Appendix D – Traffic and Transport Impact Assessment

Pacific Highway upgrade through Wyong town centre

Traffic and transport impact assessment

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Version Control

Revision No.	Date Issued	Description	Author	Approver
A	September 2024	Draft Report submitted to TfNSW for comments	KN	MR
B1	November 2024	Final Report	KN	MR

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Appendix A Car parking survey undertaken by Transport.

Glossary and acronyms

Term	Definition
AADT	Annual Average Daily Traffic
ADT	Average Daily Traffic. The total volume of traffic (24 hours) passing a roadside observation point over a sampled one-week period, divided by the number of days per week
AWT	Average Weekday Traffic. The total volume of traffic (24 hours) passing a roadside observation point over a sampled five-weekday (Monday to Friday) period, divided by the number of days
ATC	Automatic traffic count
Avg.	Average
Capacity	The nominal maximum number of vehicles which has a reasonable expectation of passing over a given section of a lane or roadway in one direction during a given time period under prevailing roadway conditions
Carriageway	The portion of a roadway used by vehicles including shoulders and ancillary lanes
CD	Concept Design
Divided road	A road with a separate carriageway for each direction of travel created by placing a physical separation (e.g. median) between the opposing traffic directions
Heavy vehicles	A heavy vehicle is classified as a Class 3 vehicle (a two-axle truck) or larger, in line with the Austroads Vehicle Classification System
Hr	Hour
Local road	A road or street used primarily for access to properties in that road or street
Median	The central reservation which divides a carriageway for traffic travelling in opposite directions
Midblock	A general location on a road between two intersections
Min	minutes
Off ramp	A ramp by which one exits a limited access highway/tunnel
On ramp	A ramp by which one enters a limited access highway/tunnel
Public transport	Includes train and bus
RMS	NSW Roads and Maritime Services, currently Transport for NSW (TfNSW)
Roundabout	An intersection where all traffic travels in one direction clockwise around a central island
Sec	Seconds
Transport	Transport for New South Wales
Veh	Vehicles

1 Introduction

1.1 Report purpose

Transport for NSW (Transport) is planning to upgrade about 2.4-kilometre section of the Pacific Highway through Wyong town centre between Cutler Drive and Johnson Road (the Proposal). The proposed upgrade includes duplication of the Pacific Highway to provide two lanes in each direction from Johnson Road at Tuggerah through Wyong town centre and replace the Wyong River road bridge with two new road bridges.

The Pacific Highway through Wyong town centre is used by about 26,000 to 36,500 motorists every day and is subjected to substantial traffic congestion during peak periods. The road between Cutler Drive and Johnson Road is currently an undivided road with two lanes (one lane in each direction).

Transport proposes to modify the Pacific Highway upgrade project through Wyong town centre to include design changes to the 100% Concept Design (Proposed Modification).

This Traffic and transport impact assessment (TTIA) report aims to support the proposed modification by assessing and reporting existing and future conditions.

1.2 The proposed modification

The proposed modification is shown in Figure 1-1. Key features of the proposed modification would include:

- Updated road and bridge design
- Urban design and public amenity improvements
- Updated commuter car park design
- Changes to construction activities and staging
- Rail enabling works
- Other design refinements, including retaining walls and drainage infrastructure
- Adjustment of the construction footprint and Review of Environmental Factors (REF) boundary
- Changes to traffic management.

A Review of Environmental Factors (REF) was prepared for the Pacific Highway upgrade through Wyong town centre in 2015 (Project REF) (Roads and Maritime, 2015). The Project REF was placed on public display between 27 October 2015 and 27 November 2015 for community and stakeholder comment. A submissions report dated February 2016 was prepared to respond to issues raised (Roads & Maritime, 2016).

Following further design development in 2017, an addendum REF for the Pacific Highway upgrade through Wyong town centre was prepared (referred to in this addendum REF as the '2017 addendum REF') (Roads & Maritime, 2017).

The proposed modifications are further described in Addendum review of environmental factors report prepared by AECOM.

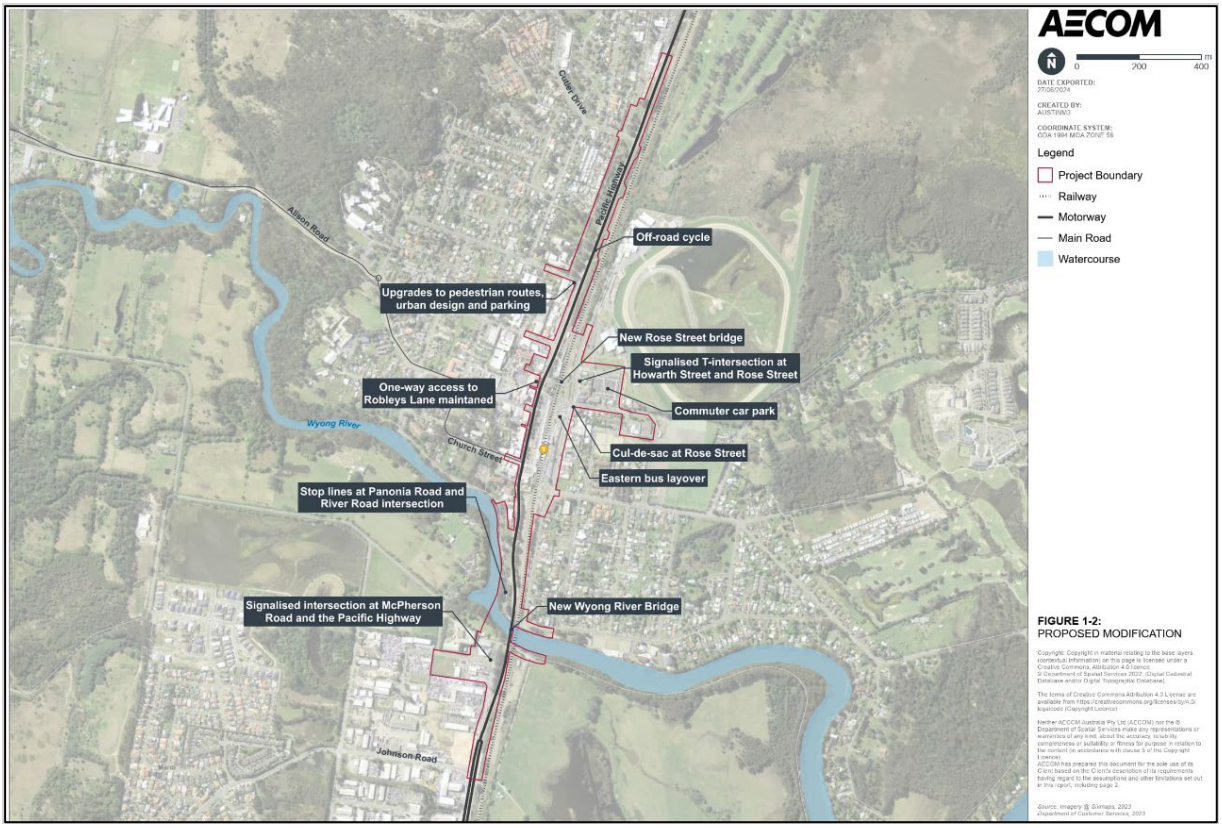


Figure 1-1 Proposed modification

1.3 Report outline

This Traffic and transport impact assessment report is structured as follows:

- Chapter 1: Introduction
- Chapter 2: Existing conditions
- Chapter 3: Traffic modelling methodology
- Chapter 4: Future traffic conditions without the Proposal
- Chapter 5: Operational impact assessment
- Chapter 6: Construction impact assessment
- Chapter 7: Mitigation and management measures
- Chapter 8: Summary and conclusions.

2 Existing conditions

2.1 Corridor description

2.1.1 Study area

The Pacific Highway is the main route through Wyong town centre and is a major urban arterial road connecting the northern suburbs of the Central Coast. It is currently a single lane in each direction through Wyong. Wyong and surrounding suburbs have experienced a large increase in the volume of traffic in recent years due to sustained urban growth across the Central Coast region.

Figure 2-1 shows the project study area and includes the section of the Pacific Highway from about 150 metres north of Cutler Drive in the north, Mildon Road in the south, Margaret Street in the west, and Ithome Street in the east. The study area also includes the Rose Street Community Car Park.

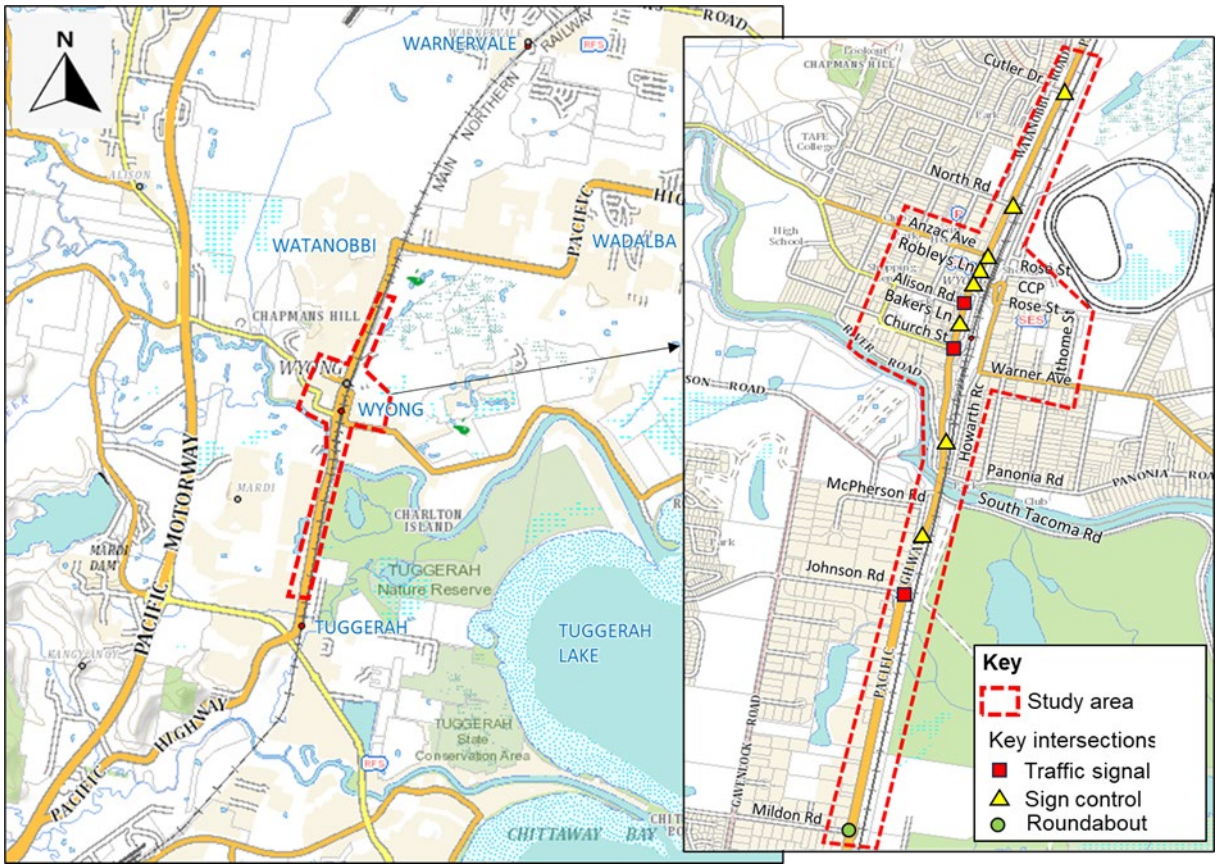


Figure 2-1 Pacific Highway, Wyong Town Centre study area

2.1.2 Route environment

Key features of the Pacific Highway through Wyong Town Centre include:

- Within the study area, a connection between the Pacific Highway and Wyong's growing residential, commercial, and industrial precincts, providing direct access to Wyong Station
- The Pacific Highway, generally an undivided two-lane road, with on-street parking provisions near the Town Centre and Wyong Station
- The Main North Railway line, which runs parallel to the highway immediately to the east of the project. At the southern end of the project area, the highway is surrounded by light industry to the west before crossing the Wyong River
- Numerous heritage buildings in the town centre, including a heritage conservation area around the Wyong railway station. The railway station is located to the east of the Pacific Highway and contains a bus interchange and provisions for car parking. The railway station is an important transport hub for upper Central Coast residents, particularly for weekday commuters travelling to Sydney and Newcastle.
- the Rose Street bridge across the railway line north of the railway station, providing the main access to the Wyong Racecourse and Wyong Regional Sports complex.
- A bus lane on the Pacific Highway southbound between Cutler Drive and Robleys Lane (about 500 metres).

2.1.3 Speed environment

Within the study area The Pacific Highway has posted speed limits varying from 50 km/h to 70 km/h (refer to Figure 2-2). The highway has a posted speed limit of 70 km/h between Cutler and North Road. Between North Road and River Road, posted speed on the highway through the Town Centre is reduced to 50 km/h. Between River Road Drive and Mildon Road posted speed on the highway is 60 km/h. For Howarth Street, Rose Street, Anzac Avenue, Church Road, and local roads posted speed limits are 50 km/h.

Figure 2-2 Posted speeds on Pacific Highway

2.1.4 Freight routes

The Pacific Highway through the Wyong Town Centre is a designated B-double route (up to 25 metres) and 4.6-metre-high vehicle route. B-doubles through Wyong Town Centre (from Church Street to the north) are restricted to travel before 7am and after 5:30pm.

Figure 2-3 shows freight routes on the Pacific Highway sourced from NSW Combined Higher Mass Limits (HML) and Restricted Access Vehicle (RAV).

There is a low clearance restriction (3.4 to 3.6 metres) on South Tacoma Road where it crosses under the Pacific Highway on the southern side of the Wyong River and a low clearance restriction (3.6 metres) on Panonia Road where it crosses under the Pacific Highway on the northern side of Wyong River.

The Pacific Highway through Wyong Town Centre is an approved route with travel conditions for Oversize Overmass Load Carrying Vehicles (OSOM route).

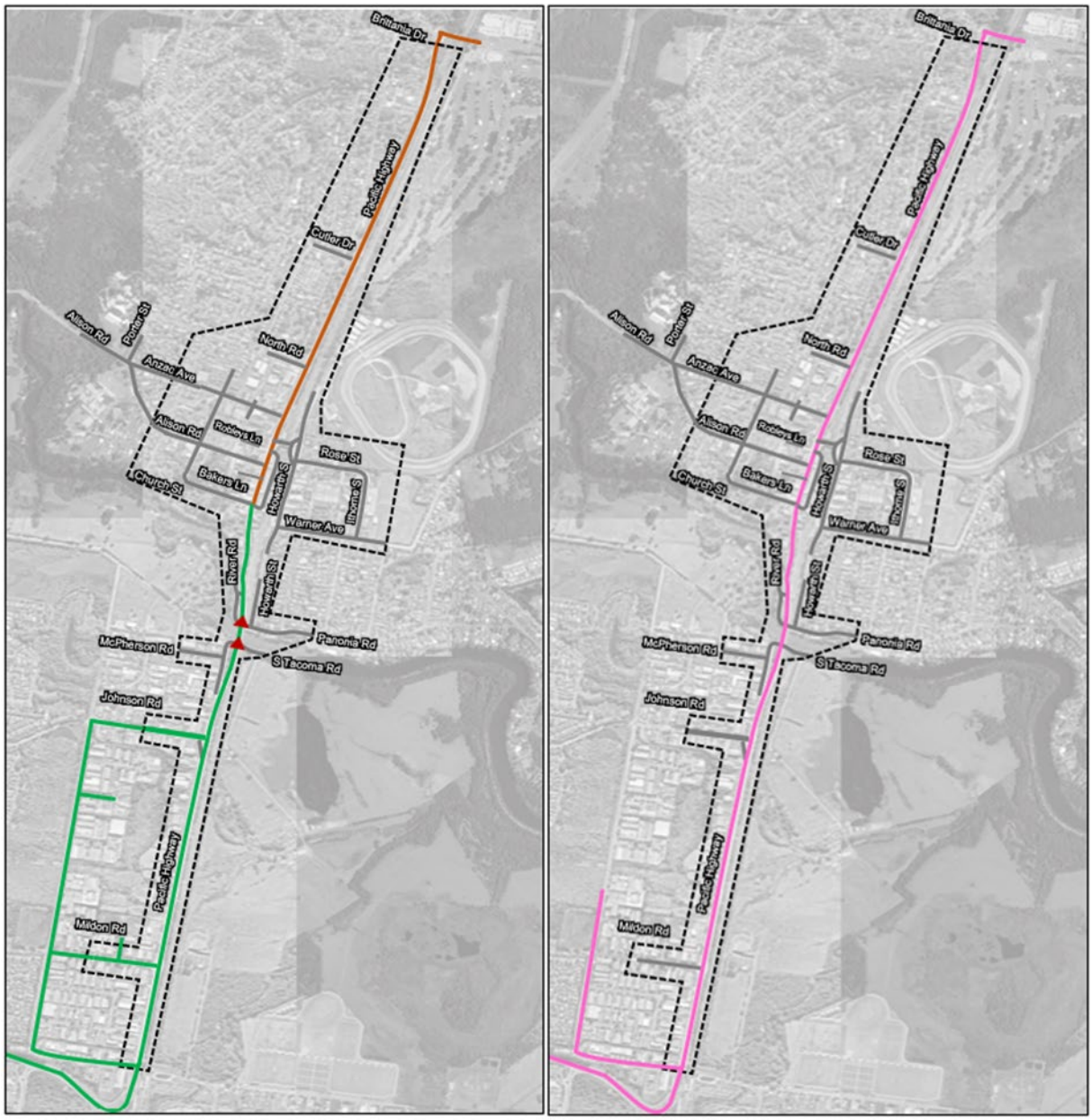


Figure 2-3 Designated freight route for 4.6m high vehicles on Pacific Highway

2.2 Existing land use

Figure 2-4 shows the land use in the study area based on the current land zoning control sourced from 2013 Wyong Local Environmental Plan 2013 (LEP 2013).

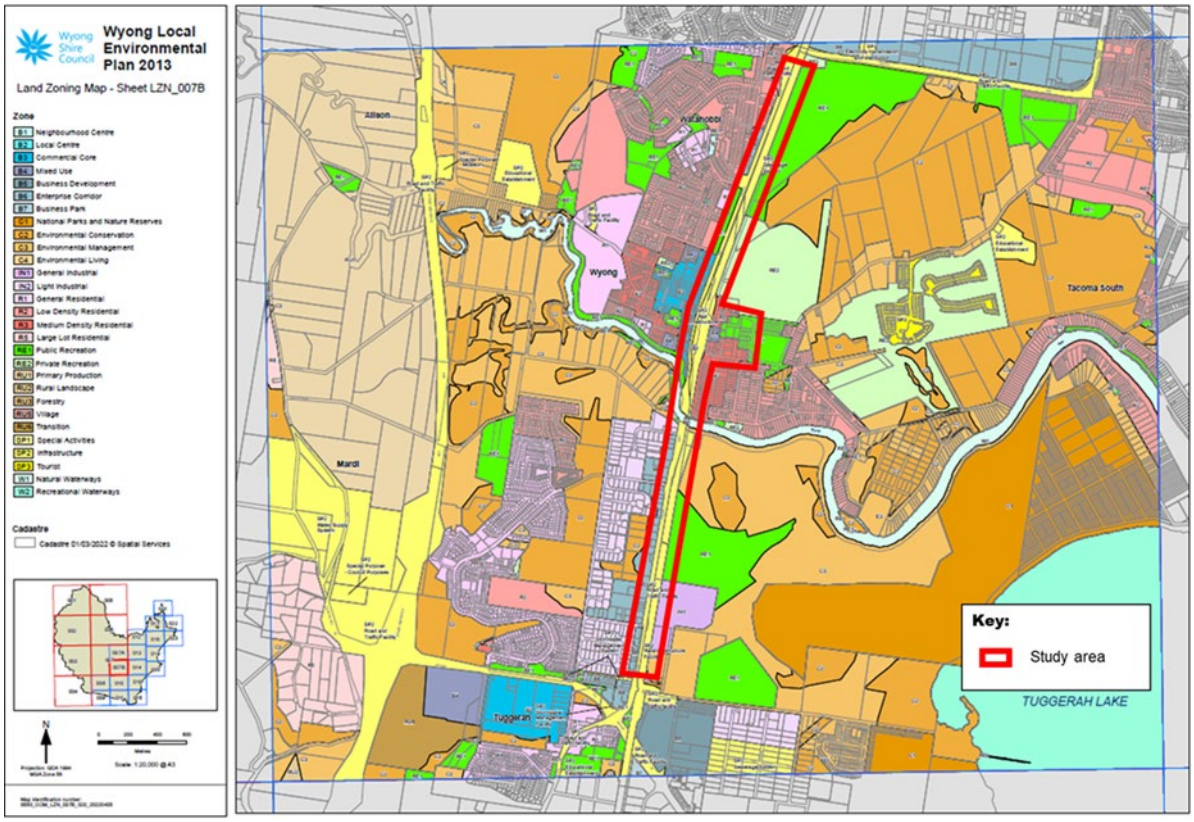


Figure 2-4 Land use map

The study area has a mix of land uses including residential, commercial, business, industrial, recreation, environmental, and local centre. General and low density residential (R1, R2) spread out within the study area primarily between North Road and Britannia Drive. Medium density residential (R3) is located along Howarth Street and Warner Avenue. Commercial core land use (B4) is located on the Pacific Highway between River Road and North Road. Light industrial (IN2) and Enterprise corridor (B6) are distributed along the Pacific Highway between Wyong Road and Wyong River.

2.3 Historical traffic growth on Pacific Highway

Average weekday traffic (AWT, 5 days) and average daily traffic (ADT, 7 days) were estimated using traffic counts on the Pacific Highway in 2011, 2014 and 2022. These counts represent samples over one or two weeks. Table 2-1 and Table 2-2 show the AWT and ADT on the Pacific Highway in 2011, 2014 and 2022and their growth from 2011 to 2022.

Table 2-1 Historical AWT on Pacific Highway through Wyong Town Centre

Road sections	Average weekday daily traffic (AWT)			Growth rate per annum	
	2011	2014	2022	2014 to 2022 (8 years)	2011 to 2022 (11 years)
Pacific Highway north of Cutler Drive	22,050	24,000	26,000	1.0%	1.6%
Pacific Highway south of Church Street	n.a	27,550	29,600	0.9%	n.a
Pacific Highway south of River Road	32,800	n.a	36,450	n.a	1.0%
Pacific Highway south of Johnson Road	n.a	30,950	32,150	0.5%	n.a
Average rate across four sites				1.0%	

Table 2-2 Historical ADT on Pacific Highway through Wyong Town Centre

Road sections	Average daily traffic (ADT)			Growth rate per annum	
	2011	2014	2022	2014 to 2022 (8 years)	2011 to 2022 (11 years)
Pacific Highway north of Cutler Drive	20,500	21,800	23,800	1.2%	1.5%
Pacific Highway south of Church Street	n.a	25,300	27,150	0.9%	n.a
Pacific Highway south of River Road	32,050	n.a	33,200	n.a	0.3%
Pacific Highway south of Johnson Road	n.a	28,250	29,750	0.7%	n.a
Average rate across four sites				0.7%	

Note: n.a-counts not available.

The data shows that the AWT on the Pacific Highway grew at about 1 per cent per year, while the ADT grew more slowly, at about 0.7 per cent per year. This is an indication that weekend traffic volumes are lower than the weekday traffic volumes.

2.4 Historical growth for heavy vehicles

Historical traffic counts on Pacific Highway south of Church Street show that the average weekday heavy vehicle volumes on the Pacific Highway have grown by about 0.5 per cent per annum between 2011 and 2022.

2.5 Review of previous traffic growth assumptions

Arcadis reviewed the future growth assumption documented in earlier traffic studies conducted by SMEC and TMA. The following two documents were reviewed:

- *Pacific Highway Upgrade through Wyong Town Centre, Traffic and Transport Assessment Report, prepared by SMEC, 2015*
- *Wyong Town Centre, Traffic Modelling Report, prepared by TMA, November 2018.*

Both SMEC and TMA reports assumed an annual growth rate of 1.5 per cent per annum on the Pacific Highway between 2014 and 2024 followed by 1.0 per cent per annum until 2041.

2.6 Public transport

2.6.1 Bus services

The study area is serviced by 17 bus routes that are operated by Busways, Red Bus Services and Coastal Liner. Table 2-3 summarises the bus services and frequencies within the study area. Figure 2-5 shows the bus routes on the Pacific Highway through Wyong Town Centre.

During the weekday morning peak two hours (7am to 9am), there are about 67 bus services (two-way), equivalent to a bus every 4 minutes. During the afternoon peak two hours (3pm to 5pm), there are about 62 bus services (two-way), with a frequency similar to the morning peak two hours.

Table 2-3 Existing bus services and frequencies

Route	Description	Bus service frequency (minutes) – Weekday	
		AM peak (7-9am)	PM peak (3-5pm)
10	Warnervale to Tuggerah via Wyee	1 service	1 service
11	Lake Haven to Tuggerah via Wyong Station	3 services (40 minutes)	-
13	Lemon Tree to Tuggerah via Warnervale	-	1 service
15	Bay Village to Tuggerah	1 service	-
16	The Entrance to Wyong	2 services (60 minutes)	-
19	Wyong to Gosford	4 services (30 minutes)	6 services (20 minutes)
24	The Entrance to Wyong (night bus)	-	-
25	The Entrance to Wyong	8 services (15 minutes)	8 services (15 minutes)
26	The Entrance to Wyong	7 services (17 minutes)	7 services (17 minutes)
30	South Tacoma to Wyong (loop service)	2 services (60 minutes)	1 service
78	Tuggerah to Lake Haven via Wadalba & Warnervale	5 services (22 minutes)	3 services (40 minutes)
79	Lake Haven to Tuggerah via Woongarrah, Hamlyn Terrace & Watanobbi	8 services (15 minutes)	9 services (13 minutes)
80	Tuggerah to Lake Haven via Pacific Highway & Lake Haven Drive	7 services (17 minutes)	10 services (12 minutes)
81	Lake Haven to Tuggerah via Kanwal, Wyong & Wadalba	9 services (13 minutes)	9 services (13 minutes)
82	Lake Haven to Tuggerah via Wyong, Tuggerah & Tacoma	6 services (20 minutes)	7 services (17 minutes)
93	Noraville to Tuggerah via Wyong & Toukley	2 services (60 minutes)	-
94	Budgewoi to Tuggerah via San Remo & Wyong	2 services (60 minutes)	-

Sources: Busways, Red Bus Services and Coastal Liner timetable as of 2023

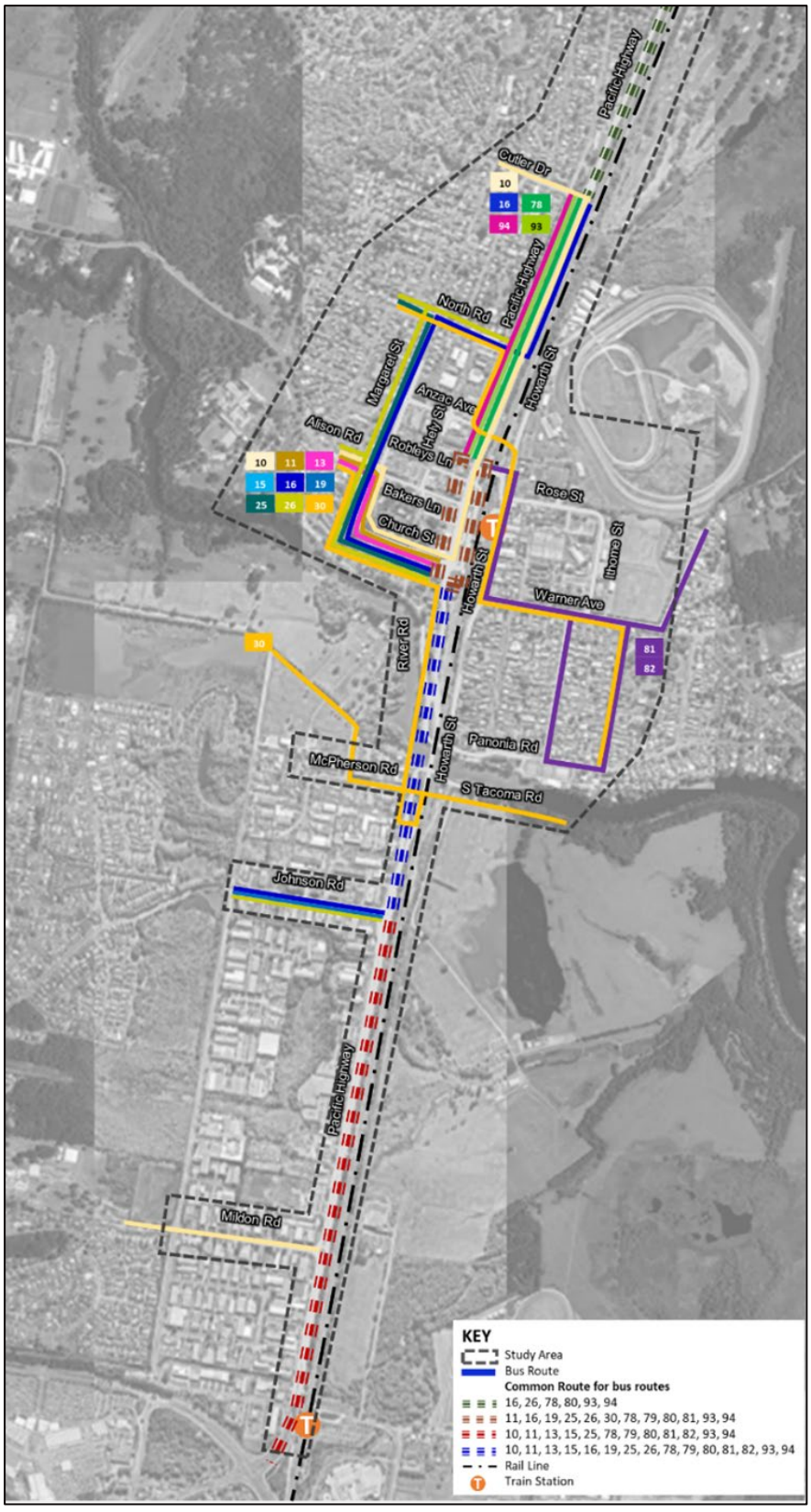


Figure 2-5 Bus routes within the study area

Currently, 11 bus stops are provided along the Pacific Highway between Cutler Drive and Mildon Road, including a transport interchange at Wyong Station. Figure 2-6 shows the location of the existing bus stops and facilities. Of these, nine are bus stop bays and two are in-lane bus stops.

Signalised pedestrian crossings are only provided on the Pacific Highway at Alison Street, Church Street and Johnson Street intersections. No pedestrian refuges are provided for bus stops near Cutler Drive, North Road and Mildon Road.

Figure 2-6 Existing bus stops and pedestrian facilities on Pacific Highway

2.6.2 Rail services

Wyong Station is the main rail station accessed from the Pacific Highway. Tuggerah Station, is also located in the study area, at its southern boundary. Wyong Station and Tuggerah Station are part of the Central Coast and Newcastle Line, which provides access to key centres throughout the Central Coast and Newcastle, and Sydney via direct links to Hornsby, Strathfield and Central.

Table 2-4 Frequency of rail service to/from Wyong Station during weekday peak periods

Service	Rail service frequency - Weekday	
	AM peak (7-9am)	PM peak (3-5am)
Wyong to Sydney	6 services (20 minutes)	4 services (30 minutes)
Sydney to Wyong	5 services (22 minutes)	8 services (15 minutes
Wyong to Newcastle	4 services (30 minutes)	3 services (40 minutes)
Newcastle to Wyong	4 services (30 minutes)	4 services (30 minutes)

2.7 Active transport

2.7.1 Pedestrian facilities

Figure 2-7 shows existing pedestrian facilities. Currently, footpaths are provided on at least one side of the Pacific Highway between North Road and Mildon Road. The footpath width varies from one to three metres along its length. Four signalised pedestrian crossings are provided on the Pacific Highway at the Alison Road, Church Street and Johnson Road intersections.

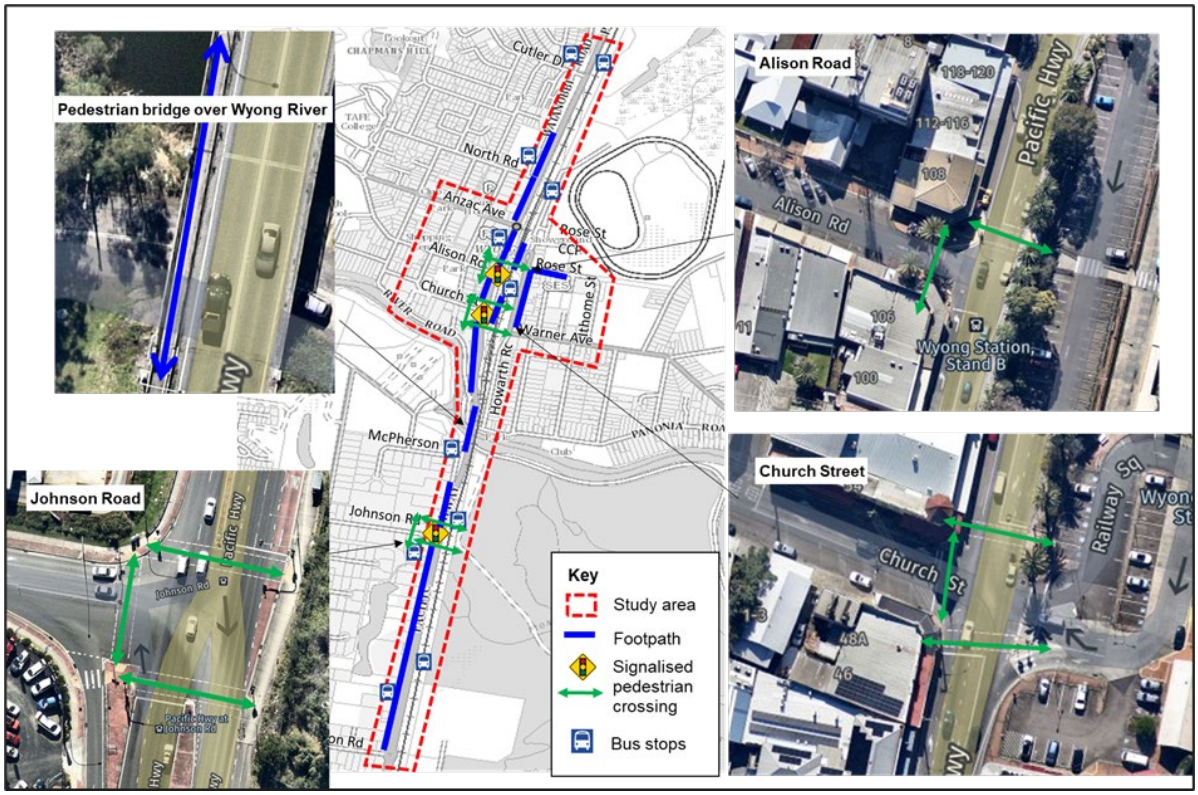


Figure 2-7 Existing pedestrian facilities on Pacific Highway, Cutler Drive to Mildon Road

2.7.2 Pedestrian crossings on the Pacific Highway

There is strong pedestrian activity in the Wyong Town Centre, particularly at the pedestrian crossing on the Pacific Highway, which provides the optimum access to commuter car parks and Wyong Station. Pedestrian volumes were counted in 2022, over a 13-hour period from 6am to 7pm. The pedestrian survey shows large pedestrian volumes crossing the Pacific Highway between 6am and 7pm (refer to Figure 2-8). The peak pedestrian volumes were observed between 1pm and 4pm, with a peak hour occurring between 1pm and 2pm.

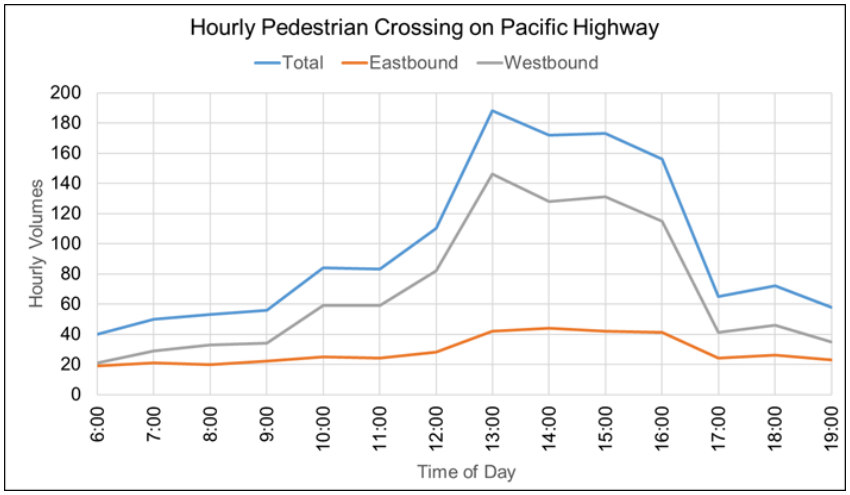


Figure 2-8 Pedestrian crossing across Pacific Highway between 6am and 7pm

Table 2-5 shows the pedestrian volumes recorded at four pedestrian crossings. A total of about 1,240 pedestrians crossed the Pacific Highway in the course of a survey. Of these, nearly 900 (more than 70 per cent) crossed at the signalised pedestrian at Alison Road. This crossing is convenient for access to Wyong Station and the rail bridge, the main bus interchange and commuter carparks.

During the one-hour peak, nearly 180 pedestrians crossed the Pacific Highway. About 130 pedestrians (more than 70 per cent) crossed at Alison Road. Figure 2-9 summarises the results of the survey at each of the crossing locations.

Table 2-5 Pedestrian counts on Pacific Highway at various locations

ID	Site	Total survey period (14 hours)			Peak one hour (1pm - 2pm)		
		Eastbound	Westbound	Total	Eastbound	Westbound	Total
3	Pacific Highway at Church Street	93	129	**222**	9	22	**31**
4	Pacific Highway at Alison Road	213	681	**894**	23	106	**129**
5	Peds Crossing Pacific Highway between Rose Street bridge & Alison Road, in/out of the car park on East	8	1	**9**	1	0	**1**
6	Peds Crossing Pacific Highway between Church Street & Alison Road, in/out of the car park on East	50	69	**119**	4	13	**17**
Total				**1,244**			**178**

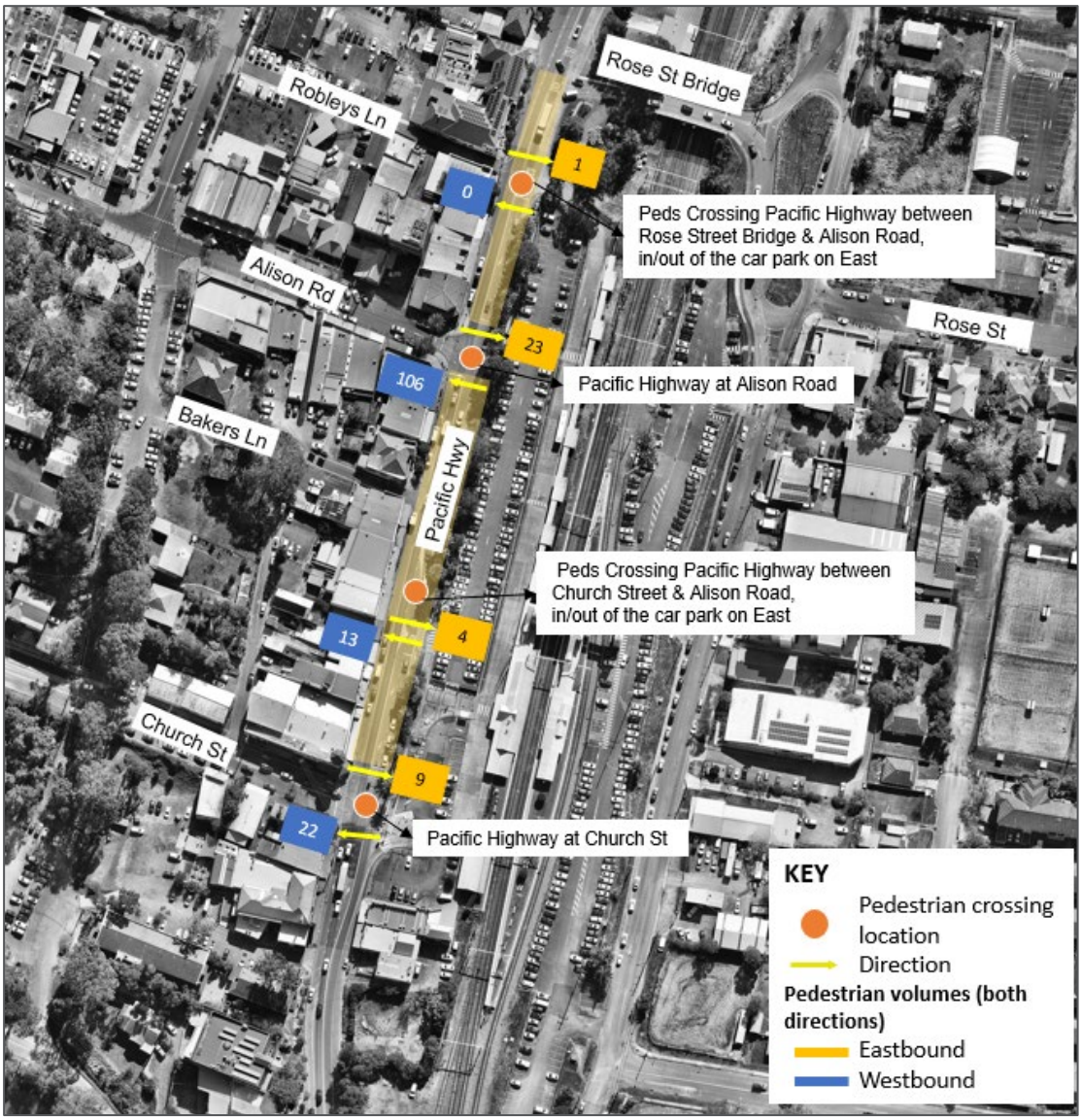


Figure 2-9 Pedestrian counts on Pacific Highway during peak one hour (1pm-2pm)

2.7.3 Cyclist

Figure 2-10 shows the locations of existing cyclist facilities. Currently, bicycle paths are provided on the Pacific Highway between Mildon Road and Johnson Road. Between Johnson Road and Cutler Drive, cyclists use road shoulder or outside lane. Cyclists can cross the Pacific Highway at the three signalised intersections near Alison Road, Church Street and Johnson Road.

Analysis of demand and facilities for active transport identified that along the Pacific Highway, there is no footpath:

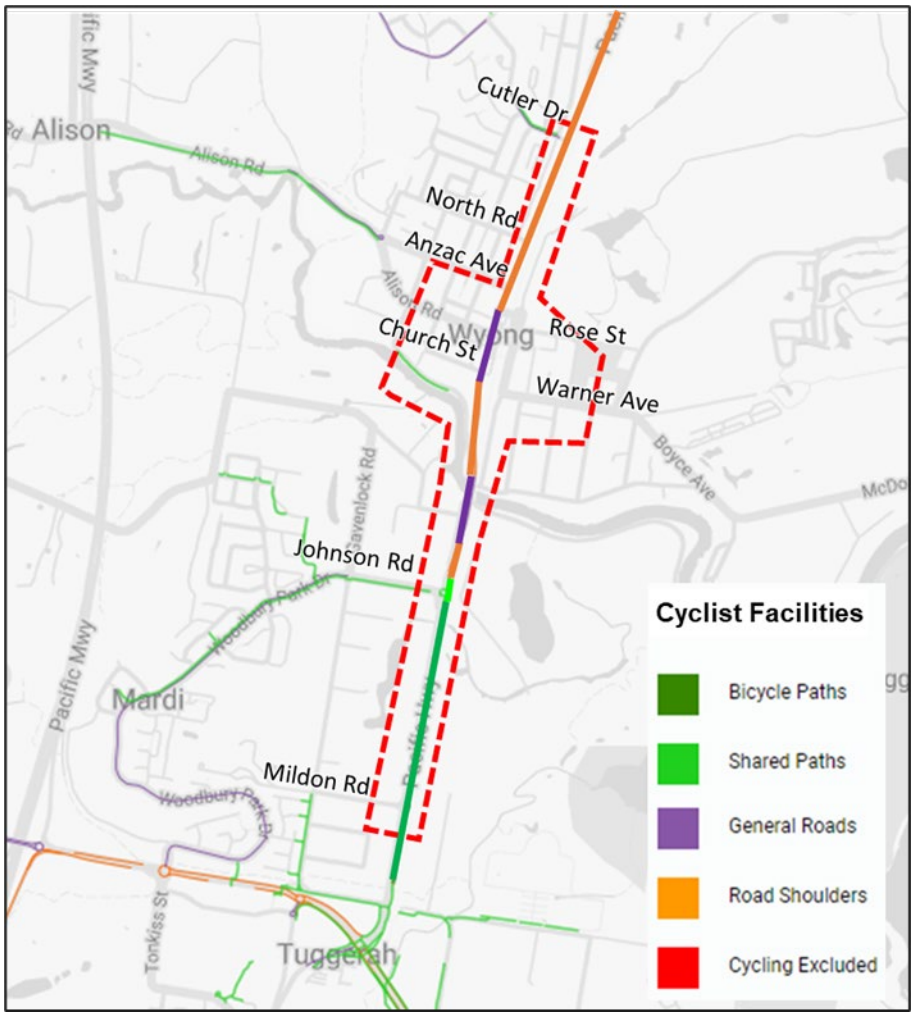
- between Wyong River bridge and Church Street
- between North Road and Cutler Drive

There is no bicycle path between Johnson Road and Cutler Drive.

Furthermore, there are no footpaths:

- along Howarth Street on-street car park and Wyong Station
-

There are no pedestrian facilities at the bus stop near Cutler Drive and North Road.



Source: TfNSW Cycleway Finder (August 2023)

Figure 2-10 Existing cyclist facilities on Pacific Highway, Cutler Drive to Mildon Road

2.8 Crash data

TfNSW provided five-year crash data, between 2017 and 2021 on the 2.4-kilometre section of the Pacific Highway through the Wyong Town Central between Cutler Drive and Johnson Road. Table 2-6 summarises five-year crash data on the Pacific Highway, classified by location and crash severity (including fatal, injury and non-casualty). Figure 2-11 shows the locations of the crashes and their severity.

Table 2-6 Recorded crashes on Pacific Highway between 2017 to 2021

Road section	Casualty				Non-casualty (towaway)	Total
	Fatal	Serious Injury	Moderate Injury	Minor/ Other Injury		
Total 2.4 km section on Pacific Highway	0	3	12	6	19	40
	0%	8%	30%	15%	48%	100%

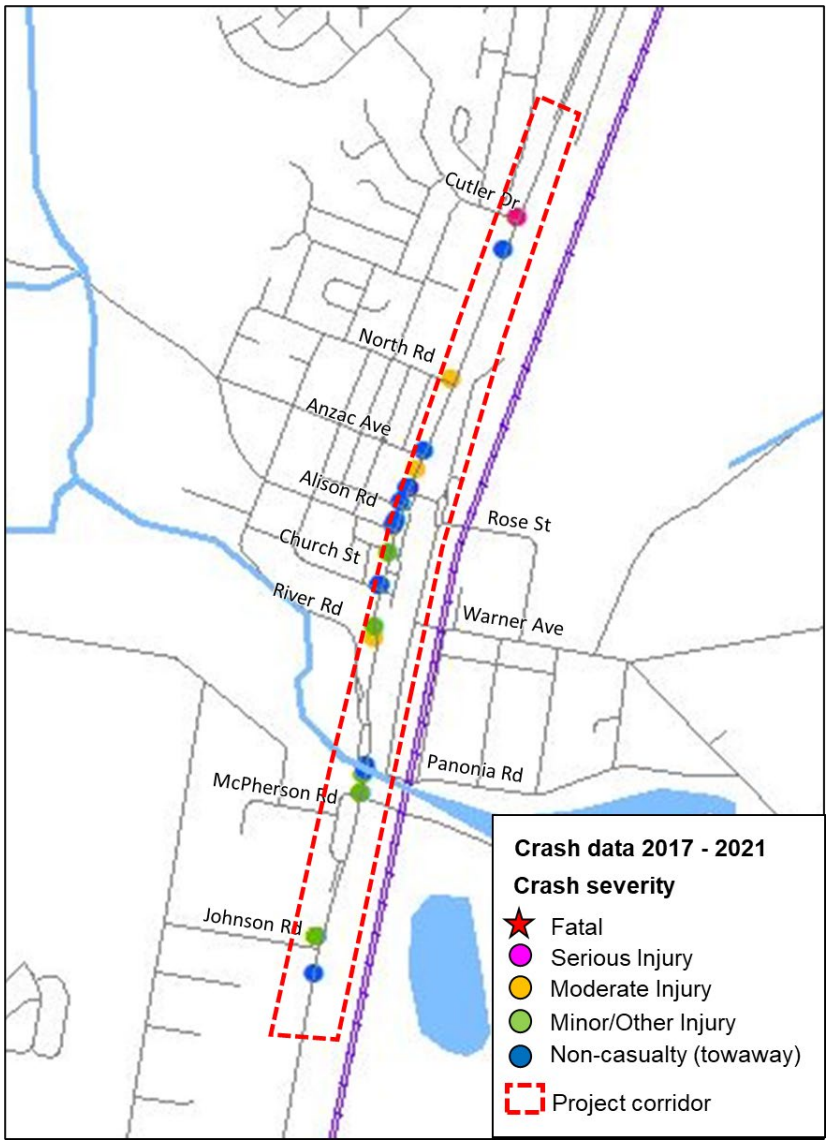


Figure 2-11 Location of crashes on Pacific Highway

There were 40 crashes recorded on the 2.4 section of the Pacific Highway between Cutler Drive and Johnson Road. More than half (53 per cent) of all crashes resulted in injury. No fatal crashes were recorded. However, more recently, on 3 December 2023, there was a fatal crash at the intersection of Cutler Drive and Pacific Highway.

Figure 2-12 shows the frequency of each crash type analysed from the 5-year data. Common crash types on the Pacific Highway include rear-end crashes, which accounted for 55 per cent of the recorded crashes. A further 30 per cent of crashes involved collisions at intersections and head-on collisions. Pedestrian crossing carriageway related crashes are accounted for 5 per cent of all crashes. Other crash types such as lane change, which accounted for 5 per cent of crashes each, and Vehicle leaving driveway accounted for 5 per cent of crashes.

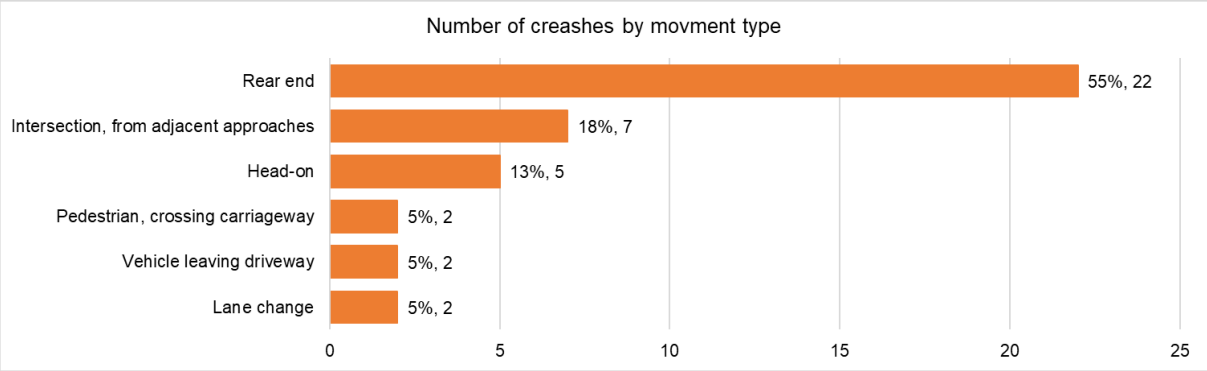


Figure 2-12 Number of crashes per movement type on Pacific Highway

Of the total 40 crashes recorded, about 28 crashes occurred at intersections, equivalent to 70 per cent of total crashes. Table 2-7 shows number of crashes at key intersections within the study area. Most crashes were recorded at priority intersections with Cutler Drive, North Road, Alison Road, Rose Street bridge, River Road.

Table 2-7 Crashes recorded at intersections with Pacific Highway

Intersections with Pacific Highway	Crashes
Cutler Drive	4
North Road	3
Anzac Avenue	1
Robleys Lane	1
Alison Road	3
Bakers Lane	1
Rose Street bridge	2
Church Street	3
River Road / Panonia Road	5
Johnson Road	5
Total intersection related crashes	28

2.9 Traffic volumes on the Pacific Highway

The traffic on the Pacific Highway through the Wyong Town Centre was counted as part of a traffic survey carried out by TfNSW in November 2022. Figure 2-13 shows the daily traffic volumes counted in that survey.

On an average weekday, the traffic volumes on the Pacific Highway through the Wyong Town Centre varied by count location, from 26,000 vehicles per day north of the town centre to 36,500 vehicles per day south of the town centre. About 2,000 heavy vehicles travelled on this section of the Pacific Highway on an average weekday, representing about five to eight per cent of total traffic.

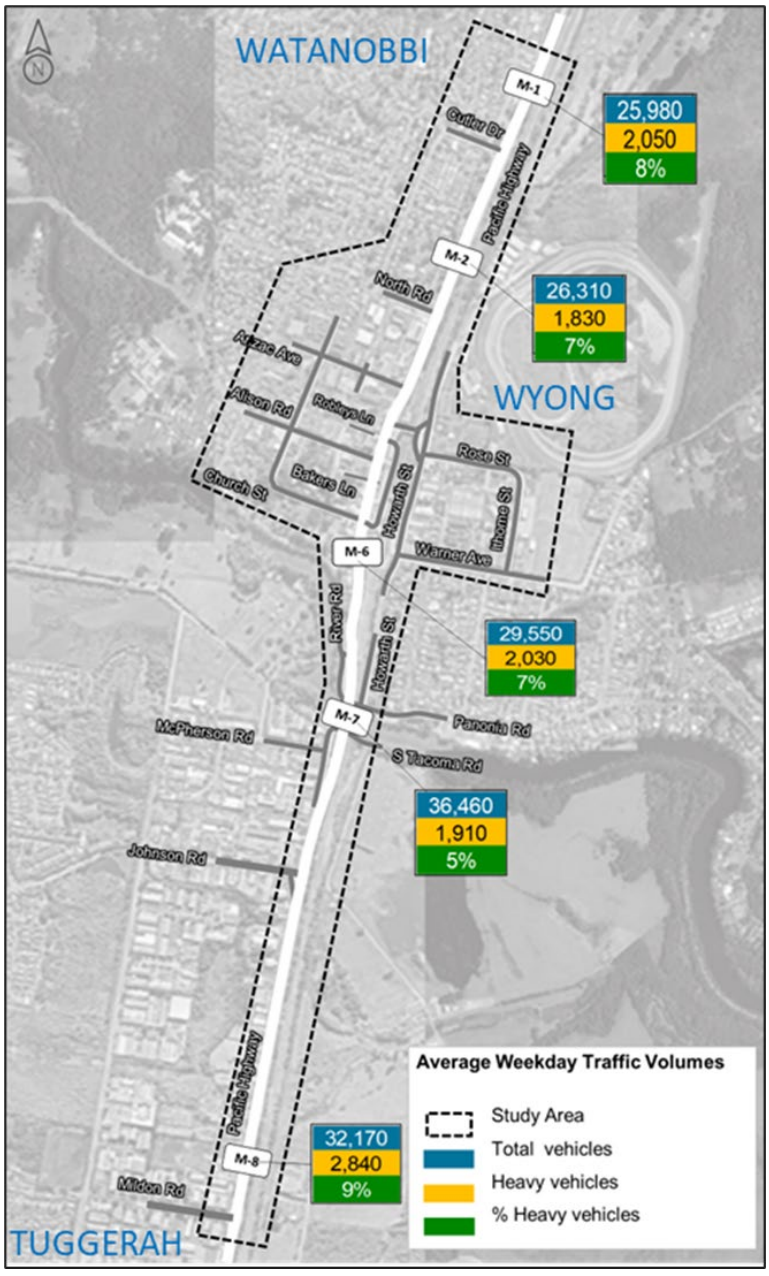


Figure 2-13 Average weekday daily traffic volumes on Pacific Highway in 2022

During the peak hour, the Pacific Highway carried up to 1,500 vehicles per hour in the peak direction depending on location. In the morning peak hour, the Pacific Highway carried higher traffic volumes in the southbound direction, towards Tuggerah. In the afternoon peak, the Pacific Highway carried higher traffic volumes in the northbound direction, towards Watanobbi.

Figure 2-14 shows directional traffic flows on the Pacific Highway in the morning peak hour (8am to 9am) and afternoon peak hour (4pm to 5pm). The red arrows in Figure 2-14 indicate the peak traffic direction.

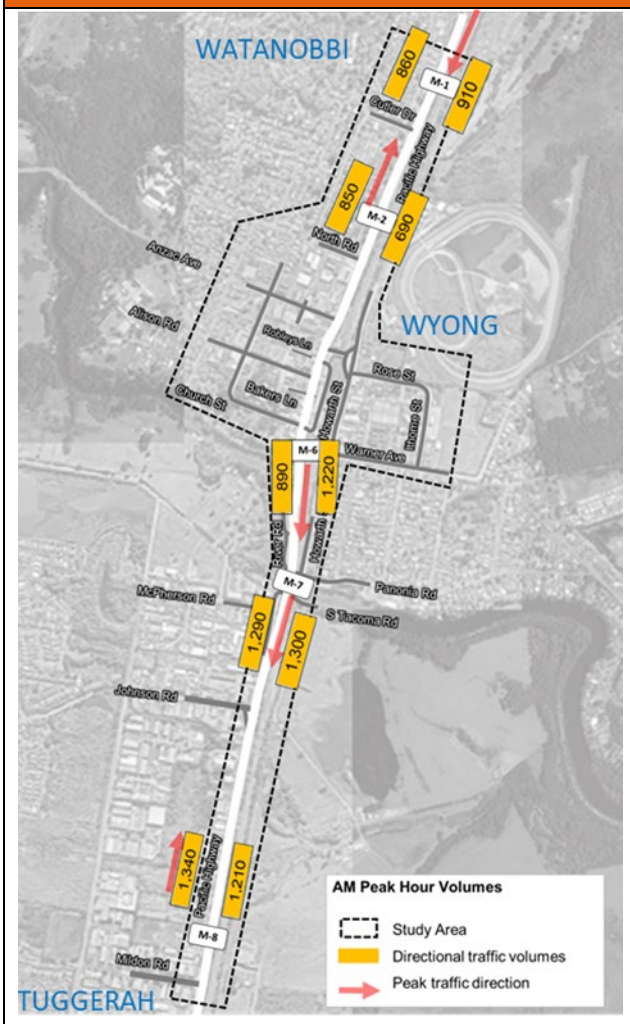
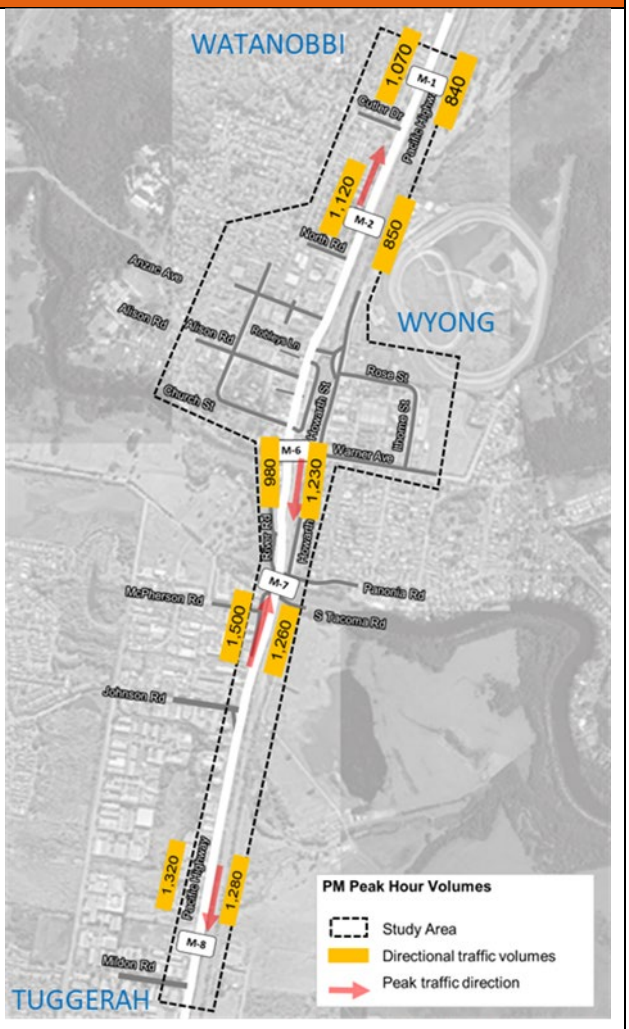
AM peak one hour volumes (vehicles)	PM peak one hour volumes (vehicles)
	

Figure 2-14 Observed peak hour pattern on Pacific Highway – AM and PM peak

2.10 Existing level of service

The existing level of service is reported for the following nine key intersections with the Pacific Highway between Cutler Drive and Johnson Road including:

- Pacific Highway / Cutler Drive
- Pacific Highway / North Road
- Pacific Highway / Anzac Avenue
- Pacific Highway / Railway bridge
- Pacific Highway / Alison Road
- Pacific Highway / Church Street
- Pacific Highway / River Road / Panonia Road
- Pacific Highway / South Tacoma Road / McPherson Road
- Pacific Highway / Johnson Road.

The intersection level of service (LoS) is reported in accordance with *TfNSW Traffic Modelling Guidelines* (Version 1.0, February 2013).

Table 2-8 below shows the TfNSW standard level of service (LoS) criteria for intersection operation. The guide recommends that the level of service is determined by the critical movement with the highest delay for priority intersections such as roundabouts and sign-controlled intersections. With these intersection controls (roundabout, Stop and Give Way sign controls), some movements may experience high levels of delay while others may experience a minimal delay.

The level of service criteria for a signalised intersection are related to the average intersection delay measured in seconds per vehicle.

LoS categorises the average delay into bands A to F, with LoS A representing the best operation and LoS F representing the worst operation. The LoS band of categories are shown in Table 2-8.

Table 2-8 Level of service criteria for intersections

Level of Service (LoS)	Average Delay per Vehicle (seconds per vehicle)	Traffic Signals, Roundabout	Give Way & Stop Signs
A	Less than 14	Good operation	Good operation
B	More than 14 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	More than 28 to 42	Satisfactory	Satisfactory, but accident study required
D	More than 42 to 56	Operating near capacity	Near capacity & accident study required
E	More than 56 to 70	At capacity; at signals, incidents will cause excessive delays Roundabouts require other control mode	At capacity, requires other control mode
F	More than 70	Unsatisfactory with excessive queuing	Unsatisfactory with excessive queuing

Source: TfNSW' Traffic Modelling Guidelines, Version 1.0, February 2013

Table 2-9 shows existing delays and level of service for nine key intersections with the Pacific Highway between Cutler Drive and Johnson Road in 2022. The existing delays and levels of service data for key intersections have been estimated using outputs from VISSIM models.

Table 2-9 Existing level of service on key intersections with Pacific Highway in 2022

Intersection	Control type	AM peak		PM peak	
		Delay (sec)	LoS	Delay (sec)	LoS
Pacific Highway / Cutler Drive	Sign control	71	F	28	B
Pacific Highway / North Road	Sign control	128	F	151	F
Pacific Highway / Anzac Avenue	Sign control	113	F	59	E
Pacific Highway / Rose Street bridge	Sign control	207	F	125	F
Pacific Highway / Alison Road	Traffic signal	5	A	8	A
Pacific Highway / Church Street	Traffic signal	21	B	25	B
Pacific Highway / River Road / Panonia Road	Sign control	177	F	161	F
Pacific Highway / South Tacoma Road / McPherson Road	Sign control	130	F	272	F
Pacific Highway / Johnson Road	Traffic signal	16	B	24	B

Source: VISSIM models

Congestion and delay – in 2022, VISSIM model shows level of service F for six key intersections, with average delay varying between 71 seconds and 272 seconds, depending on the peak hour. The traffic conditions at the intersections can be summarised as follows

- The intersection of Pacific Highway / Railway bridge intersection provides access to the commuter car parks on Howarth Street, Rose Street, and Wyong Station. The intersection has a single approach lane in each direction and is a primary pinch point in both peak hours. During the peak hours, southbound traffic on Pacific Highway is delayed by large traffic volumes turning left from railway bridge (200 to 400 vehicles per hour) onto the Pacific Highway.
- At the three intersections of Pacific Highway / Anzac Avenue, Pacific Highway / North Road and Pacific Highway / Cutler Drive, traffic operates at poor level of service (LoS F). A primary cause of the low level of service is the impact of congestion at the Pacific Highway / Rose Street bridge intersection.
- The intersection at Pacific Highway / River Road / Panonia Road has a single approach lane in each direction. During the peak hours, left and right turning traffic from River Road and Panonia Road are delayed by large volumes of northbound and southbound through-traffic on the Pacific Highway.
- During the peak hours at the intersection at Pacific Highway / South Tacoma Road / McPherson Road, left and right turning traffic from South Tacoma Road and McPherson Road are delayed by large northbound and southbound through-traffic on the Pacific Highway.

Highway queuing at intersections - the current single lane arrangement along the highway leads to congestion on the highway and queues that overflow across key intersections. Figure 2-15 shows existing queues on the Pacific Highway in 2022 AM and PM peak hours. Queuing at the intersections can be summarised as follows:

- In the morning peak, southbound queues on the highway start at the Church Street and Alison Road intersections and extend for about 1 km to north of Cutler Drive. The morning peak southbound queues block traffic exiting from Rose Street bridge. Northbound queues on the highway start at the Church Street intersection and extend about 500 metres to South Tacoma Road.
- Similar queues are observed in the afternoon peak. Southbound queues during the afternoon peak extend about 500 metres from the Church Street intersection to North Road. The afternoon peak northbound queues extend from the Church Street intersection to Wyong River bridge.

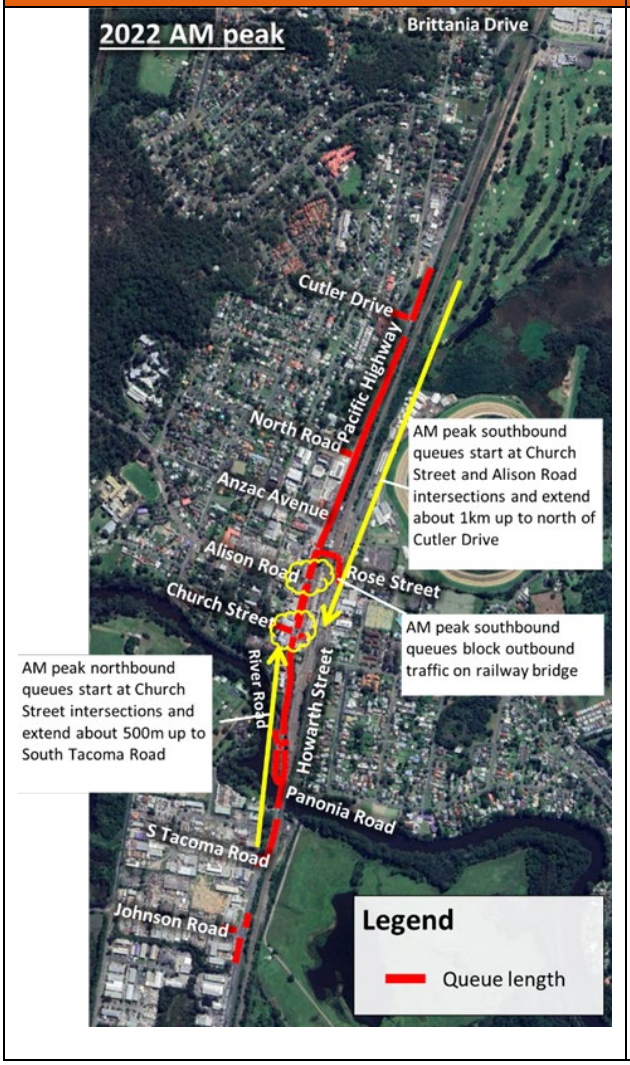
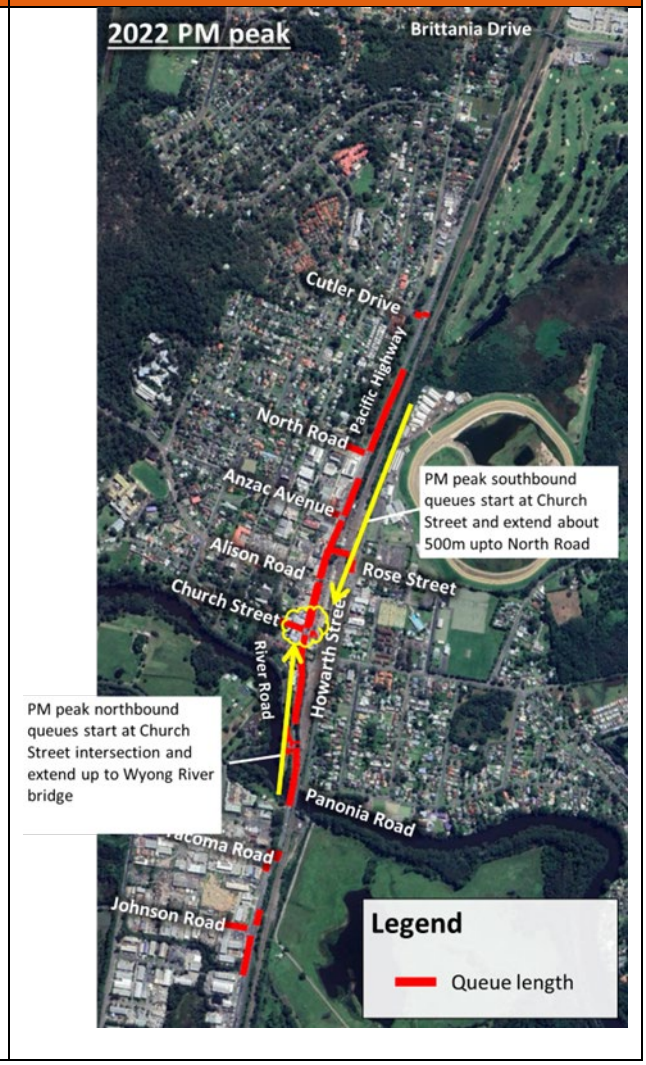
AM peak	PM peak
	

Figure 2-15 Existing queues on Pacific Highway in 2022

2.11 Current travel time on the Pacific Highway

The current travel times are reported for the 4.5-kilometre section on the Pacific Highway between Anzac Road and Brittania Drive, which is longer than the 2.4-kilometre project scope. The longer length captures the impact of upstream and downstream congestion (refer to Figure 2-16).

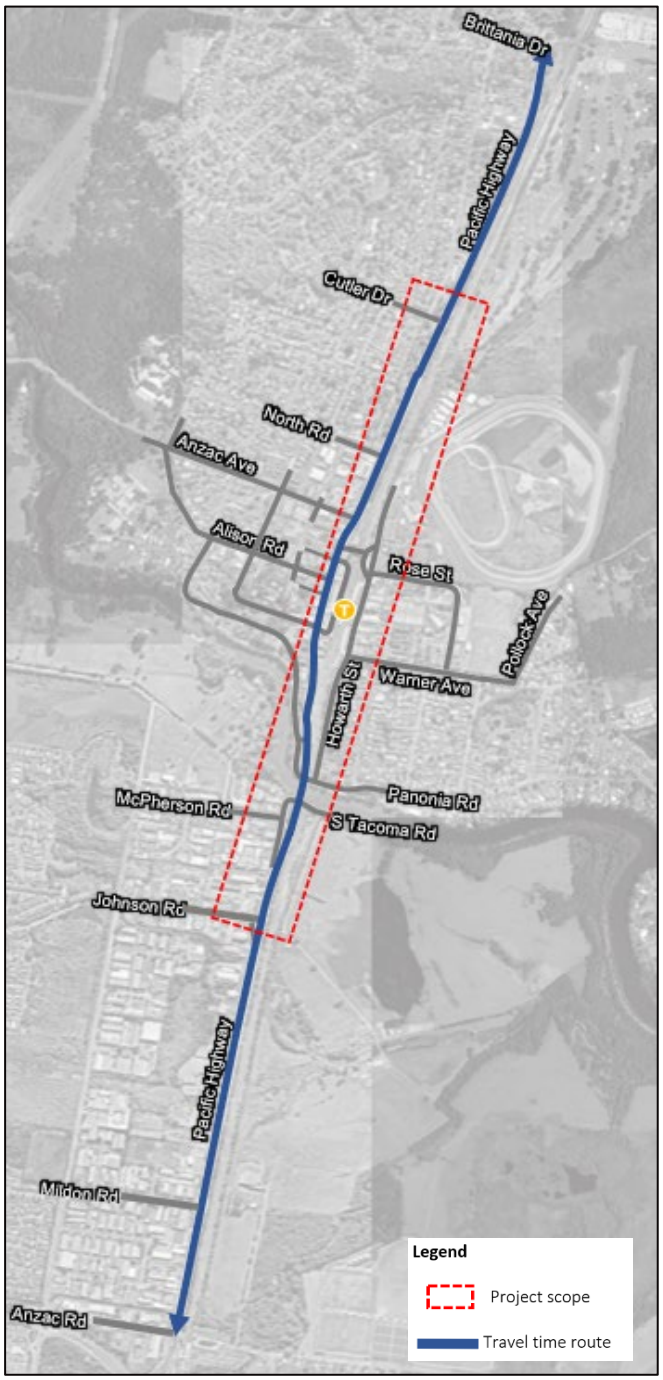


Figure 2-16 Travel time routes

Table 2-10 shows travel time and travel speed on the Pacific Highway between Anzac Road and Brittania Drive in 2022. Travel times on the Pacific Highway are reported for the southbound peak traffic direction in the morning peak and northbound in the afternoon peak.

Table 2-10 Existing travel time and travel speed on Pacific Highway in 2022

Peak period	Average travel time (minutes)	Average travel speed (km/h)
AM peak	10.6 minutes	25 km/h
PM peak	7.3 minutes	37 km/h

Source: VISSIM models.

The surveyed travel speed of 25 km/h to 37 km/h on the Pacific Highway during peak periods is substantially lower than the posted speed of 50 km/h to 70 km/h. The data suggests, currently single lane on the Pacific Highway is at capacity during peak periods with low travel speeds between Anzac Road and Brittania Drive.

3 Traffic modelling methodology

This section provides an overview of the traffic modelling and analysis methodology. The objective of the modelling was to make the best use of available traffic count data and modelling software to determine the base and future conditions for the proposal and the surrounding local road network. The impact of traffic volumes on operation performance with and without the proposal was assessed.

3.1 VISSIM model

An operational microsimulation traffic model was developed using VISSIM software for the 4.5-kilometre section of the Pacific Highway between Anzac Road and Brittania Drive. The VISSIM network is longer than the 2.4-kilometre project scope, so that it captures the impact of congestion upstream and downstream of the study area. Figure 3-1 shows VISSIM modelled network and travel zones.

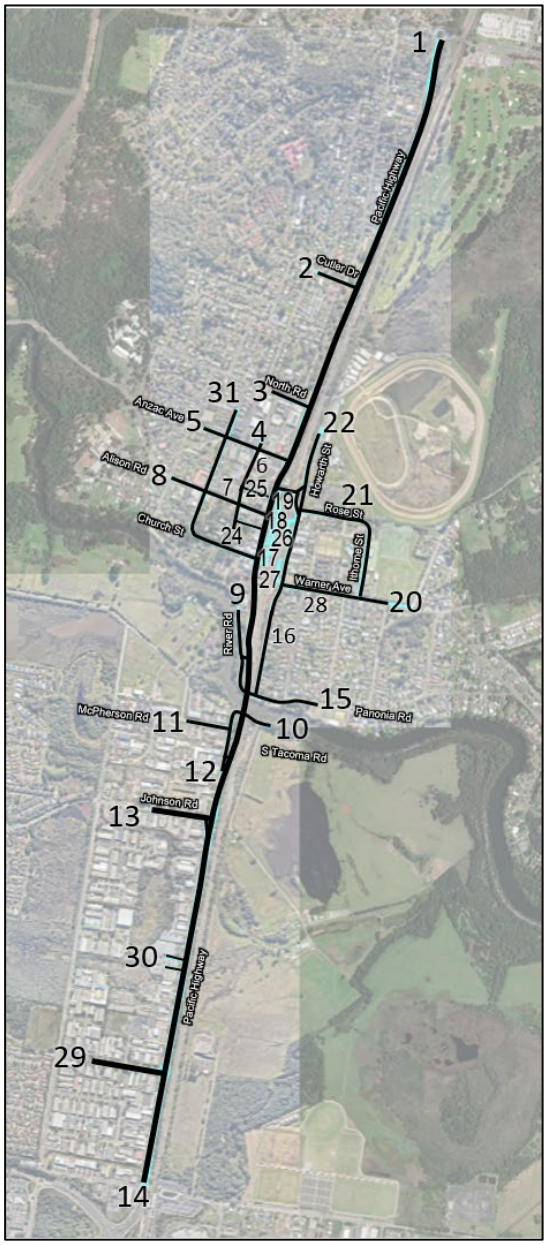


Figure 3-1 Travel zones for the base VISSIM model

The base model represents 2022 traffic conditions. The model was developed in VISSIM, and was calibrated and validated according to Transport for NSW's *Traffic Modelling Guidelines, version 1, February 2013.*

The VISSIM model was developed for the morning peak hour period (8am to 9am) and for the afternoon peak hour (4pm and 5pm).

Future year models were developed to show 2031, 2041 and 2051 traffic conditions.

3.2 SIDRA models

Intersection traffic modelling was undertaken to optimise the concept design of the following intersections:

- Pacific Highway / Railway Bridge
- Railway Bridge / Howarth Street
- Howarth Street / Commuter Car Park Access
- Howarth Street / Warner Avenue
- Warner Avenue / Ithome Street
- Rose Street / Commuter Car Park Access.

These were modelled using SIDRA Network software was used.

3.3 Relevant guidelines

The following guidelines were followed in carrying out this assessment:

- *TfNSW Traffic Modelling Guideline, version 1, February* 2013 (hereafter referred as 'TfNSW modelling guidelines')
- *TfNSW Technical Direction (TTD 2017/001) Traffic Modelling, Operational modelling reporting structure, May 2017*
- *TfNSW Technical Directions (TTD 2018/002) Traffic Modelling, Traffic Signals in Microsimulation Modelling, November 2018.*

3.4 Assessment criteria

The operation of the modelled road network provides an overview of the performance of the road network and is used to identify the impact of the proposal. This impact was assessed across the network and at intersection level:

- At a network level. This includes average travel speed, total distance travelled, and total time travelled within the modelled network
- At an intersection level. The performance of an intersection and its Level of Service (LoS) is determined by the average delay per vehicle. The performance criteria for intersections are shown in Table 2-8.

3.4.1 Network performance criteria

The following network performance statistics from the VISSIM peak hour traffic models were used in the assessment of the proposal:

- Total Vehicle Hours Travelled in the study area (VHT)
- Total Vehicle Kilometres Travelled across the study area (VKT)
- Average network travel speed, which is the average speed (kilometres per hour) of vehicles in the study area during the modelled periods
- Total stops, which is the cumulative total of every instance when a vehicle comes to a stop within the network. A stop is defined as the period when a vehicle's speed drops below five kilometres per hour until it increases to over ten kilometres per hour
- Latent demand, which is the total number of vehicles that cannot enter the model due to model constraints such as congestion.

4 Future traffic conditions without the proposal

This section outlines the future traffic conditions without the proposal. Growth rates of traffic and forecast traffic volumes in 2031, 2041, and 2051 are reported.

4.1 Future traffic growth on Pacific Highway

Future traffic growth on the Pacific Highway through the Wyong town centre was estimated using STFM outputs from the scenario that excludes “Warnervale Link Road”. These outputs were provided by TfNSW.

Figure 4-1 shows future traffic growth on the Pacific Highway through the Wyong town centre.

- The grey dotted line shows historical trend of 1.0 per cent growth per annum between 2022 and 2051
- The green dotted line shows STFM growth trend.

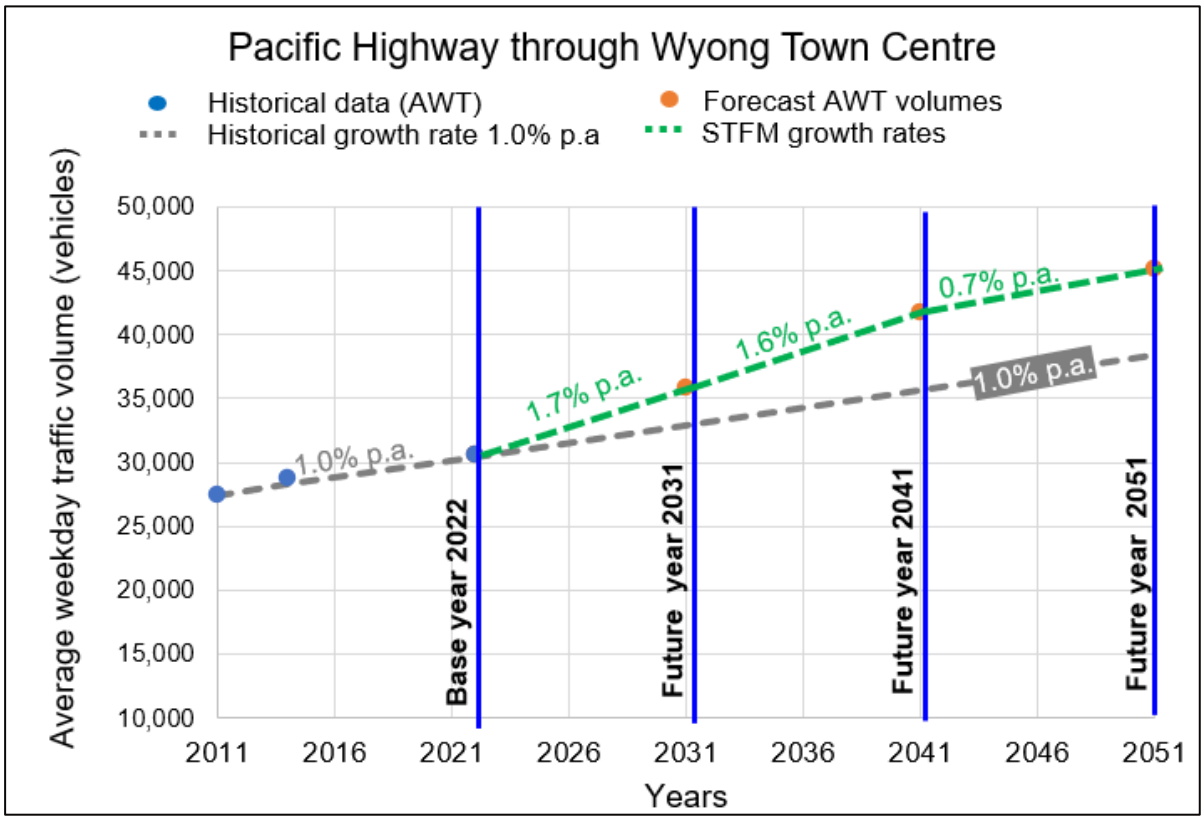


Figure 4-1 Historical and future traffic growth on the Pacific Highway between 2022 and 2051

The STFM outputs indicate that traffic volumes on the Pacific Highway will grow by 1.6 per cent to 1.7 per cent per annum until 2041, followed by 0.7 per cent per annum until 2051.

On average, the STFM suggests an average growth rate of 1.5 per cent per annum between 2022 and 2051.

4.2 Forecast traffic volumes on the Pacific Highway

Table 4-1 shows predicted daily traffic volumes on the Pacific Highway through the Wyong town centre in 2031, 2041 and 2051.

Traffic volumes on the Pacific Highway will continue to grow. On average, traffic volumes on the Pacific Highway are predicted to grow from 31,050 vehicles per day in 2022 to 35,800 and 41,400 vehicles per day in 2031 and 2041 respectively.

In 2051, traffic volumes on the Pacific Highway are predicted to increase to 44,400 vehicles per day, an increase of 43 per cent from 2022.

Table 4-1 Average weekday volumes on Pacific Highway in 2031, 2041 and 2051

Pacific Highway sections	Count	Forecast		
	2022	2031	2041	2051
Pacific Highway north of Cutler Drive	26,000	31,100	39,600	43,600
Pacific Highway south of Church Street	29,550	34,150	39,050	41,750
Pacific Highway south of River Road	36,500	41,500	46,700	50,000
Pacific Highway north of Mildon Road	32,200	36,500	40,300	42,200
Average volumes	**31,050**	**35,800**	**41,400**	**44,400**

4.3 Traffic performance without the Proposal

There is a significant need to address the constraints and issues associated with travel on the existing Pacific Highway and to provide an acceptable level of road transport infrastructure that caters for future traffic growth. The traffic demand on the Pacific Highway is projected to intensify with the forecast average growth of 1.5 per cent per annum, driven by continuing population growth particularly north of Wyong Town Centre.

Table 4-2 shows the average delay and level of service at key intersections without the proposal in 2031, 2041, and 2051. Traffic conditions at key intersections along the Pacific Highway are currently poor (LoS F) during peak hours. It is expected that by 2031, seven of the nine intersections within the study area will continue to operate Level of Service F. Traffic conditions will continue to deteriorate to 2051.

Table 4-2 Future level of service for key intersections along Pacific Highway without upgrade in 2031, 2041, and 2051

Intersection	Control type	2031				2041				2051			
		AM		PM		AM		PM		AM		PM	
		Delay (sec)	LoS	Delay (sec)	LoS	Delay (sec)	LoS	Delay (sec)	LoS	Delay (sec)	LoS	Delay (sec)	LoS
Pacific Highway / Cutler Drive	Sign control	316	F	58	E	430	F	222	F	511	F	258	F
Pacific Highway / North Road	Sign control	238	F	215	F	270	F	>600	F	327	F	>600	F
Pacific Highway / Anzac Avenue	Sign control	114	F	90	F	128	F	97	F	153	F	121	F
Pacific Highway / Railway bridge	Sign control	233	F	401	F	268	F	449	F	321	F	455	F
Pacific Highway / Alison Road	Traffic signal	122	F	46	D	135	F	66	E	155	F	69	E
Pacific Highway / Church Street	Traffic signal	28	B	33	C	39	C	41	C	46	D	44	D
Pacific Highway / River Road / Panonia Road	Sign control	543	F	>600	F	>600	F	>600	F	>600	F	>600	F
Pacific Highway / South Tacoma Road / McPherson Road	Sign control	518	F	>600	F	>600	F	>600	F	>600	F	>600	F
Pacific Highway / Johnson Road	Traffic signal	34	C	122	F	149	F	171	F	154	F	211	F

4.3.1 Impact on the broader road network

Constraint of traffic on the single lane undivided carriageway along the Pacific Highway between Johnson Road and Cutler Drive will impact traffic condition on the broader road network. Traffic performance is measured by total Vehicle Hours Travelled (VHT) and Vehicle Kilometres Travelled (VKT) on the broader network, which includes Cutler Drive, North Road, Anzac Avenue, Railway Bridge, Alison Road, Church Street, and the intersections of River Road / Panonia Road, South Tacoma Road / McPherson Road and Johnson Road. Table 4-3 shows the key network performance indicators for the broader road network in 2022, 2031, 2041 and 2051 without the proposal.

Table 4-3 Future network performance without upgrade in 2022, 2031, 2041, and 2051

Network statistics	Base case / Do minimum	
	AM peak	PM peak
2022		
Total trips (vehicles)	6,956	7,410
Latent demand (vehicles)	7	3
% Unreleased demand	0%	0%
Total trip time (VHT)	506	488
Total trip length (VKT)	16,363	17,712
Average network speed (km/h)	32	36
Stops	27,972	13,222
2031		
Total trips (vehicles)	7,576	8,126
Latent demand (vehicles)	282	124
% Unreleased demand	4%	2%
Total trip time (VHT)	740	785
Total trip length (VKT)	17,143	18,747
Average network speed (km/h)	23	24
Stops	63,200	45,940
2041		
Total trips (vehicles)	8,473	9,170
Latent demand (vehicles)	979	1,015
% Unreleased demand	12%	11%
Total trip time (VHT)	1,013	1,125
Total trip length (VKT)	17,352	18,576
Average network speed (km/h)	17	17
Stops	99,284	76,996
2051		
Total trips (vehicles)	9,108	9,752

Network statistics	Base case / Do minimum	
	AM peak	PM peak
Latent demand (vehicles)	1,453	2,282
% Unreleased demand	16%	23%
Total trip time (VHT)	1,176	1,431
Total trip length (VKT)	17,420	15,618
Average network speed (km/h)	15	11
Stops	130,199	69,511

Between 2022 to 2051, total Vehicle Hours Travelled (VHT) can be expected to increase by 159 per cent in the morning peak and by 182 per cent in the afternoon peak. Similarly, Vehicle Kilometres Travelled (VKT) will increase by 102 per cent in the morning peak. Scenarios in which travel time greatly outstrips growth in travel distance indicate a highly congested network. The percentage of latent demand would also increase to 16 per cent in the morning peak and 23 per cent in the afternoon peak indicating substantial capacity issues in the network over time.

5 Operational impact assessment

This section documents the traffic modelling and analysis of future conditions with the proposal.

5.1 The proposal

Project options were identified through a thorough analysis that included an identification of the corridor. These analyses informed the initial concept design that was displayed as part of the Review of Environmental Factors in 2015. Since then, various staging analyses, value management exercises and stakeholder feedback have resulted in a revised concept design, appropriate for the current transport context.

The proposed modification of the concept design (the Proposal) is defined as an upgrade of the 2.4-kilometre section of the Pacific Highway through Wyong Town Centre between Cutler Drive and Johnson Road, from the current single lane in each direction to a divided carriageway with 2 lanes in each direction.

Key features of the proposed modification include:

- Updated road and bridge design
- Urban design and public amenity improvements
- Updated commuter car park design
- Changes to construction activities and staging
- Rail enabling works
- Other design refinements, including retaining walls and drainage infrastructure
- Adjustment of the construction footprint and REF boundary
- Changes to traffic management.

These features are further described in the Addendum review of environmental factors report prepared by AECOM.

5.2 Intersection Level of Service improvement

The intersection level of service is reported for 2031, 2041, and 2051 at the following eight intersections (Table 5-1) on the Pacific Highway:

- Pacific Highway / Cutler Drive (new traffic signal)
- Pacific Highway / North Road (new traffic signal)
- Pacific Highway / Anzac Avenue (new traffic signal)
- Pacific Highway / Rose Street bridge (new traffic signal)
- Pacific Highway / Church Street
- Pacific Highway / River Road / Panonia Road (left-in left-out)
- Pacific Highway / South Tacoma Road / McPherson Road (new traffic signal)
- Pacific Highway / Johnson Road.

The proposal would improve the level of service at Pacific Highway intersections in 2031, 2041, and 2051. In 2031 key intersections with the Pacific Highway would improve the level of service to between A and C. Similarly, by 2041, majority of the Pacific Highway intersections would operate at a Level of Service of between A and C. However, the intersection at Anzac Avenue would operate at Level of Service D. In 2051, key intersections with the Pacific Highway would operate at a Level of Service of between A and E.

Table 5-1 Future Level of Service for key intersections along Pacific Highway with upgrade in 2031, 2041, and 2051

Intersection	Control type	2031				2041				2051			
		AM		PM		AM		PM		AM		PM	
		Delay (sec)	LoS	Delay (sec)	LoS	Delay (sec)	LoS	Delay (sec)	LoS	Delay (sec)	LoS	Delay (sec)	LoS
Pacific Highway / Cutler Drive	New traffic signal	19	B	17	B	24	B	29	C	29	C	57	E
Pacific Highway / North Road	New traffic signal	15	B	14	A	15	B	28	B	45	D	51	D
Pacific Highway / Anzac Avenue	New traffic signal	19	B	23	B	32	C	47	D	56	D	57	E
Pacific Highway / Rose Street bridge	New traffic signal	30	C	34	C	34	C	41	C	36	C	43	D
Pacific Highway / Church Street	Traffic signal	15	B	21	B	16	B	37	C	16	B	39	C
Pacific Highway / River Road / Panonia Road	Sign control (left-in left-out)	8	A	11	A	8	A	47	D	9	A	48	D
Pacific Highway / South Tacoma Road / McPherson Road	New traffic signal	6	A	9	A	7	A	12	A	7	A	16	B
Pacific Highway / Johnson Road	Traffic signal	14	A	15	B	14	A	18	B	16	B	25	B

Source: Vissim

5.3 Predicted queues at key intersections

Table 5-2 shows the predicted queue lengths in turning at eight key intersections along the upgraded Pacific Highway in 2031, 2041 and 2051. The queue length data indicates that with proposed upgrades, queues on the Pacific Highway would be contained within the proposed turn bays.

Table 5-2 Predicted queues at key intersections along Pacific Highway with upgrade in 2031, 2041, and 2051

Intersection	Approach road	Turn	95 percentile queue length (meters)					
			2031		2041		2051	
			AM	PM	AM	PM	AM	PM
Pacific Highway / Cutler Drive	North – Pacific Highway	Right	80	25	95	25	95	25
	South – Pacific Highway	Left	20	25	25	25	30	25
	West – Cutler Drive	Left	20	20	20	25	25	25
Pacific Highway / North Road	North – Pacific Highway	Right	30	35	45	45	50	50
	South – Pacific Highway	Left	10	10	10	10	15	10
	West – North Road	Left	65	60	65	65	65	65
Pacific Highway / Anzac Avenue	North - Pacific Highway	Right	20	30	45	35	55	55
	South – Pacific Highway	Left	20	10	20	15	25	15
	West – Anzac Avenue	Left	40	40	45	55	50	55
Pacific Highway / Rose Street bridge	North – Pacific Highway	Left	25	25	35	30	40	30
	East – Rose Street bridge	Bridge	65	40	65	40	70	45
	South – Pacific Highway	Right	40	55	45	55	40	55
Pacific Highway / Church Street	North – Pacific Highway	Right	25	15	25	15	30	15
	South – Pacific Highway	Left	35	45	35	45	45	45
	West – Church Street	Left	40	35	40	40	40	40
Pacific Highway / McPherson Road	North – Pacific Highway	Right	30	20	30	25	35	45
	North – Pacific Highway	Left	20	20	25	20	25	25
	West – McPherson Road	Left	25	30	25	30	30	35
Pacific Highway / Johnson Road	North - Pacific Highway	Right	45	45	55	50	55	65
Howarth Street / Rose Street bridge	North – Howarth Street	Right	35	35	35	35	35	35
	South – Howarth Street	Left	45	30	45	30	45	30
	West – Rose Street bridge	Bridge	45	40	45	45	45	45

5.4 Broader network performance improvement

Table 5-3 shows broader network performance with the proposal in 2031, 2041 and 2051. Network performance data with and without the proposal are compared in the table.

Table 5-3 Future network performance with upgrade in 2031, 2041 and 2051

Time Period	2031			2041			2051		
	Base case (without proposal)	Project case (with proposal)	% change	Base case (without proposal)	Project case (with proposal)	% change	Base case (without proposal)	Project case (with proposal)	% change
AM peak one hour									
Total trips (vehicles)	7,576	7,580		8,473	8,466		9,108	9,109	
Latent demand (vehicles)	282	2		979	1		1,453	2	
% Unreleased demand	4%	0%		12%	0%		16%	0%	
Total trip time (VHT)	740	523	-29%	1,013	622	-39%	1,176	742	-37%
Total trip length (VKT)	17,143	18,917	10%	17,352	21,517	24%	17,420	23,113	33%
Average network speed (km/h)	23	36		17	35		15	31	
Stops	63,200	14,891	-76%	99,284	19,253	-81%	130,199	31,374	-76%
PM peak one hour									
Total trips (vehicles)	8,126	8,137		9,170	9,192		9,752	9,782	
Latent demand (vehicles)	124	0		1,015	1		2,282	3	
% Unreleased demand	2%	0%		11%	0%		23%	0%	
Total trip time (VHT)	785	587	-25%	1,125	761	-32%	1,431	896	-37%
Total trip length (VKT)	18,747	20,339	9%	18,576	22,870	23%	15,618	23,952	53%
Average network speed (km/h)	24	35		17	30		11	27	
Stops	45,940	18,178	-60%	76,996	31,275	-59%	69,511	45,794	-34%

The table shows that proposal would improve traffic performance of the broader road network substantially. In 2031, the proposal would reduce network travel time by nearly 30 per cent and number of stops by up to nearly 80 per cent. By 2051, the model shows network travel time would be lowered by the proposed upgrade up to nearly 40 per cent and number of stops by nearly 80 per cent during the peak period.

Overall, the proposal would increase capacity and improve intersection operation for vehicles traveling on the Pacific Highway. The proposed upgrades would address capacity issues at intersections and improve local community accessibility.

5.5 Travel time savings on the Pacific Highway

Projected travel time savings on the Pacific Highway are shown in Table 5-4, comparing the base case (without proposal) and the project case (with proposal) in 2031, 2041, and 2051. Travel times on the Pacific Highway are shown for the southbound peak traffic direction in the AM peak and northbound peak traffic direction in the PM peak.

Table 5-4 Travel time savings in minutes on Pacific Highway in 2031, 2041 and 2051

	2031		2041		2051	
	AM	PM	AM	PM	AM	PM
Base case (without proposal)	18.1	11.7	21.8	16.2	23.1	20.1
Project case (with proposal)	7.5	8.7	8.0	10.6	9.8	12.2
Travel time savings	10.6	3.0	13.8	5.6	13.4	7.8

In 2031, the proposal would reduce journey time on the Pacific Highway in the study area by nearly 11 minutes during the morning peak. Similarly in 2041 and 2051, the proposal would provide savings of nearly 14 minutes in the morning peak hour. The savings in the afternoon peak hour are lower because traffic volumes are higher in the morning peak hour than in the afternoon peak hour.

5.6 Transport impacts

5.6.1 Property and local access

5.6.1.1 Rose Street / Howarth Street intersection options assessment

Section 3.2.3 of the Addendum review of environmental factors (AECOM) detailed the proposed modifications to the Rose Street bridge and the Howarth Street connection to Rose Street.

The proposed modifications would provide the new bridge (Rose Street bridge) on an alignment south of the existing bridge. The bridge would be narrower than that proposed in the Project REF, with narrower lanes and two westbound lanes rather than three. Rose Street is currently accessible directly from Howarth Street, and it was proposed in the Project REF that this intersection be retained.

However, the modification proposes closing the Rose Street / Howarth Street. A new signalised T-intersection is proposed to replace the Howarth Street / Rose Street roundabout.

Two design options were considered for Howarth Street / Rose Street bridge intersection: a sign-controlled intersection and a new signalised T-intersection. Traffic modelling indicates that the traffic signal option would offer greater flexibility, particularly during special events at Wyong Race Club.

Traffic modelling results, detailed in Sections 5.2 and 5.3 of this TTIA, indicate that the reduction to lane configuration on the Rose Street bridge would not adversely impact traffic flow and performance at new signalised intersections with Pacific Highway and Howarth Street. The projected queue lengths on the bridge are expected to be accommodated within the provided length of turning lanes.

The expanded Rose Street car park provides an additional entry and exit directly onto Howarth Street, which is expected to reduce reliance on Ithome Street for access to the Baker Park precinct parking facilities (Figure 5-3). The proposed closure of Rose Street at Howarth Street is anticipated to have minimal impact on traffic movement to and from the Rose Street car park accessed via Ithome Street and Warner Avenue.

The expanded Rose Street car park is estimated to generate about 130 to 140 vehicles during the peak hours on a typical weekday. Of this about 80 per cent travel to or from the west to access the facility directly via Howarth Street. The remaining 20 per cent would travel to and from east via Ithome Street and Warner Avenue. The proposed modification is estimated to result in a minor increase in traffic volumes on the Ithome Street / Warner Avenue intersection, with an additional 20 to 30 vehicles during peak hours.

5.6.1.2 Local access

Compared to the proposal in the approved REF, the proposed modification reduces access to additional local roads, including:

- Changed intersection treatment at Pacific Highway and McPherson Road from a roundabout to a signalised intersection
- Partial closure of Robley lane from Pacific Highway
- Changed intersection treatment at Howarth Street and Rose Street from a roundabout to a signalised intersection
- Closure of Rose Street from Howarth Street
- Changed intersection treatment at Panonia Road / River Road and the Pacific Highway from a roundabout to a sign-controlled intersection
- Removal of a local access from the Pacific Highway to Watanobbi Road through Apex Park, north of North Road.

The REF outlined several additional changes to local access that have been retained remain as part of the modification.

Table 5-5 outlines all local traffic movement changes resulting from the proposal.

Table 5-5 Local access changes at town centre

Intersection	Movement removed	Alternative access route	Detour distance (km)
Pacific Highway / River Road / Panonia Road	Right turn in from north on the Pacific Highway	Via Church Street, Alison Road and Hope Street	1.4
		Via Anzac Avenue and Hope Street	1.5
		Via Rose Street bridge, Howarth Street and Panonia Road	1.1
Pacific Highway / River Road / Panonia Road	Right turn out onto the Pacific Highway	Via Church Street	1.5
		Via Panonia Road, Howard Street and Rose Street bridge	1.7
Pacific Highway / Alison Road	Right turn in from north on the Pacific Highway	Via Anzac Avenue and Hely Street	0.4
		Via Church Street and Magaret Street	0.6
		Via North Road and Hely Street	0.6
		Left-turn in from Pacific Highway via new U-turn facility at McPherson Road	1.6
Pacific Highway / Bakers Lanes	All vehicle entry from the Pacific Highway	Via Alison Road and Rankens Court	0.3
Pacific Highway / Robley Lane	All vehicle entry from the Pacific Highway	Via Anzac Avenue, Church Street and Margaret Street	0.6

5.6.1.3 Local road traffic changes within Wyong town centre

Local road closures are expected to result in minor traffic redistribution within the town centre, with no significant changes in traffic volumes or patterns on local roads anticipated.

A small increase of 15 to 20 vehicles during peak hours is expected at the Pacific Highway / North Road and Pacific Highway / Anzac Avenue intersections. The Pacific Highway / Church Street intersection is anticipated to experience an increase of 60 to 90 vehicles during peak hours. However, the impact of the additional vehicles would to be mitigated by the proposed upgrades. The project is not expected to result in changes to traffic on Margaret Street.

5.6.2 Bus services

The proposed upgrade includes changes to the road corridor that impact bus travel patterns and bus stop locations. The changes in bus services compared to the REF include:

- Inclusion of an additional bus stop north of the Pacific Highway and McPherson Road intersection on the northbound carriageway. The addition of this bus stop is made possible by the change in intersection treatment from a roundabout to a signalised intersection.
- Relocation of bus stops that service the Wyong railway station and Wyong town centre from north of Alison Road to south of Church Street near the proposed Church Street Plaza. Bus stops that were proposed further south of Church Street would not be included because of the proximity of the relocated bus stops
- A new bus stop on Howarth Street southbound near Warner Avenue.

The bus stops proposed for relocation are within reasonable walking distances from the existing bus stops, resulting in minimal impacts for current users of the bus stops. No bus priority measures like dedicated bus lanes or bus jump starts at intersections have been proposed. Therefore, bus travel times would be reflective of the overall travel times for all vehicles along the Pacific Highway corridor.

Table 5-6 outlines proposed changes to each bus stop, including impacts on walking distances.

Table 5-6 Proposed changes to bus stop and impact on walking distances

Existing infrastructure	Proposed infrastructure	Change impact
Bus stop ID 2259627 Pacific Highway at Johnson Road Bus stop ID 2259626 Pacific Highway opposite Johnson Road	Retained	Nil
Bus stop ID 2259869 Pacific Highway after South Tacoma Road	Relocated onto new northbound carriageway in similar location	Relocated with improved pedestrian access at new signalised intersection at McPherson Road and new connecting footpaths and shared paths
Bus stop ID 225921 Wyong Station, Stand A Bus stop ID 225922 Wyong Station, Stand B	The existing bus interchange is removed, and new facilities are proposed. **Church Street premium bus stops** New premium bus stops along the Pacific Highway at the Church Street intersection would be provided. It is expected that all bus services would use these bus stops and provides connections to Wyong train station via the Church Street intersection and plaza. **Wyong bus layover** A new bus layover would be provided on the eastern side of Wyong station, to cater for buses laying over, special functions, train replacement buses and other degraded mode operations.	The removal of the existing bus interchange and replacement with on-highway bus stops is expected to improve bus travel times through Wyong (particularly northbound), because they will no longer need to circulate through the bus interchange area. Buses laying over will have increased running time between services, due to the need to circulate across to the new bus layover facility on the eastern side of the railway line. Passengers changing modes between rail and bus will have a slightly longer walking distance with less covered walkways. Mitigation measures are outlined above.
Bus stop ID 225916 Pacific Highway at Robley Lane	Bus stop will be removed	Nil impact expected from removal of this bus stop.
Bus stop ID 225917 Pacific Highway after North Road Bus stop ID 225944 Pacific Highway opposite North Road	The existing bus stops located on the Pacific Highway northbound and southbound at North Road will be relocated onto the new northbound and southbound carriageways, in a similar location to existing.	Relocated with improved pedestrian access at new signalised intersection at North Road, and new connecting footpaths and cycleway.
Bus stop ID 225918 Pacific Highway at Cutler Drive	The existing bus stops located on the Pacific Highway northbound and southbound at Cutler Drive will be	Relocated with improved pedestrian access at new signalised intersection

Existing infrastructure	Proposed infrastructure	Change impact
Bus stop ID 225943 Pacific Highway opposite Cutler Drive	relocated onto the new northbound and southbound carriageway, in a similar location to existing.	at Cutler Drive, and new connecting footpaths.
Bus only lane Pacific Highway southbound from 170m north of North Road to 30m south of Howarth Street rail bridge.	Bus only lane removed to accommodate widening to 4 lanes on Pacific Highway	The removal of the dedicated bus only lane is not expected to significantly impact bus travel times through the project. The widening of the Pacific Highway improves travel time for all road users, including buses.
None	A new bus stop is proposed to be provided on Howarth Street southbound, near Warner Avenue, to provide connection to Wyong Station for bus routes operating east of Wyong Station	New bus stop
None	A new bus driver amenity building will be constructed near the new bus layover facility on the eastern side of Wyong Station	Improved bus driver amenities

5.6.3 Pedestrians and cyclists

5.6.3.1 Overview

Signalised pedestrian crossings would be provided on all approaches of the following new or reconfigured traffic signals with the Pacific Highway including:

- McPherson Road
- Church Street
- Rose Street (new bridge over railway)
- Anzac Avenue
- North Road
- Cutler Drive.

The provision of signalised crossing at the above locations provides additional safe crossing opportunities for pedestrians compared with the existing provisions. Pedestrian facilities in the form of footpaths or shared paths are proposed along the western side of the Pacific Highway between Johnson Road and north of Cutler Drive. This is an improvement on the existing arrangement, which has minimal formal pedestrian facilities.

The proposal includes providing a dedicated off-road bi-directional cycleway along the length of the project. This is an improvement to the existing arrangement, which has no bicycle lanes. Cyclists are currently required to use the shoulder of the Pacific Highway, share with traffic or use footpaths.

Bakers Lane and Robley Lane would be closed at their intersections with the Pacific Highway under the proposal reducing the potential for pedestrian and vehicular conflicts at this location. The existing pedestrian crossing on Howarth Street, south of Rose Street is proposed to be upgraded to a raised pedestrian crossing. A new raised pedestrian crossing is proposed on the southern end of Howarth Street near Warner Avenue, to improve connectivity to Wyong railway station and bus stops. The provision of these two pedestrian crossings would improve the pedestrian access from Wyong station

to the proposed extension of the Rose Street commuter car park. Additionally, a shared path is proposed on the western side of Rose Street, continuing into Wyong station bus interchange.

The proposed pedestrian crossing locations and network of shared user paths and footpaths provide improved connectivity and safety to existing and proposed public transport services (including bus stops), surrounding land uses and community facilities.

5.6.3.2 Proposed modification to pedestrian and cyclist routes

As outlined in Section 2.7 of this TTIA, existing facilities for pedestrians and cyclists are limited and result in reduced attractiveness of active transport as a mode choice. As outlined above, the project will significantly improve facilities for pedestrians and cyclists, by providing new and upgraded facilities such as a cycleways, shared paths and footpaths.

The project will introduce a change in how pedestrians cross the Pacific Highway and connect with Wyong Station from the Wyong CBD, which may result in slightly longer walking distances compared to existing

The proposed upgrade includes changes to pedestrian and cyclist facilities. The proposed modifications compared to the REF include:

- Removal of the proposed pedestrian overbridge extension between the Pacific Highway and the existing pedestrian bridge at Wyong railway station
- Removal of the mid-block pedestrian refuge on the Pacific Highway opposite Robleys Lane
- Removal of on-road cycle lanes
- Provision of a dedicated off-road bi-directional cycleway and connected shared path network
- Removal of the shared path north on the western side of the Pacific Highway between North Road and Cutler Drive
- Improvements to Watanobbi Road between North Road and Cutler Drive to facilitate safe pedestrian and cyclist access

Figure 5-1 outlines the existing key pedestrian route from Alison Road to trains and buses located at Wyong Station because of the above modifications.

Figure 5-2 shows how pedestrians will access trains and buses once the project is complete. Dark blue shows the key pedestrian route along the Pacific Highway, light blue shows the connection to the new bus stops south of Church Street, and orange shows the connection to Wyong Station.

Table 5-7 summarises existing and proposed changes to pedestrian access around Wyong Station.

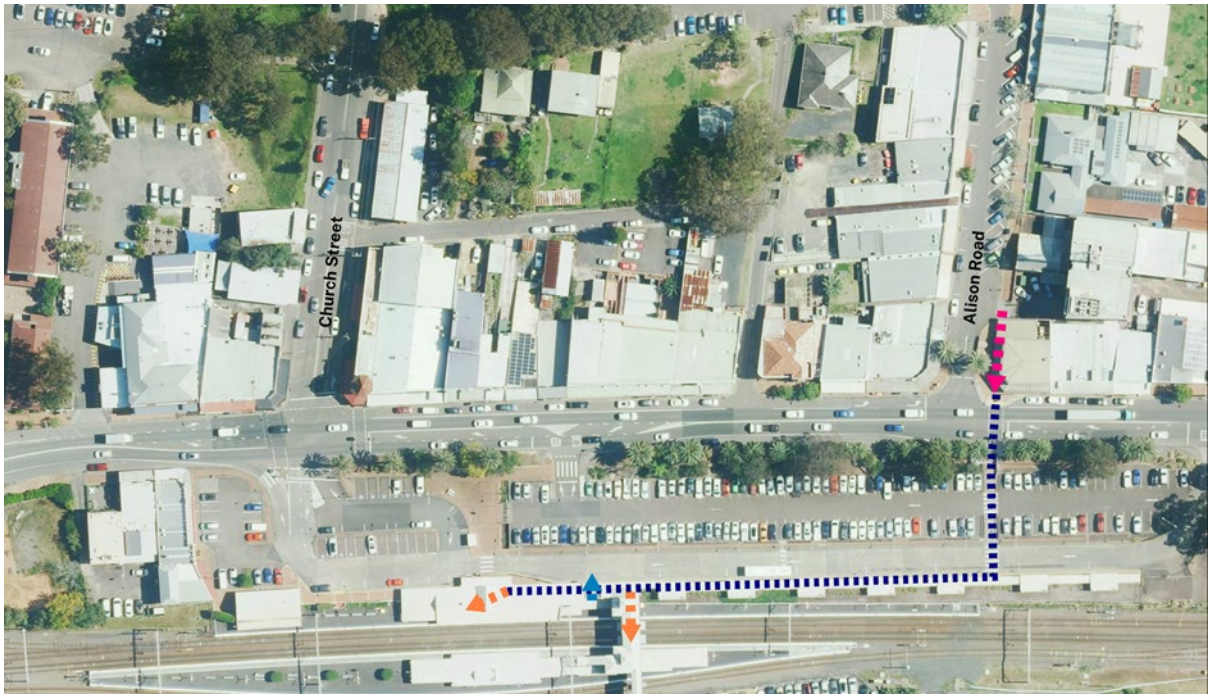


Figure 5-1 Existing primary route for pedestrians between Wyong CBD and Wyong Station

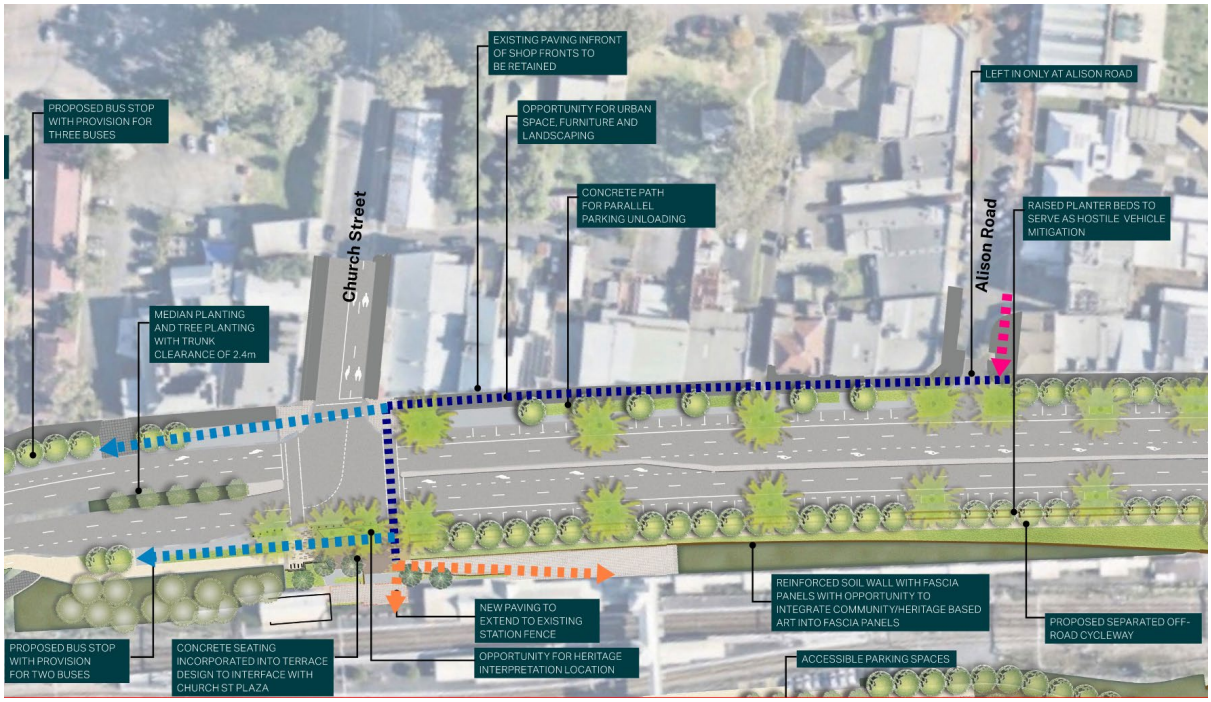


Figure 5-2 Proposed access for pedestrians between Wyong CBD and Wyong Station

Table 5-7 Pedestrian access changes around Wyong Station

Desired pedestrian route	Existing	Proposed
Alison Road to Wyong Train Station	Pedestrians cross at the existing signalised intersection at Alison Road / Pacific Highway. There are no formalised pedestrian facilities on the western side of the Pacific Highway, so pedestrians traverse down a series of staircases through the existing commuter car park to arrive at the bus interchange. Pedestrians walk along the bus interchange until they reach the entrance to Wyong Station or their bus stand.	The existing signalised intersection at Alison Road will be removed, as outlined in Table 5-5 above. Pedestrians will use the existing covered footpath along the western side of the Pacific Highway. Pedestrians will cross the Pacific Highway at Church Street and enter Wyong Station via the new Church Street Plaza. The total walking distance is about 235 metres, about 65 metres further than existing. However, the route is flat and would improve access for people with mobility impairments or disabilities.
Alison Road to Bus Stops	The bus interchange provides a covered walkway for part of the journey between Wyong CBD and public transport. This route does not cater for disabled access, and there are no other routes which provide suitable and safe access for people with mobility impairments or disabilities. The total walking distance is about 170 metres.	As above, pedestrians would use the existing covered footpath along the western side of the Pacific Highway until reaching the signalised intersection of Church Street / Pacific Highway. For buses heading north, pedestrians would cross Church Street to access the northbound bus stops. For buses heading south, pedestrians would cross the Pacific Highway to access the southbound bus stops. The total walking distance is about 250 metres, about 80 metres further than existing.
Bus Stops to Wyong Station	Bus stops are located at the Wyong Bus Interchange, immediately next to Wyong Station Platform 3. Pedestrians access the bus interchange directly from platform 3 or via the overbridge from platforms 1 and 2. The existing bus interchange is unable to be retained because of the need to protect a wider rail corridor.	Proposed bus stops which are located at Church Street, with pedestrians accessing these bus stops via the new Church Street Plaza. These bus stops are located approximately 110 metres away from the main entrance to Wyong Station, resulting in slightly longer walking distances. A new bus layover facility would be constructed on the eastern side of Wyong Station, serving as the location for train replacement buses and other special services. These bus stops are located immediately south of the pedestrian overbridge.

The project design incorporates additional measures to mitigate the impact of slightly longer walking distances, including the following.

- The roadside environment on the western side of the Pacific Highway will be widened by about 5m, providing improved safety and amenity for pedestrians.
- A new plaza will be constructed at Church Street with seating and shade to improve amenity.
- Access will be suitable for people with mobility impairments and disabilities.

- The traffic signals at Church Street will be upgraded and wait-times will be monitored to ensure pedestrian access across the Pacific Highway is appropriately prioritised. Additional measures such as pedestrians count-down timers and a raised platform intersection will be investigated at detailed design.
- Bus stops at Church Street will be designated as “premium bus stops” with additional amenities including shade, seating, lighting, timetable information, and possible CCTV / emergency help points.

Overall, the project results in significant improvements to pedestrian and cyclists access and safety in Wyong. This includes cycleways, footpath upgrades on local roads (Panonia Road, Howarth Street, South Tacoma Road, River Road), a boardwalk along Panonia Road which will create a new pedestrian link across the rail corridor and Pacific Highway, improved footpaths along Pacific Highway, and improved access for people with mobility impairments or disabilities.

5.6.4 Rail commuters and parking

The proposal would change commuter car parking arrangements around Wyong railway station. The existing eastern and western car parks at Wyong railway station will be closed and the Rose Street commuter car park will be extended to accommodate approximately 380 spaces.

The existing long term commuter car parks on the western and eastern sides of the railway line house 338 formal spaces, including 22 disabled spaces. An additional 101 on-street untimed spaces along Howarth Street are available. A survey conducted by Transport for NSW on 6 August 2024 between 12:50pm and 1:30pm indicated that occupation of these car parks were near capacity with 422 spaces occupied in total (refer to Appendix A).

The existing Rose Street commuter car park was substantially underutilised with only 8 of the 211 available spaces occupied. As a result, there is currently an over-supply of long-term parking in Wyong compared to current demand.

The proposal would change short term parking arrangements along the Pacific Highway and on nearby local roads. The changes compared to the approved REF include:

- Reduction in the total number of long-term commuter parking spaces to be provided at the expanded Rose Street commuter car park from about 488 spaces to about 380 spaces
- Potential for a future upgrade of the Rose Street commuter car park to a multi-storey facility
- Improvements to pedestrian access provided by a new plaza at the end of Rose Street (with the closure of Rose Street from the Pacific Highway)
- Minor changes to the locations of DDA compliant parking spaces, taxi spaces, and Kiss and Ride spaces
- Reverse angled parking with access lane along the Pacific Highway between Church Street and Alison Road replaced by parallel parking
- Changes to location of parking on the Pacific Highway between River Road / Panonia Road and Church Street required by the change in bus stop locations

The number and location of parking spaces would be reviewed as part of the detailed design, in consultation with Central Coast Council.

5.6.4.1 Commuter parking

The parking allocation proposed within the expanded Rose Street car park meets current demand for long term off-street parking around Wyong Station and can be upgraded as a multi-storey facility in future if demand increases.

Table 5-8 shows the proposed changes in car parking number and locations compared to existing provision.

Figure 5-3 shows the proposed configuration of the expanded Rose Street commuter car park and pedestrian facilities. Pink arrows indicate exit points from the car park to Rose Street, where a new

footpath would be provided. The dashed line indicates the primary route for pedestrians between the car park and Wyong Station. Pedestrian crossings would be provided on Howarth Street and the bus layover to give pedestrians a safe and convenient way to cross over to Wyong Station (as indicated by the orange arrow).

Figure 5-3 Expanded Rose Street commuter car park and pedestrian facilities

The current walking distances from the existing Rose Street commuter car park are about 360 to 420 metres. Pedestrian facilities would be upgraded to facilitate pedestrian access and improve connectivity to the Rose Street commuter car park. Commuters would be required to walk between about 180 and 380 metres depending on the parking space chosen.

Disability spaces would be provided near the bus layover on the eastern side of Wyong Station, with convenient access to lifts and the pedestrian overbridge. Taxi and short-term pick-up and drop-off spaces would also be provided near Wyong Station.

Table 5-8 Proposed changes to commuter parking

Parking location	Approx. existing number of spaces	Approx. proposed spaces	Description of change
Commuter car parking			
Wyong railway station Eastern car park	200 long term spaces 12 DDA spaces	39	Removal of this car park to allow for relocated bus layover facility. Car spaces retained in this location include 15 DDA spaces, 5 Taxi spaces and 19 spaces opposite Warner Avenue which would be

Parking location	Approx. existing number of spaces	Approx. proposed spaces	Description of change
			allocated to bus and railway staff operating Wyong interchange.
Wyong railway station Western long term car park	137 long term spaces 23 timed spaces 10 Disability spaces 6 Kiss and Ride spaces 3 Taxi spaces	0	Removal of this car park to allow for widening of the Pacific Highway and widened rail corridor. Timed spaces relocated to southbound Pacific Highway
Rose Street car park	211 long term spaces	380	Car park expanded as a single level car park with approximately 371 long term spaces and 9 DDA spaces
Howarth Street Northbound parallel parking (Warner Street to Rose Street)	50 long term spaces	22	Minor change with approximately 19 long term spaces and 3 Kiss and Ride spaces. About 14 informal spaces currently located on the Howarth Street / Rose Street roundabout would be removed to provide an upgraded intersection
Howarth Street Northbound parking (Panonia Road to Warner Avenue)	51 long term spaces	51	No changes proposed
Total	**703**	**492**	**Reduction in available commuter parking spaces of about 211 spaces.** **Car parking surveys show that demand for commuter parking is currently about 430 spaces. Therefore, the proposal provides sufficient spaces (492) to meet this demand.** **Future expansion of the Rose Street car park as a multi-storey structure may be provided if demand increases further.**

5.6.4.2 On-street parking

The proposal reduces slightly the number of parking spaces on the Pacific Highway and adjacent local roads to accommodate the widening of the Pacific Highway and relocation of bus facilities.

Though a small number of spaces would be removed, the project will improve safety and amenity of on-street parking by providing wider and better marked parking bays. This includes the provision of a shoulder adjacent to the parking bays that allows for pedestrians to more safely get in and out of their vehicles.

Pedestrian facilities would be amended throughout the project to accommodate changes in parking locations, to ensure that additional distances required to destinations from parking spaces is minimised.

Table 5-9 outlines the proposed changes to these parking spaces.

Table 5-9 Proposed changes to on street parking

Parking location	Approx. existing number of spaces	Approx. proposed spaces	Description of change
On street parking			
South Tacoma Road	8	13	A new parking area is proposed on South Tacoma Road, subject to further discussions with Council regarding use of residual property. The existing properties and businesses that utilise parking on South Tacoma Road have been acquired and would be demolished, negating the need for additional on-street parking.
Panonia Road, north of Wyong River	18	10	Spaces would be provided for continued use of the facilities at Wyong Centennial Park.
Pacific Highway south of Wyong River	6	15	Currently there are mostly unmarked informal parking spaces. Proposed design includes marked spaces on the Pacific Highway, and additional spaces along South Tacoma Road.
Pacific Highway Northbound (Wyong River to North Road)	70	41	The number of on-street spaces would be reduced along the northbound carriageway, but more spaces are provided in the Church Street to Rose Street bridge section where businesses are located. The number of on-street spaces would be reduced south of Church Street (to accommodate the new bus facilities) and between Anzac Avenue and North Road. In both locations, businesses which are located on the Pacific Highway have off-street parking available.
Pacific Highway Southbound (North Road to Wyong River)	16	24	More southbound parking would be provided, mitigating the impacts of the closure of the right turn into Alison Road. Southbound traffic destined for Alison Road would have more availability of timed parking on the Pacific Highway in lieu of parking on Alison Road.
Pacific Highway, north of North Road	7	0	Parking would be retained along Watanobbi Road, but informal gravel parking that is often used for private advertising of used vehicles for sale would be removed.
Total	**133**	**103**	**A small reduction in on-street parking spaces is proposed, but parking is retained in priority areas and distributed along the Pacific Highway to minimise impacts on residents and businesses.**

In addition to the above, there are 23 existing timed car spaces located at the Warner Shops, opposite Church Street that would be removed as part of the project. However, the Warner Shops property has been acquired and would be demolished as part of the project, negating the need for parking in this location.

6 Construction impact assessment

This section summarises the methodology, staging and work hours, that would most likely be used to construct the proposal and associated activities. The detailed construction staging plans and methods will be determined by the construction contractor(s) prior to commencement of construction.

6.1 Construction methodology

Section 3.3.1 of the Addendum review of environment summarises the construction staging strategy and methodology, which would be developed in more detail by the construction contractor.

Given the extent of the project, the proposal is expected to be built in three stages as follows:

- South zone - Pacific Highway from Johnson Road, across the Wyong River bridge, to its intersection with Panonia Road and River Road
- Central zone - Pacific Highway from the intersection with Panonia Road and River Road to its intersection with Anzac Avenue, including the Rose Street bridge
- North zone - Pacific Highway from the intersection with Anzac Avenue to its intersection with Cutler Drive.

Section 6.2.9 of the original Traffic and Transport Impact Assessment (TTIA, SMEC) in the 2015 REF already outlines that staging for construction of each package will be developed to maintain existing road capacity particularly at peak times, and to minimise traffic switches and disruption where possible. This principle has been retained for the proposed modification.

Key changes to the methodology from Section 6.2 of the original Traffic and Transport Impact Assessment (SMEC, 2015) include:

- the shift of the new Rose Street rail overbridge south of the existing bridge
- creation of one larger bridge over the Wyong River with a cantilevered shared path to the side of the existing.

Both changes are on key crossings and the proposed process enables construction while retaining pedestrian and traffic flows on the old structures for most of the construction period. Dome periodic lane closures may be required at night or off-peak periods for safety.

6.2 Construction hours of operation

Much of the work required for the proposal would be undertaken during standard construction hours as follows:

- 7:00 am to 6:00 pm Monday to Friday
- 8:00 am to 1:00 pm Saturdays
- No work on Sundays or public holidays.

During construction, work may affect pedestrian access to the town centre during business hours and to the station for commuting. There may be additional demand for parking, higher peak hour traffic flows that may increase risk to workers unacceptably. As a result, much of the work that may impact traffic and pedestrians in the central zone and around the station may need to be completed outside of standard business hours (such as at night or on weekends) to minimise the impact on traffic and station operation, business access and the safety of workers and the public.

Section 3.3.2 of the Addendum review of environmental factors report (AECOM) details the construction hours for the proposed upgrade and impacts from works out of standard hours.

6.3 Construction work force

For the purposes of the assessment, it is estimated that construction of the upgrade would require around 60 to 100 construction workers per day, with 120 to 150 workers per day needed during the

peak construction period. More precise estimates of the number of staff associated with the construction stage will be confirmed during the detailed design and planning stages of the upgrade works. The final number of construction workers will be confirmed by the contractor.

Construction staff would need to initially access the site by car. However, the frequency of buses on routes that service the area and the large rail station in Wyong may more use of public transport. The number of vehicles generated by workers would be negligible in the context of large current volumes already on the highway. The proposed main compound is located at the southern end of the works area. Access to it will be via a corridor that has already been upgraded and most workers would park there before travelling as a group in work vehicles to site or satellite compounds.

6.4 Main project compound

No additional ancillary facilities are proposed as part of the modification. The modification would continue to require the use of the McPherson Road ancillary site, which was proposed in Section 3.5 of the Project REF. However, the following ancillary sites identified in Section 3.5 of the Project REF, are no longer planned for use for the proposal and its construction:

- Johnson Road
- Former Wyong Grove Public School.

The McPherson Road ancillary site will be in the remnant areas of land acquired for the proposal. This site is level and large enough to provide for a main project compound. It is in a large industrial area with existing haulage and commercial traffic and has existing access from McPherson Road and the highway, including potential alternative future access as construction. This compound will be the main project office for the contractor and TfNSW and will provide facilities for ablutions, parking, storage and laydown.

Additional laydown and satellite compounds may be required and will be nominated by the contractor at future stages of the proposal. These will be subject to further assessment, including traffic impact assessment, and approval as stated in the REF Section 3.5.

6.4.1 Construction site access

Accelerating and decelerating construction vehicles entering and exiting construction sites from the highway may disrupt traffic flow on the Pacific Highway. This impact has been addressed previously, in Section 6.2.4 of the original Traffic and Transport Impact Assessment (SMEC, 2015). The Contractor should review and incorporate these access points into the Traffic Management Plans (TMP), ensuring adequate acceleration/deceleration space, sight distances, and warning signs.

All vehicles accessing construction sites or ancillary facilities for material delivery and construction work will be equipped with safety flashing lights and functioning reverse beepers. Operators must be licensed and demonstrate competence in using the equipment as part of the site management and safety plan.

6.5 Haulage routes

The Pacific Highway is classified as a heavy vehicle route in the NSW Combined Higher Mass Limits (HML) and Restricted Access Vehicle (RAV) network. These roads can be utilised during construction for transportation of materials onto site for all construction activities as well as disposal of spoil. As these are already subject to heavy vehicle and haulage impacts, there is not expected to be a significant change to the current environment.

The current REF at section 6.2.2 Page 107, discusses the impact of the overall proposal on these routes, which will not be changed by the proposal. Also, the proposed modification does not change this designation.

6.6 Construction traffic volumes

Construction activity would generate light and heavy vehicles, with volumes depending on the zone and stage of construction. Light vehicle movements are likely associated with the construction workforce travelling to, from and within the construction site, as well as small delivery vans. Heavy vehicle movements would be associated with the delivery of construction materials (concrete and its components), imported fill, construction equipment and machinery, spoil and waste removal.

The volume and type of construction vehicle movements would vary depending on the stage of construction. Section 3.4.3 of the Project REF provides estimates of construction vehicle movements. The proposed modification is consistent with this estimate.

It is estimated that during peak construction periods, the proposal would generate an average of 120 light vehicle movements and up to 300 light vehicle movements per day. Construction traffic during the construction phase is likely to an average of 40 trucks per day to current traffic, with a maximum of 80 additional truck movements per day. The traffic generation associated with the construction phase will be confirmed by the construction contractor.

Based on updated traffic surveys conducted on the Pacific Highway corridor in November 2022, the Pacific Highway carries between 26,000 to 36,500 vehicles per day, depending on the location. About 2,000 heavy vehicles used this section of the Pacific Highway on an average weekday. The additional heavy vehicle movements associated with construction would increase heavy vehicles on Pacific Highway by three to five per cent, which is considered very small proportionally and would not have a substantial impact on existing heavy vehicle volumes.

Considering all vehicles (light and heavy), construction traffic would increase traffic on Pacific Highway by about 400 vehicles per day, which is less than two per cent of the total traffic on the Pacific Highway. These increases are minor, and well within daily variations of traffic volumes. They are unlikely to affect the operational performance of the Pacific Highway.

Daily construction vehicle movements and existing average weekday daily traffic on Pacific Highway are shown in Table 6-1.

Table 6-1 Impacts of construction traffic on Pacific Highway

Existing average weekday traffic on Pacific Highway	Daily construction vehicle movements on Pacific Highway	Per cent increase on Pacific Highway
26,000 to 36,500	160 to 380	0.6 to 1.5 per cent

As the volume of traffic generated by construction is expected to be relatively low compared to existing traffic on the Pacific Highway, the effects of this short-term increase on the existing road network are not expected to significantly impact road safety in the study area, though there is a risk with construction traffic interacting with general traffic.

6.7 Impact on property access

Access to existing properties along the Pacific Highway corridor and local access to surrounding areas will be maintained throughout all stages of construction, as described in the REF section 6.2.3 Page 113. It will not be changed by the modified proposal.

The project REF and Section 6.2.5 of the original Traffic and Transport Impact Assessment (SMEC, 2015), also noted that the Rose Street overbridge would be open to traffic during all stages of construction, to ensure emergency access to Wyong township on the eastern side of the railway line is maintained. This is an essential part of the construction staging strategy, since Rose Street overbridge provides the only flood free access and the most direct route across the railway line. The proposed modification includes moving the new replacement overbridge to the south, beside the current bridge, allowing for more construction activities to be undertaken while leaving the old bridge open for ongoing access. Some short-term closures may be required during construction (overnight or 48 hours). Any short-term closures of Rose Street overbridge will be identified in the Traffic Management Plan, in consultation with key stakeholders and community.

Temporary disruptions to private property access may be necessary for some construction activities. Planned disruptions will involve engagement with affected property owners, with alternative access arrangements provided when possible. Properties impacted by access issues or temporary local road closures will be notified before construction begins. Affected property owners will be advised to use alternative routes during road closures and consulted about temporary access.

6.8 Temporary alternative routes for traffic

In the event road closures are required, especially for bridge work over Wyong River, suitable alternative routes will be identified. For partial road closures, appropriate traffic management schemes will be implemented to ensure safe access. Alternative routes were discussed in Section 6.2.5 of the original Traffic and Transport Impact Assessment (SMEC, 2015). However, updates to construction staging outlined in the Addendum review of environmental factors for the proposed modification have resulted in several possible new alternative routes, including:

- During South Stage 1:
  - McPherson Road is proposed to be closed from Pacific Highway intersection. Traffic from McPherson Road and South Tacoma Road would be detoured via Gavenlock Road and Johnson Road to access the Pacific Highway. This detour is expected to result in a minor increase of 30 to 70 vehicles during peak hours at the Pacific Highway / Johnson Road intersection
  - Access from the Pacific Highway to South Tacoma Road would be closed to allow for the construction of the proposed intersection with McPherson Road and its approaches south of bridges, with alternative access provided via Johnson Road and Gavenlock Road
  - A small section of South Tacoma Road, under the Pacific Highway bridge over the Wyong River, would be restricted to one-way traffic. While this is the only access for a community located downriver, the impact is expected to be minimal because of the relatively low traffic volumes and the short length of road affected.
- During South Stage 2:
  - Closure of McPherson Road is proposed. Traffic from McPherson Road and South Tacoma Road would be detoured via Gavenlock Road and Johnson Road, to access the Pacific Highway.

The alternative routes will be confirmed by the construction contractor. Any additional alternative routes discussed would need to be assessed for traffic impacts and significant impacts on local amenity. Council will need to be consulted for detours that use local roads.

6.9 Impact on walking and cycling facilities

Construction work is not expected to impact significantly existing pedestrian access routes or crossings but would temporarily constrain movements on current pathways to the station and surrounding areas. Currently, there is an eastern footpath along the highway opposite Alison Road, which provides a direct east-west crossing. Once the signals at Alison Road are removed, pedestrian access between the eastern and western sides will need to cross using a longer route via the station and Church Street. This detour will remain in place until a new verge is established and signals are provided at the Rose Street bridge intersection.

Pedestrian and cyclist access would be maintained throughout the construction period. If maintaining access is not feasible, temporary alternative arrangements will be provided after consultation with council and advance notification of the broader community.

On-road cyclists will be impacted by the construction works. Provision of on-road cycling facilities will be restricted by traffic management measures during work periods. Existing facilities, especially in the central zone and bridges, are limited. As offroad facilities are extended cycle access will be improved. Alternative routes for traffic and cycling will be detailed in the Traffic Management Plan (TMP) and an updated construction staging strategy will be prepared by the contractor; it may include early works on offroad and shared facilities.

Appropriate onsite signage and wayfinding facilities would be developed and implemented to communicate changes to pedestrian and cyclist access during construction. This is particularly important for the central zone as a high proportion of people may be visiting the area and may not be familiar with or aware of local construction changes.

Temporary footpaths would be adequately signposted to indicate the direction of the footpath, will be of all-weather standard, and have an unobstructed width of at least one meter at local constrictions (and at least two meters elsewhere). However, temporary paths might have a short-term safety risk if they are not sufficiently lit or if construction and earthworks obstruct visibility, particularly along routes to the commuter car park. The contractor would need to assess obstructions and lighting and provide temporary facilities for security and visibility, especially where this currently exists.

Existing crossing facilities and associated signs would be maintained for as long as possible, until the permanent facilities are upgraded or opened. If access to an existing crossing cannot be provided for the full construction period, alternative facilities would be placed as close as possible to the established crossing.

As stated in the project REF and the original Traffic and Transport Impact Assessment (SMEC, 2015), safe pedestrian access to the Rose Street commuter car park would be provided during all construction stages involving work on the eastern side of the railway line. This is likely to be via the existing footpath of Howarth and Rose Streets which will remain, although upgraded. Temporary lighting on paths will also be investigated and provided where current road lighting is insufficient.

Routes may be temporary moved or relocated to accommodate construction activities such as for the new carpark entry plaza, Rose Street intersection closure and footpath upgrade. Cyclists would be considered when implementing temporary traffic arrangements, ensuring lane widths and shoulder widths minimise potential conflicts between cyclists and vehicles.

6.10 Impact on public transport

Some localised impacts are expected during construction. All existing bus services would be maintained. However, there may be minor delays due to reduced speed limits in the construction area and congestion along the highway. Local timetables may need to be adjusted due to construction traffic management and changes to bus stops, though these are likely be minor given the current congestion in the area, and the short length affected.

There is likely to be some localised disruption as the bus interchange near the station is closed during the construction phase to accommodate the wider road works. Buses will need to operate from permanent and temporary facilities near the Church Street intersection, which remains close to the station and has existing signals for crossing the highway to the business centre. Additionally, direct services that access the station will likely be relocated to the eastern side and affected by restrictions

at River Road and the Rose Street bridge. Buses will need to move in and out of already congested traffic along the highway, potentially affecting operations and scheduling.

It is feasible to stage this closure in the contractor's Traffic Management Plan with adequate and advance notice and alternative access and staged implementation of new and temporary facilities to limit disruption.

However, as outlined in Section 6.2.6 of the original Traffic and Transport Impact Assessment (SMEC, 2015) changes to bus operations and other bus stops are likely to be required during construction, including temporary relocations at various stages. Impacts are possible as waiting areas at some locations may be reduced with smaller sheltered areas. For larger stops, temporary seating and cover must be provided and impacts will be short term. All temporary bus stop locations would need to be located within acceptable walking distance of the existing stops, and for those in the central zone (town centre), they need to have nearby access to suitable safe crossing points across the highway and there must be a link to the station. The contractor will need to identify suitable alternative locations and consult with affected bus operators to ensure a smooth transition and minimal disruption.

The proposed modification would also have two changes to bus operations and bus stops required during construction, including:

- During South Stage 1 and 2, McPherson Road would be closed from the intersection at Pacific Highway. Bus route 30 would be detoured via Gavenlock Road and Johnson Road to access the Pacific Highway. The existing northbound bus stop north of South Tacoma Road would be permanently removed (in Stage 2 construction)
- During Central Stage 2, 3 and 4, bus interchange is proposed to be closed. Temporary northbound and southbound bus stop would be provided on Pacific Highway immediately south of the Church Road intersection including southbound train replacement service. Eventually this location will have permanent facilities built and will replace the interchange for the station during operation.
- A temporary northbound train replacement bus stop would be provided on Howarth Street between Warner Avenue and Rose Street, until the ultimate layover area next to the station is built.

The alternative public transport arrangements would be confirmed by the construction contractor.

6.11 Rose Street overbridge construction

The Rose Street overbridge would remain open to traffic during all stages of construction to ensure emergency access to the eastern side of the railway line. This is essential to the construction staging strategy because the Rose Street overbridge provides the only flood-free and most direct route across the railway.

Any short-term closures of Rose Street overbridge would be identified in the Traffic Management Plan, in consultation with key stakeholders and community.

The proposed modification also includes a further shift in the design of the new rail overbridge to the south of the current bridge, allowing for the full retention of the old bridge during construction for ongoing traffic and pedestrian access.

The demolition and construction of some elements of the Rose Street bridge would take place during rail shutdown periods for safety reasons and in accordance with Sydney Trains procedures. These may include some temporary delays and lane restrictions to traffic travelling over the old bridge or the new bridge once opened for road user safety, such as for crane movements or construction vehicle access.

Rail possession periods of up to 60 hours for work over or within the rail corridor are typically granted during planned shutdown periods, which occur three times a year, usually over long weekends. During these shutdown periods, work would be conducted 24 hours a day.

6.12 Impacts on “on-street” parking

Construction work would result in the temporary loss of on-street parking adjacent to the Pacific Highway. This impact may be staged as construction progresses. It is anticipated these parking impacts would be temporary in nature and reinstated after the completion of construction activities. The contractor would consult with affected businesses and property owners to identify suitable alternative parking arrangements, which would include the provision of accessible parking where required.

The project REF notes that there would be short term on street parking available in the town centre streets immediately adjacent to the highway. It is expected that some highway parking would shift to these areas during construction. While this may cause short delays and inconvenience, the overall impact is expected to be negligible. These impacts will be consistent with the current situation as parking in the business centre is short term and restricted now.

6.13 Impacts on commuter parking

The existing commuter car parks at the station will need to be closed fully on the western side and most of the eastern side, and long-term commuter parking would relocate to the Rose Street facility or other overflow parking on Howarth Street south of Warner Avenue.

This relocation would be coordinated during the early works to minimise the impact on commuters throughout the proposed construction period. The upgrade to the Rose Street car park has been identified in the proposed modification as an early package of work, and would be completed before the highway works in the central zone. The early upgrade, potentially with some interim and temporary changes, will provide additional parking space to reduce the impacts of the closure of the station carparking during construction and for permanent operations.

During construction the following changes would be made for commuter car park arrangements and access:

- During Central Stage 1A, the Rose Street commuter car park will be temporarily closed for upgrading. However, commuters will still be able to park on both the eastern and western sides of the railway, as happens currently. The Rose Street carpark is under-utilised when the station car parks are available, so impacts on parking will be limited.
- During Central Stage 2, the commuter car park on the western side of the railway line will be closed. Commuters will use the expanded Rose Street commuter car park, which will provide

about 380 spaces. A car park survey conducted on Tuesday 6 August 2024 shows that the western commuter car park on was at capacity, with about 137 vehicles. The expanded Rose Street commuter car park will comfortably accommodate this demand, as its capacity exceeds current usage.

- During Central Stage 3, Rose Street will be permanently closed at Howarth Street. Commuters will access the upgraded Rose Street commuter car park via Warner Avenue and Ithome Street.

6.14 Impacts from construction traffic on pedestrian and road user safety

During the construction, the introduction of additional heavy vehicles on the road network has the potential to impact the safety of pedestrians, cyclists and other road users, especially where there is increased interaction with pedestrians and cyclists.

Most of the construction footprint does not include formal cyclist facilities although there are footpaths in many areas, including in locations where indicative haulage routes are proposed. In other locations, pedestrians may still use grass verges and other areas between paths to access bus stops, community facilities and other destinations.

Key locations where pedestrian and cyclist safety issues may potentially arise include:

- Access and egress points for construction ancillary facility and key work areas, where entering and exiting construction vehicles may interface with pedestrians and cyclists
- High-demand locations, such as near the train station, business centre, schools, and recreational facilities, where moving construction equipment may conflict with pedestrian movements.

Safe pedestrian and cyclist access would be maintained throughout construction. Temporary alternative access arrangements would be provided following consultation with affected landowners as required.

6.15 Emergency service access

Section 6.2.5 of the original Traffic and Transport Impact Assessment (SMEC, 2015) outlined emergency vehicles access are likely to be required during construction. Emergency vehicle access would be prioritised, and the construction footprint would be arranged so that emergency vehicle access to nearby buildings and the surrounding area would be maintained, or alternative arrangements would be put in place as determined in consultation with relevant emergency services.

Onsite temporary traffic management with call ins to traffic controllers may also be used to minimise the impact of local congestion and restricted access due to changed traffic conditions. Ongoing consultation would be carried out with emergency service providers in relation to changed traffic conditions.

6.16 Traffic management

The construction staging maintains one travel lane in each direction. However, lane closures or contraflow arrangements would be required during off-peak times to complete tasks such as pavement resurfacing, intersection works, utility crossing and drainage works on the main highway. During off-peak times, closures will reduce overall traffic impacts, minimise disruption of access to businesses and impacts on pedestrian access to the town centre and station.

Initially, construction traffic would access the McPherson Road ancillary site via the Pacific Highway. The site currently has several accesses off the local road in place. Temporary access roads connecting construction ancillary facilities to construction sites would be established early in the construction program to minimise impacts on the ongoing operation of the Pacific Highway. Traffic management plans and construction staging will be progressively developed and refined throughout the construction period to ensure the safe and efficient movement of traffic through and around the corridor, as well as to and from construction locations and ancillary facilities.

Temporary speed limit reductions and lane closures on the Pacific Highway would be required during construction. Most construction work would be carried out during standard working hours and would have some impact on traffic operations. In some cases, work may also be conducted outside of standard working hours under a Road Occupancy Licence (ROL) to reduce disruptions during peak periods. Where feasible, heavy vehicle movements would be scheduled outside of peak traffic hours to lessen impacts on the road network during construction.

7 Mitigation and management measures

Consistent with the Project REF, measures for managing potential traffic impacts during construction and operation are discussed below.

7.1 Construction phase

7.1.1 Property and local access

When developing a Traffic Management Plan, it is desirable to maintain pedestrian and vehicle access to adjoining properties throughout the duration of the work.

Properties impacted during construction (accesses or temporary local road closures) would be notified prior to the commencement of construction and advised to use alternative routes during the construction period (for local road closures) and consulted regarding temporary access arrangements to their properties.

7.1.2 Bus services

In the case that bus stops require temporary relocation during construction, a suitable location will be identified by the contractor. Consultation with affected bus operators would be undertaken in conjunction with any temporary bus stop relocations.

A community engagement plan would be implemented to keep the community, including public transport operators, informed of any upcoming activities that may affect public transport operations.

7.1.3 Pedestrians and cyclists

Appropriate signage and way finding facilities relating to changes to pedestrian and cyclist access during construction would be developed and implemented.

Crossing facilities and associated signs would be retained where possible. If access to an existing crossing cannot be provided, alternative facilities as close as possible to established crossing are to be provided.

Safe pedestrian access to the Rose Street commuter car park would be provided for all stages of construction that involve work on the eastern side of the railway line. Cyclists will be considered when implementing temporary traffic arrangements.

Measures for managing road user safety during construction would be implemented and included in the TMP. This may include site specific traffic control measures, temporary alternative access arrangements, measures for consulting and informing the local community of impacts on the local road network, and measures for ensuring drivers are aware of areas of increased road safety risk, or other measures deemed appropriate.

7.1.4 Traffic management

A range of mitigation and management measures would be needed to manage the impacts to traffic and transport during construction. This would be through the development of a construction traffic management plan (CTMP) prepared and implemented in accordance with *Issue 6.1 of the Traffic Control at Work Sites (TCAWS) Technical Manual (Transport for NSW, February 2022).* The construction traffic management plan would enable the safe management of traffic, provide for the safety of construction personnel and minimise impacts on the local community.

The plan would include as a minimum:

- Haulage routes, including the source locations and their access points for the site and hours of haulage, which consider impacts on peak traffic periods and school drop-off and pick-up times

- Design and construction of access points to the ancillary sites in accordance with Transport for NSW and Council requirements
- The design of temporary works required to accommodate the heavy vehicle movements along the short sections of local roads required for access to ancillary sites
- Designated areas within the proposal area for heavy vehicle turning movements, parking, loading and unloading
- On-site parking arrangements for construction, supervisory and management personnel
- Sequence for implementing traffic works and traffic management devices
- Safety principles for construction activities, such as speed limits around the site and procedures for specific activities
- Induction requirements for construction, supervisory and management personnel
- Procedures for inspections and record keeping for maintaining traffic control measures
- Detailed Traffic Control Plans For each stage of construction, prepared and implemented in accordance with *Issue 6.1 of the Traffic Control at Work Sites (TCAWS) Technical Manual (Transport for NSW, February 2022)* by suitably qualified personnel
- Dilapidation surveys of roads around the proposal area prior to their use for construction as well as after construction is complete.
- Direct access at each of the ancillary facilities frontages provided with adequate sight distances relating to the posted road speed. This would allow vehicles on the main road to see vehicles emerging from the ancillary facilities and would allow ample room to slow down and stop if necessary. Similarly, it would allow vehicles waiting to emerge from the site access, adequate sight distance to see approaching vehicles and determine acceptable gaps for them to enter the main road traffic
- Construction sites and ancillary facilities with traffic control at the site access to manage the vehicular traffic into and out of each site and to manage pedestrian movement across the access
- Only left-in / left-out movements would be provided at ancillary site accesses located on through-roads
- Reduced temporary construction speed limits associated with traffic switches and temporary lane or road closures would be preferentially scheduled outside peak periods to reduce impacts on traffic on the road network
- A temporary parking area at designated ancillary facilities would be provided for use by construction staff.

The Construction Environment Management Plan (CTMP) would specifically address night work safety issues to protect motorists, pedestrians including station users and construction personnel.

The CTMP would link to a community consultation plan that provides for local residents to be informed prior to and during construction activities. This may include a dedicated telephone contact line for community issues to be registered and addressed. Other stakeholders to be included in the plan are emergency services, bus operators, local business and other major stakeholders with measures to inform them of changes in traffic management during construction.

A Traffic Management Plan (TMP) will be prepared and implemented as part for the CTMP. The TMP will be prepared in accordance with *Issue 6.1 of the Traffic Control at Work Sites (TCAWS) Technical Manual (Transport for NSW, February 2022) and QA Specification G10 Control and Traffic (Transport for NSW, 2020).*

Access to local roads, properties, and businesses would be maintained as much as practicable during construction. Short-term interruptions may occur, but only with the agreement of affected property owners, businesses, or government agencies. Alternative access arrangements will be developed in consultation with affected parties. Some delays may also occur on local roads due to heavy vehicle access to ancillary facilities.

The contractor will be responsible for coordinating with Transport for NSW and other key stakeholders, including local councils, to ensure that road closures and disruptions are managed safely and efficiently.

7.2 Operational phase

7.2.1 Property and local access

The following mitigation and management measures would be implemented to minimise the impacts to properties and local access:

- The alternative access routes imposed by the proposal for Alison Road, Bakers Lane and Robley Lane would be communicated to the community and retail owners impacted by the changes in access arrangement.
- Properties along the proposal corridor (including the Pacific Highway and local roads impacted by the proposed upgrade) would be provided with new formal access to the road network and developed in the detail design phase
- A signage strategy will be developed to guide road users to the new commuter car parking facilities and transport interchange.

7.2.2 Bus services

The proposal would change bus operations, including changes to the bus interchange arrangements, access to the new facility, additional and relocated bus stops and the removal of the southbound bus lane on the Pacific Highway would be undertaken in consultation with the relevant bus operators.

Bus services travelling direct to the station will be affected, as they need to use Howarth Street and the station layover on the eastern side rather than the western interchange, which will be removed. However, a new Rose Street rail bridge and traffic signals will provide improved access to this area, offering more bus capacity. Customers will continue to alight near the station pedestrian bridge and platforms, retaining convenient access to the station.

The proposed modification includes a new bus area just south of Church Street for most other services using the highway. This facility connects to the station entry via gentle grade to a plaza, ensuring a seamless transition for passengers. The new bus area south of Church Street is located near signalised crossings across the highway, maintaining safe pedestrian access. While the original interchange was closer to the station platforms and overbridge, the new facility offers smoother operations for most bus services traveling along the highway, as they will no longer need to enter the former carpark and re-enter the highway. The new bus facility includes space for a layover that can accommodate two buses in the designated bus bays, enhancing operational efficiency.

7.2.3 Pedestrians and cyclists

The impacts on pedestrians and cyclists during operation are positive, with improvements to the pedestrian and cyclist network under the proposal. The proposed modification includes some additional design improvements to footpaths that enhance connectivity around the town centre and adding amenity to the shared facility on Watanobbi Road in Apex Park.

A key feature of the proposed modification is the inclusion of a dedicated bi-directional cycle path instead of on road cycle lanes from Johnson Road to North Road. This facility offers safe and efficient cycle access through Wyong, minimising potential conflicts with parking, buses, traffic lights and general traffic.

7.2.4 Traffic management

The traffic modelling updated in this TTIA shows that impacts on traffic flows during operation are positive, with improvements to the network including with the proposed modification. All traffic devices would be designed and implemented in accordance with current standards, Transport for NSW and Council requirements. During the initial operation phase, traffic signals and other traffic management measures will be actively monitored and adjusted as needed to ensure optimal performance and address any unforeseen traffic issues.

8 Summary and conclusions

8.1 Overview

The overall purpose of this Traffic and transport impact assessment report is to identify and assess the traffic and transport impacts related to the proposed upgrade of 2.4-kilometre section of the Pacific Highway through the Wyong town centre. This involves an assessment of the existing and future traffic conditions and modelling of Concept Design for future years.

Future traffic conditions on the Pacific Highway were modelled for 2031, 2041, and 2051 for both morning (AM) and afternoon (PM) peak periods.

8.2 Existing traffic conditions

The Pacific Highway through Wyong town centre carries around 26,000 to 36,500 vehicles per day (as per counts undertaken in 2022) and is currently one lane in each direction. The highway connects Wyong's growing residential, commercial, and industrial precincts and has experienced a large increase in traffic volumes due to sustained urban growth across the Central Coast.

Traffic queues extend through the town and along the northern and southern approaches of the Pacific Highway during the morning and afternoon peaks. These delays indicate there is insufficient capacity in the current road network.

The intersection of Rose Street and the Pacific Highway was observed to have substantial delays and queues under existing traffic conditions. Vehicles turning onto the highway from the Rose Street bridge experience delays caused by congestion on the highway in both morning and afternoon peak periods. The intersection of the Pacific Highway and South Tacoma Road, which has a right turn out of South Tacoma Road, operates at LoS F, because of vehicles waiting to find a gap in both directions of traffic on the Pacific Highway.

Six intersections currently operate at Level of Service F including:

- Pacific Highway / Railway bridge
- Pacific Highway / Anzac Road
- Pacific Highway / North Road
- Pacific Highway / Cutler Drive
- Pacific Highway / River Road / Panonia Road
- Pacific Highway / South Tacoma Road / McPherson Road.

8.3 Future traffic conditions without the proposal

The Pacific Highway serves as a vital arterial route running from Doyalson in the north to Wyong Road at Tuggerah, extending further into surrounding southern and eastern suburbs. As of 2022, the highway carried between 26,000 and 36,500 vehicles daily and was configured as a single lane in each direction through the Wyong Town Centre, offering limited access and minimal provision for bicycles and pedestrians. Traffic demand during peak periods on the Pacific Highway exceed the road's capacity, leading to extensive traffic congestion and delays.

In the immediate future, failing to address the current situation presents the following risks:

Congestion and delay: The anticipated growth in traffic demand in 2031, 2041, and 2051 is expected to worsen the existing delays and congestion issues at these locations. Specifically, at the intersection of Pacific Highway / South Tacoma Road / McPherson Road, the average delays during the AM peak are anticipated to increase significantly from 130 seconds to more than 600 seconds. Similarly, at the Pacific Highway / River Road / Panonia Road intersection during the PM peak, average delays are expected to rise from 272 seconds to more than 600 seconds.

Highway speed: The 2022 average travel speeds on Pacific Highway, particularly during peak periods, range from approximately 25 km/h to 37 km/h, which is significantly lower than the posted speed limit of 50 km/h to 70 km/h. Without the proposed upgrade, it is projected that by 2031, average speeds on the Pacific Highway will decrease to a range of 15 km/h to 23 km/h. By 2051, the average speeds are anticipated to decline further, reaching a range of 12 km/h to 13 km/h.

Level of Service - Considering the existing level of service (LoS F) at key intersections along the Pacific Highway during morning and afternoon peak periods, it is expected that by 2031, seven of nine intersections in the study area will operate at Level of Service F. This deterioration continues to 2051.

Travel time: Travel times on the Pacific Highway are expected to deteriorate in the future without upgrade. In the absence of the upgrade, the average southbound travel times between Anzac Road and Britannia Drive would increase from 10.6 minutes in 2022 to 18.1 minutes in 2031. Northbound travel times would increase from 7.3 minutes in 2022 to 11.7 minutes by 2031. In 2041, the travel times are expected to be in the range of 16.2 minutes and 21.8 minutes depending on the peak hour. These travel times are expected to be worsen by 2051, when motorists may experience journeys lasting between 20.1 minutes and 23.1 minutes during peak periods.

8.4 Traffic performance of the proposal

The proposal would improve the Level of Service at Pacific Highway intersections in 2031, 2041, and 2051. In 2031 key intersections would provide Level of Service between A and C. Similarly, by 2041 and 2051, majority of the Pacific Highway intersections would provide Level of Service between A and D.

In 2031, the proposal would reduce journey times on the Pacific Highway by up to 10.6 minutes during peak periods. Similarly in 2041 and 2051, peak hour travel time savings by the proposal are estimated to be up to 13.8 and 13.4 minutes respectively.

Overall, the proposal would increase lane capacity and improve intersection operation for vehicles traveling north-south along the Pacific Highway. The proposed upgrades would address capacity issues at intersections and improve local community accessibilities. The upgrade would improve access to local communities at the Wyong town centre.

8.5 Operational impact

Commercial and retail properties with existing driveway access directly onto the Pacific Highway will be restricted to left-in/left-out with the introduction of a central median. However, the impacts on retail and commercial access will be offset by the improved travel times and speeds along the Pacific Highway corridor through Wyong town centre.

The proposal also includes significant changes to commuter car parking arrangements around Wyong Station. This involves the closure of the existing eastern and western car parks at Wyong Station and the expansion of the Rose Street commuter car park. The parking allocation in the proposed upgrade exceeds the number of vehicles currently observed using the existing off-street parking facilities around Wyong Station.

While the distance for pedestrians walking to the commuter car parking areas will increase under the proposed upgrade, pedestrian facilities will be enhanced to improve access and connectivity to the Rose Street commuter car park. This includes improved footpaths, safer crossings, and a plaza with a gentle grade connecting the new bus area south of Church Street to the station entry, supporting seamless pedestrian transitions and enhancing connectivity to the station and town centre. A new bi-directional cycle path between Johnson Road and North Road will replace on-road cycle lanes, providing safer and more efficient access while reducing conflicts with traffic.

Traffic flow improvements are anticipated with the proposed upgrade, supported by traffic devices designed to meet current standards. During the initial operation phase, traffic signals and management measures will be monitored and adjusted as needed to ensure optimal performance and address unforeseen issues.

8.6 Construction traffic impact

As stated in the project REF and the original Traffic and Transport Impact Assessment (SMEC, 2015), construction traffic impact on the Pacific Highway is expected to be minor and would not impact the operational performance of the highway. Construction traffic is anticipated to increase volumes on Pacific Highway less than two per cent of total traffic. The effects of this relatively short-term increase on the existing road network are not expected to significantly impact road safety in the study area, though there is a risk with construction traffic interacting with general traffic.

Construction work is not expected to impact existing pedestrian access routes or crossings. Pedestrian and cyclist access would be retained throughout the construction period. If maintaining access is not feasible, temporary alternative arrangements would be provided after consultation with affected landowner. However, longer detours, such as via the station and Church Street, would be required until new pathways and signals are established at the Rose Street bridge intersection. Cyclist access would also be impacted by traffic management, but off-road facilities and alternative routes would improve access as the project progresses.

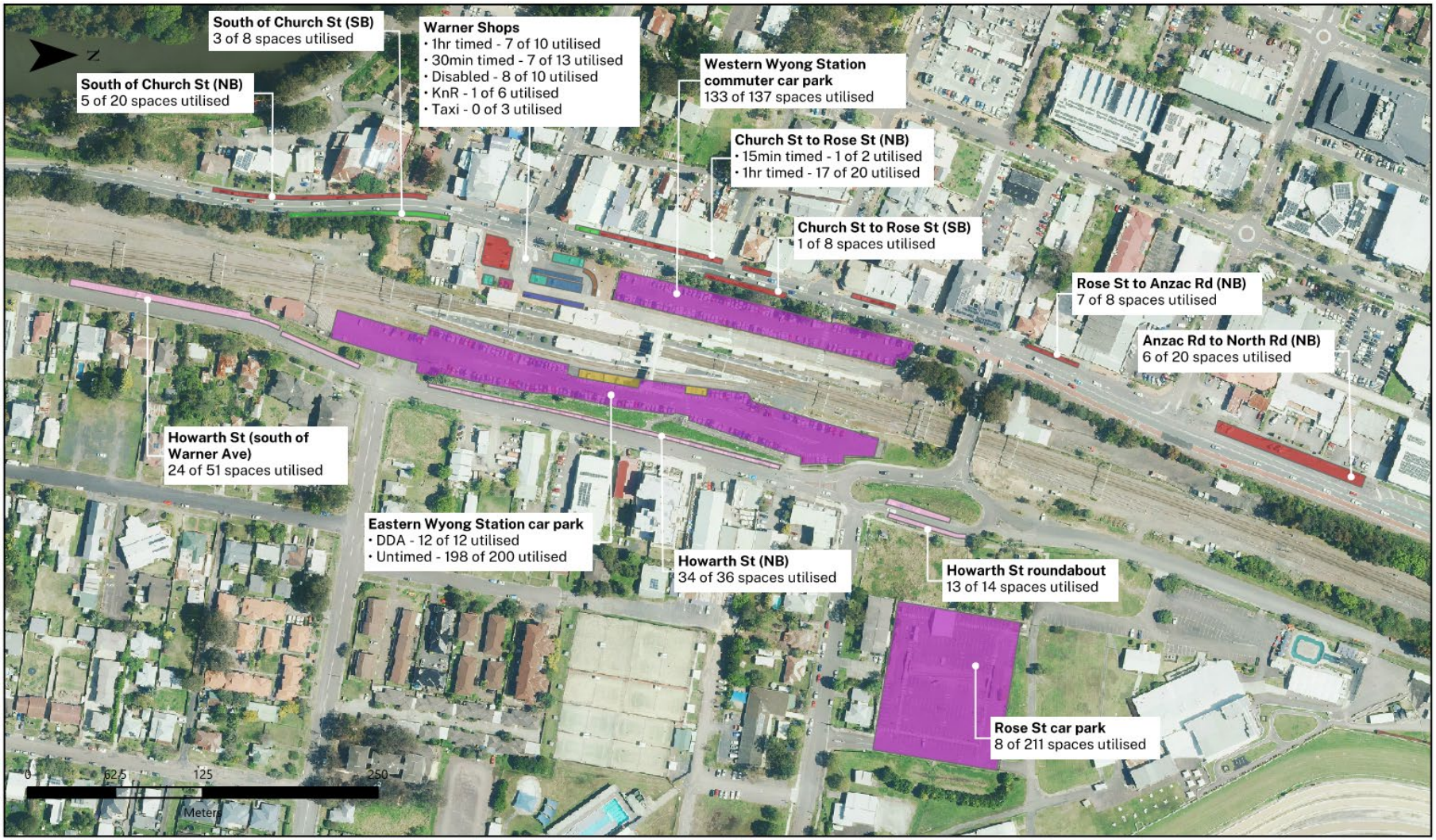
Impact on property access would be minimal and temporary, with disruptions managed through consultation and alternative arrangements. The Rose Street overbridge will remain open throughout construction to ensure flood-free and emergency access to Wyong township. Short-term closures (e.g., overnight or up to 48 hours) may occur and will be managed through Traffic Management Plans (TMPs) and stakeholder consultation. Major works, including demolition and construction, will take place during rail shutdown periods to minimise disruption and ensure safety.

Bus services would be maintained, but minor delays may occur due to reduced speed limits and construction-related congestion. The station bus interchange would be closed during construction, with services shifted to temporary and permanent facilities near Church Street and Pacific Highway.

Temporary loss of on-street parking adjacent to the highway is anticipated, with parking reinstated after construction. All station commuter car parks on the western side and most on the eastern side will close entirely, with long-term parking relocated to the upgraded Rose Street facility (380 spaces) and overflow parking on Howarth Street.

Traffic management plans and construction staging would be progressively refined during construction to facilitate the safe and efficient movement of traffic through and around the proposal area as well as to and from construction locations and ancillary facilities.

Appendix A - Car parking survey undertaken by Transport



Legend

Parking Type

- 0.5P
- 15M
- 1P
- Commuter
- DDA
- Disabled
- KnR
- Private (TfNSW)
- Taxi
- Untimed
- <all other values>

Pacific Highway Upgrade, Wyong Town Centre

Car Parking Survey - Tuesday 6 August 2024

12:50 pm to 1:30 pm

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