AM and PM peak hour survey data results. Existing traffic flows at key intersections were analysed using SIDRA 9 to obtain the current operation of the key intersections. The intersection layout in the model is shown in , while the results of the SIDRA analysis are shown in Table 2-9. Details of the SIDRA results can be found in Appendix B.



Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.

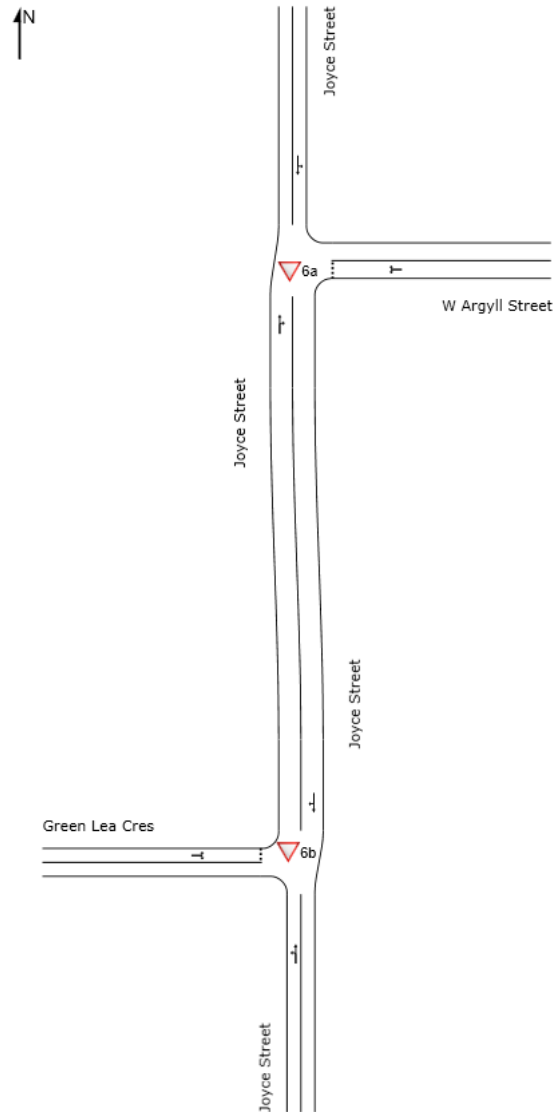
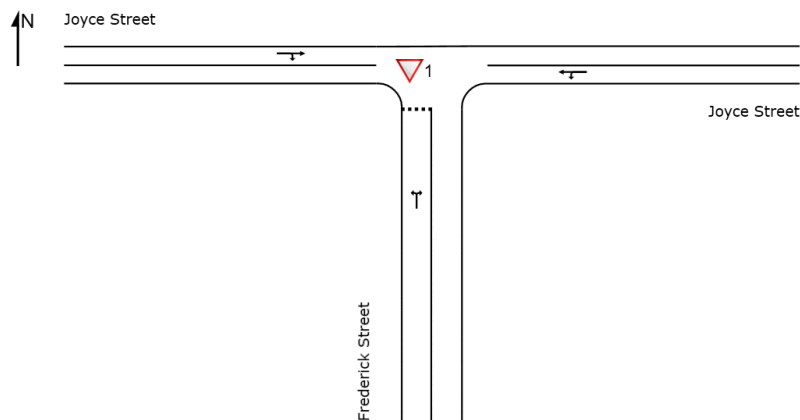


Figure 2-17 SIDRA intersection network layouts – Sites 1, 2, 6 and 7

**Note refer to Table 2-9 for intersection ID numbers*

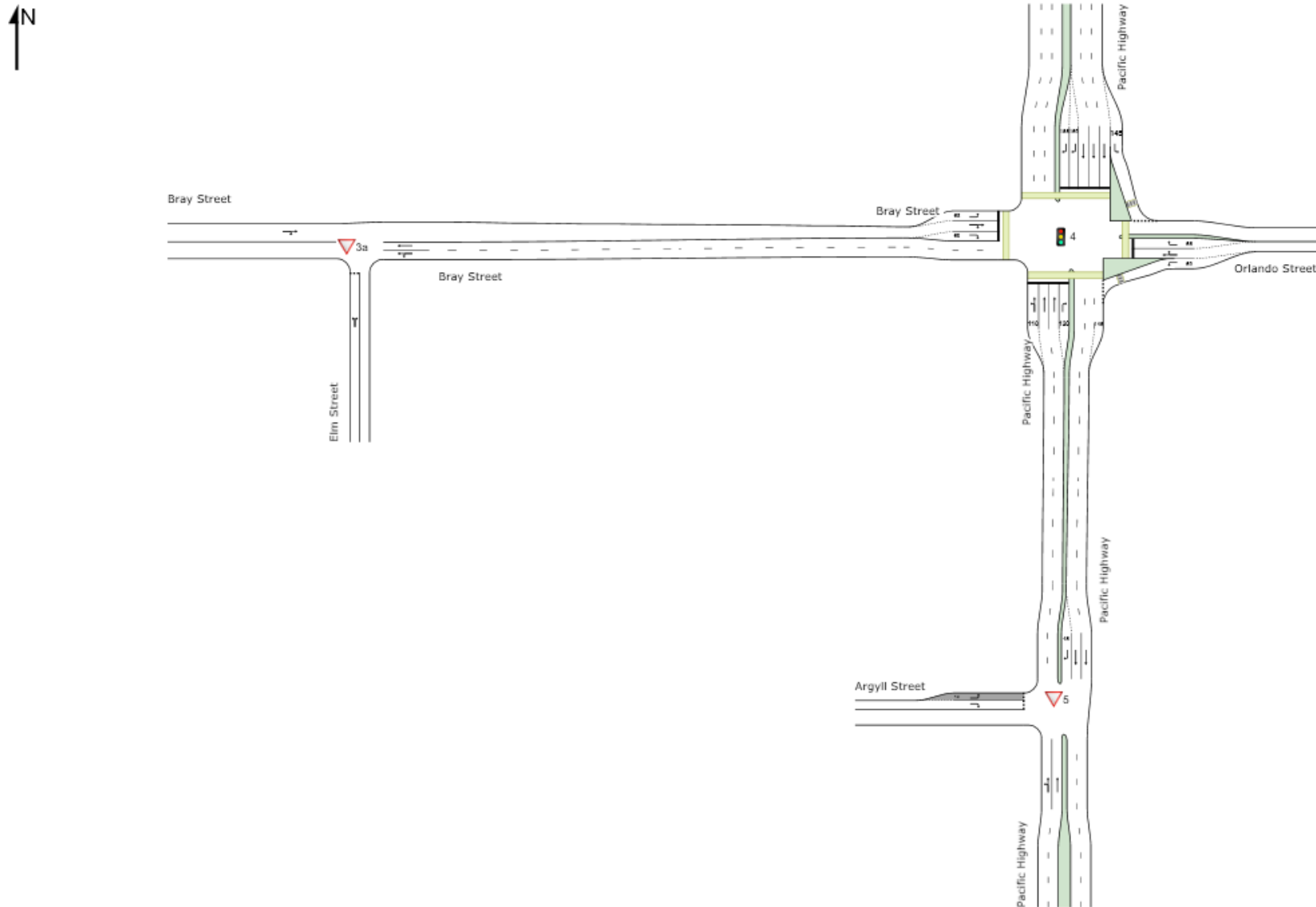


Figure 2-18 SIDRA intersection network layout – Sites 3, 4 and 5

**Note refer to Table 2-9 for intersection ID numbers*

Table 2-9 Existing intersection performance (2022 Base Case)

ID	Intersection Name	AM Peak Hour (08:15 - 09:15)				PM Peak Hour (15:15 - 16:15)			
		Ave Delay (s)	LoS	95 th % Queue (m)	DoS	Ave Delay (s)	LoS	95 th % Queue (m)	DoS
1	Bray Street / Joyce Street	8	LoS A	16	0.41	8	LoS A	9	0.33
2	Bray Street / Frederick Street	7	LoS A	1	0.32	9	LoS A	2	0.31
3	Bray Street / Elm Street / Access Road	17	LoS B	36	0.33	18	LoS B	99	0.31
4	Bray Street / Pacific Highway / Orlando Street	40	LoS C	239	0.95	56	LoS D	308	0.92
5	Argyll Street / Pacific Highway	100+	LoS F	20	1.05	100+	LoS F	17	1.00
6	Argyll Street / Frederick Street	5	LoS A	0	0.02	5	LoS A	1	0.03
7	West Argyll Street / Joyce Street	5	LoS A	2	0.17	5	LoS A	1	0.14

Notes:

- The average delay for priority-controlled intersections is selected from the movement on the approach with the highest average delay.
- The level of service for priority-controlled intersections is based on the highest average delay per vehicle for the most critical movement.
- The degree of saturation (DoS) is defined as the ratio of the arrival flow (demand) to the capacity of each approach.
- Average delay is given in seconds per vehicle.

The SIDRA results indicate that Argyll Street / Pacific Highway intersection operates over capacity during the weekday AM and PM peak periods at LoS F. This is mainly due to high traffic volumes along Pacific Highway causing delays for vehicles to make the right turn movement from Argyll Street (minor approach) to Pacific Highway. However, the right turn movement from Argyll Street is low, with six vehicles during AM peak and three vehicles during PM peak observed to make this movement. The operation along the critical movements along the Pacific Highway operate with a satisfactory LoS. Additionally, drivers familiar with the area making this right turn movement can do so instead using the nearby signalised intersection of Bray Street / Pacific Highway, which is noted to operate with an acceptable LoS D or better during peak periods.

All other intersections analysed in the road network currently operate at an acceptable LoS (i.e. better than Level of Service E) during the weekday morning and weekday evening peak periods.

A high-level validation of the intersection modelling has been undertaken by comparing the SIDRA modelling results with Google traffic information (via Google Maps Traffic Layer). This indicates that the results of the SIDRA modelling are consistent with “typical” weekday peak hour conditions, as shown at Figure 2-19.

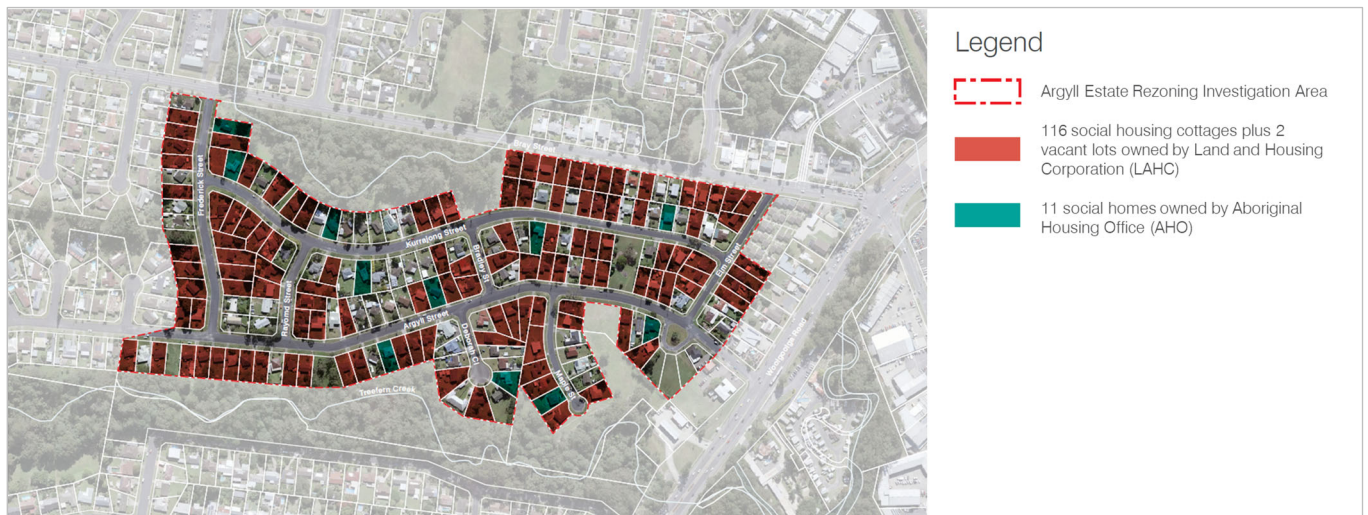


Figure 2-19 High-level validation comparison of SIDRA results

Source: Google Maps Traffic Layer (2022)

3. Description of the proposal

CHCC and LAHC have developed a project charter to jointly investigate the potential for Argyll Estate to be redeveloped for medium density residential development. The estate consists of 118 ageing social housing cottages and two vacant land lots owned by LAHC, 11 social homes owned by Aboriginal Housing Office (AHO), and around 68 privately owned homes. The existing features of the investigation area (the “Proposal site”) is shown in Figure 3-1.



Source: Argyll Estate Renewal | Scenario update – Preferred option version 25 March 2022 (architectus); modified by GHD

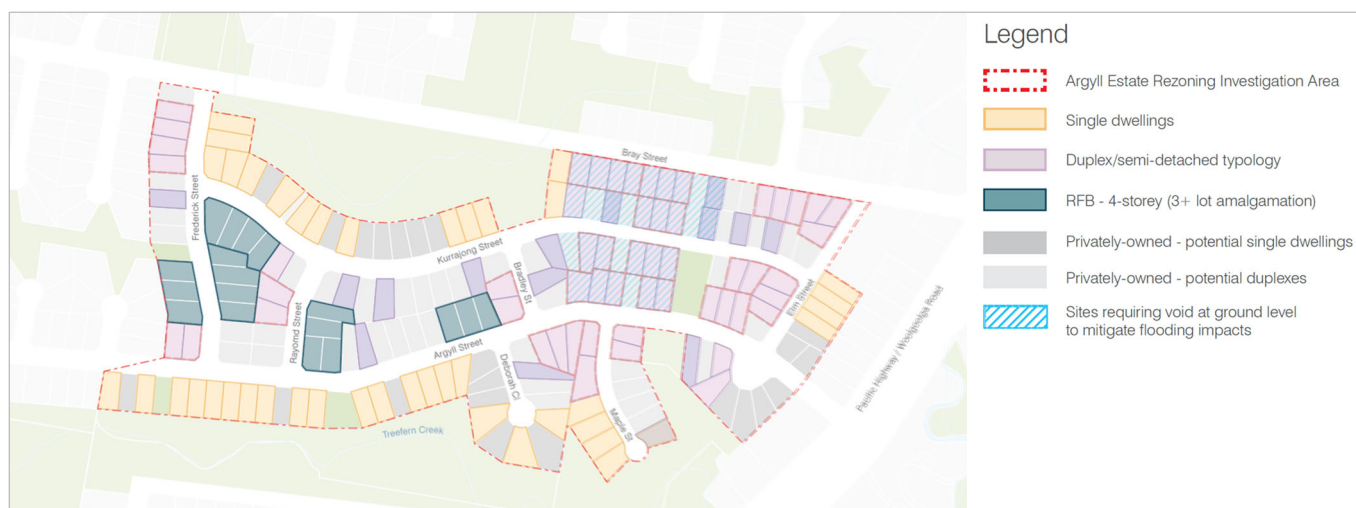
Figure 3-1 Investigation area

The proposed changes in land zoning and minimum lot sizes are shown in Figure 3-2, while the indicative growth scenario currently under consideration is shown in Figure 3-3.



Source: Argyll Estate Renewal | Scenario update – Preferred option version 25 March 2022 (architectus); modified by GHD

Figure 3-2 Existing and proposed lot sizes and land zoning



Source: Argyll Estate Renewal | Scenario update – Preferred option version 05 April 2022 (architectus); modified by GHD

Figure 3-3 Indicative growth scenario – preferred option

There are currently 197 existing dwellings in the Proposal site (129 on LAHC sites, and 68 on private sites). The growth scenario looks into the redevelopment of a portion of the existing properties into dual occupancy dwellings and residential flat buildings (RFB), increasing the number of dwellings from 129 to 365 for LAHC-owned sites, and from 68 to 95 on private sites. This would introduce 263 additional dwellings, bringing the total number of dwellings to 460.

A breakdown of the proposed total number of dwellings is summarised in Table 3-1.

Table 3-1 Proposed number of dwellings per site

Dwelling Type	Lot Type	Configuration	Dwellings per Site	Total Dwellings
Single Dwelling	1	Existing (no change) – LAHC land	1	42
	1	Existing (no change) – Private land	1	41 ^a
Single Dwelling Total				83
Dual Occupancy	1	3 Bed – LAHC land	2	138
		3 Bed – Private land	1	54 ^b
Dual Occupancy Total				192
Residential Flat Building (RFB)	3	1 Bed / 2 Bed / 3 Bed	28	56
	4	1 Bed / 2 Bed – LAHC land	43	129
RFB Total				185
Grand Total (Precinct)				460

^a 22 sites unsuitable for redevelopment plus 19 (40% of developable sites) to remain as is

^b 27 sites redeveloped into dual occupancy dwellings (60% take up assumed)

The redevelopment is planned to be carried out over a ten-year delivery period, with bulk of the works proposed to be delivered in the first four years beginning late 2023. The breakdown of the number of dwellings proposed to be delivered over a ten-year period is summarised in Table 3-2.

Table 3-2 Proposed number of dwellings – 10-year projection

Year		LAHC owned Land					Private owned Land		Total per year	Cum. total per year
		Dual Occupancy	Residential Flat Building (RFB)			Existing SD (No change)	Existing SD (No change)	Dual Occupancy		
		3 Bed	1 Bed	2 Bed	3 Bed	4 Bed	4 Bed	3 Bed		
2024	YEAR 1	22	40	28	3	42	41	0	176	176
2025	YEAR 2	10	40	28	3			6	87	263
2026	YEAR 3	22	26	17	0			6	71	334
2027	YEAR 4	84	0	0	0			6	90	424
4-year total		138	106	73	6	42	41	18	424	
2028	YEAR 5							6	6	430
2029	YEAR 6							6	6	436
2030	YEAR 7							6	6	442
2031	YEAR 8							6	6	448
2032	YEAR 9							6	6	454
2033	YEAR 10							6	6	460
10-year total		138	106	73	6	42	41	54	460	

Note: SD = Single dwelling (to remain undeveloped (i.e. no change))

4. Traffic Impact Assessment

This section reviews the expected traffic impacts associated with the Proposal. The assessment has been undertaken for a typical weekday AM and PM peak scenario.

4.1 Traffic generation

An estimate of the peak hour traffic generation for the Proposal has been determined based on trip generation rates provided in *Roads and Maritime's Guide to Traffic Generating Developments (2002)*. The expected increase in traffic associated with the proposal has been determined by applying the trip generation rates to the existing and proposed land uses and dwelling breakdown as discussed in Section 3.

The estimated number of vehicles trips generated by the Proposal site is detailed in Table 4-1.

Table 4-1 Peak hour trip generation

Land use	Trip generation rate (peak hour vehicles trips, vph)	Argyll Estate Proposed Dwelling Type	Trip generation (2022, Existing)		Trip generation (2027, Year 4)		Trip generation (2033, Year 10)	
			Dwellings	Trips	Dwellings	Trips	Dwellings	Trips
Dwelling Houses	0.85 per dwelling	Single dwellings and dual occupancy dwellings	197	168	83	71	83	71
Medium density residential flat building	0.50 per dwelling for smaller units and flats (up to two bedrooms) 0.65 per dwelling for later units and town houses (three or more bedrooms)	RFB – 1BR	0	0	106	53	106	53
		RFB – 2BR	0	0	73	37	73	37
		RFB – 3BR	0	0	162	106	198	129
Trip generation				168	267		290	
Total additional trips					99		122	

The Proposal is estimated to generate 99 additional peak hour vehicle trips in 2027 (Year 4), and 122 additional peak hour vehicle trips in 2033 (Year 10). The distribution of this additional traffic to the network has been assumed based on the observed distribution of the existing (2022) traffic to access the Proposal site:

- Bray Street via Frederick Street 30 per cent (AM peak) 27 per cent (PM peak)
- Bray Street via Elm Street 29 per cent (AM peak) 28 per cent (PM peak)
- Pacific Highway via Argyll Street 13 per cent (AM peak) 11 per cent (PM peak)
- Other roads 28 per cent (AM peak) 34 per cent (PM peak)

Directional traffic distribution of development-generated trips has been assumed to be as follows, based on the Institute of Transportation Engineers' Trip Generation (2018) rates for low rise residential developments:

- Weekday AM peak hour of generator: 20% entering, 80% exiting
- Weekday PM peak hour of generator: 64% entering, 36% exiting

In addition to the Proposal trip generation, the following assumptions have been applied to estimate the future traffic in the network:

- Future infill development in proximity to the Proposal site is expected have a dwelling yield of 170 additional dwellings by year 2044, contributing to traffic along Bray Street. For the purposes of this assessment, it has been assumed that 25 per cent of this would be realised by 2027 and 50 per cent by 2033. Using a trip generation rate of 0.85 peak hour trips per dwelling results to the following additional traffic on Bray Street. These trips have been assumed to be split equally for both directions.
 - 2027 (Year 4) +37 vph

- 2033 (Year 10) +73 vph
- By 2033 (Year 10), the Coffs Harbour Bypass is expected to be fully operational, which would result to a 28 per cent decrease in traffic along Bray Street and a 26 per cent decrease along Pacific Highway near the Proposal site. This assumption is based upon estimates from the *Coffs Harbour Bypass Environmental Impact Statement - Traffic and Transport Assessment* (Arup, 2019).

4.2 Intersection performance

The assessment of traffic generated by the Proposal and potential effect on the existing road network were carried out using SIDRA 9 intersection modelling software. Future year traffic volume was estimated by projecting existing background traffic to grow based on an annual average growth rate of 1.1 per cent from 2022 to 2024, and 0.9 per cent from 2024 to 2033.

The following key assumptions were applied in SIDRA modelling:

- An optimum cycle time of 140 seconds were applied in base and future models.
- A total of 50 pedestrians were assumed crossing each crossing at the signalised intersection at Pacific Highway and Bray Street under existing and future scenarios. This is considered a conservative assumption for the purposes of the traffic modelling analysis.

A summary of the SIDRA results for the 2027 and 2033 intersection performance for the “without” and “with” Argyll Estate development for the weekday AM and PM peak periods is shown in Table 4-2 to Table 4-5.

Table 4-2 Future intersection performance (2027, Year 4) without Argyll Estate development

ID	Intersection Name	AM Peak Hour (08:15 - 09:15)				PM Peak Hour (15:15 - 16:15)			
		Ave Delay (s)	LoS	95 th % Queue (m)	DoS	Ave Delay (s)	LoS	95 th % Queue (m)	DoS
1	Bray Street / Joyce Street	9	LoS A	21	0.45	9	LoS A	11	0.36
2	Bray Street / Frederick Street	8	LoS A	1	0.35	10	LoS A	1	0.34
3	Bray Street / Elm Street / Access Road	20	LOS A	74	0.35	22	LoS B	185	0.33
4	Bray Street / Pacific Highway / Orlando Street	43	LoS D	251	1.08	71	LoS F	392	0.98
5	Argyll Street / Pacific Highway	100+	LoS F	25	1.23	100+	LoS F	24	1.00
6	Argyll Street / Frederick Street	5	LoS A	0	0.02	5	LoS A	0	0.03
7	West Argyll Street / Joyce Street	5	LoS A	0	0.18	5	LoS A	1	0.15

Notes:

- The average delay for priority-controlled intersections is selected from the movement on the approach with the highest average delay.
- The level of service for priority-controlled intersections is based on the highest average delay per vehicle for the most critical movement.
- The degree of saturation (DoS) is defined as the ratio of the arrival flow (demand) to the capacity of each approach.
- Average delay is given in seconds per vehicle.

Table 4-3 Future intersection performance (2027, Year 4) with Argyll Estate development

ID	Intersection Name	AM Peak Hour (08:15 - 09:15)				PM Peak Hour (15:15 - 16:15)			
		Ave Delay (s)	LoS	95 th % Queue (m)	DoS	Ave Delay (s)	LoS	95 th % Queue (m)	DoS
1	Bray Street / Joyce Street	9	LoS A	21	0.45	9	LoS A	12	0.37
2	Bray Street / Frederick Street	8	LoS A	1	0.35	10	LoS A	2	0.34
3	Bray Street / Elm Street / Access Road	21	LOS C	85	0.35	23	LoS B	192	0.34
4	Bray Street / Pacific Highway / Orlando Street	43	LoS D	254	1.08	73	LoS F	392	0.99
5	Argyll Street / Pacific Highway	100+	LoS F	46	1.75	100+	LoS F	24	1.00
6	Argyll Street / Frederick Street	5	LoS A	0	0.02	5	LoS A	1	0.04
7	West Argyll Street / Joyce Street	5	LoS A	0	0.18	5	LoS A	1	0.15

Notes:

- The average delay for priority-controlled intersections is selected from the movement on the approach with the highest average delay.
- The level of service for priority-controlled intersections is based on the highest average delay per vehicle for the most critical movement.
- The degree of saturation (DoS) is defined as the ratio of the arrival flow (demand) to the capacity of each approach.
- Average delay is given in seconds per vehicle.

A comparison of the SIDRA modelling results for the base 2022 and 2027 “without” and “with” development scenario indicates the following:

- During the PM peak period, the Bray Street / Pacific Highway / Orlando Street is expected to reduce from LoS D in 2022 to LoS F in 2027, for both the “without” and “with” Proposal scenarios.
- The intersection performance of Argyll Street / Pacific Highway is expected to remain at LoS F during AM and PM peak periods in 2027 for both the “without” and “with” Proposal scenarios, which is similar to existing 2022 scenario.
- All other intersections are expected to operate with and acceptable LoS (i.e. better than LoS E) during the weekday morning and weekday evening peak periods.

- The Proposal is expected to have minimal impacts to the operation of intersections in the surrounding road network in 2027.

Table 4-4 Future intersection performance (2033, Year 10) – without Argyll Estate development

ID	Intersection Name	AM Peak Hour (08:15 - 09:15)				PM Peak Hour (15:15 – 16:15)			
		Ave Delay (s)	LoS	95 th % Queue (m)	DoS	Ave Delay (s)	LoS	95 th % Queue (m)	DoS
1	Bray Street / Joyce Street	7	LoS A	10	0.34	7	LoS A	8	0.28
2	Bray Street / Frederick Street	7	LoS A	1	0.27	8	LoS A	1	0.27
3	Bray Street / Elm Street / Access Road	14	LoS A	8	0.28	15	LOS B	39	0.27
4	Bray Street / Pacific Highway / Orlando Street	37	LoS C	190	0.71	49	LoS D	218	0.84
5	Argyll Street / Pacific Highway	100+	LoS F	27	1.19	100+	LoS F	15	0.86
6	Argyll Street / Frederick Street	5	LoS A	0	0.02	5	LoS A	0	0.03
7	West Argyll Street / Joyce Street	5	LoS A	0	0.19	5	LoS A	1	0.16

Notes:

- The average delay for priority-controlled intersections is selected from the movement on the approach with the highest average delay.
- The level of service for priority-controlled intersections is based on the highest average delay per vehicle for the most critical movement.
- The degree of saturation (DoS) is defined as the ratio of the arrival flow (demand) to the capacity of each approach.
- Average delay is given in seconds per vehicle.

Table 4-5 Future intersection performance (2033, Year 10) – with Argyll Estate development

ID	Intersection Name	AM Peak Hour (08:15 - 09:15)				PM Peak Hour (15:15 – 16:15)			
		Ave Delay (s)	LoS	95 th % Queue (m)	DoS	Ave Delay (s)	LoS	95 th % Queue (m)	DoS
1	Bray Street / Joyce Street	7	LoS A	10	0.35	7	LoS A	8	0.29
2	Bray Street / Frederick Street	7	LoS A	1	0.28	8	LoS A	1	0.28
3	Bray Street / Elm Street / Access Road	14	LoS A	14	0.40	15	LOS B	8	0.28
4	Bray Street / Pacific Highway / Orlando Street	37	LoS C	174	0.77	51	LoS D	226	0.86
5	Argyll Street / Pacific Highway	100+	LoS F	56	1.91	100+	LoS F	19	1.00
6	Argyll Street / Frederick Street	5	LoS A	0	0.03	5	LoS A	1	0.04
7	West Argyll Street / Joyce Street	5	LoS A	1	0.20	5	LoS A	1	0.16

Notes:

- The average delay for priority-controlled intersections is selected from the movement on the approach with the highest average delay.
- The level of service for priority-controlled intersections is based on the highest average delay per vehicle for the most critical movement.
- The degree of saturation (DoS) is defined as the ratio of the arrival flow (demand) to the capacity of each approach.
- Average delay is given in seconds per vehicle.

A comparison of the SIDRA modelling results for the base 2027 and 2033 “without” and “with” development scenario indicates the following:

- The intersections along the Pacific Highway and Bray Street are expected to operate with lower average delays in 2033, which is associated with the expected decrease in traffic related to the implementation of the proposed Coffs Harbour Bypass..

- The operation of the Bray Street / Pacific Highway / Orlando Street intersection is expected to improve during PM peak, from LoS F in 2027 to an acceptable LoS D in 2033 for both the “without” and “with” development scenarios.
- The Argyll Street / Pacific Highway intersection is expected to continue to operate at LoS F during AM and PM peak periods for both the “without” and “with” development scenarios in 2033. However, the critical movements along the Pacific Highway at this intersection are expected to operate satisfactorily. Additionally, an alternative access to the Pacific Highway is provided via the nearby signalised intersection of Bray Street / Pacific Highway, which, is noted to operate with an acceptable LoS D or better during peak periods in 2033.
- All other intersections are expected to operate with an acceptable LoS (i.e. better than LoS E) during the weekday morning and weekday evening peak periods.
- The Proposal is expected to have minimal impacts to the operation of intersections in the surrounding road network in 2033.

4.3 West Argyll Street and Argyll Street connection

Argyll Street is currently a no-through road at its western end. West Argyll Street functions as a local road located to the west of the Proposal site, where it forms a loop road with Jackson Place and is connected to Joyce Street via a priority-controlled intersection.

Argyll Street and West Argyll Street share the same alignment but are currently disconnected for traffic and do not allow for through vehicle movement. CHCC have requested that the potential to connect the two roads is considered to potentially improve the permeability of the local network for traffic. The layout of the existing roads is shown in Figure 4-1.



Base map: SIX Maps; modified by GHD

Figure 4-1 Existing West Argyll Street and Argyll Street layout

4.3.1 Intersection performance with new connection at West Argyll Street

To provide a high-level assessment of the potential impacts of connecting the two roads, the scenario has been modelled using SIDRA 9 intersection for the full development scenario in 2033. The following assumptions have been adopted for this analysis:

- 50 per cent of the vehicles turning right from Joyce Street to Bray Street would be diverted to the new route to access Pacific Highway (heading northeast).
- Southwest-bound vehicles coming from the Proposal site would access Joyce Street from the new connection in West Argyll Street, instead of using Frederick Street – Bray Street – Joyce Street.
- Northeast-bound vehicles coming from West Argyll Street heading to Pacific Highway would utilise the new Argyll Street connection instead of going through Joyce Street and Bray Street.

The potential diversions that have been assumed for the purpose of this assessment is shown in Figure 4-2. The following vehicle volumes are assumed to be diverted to the new connection:

- From Joyce Street to Pacific Highway (green) 26 vph (AM peak) 70 vph (PM peak)
- From Frederick Street to Joyce Street (red) 13 vph (AM peak) 11 vph (PM peak)
- From West Argyll Street to Pacific Highway (blue) 4 vph (AM peak) 9 vph (PM peak)

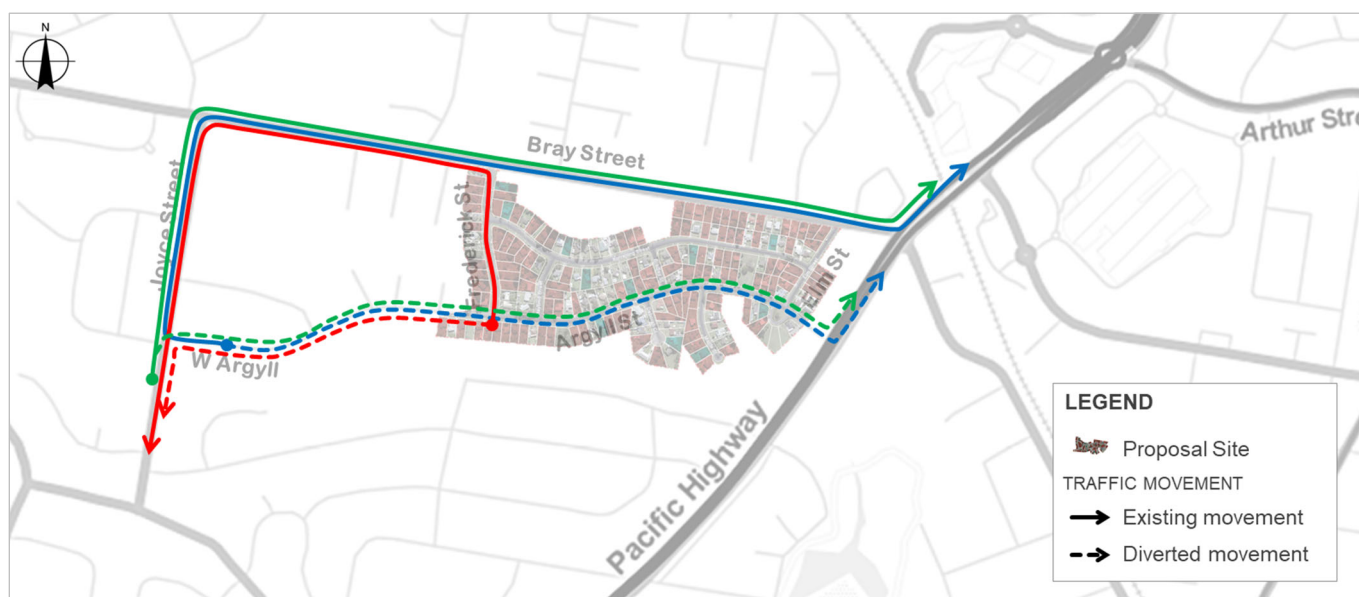


Figure 4-2 Potential diversions with West Argyll and Argyll Street connection

The SIDRA results for weekday 2033 AM and PM peak periods are summarised in Table 4-6 and Table 4-7.

Table 4-6 Future intersection performance (2033, Year 10) – connected West Argyll and Argyll Street, without Argyll Estate development

ID	Intersection Name	AM Peak Hour (08:15 - 09:15)				PM Peak Hour (15:15 - 16:15)			
		Ave Delay (s)	LoS	95 th % Queue (m)	DoS	Ave Delay (s)	LoS	95 th % Queue (m)	DoS
1	Bray Street / Joyce Street	7	LoS A	10	0.34	7	LoS A	6	0.28
2	Bray Street / Frederick Street	7	LoS A	1	0.26	8	LoS A	1	0.27
3	Bray Street / Elm Street	13	LoS A	3	0.27	9	LoS A	2	0.27
4	Bray Street / Pacific Highway / Orlando Street	37	LOS C	190	0.71	49	LoS D	218	0.84
5	Argyll Street / Pacific Highway	100+	LoS F	27	1.19	100+	LoS F	15	0.86
6	Argyll Street / Frederick Street	5	LoS A	0	0.03	5	LoS A	1	0.05
7	West Argyll Street / Joyce Street	5	LoS A	2	0.20	5	LoS A	4	0.16

Notes:

- The average delay for priority-controlled intersections is selected from the movement on the approach with the highest average delay.
- The level of service for priority-controlled intersections is based on the highest average delay per vehicle for the most critical movement.

- The degree of saturation (DoS) is defined as the ratio of the arrival flow (demand) to the capacity of each approach.
- Average delay is given in seconds per vehicle.

Table 4-7 Future intersection performance (2033, Year 10) – connected West Argyll and Argyll Street, with Argyll Estate development

ID	Intersection Name	AM Peak Hour (08:15 - 09:15)				PM Peak Hour (15:15 – 16:15)			
		Ave Delay (s)	LoS	95 th % Queue (m)	DoS	Ave Delay (s)	LoS	95 th % Queue (m)	DoS
1	Bray Street / Joyce Street	8	LoS A	10	0.35	8	LoS A	6	0.28
2	Bray Street / Frederick Street	7	LoS A	1	0.26	8	LoS A	2	0.28
3	Bray Street / Elm Street	14	LoS A	4	0.49	9	LoS A	3	0.29
4	Bray Street / Pacific Highway / Orlando Street	38	LOS C	193	0.75	51	LoS D	226	0.86
5	Argyll Street / Pacific Highway	100+	LoS F	55	1.86	100+	LoS F	19	1.00
6	Argyll Street / Frederick Street	5	LoS A	1	0.04	5	LoS A	2	0.05
7	West Argyll Street / Joyce Street	5	LoS A	2	0.20	5	LoS A	4	0.17

Notes:

- The average delay for priority-controlled intersections is selected from the movement on the approach with the highest average delay.
- The level of service for priority-controlled intersections is based on the highest average delay per vehicle for the most critical movement.
- The degree of saturation (DoS) is defined as the ratio of the arrival flow (demand) to the capacity of each approach.
- Average delay is given in seconds per vehicle.

A comparison of the SIDRA results for the 2033 without and with connection of West Argyll Street and Argyll Street (assuming full development of the Proposal) scenarios indicates the following:

- The LoS of all intersections remains the same with the West Argyll Street connection, as compared to without connection.
- The intersection performance of Argyll Street / Pacific Highway is expected to continue operating at LoS F during AM and PM peak periods. A slight increase in average delays is expected, although it is noted that an alternative access to the Pacific Highway is provided via the nearby signalised intersection of Bray Street / Pacific Highway, which, is noted to operate with an acceptable LoS D or better during peak periods in 2033.
- All other intersections are expected to operate with and acceptable LoS (i.e. better than LoS E) during the weekday morning and weekday evening peak periods.

It should be noted that the methodology provides an indication of the potential impacts of the reconnection given the high-level assumptions that have been made for the purposes of the assessment. To capture local travel behaviours more accurately, a local origin-destination study within the study area would be necessary to identify preferred routes and destinations of residents.

Additionally, it is recommended that community consultation is undertaken to confirm if the potential connection is in line with the community's needs.

4.3.2 Traffic calming measures

While the connection of West Argyll Street and Argyll Street may improve connectivity and permeability in the road network, connecting the two streets has the potential to attract through traffic along Argyll Street and encourage the use of residential roads as a shortcut to access the Pacific Highway. This could result to higher traffic volumes along this the residential access local road, potentially introducing safety risks for valuable road users and becoming a barrier for pedestrians to cross the road.

Traffic calming measures outlined in the following sub-sections could be considered by council. This section has been prepared in reference to the Local Area Traffic Management (LATM) Toolkit from the *Austrroads Guide to Traffic Management Part 8: Local Street Management (2020)*.

Vertical deflection devices

Vertical deflection devices are physical devices which create a vertical change in the path of travel. They generally result in reduced vehicle speeds as drivers attempt to avoid discomfort when travelling over the device. Vertical deflection devices which may be considered for West Argyll / Argyll Street include road humps and road cushions.

Road humps are typically 70 to 120 mm high with a total length of 3 m to 4 m (Austrroads, 2020). The provision of road humps can result in a reduction in vehicle speeds, road crashes and through traffic.

Road cushions are an alternative to road humps that occupy only part of the roadway (as opposed to road humps which occupy the whole width). Road cushions are designed to be more sympathetic to cyclists, buses and commercial vehicles. They are generally 70 mm to 80 mm high, 3.0 m long, with a width of 1.6 to 1.9 m (Austrroads 2020).

Since the road is not on a bus route and shared paths / off-street cycling routes are planned to be provided along the street, road humps are considered to be most suitable for West Argyll and Argyll Streets. Austrroads recommends that road humps be spaced at least 80 m apart, and generally not more than 120 – 150 m.

Horizontal deflection devices

Horizontal deflection devices are physical features which alter the horizontal path of a vehicle. The deflection may result in a reduction in traffic volume, speed and conflicts. Horizontal deflection devices which may be suitable for the location include lane narrowing and slow points.

Lane narrowing involves reducing the trafficable carriageway width to reduce vehicle speeds, while a slow point is a series of kerb extensions which narrow and / or angle the roadway. Slow points can be either one or two lanes, however, two-lane slow points are usually less effective in controlling speeds and providing adequate visual obstruction (Austrroads 2020).

The potential connection could take advantage of the existing layout to keep the trafficable carriageway width at a minimum and introduce horizontal deflection devices to maintain vehicle speeds in the area. Examples of these applications are shown in Figure 4-3 and Figure 4-4.



Source: AGTM Part 8 (Austrroads 2020) | (L) City of Yarra, Victoria; (R) City of Glenorchy, Tasmania

Figure 4-3 **Examples of lane narrowing / kerb extensions**



Source: AGTM Part 8 (Austroads 2020) | (L) City of South Perth, Western Australia; (R) City of Prospect, South Australia

Figure 4-4 Examples of one-lane slow points

Opportunities to introduce landscaping and vegetation on narrow points / kerb extensions to serve as in-street rain gardens may also be explored, noting that proper consideration of the type of vegetation and maintenance be in place to ensure that landscaping would not obscure views and impact safety. The potential to design narrow points and kerb extensions to double as pedestrian and cyclist refuge areas at crossing points could also be considered.

Literature cited in the guide recommends that deflection devices be spaced about 80 m – 120 m apart to have the intended influence on speeds for the road.

4.4 Mode shift

The Coffs Harbour LGMS identifies car reliance as one of the key challenges for the Transport and Infrastructure sector in the LGA. Over the years, initiatives to address this have been developed, guided by Regional and Local strategic documents and policies. In addition to the funding of the Coffs Harbour Bypass, other initiatives have also been adopted by TfNSW. Initiatives relevant to the study area include:

- Using the NSW Movement and Place Framework to plan road networks and allocate road space in a way that improves the liveability of places
- Improving public transport opportunities, including services and infrastructure
- Increasing active transport mode share to and from the area, by providing walking and cycling connectivity and facilities.

The LGMS further identifies opportunities that can be built upon for the Transport and Infrastructure sector. The opportunities focus on improving public transport services (access, technology / innovation) and the improvement of active transport networks.

As discussed in Section 2.4, the existing active transport network within and around the Proposal site is disconnected and inconsistent. Access to places which are supposedly within walking distances are hindered by large block sizes and the absence of dedicated walking / cycling paths, further encouraging car use as the primary mode of transport.

CHCC are currently developing an Active Transport Plan to improve connections across the LGA, including the investigation area.

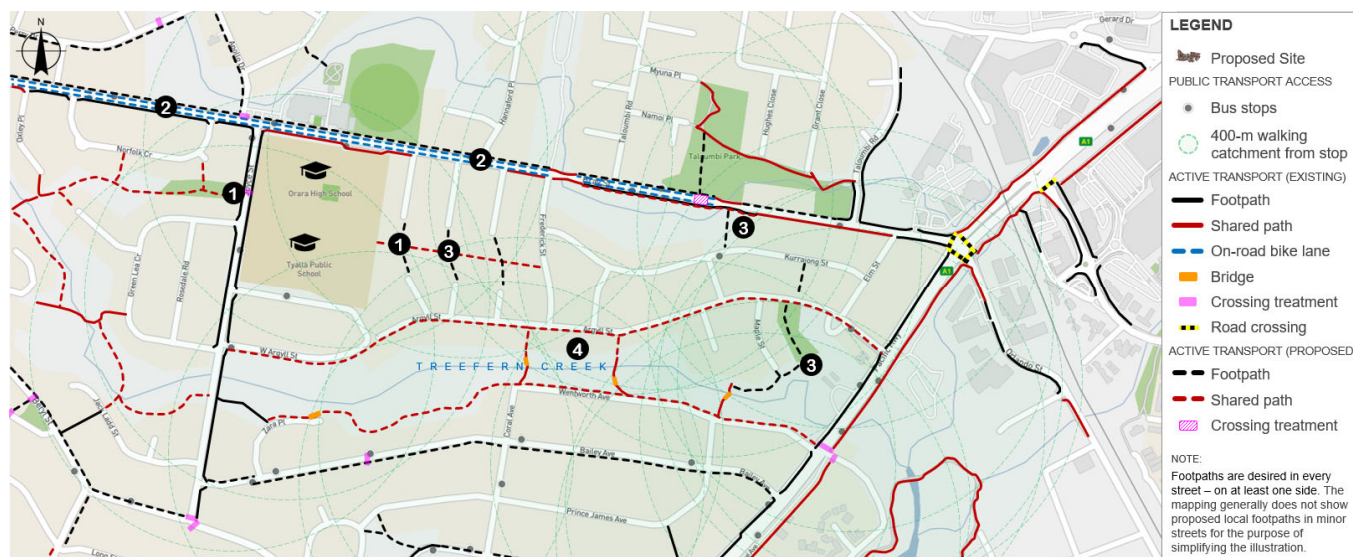
The potential active transport facilities and networks identified in Figure 4-5 have been discussed and developed in consultation with CHCC. This includes potential active transport facilities / connections in the vicinity of the Proposal site, including improved connection to public transport facilities (bus stops) and other key attractors, such as nearby schools.

These opportunities have been identified with a focus on improving everyday trips (e.g. commute to school / work) and generally align to the following strategies:

1. Improving / completing connections to the schools

2. Completing footpath and cycling connections along Bray Street
3. Improving permeability
4. Optimising use of existing reserves for active transport links and 'linear parks'.

It is recommended that these opportunities are considered to provide improved walking and cycling connectivity to the Proposal site, including to key surrounding attractors such as schools and recreation areas, as well as connecting with public transport services. This will help achieve a higher mode share for walking cycling and public transport for residents and visitors to the area.



Data from CHCC Active Transport Map; Base map from TfNSW Trip Planner Map; modified by GHD

Figure 4-5 Active and public transport improvement strategies

The operation of the Coffs Harbour Bypass is expected to reduce traffic along Bray Street and Pacific Highway, which could provide opportunities for the development of strategic active transport links along these corridors. Improving walking and cycling connections along Bray Street is seen to provide benefits to the immediate community and could complement future strategic links across the LGA (e.g. potential strategic cycling paths along Pacific Highway after the completion of the bypass). Completing a shared path along Bray Street and proding a new shared path along Argyll Street / West Argyll Street would also improve access to the schools located west of the Proposal site.

Open spaces within the Proposal site and the adjoining residential estates provide opportunity for activation and improved permeability. The provision of walking and cycling paths to connect local streets and areas of interest (e.g. schools, parks, fields) through these open spaces could improve the pedestrian experience by providing shorter routes and giving people a safer and more enjoyable walking / cycling environment. These links would also open up new access points to bus stops along Bray Street and Wentworth Avenue and could potentially encourage an increase in public transport use.

The proposed links (shown in Figure 4-5) would open up the following walking / cycling connections:

- Kurrajong Street and Bray Street / Taloumbi Park
- Direct access to schools from Frederick Street
- Joyce Street and Pacific Highway via Argyll Street and Treefern Creek
- Argyll Street and Wentworth Ave (south of Treefern Creek)

Table 4-8 and Table 4-9 outline the required minimum path widths that to allow for pedestrians and cyclists to safely use the facilities. These tables are lifted from Table 5.1 and 5.3 of *Austrroads Guide to Road Design Part 6A: Paths for Walking and Cycling (2021)*.

Table 4-8 Width requirements for pedestrian paths

Situation	Suggested minimum width	Comments
General low volume	1.2 m *	- General minimum is 1.2 m for most roads and streets. - Clear width required for one wheelchair. - Not adequate for commercial or shopping environments.
High pedestrian volumes	2.4 m (or higher based on volume)	Generally commercial and shopping areas.
For wheelchairs to pass	1.8 m	Refer also to AS 1428.1:2009.

* In constrained locations an absolute minimum of 1.0 m should be provided. In these situations, path users should be able to detect other path users with sufficient time to respond and take appropriate actions.

Table 4-9 Width requirements for shared paths

	Local access path	Regional path ⁽³⁾	Recreational path
Desirable minimum width	2.5 m	3.0	3.5
Maximum width – typical maximum	2.0 ⁽¹⁾ – 3.0 ⁽²⁾ m	2.5 ⁽¹⁾ – 4.0 ⁽²⁾ m	3.0 ⁽¹⁾ – 4.0 ⁽²⁾ m

(1) A lesser width should only be adopted where cyclist volumes and operational speeds will remain low.

(2) A greater width may be required where the numbers of cyclists and pedestrians are very high or there is a high probability of conflict between users (e.g. people walking dogs, in-line skaters etc.).

(3) May be part of a principal bicycle network in some jurisdictions.

It is worth noting that the TfNSW Walking Space Guide (2020), which provides guidance on the amount of space necessary to allow for comfortable walking environments for pedestrians, recommends wider widths – at least 2 m for local (Type 1 - low activity) footpaths. Council is generally adopting a minimum path width of 1.5 m.

Based on a desktop check, roads within the Proposal site are expected to have enough space to accommodate the proposed footpaths with widths of 1.5 m. Wider roads such as Argyll Street also have the capacity to provide wider footpaths.

5. Parking requirements

This section provides an overview of the car parking requirements for the Proposal. The requirements have been determined based on *Roads and Maritime Service's (RMS) Guide to Traffic Generating Developments (2002)* and *Coffs Harbour City Council Development Control Plan (DCP) 2015* and recent guidance provided by CHCC in April 2022.

Roads and Maritime parking requirements

The parking rates provided in Roads and Maritime's *Guide to Traffic Generating Developments (2002)* are summarised in Table 5-1 along with the resulting number of required parking spaces.

Table 5-1 Parking requirements based on RMS Guide to Traffic Generating Developments (2002)

Dwelling type	Parking rate (Off-street)	Argyll Estate proposed dwelling type	Parking space requirements (2027, Year 4)		Parking space requirements (2033, Year 10)	
			Dwellings	Spaces	Dwellings	Spaces
Dwelling houses	1 space for each unit	Single dwellings and dual occupancy dwellings *	239	239	275	275
High density residential flat buildings (RFB) – Metropolitan Sub-Regional Centres	0.6 spaces per 1BR unit	RFB – 1BR	106	64	106	64
	0.9 spaces per 2BR unit	RFB – 2BR	73	66	73	66
	1.40 spaces per 3BR unit	RFB – 3BR	6	9	6	9
	+ 1 space per each 5 units for visitor parking or part thereof	RFB Total	185	37	185	37
Total parking space requirement (RTA/RMS)			415		451	

* GFA between 115 - 220 m²

Table 5-1 indicates that up to 451 parking spaces would be required for the proposed development at Year 10 based on RMS requirements.

DCP parking requirements

Part F1.4 of the CHCC DCP (2015) sets out the parking rates for off-street parking for residential uses. The DCP parking rates and resulting parking requirements for the proposed development are summarised in Table 5-2. The parking requirements have been based on the indicative growth scenario breakdown as discussed in Section 3.

Table 5-2 Parking requirements based on Coffs Harbour City Council DCP (2015)

Dwelling type	Parking rate (Off-street)	Argyll Estate proposed dwelling type	Parking space requirements (2027, Year 4)		Parking space requirements (2033, Year 10)	
			Dwellings	Spaces	Dwellings	Spaces
Attached dwelling / Dwelling house / Dual occupancy / Semi - detached	1 space for GFA ≤100m² 2 spaces for GFA >100m²	Single dwellings and dual occupancy dwellings *	239	478	275	550
Multi-dwelling housing / Residential flat building (RFB)	1 space for GFA ≤100m² 2 spaces for GFA >100m² + 1 space per every five dwellings or part thereof for visitor / overflow spaces	RFB – 1BR	106	106	106	106
		RFB – 2BR	73	73	73	73
		RFB – 3BR	6	6	6	6
		RFB Total	185	37	185	37
Total parking space requirement (CHCC DCP)			700		772	

* GFA between 115 - 220 m²

Table 5-2 indicates that up to 772 parking spaces would be required for the proposed development at Year 10 based on DCP requirements. It must be noted that the CHCC DCP indicates the following requirements for car spaces of Attached Dwelling houses:

- ≤100m² GFA: one space behind front setback
- >100m² GFA: two spaces, at least one space behind front setback

Further, the DCP indicated that stack parking is acceptable for attached dwelling houses, but not for multi-dwelling housing and RFBs.

The DCP requirements are noted to be much greater (50 per cent more) than that of the RMS requirements. A review of the parking requirements of regional cities in the North Coast Region (refer to Table 5-3) also show that the current CHCC DCP parking rate of two car spaces for dwellings with GFA >100m² is on the higher side and may result to the provision excess parking spaces which would not be utilised.

Table 5-3 Comparison of parking requirements – North Coast Regional Cities

Dwelling type	Coffs Harbour DCP 2015	Port Macquarie DCP 2013	Tweed Shire DCP 2008
Attached dwelling / Dwelling house/ Dual occupancy / Semi-detached dwelling	1 for GFA ≤100m ² 2 for GFA >100m ²	1 per dwelling	1 space per dwelling plus provision for driveway parking of another vehicle
Multi-dwelling housing / Residential flat building (RFB)	1 for GFA ≤100m ² 2 for GFA >100m ²	1 per 1- or 2-bedroom unit 1.5 per 3- to 4-bedroom unit	1 per each 1-bedroom unit, 1.5 per 2-bedroom unit, 2 per 3+ bedroom units
Visitor parking	+ 1 space per five dwellings or part thereof	+ 1 space per 4 units	+1 space per 4 units

Discussions with CHCC indicated that Council are looking to reduce parking rates for residential flat buildings (RFBs) and attached dwellings / dwelling houses / dual occupancy / semi- detached dwellings. Council has recommended that the following reduced parking rates be adopted for these dwelling types:

- 1 space per dwelling (regardless of GFA)
- No visitor parking requirements
- Alternative arrangements to be considered where parking rates may trigger the need for basement parking or additional levels of basement parking.

These updated rates are listed in Table 5-4.

Table 5-4 Parking requirements based on the Coffs Harbour City Council recommendations (2022)

Dwelling type	Parking rate (Off-street)	Argyll Estate proposed dwelling type	Parking space requirements (2027, Year 4)		Parking space requirements (2033, Year 10)	
			Dwellings	Spaces	Dwellings	Spaces
Attached dwelling / Dwelling house	1 space per dwelling	Single dwellings	83	83	83	166
Dual occupancy / semi-detached	1 space per dwelling	Dual occupancy	156	156	192	192
Multi-dwelling housing / Residential flat building (RFB)	1 space per dwelling	RFB – 1BR	106	106	106	106
		RFB – 2BR	73	73	73	73
		RFB – 3BR	6	6	6	6
Total parking space requirement (CHCC DCP 2022 [recommended])			424		460	

It should also be noted that the clause 18 of the NSW Housing State Environmental Planning Policy (SEPP) provides reduced parking rates for a development application made by a social housing provider for development

on land in an accessible area. However, the site does not qualify as an 'accessible area' as services at bus stops within the 400m walking catchment are not frequent enough.

Given the above revised parking requirements are similar to the RMS requirements (refer to Table 5-1), it is recommended that the revised Council parking rates are adopted.

6. Summary and conclusion

6.1 Overview

GHD Pty Ltd (GHD) has been commissioned by LAHC to conduct the Traffic and Transport Study (the Study) to inform the Planning Proposal of the potential redevelopment. The study involves the following scope of works:

- Assessment of existing and future traffic and transport covering
 - Vehicle movements and intersection capacity during peak periods
 - Access to public transport, connectivity to walking and cycling networks
 - Parking requirements
- High-level assessment of multi-modal transport to identify potential impacts
- Assessment of cumulative impacts of other approved developments (if any)
- Identification of infrastructure and sustainable transport initiatives to offset potential impacts

6.2 Key findings

Existing conditions

- Existing traffic conditions were determined from traffic volume counts conducted on 10 June 2021 and 15 March 2022. An annual growth rate of 1.1 per cent has been applied to estimate 2022 volume counts from the historical data.
- The existing peak hour for the network occurred between 08:15-09:15 AM and 15:15-16:15 PM.
- Results of the traffic modelling using SIDRA 9 indicate that:
- The Argyll Street / Pacific Highway intersection operates over capacity during the weekday AM and PM peak periods at LoS F. This is mainly due to high traffic volumes along Pacific Highway causing delays for vehicles to make the right turn movement from Argyll Street (minor approach) to Pacific Highway. However, the right turn movement from Argyll Street is low, with six vehicles during AM peak and three vehicles during PM peak observed to make this movement. The operation along the critical movements along the Pacific Highway operate with a satisfactory LoS. Additionally, drivers familiar with the area making this right turn movement can do so instead using the nearby signalised intersection of Bray Street / Pacific Highway, which is noted to operate with an acceptable LoS D or better during peak periods.
- All other intersections analysed in the road network currently operate at an acceptable LoS (i.e. better than Level of Service E) during the weekday morning and weekday evening peak periods.

6.2.1 Traffic impact assessment

- The Proposal seeks to increase the total number of dwellings in the Proposal site through the redevelopment of some existing properties into dual occupancy dwellings and residential flat buildings (RFB).
 - LAHC-owned sites: from 129 dwellings to 365
 - Private sites: from 68 dwellings to 95
 - Total of 263 additional dwellings, bringing the total number of dwellings to 460.
- The redevelopment is planned to be carried out over a ten-year delivery period, with bulk of the works proposed to be delivered in the first four years beginning late 2023. Assessment scenarios for the study were set for 2027 (Year 4 of redevelopment) and 2033 (Year 10).
- The Proposal is estimated to generate 99 additional peak hour vehicle trips in 2027, and 122 additional peak hour vehicle trips in 2033.
- The impacts of other future developments in proximity to the site have been included to estimate future traffic. This includes additional traffic from resulting from the future Bray Street infill development (+37

vph in 2027, + 73 vph in 2033) and a reduction in traffic resulting from the operation of the Coffs Harbour Bypass (-28 per cent along Bray Street by 2033).

A comparison of the SIDRA modelling results for the base 2027 and 2033 “without” and “with” development scenario indicates the following:

- The intersections along the Pacific Highway and Bray Street are expected to operate with lower average delays in 2033, which is associated with the expected decrease in traffic related to the implementation of the proposed Coffs Harbour Bypass.
- The operation of the Bray Street / Pacific Highway / Orlando Street intersection is expected to improve during PM peak, from LoS F in 2027 to an acceptable LoS D in 2033 for both the “without” and “with” development scenarios.
- The Argyll Street / Pacific Highway intersection is expected to continue to operate at LoS F during AM and PM peak periods for both the “without” and “with” development scenarios in 2033. However, the critical movements along the Pacific Highway at this intersection are expected to operate satisfactorily. Additionally, an alternative access to the Pacific Highway is provided via the nearby signalised intersection of Bray Street / Pacific Highway, which, is noted to operate with an acceptable LoS D or better during peak periods in 2033.
- All other intersections are expected to operate with and acceptable LoS (i.e. better than LoS E) during the weekday morning and weekday evening peak periods.
- The Proposal is expected to have minimal impacts to the operation of intersections in the surrounding road network in 2033.

6.2.2 West Argyll Street and Argyll Street Connection

The potential connection of West Argyll Street and Argyll Street was also modelled using SIDRA 9 using high-level assumptions about the percentage of traffic that would be diverted from the existing network to the new connection. A comparison of the SIDRA results for the 2033 without and with connection of West Argyll Street and Argyll Street (assuming full development of the Proposal) scenarios indicates the following:

- The LoS of all intersections remains the same with the West Argyll Street connection, as compared to without connection.
- The intersection performance of Argyll Street / Pacific Highway is expected to continue operating at LoS F during AM and PM peak periods. A slight increase in average delays is expected, although it is noted that an alternative access to the Pacific Highway is provided via the nearby signalised intersection of Bray Street / Pacific Highway, which, is noted to operate with an acceptable LoS D or better during peak periods in 2033.
- All other intersections are expected to operate with and acceptable LoS (i.e. better than LoS E) during the weekday morning and weekday evening peak periods.

It should be noted that the methodology provides an indication of the potential impacts of the reconnection given the high-level assumptions that have been made for the purposes of the assessment. To capture local travel behaviours more accurately, a local origin-destination study within the study area would be necessary to identify preferred routes and destinations of residents.

Additionally, it is recommended that community consultation is undertaken to confirm if the potential connection is in line with the community’s needs.

6.2.3 Mode shift and active transport

CHCC are currently developing an Active Transport Plan to improve connections across the LGA, including the investigation area.

A high-level review of the proposed infrastructure indicate that

- The completion of walking and cycling links (shared path) along Bray Street would benefit immediate community (schools, residential estates) and also complement strategic transport links across the LGA (e.g. potential protected cycling paths along Pacific Highway after the completion of the bypass).
- Open spaces provide opportunity for activation and improved permeability

- Providing paths through these open spaces would shorten walking distances and provide a safer and more enjoyable walking / cycling environment
- Paths would also open up connections across different streets, giving pedestrians additional route options and improved access to bus stops, potentially encouraging an increase in public transport use.
- The potential active transport facilities and networks identified in Figure 4-5 have been discussed and developed in consultation with CHCC. It is recommended that these opportunities are considered to provide improved walking and cycling connectivity to the Proposal site, including to key surrounding attractors such as schools and recreation areas, as well as connecting with public transport services. This will help achieve a higher mode share for walking cycling and public transport for residents and visitors to the area.

6.2.4 Parking Assessment

Parking space requirements have been determined based on Roads and Maritime Service's (RMS) Guide to Traffic Generating Developments (2002) and Coffs Harbour City Council Development Control Plan (DCP) 2015 and recent guidance provided by CHCC in April 2022. The parking analysis indicates that:

- RMS requirements indicate that a total of 415 parking spaces would be required in the Proposal site by 2027, and 451 spaces by 2033.
- DCP requirements indicate that a total of 700 parking spaces would be required in the Proposal site by 2027, and 772 spaces by 2033.
- The DCP requirements are much greater (around 50 per cent more) than that of RMS requirements. A review of parking requirements of regional cities within the North Coast Region show that the current DCP parking rates are extremely conservative and may warrant a review.
- Discussions with CHCC indicated that Council are looking to reduce parking rates for residential flat buildings (RFBs). The revised CHCC requirements indicate that a total of 424 parking spaces would be required for the Proposal site by 2027, and 460 spaces by 2033.
- Given the above revised parking requirements are similar to the RMS requirements, it is recommended that the revised Council parking rates are adopted.

6.3 Conclusion

Based on the assumptions and findings outlined in this report, it is considered that the Proposal satisfies the planning requirements on traffic engineering grounds and is not anticipated to have adverse traffic impacts on the surrounding road network.

Appendix A

Traffic count data

Site 1. Bray Street / Joyce Street

SURVEY INFORMATION

Site ID: 24.4

Location: Bray St & Joyce St, Coffs Harbour

Date: 10 / June / 2021

Time Period 1: 06:30 to 09:30

Time Period 2: 15:00 to 18:00

Primary Classes:

- Lights (1-2)
- Light Trucks (3-5)
- Heavy Trucks (6-12)
- Bicycles on Road
- None

Secondary Classes:

- Pedestrians
- None

Weather Conditions 1: Fine Weather Conditions 2: Fine

Intersection Legs:

North ☐ ON

East ☒ ON Bray St WB

South ☒ ON Joyce St NB

West ☒ ON Bray St EB

Output time interval: 15 min

MAP

Co-ordinates -30.281492 153.111998

Turning Movement Count Summary

Site ID: 24.4

Location: Bray St & Joyce St, Coffs Harbour

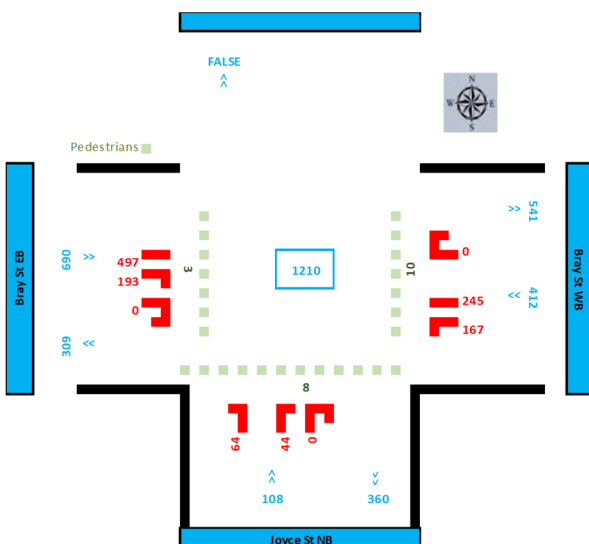
Date: 10-June-2021

Surveyed Time: 6:30 AM to 9:30 AM

Weather: Fine

Data for hour starting: 8:00 AM to 9:00 AM

Vehicle Class: ALL VEHICLES



Turning Movement Count Summary

Site ID: 24.4

Location: Bray St & Joyce St, Coffs Harbour

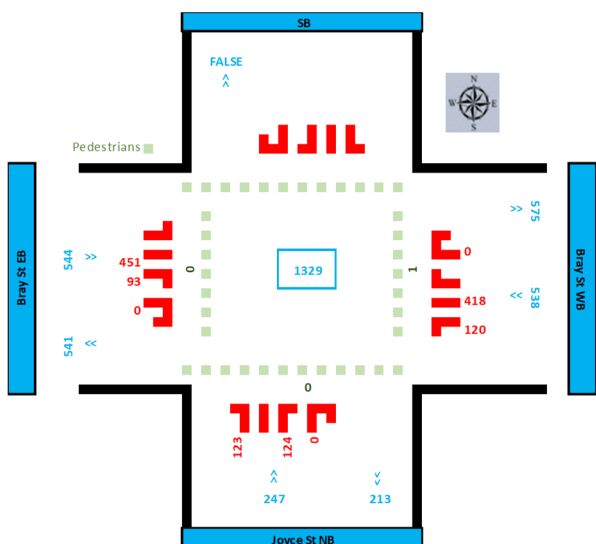
Date: 10-June-2021

Surveyed Time: 3:00 PM to 6:00 PM

Weather: Fine

Data for hour starting: 3:00 PM to 4:00 PM

Vehicle Class: ALL VEHICLES





Site 2. Bray Street / Frederick Street

TRANS TRAFFIC SURVEY

TURNING MOVEMENT SURVEY

Intersection of Bray St and Frederick St, Coffs Harbour

GPS -30.282380, 153.118118

Date:	Tue 15-03-22
Weather:	Fine
Suburban:	Coffs Harbour
Customer:	

North:	N/A
East:	Bray St
South:	Frederick St
West:	Bray St

Survey	AM: 6:30 AM-9:30 AM
Period	PM: 3:00 PM-6:00 PM
Traffic	AM: 8:00 AM-9:00 AM
Peak	PM: 3:30 PM-4:30 PM

All Vehicles

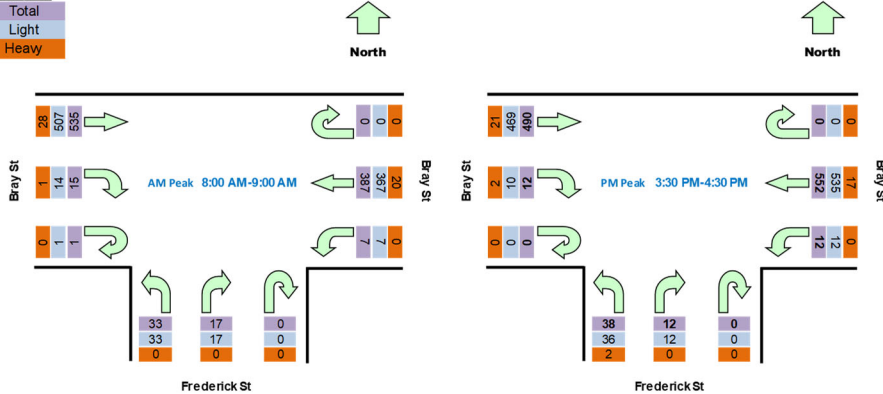
Time		East Approach Bray St			South Approach Frederick St			West Approach Bray St			Hourly Total	
Period Start	Period End	U	WB	L	U	R	L	U	R	EB	Hour	Peak
06:30	06:45	0	34	0	0	1	2	0	1	62	533	
06:45	07:00	0	51	1	0	1	4	0	0	85	609	
07:00	07:15	0	61	0	0	1	2	0	3	74	690	
07:15	07:30	0	60	3	0	3	3	0	3	78	766	
07:30	07:45	0	69	2	0	1	5	0	1	98	866	
07:45	08:00	0	80	1	0	3	1	0	0	138	941	
08:00	08:15	0	68	1	0	3	8	0	3	134	995	Peak
08:15	08:30	0	90	1	0	4	9	1	4	141	985	
08:30	08:45	0	100	2	0	6	13	0	6	124	938	
08:45	09:00	0	129	3	0	4	3	0	2	136		
09:00	09:15	0	86	2	0	2	8	0	2	107		
09:15	09:30	0	82	3	0	4	6	0	4	104		
15:00	15:15	0	131	1	0	4	15	0	4	81	1056	
15:15	15:30	0	122	5	0	2	9	0	7	131	1103	
15:30	15:45	0	136	5	0	3	17	0	3	127	1116	Peak
15:45	16:00	0	116	2	0	2	4	0	2	127	1074	
16:00	16:15	0	146	3	0	5	9	0	1	119	1077	
16:15	16:30	0	154	2	0	2	8	0	6	117	1091	
16:30	16:45	0	128	2	0	6	6	0	7	100	1072	
16:45	17:00	0	128	5	0	7	13	0	4	99	1068	
17:00	17:15	0	162	5	0	7	6	0	2	115	1039	
17:15	17:30	0	134	3	0	3	3	0	6	121		
17:30	17:45	0	127	2	0	2	5	1	2	106		
17:45	18:00	0	131	4	0	2	7	0	2	81		

Peak Time		East Approach Bray St			South Approach Frederick St			West Approach Bray St			Peak total
Period Start	Period End	U	WB	L	U	R	L	U	R	EB	
08:00	09:00	0	387	7	0	17	33	1	15	535	995
15:30	16:30	0	552	12	0	12	38	0	12	490	1116

Note: Site sketch is for illustrating traffic flows. Direction is indicative only, drawing is not to scale and not an exact streets configuration.

Graphic

Total
Light
Heavy



Light Vehicles

Time		East Approach Bray St			South Approach Frederick St			West Approach Bray St		
Period Start	Period End	U	WB	L	U	R	L	U	R	EB
06:30	06:45	0	30	0	0	1	2	0	1	60
06:45	07:00	0	45	1	0	1	3	0	0	80
07:00	07:15	0	56	0	0	1	2	0	3	74
07:15	07:30	0	55	3	0	3	3	0	3	75
07:30	07:45	0	68	2	0	1	4	0	1	92
07:45	08:00	0	78	1	0	2	1	0	0	136
08:00	08:15	0	64	1	0	3	8	0	3	125
08:15	08:30	0	85	1	0	4	9	1	4	134
08:30	08:45	0	95	2	0	6	13	0	6	115
08:45	09:00	0	123	3	0	4	3	0	1	133
09:00	09:15	0	81	2	0	2	8	0	2	103
09:15	09:30	0	78	3	0	4	6	0	4	99
15:00	15:15	0	125	1	0	4	15	0	4	80
15:15	15:30	0	119	5	0	2	6	0	7	126
15:30	15:45	0	129	5	0	3	16	0	2	118
15:45	16:00	0	114	2	0	2	3	0	2	125
16:00	16:15	0	139	3	0	5	9	0	1	114
16:15	16:30	0	153	2	0	2	8	0	5	112
16:30	16:45	0	120	2	0	6	6	0	7	98
16:45	17:00	0	125	5	0	7	13	0	4	97
17:00	17:15	0	161	5	0	7	6	0	2	115
17:15	17:30	0	134	3	0	3	2	0	6	121
17:30	17:45	0	123	2	0	2	5	1	2	102
17:45	18:00	0	130	4	0	2	7	0	2	78

Peak Time		East Approach Bray St			South Approach Frederick St			West Approach Bray St			Peak total
Period Start	Period End	U	WB	L	U	R	L	U	R	EB	
08:00	09:00	0	367	7	0	17	33	1	14	507	946
15:30	16:30	0	535	12	0	12	36	0	10	469	1074

Heavy Vehicles

Time		East Approach Bray St			South Approach Frederick St			West Approach Bray St		
Period Start	Period End	U	WB	L	U	R	L	U	R	EB
06:30	06:45	0	4	0	0	0	0	0	0	2
06:45	07:00	0	6	0	0	0	1	0	0	5
07:00	07:15	0	5	0	0	0	0	0	0	0
07:15	07:30	0	5	0	0	0	0	0	0	3
07:30	07:45	0	1	0	0	0	1	0	0	6
07:45	08:00	0	2	0	0	1	0	0	0	2
08:00	08:15	0	4	0	0	0	0	0	0	9
08:15	08:30	0	5	0	0	0	0	0	0	7
08:30	08:45	0	5	0	0	0	0	0	0	9
08:45	09:00	0	6	0	0	0	0	0	1	3
09:00	09:15	0	5	0	0	0	0	0	0	4
09:15	09:30	0	4	0	0	0	0	0	0	5
15:00	15:15	0	6	0	0	0	0	0	0	1
15:15	15:30	0	3	0	0	0	3	0	0	5
15:30	15:45	0	7	0	0	0	1	0	1	9
15:45	16:00	0	2	0	0	0	1	0	0	2
16:00	16:15	0	7	0	0	0	0	0	0	5
16:15	16:30	0	1	0	0	0	0	0	1	5
16:30	16:45	0	8	0	0	0	0	0	0	2
16:45	17:00	0	3	0	0	0	0	0	0	2
17:00	17:15	0	1	0	0	0	0	0	0	0
17:15	17:30	0	0	0	0	0	1	0	0	0
17:30	17:45	0	4	0	0	0	0	0	0	4
17:45	18:00	0	1	0	0	0	0	0	0	3

Peak Time		East Approach Bray St			South Approach Frederick St			West Approach Bray St			Peak total
Period Start	Period End	U	WB	L	U	R	L	U	R	EB	
08:00	09:00	0	20	0	0	0	0	0	1	28	49
15:30	16:30	0	17	0	0	0	2	0	2	21	42

Site 3. Bray Street / Elm Street

TRANS TRAFFIC SURVEY

TURNING MOVEMENT SURVEY

Intersection of Bray St and Elm St, Coffs Harbour

GPS -30.283470, 153.125371

Date:	Tue 15-03-22
Weather:	Fine
Suburban:	Coffs Harbour
Customer:	

North:	N/A
East:	Bray St
South:	Elm St
West:	Bray St

Survey	AM:	6:30 AM-9:30 AM
Period	PM:	3:00 PM-6:00 PM
Traffic	AM:	8:00 AM-9:00 AM
Peak	PM:	3:30 PM-4:30 PM

All Vehicles

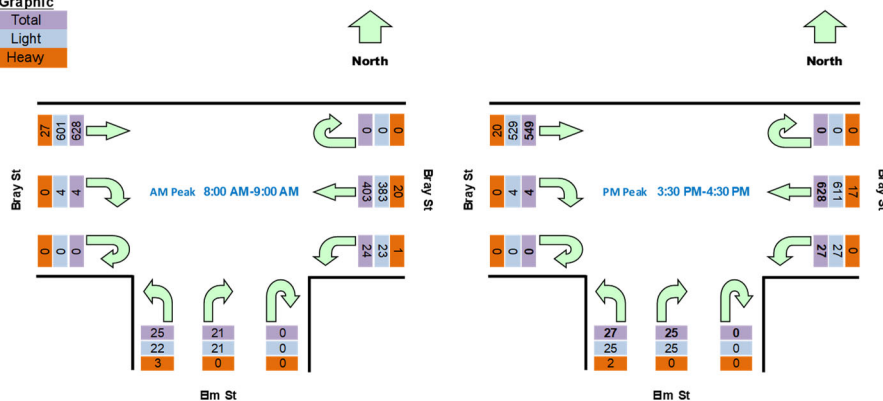
Time		East Approach Bray St			South Approach Elm St			West Approach Bray St			Hourly Total	
Period Start	Period End	U	WB	L	U	R	L	U	R	EB	Hour	Peak
06:30	06:45	0	36	1	0	1	0	0	0	85	615	
06:45	07:00	0	58	3	0	5	1	0	0	93	679	
07:00	07:15	0	59	1	0	4	3	0	1	95	764	
07:15	07:30	0	75	2	0	7	3	0	0	82	859	
07:30	07:45	0	65	3	0	6	3	0	1	109	962	
07:45	08:00	0	82	4	0	4	3	0	1	151	1055	
08:00	08:15	0	74	3	0	1	4	0	1	175	1105	Peak
08:15	08:30	0	98	5	0	3	3	0	3	160	1089	
08:30	08:45	0	111	9	0	7	6	0	0	147	1059	
08:45	09:00	0	120	7	0	10	12	0	0	146		
09:00	09:15	0	100	8	0	6	5	0	1	122		
09:15	09:30	0	93	7	0	5	3	0	1	133		
15:00	15:15	0	143	10	0	10	11	0	0	99	1178	
15:15	15:30	0	140	11	1	9	9	0	2	127	1232	
15:30	15:45	0	163	6	0	6	6	0	0	134	1260	Peak
15:45	16:00	0	128	9	0	7	7	0	1	139	1231	
16:00	16:15	0	171	7	0	4	4	0	2	139	1239	
16:15	16:30	0	166	5	0	8	10	0	1	137	1235	
16:30	16:45	0	141	4	0	10	7	0	2	122	1208	
16:45	17:00	0	147	9	0	6	9	0	1	127	1203	
17:00	17:15	0	174	6	0	6	13	0	2	122	1171	
17:15	17:30	0	139	5	0	7	8	0	0	141		
17:30	17:45	0	143	4	0	9	4	0	1	120		
17:45	18:00	0	149	4	0	8	8	0	0	98		

Peak Time		East Approach Bray St			South Approach Elm St			West Approach Bray St			Peak total
Period Start	Period End	U	WB	L	U	R	L	U	R	EB	
08:00	09:00	0	403	24	0	21	25	0	4	628	1105
15:30	16:30	0	628	27	0	25	27	0	4	549	1260

Note: Site sketch is for illustrating traffic flows. Direction is indicative only, drawing is not to scale and not an exact streets configuration.

Graphic

Total	
Light	
Heavy	



Light Vehicles

Time		East Approach Bray St			South Approach Elm St			West Approach Bray St		
Period Start	Period End	U	WB	L	U	R	L	U	R	EB
06:30	06:45	0	32	1	0	1	0	0	0	83
06:45	07:00	0	52	3	0	5	1	0	0	86
07:00	07:15	0	54	1	0	4	3	0	1	93
07:15	07:30	0	70	2	0	7	3	0	0	79
07:30	07:45	0	64	2	0	5	3	0	1	104
07:45	08:00	0	82	4	0	4	1	0	1	148
08:00	08:15	0	69	3	0	1	4	0	1	165
08:15	08:30	0	94	5	0	3	2	0	3	154
08:30	08:45	0	104	8	0	7	5	0	0	140
08:45	09:00	0	116	7	0	10	11	0	0	142
09:00	09:15	0	95	8	0	6	5	0	1	120
09:15	09:30	0	88	7	0	5	3	0	1	127
15:00	15:15	0	137	10	0	10	11	0	0	98
15:15	15:30	0	138	11	1	9	8	0	1	123
15:30	15:45	0	156	6	0	6	5	0	0	127
15:45	16:00	0	125	9	0	7	6	0	1	133
16:00	16:15	0	166	7	0	4	4	0	2	136
16:15	16:30	0	164	5	0	8	10	0	1	133
16:30	16:45	0	130	4	0	10	7	0	2	120
16:45	17:00	0	145	9	0	6	9	0	1	124
17:00	17:15	0	173	5	0	6	13	0	2	121
17:15	17:30	0	139	5	0	7	8	0	0	141
17:30	17:45	0	139	4	0	9	4	0	1	116
17:45	18:00	0	147	4	0	8	8	0	0	95

Peak Time		East Approach Bray St			South Approach Elm St			West Approach Bray St			Peak total
Period Start	Period End	U	WB	L	U	R	L	U	R	EB	
08:00	09:00	0	383	23	0	21	22	0	4	601	1054
15:30	16:30	0	611	27	0	25	25	0	4	529	1221

Heavy Vehicles

Time		East Approach Bray St			South Approach Elm St			West Approach Bray St		
Period Start	Period End	U	WB	L	U	R	L	U	R	EB
06:30	06:45	0	4	0	0	0	0	0	0	2
06:45	07:00	0	6	0	0	0	0	0	0	7
07:00	07:15	0	5	0	0	0	0	0	0	2
07:15	07:30	0	5	0	0	0	0	0	0	3
07:30	07:45	0	1	1	0	1	0	0	0	5
07:45	08:00	0	0	0	0	0	2	0	0	3
08:00	08:15	0	5	0	0	0	0	0	0	10
08:15	08:30	0	4	0	0	0	1	0	0	6
08:30	08:45	0	7	1	0	0	1	0	0	7
08:45	09:00	0	4	0	0	0	1	0	0	4
09:00	09:15	0	5	0	0	0	0	0	0	2
09:15	09:30	0	5	0	0	0	0	0	0	6
15:00	15:15	0	6	0	0	0	0	0	0	1
15:15	15:30	0	2	0	0	0	1	0	1	4
15:30	15:45	0	7	0	0	0	1	0	0	7
15:45	16:00	0	3	0	0	0	1	0	0	6
16:00	16:15	0	5	0	0	0	0	0	0	3
16:15	16:30	0	2	0	0	0	0	0	0	4
16:30	16:45	0	11	0	0	0	0	0	0	2
16:45	17:00	0	2	0	0	0	0	0	0	3
17:00	17:15	0	1	1	0	0	0	0	0	1
17:15	17:30	0	0	0	0	0	0	0	0	0
17:30	17:45	0	4	0	0	0	0	0	0	4
17:45	18:00	0	2	0	0	0	0	0	0	3

Peak Time		East Approach Bray St			South Approach Elm St			West Approach Bray St			Peak total
Period Start	Period End	U	WB	L	U	R	L	U	R	EB	
08:00	09:00	0	20	1	0	0	3	0	0	27	51
15:30	16:30	0	17	0	0	0	2	0	0	20	39

Site 4. Pacific Highway / Bray Street / Orlando Street



SURVEY INFORMATION

Site ID: 25.5

Location: Bray St/Orlando St & Pacific Hwy, Coffs Harbour

Date: 10 / June / 2021

Time Period 1: 06:30 to 09:30

Time Period 2: 15:00 to 18:00

Primary Classes:

- Lights (1-2)
- Light Trucks (3-5)
- Heavy Trucks (6-12)
- Bicycles on Road
- None

Secondary Classes:

- Pedestrians
- None

Weather Conditions 1: Fine Weather Conditions 2: Fine

Intersection Legs:

North	☒	Pacific Hwy SB
East	☒	Orlando St WB
South	☒	Pacific Hwy NB
West	☒	Bray St EB

Output time interval: 15 min

Co-ordinates -30.283705 153.126754

MAP



Turning Movement Count Summary

Site ID: 25.5

Location: Bray St/Orlando St & Pacific Hwy, Coffs Harbour

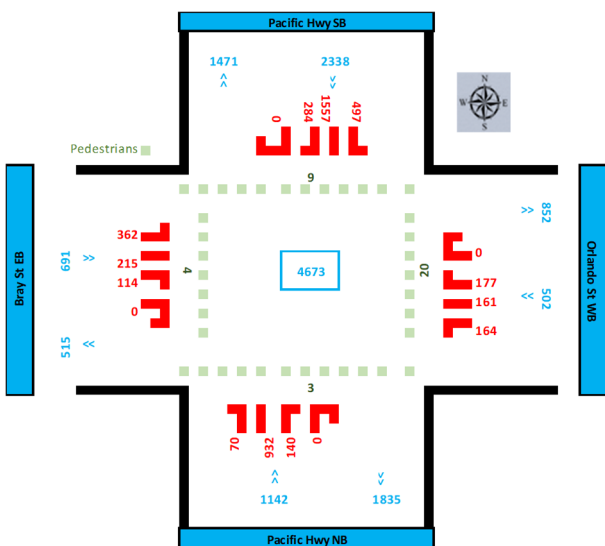
Date: 10-June-2021

Surveyed Time: 6:30 AM to 9:30 AM

Weather: Fine

Data for hour starting: 8:15 AM to 9:15 AM

Vehicle Class: ALL VEHICLES



Turning Movement Count Summary

Site ID: 25.5

Location: Bray St/Orlando St & Pacific Hwy, Coffs Harbour

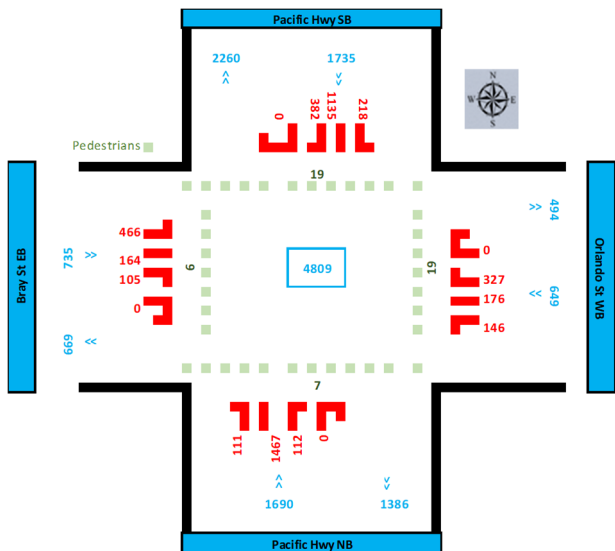
Date: 10-June-2021

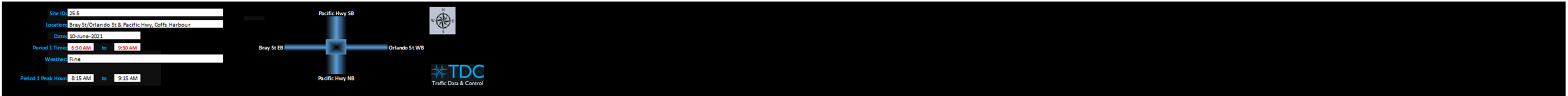
Surveyed Time: 3:00 PM to 6:00 PM

Weather: Fine

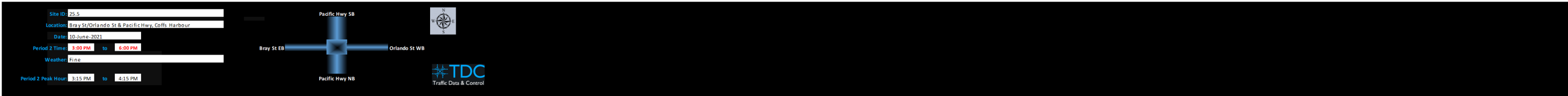
Data for hour starting: 3:15 PM to 4:15 PM

Vehicle Class: ALL VEHICLES





TOTALS AND PEAKS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
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TOTALS AND PEAKS																																		
Period 2 Total																																		
506	24	3	0	2621	124	235	0	1175	20	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Period 2 Peak Hr																																		
206	10	2	0	1003	49	83	0	374	7	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Grand Total																																		
712	34	5	0	3624	173	318	0	1549	27	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Grand Total																																		
1341	4711	1809	4832	1980	4899	1735	649	1600	735																					1341	4711	1809	4832	1980
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TDC
Traffic Data & Control

Site ID:

25.6

Location:

Argyll St & Pacific Hwy Coffs Harbour

Date:

9 / June / 2021

Time Period 1:

06:30 to 09:30

Time Period 2:

15:00 to 18:00

Primary Classes:

1 Lights (1-2)

2 Light Trucks (3-5)

3 Heavy Trucks (6-12)

4 Bicycles on Road

5 None

Secondary Classes:

1 Pedestrians

2 None

Weather Conditions 1:

Fine

Weather Conditions 2:

Fine

Intersection Legs:

North

☒

No

Pacific Hwy SB

East

☒

No

Argyll St WB

South

☒

No

Pacific Hwy NB

West

☒

No

Argyll St EB

Output time interval:

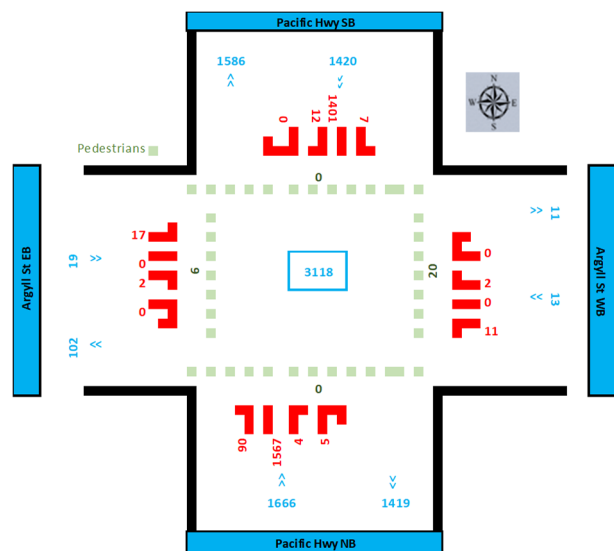
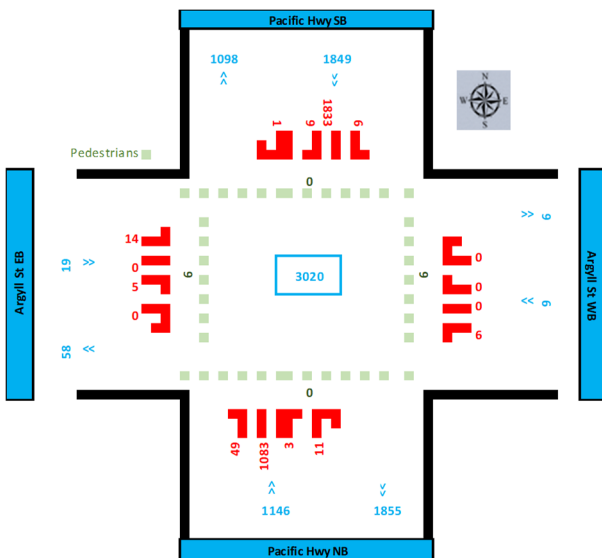
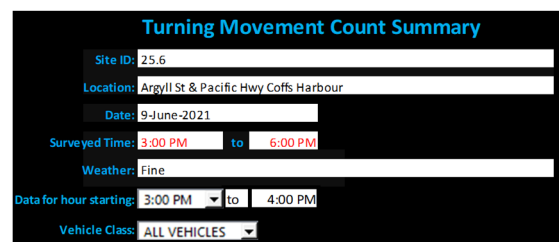
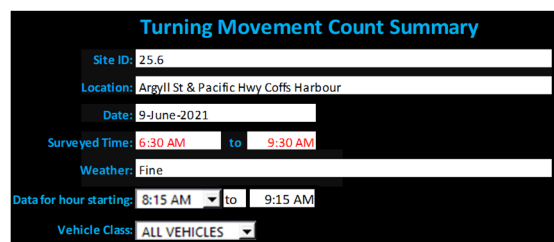
15 min

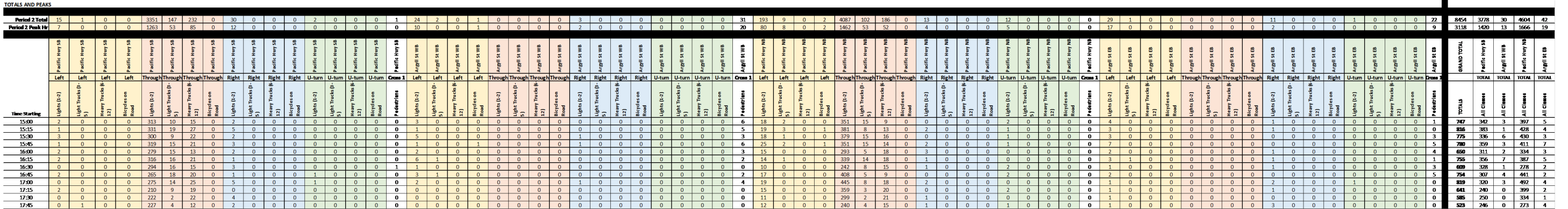
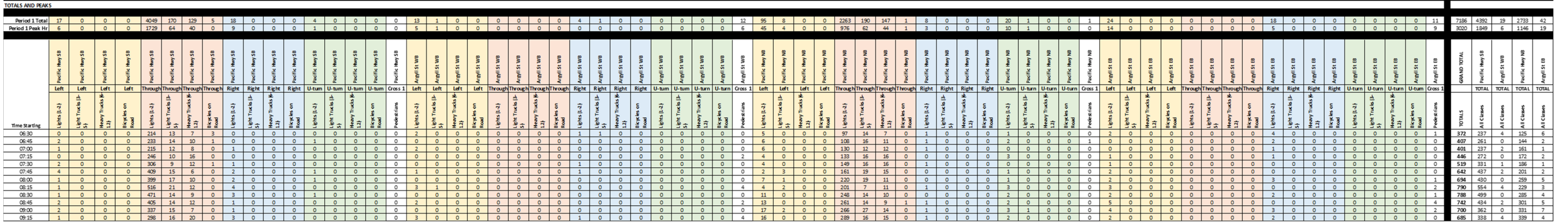
SURVEY INFORMATION

MAP

Co-ordinates

-30.285695 153.125229





Site 6. Frederick Street / Argyll Street



Intersection of Argyll St and Frederick St, Coffs Harb

GPS -30.285155, 153.118124

Date:	Tue 15-03-22
Weather:	Fine
Suburban:	Coffs Harbour
Customer:	

North:	Frederick St
East:	Argyll St
South:	N/A
West:	Argyll St

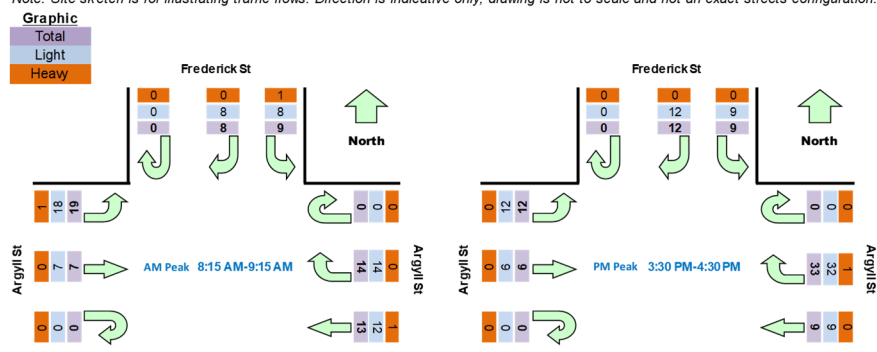
Survey	AM:	6:30 AM-9:30 AM
Period	PM:	3:00 PM-6:00 PM
Traffic	AM:	8:15 AM-9:15 AM
Peak	PM:	3:30 PM-4:30 PM

All Vehicles

Time		North Approach Frederick St			East Approach Argyll St			West Approach Argyll St			Hourly Total	
Period Start	Period End	U	R	L	U	R	WB	U	EB	L	Hour	Peak
06:30	06:45	0	0	0	0	3	0	0	0	1	28	
06:45	07:00	0	1	0	0	1	1	0	3	0	29	
07:00	07:15	0	0	3	0	2	1	0	0	1	27	
07:15	07:30	0	1	3	0	4	0	0	1	2	31	
07:30	07:45	0	3	0	0	1	0	0	0	1	41	
07:45	08:00	0	0	0	0	1	1	0	0	2	56	
08:00	08:15	0	3	1	0	3	0	0	1	3	65	
08:15	08:30	0	3	1	0	6	5	0	2	4	70	Peak
08:30	08:45	0	1	3	0	4	3	0	2	7	66	
08:45	09:00	0	1	4	0	1	4	0	1	2		
09:00	09:15	0	3	1	0	3	1	0	2	6		
09:15	09:30	0	3	3	1	3	2	0	1	4		
15:00	15:15	0	4	3	0	13	1	0	0	5	74	
15:15	15:30	0	3	0	0	4	4	0	3	1	73	
15:30	15:45	0	2	2	0	7	4	0	2	4	81	Peak
15:45	16:00	0	2	1	0	6	1	0	0	2	70	
16:00	16:15	0	3	4	0	10	3	0	2	3	70	
16:15	16:30	0	5	2	0	10	1	0	2	3	59	
16:30	16:45	0	0	1	0	2	2	0	1	4	43	
16:45	17:00	0	2	3	0	2	0	0	2	3	38	
17:00	17:15	0	2	1	0	6	3	0	2	0	35	
17:15	17:30	0	1	1	0	2	1	0	1	1		
17:30	17:45	0	1	0	0	2	1	0	0	1		
17:45	18:00	0	1	0	0	2	3	0	1	2		

Peak Time		North Approach Frederick St			East Approach Argyll St			West Approach Argyll St			Peak total
Period Start	Period End	U	R	L	U	R	WB	U	EB	L	
08:15	09:15	0	8	9	0	14	13	0	7	19	70
15:30	16:30	0	12	9	0	33	9	0	6	12	81

Note: Site sketch is for illustrating traffic flows. Direction is indicative only, drawing is not to scale and not an exact streets configuration.



Light Vehicles

Time		North Approach Frederick St			East Approach Argyll St			West Approach Argyll St		
Period Start	Period End	U	R	L	U	R	WB	U	EB	L
06:30	06:45	0	0	0	0	3	0	0	0	1
06:45	07:00	0	1	0	0	1	1	0	3	0
07:00	07:15	0	0	3	0	2	1	0	0	1
07:15	07:30	0	1	3	0	4	0	0	1	2
07:30	07:45	0	3	0	0	1	0	0	0	1
07:45	08:00	0	0	0	0	0	1	0	0	2
08:00	08:15	0	3	1	0	3	0	0	1	3
08:15	08:30	0	3	1	0	6	5	0	2	4
08:30	08:45	0	1	3	0	4	3	0	2	7
08:45	09:00	0	1	3	0	1	3	0	1	2
09:00	09:15	0	3	1	0	3	1	0	2	5
09:15	09:30	0	3	2	1	3	2	0	1	4
15:00	15:15	0	4	2	0	12	1	0	0	5
15:15	15:30	0	3	0	0	3	4	0	3	1
15:30	15:45	0	2	2	0	6	4	0	2	4
15:45	16:00	0	2	1	0	6	1	0	0	2
16:00	16:15	0	3	4	0	10	3	0	2	3
16:15	16:30	0	5	2	0	10	1	0	2	3
16:30	16:45	0	0	1	0	2	2	0	1	4
16:45	17:00	0	2	3	0	2	0	0	2	3
17:00	17:15	0	2	1	0	6	3	0	2	0
17:15	17:30	0	1	1	0	2	1	0	1	1
17:30	17:45	0	1	0	0	2	1	0	0	1
17:45	18:00	0	1	0	0	2	3	0	1	2

Peak Time		North Approach Frederick St			East Approach Argyll St			West Approach Argyll St			Peak total
Period Start	Period End	U	R	L	U	R	WB	U	EB	L	
08:15	09:15	0	8	8	0	14	12	0	7	18	67
15:30	16:30	0	12	9	0	32	9	0	6	12	80

Heavy Vehicles

Time		North Approach Frederick St			East Approach Argyll St			West Approach Argyll St		
Period Start	Period End	U	R	L	U	R	WB	U	EB	L
06:30	06:45	0	0	0	0	0	0	0	0	0
06:45	07:00	0	0	0	0	0	0	0	0	0
07:00	07:15	0	0	0	0	0	0	0	0	0
07:15	07:30	0	0	0	0	0	0	0	0	0
07:30	07:45	0	0	0	0	0	0	0	0	0
07:45	08:00	0	0	0	0	1	0	0	0	0
08:00	08:15	0	0	0	0	0	0	0	0	0
08:15	08:30	0	0	0	0	0	0	0	0	0
08:30	08:45	0	0	0	0	0	0	0	0	0
08:45	09:00	0	0	1	0	0	1	0	0	0
09:00	09:15	0	0	0	0	0	0	0	0	1
09:15	09:30	0	0	1	0	0	0	0	0	0
15:00	15:15	0	0	1	0	1	0	0	0	0
15:15	15:30	0	0	0	0	1	0	0	0	0
15:30	15:45	0	0	0	0	1	0	0	0	0
15:45	16:00	0	0	0	0	0	0	0	0	0
16:00	16:15	0	0	0	0	0	0	0	0	0
16:15	16:30	0	0	0	0	0	0	0	0	0
16:30	16:45	0	0	0	0	0	0	0	0	0
16:45	17:00	0	0	0	0	0	0	0	0	0
17:00	17:15	0	0	0	0	0	0	0	0	0
17:15	17:30	0	0	0	0	0	0	0	0	0
17:30	17:45	0	0	0	0	0	0	0	0	0
17:45	18:00	0	0	0	0	0	0	0	0	0

Peak Time		North Approach Frederick St			East Approach Argyll St			West Approach Argyll St			Peak total
Period Start	Period End	U	R	L	U	R	WB	U	EB	L	
08:15	09:15	0	0	1	0	0	1	0	0	1	3
15:30	16:30	0	0	0	0	1	0	0	0	0	1

Site 7. Joyce Street / West Argyll Street

TRANS TRAFFIC SURVEY

TURNING MOVEMENT SURVEY

trafficsurvey.com.au



Intersection of W Argyll St and Joyce St, Coffs Harbour

GPS -30.285521, 153.111195

Date:	Tue 15-03-22
Weather:	Fine
Suburban:	Coffs Harbour
Customer:	

North:	Joyce St
East:	W Argyll St
South:	Joyce St
West:	Green Lea Cres

Survey	AM: 6:30 AM-9:30 AM
Period	PM: 3:00 PM-6:00 PM
Traffic	AM: 8:15 AM-9:15 AM
Peak	PM: 3:00 PM-4:00 PM

0.333 x 1.58

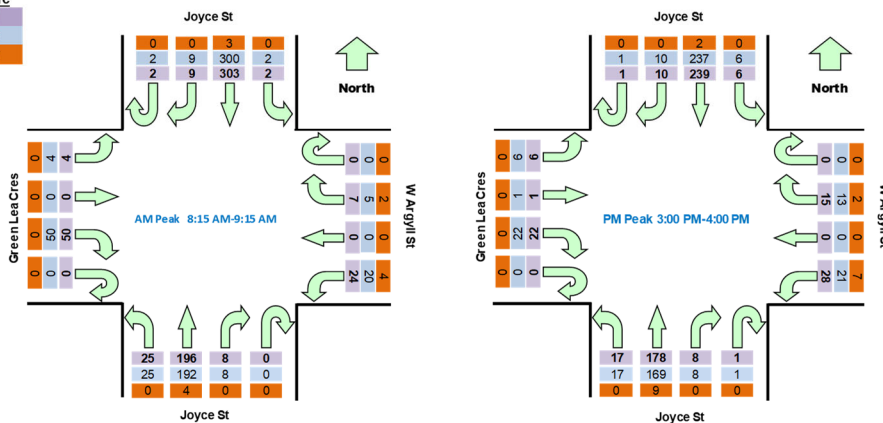
All Vehicles

Time	North Approach Joyce St	East Approach W Argyll St	South Approach Joyce St	West Approach Green Lea Cres	Hourly Total
Period Start/Period End	U R SB L	U R WB L	U R NB L	U R EB L	Hour Peak
06:30 06:45	0 0 20 0	0 0 0 1	0 1 5 0	0 4 0 0	169
06:45 07:00	0 1 22 0	0 1 0 1	0 0 7 1	0 4 1 1	197
07:00 07:15	0 1 21 1	0 0 0 2	0 0 14 2	0 1 0 0	233
07:15 07:30	0 0 34 0	0 0 0 1	0 0 17 1	0 2 0 2	268
07:30 07:45	0 0 36 0	0 0 0 2	0 1 14 4	0 2 0 0	340
07:45 08:00	0 0 41 0	0 0 2 0	0 0 28 1	0 2 0 1	476
08:00 08:15	0 0 46 0	0 0 2 1	0 0 25 1	0 2 0 0	605
08:15 08:30	0 0 70 0	0 1 0 1	0 1 43 3	0 10 0 0	630 Peak
08:30 08:45	1 5 96 2	0 1 0 10	0 1 58 10	0 11 0 0	567
08:45 09:00	1 3 90 0	0 2 0 8	0 4 64 9	0 21 0 2	
09:00 09:15	0 1 47 0	0 3 0 5	0 2 31 3	0 8 0 2	
09:15 09:30	0 0 37 0	0 0 0 1	1 1 19 1	0 4 0 2	
15:00 15:15	1 6 48 3	0 3 0 11	0 5 40 7	0 8 0 2	532 Peak
15:15 15:30	0 1 102 2	0 10 0 15	0 2 51 4	0 4 1 1	484
15:30 15:45	0 3 57 1	0 1 0 1	1 1 51 2	0 6 0 2	392
15:45 16:00	0 0 32 0	0 1 0 1	0 0 36 4	0 4 0 1	346
16:00 16:15	0 0 36 3	0 0 0 0	0 0 42 3	0 1 0 1	358
16:15 16:30	0 0 42 3	0 1 0 4	0 3 42 2	0 1 0 3	371
16:30 16:45	0 2 32 2	0 1 0 0	0 0 37 4	0 2 0 0	367
16:45 17:00	0 0 41 0	0 0 1 0	0 0 45 2	0 2 0 0	369
17:00 17:15	0 2 28 1	0 1 0 1	1 1 60 3	0 0 1 0	363
17:15 17:30	0 1 33 0	0 0 0 0	0 6 49 5	0 3 0 0	
17:30 17:45	0 0 35 3	0 1 0 0	0 1 37 4	0 0 0 1	
17:45 18:00	0 3 26 0	0 0 0 0	0 0 45 7	0 4 0 0	

Peak Time	North Approach Joyce St	East Approach W Argyll St	South Approach Joyce St	West Approach Green Lea Cres	Peak total
Period Start/Period End	U R SB L	U R WB L	U R NB L	U R EB L	
08:15 09:15	2 9 303 2	0 7 0 24	0 8 196 25	0 50 0 4	630
15:00 16:00	1 10 239 6	0 15 0 28	1 8 178 17	0 22 1 6	532

Note: Site sketch is for illustrating traffic flows. Direction is indicative only, drawing is not to scale and not an exact streets configuration.

Graphic
Total
Light
Heavy



Light Vehicles

Time		North Approach Joyce St				East Approach W Argyl St				South Approach Joyce St				West Approach Green Lea Cres			
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L
06:30	06:45	0	0	19	0	0	0	0	1	0	0	4	0	0	3	0	0
06:45	07:00	0	0	21	0	0	1	0	1	0	0	7	1	0	3	1	0
07:00	07:15	0	0	21	1	0	0	0	1	0	0	12	2	0	1	0	0
07:15	07:30	0	0	33	0	0	0	0	1	0	0	16	1	0	2	0	2
07:30	07:45	0	0	36	0	0	0	0	2	0	1	14	4	0	2	0	0
07:45	08:00	0	0	41	0	0	2	0	0	0	0	27	1	0	2	0	1
08:00	08:15	0	0	46	0	0	2	0	1	0	0	24	1	0	2	0	0
08:15	08:30	0	0	69	0	0	1	0	0	0	1	42	3	0	10	0	0
08:30	08:45	1	5	95	2	0	0	0	10	0	1	57	10	0	11	0	0
08:45	09:00	1	3	89	0	0	2	0	8	0	4	62	9	0	21	0	2
09:00	09:15	0	1	47	0	0	2	0	2	0	2	31	3	0	8	0	2
09:15	09:30	0	0	37	0	0	0	0	1	1	1	18	1	0	4	0	2
15:00	15:15	1	6	48	3	0	3	0	8	0	5	37	7	0	8	0	2
15:15	15:30	0	1	100	2	0	8	0	11	0	2	47	4	0	4	1	1
15:30	15:45	0	3	57	1	0	1	0	1	1	1	50	2	0	6	0	2
15:45	16:00	0	0	32	0	0	1	0	1	0	0	35	4	0	4	0	1
16:00	16:15	0	0	34	3	0	0	0	0	0	0	42	2	0	1	0	0
16:15	16:30	0	0	41	3	0	1	0	4	0	3	41	2	0	1	0	3
16:30	16:45	0	2	32	2	0	1	0	0	0	0	37	4	0	1	0	0
16:45	17:00	0	0	41	0	0	1	0	0	0	0	45	2	0	2	0	0
17:00	17:15	0	2	28	1	0	1	0	1	1	1	60	3	0	0	1	0
17:15	17:30	0	1	33	0	0	0	0	0	0	6	49	4	0	3	0	0
17:30	17:45	0	0	34	3	0	1	0	0	0	1	37	4	0	0	0	1
17:45	18:00	0	3	26	0	0	0	0	0	0	0	45	7	0	4	0	0

Peak Time		North Approach Joyce St				East Approach W Argyl St				South Approach Joyce St				West Approach Green Lea Cres				Peak total
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	
08:15	09:15	2	9	300	2	0	5	0	20	0	8	192	25	0	50	0	4	617
15:00	16:00	1	10	237	6	0	13	0	21	1	8	169	17	0	22	1	6	512

Heavy Vehicles

Time		North Approach Joyce St				East Approach W Argyl St				South Approach Joyce St				West Approach Green Lea Cres			
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L
06:30	06:45	0	0	1	0	0	0	0	0	0	1	1	0	0	1	0	0
06:45	07:00	0	1	1	0	0	0	0	0	0	0	0	0	0	1	0	1
07:00	07:15	0	1	0	0	0	0	0	1	0	0	2	0	0	0	0	0
07:15	07:30	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0
07:30	07:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45	08:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
08:00	08:15	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
08:15	08:30	0	0	1	0	0	0	0	1	0	0	1	0	0	0	0	0
08:30	08:45	0	0	1	0	0	1	0	0	0	0	1	0	0	0	0	0
08:45	09:00	0	0	1	0	0	0	0	0	0	0	2	0	0	0	0	0
09:00	09:15	0	0	0	0	0	1	0	3	0	0	0	0	0	0	0	0
09:15	09:30	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
15:00	15:15	0	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0
15:15	15:30	0	0	2	0	0	2	0	4	0	0	4	0	0	0	0	0
15:30	15:45	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
15:45	16:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
16:00	16:15	0	0	2	0	0	0	0	0	0	0	0	1	0	0	0	1
16:15	16:30	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0
16:30	16:45	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
16:45	17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00	17:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15	17:30	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
17:30	17:45	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45	18:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Peak Time		North Approach Joyce St				East Approach W Argyl St				South Approach Joyce St				West Approach Green Lea Cres				Peak total
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	
08:15	09:15	0	0	3	0	0	2	0	4	0	0	4	0	0	0	0	0	13
15:00	16:00	0	0	2	0	0	2	0	7	0	0	9	0	0	0	0	0	20

Appendix B

SIDRA results summary

MOVEMENT SUMMARY

▼ Site: 1 [2022_Base_AM Peak_Bray Street and Joyce Street_1
(Site Folder: Base 2022_AM Peak)]

Bray Street and Joyce Street
Site Category: Bray Street and Joyce Street
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: Frederick Street														
1	L2	66	2	69	3.0	0.111	5.3	LOS A	0.4	2.7	0.34	0.61	0.34	44.6
3	R2	46	4	48	8.7	0.111	7.8	LOS A	0.4	2.7	0.34	0.61	0.34	44.4
Approach		112	6	118	5.4	0.111	6.3	LOS A	0.4	2.7	0.34	0.61	0.34	44.5
East: Joyce Street														
4	L2	169	9	178	5.3	0.239	4.7	LOS A	0.0	0.0	0.00	0.22	0.00	47.7
5	T1	249	10	262	4.0	0.239	0.1	LOS A	0.0	0.0	0.00	0.22	0.00	48.7
Approach		418	19	440	4.5	0.239	1.9	NA	0.0	0.0	0.00	0.22	0.00	48.3
West: Joyce Street														
11	T1	503	17	529	3.4	0.408	1.0	LOS A	2.3	16.4	0.40	0.19	0.45	48.0
12	R2	195	0	205	0.0	0.408	6.7	LOS A	2.3	16.4	0.40	0.19	0.45	46.8
Approach		698	17	735	2.4	0.408	2.6	NA	2.3	16.4	0.40	0.19	0.45	47.7
All Vehicles		1228	42	1293	3.4	0.408	2.7	NA	2.3	16.4	0.26	0.24	0.29	47.7

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.
 Minor Road Approach LOS values are based on average delay for all vehicle movements.
 NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
 Delay Model: SIDRA Standard (Geometric Delay is included).
 Queue Model: SIDRA Standard.
 Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 2 [2022_Base_AM Peak_Bray Street and Frederick Street_2 (Site Folder: Base 2022_AM Peak)]

Network: N101
[2022_Base_AM Peak_Frederick Street between Bray Street and Argyll Street_2 & 6 (Network Folder: Base 2022_AM Peak)]

Bray Street and Frederick Street
Site Category: Bray Street and Frederick Street
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %				[Veh. veh	Dist m				
South: Frederick Street														
1	L2	35	0.0	35	0.0	0.053	6.1	LOS A	0.1	0.5	0.41	0.65	0.41	44.6
3	R2	18	0.0	18	0.0	0.053	6.8	LOS A	0.1	0.5	0.41	0.65	0.41	44.3
Approach		53	0.0	53	0.0	0.053	6.3	LOS A	0.1	0.5	0.41	0.65	0.41	44.5
East: Bray Street														
4	L2	7	0.0	7	0.0	0.221	4.6	LOS A	0.0	0.0	0.00	0.01	0.00	49.8
5	T1	407	5.2	407	5.2	0.221	0.1	LOS A	0.0	0.0	0.00	0.01	0.00	49.8
Approach		415	5.1	415	5.1	0.221	0.2	NA	0.0	0.0	0.00	0.01	0.00	49.8
West: Bray Street														
11	T1	563	5.2	563	5.2	0.315	0.1	LOS A	0.1	0.6	0.04	0.02	0.05	49.8
12	R2	16	6.7	16	6.7	0.315	7.1	LOS A	0.1	0.6	0.04	0.02	0.05	49.6
Approach		579	5.3	579	5.3	0.315	0.3	NA	0.1	0.6	0.04	0.02	0.05	49.8
All Vehicles		1046	4.9	1046	4.9	0.315	0.5	NA	0.1	0.6	0.04	0.05	0.05	49.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

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: 3a [2022_Base_AM Peak_Bray Street and Elm Street
_3a (Site Folder: Base 2022_AM Peak)]

■ Network: N102
[2022_Base_AM Peak_Pacific
Highway from Bray St to Argyll
Street_3,4 & 5 -RMS target
delay (Network Folder: Base
2022_AM Peak)]

Bray Street and Elm Street
Site Category: Bray Street and Elm Street
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %	v/c	sec		[Veh. veh	Dist] m				km/h
South: Elm Street														
1	L2	26	12.0	26	12.0	0.150	6.5	LOS A	0.4	2.8	0.58	0.72	0.58	40.4
3	R2	22	0.0	22	0.0	0.150	16.9	LOS B	0.4	2.8	0.58	0.72	0.58	28.9
Approach		48	6.5	48	6.5	0.150	11.2	LOS A	0.4	2.8	0.58	0.72	0.58	37.4
East: Bray Street														
4	L2	25	4.2	25	4.2	0.041	4.6	LOS A	0.0	0.0	0.00	0.18	0.00	45.0
5	T1	424	5.0	424	5.0	0.205	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	49.7
Approach		449	4.9	449	4.9	0.205	0.3	NA	0.0	0.0	0.00	0.03	0.00	49.6
West: Bray Street														
11	T1	661	4.3	661	4.3	0.325	0.0	LOS A	5.0	36.0	0.01	0.00	0.01	59.8
12	R2	4	0.0	4	0.0	0.325	8.4	LOS A	5.0	36.0	0.01	0.00	0.01	55.6
Approach		665	4.3	665	4.3	0.325	0.1	NA	5.0	36.0	0.01	0.00	0.01	59.8
All Vehicles		1163	4.6	1163	4.6	0.325	0.6	NA	5.0	36.0	0.03	0.04	0.03	53.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

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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■ ■ Network: N102
[2022_Base_AM Peak_Pacific
Highway from Bray St to Argyll
Street_3,4 & 5 -RMS target
delay (Network Folder: Base
2022_AM Peak)]

Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 140 seconds (Network Optimum Cycle Time - Minimum Degree of Saturation)

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network 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.
 Delay Model: SIDRA Standard (Geometric Delay is included).
 Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

- * Critical Movement (Signal Timing)

Pedestrian Movement Performance											
Mov ID	Crossing	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	sec		[Ped ped	Dist] m			sec	m	m/sec
South: Pacific Highway											
P1	Full	53	64.3	LOS F	0.2	0.2	0.96	0.96	238.6	226.7	0.95
East: Orlando Street											

P2 Full	53	64.3	LOS F	0.2	0.2	0.96	0.96	229.1	214.3	0.94
North: Pacific Highway										
P3 Full	53	64.3	LOS F	0.2	0.2	0.96	0.96	241.9	230.9	0.95
West: Bray Street										
P4 Full	53	64.3	LOS F	0.2	0.2	0.96	0.96	232.0	218.0	0.94
All Pedestrians	211	64.3	LOS F	0.2	0.2	0.96	0.96	235.4	222.5	0.95

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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MOVEMENT SUMMARY

▼ Site: 5 [2022_Base_AM Peak_Pacific Highway and Argyll Street_5 (Site Folder: Base 2022_AM Peak)]

■ Network: N102
[2022_Base_AM Peak_Pacific Highway from Bray St to Argyll Street_3,4 & 5 -RMS target delay (Network Folder: Base 2022_AM Peak)]

Pacific Highway and Argyll Street
Site Category: Pacific Highway and Argyll Street
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %	v/c	sec		[Veh. veh	Dist m				km/h
South: Pacific Highway														
1	L2	54	9.8	54	9.8	0.328	5.7	LOS A	0.0	0.0	0.00	0.05	0.00	57.3
2	T1	1149	9.9	1149	9.9	0.328	0.1	LOS A	0.0	0.0	0.00	0.03	0.00	59.3
Approach		1203	9.9	1203	9.9	0.328	0.4	NA	0.0	0.0	0.00	0.03	0.00	59.2
North: Pacific Highway														
8	T1	1946	5.7	1946	5.7	0.518	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.6
9	R2	11	0.0	11	0.0	0.036	17.1	LOS B	0.1	0.7	0.81	0.92	0.81	39.4
Approach		1957	5.7	1957	5.7	0.518	0.2	NA	0.1	0.7	0.00	0.00	0.00	59.4
West: Argyll Street														
10	L2	16	0.0	16	0.0	0.022	7.6	LOS A	0.1	0.5	0.50	0.67	0.50	41.5
12	R2	6	0.0	6	0.0	1.053	999.4	LOS F	2.8	19.6	1.00	1.09	1.39	3.3
Approach		22	0.0	22	0.0	1.053	290.9	LOS F	2.8	19.6	0.65	0.79	0.76	6.9
All Vehicles		3182	7.2	3182	7.2	1.053	2.3	NA	2.8	19.6	0.01	0.02	0.01	56.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

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: 6 [2022_Base_AM Peak_Argyll Street and Frederick Street_6 (Site Folder: Base 2022_AM Peak)]

Network: N101
[2022_Base_AM Peak_Frederick Street between Bray Street and Argyll Street_2 & 6 (Network Folder: Base 2022_AM Peak)]

Argyll Street and Frederick Street
Site Category: Argyll Street and Frederick Street
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %	v/c	sec		[Veh. veh	Dist] m				km/h
East: Argyll Street														
11	T1	14	7.7	14	7.7	0.015	0.1	LOS A	0.0	0.2	0.08	0.27	0.08	48.2
12	R2	15	0.0	15	0.0	0.015	4.6	LOS A	0.0	0.2	0.08	0.27	0.08	46.5
Approach		28	3.7	28	3.7	0.015	2.4	NA	0.0	0.2	0.08	0.27	0.08	47.6
North: Frederick Street														
1	L2	9	11.1	9	11.1	0.012	4.7	LOS A	0.0	0.1	0.03	0.52	0.03	45.6
3	R2	8	0.0	8	0.0	0.012	4.6	LOS A	0.0	0.1	0.03	0.52	0.03	45.7
Approach		18	5.9	18	5.9	0.012	4.7	LOS A	0.0	0.1	0.03	0.52	0.03	45.6
West: Argyll Street														
4	L2	20	5.3	20	5.3	0.014	4.6	LOS A	0.0	0.0	0.00	0.39	0.00	45.9
5	T1	7	0.0	7	0.0	0.014	0.0	LOS A	0.0	0.0	0.00	0.39	0.00	47.8
Approach		27	3.8	27	3.8	0.014	3.4	NA	0.0	0.0	0.00	0.39	0.00	46.7
All Vehicles		74	4.3	74	4.3	0.015	3.3	NA	0.0	0.2	0.04	0.37	0.04	46.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

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: 7a [2022_Base_AM Peak_Joyce Street and W Argyll Street_7a (Site Folder: Base 2022_AM Peak)]

Network: N101
[2022_Base_AM Peak_Joyce Street and Green Lea Cres_7 (Network Folder: Base 2022_AM Peak)]

Joyce Street and W Argyll Street
Site Category: Joyce Street and W Argyll Street
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %	v/c	sec		[Veh. veh	Dist] m				km/h
South: Joyce Street														
11	T1	211	2.0	211	2.0	0.105	0.3	LOS A	0.1	0.4	0.04	0.19	0.04	49.8
12	R2	8	0.0	8	0.0	0.105	3.2	LOS A	0.1	0.4	0.04	0.19	0.04	20.5
Approach		219	1.9	219	1.9	0.105	0.4	NA	0.1	0.4	0.04	0.19	0.04	46.9
East: W Argyll Street														
1	L2	25	16.7	25	16.7	0.031	1.3	LOS A	0.1	0.9	0.37	0.26	0.37	19.7
3	R2	7	28.6	7	28.6	0.031	1.6	LOS A	0.1	0.9	0.37	0.26	0.37	26.9
Approach		33	19.4	33	19.4	0.031	1.4	LOS A	0.1	0.9	0.37	0.26	0.37	21.7
North: Joyce Street														
4	L2	2	0.0	2	0.0	0.169	4.6	LOS A	0.0	0.0	0.00	0.00	0.00	49.4
5	T1	328	1.0	328	1.0	0.169	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
Approach		331	1.0	331	1.0	0.169	0.1	NA	0.0	0.0	0.00	0.00	0.00	49.9
All Vehicles		582	2.4	582	2.4	0.169	0.3	NA	0.1	0.9	0.04	0.09	0.04	44.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

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: 7b [2022_Base_AM Peak_Joyce Street and Green Lea Cres_7b (Site Folder: Base 2022_AM Peak)]

■ Network: N101
[2022_Base_AM Peak_Joyce Street and Green Lea Cres_7 (Network Folder: Base 2022_AM Peak)]

Joyce Street and Green Lea Cres
Site Category: Joyce Street and Green Lea Cres
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %	v/c	sec		[Veh. veh	Dist] m				km/h
South: Joyce Street														
4	L2	26	0.0	26	0.0	0.124	4.6	LOS A	0.0	0.0	0.00	0.06	0.00	49.1
5	T1	215	2.0	215	2.0	0.124	0.0	LOS A	0.0	0.0	0.00	0.06	0.00	49.3
Approach		241	1.7	241	1.7	0.124	0.5	NA	0.0	0.0	0.00	0.06	0.00	49.2
North: Joyce Street														
11	T1	344	2.1	344	2.1	0.169	0.2	LOS A	0.1	0.5	0.02	0.19	0.02	49.9
12	R2	9	0.0	9	0.0	0.169	2.9	LOS A	0.1	0.5	0.02	0.19	0.02	21.0
Approach		354	2.1	354	2.1	0.169	0.3	NA	0.1	0.5	0.02	0.19	0.02	48.1
West: Green Lea Cres														
1	L2	4	0.0	4	0.0	0.075	0.7	LOS A	0.2	1.7	0.45	0.46	0.45	19.4
3	R2	53	0.0	53	0.0	0.075	3.3	LOS A	0.2	1.7	0.45	0.46	0.45	27.5
Approach		57	0.0	57	0.0	0.075	3.1	LOS A	0.2	1.7	0.45	0.46	0.45	27.0
All Vehicles		652	1.8	652	1.8	0.169	0.6	NA	0.2	1.7	0.05	0.17	0.05	43.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

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: 1 [2022_Base_PM Peak_Bray Street and Joyce Street_1
(Site Folder: Base 2022 PM Peak)]

Bray Street and Joyce Street
Site Category: Bray Street and Joyce Street
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: Frederick Street														
1	L2	125	2	132	1.6	0.271	6.2	LOS A	1.0	7.2	0.48	0.73	0.53	44.1
3	R2	126	4	133	3.2	0.271	8.0	LOS A	1.0	7.2	0.48	0.73	0.53	43.9
Approach		251	6	264	2.4	0.271	7.1	LOS A	1.0	7.2	0.48	0.73	0.53	44.0
East: Joyce Street														
4	L2	122	4	128	3.3	0.308	4.7	LOS A	0.0	0.0	0.00	0.12	0.00	48.4
5	T1	422	22	444	5.2	0.308	0.1	LOS A	0.0	0.0	0.00	0.12	0.00	49.2
Approach		544	26	573	4.8	0.308	1.1	NA	0.0	0.0	0.00	0.12	0.00	49.0
West: Joyce Street														
11	T1	457	16	481	3.5	0.328	0.8	LOS A	1.2	8.7	0.29	0.11	0.32	48.6
12	R2	95	2	100	2.1	0.328	7.4	LOS A	1.2	8.7	0.29	0.11	0.32	47.5
Approach		552	18	581	3.3	0.328	2.0	NA	1.2	8.7	0.29	0.11	0.32	48.5
All Vehicles		1347	50	1418	3.7	0.328	2.6	NA	1.2	8.7	0.21	0.23	0.23	47.9

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.
 Minor Road Approach LOS values are based on average delay for all vehicle movements.
 NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
 Delay Model: SIDRA Standard (Geometric Delay is included).
 Queue Model: SIDRA Standard.
 Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

▼ Site: 2 [2022_Base_PM Peak_Bray Street and Frederick Street_2 (Site Folder: Base 2022 PM Peak)]

■ Network: N101
[2022_Base_PM Peak_Frederick Street between Bray Street and Argyll Street (Network Folder: Base 2022 - PM Peak)]

Bray Street and Frederick Street
Site Category: Bray Street and Frederick Street
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %	v/c	sec		[Veh. veh	Dist] m				km/h
South: Frederick Street														
1	L2	40	5.3	40	5.3	0.064	7.3	LOS A	0.2	1.5	0.50	0.71	0.50	43.9
3	R2	13	0.0	13	0.0	0.064	7.3	LOS A	0.2	1.5	0.50	0.71	0.50	43.7
Approach		53	4.0	53	4.0	0.064	7.3	LOS A	0.2	1.5	0.50	0.71	0.50	43.9
East: Bray Street														
4	L2	13	0.0	13	0.0	0.312	4.7	LOS A	0.0	0.0	0.00	0.01	0.00	49.7
5	T1	581	3.1	581	3.1	0.312	0.1	LOS A	0.0	0.0	0.00	0.01	0.00	49.8
Approach		594	3.0	594	3.0	0.312	0.2	NA	0.0	0.0	0.00	0.01	0.00	49.8
West: Bray Street														
11	T1	516	4.3	516	4.3	0.290	0.2	LOS A	0.3	1.9	0.05	0.01	0.06	49.7
12	R2	13	16.7	13	16.7	0.290	9.3	LOS A	0.3	1.9	0.05	0.01	0.06	49.4
Approach		528	4.6	528	4.6	0.290	0.4	NA	0.3	1.9	0.05	0.01	0.06	49.7
All Vehicles		1175	3.8	1175	3.8	0.312	0.6	NA	0.3	1.9	0.05	0.04	0.05	49.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

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: 3a [2022_Base_PM Peak_Bray Street and Elm Street _3a
(Site Folder: Base 2022 PM Peak)]

Network: N102
[2022_Base_PM Peak_Pacific
Highway from Bray St to Argyll
Street (Network Folder: Base
2022 - PM Peak)]

Bray Street and Elm Street
Site Category: Bray Street and Elm Street
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %	v/c	sec		[Veh. veh	Dist] m				km/h
South: Elm Street														
1	L2	28	7.4	28	7.4	0.197	7.9	LOS A	0.6	4.5	0.67	0.80	0.67	39.5
3	R2	26	0.0	26	0.0	0.197	18.2	LOS B	0.6	4.5	0.67	0.80	0.67	27.2
Approach		55	3.8	55	3.8	0.197	12.8	LOS A	0.6	4.5	0.67	0.80	0.67	36.0
East: Bray Street														
4	L2	28	0.0	28	0.0	0.062	4.6	LOS A	0.0	0.0	0.00	0.13	0.00	46.0
5	T1	661	2.7	661	2.7	0.309	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	49.7
Approach		689	2.6	689	2.6	0.309	0.2	NA	0.0	0.0	0.00	0.02	0.00	49.6
West: Bray Street														
11	T1	578	3.6	578	3.6	0.284	0.1	LOS A	13.8	99.3	0.02	0.00	0.02	59.7
12	R2	4	0.0	4	0.0	0.284	10.3	LOS A	13.8	99.3	0.02	0.00	0.02	55.5
Approach		582	3.6	582	3.6	0.284	0.2	NA	13.8	99.3	0.02	0.00	0.02	59.6
All Vehicles		1326	3.1	1326	3.1	0.309	0.7	NA	13.8	99.3	0.04	0.05	0.04	52.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

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: 4 [2022_Base_PM Peak_Bray Street and Pacific Highway_4 (Site Folder: Base 2022 PM Peak)]

 Network: N102
[2022_Base_PM Peak_Pacific Highway from Bray St to Argyll Street (Network Folder: Base 2022 - PM Peak)]

Bray Street and Pacific Highway

Site Category: Bray Street and Pacific Highway

Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 130 seconds (Network Optimum Cycle Time - Minimum Degree of Saturation)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %				[Veh. veh	Dist] m				
						v/c	sec							km/h
South: Pacific Highway														
1	L2	118	0.0	118	0.0	* 0.917	68.4	LOS E	42.0	307.6	1.00	1.08	1.22	11.7
2	T1	1558	6.9	1558	6.9	* 0.917	62.1	LOS E	42.0	307.6	1.00	1.08	1.23	18.1
3	R2	121	7.0	121	7.0	0.737	70.3	LOS E	8.0	59.5	1.00	0.87	1.15	23.3
Approach		1797	6.4	1797	6.4	0.917	63.1	LOS E	42.0	308.2	1.00	1.06	1.22	18.2
East: Orlando Street														
4	L2	158	6.0	158	6.0	0.163	12.3	LOS A	2.9	21.1	0.36	0.65	0.36	44.7
5	T1	188	3.4	188	3.4	* 0.876	68.0	LOS E	18.9	137.0	1.00	1.01	1.26	19.0
6	R2	349	5.1	349	5.1	0.876	72.6	LOS F	18.9	137.0	1.00	0.98	1.26	22.4
Approach		696	4.8	696	4.8	0.876	57.7	LOS E	18.9	137.0	0.85	0.91	1.06	23.6
North: Pacific Highway														
7	L2	234	6.3	234	6.3	0.171	7.3	LOS A	2.1	15.8	0.21	0.61	0.21	50.3
8	T1	1206	11.7	1206	11.7	0.713	40.6	LOS C	23.8	183.5	0.92	0.81	0.92	14.3
9	R2	407	2.6	407	2.6	* 0.919	83.8	LOS F	15.3	109.2	1.00	1.01	1.42	7.9
Approach		1847	9.0	1847	9.0	0.919	45.9	LOS D	23.8	183.5	0.85	0.83	0.94	15.8
West: Bray Street														
10	L2	497	3.0	497	3.0	0.910	64.0	LOS E	20.5	146.9	0.96	0.97	1.20	12.7
11	T1	176	4.8	176	4.8	0.496	51.8	LOS D	10.1	73.7	0.95	0.78	0.95	25.2
12	R2	113	1.9	113	1.9	0.450	57.6	LOS E	6.5	46.3	0.94	0.79	0.94	6.2
Approach		785	3.2	785	3.2	0.910	60.3	LOS E	20.5	146.9	0.95	0.90	1.10	15.0
All Vehicles		5125	6.7	5125	6.7	0.919	55.7	LOS D	42.0	308.2	0.92	0.93	1.08	17.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network 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.

Delay Model: SIDRA Standard (Geometric Delay is included).

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance											
Mov ID	Crossing	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	sec		[Ped ped	Dist] m			sec	m	m/sec
South: Pacific Highway											
P1	Full	53	59.3	LOS E	0.2	0.2	0.96	0.96	233.6	226.7	0.97
East: Orlando Street											
P2	Full	53	59.3	LOS E	0.2	0.2	0.96	0.96	224.1	214.3	0.96

North: Pacific Highway											
P3	Full	53	59.3	LOS E	0.2	0.2	0.96	0.96	236.9	230.9	0.97
West: Bray Street											
P4	Full	53	59.3	LOS E	0.2	0.2	0.96	0.96	227.0	218.0	0.96
All Pedestrians		211	59.3	LOS E	0.2	0.2	0.96	0.96	230.4	222.5	0.97

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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MOVEMENT SUMMARY

▼ Site: 5 [2022_Base_PM Peak_Pacific Highway and Argyll Street_5 (Site Folder: Base 2022 PM Peak)]

■ Network: N102
[2022_Base_PM Peak_Pacific Highway from Bray St to Argyll Street (Network Folder: Base 2022 - PM Peak)]

Pacific Highway and Argyll Street
Site Category: Pacific Highway and Argyll Street
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %	v/c	sec		[Veh. veh	Dist] m				km/h
South: Pacific Highway														
1	L2	95	10.0	95	10.0	0.608	6.0	LOS A	0.0	0.0	0.00	0.07	0.00	56.6
2	T1	1664	6.8	1664	6.8	0.608	0.4	LOS A	0.0	0.0	0.00	0.03	0.00	58.7
Approach		1759	6.9	1759	6.9	0.608	0.7	NA	0.0	0.0	0.00	0.03	0.00	58.5
North: Pacific Highway														
8	T1	1488	9.9	1488	9.9	0.408	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.7
9	R2	14	0.0	14	0.0	0.160	47.3	LOS D	0.4	2.7	0.95	0.98	0.96	27.5
Approach		1502	9.8	1502	9.8	0.408	0.5	NA	0.4	2.7	0.01	0.01	0.01	59.1
West: Argyll Street														
10	L2	19	0.0	19	0.0	0.025	5.5	LOS A	0.1	0.4	0.31	0.54	0.31	43.2
12	R2	3	0.0	3	0.0	1.000	1664.5	LOS F	2.4	16.5	1.00	1.05	1.21	2.1
Approach		22	0.0	22	0.0	1.000	242.5	LOS F	2.4	16.5	0.40	0.61	0.43	7.4
All Vehicles		3283	8.2	3283	8.2	1.000	2.3	NA	2.4	16.5	0.01	0.03	0.01	56.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

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: 6 [2022_Base_PM Peak_Argyll Street and Frederick Street_6 (Site Folder: Base 2022 PM Peak)]

■ Network: N101
[2022_Base_PM Peak_Frederick Street between Bray Street and Argyll Street (Network Folder: Base 2022 - PM Peak)]

Argyll Street and Frederick Street
Site Category: Argyll Street and Frederick Street
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] %	[Total veh/h	HV] %	v/c	sec		[Veh. veh	Dist] m				km/h
East: Argyll Street														
11	T1	9	0.0	9	0.0	0.025	0.0	LOS A	0.1	0.8	0.07	0.40	0.07	47.5
12	R2	35	3.0	35	3.0	0.025	4.6	LOS A	0.1	0.8	0.07	0.40	0.07	45.3
Approach		44	2.4	44	2.4	0.025	3.7	NA	0.1	0.8	0.07	0.40	0.07	46.0
North: Frederick Street														
1	L2	9	0.0	9	0.0	0.014	4.6	LOS A	0.0	0.3	0.03	0.52	0.03	45.8
3	R2	13	0.0	13	0.0	0.014	4.6	LOS A	0.0	0.3	0.03	0.52	0.03	45.7
Approach		22	0.0	22	0.0	0.014	4.6	LOS A	0.0	0.3	0.03	0.52	0.03	45.7
West: Argyll Street														
4	L2	13	0.0	13	0.0	0.009	4.6	LOS A	0.0	0.0	0.00	0.36	0.00	46.2
5	T1	6	0.0	6	0.0	0.009	0.0	LOS A	0.0	0.0	0.00	0.36	0.00	48.0
Approach		19	0.0	19	0.0	0.009	3.0	NA	0.0	0.0	0.00	0.36	0.00	47.1
All Vehicles		85	1.2	85	1.2	0.025	3.8	NA	0.1	0.8	0.05	0.42	0.05	46.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

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: 7a [2022_Base_PM Peak_Joyce Street and W Argyll Street_7a (Site Folder: Base 2022 PM Peak)]

Network: N101
[2022_Base_PM Peak_Joyce Street and Green Lea Cres (Network Folder: Base 2022 - PM Peak)]

Joyce Street and W Argyll Street
Site Category: Joyce Street and W Argyll Street
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %	v/c	sec		[Veh. veh	Dist] m				km/h
South: Joyce Street														
11	T1	194	4.9	194	4.9	0.099	0.3	LOS A	0.1	0.5	0.04	0.20	0.04	49.8
12	R2	9	0.0	9	0.0	0.099	3.0	LOS A	0.1	0.5	0.04	0.20	0.04	20.5
Approach		203	4.7	203	4.7	0.099	0.4	NA	0.1	0.5	0.04	0.20	0.04	46.3
East: W Argyll Street														
1	L2	29	25.0	29	25.0	0.046	1.1	LOS A	0.1	1.1	0.30	0.23	0.30	19.7
3	R2	16	13.3	16	13.3	0.046	1.2	LOS A	0.1	1.1	0.30	0.23	0.30	27.0
Approach		45	20.9	45	20.9	0.046	1.1	LOS A	0.1	1.1	0.30	0.23	0.30	22.8
North: Joyce Street														
4	L2	6	0.0	6	0.0	0.137	4.6	LOS A	0.0	0.0	0.00	0.01	0.00	49.3
5	T1	262	0.8	262	0.8	0.137	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	49.8
Approach		268	0.8	268	0.8	0.137	0.1	NA	0.0	0.0	0.00	0.01	0.00	49.8
All Vehicles		517	4.1	517	4.1	0.137	0.3	NA	0.1	1.1	0.04	0.10	0.04	42.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

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: 7b [2022_Base_PM Peak_Joyce Street and Green Lea Cres_7b (Site Folder: Base 2022 PM Peak)]

■ Network: N101
[2022_Base_PM Peak_Joyce Street and Green Lea Cres (Network Folder: Base 2022 - PM Peak)]

Joyce Street and Green Lea Cres
Site Category: Joyce Street and Green Lea Cres
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %	v/c	sec		[Veh. veh	Dist] m				km/h
South: Joyce Street														
4	L2	18	0.0	18	0.0	0.112	4.6	LOS A	0.0	0.0	0.00	0.05	0.00	49.2
5	T1	196	4.8	196	4.8	0.112	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	49.4
Approach		214	4.4	214	4.4	0.112	0.4	NA	0.0	0.0	0.00	0.05	0.00	49.4
North: Joyce Street														
11	T1	281	3.4	281	3.4	0.141	0.2	LOS A	0.1	0.5	0.03	0.20	0.03	49.9
12	R2	11	0.0	11	0.0	0.141	2.8	LOS A	0.1	0.5	0.03	0.20	0.03	21.0
Approach		292	3.2	292	3.2	0.141	0.3	NA	0.1	0.5	0.03	0.20	0.03	47.5
West: Green Lea Cres														
1	L2	7	0.0	7	0.0	0.025	0.6	LOS A	0.1	0.5	0.27	0.25	0.27	19.7
3	R2	23	0.0	23	0.0	0.025	1.3	LOS A	0.1	0.5	0.27	0.25	0.27	27.8
Approach		31	0.0	31	0.0	0.025	1.2	LOS A	0.1	0.5	0.27	0.25	0.27	26.3
All Vehicles		536	3.5	536	3.5	0.141	0.4	NA	0.1	0.5	0.03	0.14	0.03	44.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

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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