# Tuggerah to Wyong Economic Corridor Transport Study

Central Coast Council

Final Report


Prepared by: GTA Consultants (NSW) Pty Ltd for Central Coast Council

on 15/07/20

Reference: N185680

Issue #: A

GTAconsultants

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### Quality Record

| Issue | Date | Description | Prepared By | Checked By | Approved By | Signed |
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| A-Dr | 31/03/20 | Draft | Liam Clark | Anthony Leung | Nick Buchanan | - |
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# 1. INTRODUCTION

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## 1.1. Introduction and Scope

The Tuggerah to Wyong Economic Corridor ('the Corridor') is in the northern part of the Central Coast Local Government Area (LGA), located approximately 15 kilometres north of Gosford. It is surrounded by Warnervale, Lake Haven and Lake Macquarie to the north, Tuggerah Lake to the east and smaller towns and several National Parks to the west.

Action 3.7 of the Tuggerah to Wyong Economic Corridor Strategy (2019) from Central Coast Council (Council) states that Council will *"prepare a Transport Study to investigate future transport improvement opportunities within the corridor that will achieve efficiency, sustainability and liveability. A key aim of the study should be to enhance active transport options for workers and residents throughout the corridor, and identify any land acquisitions that may be required to accommodate new roads and links."*

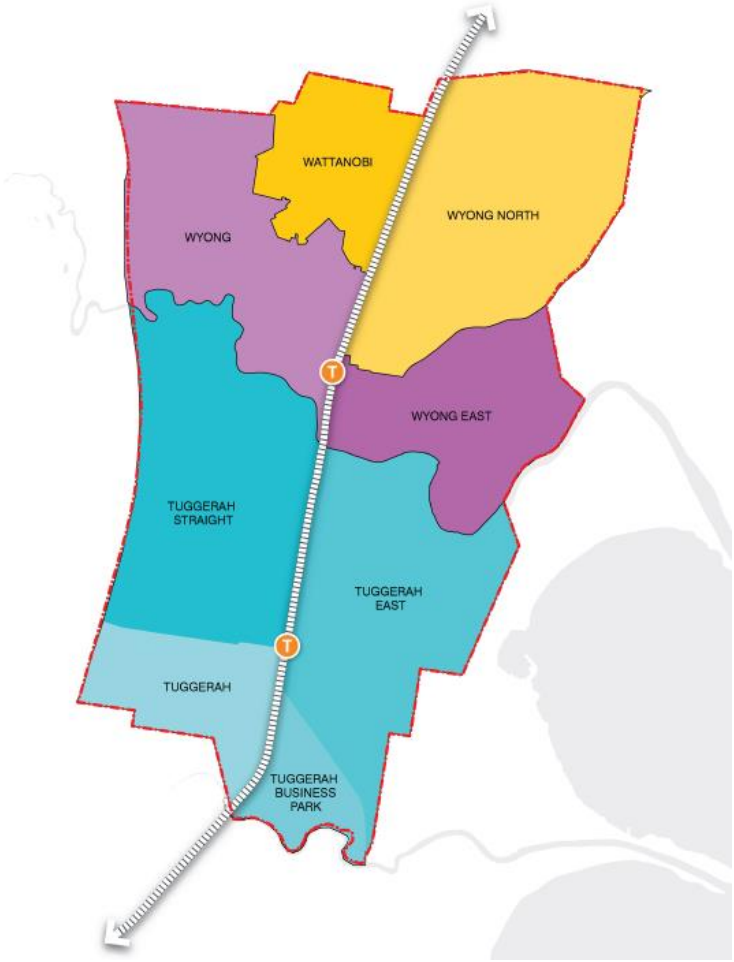
Following on from this action, GTA Consultants (GTA) has been commissioned by Council to prepare the Tuggerah to Wyong Economic Corridor Transport Study. The Study will examine travel behaviours and profiles of residents and employees on a regional, Corridor and precinct level as well as the state of the existing transport networks covering public transport, active transport and road connections. This information will be used to inform future transport improvement opportunities within the Corridor that will achieve improved efficiency, sustainability and liveability for residents, visitors and workers in the Corridor, with a strong focus on public transport and active transport options.

The early sections of this Study comprise an appraisal of the Corridor's underlying transport, land use and travel pattern conditions. Subsequent sections of this Study involve the identification of future transport improvement opportunities that culminate in the Tuggerah to Wyong Economic Corridor Transport Study.

## 1.2. Study Area

The study area comprises the Tuggerah to Wyong Economic Corridor, as shown in Figure 1.1.

Figure 1.1: Study Area




Source: Draft Tuggerah to Wyong Economic Corridor Strategy

## 1.3. Objectives

The main objectives of this Study are to:

- Assess the capacity of the existing transport network in the Tuggerah to Wyong Economic Corridor
- Determine the future demand and impact of future development (as outlined in the draft Tuggerah to Wyong Economic Corridor Strategy) on the existing transport network
- Review known infrastructure commitments and timeframes for delivery both within the study area, and those external to the study area but potentially having an impact on the study area
- Determine key network infrastructure requirements for vehicles, pedestrians, cyclists and public transport based on predicted population and employment growth outlined in the draft Tuggerah to Wyong Economic Corridor Strategy

- Ensure that the road network provides an efficient and safe network for public transport, pedestrians and bicycles and ensure alignment with the overall vision outlined in the draft Tuggerah to Wyong Economic Corridor Strategy
- Identify opportunities for improvements (short, medium and long term) to the existing transport network to improve all non-car modes of transport to help tackle car dependency and provide improved measures of efficiency, sustainability and liveability.

# 2. POLICY CONTEXT

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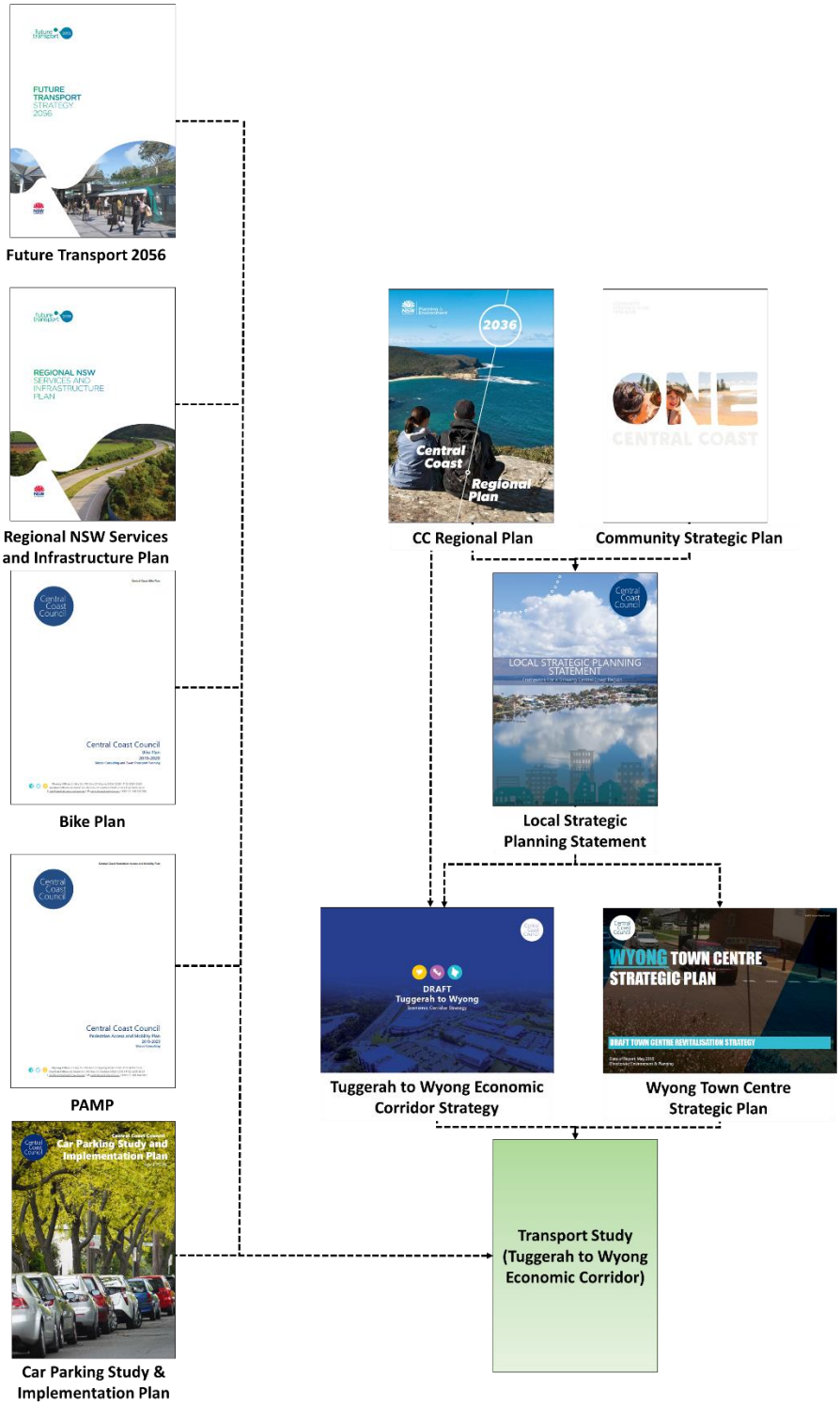
## 2.1. Policies and Strategic Context

Figure 2.1 depicts the relationship between existing State Government and Council plans and their interactions with the development of this Transport Study. These plans are summarised in the subsequent sub-sections.

Figure 2.1: Policy context



### 2.1.1. Future Transport 2056 Strategy

The *Future Transport Strategy 2056* (Future Transport) was released in 2018 and is a 40-year strategy for Sydney and Regional New South Wales (NSW) prepared by Transport for NSW (TfNSW). The plan refers to several long-term strategies and projects related to the Central Coast, including:

- 'Turn up and go' services on major public corridors within the Central Coast
- Investigation of Sydney-Central Coast-Newcastle Faster Rail Improvement
- Bus Headstart for Central Coast (ensuring new residential subdivisions get bus routes as soon as residents begin living there)
- Central Coast Place Plans
- Designation of Gosford as a satellite city and Wyong as a regional centre transport hub
- Warnervale Link Road, Albert Warner Drive to Pacific Highway
- Pacific Motorway Widening and Reconstruction, Wyong Road to Doyalson Link Road (State and Federal funded)
- Wyong Road (Mingara Drive to Tumbi Road) upgrade.

Figure 2.2: Future NSW regional network

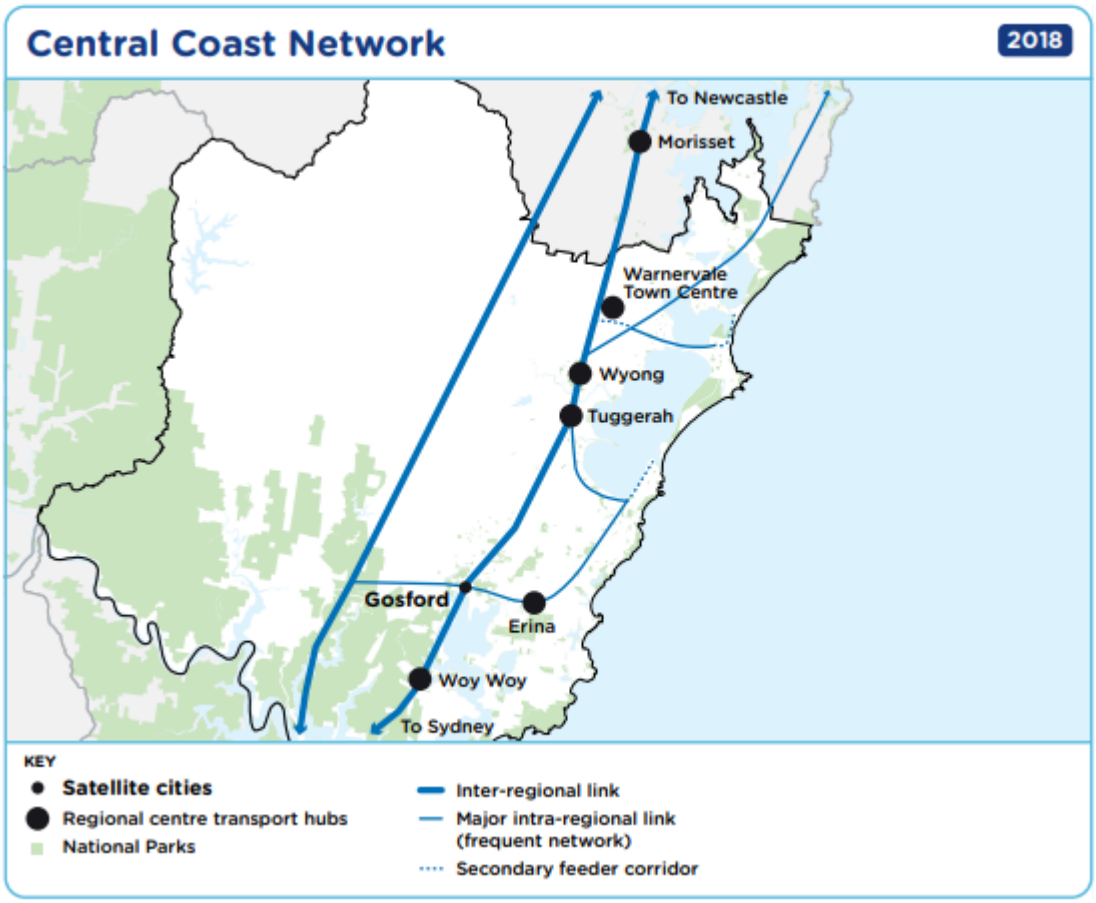
### 2.1.2. Regional NSW Services and Infrastructure Plan

The *Regional NSW Services and Infrastructure Plan* (2018) supports the *Future Transport Strategy 2056* by providing further detail on the vision and the delivery of specific projects across Regional New South Wales. The plan notes the two key projects to be delivered in the Tuggerah to Wyong Economic Corridor, including:

- Warnervale Link Road
- Pacific Highway upgrade through Wyong Town Centre.

Along with other projects adjacent to the Corridor, the plan depicts the future Central Coast network hierarchy, shown in Figure 2.3.

Figure 2.3: Future Central Coast Network




### 2.1.3. Central Coast Regional Plan 2036

The *Central Coast Regional Plan 2036* (2016) (CCRP) provides the State-government led strategy to guide land use planning priorities and decisions over the period to 2036. Addressing issues concerning population growth, housing supply, economic development, agriculture, environment, heritage and culture, several high-level transport-related goals are stated:

- Plan for communities to be better connected by an integrated transport system that prioritises safe walking, cycling and public transport.
- Investigate options to improve public transport services and better link centres, corridors and growth areas.

Regarding the Tuggerah to Wyong Economic Corridor:

- Create a diverse, connected and vibrant Tuggerah centre.
- Leverage the planned Pacific Highway upgrade and new Link Road to improve transport connectivity and amenity along the Tuggerah to Warnervale corridor.

### 2.1.4. Community Strategic Plan

The *One – Central Coast* Community Strategic Plan (2018) (CSP) is the product of extensive community consultation and stakeholder engagement, providing the community with the opportunity to have their aspirations and priorities incorporated into Council's strategic planning and service delivery. Relevant to this study, it is important to recognise the following transport-related priorities contained in the CSP:

- H2: Improve pedestrian movement safety, speed and vehicle congestion around schools, town centres, neighbourhoods and community facilities.
- J2: Address commuter parking, drop-off zones, access and movement around transport hubs to support and increase use of public transport.
- J4: Design long-term, innovative and sustainable transport management options for population growth and expansion.
- K1: Create a regional network of interconnected shared pathways and cycle ways to maximise access to key destinations and facilities.
- K2: Design and deliver pathways, walking trails and other pedestrian movement infrastructure to maximise access, inclusion and mobility to meet the needs of all community members.

### 2.1.5. Local Strategic Planning Statement (Draft)

Every Council in New South Wales is required to prepare a Local Strategic Planning Statement (LSPS) that sets out their 20-year vision for land use, to inform the development of an updated Local Environmental Plan (LEP) and Development Control Plan (DCP). Regarding the Central Coast, its 2020 LSPS Working Draft is intended to harmonise the State Government's *Central Coast Regional Plan 2036* with the *One – Central Coast* Community Strategic Plan.

Involving transport matters, the LSPS refers to the following planning priorities:

- Improve connectivity within and between centres.
- Provide efficient and accessible public transportation.
- Develop a region wide network of shared pathways and cycleways to maximise access to key locations and facilities.

Supporting these priorities are a series of actions:

- Implementation of the Movement and Place framework.
- Preparation of a Central Coast Future Transport Plan.
- Develop an Active Transport Strategy.
- Develop a Coast wide accessible and on-demand service.
- Implement the Pedestrian Access and Mobility Plan (PAMP) and Bike Plan.

The LSPS also recognises the committed Warnervale Link Road from Albert Warner Drive to the Pacific Highway.

### 2.1.6. Tuggerah to Wyong Economic Corridor Strategy

Following on from higher level plans, the *Draft Tuggerah to Wyong Economic Corridor Strategy* (2019) ('the Strategy') provides a holistic vision for the Tuggerah to Wyong Economic Corridor. Containing a mix of strategies, directions and actions, the Strategy envisages a flourishing corridor with employment opportunities, housing choice, sporting venues, and passive recreational activities. Pertaining to transport, the Strategy details many fine-grain initiatives to support the overall vision, including:

Direction 3 (Transport and Movement) – Maximise connectivity between activity nodes and centres to support renewal opportunities:

Action 3.1: Strengthen the existing cycle network:

- Enable cyclists to ride between key destinations within the corridor.
- Maintain the cycle network, provide supporting facilities and encourage cycling as a mode of transport.
- Investigate opportunities to explore off-road routes through safer, scenic areas within the Corridor, as opposed to Pacific Highway and other main roads.

Action 3.2: Reinforce key pedestrian links:

- Improve pedestrian links and infrastructure within urban areas (such as Wyong Town Centre, North Wyong industrial area and Tuggerah) and employment/residential areas within 800m of train stations.
- Investigate further opportunities including the Wyong River Foreshore Link and inter-precinct links.

Action 3.3: Investigate opportunities to strengthen the local street network:

- As some street networks lack legibility and permeability, investigate further opportunities including a defined street hierarchy and delivery of key links.

Action 3.4: Minimise potential impacts of Pacific Highway upgrades:

- Minimise potential impacts on the centre's character, public domain amenity and ensuring that the east and west sides of the town centre are well-connected.

Action 3.5: Understand and leverage the opportunities associated with the Sydney to Newcastle fast rail project:

- Noting benefits associated with a stop at both centres (Tuggerah and Wyong), work with the NSW Government on any future progression of the project.

Action 3.6: Advocate for the completion of Pacific Highway upgrades and a link road to Warnervale:

- Press the RMS for the planned Pacific Highway works to be funded and undertaken as soon as possible.
- Advocate for a new link road connecting North Wyong to Warnervale.

Direction 7 (North Wyong and Watanobbi Precinct) – Rationalise access and circulation

- Action 7.1: Consolidate access points to the Pacific Highway.
- Action 7.2: Improve the permeability and circulation within the employment precinct.

Direction 10 (Wyong and East Wyong Precinct) – Connect to East Wyong

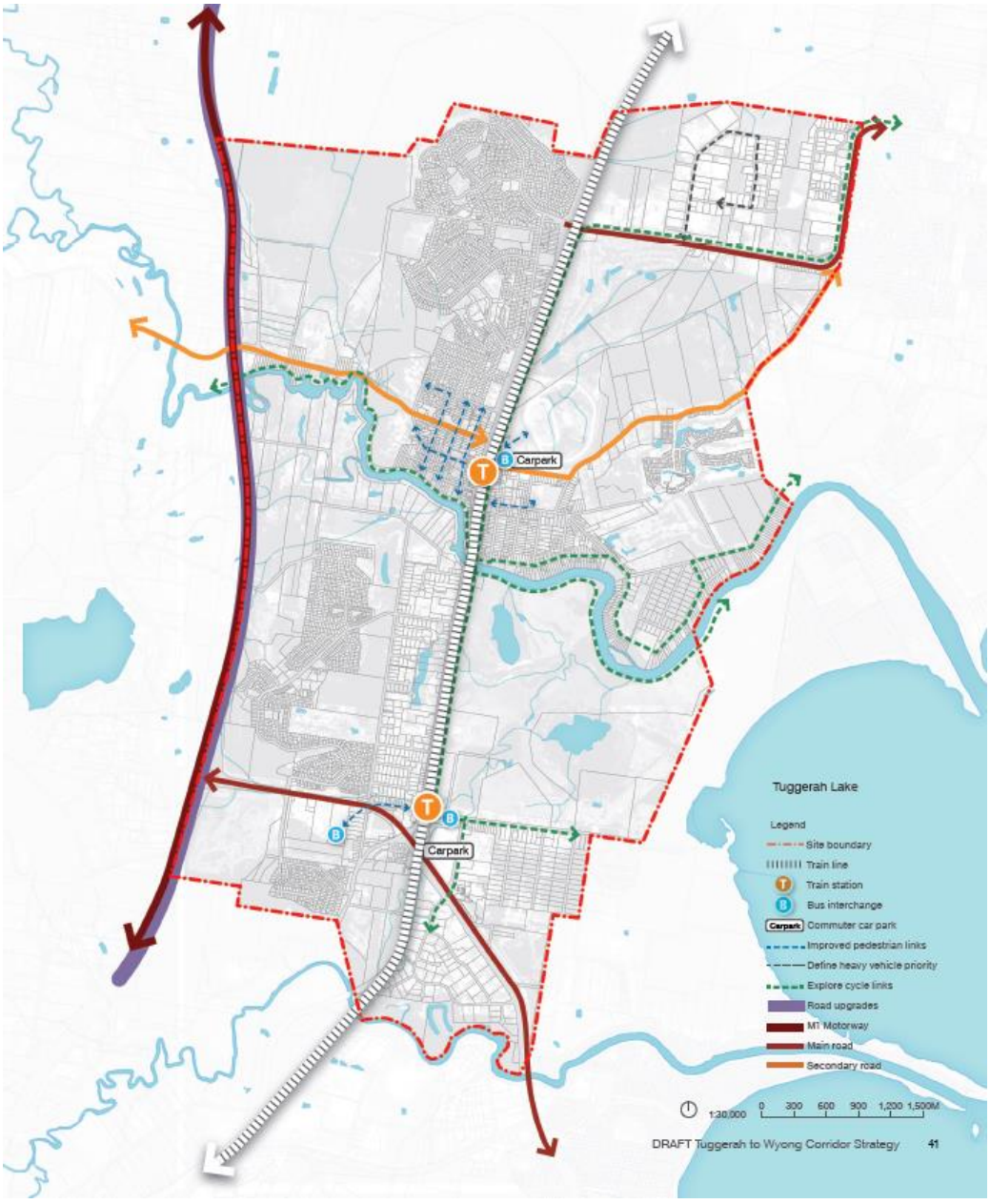
- Action 10.1: Minimise adverse impacts of the proposed widening of Pacific Highway.

Direction 13 (Tuggerah Precinct): Sustainable renewal in Tuggerah Town Centre

- Action 13.1: Investigate transit-oriented development at Tuggerah Station.

The transport network shown in the Strategy is outlined in Figure 2.4.

Figure 2.4: Corridor Strategy's future transport network




Source: Draft Tuggerah to Wyong Economic Corridor Strategy

## 2.1.7. Wyong Town Centre Strategic Plan (Draft)

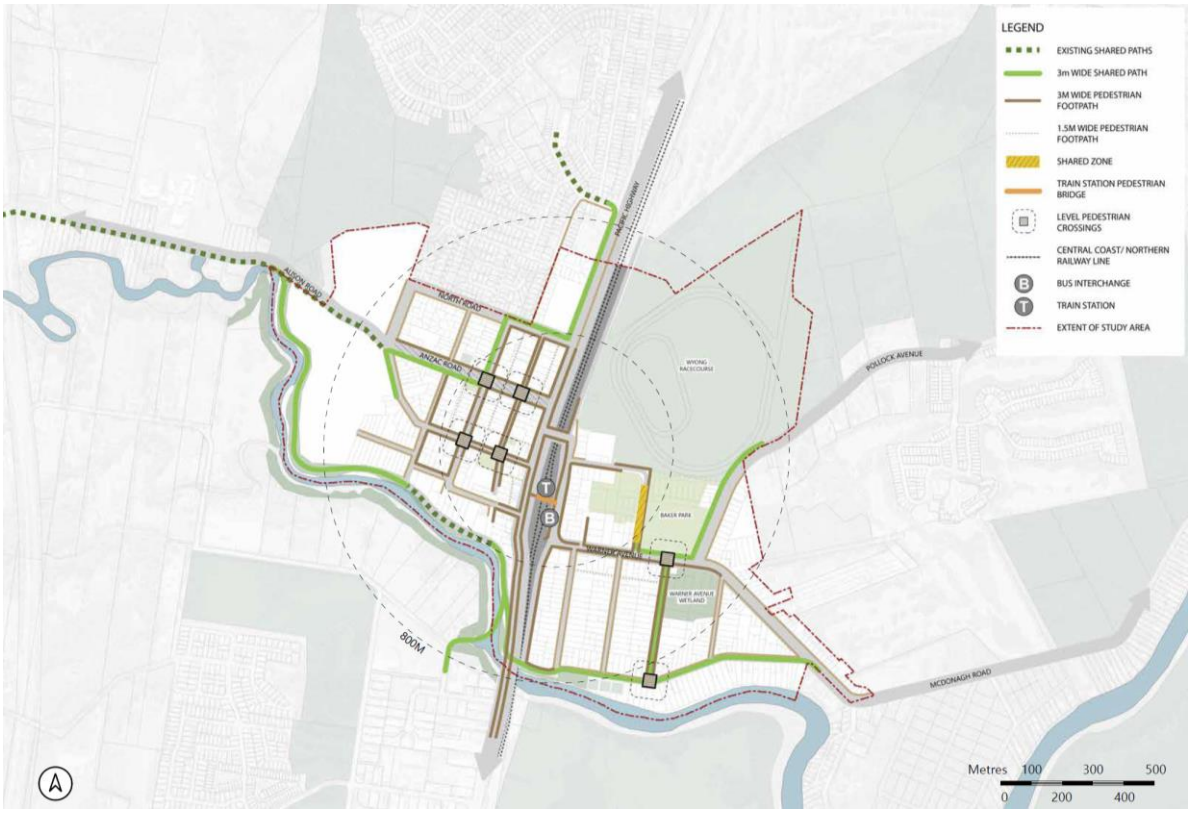
The draft *Wyong Town Centre Strategic Plan* (2019) consolidates previous precinct master planning undertaken for Wyong over the last 15 years. It also provides an important update to past plans, incorporating the themes found in the Central Coast CSP and the strategic goals of the Central Coast Regional Plan 2036 and Central Coast LSPS. The Plan notes that Wyong's disconnected street grid creates poor vehicular and pedestrian access in the east-west direction, leading to a concentration of activity on the western side of the town centre.

The Plan also identifies that the Pacific Highway bus interchange is significantly affected by congestion during peak hour traffic in terms of bus movements entering from and onto Pacific Highway, and that a relocation to the eastern side of the railway line may be an appropriate solution.

On this note however, it is not immediate clear how a relocation to the eastern side would resolve bus congestion issues as many bus routes would still be subject to the same congestion along Pacific Highway before having to branch over to the eastern side of the railway line. Several other initiatives are also proposed in the Plan's *Pedestrian and Active Transport Strategy*:

- Improve disabled parking and taxi spaces east of the railway station.
- New station bridge to improve access between the Pacific Highway and the railway station, between Alison Road and Church Street.
- New shared pathway along Wyong River.
- Implement kerbless shared zones to emphasise the shared nature of the town centre's streets.
- Create a shared zone along Ithome Street in Wyong East.

Figure 2.5: Wyong Town Centre Pedestrian and Active Transport Strategy – Proposed Interventions




Source: Draft Wyong Town Centre Strategic Plan

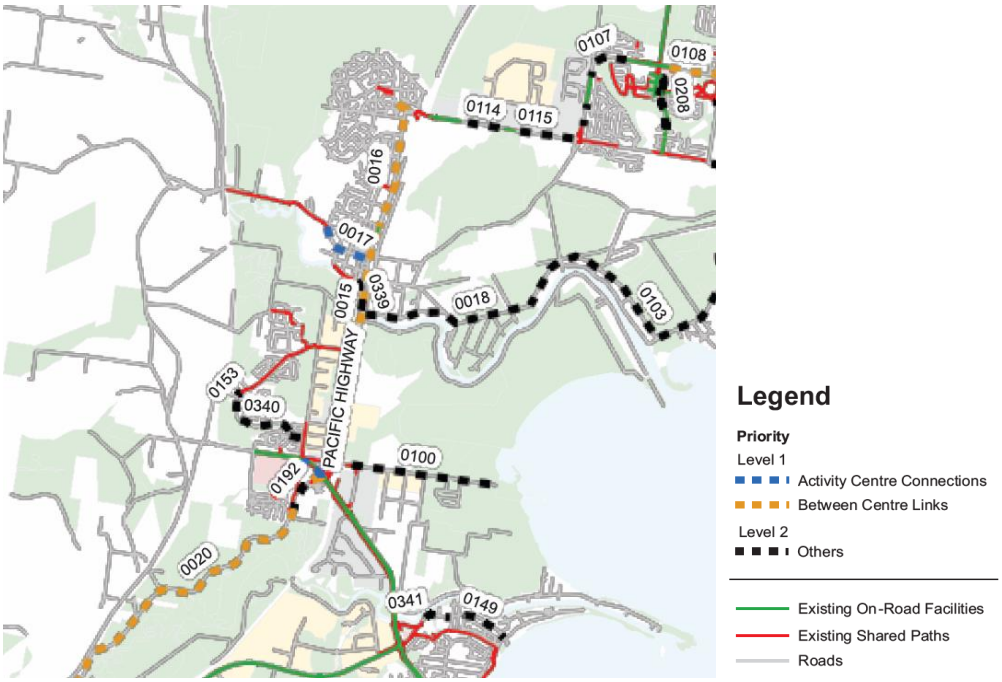
## 2.1.8. Central Coast Bike Plan 2019-2029

The *Central Coast Bike Plan* (2019) proposes 412 new shared path and on-road facility links, differentiated by whether they are connections within centres or connections between centres. The top priority project within the Tuggerah to Wyong Corridor – ranked 10th overall – is a regional shared path on the Pacific Highway from Johnson Road in Tuggerah to North Road in Wyong (0015 on map), which would 'close the gap' to Wyong by extending the existing Pacific Highway bi-directional separated cycleway from Tuggerah to Wyong, allowing a safer connection between Wyong and Tuggerah.

Ranked 39th is a 134-metre segment of shared path on the Pacific Highway, connecting to the existing facilities at the Wyong Road intersection. The 56th priority is a regional shared path from North Road in Wyong to Britannia Drive in Watanobbi (0016), while Priority 81 (0114) and Priority 87 (0115) provide a combined 1,354 metres of shared path in the North Wyong Employment Area. Finally, ranked 113th is a regional shared path on Alison Road from Anzac Avenue to the Pacific Highway (0017). Combined, the Bike Plan estimates that these Schedule 1 works will cost $6.6 million, adding 5.5km of new cycleways or shared paths to the existing network.

It should be noted that while there is a clear prioritisation of projects in the Bike Plan, Central Coast Council may deliver projects out of priority in order to accommodate other non-cycleway project dependencies and constraint, such as the Wyong CBD upgrade and Warnervale Link Road.

Figure 2.6: Bike Plan proposed routes

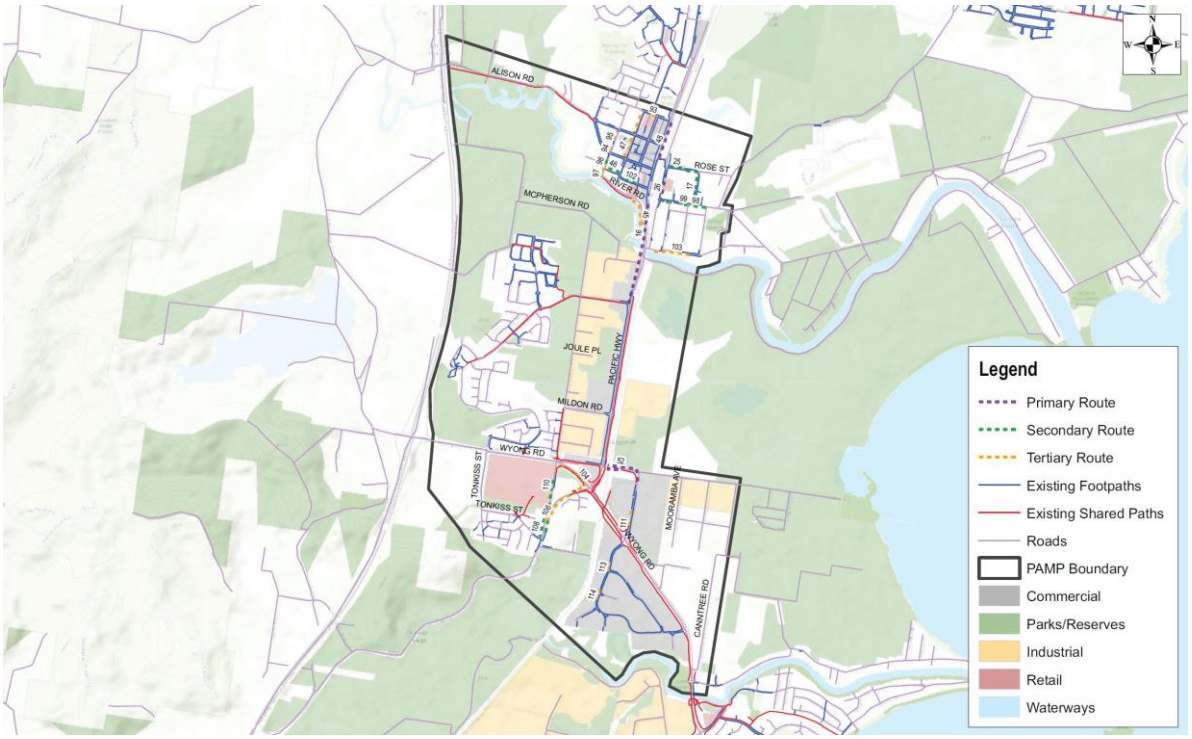



Source: Central Coast Bike Plan

## 2.1.9. Pedestrian Access and Mobility Plan (PAMP)

The *Central Coast Pedestrian Access and Mobility Plan* (2019) (PAMP), developed concurrently with the Bike Plan, outlines the steps required to achieve Council's vision of providing a safe, high-quality and well-connected pedestrian network. Identified as a strategic centre in the PAMP, a list of new pathways on priority routes were proposed for the Wyong/Tuggerah area as illustrated in Figure 2.7. Subject to budget availability, these pathways – amongst others in the Central Coast Local Government Area – will be funded and delivered according to their priority in the PAMP.

Figure 2.7: PAMP Schedule 1 and Schedule 2 works




Source: Central Coast Bike Plan

## 2.1.10. Central Coast Car Parking Study and Implementation Plan 2020

Council has prepared the *Car Parking Study and Implementation Plan 2020* although it has neither been ratified by Councillors nor publicly released. This document sets out the key parking supply and management principles and actions for the entire LGA, while also applying these principles and actions to ten key focus areas in the LGA including Tuggerah and Wyong, culminating in short, medium and long-term actions for the focus areas. The main principles and actions and associated location-specific actions for Tuggerah and Wyong are summarised below.

Figure 2.8: Key principles and actions of the Car Parking Study and Implementation Plan 2020


Source: Central Coast Car Parking Study and Implementation Plan 2020

Based on Figure 2.8, Council is focused on making the most of smart parking technology and parking demand and supply management techniques to support the supply and management of parking throughout the LGA. High-level actions from these principles include using parking apps that align with state-led technology as well as parking detection technology (sensors and license plate recognition), implementation of demand-responsive parking management techniques such as pricing, as well as rationalising the supply of parking through the removal of minimum parking requirements and repurposing long-stay parking for short-stay parking to support local activity centres.

In relation to Tuggerah, a specific action includes advocating TfNSW to fast track the delivery of additional commuter parking at Tuggerah Station in the medium-term (2028), as shown in Figure 2.9 below. The rationale behind this action is that it could encourage commuters away from Wyong, which could free-up parking capacity close to the Wyong commercial core, despite the community survey indicating the majority of respondents not willing to use an expanded Tuggerah commuter car park and the fact that commuter parking users tend to go to their nearest car park in advance of congestion bottlenecks. This action is in contrast to the *Car Parking Study and Implementation Plan*'s principle of rationalising parking supply, including the specific action of "*limit[ing] the future supply of parking within centres that have high access to public transport"*.

Figure 2.9: Proposed expanded commuter car park at Tuggerah station


Source: Central Coast Car Parking Study and Implementation Plan 2020

In Wyong, specific actions include:

- Short-term – Increase utilisation of the existing Rose Street commuter car park, which had 180 vacant spaces during peak periods according to a 2018 weekday survey (refer to sub-section 4.7.1 below), by improving directional signs and marketing.
- Medium-term – Advocate TfNSW to bring forward the delivery of the Rose Street car park expansion.
- Long-term – Investigate potential sites for a new parking station on the western side of the Pacific Highway.

These actions are depicted in Figure 2.10 below.

Figure 2.10: Short, medium and long-term parking actions for Wyong


Source: Central Coast Car Parking Study and Implementation Plan 2020

The rationale behind advocating for the early delivery of the Rose Street car park expansion is not clear given the existing underutilisation of the existing Rose Street commuter car park and the specific short-term action of boosting its utilisation. Moreover, advocating for a commuter car park expansion and the long-term delivery of a new car park on the western side of the Pacific Highway diverges from the Car Parking Study and Implementation Plan's principle of rationalising parking supply, including the specific actions of *"limit[ing] the future supply of parking within centres that have high access to public transport"* and encouraging the use of alternative transport modes.

### 2.1.11. Summary

The strategic documents and plans set out by Council establish a strong vision for land use and transport for the Corridor and at an initial level have identified possible transport infrastructural interventions to realise this vision. In summary, there is a strong focus from these documents for the Corridor to become more integrated with the local community by having an accessible multi-modal transport network that prioritises safe walking, cycling and public transport connections to employment, community services and places of residence, as well as strong multi-modal corridor between Tuggerah and Wyong.

Underlying transport issues that have already been identified for the Corridor and the LGA include:

- Pedestrian safety, speeding and congestion near schools and town centres
- Commuter parking issues

- Ensuring future growth in population, jobs and dwellings are supported by an adaptive transport system
- Connectivity to key destinations via walking and public transport, including between Tuggerah and Wyong
- The impacts of planned upgrades to Pacific Highway to the supporting transport network
- Street network permeability and legibility in Wyong and Tuggerah
- Severance issues between Wyong and Wyong East caused by the Pacific Highway and the railway line
- Ensuring the proposed Sydney to Newcastle fast rail project results in benefits to this Corridor, including a potential stop location.

# 3. LAND USE AND TRANSPORT CONTEXT

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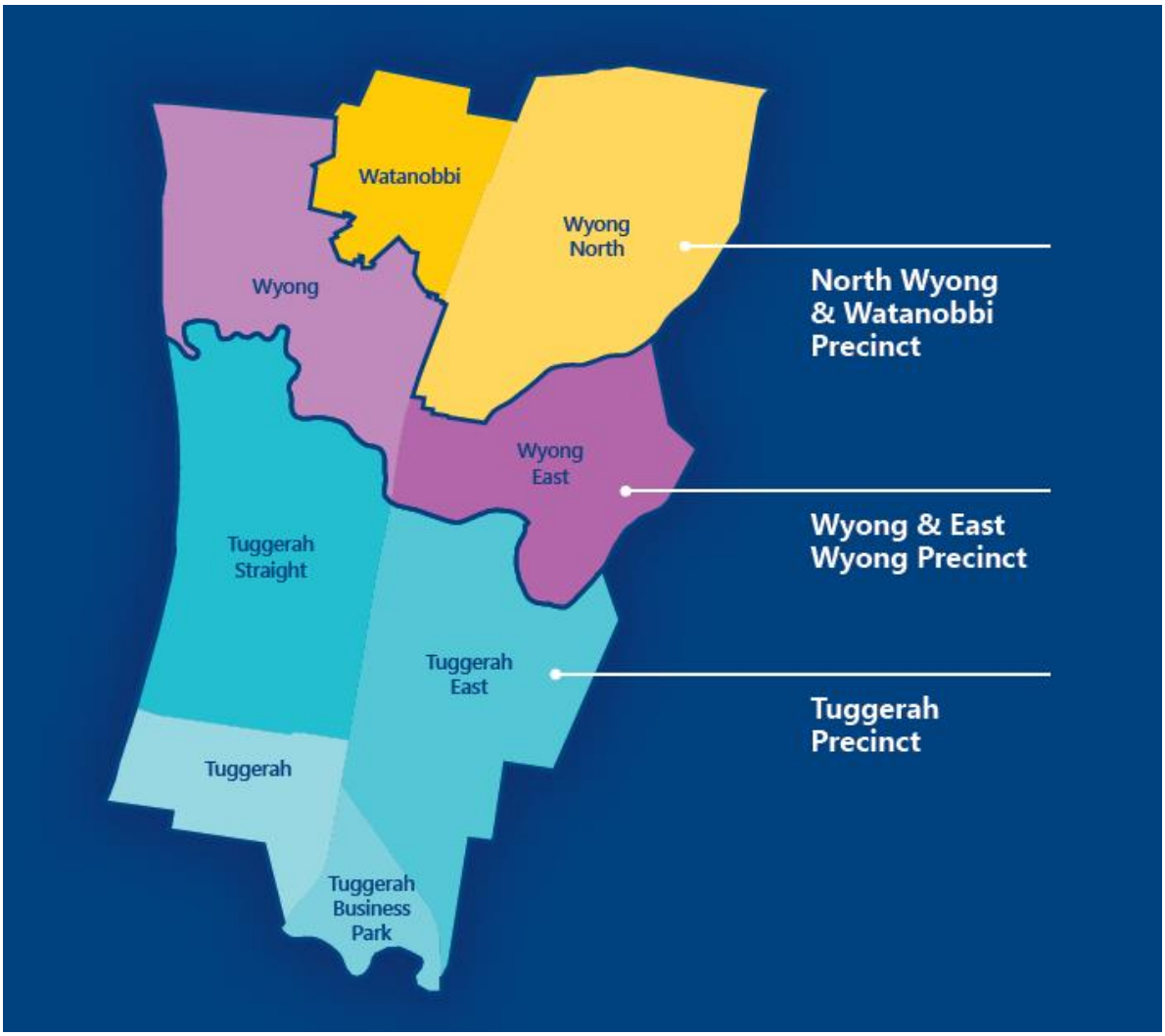
## 3.1. Existing Land Use

For the purposes of land use planning in the Economic Corridor Strategy, the Corridor is divided into three precincts shown in Figure 3.1:

- North Wyong and Watanobbi Precinct
- Wyong & East Wyong Precinct
- Tuggerah Precinct.

Figure 3.1: Tuggerah to Wyong Economic Corridor Precincts




Encompassing an area of 24 km$^2$, the Corridor is characterised by a variety of land uses, including residential, commercial, industrial and natural areas. It has a population of approximately 13,200 (2016 Census data).

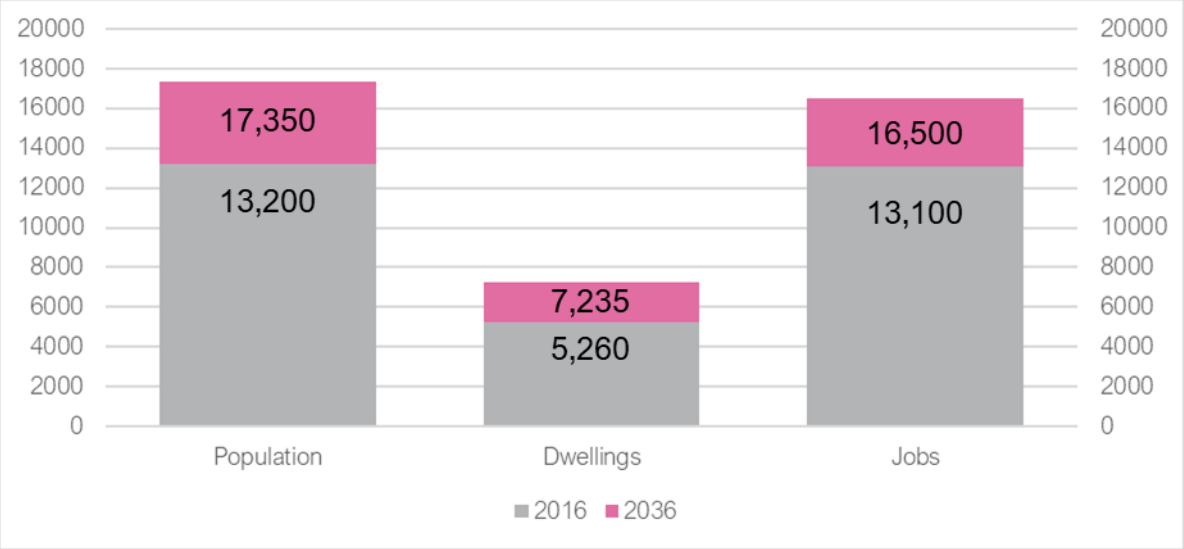
Major features, attractions and employment centres of the Corridor include the Pacific Highway, Central Coast & Newcastle railway line, North Wyong Employment Area, Wyong Racecourse, Wyong town centre, Wyong TAFE Campus, Wyong River, Tuggerah Regional Sporting Complex, Tuggerah Straight employment lands, Tuggerah Business Park and Westfield Tuggerah.

## 3.2. Population, Employment and Demographics

### 3.2.1. Population and Employment Growth

Figure 3.2 provides a summary of the projected growth in population, dwellings and jobs from 2016 to 2036. The population is expected to grow by 4,150 (31 per cent). The growth rate of dwellings exceeds population growth at 38 per cent, caused by an expected slight decline in the average household size (2.6 to 2.5). Local jobs are predicted to increase by 3,400, or 26 per cent.

Figure 3.2: Population and Employment Growth (2016-2036)




Source: Draft Tuggerah to Wyong Economic Corridor Strategy

As shown in Table 3.1, the majority (58 per cent) of the Corridor's residential growth is expected to be within the Wyong and Wyong East Precinct and approximately 62 per cent of the employment growth is planned for the Tuggerah Precinct. These targets reflect the mixed-use nature of both Wyong and Tuggerah, yet also highlight the more dominant function of each town and their mutually supporting roles within the Corridor.

Table 3.1: Precinct Targets 2036

| Precinct | Residents | Dwellings | Jobs |
|---|---|---|---|
| North Wyong & Watanobbi | +0 | +75 | +300 |
| Wyong & Wyong East | +2,400 | +1,150 | +1,000 |
| Tuggerah | +1,850 | +750 | +2,100 |

## 3.3. Demographics

### 3.3.1. Socio-economic Conditions

The Socio-Economic Indexes for Areas (SEIFA) is one measure of relative socio-economic advantage and disadvantage. Variables include but are not excluded to household incomes, employment status, educational attainment and English language ability. Nationally, Wyong is in the first quintile under this index and within the Central Coast it is the most disadvantaged suburb. Australian Bureau of Statistics (ABS) Statistical Areas 1 (SA1s) in Tuggerah and Mardi are less disadvantaged as they are in the fourth and second quintiles, respectively.

Concerning transport, a low socio-economic index score is often linked to either lower rates of car ownership with a strong reliance on public transport or alternatively higher rates of car ownership combined with a higher proportion of household expenditure on transport costs due to a lack of convenient public transport options.

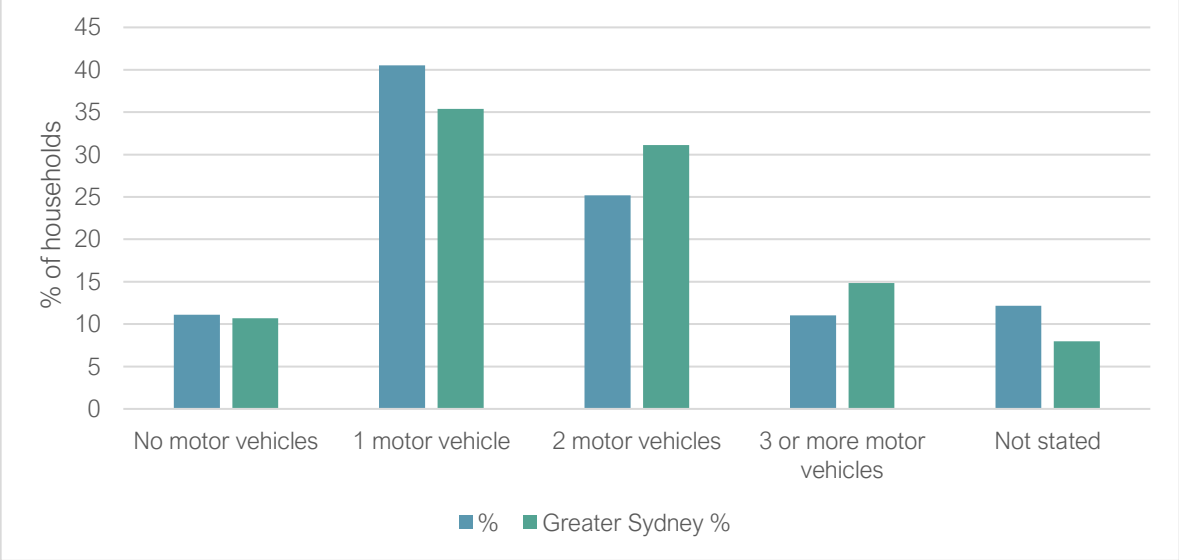
In areas with poor public transport, this combination of socio-economic disadvantage and public transport reliance is referred to as "transport disadvantage", where there is significant difficulty in accessing employment, education, necessary services, social networks and opportunities for community participation, becoming ever-more challenging for vulnerable people to improve their situation. It is for this reason that an assessment of existing public transport services in the Tuggerah to Wyong Corridor, in Section 4.3, is an essential input into the planning for change and growth in the Corridor.

### 3.3.2. Car Ownership

Figure 3.3 depicts car ownership levels in both Tuggerah-Mardi (an aggregation of Tuggerah, Mardi, Tacoma South and Chittaway Point suburbs due to the shape of the statistical boundary) and Wyong for 2016, showing a distinct difference between the two areas. 58 per cent of households in Tuggerah-Mardi had access to two or more motor vehicles compared to only 35 per cent in Wyong. Conversely, only 36 per cent of households in Tuggerah-Mardi had access to one or no motor vehicles whereas this figure was more than half (53 per cent) of households in Wyong.

As the initial cost of car purchase and ongoing costs of petrol, registration, insurance and maintenance are relatively high compared to lower household incomes in Wyong, the financial commitment involved is a strong deterrence against car ownership, highlighting a critical need to improve non-car based transport services and infrastructure for this part of the Corridor for access to essential services, education, recreation and employment opportunities.

Figure 3.3: Comparison of car ownership percentage between Tuggerah and Wyong



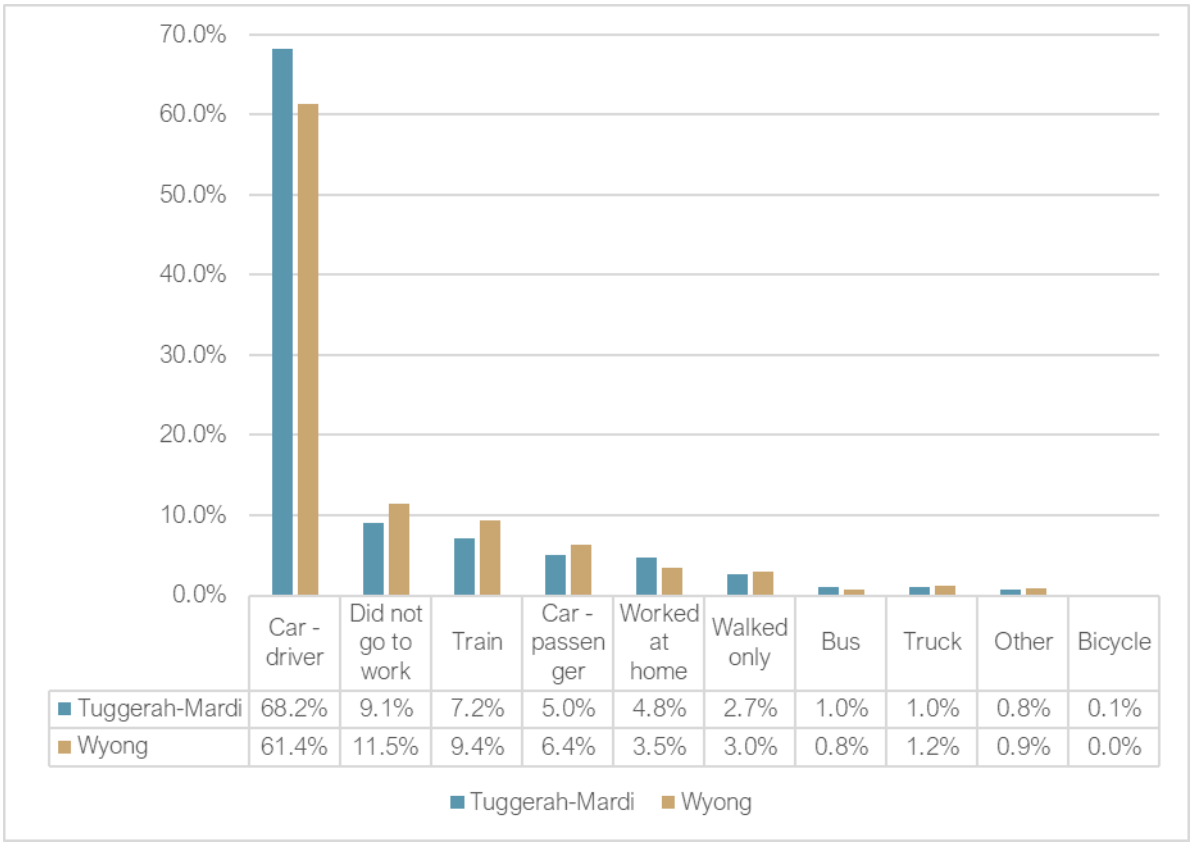

Source: Australian Bureau Census of Population and Housing, 2016

## 3.4. Travel Patterns and Demand

### 3.4.1. Mode Split

Following on from this divergence in car ownership, it can be inferred that the car use is a more predominant mode of transport in Tuggerah-Mardi compared to Wyong. The 'Method of travel to work' data reveals that car use is the dominant mode of transport in Tuggerah-Mardi compared to Wyong , showing that 73 per cent of employed persons in Tuggerah-Mardi get to work by car either as a driver or passenger. This travel mode behaviour contrasts with Wyong where only 68 per cent of trips to work are made by car. This 5 per cent difference is redistributed towards a slightly higher percentage of people in Wyong that catch the train to work or did not go to work. The full mode split for Tuggerah-Mardi and Wyong is depicted in Figure 3.4.

Figure 3.4: Method of Travel to Work – Tuggerah-Mardi and Wyong

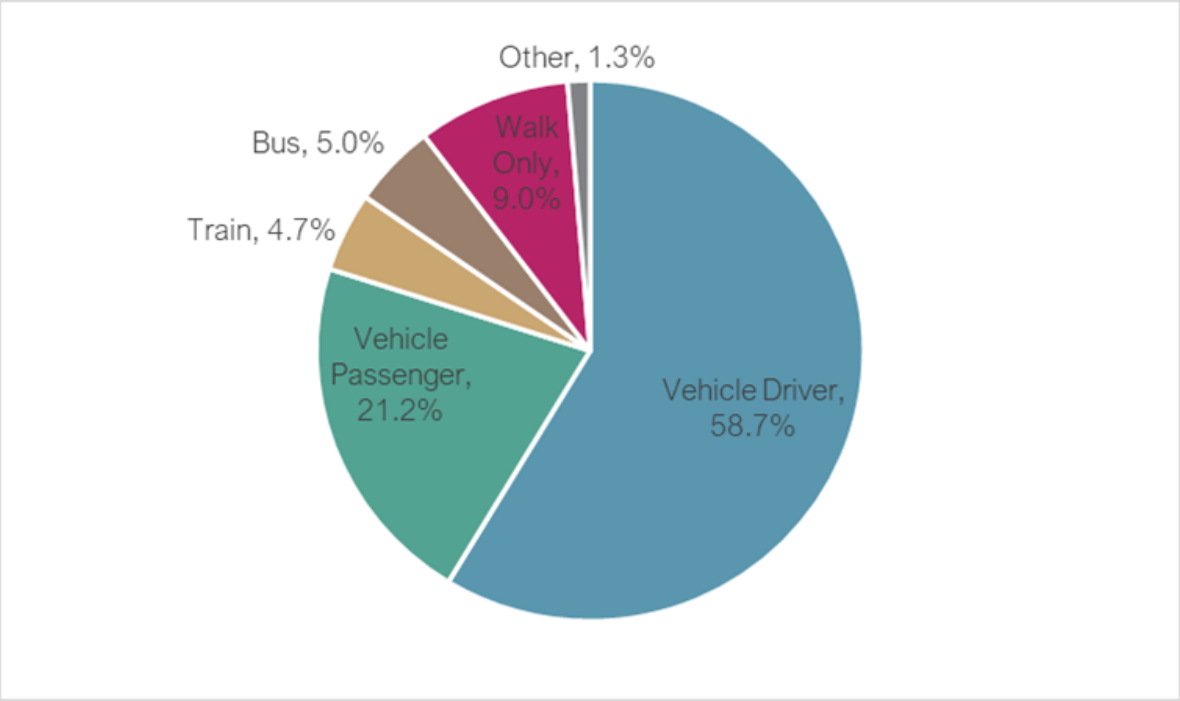



| | Car - driver | Did not go to work | Train | Car - passenger | Worked at home | Walked only | Bus | Truck | Other | Bicycle |
|---|---|---|---|---|---|---|---|---|---|---|
| Tuggerah-Mardi | 68.2% | 9.1% | 7.2% | 5.0% | 4.8% | 2.7% | 1.0% | 1.0% | 0.8% | 0.1% |
| Wyong | 61.4% | 11.5% | 9.4% | 6.4% | 3.5% | 3.0% | 0.8% | 1.2% | 0.9% | 0.0% |

Source: ABS - 2016 Census of Population and Housing

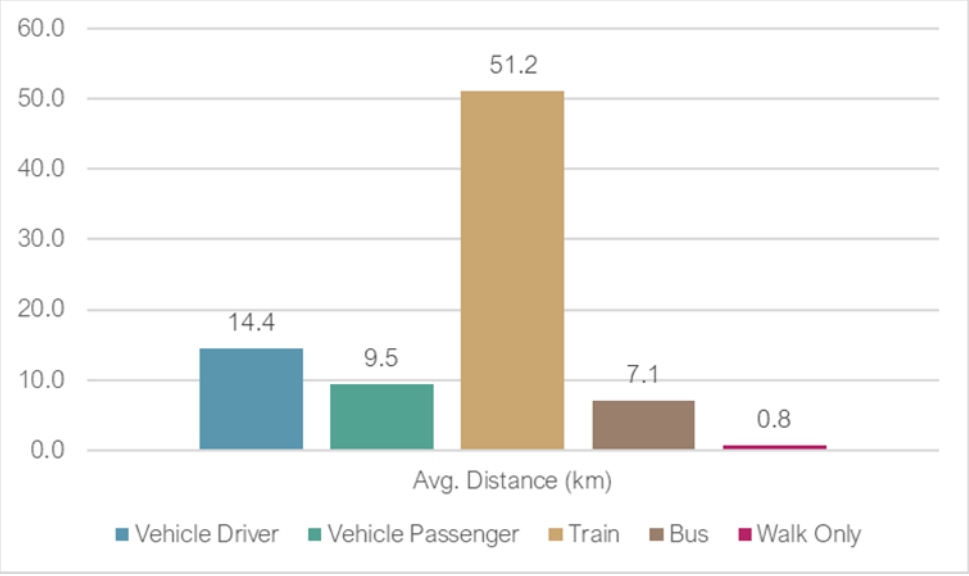
Mode share data for all trip purposes (i.e. work, education, recreational and all other purposes) is only available at an LGA-wide level but is still insightful when analysed in conjunction with the Corridor-specific work trip data. Figure 3.5 highlights that 80 per cent of all trips in the Central Coast are made by private vehicle. While train trips only account for 4.7 per cent of all trips, Figure 3.6 shows that the average train trip is 51.2 km (i.e. likely to be either to Sydney or Newcastle). Considering the average travel distance and the low frequency of all-day train services (i.e. outside of the weekday peak), it is likely that residents tend not to make local trips by train and use it only for journey to work trips on weekdays. This assertion will be corroborated through an analysis of Opal ticket data in Section 4.3.2 of the report.

Figure 3.5: Mode Share for All Trips in Central Coast LGA (2018/19)




Source: https://www.transport.nsw.gov.au/data-and-research/passenger-travel/surveys/household-travel-survey-hts/household-travel-survey-1

Figure 3.6: Mode Share (km) for All Trips in Central Coast LGA (2018/19)




Source: https://www.transport.nsw.gov.au/data-and-research/passenger-travel/surveys/household-travel-survey-hts/household-travel-survey-1

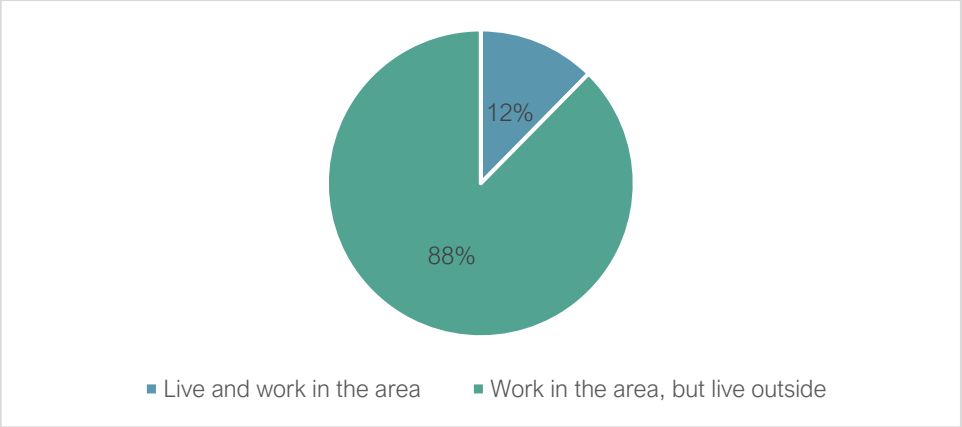
### 3.4.2. Trip containment

The proportion of individuals living and working in the same labour market region is referred to as the level of self - containment and is seen as a positive as it reduces the length of trips and can also lead to greater flexibility at what time the trips are undertaken (e.g. outside peak times).

Trip containment has important environmental consequences in its capacity to increase the likelihood of transport to work via methods other than private cars, given distances between home and work are probably shorter. Despite the shorter distances, car use may be the only viable commuting option unless appropriate public transport and/or safe and convenient active transport facilities are available between nearby areas.

Combining the Wyong and the Tuggerah – Kangy Angy Statistical Area 2 (SA2) data to represent the Corridor, Figure 3.7 shows that 12 per cent of workers (1,783) live and work in the Corridor while 88 per cent of workers (12,635) live outside the Corridor area. Further, 32 per cent of workers (4,565) travel from the following four SA2 areas: Chittaway Bay – Tumbi Umbi, Bateau Bay – Killarney Vale, Warnervale – Wadalba, and Gorokan – Kanwal – Charmhaven (Figure 3.9). The majority of the remaining workers live in other parts of the Central Coast, with a small number commuting from Greater Sydney and the Hunter Region.

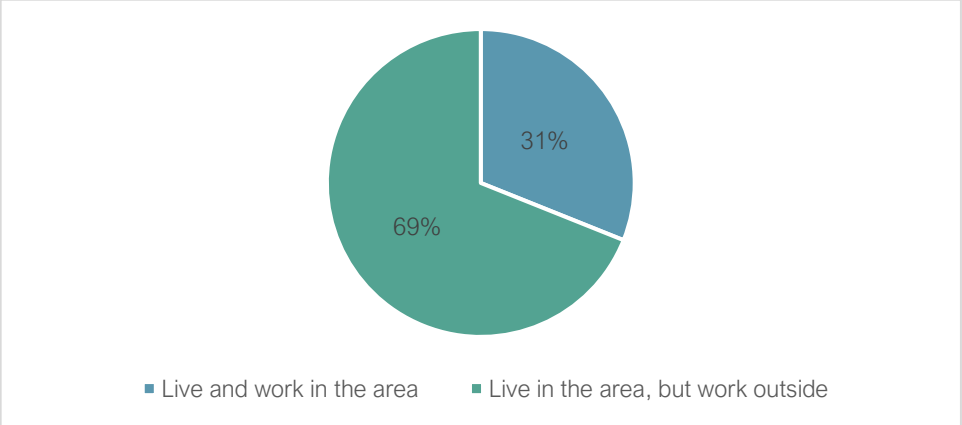
Figure 3.7: Percentage of Residential Location of Local Workers, 2016




Source: ABS - 2016 Census of Population and Housing

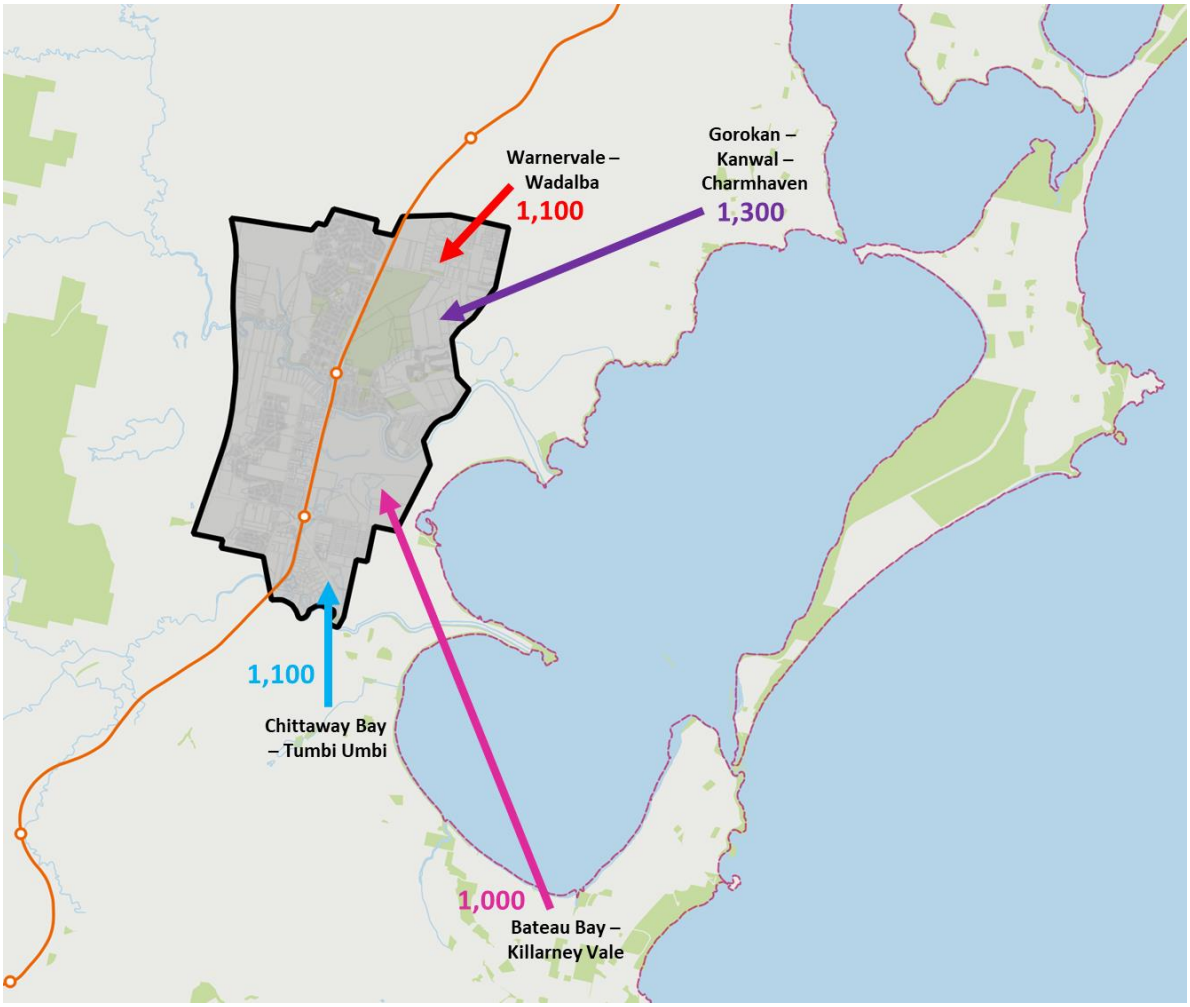
In comparison, Figure 3.8 shows the employment location of Corridor residents. Thirty-one per cent of resident workers live and work in the Corridor, demonstrating the need for high quality transport connections within the local area that cater for more than just car-based modes.

Figure 3.8: Percentage of Employment Location of Resident Corridor Workers, 2016




Source: ABS - 2016 Census of Population and Housing

Figure 3.9: Four most numerous SA2 origins of external workers working in the Corridor




Source: GTA Consultants based on ABS - 2016 Census of Population and Housing

Figure 3.10: Corridor residents' Place of Work


Source: GTA Consultants based on ABS - 2016 Census of Population and Housing

# 4. EXISTING TRAVEL NETWORKS

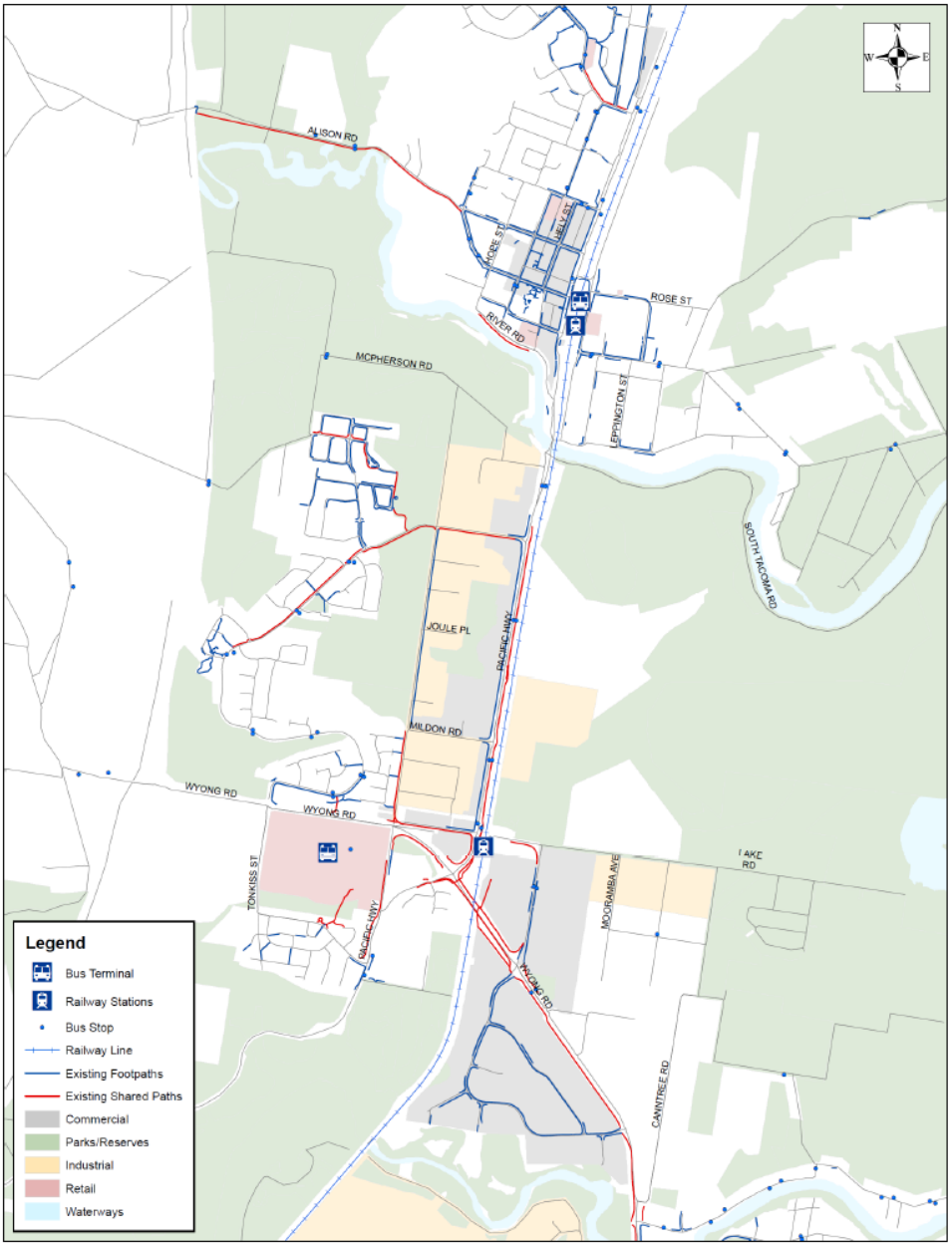
4

# 4.1. Walking

## 4.1.1. Existing Network

Most streets within the Corridor's high activity areas have a sealed footpath on at least one side, however many streets in the Corridor outside of high activity areas do not have footpaths on either side (Figure 4.1). Some intersections and mid-block crossings are signalised but most formalised crossings are either zebra crossings or pedestrian refuges, such as the three zebra crossings at the Alison Road/ Margaret Street intersection in the Wyong town centre. The Community Strategic Plan notes the importance of footpaths to meet the needs of all community members. Currently, wheelchair users and parents with prams are able to move within the town centres but there is not a satisfactory quantum or distribution of walking infrastructure to enable them to get there.

Figure 4.1: Tuggerah to Wyong Corridor Existing Footpath Network




Source: Central Coast PAMP

### 4.1.2. Walking Catchments

Recognising that the Wyong and Tuggerah town centres are the primary attractors within the Corridor, Figure 4.2 and Figure 4.3 show the walking catchments from these centres at five-minute intervals up to 20 minutes, highlighting the geographical extent considered to be within a reasonable walking distance from each town centre, noting that the catchments shown do not account for the presence or otherwise of footpaths. Also captured in Figure 4.2 and Figure 4.3 are the suburbs of Mardi, Watanobbi and parts of Wyong farther to the east, from which residents are not able to walk into their closest town centre within a reasonable walking distance.

Figure 4.2: Walking Catchment from Wyong Station

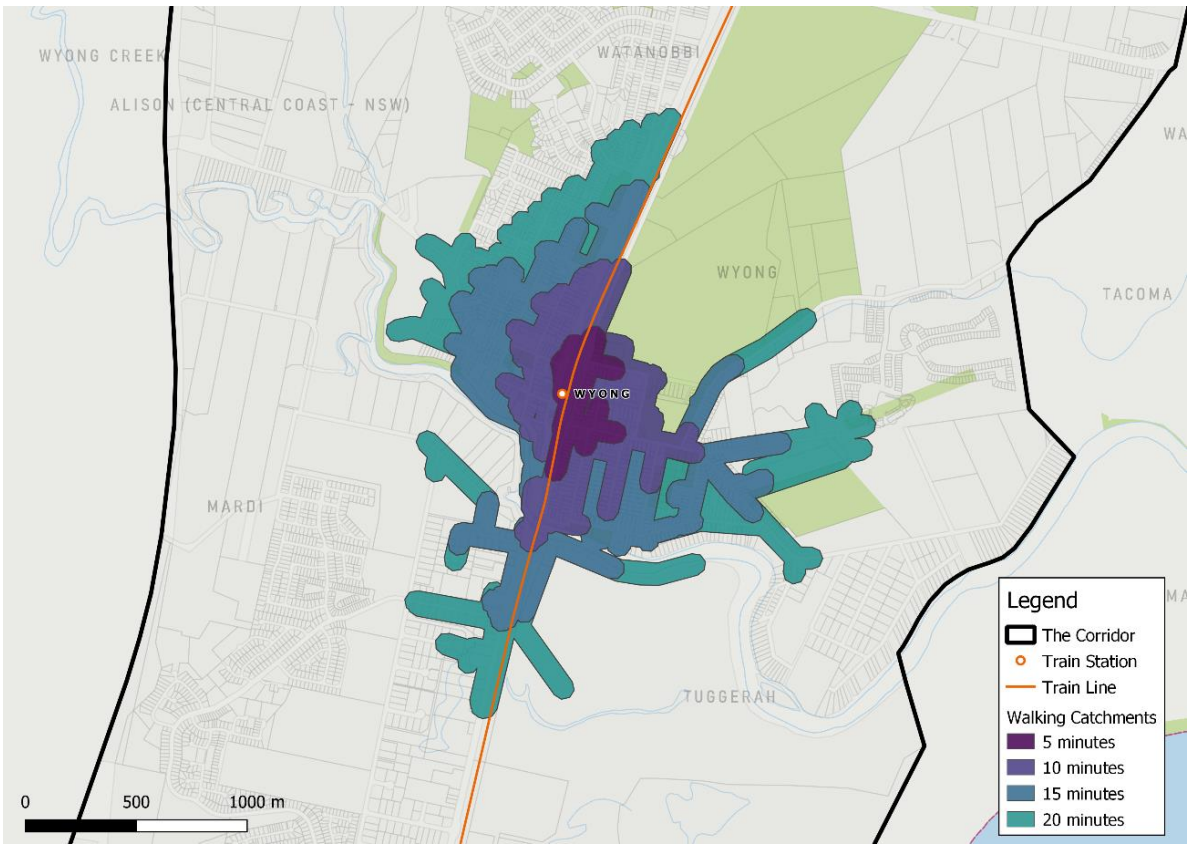
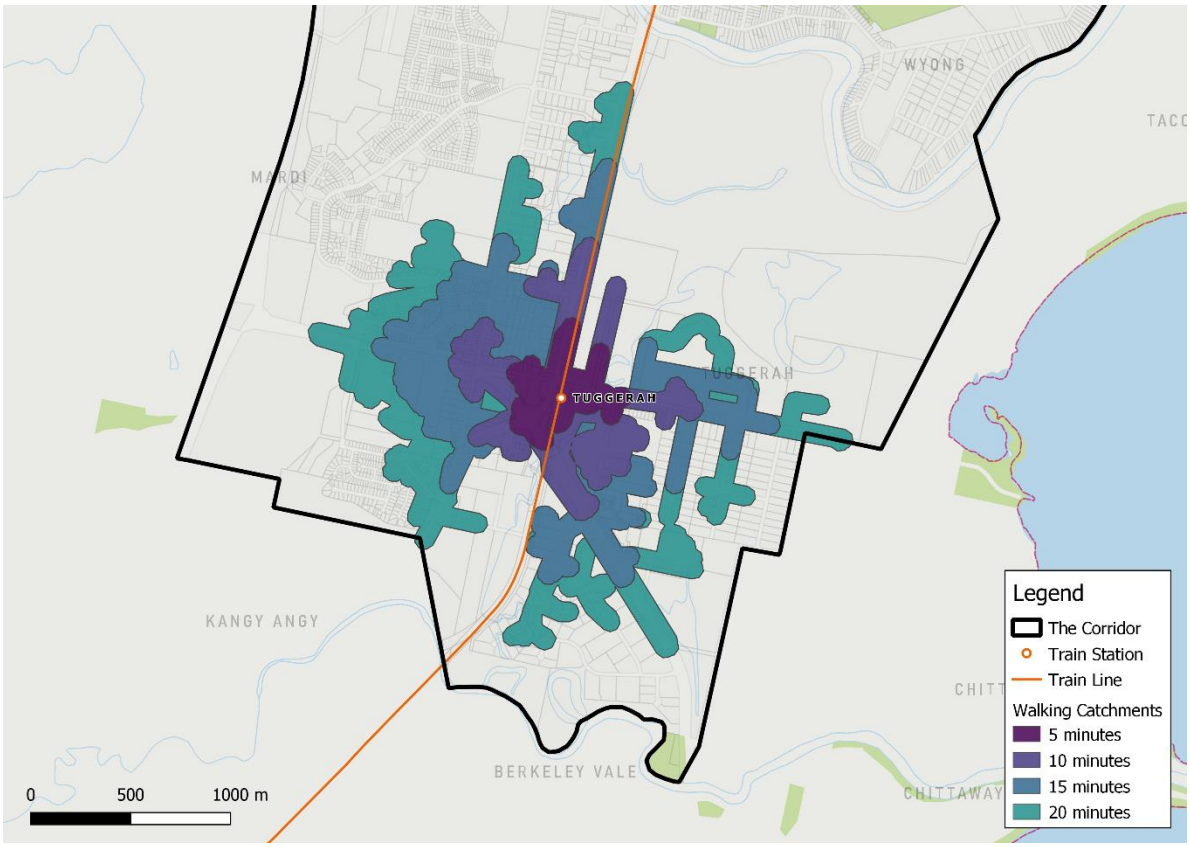


Figure 4.3: Walking Catchment from Tuggerah Station




## 4.2. Cycling

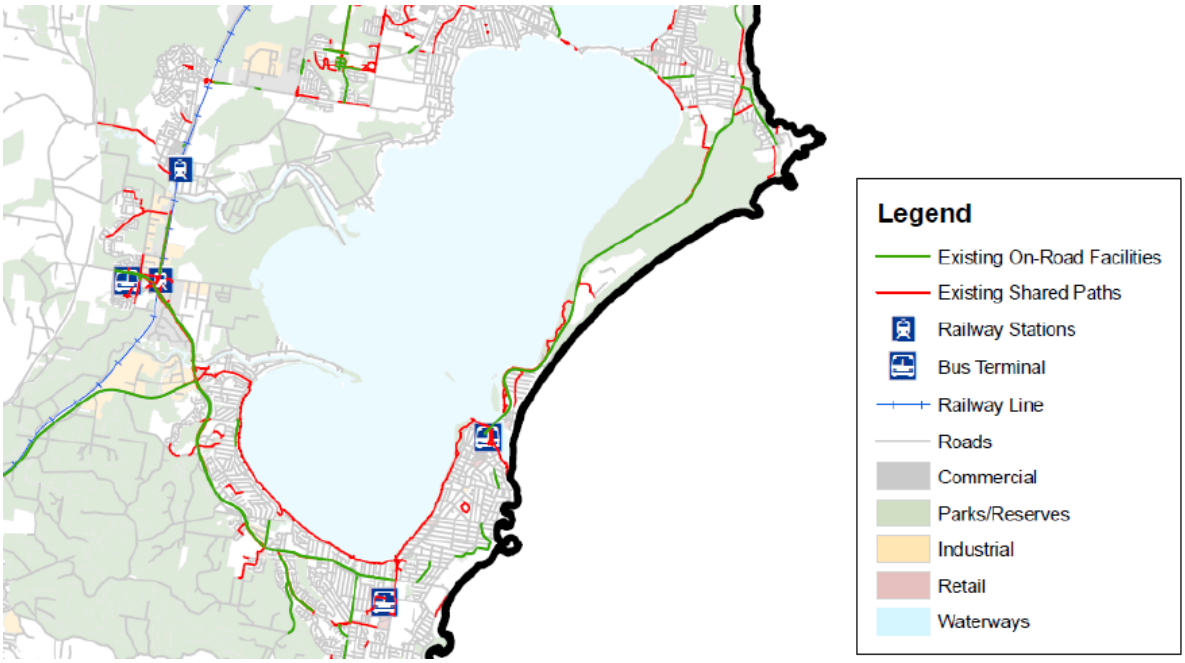
### 4.2.1. Existing Network

Figure 4.1 shows which footpaths are also designated as shared paths and Figure 4.4 shows the bicycle network across the Greater Wyong area (which includes Tuggerah), categorised into shared paths and on-road facilities.

Regarding on-road facilities, there are painted bicycle lanes on Wyong Road from the south into the Tuggerah town centre, as well as a bi-directional separated cycleway from Tuggerah towards Wyong along the eastern side of Pacific Highway, but it ends before and is disconnected from the Wyong town centre at the Johnson Road intersection with Pacific Highway.

Beyond the on-road cycling facilities above, there is a limited network of shared paths, meaning that cyclists are forced to ride in mixed traffic on those roads without these facilities. There are, however, some shared path facilities such as the Alison Road shared path that provides access to Wyong from the west and the Woodbury Park Drive shared path connecting Mardi to Tuggerah, however it stops short at Brickendon Avenue before a 30-metre steep climb and descent to Westfield Tuggerah, creating an underlying connectivity issue not easily solved through infrastructure. Apart from another moderate climb in Watanobbi, the flat topography of the Corridor is generally conducive to cycling. Additionally, there is a shared path along Wyong Road in the south, from Pacific Highway to Gavenlock Road, connecting to the Westfield's off Gavenlock Road.

Figure 4.4: Existing Bicycle Routes within Greater Wyong




Source: Central Coast Bike Plan (2019)

### 4.2.2. Cycling Catchments

Figure 4.5 and Figure 4.6 show the cycling catchments for Wyong and Tuggerah town centres at five-minute intervals up to a maximum of 20 minutes. As shown, a reasonable 15 to 20 minute bicycle ride allows one to travel between the town centres, although it does not account for the gap in safe cycling facilities between Johnson Road in Tuggerah and Wyong and assumes one would ride on-road for this section.

Furthermore, there is a comprehensive level of cycling catchment coverage from both Wyong and Tuggerah town centres at up to a 20-minute bicycle ride, though the quality of cycling infrastructure along the routes that lead to these town centres varies. For instance, there are no facilities between Wyong and Wyong East or Watanobbi but cycling access to Tuggerah from the south-east is supported by shared paths and painted bicycle lanes. The cycling facility interface between Westfield Tuggerah and the shared path and bicycle lane network immediately outside the mall is missing.

Figure 4.5: Cycling Catchment from Wyong Station

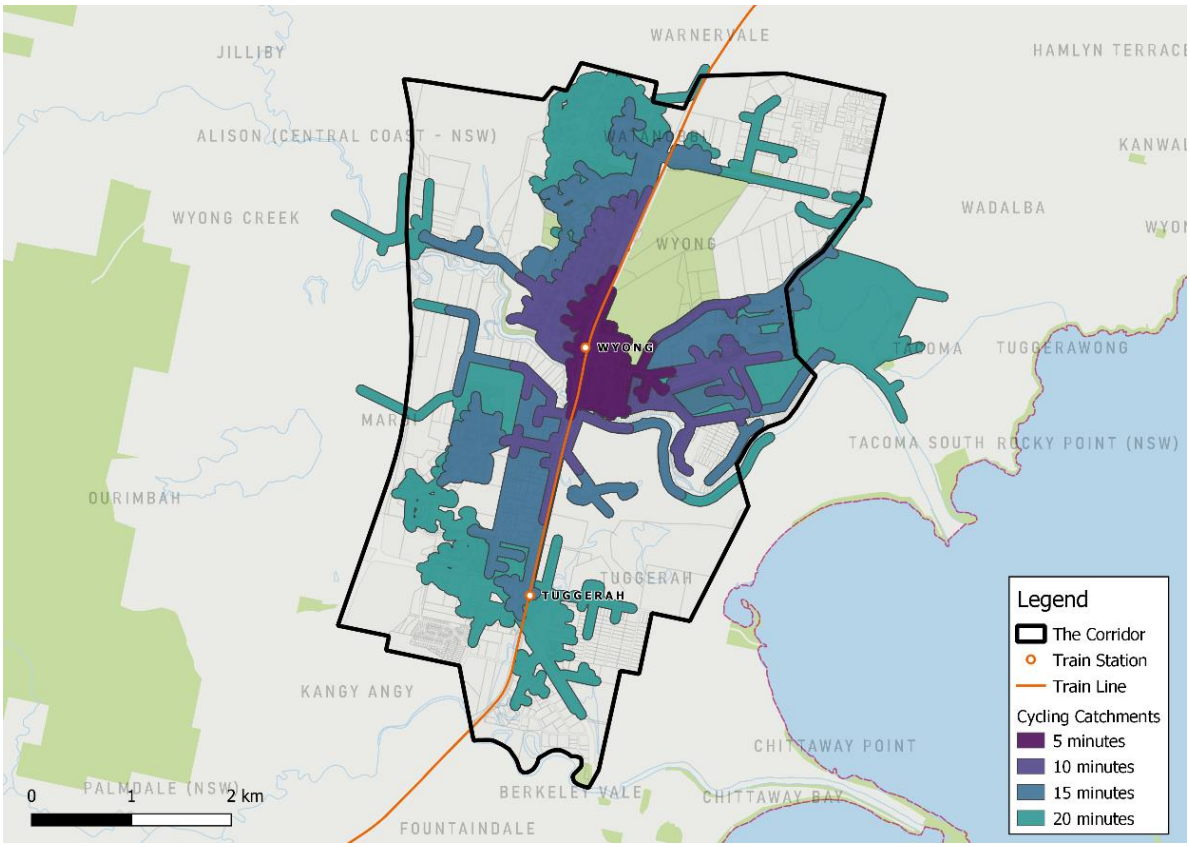
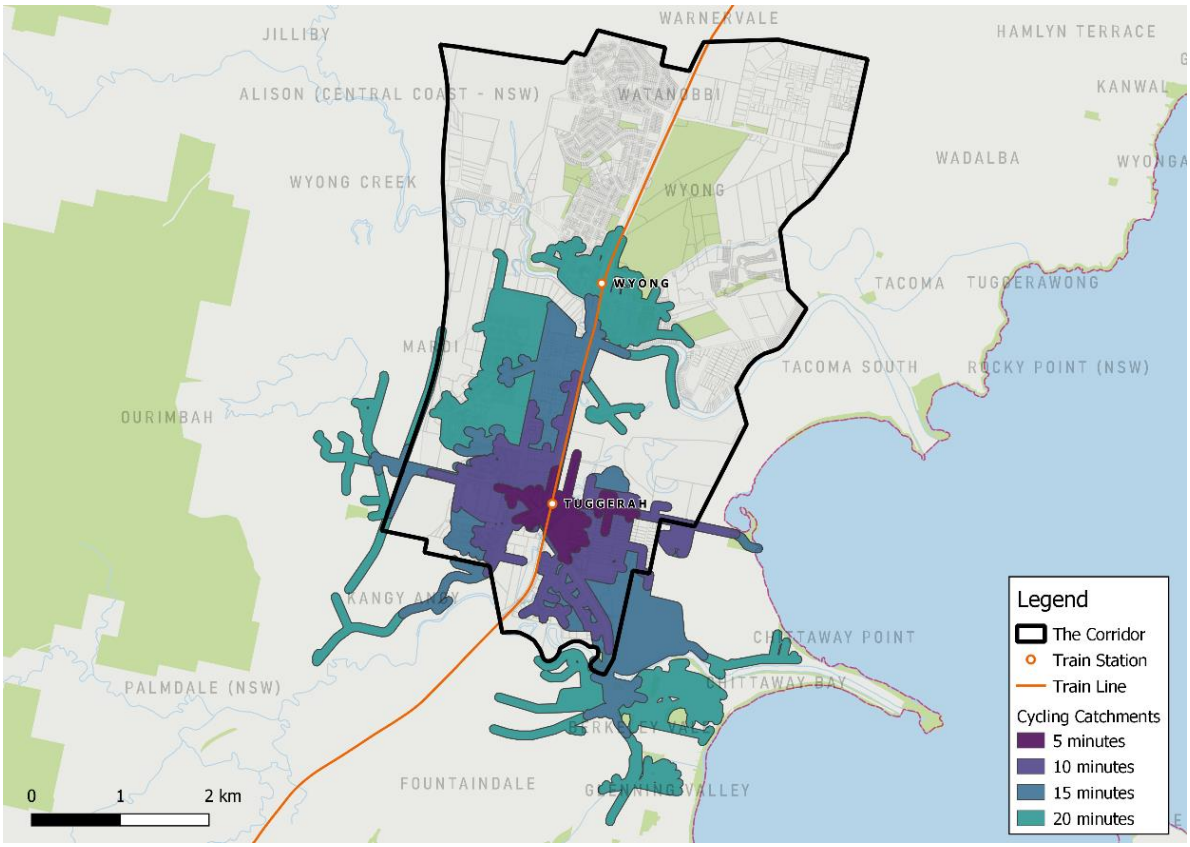


Figure 4.6: Cycling Catchment from Tuggerah Station

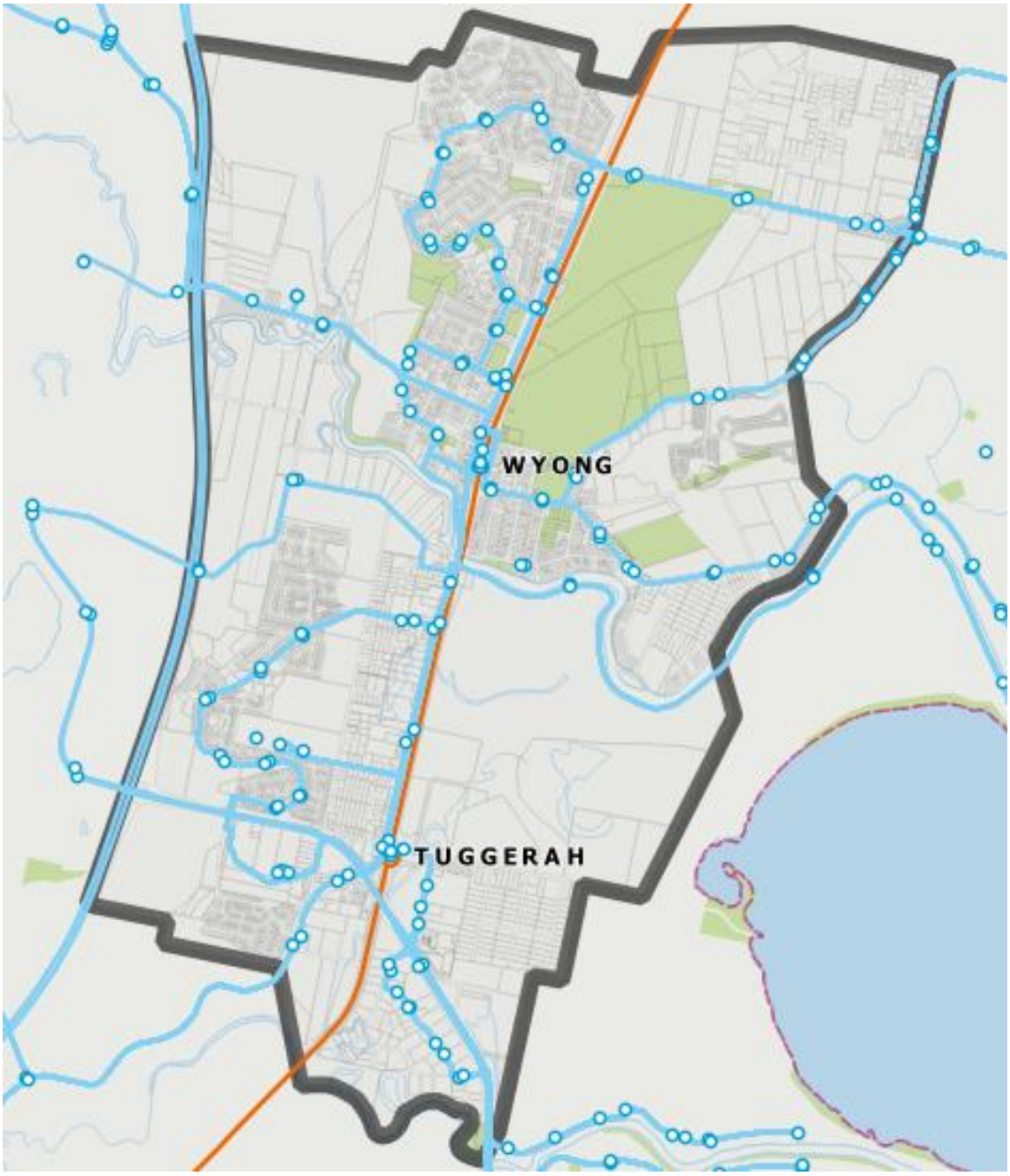



## 4.3. Public Transport Network

### 4.3.1. Bus and Train Networks

The Tuggerah to Wyong Corridor is served by a bus network that due to the geography of the Corridor, runs mostly in a north-south direction (Figure 4.7). While there is a degree of meandering in some routes, the limited east-west routes connect the Corridor with places such as Tuggerawong, Rocky Point as well as The Entrance. Tuggerah Station and Wyong Station act as major bus-rail interchanges in the Corridor, at which multiple bus routes in the region converge.

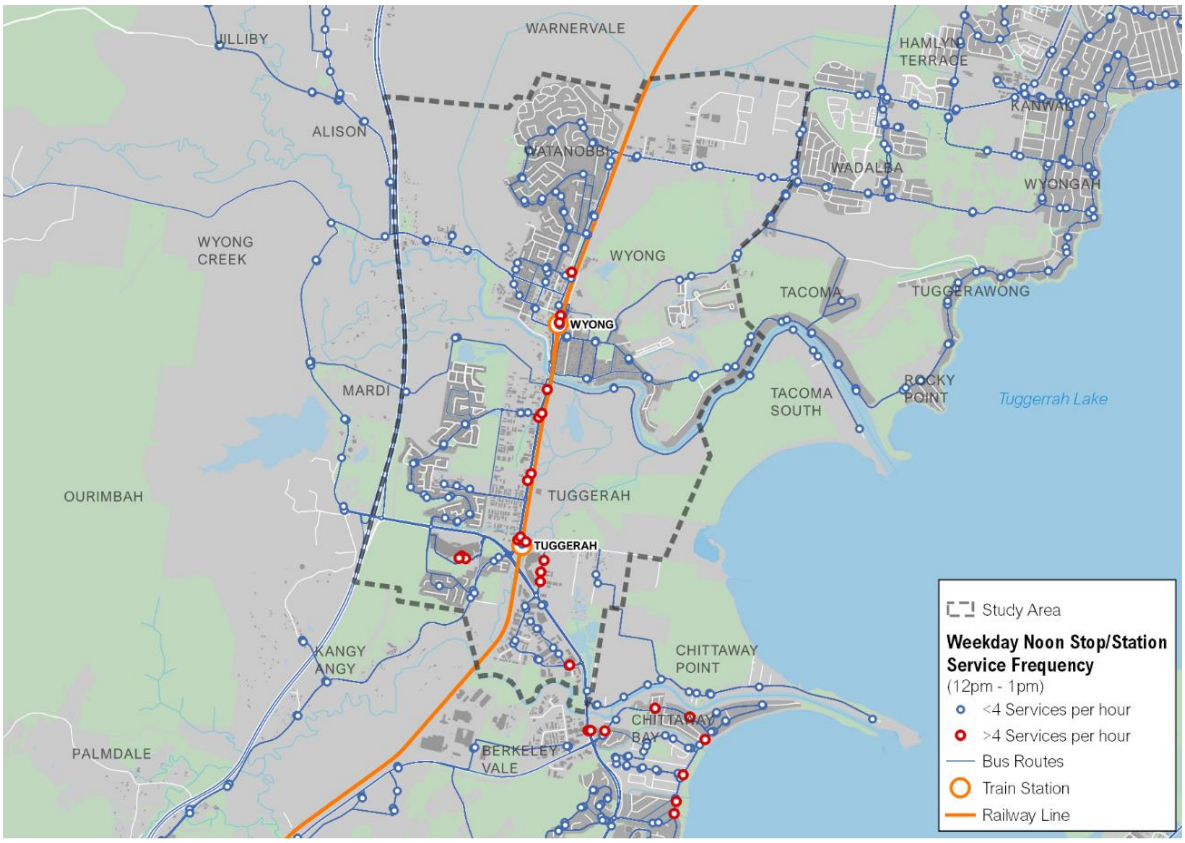
Figure 4.7: Bus Network




Source: GTA Consultants based on TfNSW data

The service frequencies of the public transport network and walking access to stops are indicated in Figure 4.8 and Figure 4.9.

Figure 4.8: Public transport stop frequencies in the Corridor, weekday interpeak

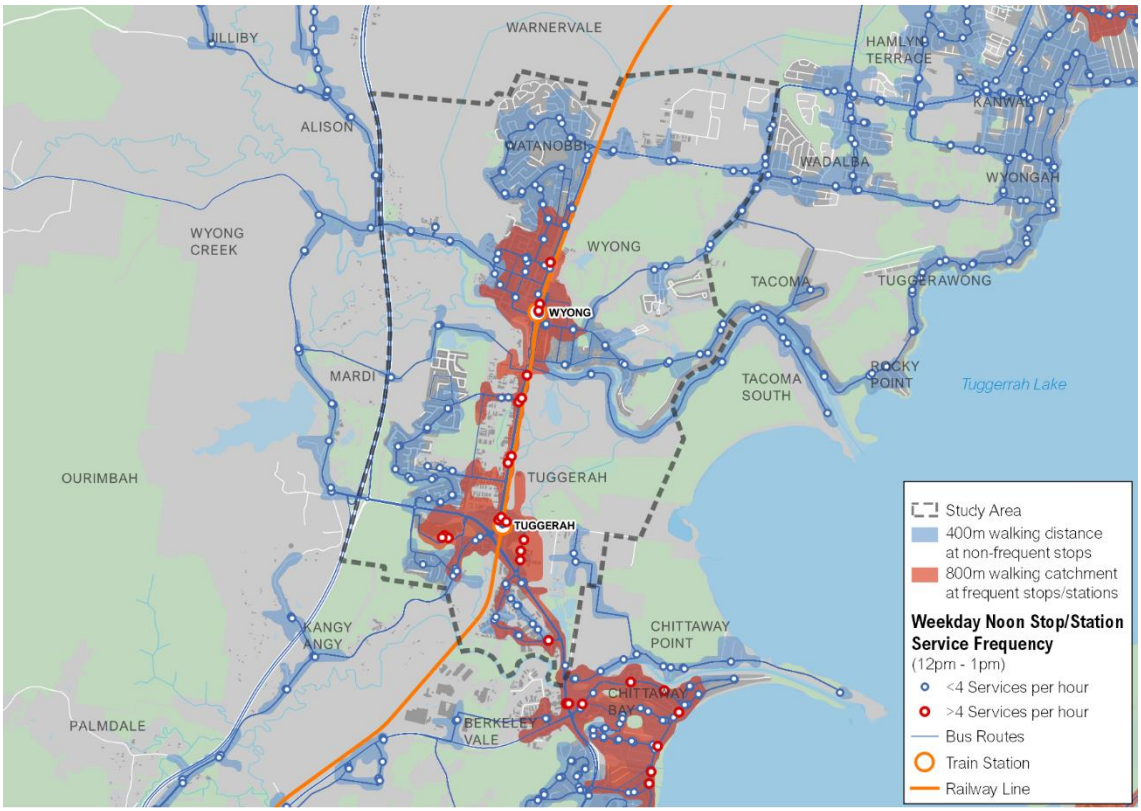



Source: GTA Consultants based on TfNSW timetable data from February 2020

Figure 4.8 and Figure 4.9 show that frequent public transport stops in the Corridor are primarily limited to the bus stops and train stations along the Pacific Highway/ railway line corridor providing frequent interpeak public transport access along this axis between the two town centres. Stops with frequent services are defined as stops with a service frequency of four or more services per hour in the weekday interpeak (12pm to 1pm). Outside of this north-south axis, frequent public transport stops are also available at Westfield Tuggerah and the Tuggerah Super Centre, providing frequent bus access to these shopping centres from Tuggerah and Wyong.

Beyond the identified frequent stops, it is shown that bus stops in the nearby residential areas such as Mardi, Woodbury Park and the residential areas of Wyong and Watanobbi do not have frequent bus access and these places are typically beyond a 800 metre walk from the nearest frequent public transport stop, which may limit the attractiveness and usefulness of these services to residents.

Figure 4.9: Walking access to frequent and non-frequent public transport stops in the Corridor, weekday interpeak



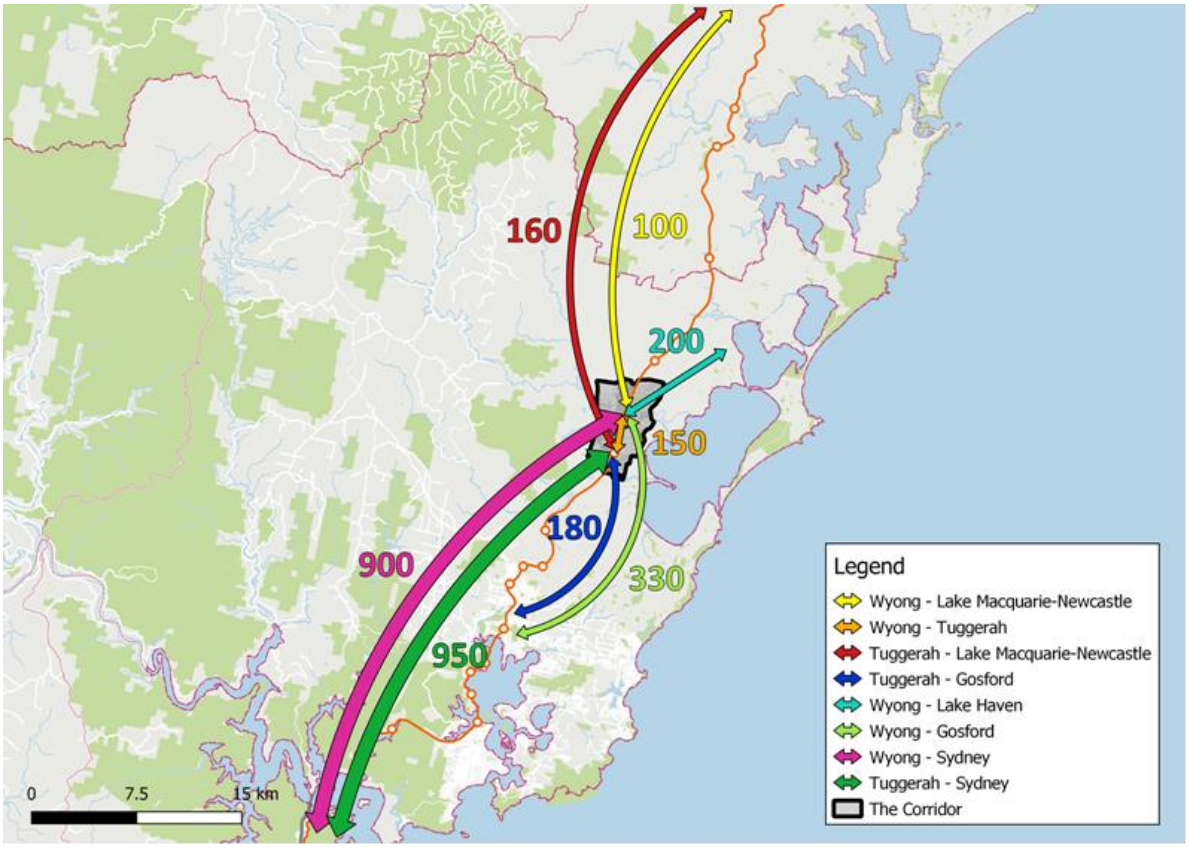

Source: GTA Consultants based on TfNSW data from February 2020

### 4.3.2. Public Transport Patronage

Bus and rail boarding and alighting statistics in the study area are shown in Figure 4.10 and Figure 4.11, based on Opal data obtained from TfNSW for a selected Thursday and Saturday 2019. Key findings from this patronage analysis are:

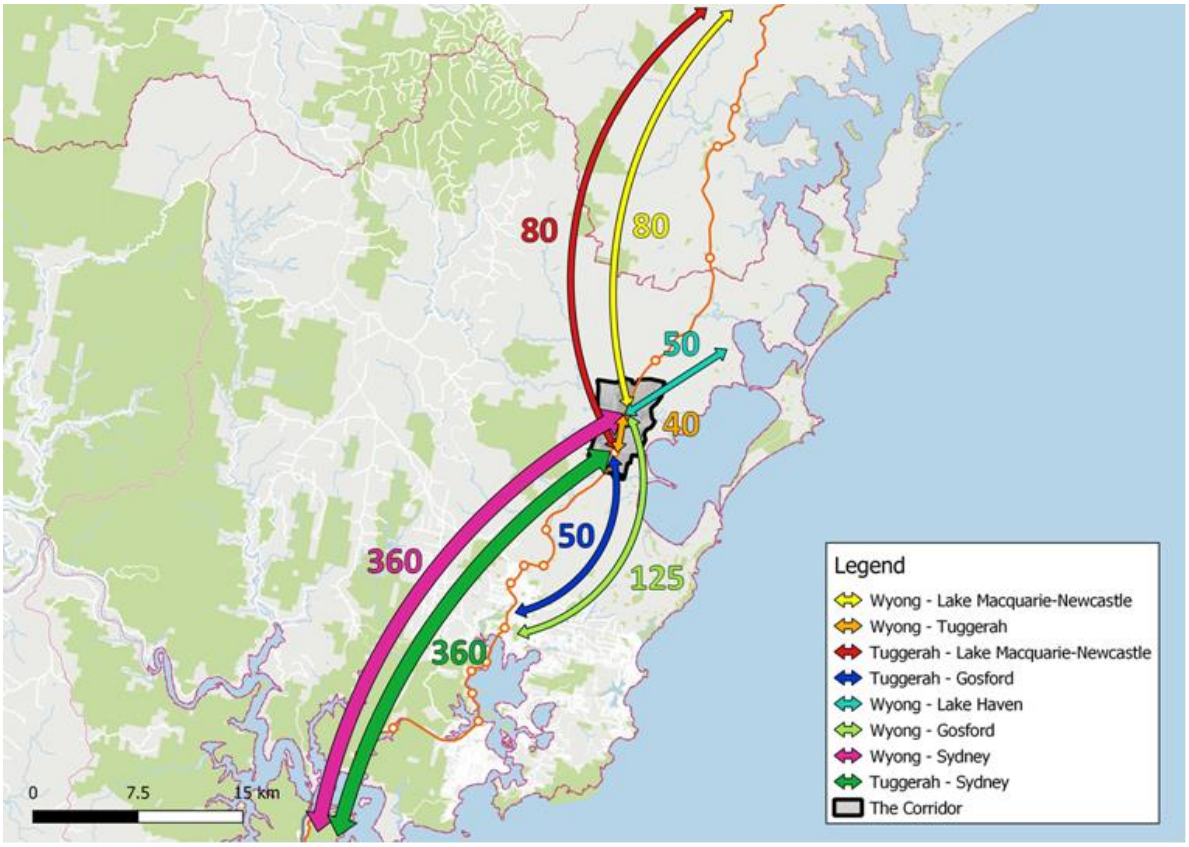
- The predominant public transport trip is the weekday commute from the Corridor to Sydney in the morning and vice versa in the afternoon
- Wyong – Gosford is also a particularly high patronage trip, followed by trips to/from Lake Macquarie – Newcastle
- In-corridor trips directly between the Tuggerah and Wyong town centres, as well as trips to the nearby Lake Haven town centre also have a moderate patronage
- Public transport patronage on the Saturday is much lower compared to weekday trips. Except for the Wyong to Lake Macquarie – Newcastle trip (100 trips to 80 trips), all other high patronage trips are generally at 20 to 50 per cent of their weekday equivalent. This indicates a predominant use of public transport for journey to work purposes but little else, which is supported by the mode share data for all trips from Figure 3.5.

Figure 4.10: High patronage public transport trips – selected Thursday




Source: GTA Consultants based on TfNSW data from September 2019

Figure 4.11: High patronage public transport trips – selected Saturday




Source: GTA Consultants based on TfNSW data from September 2019

### 4.3.3. Public transport interchanges

The Opal data provided also indicates the number of public transport interchanges that occurred within the LGA during the sampled week in 2019, where these interchanges occurred, as well as the origin and the onward destination of the interchanges (anonymised at a Census Statistical Area 3 (SA3) level). To protect the privacy of public transport users where counts are fewer than 18, these trips are shown as '<18' in place of the actual count. Only six trips involving an interchange in the Wyong SA3 passed this threshold, and are explained in Table 4.1 below.

Table 4.1: Interchanges within Wyong SA3

| Journey Origin (SA3) | Interchange Location 1 | Mode | Interchange Location 2 | Mode | Journey Destination (SA3) | Journey Destination | Number of Interchanges |
|---|---|---|---|---|---|---|---|
| Wyong | Wyong Station, Stand A | Bus | Wyong Station | Train | Gosford | Gosford Station | 92 |
| Gosford | Wyong Station | Train | Wyong Station, Stand A | Bus | Wyong | Lake Haven Centre, Stand 1 | 31 |
| Wyong | Tuggerah Station, Bryant Dr | Bus | Tuggerah Station | Train | Gosford | Gosford Station | 28 |

| Journey Origin (SA3) | Interchange Location 1 | Mode | Interchange Location 2 | Mode | Journey Destination (SA3) | Journey Destination | Number of Interchanges |
|---|---|---|---|---|---|---|---|
| Wyong | Tuggerah Station, Bryant Dr | Bus | Tuggerah Station | Train | Sydney Inner City | Unknown (Outside Central Coast LGA) | 28 |
| Wyong | Wyong Station, Stand A | Bus | Wyong Station | Train | Hornsby | Unknown (Outside Central Coast LGA) | 24 |
| Wyong | Wyong Station, Stand A | Bus | Wyong Station | Train | Sydney Inner City | Unknown (Outside Central Coast LGA) | 19 |

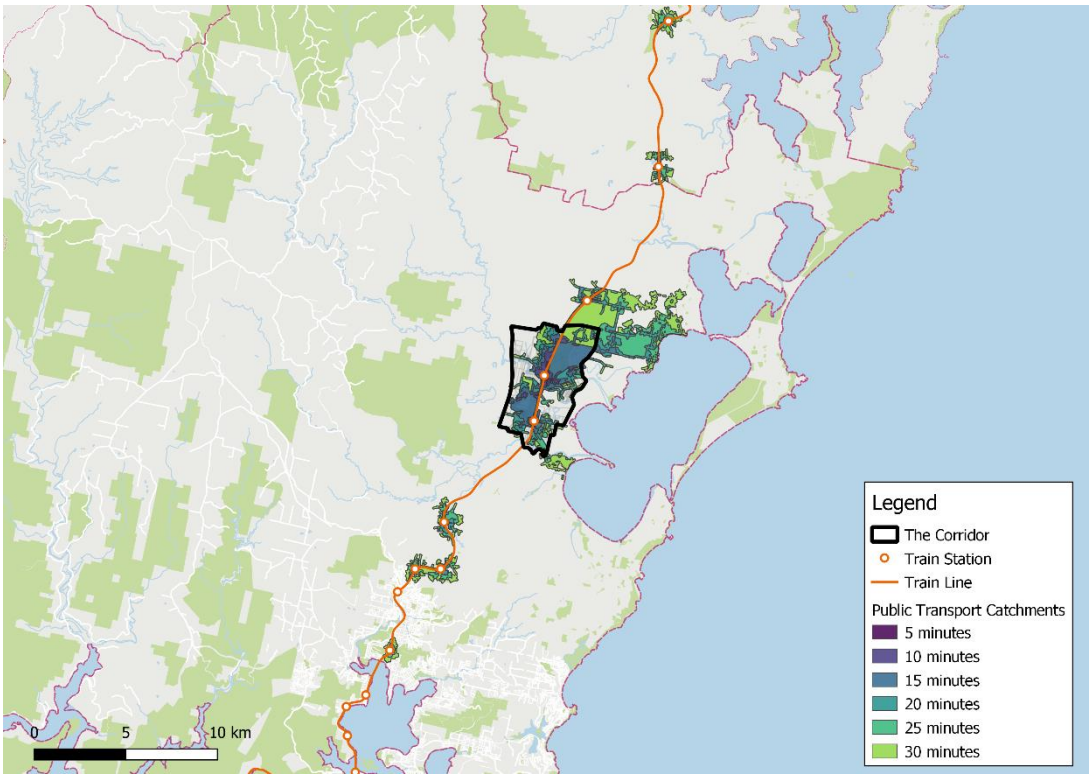
Source Data: Transport for NSW

As shown in Table 4.1, all major interchange activity in the Corridor takes place at either Wyong Station or Tuggerah Station and their surrounding bus stops via a bus to train interchange or vice versa, which reflects the station's role as an important public transport interchange. In terms of the origins of journeys, the majority comprise those travelling from within the Central Coast LGA. Regarding destinations, the top six interchange journeys all involve destinations outside of the Corridor. This includes two trips to Gosford Station, one trip to Lake Haven and three to Sydney. This demonstrates that two-legged public transport journeys, while not high in volume, generally occur to move people outside of the Corridor, as opposed to within it. This data is expected, as the local bus network is sufficiently comprehensive to get people to their destination in one bus trip, especially within the Corridor.

### 4.3.4. Public transport accessibility

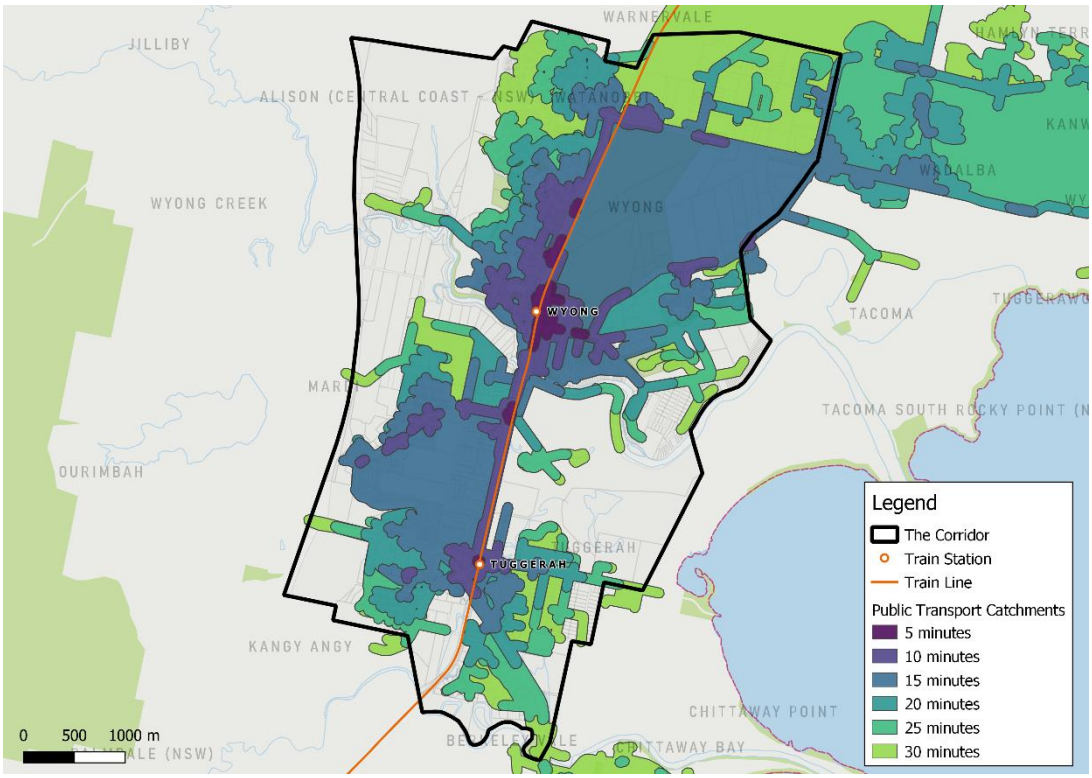
Public transport accessibility catchments measured by travel time at five-minute intervals up to 30 minutes are shown at regional and corridor-level scales in Figure 4.12 to Figure 4.15. The catchments show how far one can travel via public transport within the defined trip times in the interpeak period (i.e. 12 pm) on a weekday in April 2020. The travel times and catchment coverage are a function of the timetabled journey times provided by TfNSW and the relevant bus operators. Accordingly, any delays in travel times due to peak congestion (e.g. that experienced along Pacific Highway in Wyong as documented in the *Wyong Town Centre Strategic Plan*) would impact on the travel time catchments shown.

Figure 4.12: Regional Public Transport Accessibility from Wyong Station




At a regional level from Wyong, the public transport network allows access within 30 minutes to locations as far north as Wyee and Morisset, south to Ourimbah and Gosford, and towards parts of Lake Haven in the north-east.

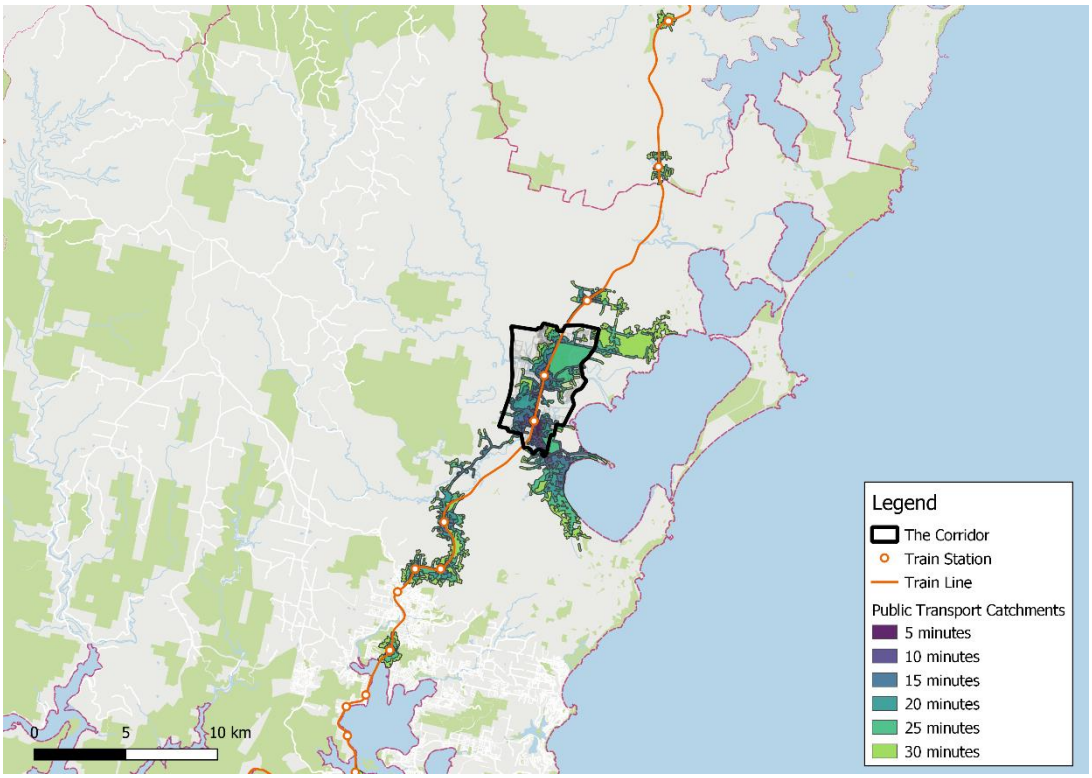
Figure 4.13: Local Public Transport Accessibility from Wyong Station




Source: GTA, Data extracted from Targomo

At local level from Wyong, the public transport network allows access within 30 minutes to most locations within the corridor, including Tuggerah and Watanobbi.

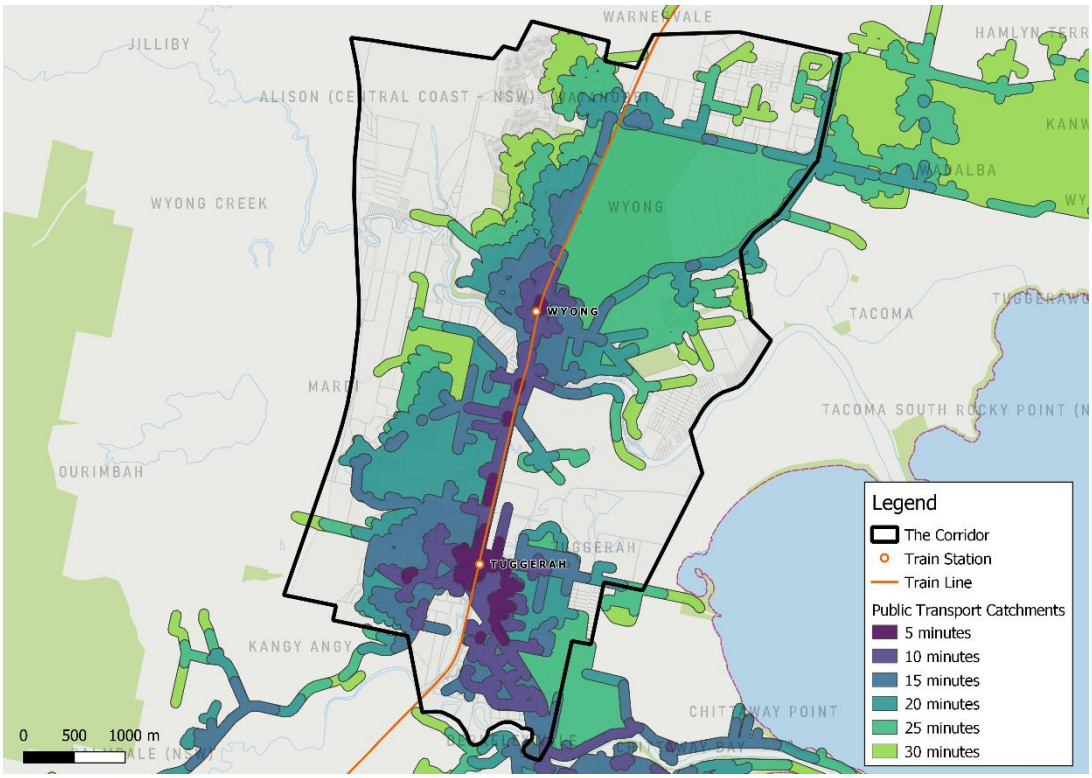
Figure 4.14: Regional Public Transport Accessibility from Tuggerah Station




Source: GTA, Data extracted from Targomo

At a regional level from Tuggerah and in a similar manner as public transport access from Wyong, the public transport network allows access within 30 minutes to locations as far north as Wyee and Morisset, south to Ourimbah and Gosford, and towards parts of Lake Haven in the north-east.

Figure 4.15: Local Public Transport Accessibility from Tuggerah Station




Source: GTA, Data extracted from Targomo

At local level from Tuggerah, the public transport network allows access within 30 minutes to most locations within the corridor, including Wyong and parts of Watanobbi.

It is acknowledged that the origin points for this accessibility analysis is from the two train stations where public transport accessibility will be the strongest and does not account for walk times from nearby residential locations. Shifting the origin points to a residential location such as Wyong East, Woodbury Park or Mardi will yield different public transport accessibility results in terms of a more contracted catchment as it accounts for longer walk times or longer wait times for an infrequent connecting bus service.

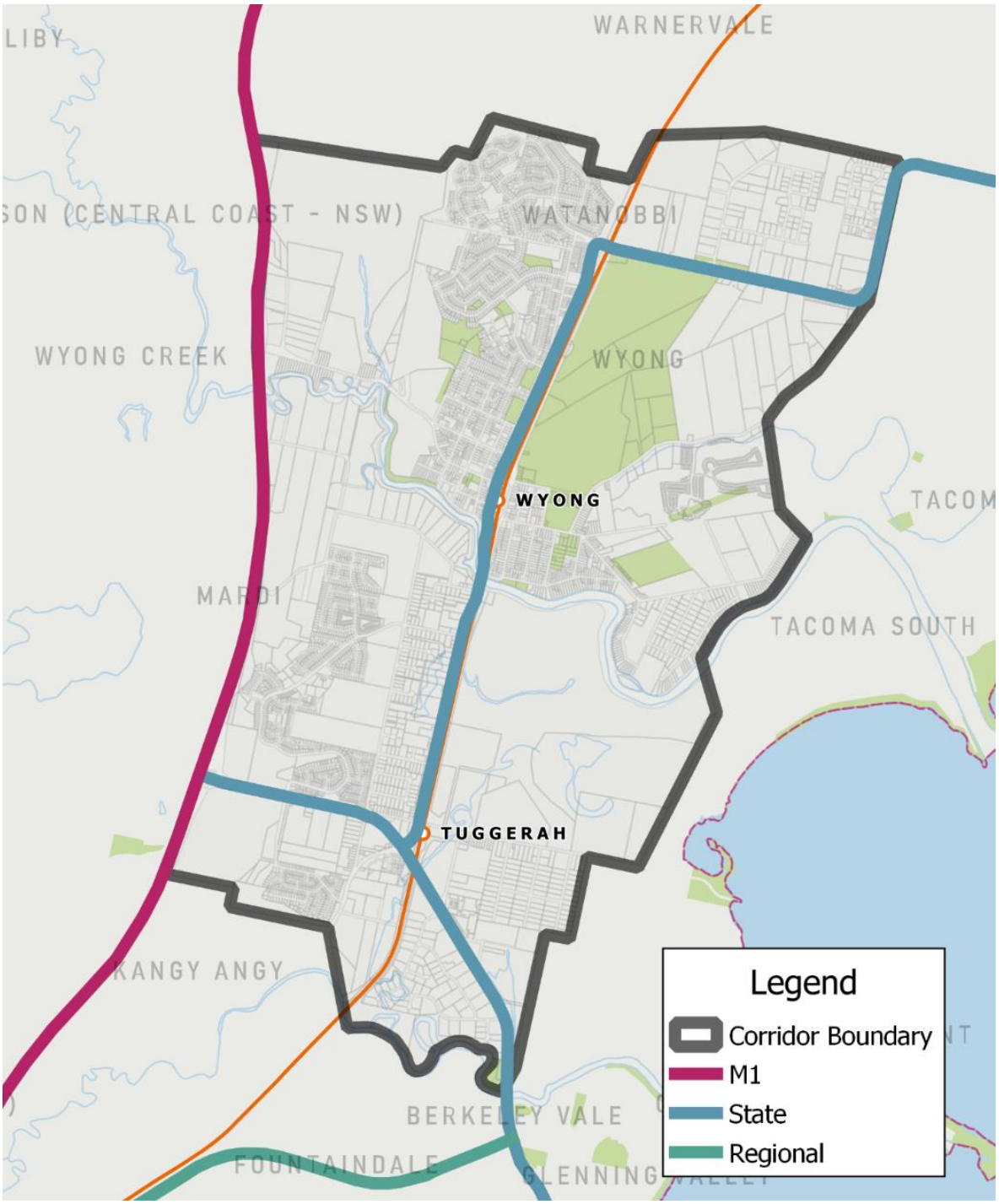
Nonetheless, the preceding analyses show that, as a consequence of the frequent north-south public transport axis along the Pacific Highway and railway line, a 30-minute public transport journey from Wyong or Tuggerah stations allows access to most parts of the Corridor, including attractors such as Wyong and Tuggerah town centres, Westfield Tuggerah and the various industrial and commercial employment lands throughout the Corridor. Regionally, a 30-minute public transport journey allows access to key destinations such as Gosford and people living as far away as Wyee to reach the Corridor via public transport. This catchment coverage is contingent on timetabled journey times being attained which may not be possible during peak congestion periods on roads for bus transport.

## 4.4. Road Network

### 4.4.1. Hierarchy

Key roads within the Corridor are illustrated in Figure 4.16 and described in Table 4.2 below.

Figure 4.16: State and Regional Roads




Source: GTA Consultants based on STFM data from TfNSW

Table 4.2: Key Roads in the Corridor

| Road Name | Classification | Key Function |
|---|---|---|
| M1 Pacific Motorway | Motorway | A primary arterial road and freight route connecting Sydney to the Central Coast, Newcastle and Hunter region. Bypassing the Wyong and Tuggerah town centres, the freeway carries a mix of commuter traffic, freight and periodical holiday travellers. |
| Pacific Highway | State | Superseded by the M1 Pacific Motorway, the Pacific Highway remains an important arterial route. It operates as the Corridor's primary north-route road, connecting to Lake Haven in the north and Ourimbah in the south. |
| Wyong Road | State | An arterial road and freight route providing an east-west connection from the M1 interchange to Westfield Tuggerah, Tuggerah Super Centre, Tuggerah Station and further south-east towards Bateau Bay. |
| Alison Road | Collector | An east-west collector road connecting the Pacific Highway to the Wyong Town Centre and Hue Hue Road to the west. |
| Anzac Avenue | Collector | An east-west collector road in the Wyong Town Centre, running parallel to Alison Road and then meeting it at a roundabout intersection to the west. |
| Woodbury Park Drive | Collector | A collector road that links local roads in Mardi to the Tuggerah Business Park and Westfield Tuggerah at Wyong Road. |

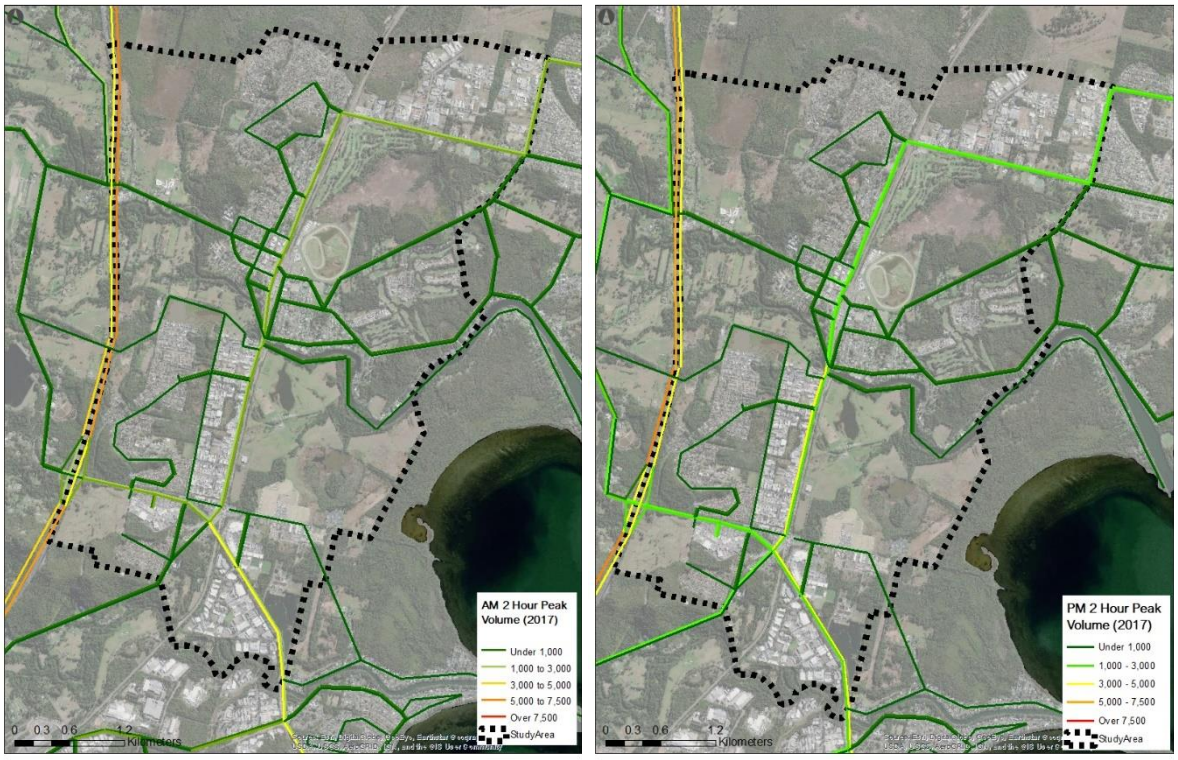
### 4.4.2. Performance

Figure 4.17 and Figure 4.18 show the two-hour traffic volumes and volume capacity ratios (VCR) in the AM and PM Peaks based on 2017 Sydney Traffic Forecasting Model (STFM) data as a measure of existing conditions. VCR provides a reliable indication of not only the traffic volume but also the physical capacity of the road network to carry the traffic. As the maps illustrate, the VCR at most of the key roads in the Corridor are within an acceptable range of up to 0.8 (i.e. the volume is no more than 80 per cent of capacity) except some roads which exhibit congestion characteristics such as pinch points along the Pacific Highway immediately south of Wyong town centre by the Wyong River where the four-lane dual carriageway becomes a two-lane road. Other areas of congestion include Wyong Road near its interchange with the M1 and the Pacific Highway between Watanobbi and Wadalba. Given the location of these congestion points, it is possible that reliability of bus services along these routes are also impacted, especially the frequent bus services between Wyong and Tuggerah.

The congestion exhibited at Wyong River and at the Pacific Highway at Watanobbi is a likely driver for the identified road upgrade projects in *Future Transport 2056* and the Economic Corridor Strategy such as the Pacific Highway widening upgrades and the Warnervale Link Road.

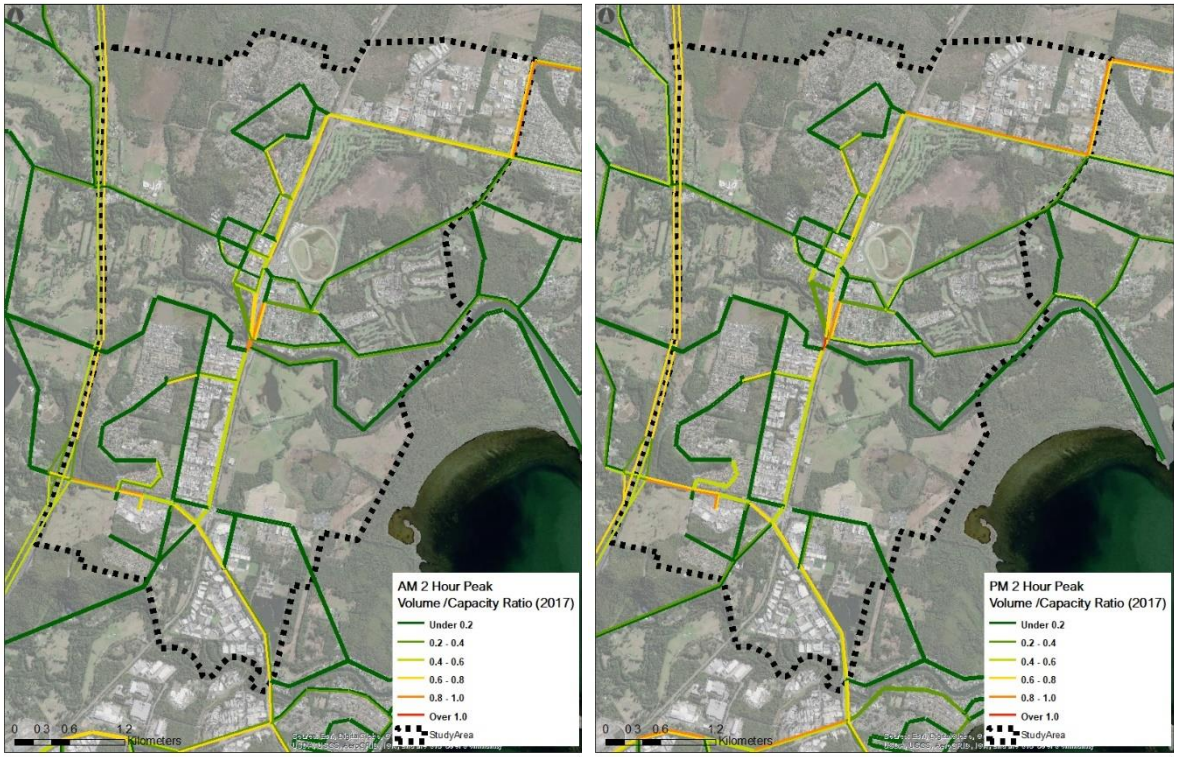
Additionally, the extra capacity enabled by the recent upgrade of the Pacific Highway – Wyong Road intersection has contributed to a downstream negative impact on the performance of the Wyong Road – Bryant Drive – Reliance Drive roundabout intersection, leading to a level of congestion that is not conducive to further growth in the area without an intervention.

Figure 4.17: Two-hour Traffic Volumes in AM and PM Peaks




Source: GTA Consultants based on STFM data from TfNSW

Figure 4.18: Two-hour Volume Capacity Ratio (VCR) in AM and PM Peaks



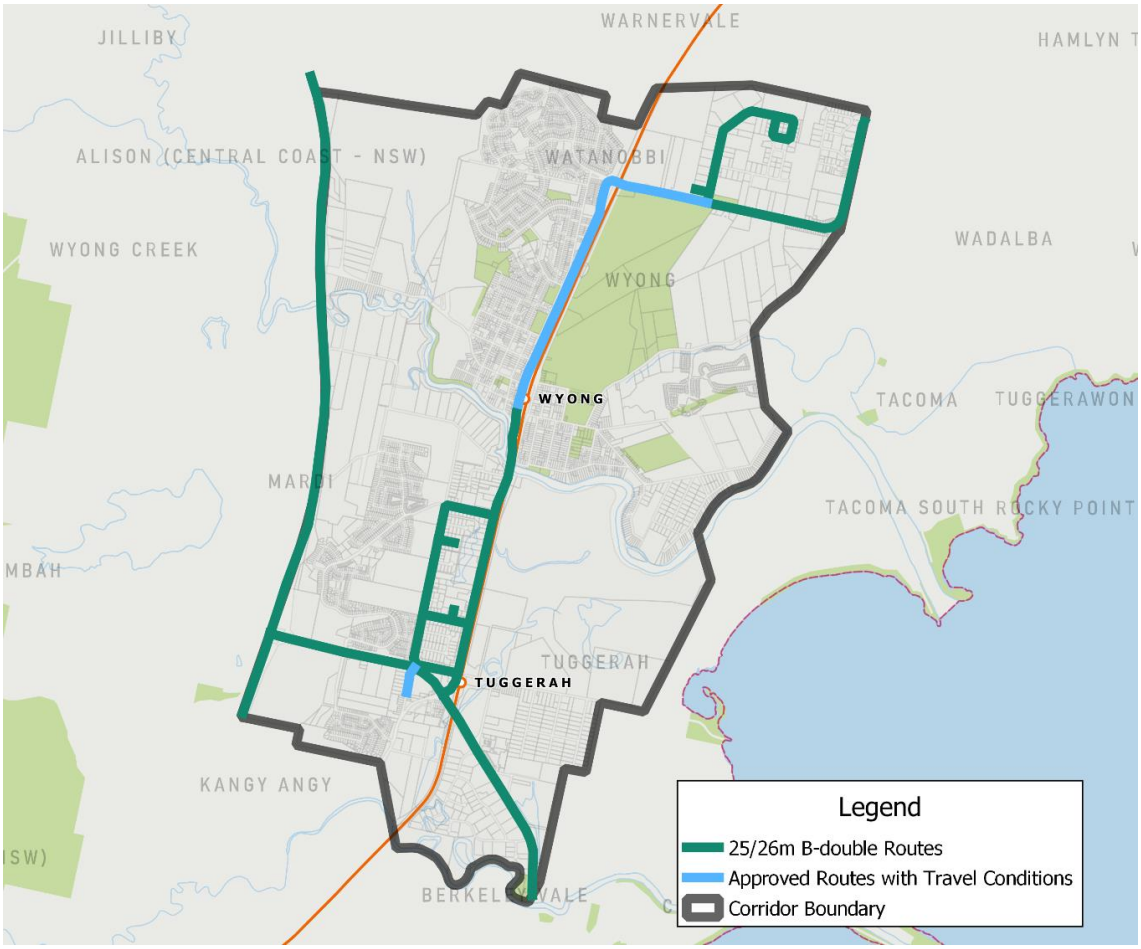

Source: STFM data, RMS/TfNSW

## 4.5. Freight

### 4.5.1. Network

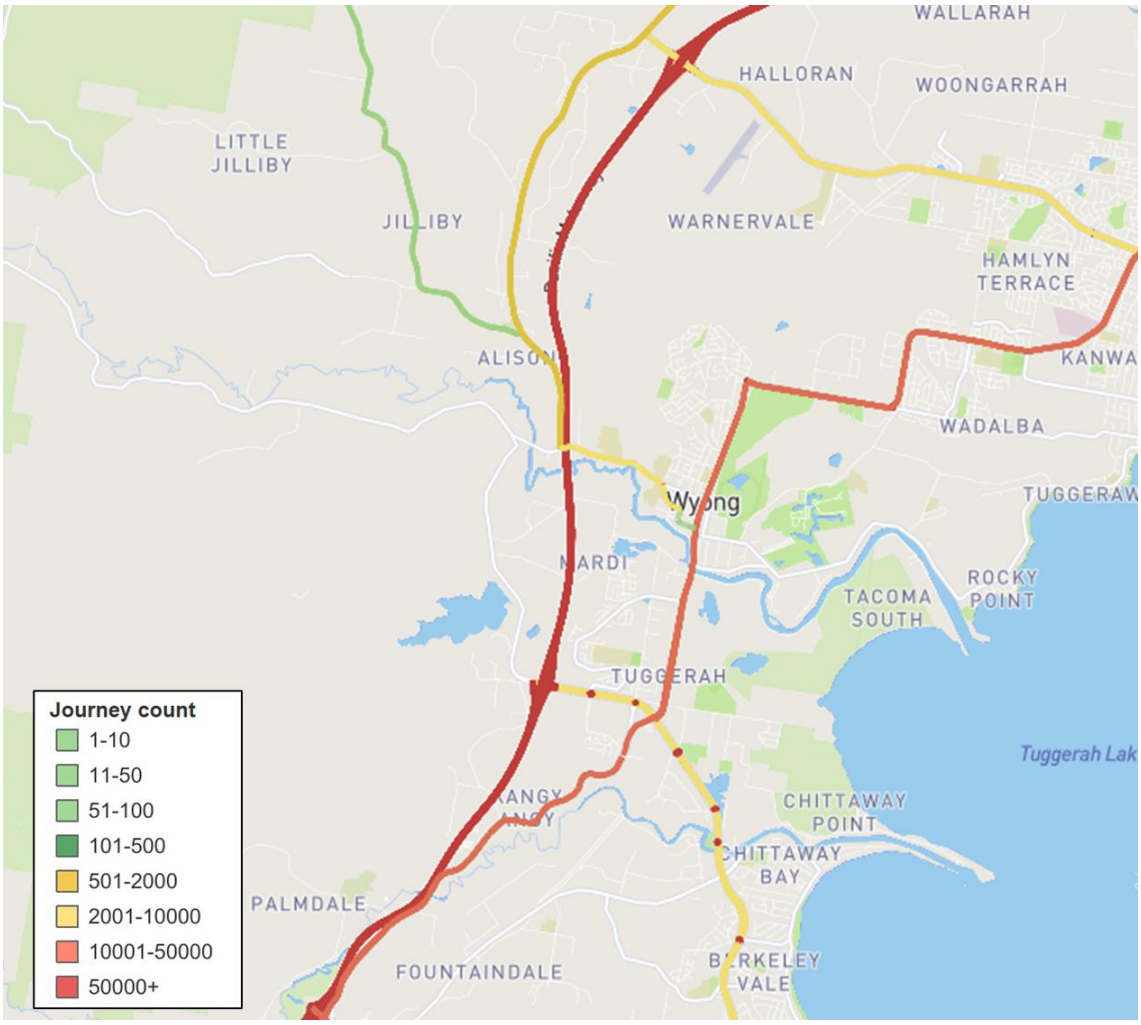
Figure 4.19 shows the B-double truck routes throughout the Corridor while Figure 4.20 shows freight journey volumes that have been extracted from TfNSW's interactive telematics visualisation showing heavy vehicle counts on roads in NSW during 2018. The data covers heavy vehicles enrolled in the Intelligent Access Program (IAP), which is a telematics application used for high productivity vehicles and Special Purpose Vehicles (SPVs) in NSW. The visualisation shows aggregated freight journey data in the Corridor collected from vehicles enrolled in the IAP. As such, Figure 4.20 is likely to undercount actual freight volumes but nonetheless provides an initial understanding of freight journey activity in the LGA.

Figure 4.19: B-double Routes




Source: GTA Consultants based on data from TfNSW

Figure 4.20: Freight Volumes Map, January to December 2018




Source: TfNSW Freight Data Hub

As a result of Westfield Tuggerah, Tuggerah Super Centre, Tuggerah Business Park and the North Wyong Employment Area constituting four key freight-generating locations within the Corridor, the freight volumes shows a high volume of freight traffic (10,001 to 50,000 trucks in 2018) that passes through Pacific Highway to reach these key locations. Asides from this high-volume freight route, the M1 Pacific Motorway carries an even higher volume, which typifies its importance as a state-wide corridor for freight and road-based travel.

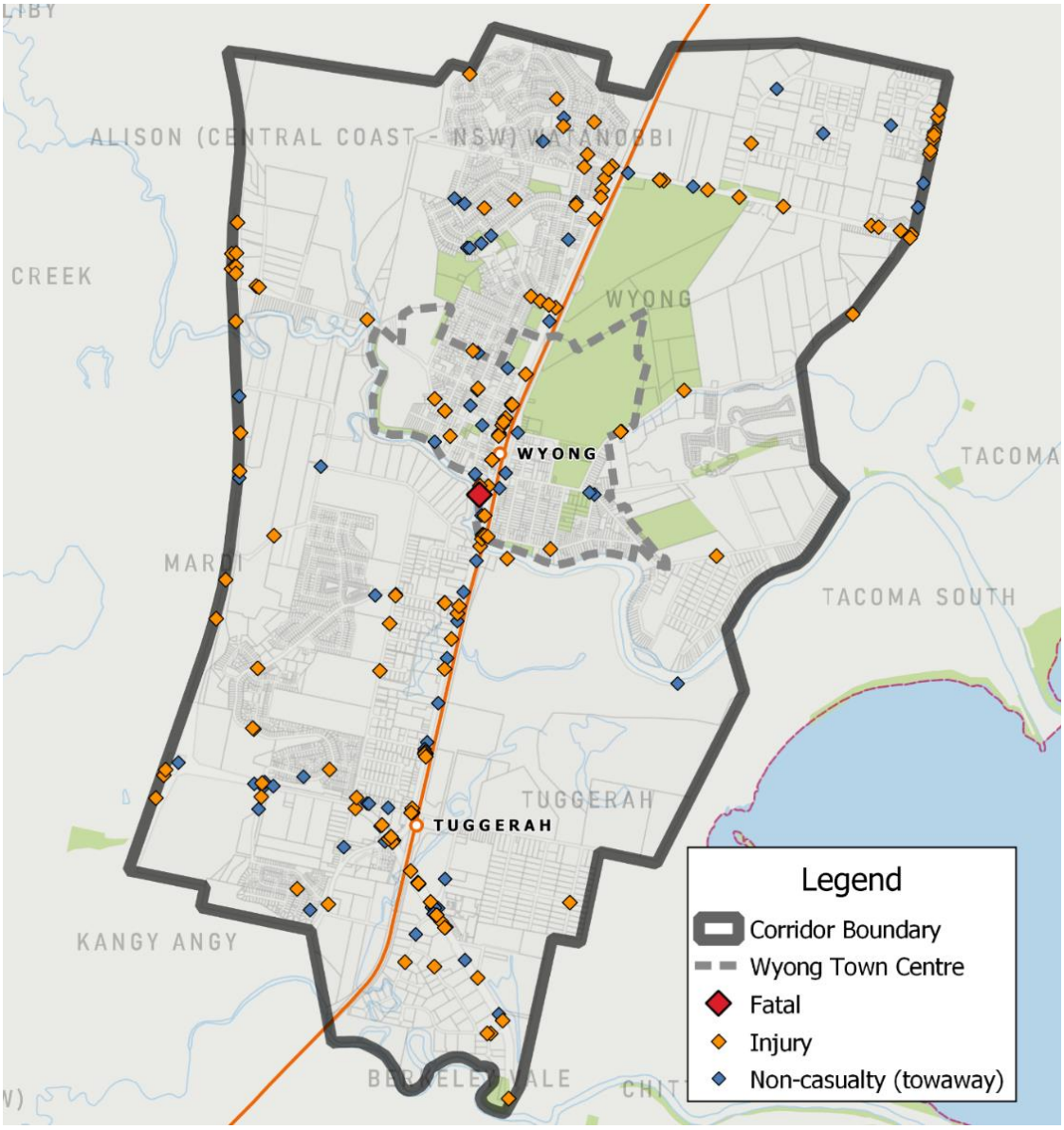
Given the signficant freight traffic along Pacific Highway, the mixing of freight activity with town centre functions in Wyong and Tuggerah is a concern, especially the conflict between trucks and vulnerable road users. It is for this reason that there is a desire to minimise the adverse impacts of the proposed widening of Pacific Highway in the *Economic Corridor Strategy*.

## 4.6. Road Safety

### 4.6.1. Overview

Road safety is an important aspect of the transport network as part of the State Government's 'Towards Zero' goal of zero deaths and serious injuries on the road network. The State Government's *2021 Road Safety Plan* outlines a number of priority actions including creating liveable and safe urban communities, such as the 10km/h shared zone on Alison Road in Wyong. Figure 4.21 shows the number of road crashes in the Corridor categorised by fatal, injury and non-casualty (crashes with no injury or fatalities) crashes. As shown, there is a cluster of injury crashes in Wyong town centre in the shopping area despite this area being intended as an area with high volumes of pedestrian activity. Elsewhere, the crashes follow a linear pattern along the key corridors of the Pacific Highway and Wyong Road.

Figure 4.21: Car Crashes (2015-2019)

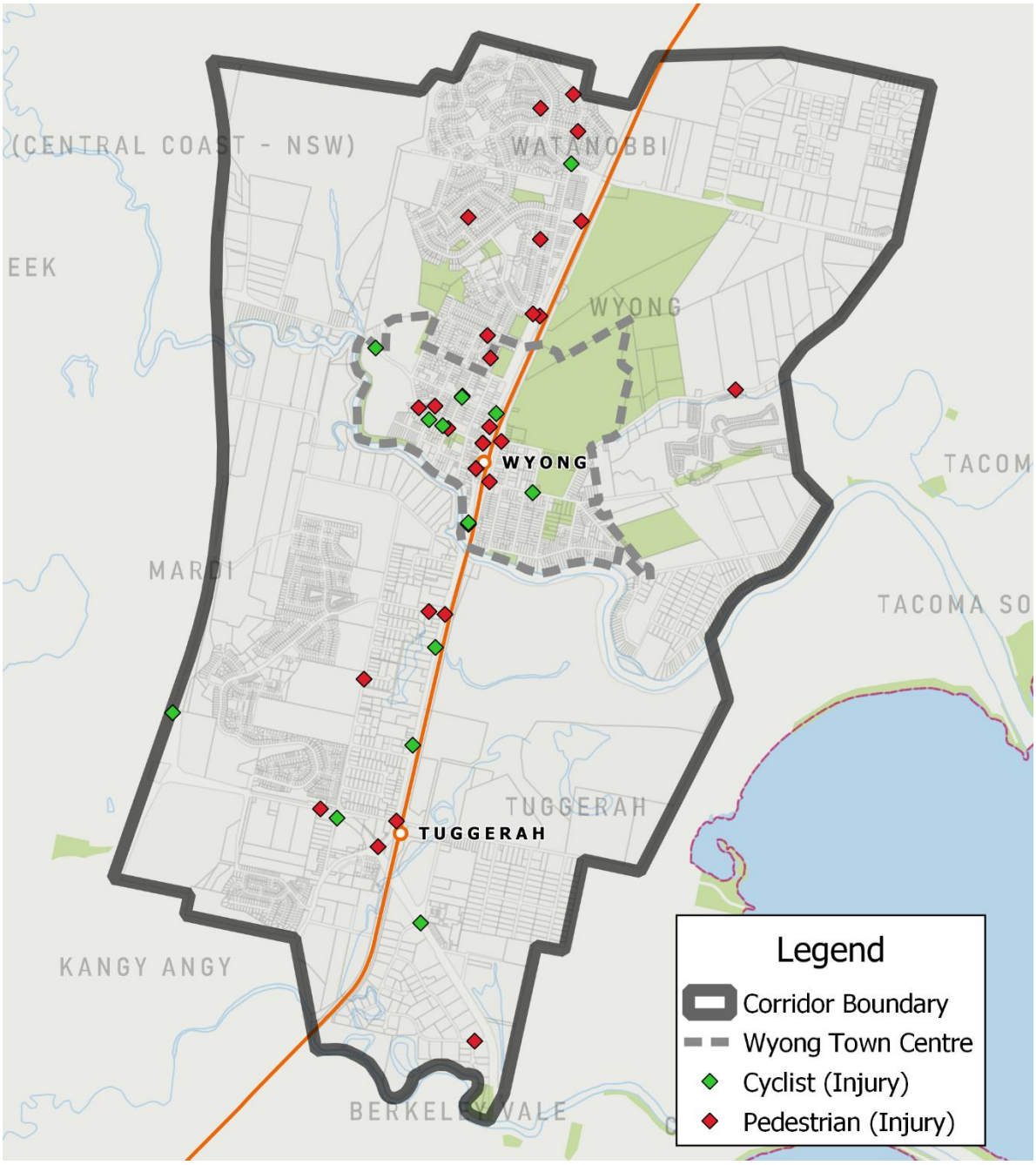



Source: GTA Consultants based on data from TfNSW

### 4.6.2. Crashes Involving Pedestrians and Cyclists

A pedestrian and cyclist crash map of the study area for a ten-year history from 2010 to June 2019 is shown in Figure 4.22. As is evident in the map, around half of all such accidents occurred within the Wyong Town Centre. This follows the pattern in many other jurisdictions whereby accidents are clustered in the city centre despite generally slower traffic compared to other higher speed roads. As there is much greater interaction between different road user groups within the Wyong Town Centre, accidents are more likely in the absence of appropriate interventions to slow vehicle speeds and prioritise walking and cycling activity.

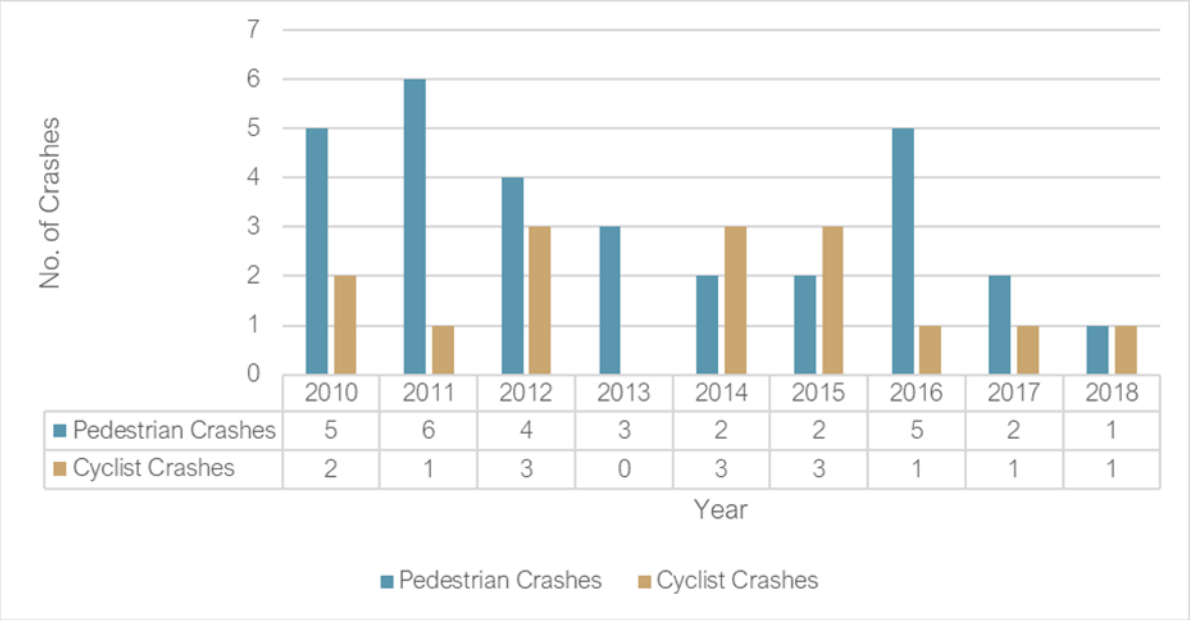
Figure 4.22: Pedestrian and Cyclist Crashes (2010-2018)




Source: GTA Consultants based on data from TfNSW

The annual trends on crashes involving pedestrians and cyclists within the crash history period are shown in Figure 4.23.

Figure 4.23: Pedestrian and Cyclist Crashes (Yearly Count)

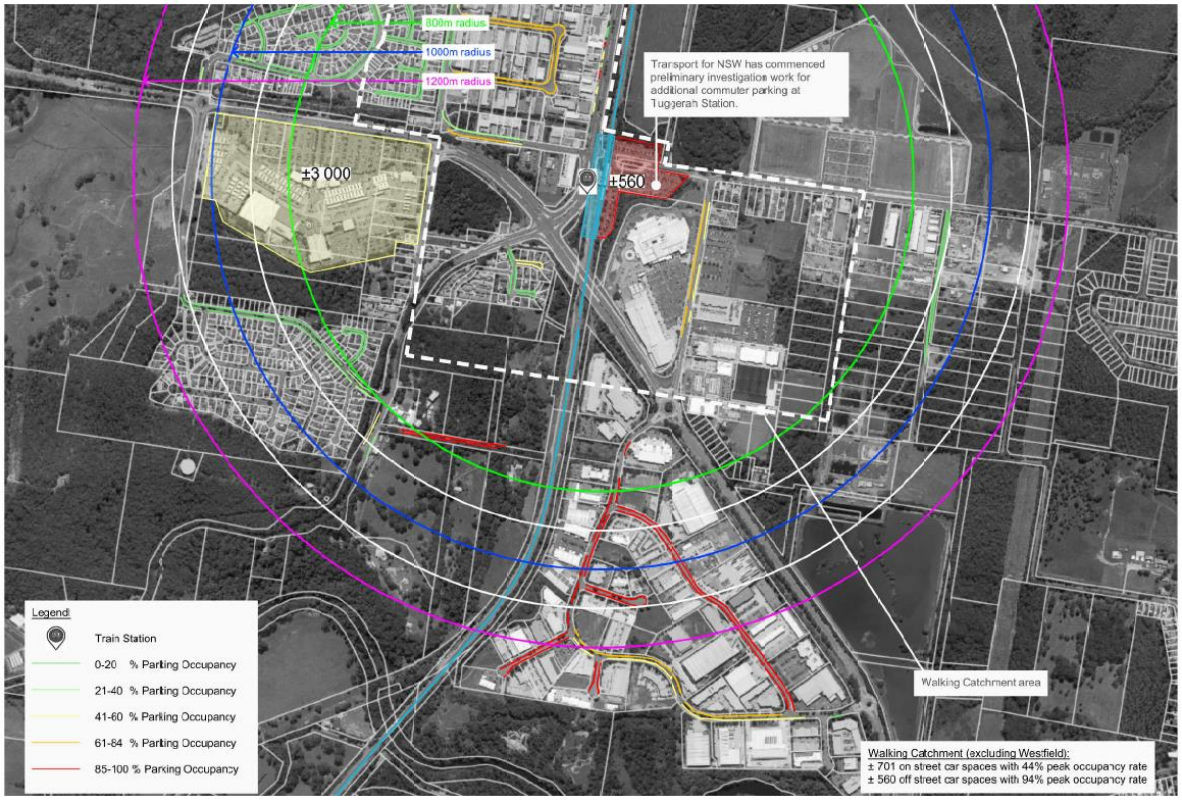



## 4.7. Parking

### 4.7.1. Parking demand conditions

To support the development of Council's yet to be ratified *Car Parking Study and Implementation Plan 2020*, weekday parking occupancy surveys were conducted in key focus activity centres throughout the LGA, including in Tuggerah and Wyong. The purpose of these surveys was to provide a baseline assessment of parking demand to identify any underlying parking demand issues. The parking occupancy results are presented below.

Figure 4.24: Tuggerah weekday parking occupancy survey results (2018)

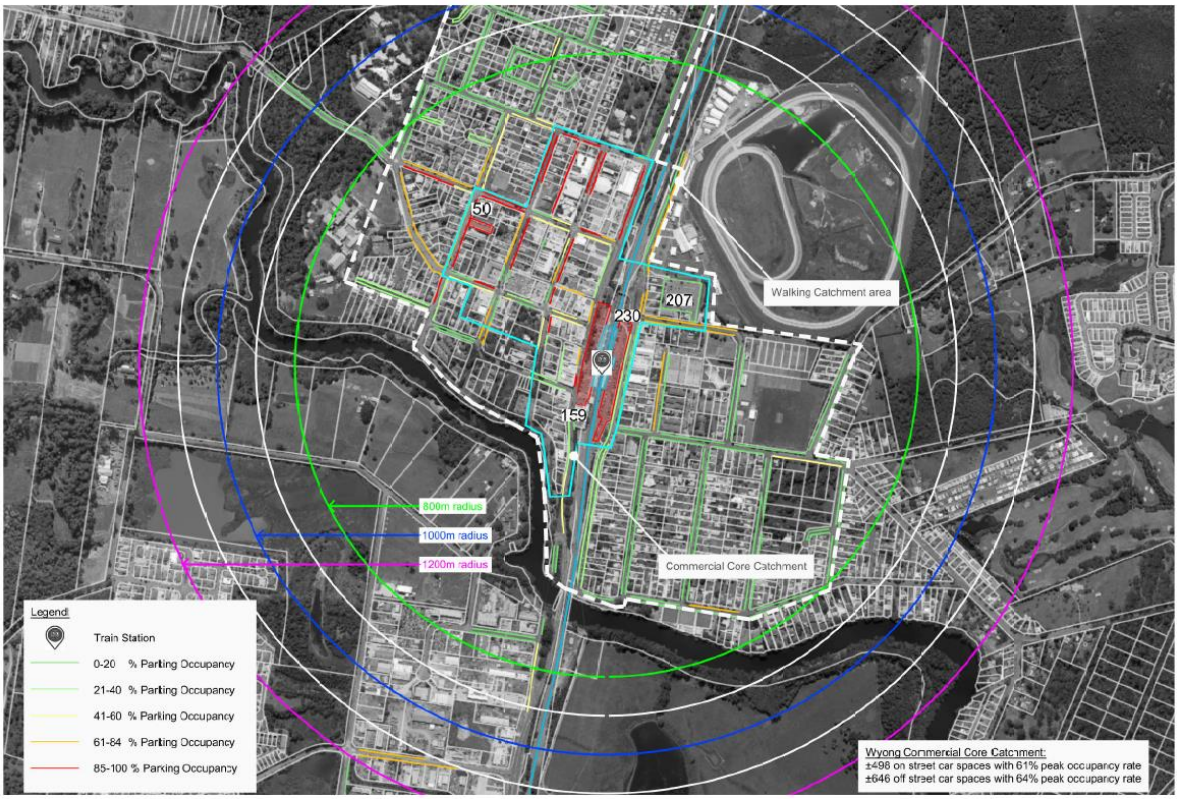



Source: Central Coast Council Car Parking Study and Implementation Plan 2020

In Tuggerah, Figure 4.24 shows the areas of high parking demand (considered in the *Car Parking Study* to be occupancies of 85 per cent or greater). Such areas include the Tuggerah Business Park in the south along Reliance Drive and Pioneer Avenue, as well as the Tuggerah train station commuter car park. Outside of these two areas, parking demands are below 85 per cent occupancy, meaning parking is either underutilised or used at an optimal level where it is relatively easy to find a parking space without cruising for parking.

Besides the parking occupancy survey, the views of the community with respect to parking in Tuggerah were canvassed as part of the *Car Parking Study*. It is clear from these results that Tuggerah is treated as an interchange to travel somewhere else rather than a major destination, with 75 per cent of respondents indicating they came to Tuggerah to commute elsewhere and 71 per cent of respondents reporting a lack of commuter parking in Tuggerah.

Figure 4.25: Wyong weekday parking occupancy survey results (2018)




Source: Central Coast Council Car Parking Study and Implementation Plan 2020

In Wyong, Figure 4.25 shows the areas of high parking demand which are located at the Wyong train station commuter car park and on selected streets in the Wyong town centre such as Hely Street, Margaret Street and Pauline Lane. Outside of these two areas, parking demands are below 85 per cent occupancy, meaning parking is either underutilised or used at an optimal level where it is relatively easy to find a parking space without cruising for parking, which reflects the largely residential nature of parking and land uses outside of the train station and town centre. Furthermore, the Rose Street commuter car park in Wyong East (indicated by '207' in Figure 4.25) exhibited significant underutilisation at only 21 to 40 per cent occupancy, reflecting its slightly more distant location away from Wyong train station and town centre.

Besides the parking occupancy survey, the views of the community with respect to parking in Wyong were canvassed as part of the *Car Parking Study*. It is clear from these results that Wyong is a more balanced destination compared to Tuggerah with a fairly even distribution of responses in terms of trip purposes to Wyong, including for commuting, shopping, employment and personal appointments. Furthermore, over 60 per cent of respondents stated they would not use an expanded commuter car park in Tuggerah instead of Wyong to commute, which reflects the principle that park and rides need to be conveniently located to users in advance of any congestion bottlenecks.

A critique of the maps from the *Car Parking Study* shown in Figure 4.24 and Figure 4.25 is that the highest occupancy band ranges from 85 to 100 per cent. In practice, an occupancy of around 85 per cent is considered an optimum occupancy range as it means around one in seven parking spaces are available, resulting in a relative ease for drivers to find parking[1].

[1] Shoup, D.C. (2005) The High Cost of Free Parking. Chicago: Planners Press, American Planning Association.

As such, portraying parking occupancy in a 85 to 100 per cent band means that a parking occupancy of 87 per cent for example (which in practical terms is virtually indistinguishable from an occupancy of 85 per cent) is shown in the same way as a parking occupancy of 100 per cent (completely full). Accordingly, there is a risk that problems of parking occupancy may be unduly overemphasised.

### 4.7.2. Development Controls

The *Wyong Development Control Plan (2013)*, or WDCP 2013, is in the process of being consolidated with the *Gosford Development Control Plan 2013* to form a *Central Coast Development Control Plan* (CCDCP). For now, the WDCP 2013 controls apply to the former Wyong Shire area, which encompasses the Corridor. Recognising that local parking policy is an important tool for influencing the demand for particular modes of transport, the number of off-street parking spaces required for new development in the Corridor are shown in Table 4.3.

Table 4.3: WCDP 2013 Parking Requirements

| Land Use | | Parking Requirements |
|---|---|---|
| Residential accommodation | | |
| Dwelling House | 3 or less bedrooms | 1 space per dwelling |
| | 4 or more bedrooms | 2 spaces per dwelling |
| Dual Occupancy | 3 or less bedrooms | 1 space per dwelling |
| | 4 or more bedrooms | 2 spaces per dwelling |
| | Additional requirements | Minimum 1 fully enclosed garage per dwelling |
| Multi Dwelling Housing and Residential Flat Buildings | 1-bedroom dwelling | 1 space per dwelling |
| | 2-bedroom dwelling | 1.2 spaces per dwelling |
| | 3 or more bedrooms | 1.5 spaces per dwelling |
| | Visitor parking | Minimum 1 space for developments up to 5 dwellings<br>1 space per 5 dwellings for larger developments |
| Commercial premises | | |
| Office Premises (normal office density) | In major centres | 1 space per 45m$^2$ GFA |
| | Outside major centres | 1 space per 40m$^2$ GFA |
| Shops in neighbourhood centre | | 1 space per 20m$^2$ GFA |
| Shops in neighbourhood centre | | 1 space per 20m$^2$ GFA |
| Shops in town or major centre | Up to 13,000m$^2$ GFA | 4.7 spaces per 100m$^2$ GFA |
| | 13,000-26,000m$^2$ GFA | 4.3 spaces per 100m$^2$ GFA |
| | 26,000-40,000m$^2$ GFA | 3.3 spaces per 100m$^2$ GFA |
| | Over 40,000m$^2$ GFA | 3.1 spaces per 100m$^2$ GFA |
| Business premises up to 200m$^2$ | In major centres | 1 space per 1.25 employees + 1 space per 45m$^2$ GFA |
| | Outside major centres | 1 space per employee + 1 space per 40m$^2$ GFA |
| Business premises greater than 200m$^2$ | | 1 space per 40m$^2$ |

The WDCP 2013 states that "transport choice" and "alternative transport" such as walking, cycling and public transport is key to helping the environment, providing more equitable access to jobs and services, and improving the area's liveability. Yet the WDCP's parking controls do not necessarily foster the advancement of these objectives. As it stands, the current controls if allowed to continue in future iterations of the DCP will promote the low-density development and high parking capacity (both residential and commercial) that currently characterises the Corridor, as existing parking controls will mandate a large supply of parking irrespective of actual demand, creating developments where the car park is often larger than the development itself. Such development patterns are not conducive to compact developments and land use patterns that facilitate walking, cycling and public transport access.

In contrast, a relaxation of these controls could help facilitate a higher density of development, creating more compact and walkable neighbourhoods and is a key action recommended in Council's yet to be ratified *Car Parking Study and Implementation Plan 2020*. Encouraging travel patterns that are supported by walking, cycling and public transport usage goes beyond the provision of transport infrastructure and is closely linked to the types of land use fostered by planning controls.

## 4.8. Summary of Findings

A summary of the existing conditions is presented in Table 4.4. The summary outlines the key issues and opportunities that were identified in the preceding analysis of the existing transport conditions and categorises them by travel mode or focus area. The identified issues and opportunities will be used to inform ideas around the potential future transport changes that are required and the resultant recommended actions for the subsequent stages of this Transport Study.

Table 4.4: Summary of Key Issues and Opportunities

| Area / Mode | Issues and Opportunities |
|---|---|
| Travel characteristics | • High dependence on the private car for residents that own a car, yet there is also a relatively high percentage of residents without a car living in areas with infrequent public transport, contributing to transport disadvantage. |
| Walking | • Many residents are within a 20-minute walk to their closest town centre (either Wyong or Tuggerah), which is good base from which to encourage more walking to work through better walking facility provision, since there are limited existing footpaths.<br>• Both the railway line and the Pacific Highway act as barriers between the eastern and western sides of Wyong. |
| Cycling | • The skeleton of a potential high-quality, connected, cycling network is already in place; key interventions are required to maximise the utility of existing facilities, such as the extension of the bidirectional separated cycleway from Tuggerah into Wyong Town Centre as a shared path.<br>• Given the Pacific Highway bicycle facility is a bidirectional separated cycleway, it is better for the proposed extension into Wyong to continue with the same typology, rather than diverting cyclists into a shared facility with pedestrians.<br>• Council's Bike Plan prioritises other areas of the Central Coast with the highest project in the Corridor only ranked 10th. 12 other projects have been identified within the Corridor. When these works are delivered, the bike network in the Corridor will be significantly improved.<br>• Steep topography is a barrier to cycling in southern Mardi. |

| Area / Mode | Issues and Opportunities |
|---|---|
| Bus and Train | • Public transport stops with frequent services exist along the north-south axis between Wyong and Tuggerah as well as at Westfield Tuggerah and the Tuggerah Super Centre, allowing for convenient public transport journeys along this corridor.<br>• Outside of this corridor and into the surrounding residential areas, public transport services are infrequent (fewer than four buses per hour), which diminishes the attractiveness and reliability of the services.<br>• Thirty-minute public transport access along the corridor is achievable from Tuggerah and Wyong train stations, though this travel catchment may be constrained from more distant residential areas in the Corridor.<br>• Congestion at key pinch points (see road section below) may generate bus reliability issues along the Pacific Highway in the absence of bus priority and impact on the 30-minute travel catchments from the Corridor.<br>• Rail primarily serves residents commuting to Sydney, Gosford and the Hunter. Lower frequency of services compared to the peak discourages rail as a mode for local trips. |
| Road | • Volume Capacity Ratio (VCR) indicates most roads in the Corridor are not at or near capacity but congestion pinch points exist at Pacific Highway south of Wyong town centre, at Pacific Highway near Watanobbi and at Wyong Road near the interchange with the M1.<br>• Planned projects such as Warnervale Link Road and the Pacific Highway Upgrades will seek to relieve congestion at these pinch points.<br>• While these upgrades occur, an opportunity arises to mitigate the widening impacts on the local amenity of the town centres, including returning more space for walking and cycling. |
| Freight | • A high volume of freight traffic runs through the Pacific Highway through the town centres in addition to freight traffic on the M1 Motorway.<br>• Conflict exists between freight traffic and vulnerable road users along the Pacific Highway, which highlights the need for planned interventions such as the cycleway extension on the Pacific Highway from Johnson Road to Wyong. |
| Parking | • Current development controls contribute to maintaining the status quo of high parking supply and encourage the continued predominance of the car as a mode of transport. |

# 5. FUTURE NETWORK

5

## 5.1. Future Transport Infrastructure

Section 5.1 outlines the expected major changes to the Tuggerah to Wyong Corridor's transport infrastructure over the next decade.

### 5.1.1. Pacific Highway Upgrade through Wyong town centre

This proposed project, in planning for almost ten years, would involve upgrading the Pacific Highway through the Wyong town centre to provide two lanes in each direction between Johnson Road at Tuggerah and Cutler Drive at Wyong. In addition to this widening, the project also proposes the following changes:

- New roundabout at the McPherson Road/ Pacific Highway intersection south of the Wyong River
- New twin bridges over the Wyong River, replacing the existing road bridge
- New roundabout at the River Road/ Pacific Highway intersection
- Replacement of the Rose Street rail overbridge with a wider bridge
- Intersection and signal upgrades at Church Street, Rose Street bridge, Anzac Avenue, North Road and Cutler Drive
- Relocation of existing bus interchange and commuter parking to a new bus layover facility on the eastern side of the railway tracks, with new pick up and drop off spaces and new commuter parking at the Wyong Squash centre site on Rose Street
- Bus stops at existing bus interchange replaced with offline bus stops with indented bus bays on either side of Pacific Highway in the town centre
- Alison Road becomes a left-in only intersection
- Unidirectional bicycle lanes provided on either side of Pacific Highway from Johnson Road in Tuggerah to Cutler Drive in Wyong, including along the new bridges over Wyong River
- Shared path provided on the eastern side of Pacific Highway Johnson Road in Tuggerah to North Road in Wyong, including along the new bridge over Wyong River.

In relation to transport and movement in the Corridor, this proposed project would relieve the traffic pinch point along the Pacific Highway currently experienced in the town centre and at the Wyong River as the dual carriageway four-lane highway in Tuggerah turns into a two-lane highway, with associated benefits for the movement of cars and freight.

Due to the required widening, the existing commuter parking and bus interchange on the western side of the railway line will be removed. Bus stops will be relocated to offline bus stops with indented bus bays on either side of Pacific Highway near the new Rose Street overbridge, while layover and commuter parking functions are relocated to the eastern side of the railway line. Offline bus stops have implications for bus operations as bus drivers will have to pull the buses in and out of traffic as well as cross the proposed bicycle lanes, creating potential operational delays and safety risks to more vulnerable road users. The concentration of all commuter parking on the eastern side of the railway line will necessitate more traffic movements over the upgraded Rose Street overbridge, including the displacement of the squash centre, while precise bus layover operations, including bus staging and short and long-term layover requirements will need to be carefully considered. The expansion of the commuter car park at Rose Street by demolishing the squash centre is also questionable given existing underutilisation of the existing Rose Street commuter car park, as well as the relative compactness of the Wyong and Wyong east residential neighbourhoods in relation to the location of Wyong train station.

In terms of active transport, the continuous on-street bicycle lanes proposed do not appear to be physically separated from general traffic (apart from some on-road to shared path transitions along the new Wyong River bridge on the eastern side of Pacific Highway), posing safety risks to cyclists from sideswipe and encroachment from larger and faster vehicles, including trucks and buses.

Moreover, the interface between these lanes and the existing separated bidirectional cycleway south of Johnson Road is unclear. As commented earlier, on-road cycle lanes in town centre will be crossed over by buses accessing the offline indented bus bays, leading to safety risks for cyclists and driving difficulties for bus drivers.

The proposed intersection upgrades have the potential to deliver clear benefits to the Wyong town centre in terms of creating better pedestrian amenity and prioritising people movement. For instance, the proposed left-in only intersection at Alison Road would result in fewer cars accessing this street, leading to the ability to transform this street into a high-quality kerbless shared zone that prioritises people over cars. Accordingly, traffic movements from west of the Wyong town centre can filter through Anzac Avenue and Church Street to access the Pacific Highway via the upgraded signalised intersections instead.

### 5.1.2. Warnervale Link Road

The Warnervale Link Road is a proposed new road that would connect the growing residential area of Warnervale, which sits outside the Corridor, with Wyong and Tuggerah. The project proponent was initially Central Coast Council which led early investigations, but the project has since been progressed by the former Roads and Maritime Services (now TfNSW)[2]. This is a key project listed in strategic planning documents such as *Future Transport 2056* and the *Central Coast Regional Plan 2036* as documented earlier in Section 2.1. The project involves the following components[3]:

- A new 2.3-kilometre two lane road between Pacific Highway at Wyong and Albert Warner Drive at Warnervale including a bridge over Porters Creek Wetland, including a shared pedestrian and cycle path on the western side of the Pacific Highway and link road (effectively serving as a northward extension of the Pacific Highway upgrades through Wyong)
- Widening the Pacific Highway to two lanes in each direction from Cutler Drive to Amy Close
- Traffic signalisation of the Brittania Drive intersection with Pacific Highway at Watanobbi, including replacement of the Pacific Highway bridge over the railway with a longer, wider and higher bridge. There would be no right turn from Brittania Drive southwards toward Wyong and no ability to head east on Pacific Highway to North Wyong and Wadalba. Instead, drivers would have to head north on the link road and subsequently use a proposed U-turn bay to head south or east.

The proposed alignment of the link road is shown in Figure 5.1.

[2] Roads and Maritime Services (2017) Warnervale Link Road Community Update
[3] *Ibid* at 2

Figure 5.1: Warnervale Link Road – strategic design


Source: Roads and Maritime Services (2017)

Based on the latest project updates provided by the former Roads and Maritime Services between 2017 and 2019, Roads and Maritime were progressing investigations on Stage 2 of the link road only, which pertains only to the segment of the road from the Lakes Grammar Senior School/Aldenham Road roundabout and the railway line, as shown in Figure 5.2:

Figure 5.2: Warnervale Link Road – Stage 2 strategic design


Source: Roads and Maritime Services (2017)

The remaining parts of the link road (Stage 1) are subject to further studies, including environmental impact studies of the link road over sensitive areas such as the Porter's Creek Wetland[4].

[4] *Ibid* at 2

In terms of project benefits, it is clear the link road would support the planned growth of Warnervale, which will increase by 75,500 residents by 2036 according to the *Central Coast Regional Plan* as well as associated job growth, by providing a direct road link between Warnervale and the existing north-south Pacific Highway axis along the Corridor. Without the link road, traffic generated by the redevelopment of Warnervale would be required to continue on the existing indirect route from Wyong via Pacific Highway, Minnesota Road and Warnervale Road, which would reduce the convenience of access to and from this growth centre.

The new link road would also likely divert traffic away from existing regional and local roads such as Pacific Highway through Wadalba and Kanwal, Minnesota Road and Warnervale Road.

While there are clear benefits associated with the project, there are also specific considerations for Council to be aware of as this project progresses through planning and design, including:

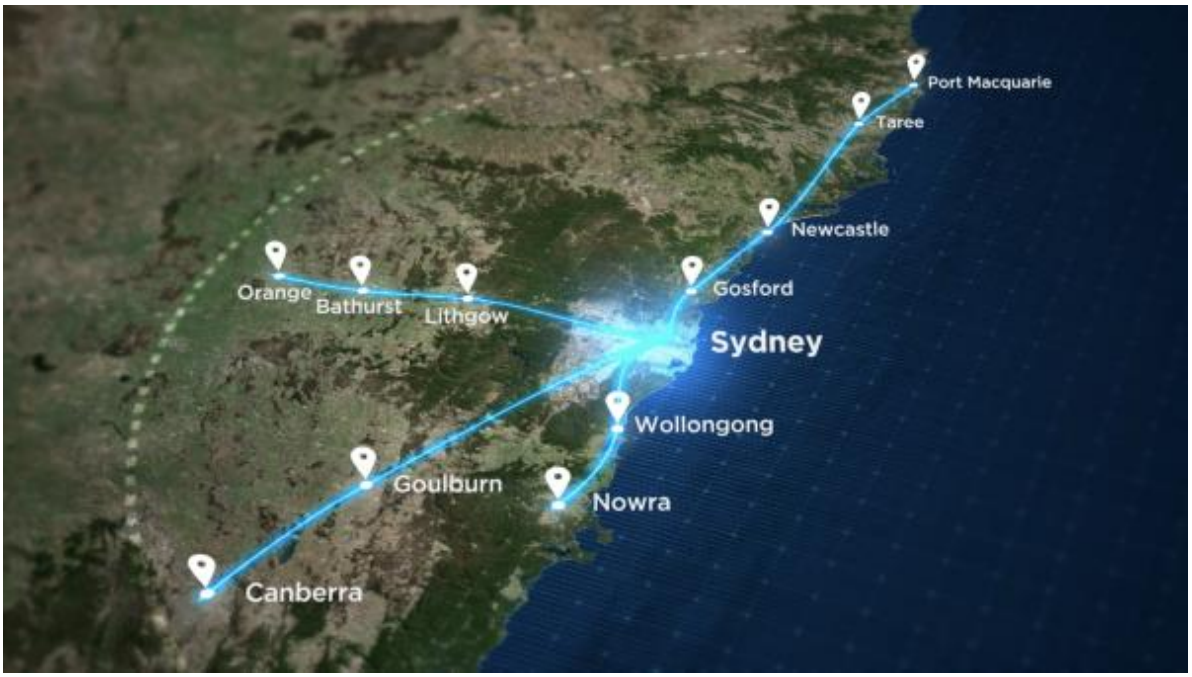
- Integration of the Pacific Highway upgrades project with the link road, including the walking and cycling interface. For instance, while the link road proposes a shared path along the western side of the Pacific Highway towards the Brittania Drive roundabout from Cutler Drive, the Pacific Highway upgrades propose a bicycle lane plus a separate footpath/ shared path up to Cutler Drive.
- The inconvenience to Watanobbi residents from the changes to the Brittania Drive intersection in terms of the severance of connections heading south and east and any perceived or real safety and inconvenience risks from using the U-turn bay. This arrangement may result in more local traffic from Watanobbi filtering through local streets to reach Wyong.
- Consideration of peak period high occupancy or bus lanes in each direction to mitigate any congestion impacts on bus running times and freight operations in peak periods.

### 5.1.3. Faster Rail – Northern Corridor

Faster rail has been identified as a long-term project in *Future Transport 2056* to deliver a rail network capable of accommodating trains that run at faster rail speeds (e.g. 160 km/h to 200 km/h) at a minimum. Trains that run at this speed is not a new concept in Australia, with the Queensland Tilt Trains already running at top service speeds of around 160 km/h.

The NSW Government established the *Fast Rail Network Strategy 2019* which identified four potential faster rail routes in NSW, including the Northern Corridor which would connect Sydney with Port Macquarie via the Central Coast, Newcastle and Taree. The indicative routes are shown in Figure 5.3.

Figure 5.3: Four potential faster rail routes in NSW




Source: https://www.nsw.gov.au/projects/a-fast-rail-future-for-nsw

The benefits of faster rail include reduced travel times, with a trip from Sydney to Gosford taking one hour instead of one hour and 19 minutes, and Sydney to Newcastle taking two hours instead of two-and-a-half hours. Even faster journey times are possible under a high-speed rail (> 200 km/h) solution.[5]

In conjunction with the NSW Government's early investigations into faster rail, the Federal Government through its National Faster Rail Agency is supporting investigations in NSW through the establishment of business cases for the corridors shown in Figure 5.3, including a business case for the Sydney to Newcastle section.[6] This business case was due to be completed in mid-2019 but the results have not been publicly released.

Notwithstanding the limited information available in the public domain on faster rail on the Northern Corridor, in particular between Sydney and Newcastle, the *Fast Rail Network Strategy* recognises faster rail speeds could be realised through dedicated track improvements on existing routes that enable faster journey speeds such as removing or easing curves and deviations in conjunction with new rolling stock. However, high-speed rail (> 200 km/h) would necessitate a new track and corridor altogether.

In relation to the Corridor, significant consideration would need to be given to whether faster rail on the existing track and if so, whether a stop is feasible within the Corridor. Any stop in the Corridor (e.g. either at Tuggerah or Wyong) would have local accessibility benefits that need to be weighed up against increases in journey times from the increased dwell time of an additional stop. The construction of a separate high-speed train line between Sydney and Newcastle may not necessarily follow an alignment similar to the existing railway line, in which case the Corridor could be bypassed.

[5] NSW Government (2019) A fast rail future for NSW. Available at https://www.nsw.gov.au/projects/a-fast-rail-future-for-nsw Accessed 22 April 2020

[6] National Faster Rail Agency (2019) Faster Rail Plan. Canberra

## 5.2. Future Travel Pattern Changes

### 5.2.1. Future Road Network in 2036

As detailed in Section 4.4.2 of the Transport Study, data from the Sydney Traffic Forecasting Model (STFM) was used as a measure of existing traffic conditions. Identified areas of congestion included the Pacific Highway immediately south of the Wyong town centre, Wyong Road near the M1 interchange, as well as the Pacific Highway between Watanobbi and Wadalba.

With reference to the land use vision proposed in the Tuggerah to Wyong Economic Strategy, one aspect is to interrogate how the increase in residents, dwellings and jobs will impact the Corridor's road network. The Precinct Targets for 2036 are listed in Table 5.1.

Table 5.1: Precinct Targets 2036

| Precinct | Residents | Dwellings | Jobs |
|---|---|---|---|
| North Wyong & Watanobbi | 0 | 75 | 300 |
| Wyong & Wyong East | 2,400 | 1,150 | 1,000 |
| Tuggerah | 1,850 | 750 | 2,100 |
| Total | 4,250 | 1,975 | 3,400 |

As these targets are in general accordance with previous planning strategies and existing zoning controls, it can be assumed that the population and land use assumptions in future year scenarios of the STFM are still applicable and congruent with the vision laid out in the Tuggerah to Wyong Economic Corridor Strategy. Concerning the impacts of major infrastructure changes, the STFM accounts for both the Warnervale Link Road and the Pacific Highway upgrade in its 2036 scenario model. While the future 2036 STFM does not include any inputs or additional modelling by GTA, its inclusion of the key infrastructure changes means that a high level of confidence can be given to its outputs and the subsequent analysis. The forecasted change in volumes and volume capacity ratios for the three especially congested road links in the Corridor is displayed in Table 5.2 and Table 5.3.

Table 5.2: STFM Road Volumes – 2017 and 2036

| Road Link | | AM | | PM | |
|---|---|---|---|---|---|
| Pacific Hwy across Wyong River | Traffic Direction | Northbound | Southbound | Northbound | Southbound |
| | 2017 | 2,880 | 2,910 | 3,610 | 2,733 |
| | 2036 | 3,556 | 3,882 | 4,687 | 3,446 |
| | Change | +676 (+23%) | +972 (+33%) | +1,077 (+30%) | +713 (+26%) |
| Pacific Hwy – Johns Rd to 501 Pacific Hwy | Traffic Direction | Northbound | Southbound | Northbound | Southbound |
| | 2017 | 1,499 | 1,973 | 2,133 | 1,615 |
| | 2036 | 1,940 | 3,220 | 3,393 | 2,152 |
| | Change | +441 (+29%) | +1,247 (+63%) | +1,260 (+59%) | +537 (+33%) |
| Wyong Rd – Tonkiss St to Pacific Mwy | Traffic Direction | Eastbound | Westbound | Eastbound | Westbound |
| | 2017 | 2,701 | 1,872 | 2,427 | 2,625 |
| | 2036 | 3,299 | 2,099 | 2,809 (EB) | 3,085 (WB) |
| | Change | +598 (+22%) | +227 (+12%) | +382 (+16%) | +460 (+18%) |

Table 5.3: STFM Volume Capacity Ratios – 2017 and 2036

| Road Link | | AM | | PM | |
|---|---|---|---|---|---|
| Pacific Hwy across Wyong River | Traffic Direction | Northbound | Southbound | Northbound | Southbound |
| | 2017 | 0.85 | 0.86 | 1.06 | 0.8 |
| | 2036 | 0.74 | 0.81 | 0.98 | 0.72 |
| | Change | -0.11 | -0.05 | -0.08 | -0.08 |
| Pacific Hwy – Johns Rd to 501 Pacific Hwy | Traffic Direction | Northbound | Southbound | Northbound | Southbound |
| | 2017 | 0.62 | 0.82 | 0.89 | 0.67 |
| | 2036 | 0.4 | 0.67 | 0.71 | 0.45 |
| | Change | -0.22 | -0.15 | -0.18 | -0.22 |
| Wyong Rd – Tonkiss St to Pacific Mwy | Traffic Direction | Eastbound | Westbound | Eastbound | Westbound |
| | 2017 | 0.84 | 0.58 | 0.76 | 0.82 |
| | 2036 | 0.61 | 0.39 | 0.52 | 0.57 |
| | Change | -0.23 | -0.19 | -0.24 | -0.25 |

Looking at the 2017 existing conditions, all three of the identified congested road links have a volume capacity ratio (VCR) of more than 0.8 in at least one direction, for both the AM and PM periods. The segment of the Pacific Highway across the Wyong River has an average VCR of 0.89, however this figure is expected to drop to 0.81 by 2036 after accounting for the increase in traffic and the widening of the Pacific Highway. Even with the added lane capacity, the 2036 VCR for the northbound PM peak remains high at 0.98, meaning that by the late 2030s the VCR will rise above 1.0 and the peak period will be elongated. Therefore, the outputs of the STFM show that the Pacific Highway widening will not solve future traffic pressures on its own, and that part of the solution to long-term traffic relief will need to come from a greater mode shift to active and public transport.

The north-south oriented segment of the Pacific Highway running adjacent to the North Wyong Employment Area (NWEA) had a 2017 VCR of 0.82 for the southbound direction in the AM peak and 0.89 in the reverse direction in the PM peak. By 2036, these VCRs are forecasted to drop, respectively, to 0.67 and 0.71. It is important to note, however, that the 2036 scenario assumes the delivery of the Warnervale Link Road, as well as a doubling of the Pacific Highway lanes. While the Link Road is being progressed, there is no existing commitment to widening this section of the Pacific Highway. If the 2036 modelled volumes were applied to this section of the Pacific Highway without the road widening, the PM northbound peak period VCR is estimated at 1.4, which is well over capacity.

Finally, the congested segment of Wyong Road from Tonkiss Street to the Pacific Motorway is forecast to experience a relatively modest increase in traffic of 17%, but also a significant decrease in its average VCR (-0.23) to 0.52. Again, an extra lane in both directions on Wyong Road has been included in the 2036 scenario of the STFM. Interpreting the 2036 modelled volumes without this additional lane capacity, the average VCR is expected to increase from 0.75 to 0.88 and the eastbound AM peak forecast to be 1.03.

Referring back to the same rationale as the Pacific Highway over Wyong River, by the late 2030s or early 2040s, extra lane capacity will need to be added on the Pacific Highway at the NWEA and on Wyong Road, or alternatively, there will need to be an prominent mode shift away from the private car.

If Scentre Group's proposed redevelopment of the existing Westfield site into their vision of a 'Tuggerah Town Centre' were to go ahead, its population and job increase would go beyond the targets currently stipulated in the Economic Corridor Strategy. While this may increase traffic volumes to levels higher than those forecasted, the redevelopment's provision of 8.2km of active transport pathways (including 4.5km cycleways) may catalyse a mode shift towards active transport and result in decreased vehicle traffic.

Further transport modelling would need to be undertaken to fully understand the impact of the proposed development on the Corridor's traffic volumes and mode split.

Finally, the proposed development to the east of Tuggerah station, such as the expansion of the Central Coast Mariners' Centre of Excellence, would put further pressure on the performance of the Wyong Road – Bryant Drive – Reliance Drive intersection. To support the Economic Corridor Strategy's identified "economic momentum" of the Central Coast Mariners' development and adjacent sporting facilities, improvement of the existing Wyong Road – Bryant Drive – Reliance Drive intersection and surrounding local road network is recommended.

### 5.2.2. Future Travel Characteristics in 2036

As shown earlier in the report in Section 3.4.1, the overall existing (2016) journey to work mode share for Tuggerah-Mardi and Wyong was approximately 71 per cent for car drivers and passengers, with train travel at eight per cent, walking only at three percent and cycling at just 0.1 per cent.

With the anticipated growth indicated prior in Section 5.2.1, if these travel patterns continued (and directly applied to the future trips (plus existing trips) in 2036, there would be an increase of almost 6,000 trips with approximately 5,000 trips by private vehicle a day in the area.

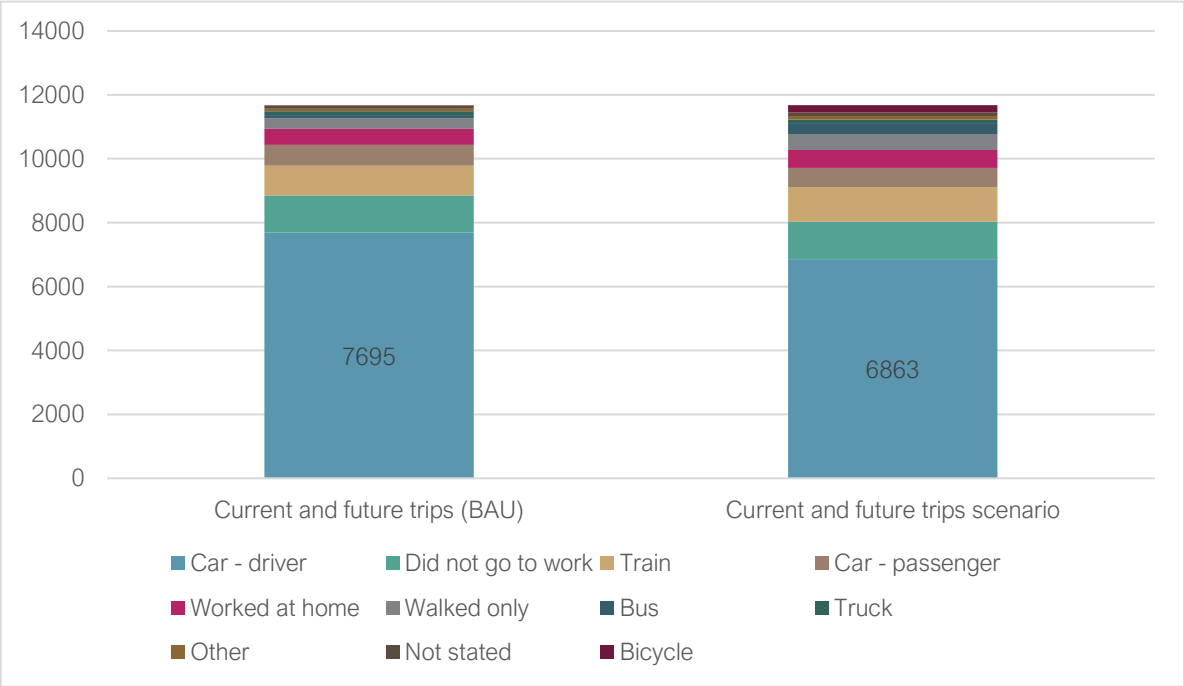
If we look at changing the travel mode share with a reduction in car trips and an increase in walking, cycling and public transport, while the total number of trips stays the same, this would result in more than 800 fewer car trips while there would be an increase of over 400 walking and cycling trips and a further approximately 400 trips by bus and train. We have based this travel mode change on being both aspirational and realistic as to the type of changes could be expected on the Central Coast by 2036, should major projects be delivered.

An outline of this is provided in both Table 5.4 and Figure 5.4.

Table 5.4: Current and Future Travel Mode in Tuggerah-Mardi and Wyong

| Mode | Current Travel | Current Mode % | Future Travel with Current Mode % | Potential Future Mode % | Potential Future Travel | Future Difference |
|---|---|---|---|---|---|---|
| Car - driver | 2655 | 66% | 7695 | 55% | 6863 | -832 |
| Did not go to work | 400 | 10% | 1159 | 10% | 1165 | 6 |
| Train | 322 | 8% | 933 | 10% | 1087 | 154 |
| Car - passenger | 222 | 6% | 643 | 5% | 605 | -39 |
| Worked at home | 175 | 4% | 507 | 5% | 558 | 50 |
| Walked only | 113 | 3% | 328 | 5% | 496 | 168 |
| Bus | 35 | 1% | 101 | 4% | 341 | 240 |
| Truck | 42 | 1% | 122 | 1% | 119 | -3 |
| Other | 33 | 1% | 96 | 1% | 110 | 14 |
| Not stated | 30 | 1% | 87 | 1% | 107 | 20 |
| Bicycle | 3 | 0.1% | 9 | 3% | 233 | 224 |
| **Total** | **4030** | **100%** | **11680** | **100%** | **11684** | **0** |

Figure 5.4: Current and Future Travel Mode in Tuggerah-Mardi and Wyong




## 5.3. Future Movement and Place

Transport for NSW's *Future Transport Strategy 2056* acknowledges the role of the Movement and Place Framework in allocating road space in a way that improves the liveability of places. Having the potential to improve the integration of land use and transport planning, some of the issues that the Movement and Place Framework aims to resolve include:

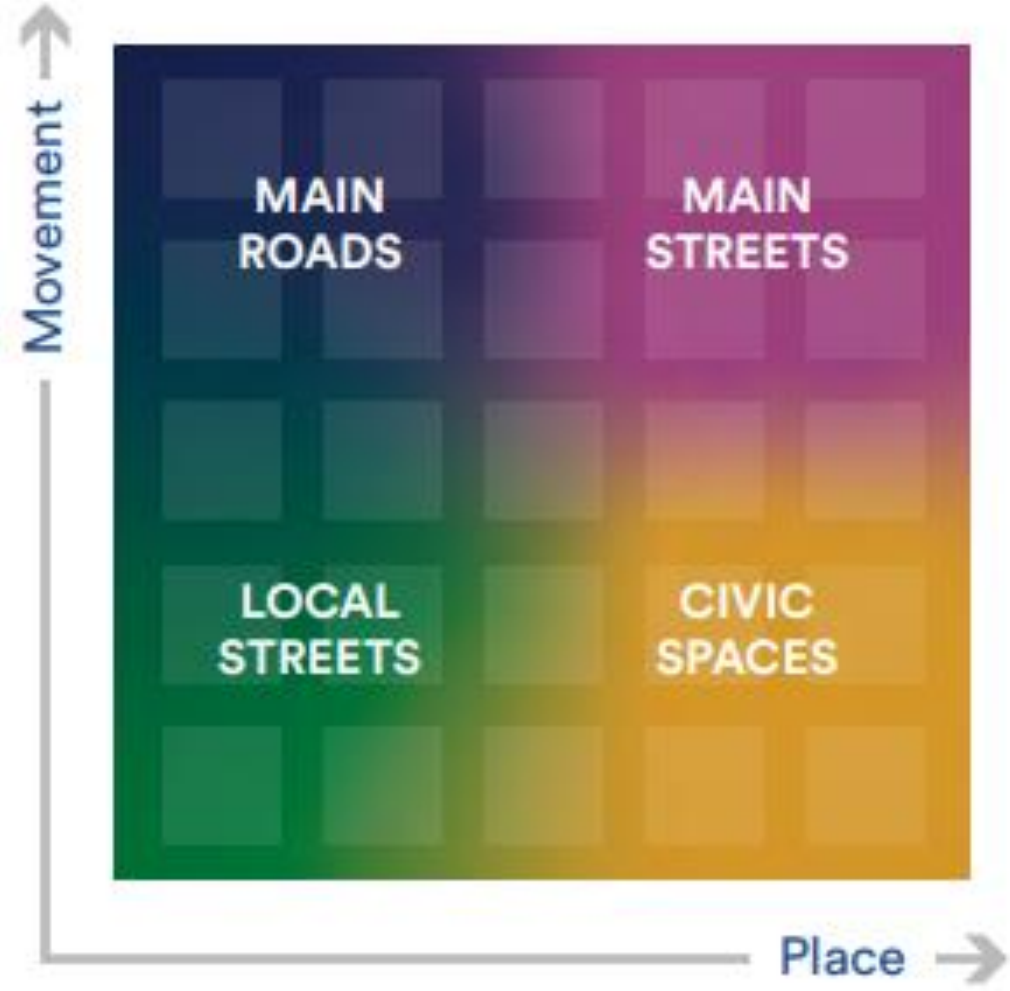
- Reconciling the tension that can exist between Place and Movement functions. The best practice approach includes finding ways of managing the effective movement of people, vehicles and goods and the creation of places that support social activity, economic vitality, public spaces, ecological functions and community.
- Balancing movement, safety and amenity. Existing main streets typically coincide with roads that carry out arterial functions, leading to detrimental safety and amenity outcomes (e.g. Pacific Highway through Wyong Town Centre). The primary aim is to reallocate space in the road corridor in a manner that reflects the quantum of people agglomeration and accounts for vulnerable road users, rather than just traffic volumes.
- Supporting streets' economic and environmental systems. Roads and streets are more than just conduits of traffic; they are complex and sensitive ecosystems that support people's livelihoods, environmental health and overall well-being. It is people, not cars, that spend at local shops and contribute to the dynamism of a centre.

In March 2020, the Practitioners Guide to Movement and Place was released by the NSW Government as a complementing document to provide a common structure for place-based transport and city and town planning across NSW. It provides further information on how to understand street environments and implement the framework.

Classification, as part of the Movement and Place process, categorises streets into four types of environments: civic spaces, local streets, main streets and main roads. 'Civic spaces' refers to streets that have a significant role in their communities, prioritising pedestrian activity and shared use. Local streets are the majority of streets in the road network, with a low movement and low place function.

Main streets are those streets that have an intensity in both movement function and place function, while main roads are the routes central to the efficient movement of people and freight. Here, place activity levels are less intense.

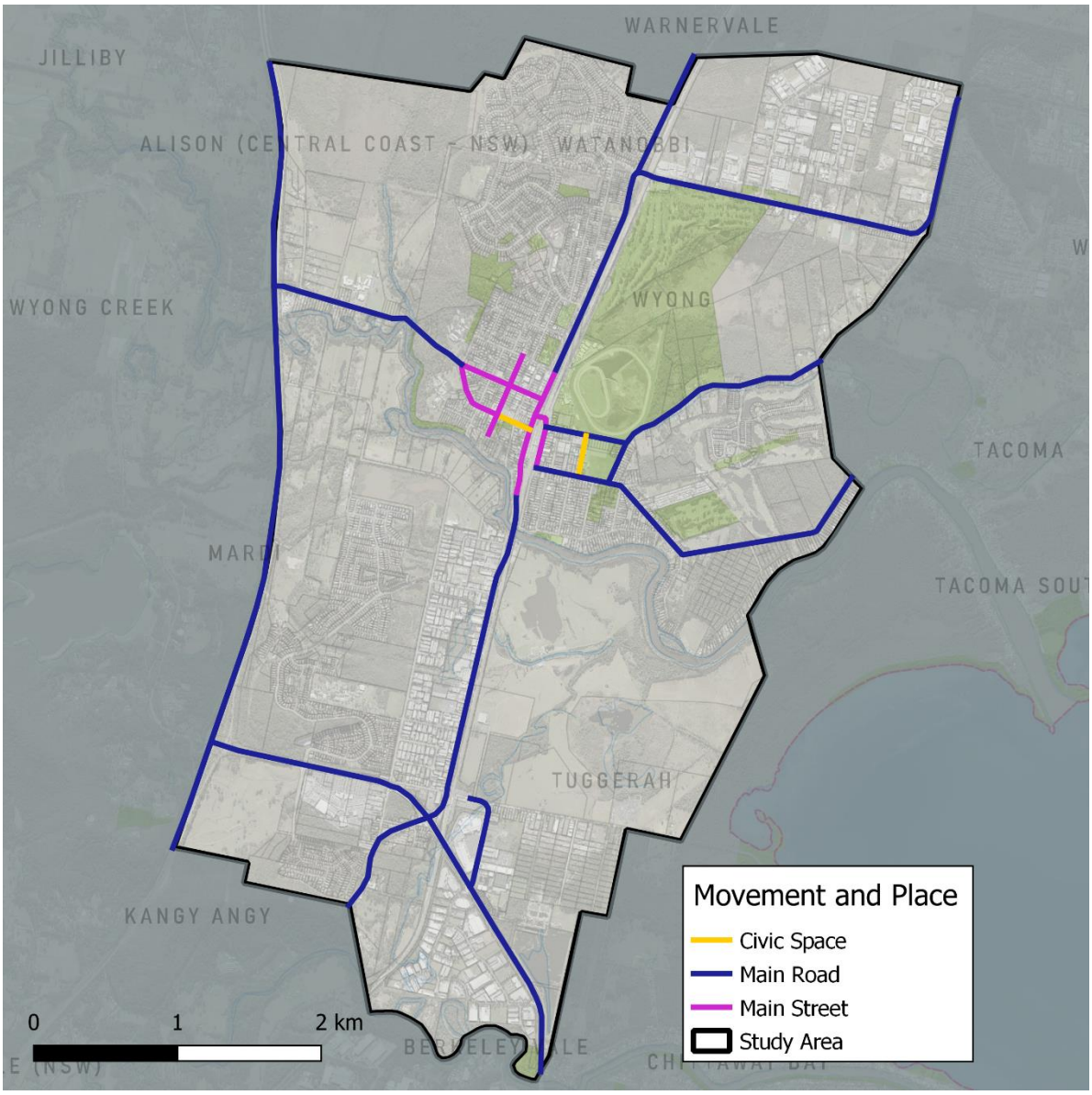
Figure 5.5: Movement and Place – four street environments




With consideration to the Study's objectives, current and future traffic conditions, as well as the various projects in planning and delivery, Figure 5.6 depicts a vision for the future Movement and Place functions of the Tuggerah to Wyong Corridor's street network. Key changes include the designation of Alison Road and Ithome Street as 'Civic Spaces', as well as the western section of Alison Road and eastern section of Anzac Avenue as 'Main Streets'.

Consideration was given to streets within Tuggerah, however the existing and future land use is based upon large floorplates whereby the development is the major attractor, as opposed to a smaller retailer fronting a main street. Therefore, the priority is to facilitate better access and focus on the movement function of these streets.

Figure 5.6: Movement and Place Classification of Future Corridor Road Network



## 5.4. Future Transport Trends

Technology is improving at an ever-increasing pace. It has significantly shaped and will continue to shape the future of transport and mobility. Initial research indicates that the evolution of transport technologies will likely generate a broad spectrum of human responses. and TfNSW has developed four different scenarios.

While these scenarios are the most likely to eventuate, others cannot be ruled out. It also remains unclear which, if any, scenario will become the dominant paradigm for future mobility. Consequently, strategies are needed that accommodate this end-state uncertainty and enable multiple potential outcomes.

Table 5.5: Transport for NSW's Future Scenarios

| Scenario | Description |
|---|---|
| Scenario 1: My (autonomous) car is (still) king | • Individual point-to-point trips in personally owned vehicles.<br>• Customers have access to more personal point to point transport options using connected and automated vehicles that are increasingly customised to their needs (e.g. cars, pods). |
| Scenario 2: We're all in this together | • Aggregated demand, shared-use and network optimisation.<br>• Customers access a broad range of automated (shared and personal) on-demand and mass transport modes with dynamic demand management and integrated payments. |
| Scenario 3: Super-commuting with public, active and shared transport | • A lifestyle based on mass transit, flexible and active transport.<br>• Customers use an extended public transport, active and flexible shared-service network. Autonomous vehicles are for specific high-productivity uses only. |
| Scenario 4: Why travel so much | • Technology reduces demand for mobility.<br>• Customers choose where they wish to work, shop, learn, socialise and be entertained. Technology enables travel to be minimised as services are 'delivered' in or near the home. |

Source: Future Transport Technology | Roadmap 2016

It is critical to note that these four scenarios are not mutually exclusive. Rather, they represent 'use-cases' that are likely to co-exist. With this in mind, the technological developments that have the potential to impact the Tuggerah to Wyong Economic Corridor are summarised below.

Table 5.6: Potential future trends for the Corridor

| Key Characteristic | Potential Outcomes |
|---|---|
| Shared Mobility (car sharing) | • More car sharing<br>• Fewer privately owned cars than would otherwise be the case<br>• Later and lower take up of driver's licences |
| On-demand transport (buses) | • Increases access to local services, potential decline in regular bus route patronage<br>• Tuggerah to Wyong Corridor unlikely to be an early adopter; given the narrow funnelling of the Corridor around the Pacific Highway, regular scheduled transit is likely to be more appropriate |
| Electric vehicles | • More vehicle charging stations required (either private or public stations) |
| Connected and Automated Vehicles (CAVs) | • Low mix of CAVs/ non-CAVs, some increase in discretionary trips, additional vehicle circulation<br>• Less available road space for vehicles |
| Intelligent Transport Systems (Smart Motorways) | • Increased throughput of the Pacific Motorway |

| Key Characteristic | Potential Outcomes |
|---|---|
| Smart Parking Management | • Less need for off-street parking with more efficient utilisation of existing commuter car parks in Wyong and Tuggerah<br>• Better utilisation of car parks, reduction in vehicle circulation |
| Mass Transit (high priority bus lanes, new faster rail line and stop at Gosford) | • Increased public transport capacity, and bus, cycle and walking networks support access to new stations<br>• Kerbside lanes used for higher priority use<br>• Reallocation of road space and kerbside parking restrictions<br>• Increase in bicycle use, reduction of car ownership |
| Reclaiming public spaces | • More local trips by walking and cycling<br>• Increase in shorter, more local trips<br>• Opportunity for more outdoor spaces, cafes etc |
| Road Pricing | Depending on the type of pricing, it could:<br>• Increase use of non-toll roads<br>• Decrease overall car usage<br>• Make additional funds available to support other travel modes. |
| Improvement of urban freight logistics | • Slight shift of freight to off-peak periods<br>• Increase consolidation and reduce freight trips |
| Automated drones/ deliveries | • Parcel delivery by drone has the potential to reduce road-based delivery operations.<br>• Will require regulation. |
| Ageing Population | • Investment on more accessible and walkable streets<br>• Increased short trips<br>• Increasing opportunity for on-demand trips |
| TOD (development around major public transport nodes) | • Development concentrated around nodes reduces car dependence and overall car trips<br>• Network redundancy more prevalent<br>• Less requirements for parking |
| Flexible Work Arrangements and Tele-working | • Viability of flexible work arrangements highlighted by COVID-19<br>• Increase in non-work and non-peak hour trips<br>• Work from home, reduce commuting trips one day a week<br>• Modified hours shift the peak over a longer period<br>• Increased access to local shops<br>• Possible decline in travel demand with benefits for all travel modes |

# 6. OPPORTUNITIES FOR IMPROVEMENT

6

## 6.1. Future Actions

Based on the analysis and review from the preceding chapters, GTA has identified short (0-5 years), medium (5-10 years) and long-term (10+ years) opportunities for improvements to the existing transport network, having regard to the study's objectives of prioritising public transport and active transport and supporting the future growth of the Tuggerah to Wyong Economic Corridor. The proposed actions should be considered for inclusion in a future Development Contributions Plan's works schedule. For some of the proposed actions listed, other sources of funding may be more appropriate.

### 6.1.1. Walking and Cycling

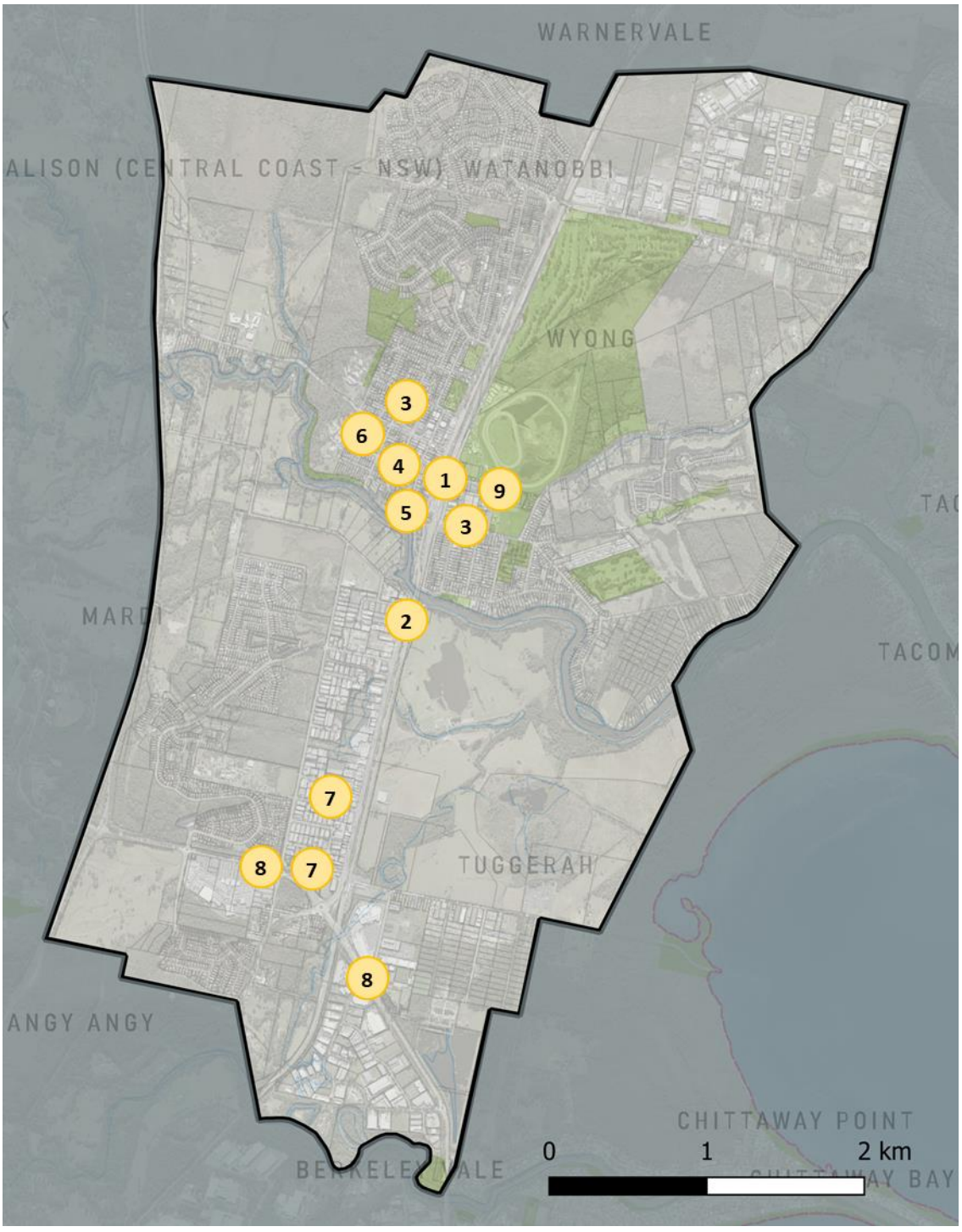
The following opportunities have been identified for improving walking and cycling in the area.

Table 6.1: Recommended Walking and Cycling Actions

| Ref | Recommended Action | Priority | Timing | Responsibility |
|---|---|---|---|---|
| 1 | Investigate options and advocate for a new active transport rail overbridge as part of TfNSW's Pacific Highway upgrade through Wyong. | High | Short | Council/TfNSW |
| 2 | Extend the separated bidirectional cycleway and a separate footpath on the Pacific Highway from the Johnson Road intersection to Wyong town centre as part of TfNSW's Pacific Highway upgrade through Wyong. | High | Medium | Council/TfNSW |
| 3 | Investigate footpath upgrades and cycling links connecting Wyong East with Wyong town centre, including new and widened footpaths and cycling facilities on Warner Avenue. | High | Short | Council |
| 4 | Upgrade the existing Alison Road shared zone to an improved shared zone with better pedestrian amenity. | High | Short | Council |
| 5 | Investigate shared zone expansions to other streets in Wyong in addition to Alison Road, including Hely Street, Robleys Lane, Rankens Court, Peters Lane and Church Street. | Medium | Medium | Council |
| 6 | On Alison Road between Margaret Street and Anzac Avenue, investigate options to prioritise the street for more 'Place' functions under the Movement and Place framework, including interventions to slow traffic speeds, reduce traffic flow and prioritise safe walking and cycling. | Medium | Short | Council |
| 7 | Investigate cycling connections from Tuggerah industrial area and Woodbury Park Road to connect with the Pacific Highway separated cycleway, including at Mildon Road, Anzac Road and Gavenlock Road. | Medium | Short | Council |
| 8 | Investigate and advocate for intersection improvements of existing cycling facilities in Tuggerah, including at Westfield Tuggerah and the Bryant Drive roundabout at Tuggerah Super Centre. | Medium | Medium | Council/TfNSW |
| 9 | Transform Ithome Street into a shared zone, enhancing the sense of community at Wyong's main sporting and recreational area. | Medium | Medium | Council |

| Ref | Recommended Action | Priority | Timing | Responsibility |
|---|---|---|---|---|
| - | Review the provision of footpaths in existing neighbourhoods and identify opportunities to increase footpath provision to at least one side of a street. | Medium | Long | Council |
| - | Review planning standards (DCP/LEP) to include minimum footpath, cycle facility and end-of-trip facility provision requirements for new residential and commercial subdivisions. | High | Short | Council |
| - | Ensure that Safe Systems principles are embedded into the planning and delivery of all future pedestrian and cyclist infrastructure. | High | Short | Council/TfNSW |
| - | Ensure that Green Travel Plans (GTP), or an equivalent plan, are required for development consent for new major developments in the Corridor. Where possible, review existing major trip generators across the Corridor and engage with landowners to develop a GTP. | High | Short | Council |

Figure 6.1: Walking and Cycling Opportunities



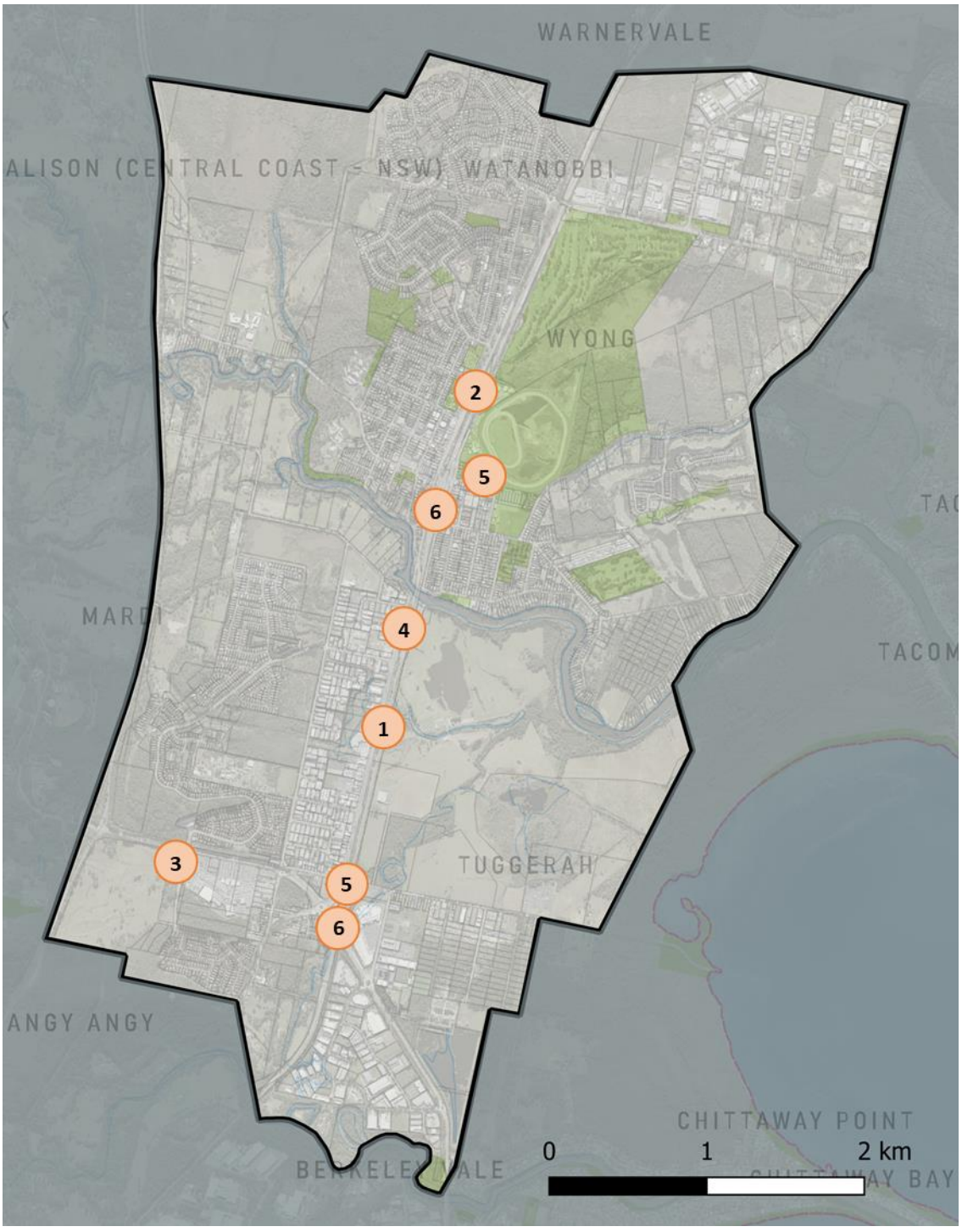
### 6.1.2. Public Transport

The following opportunities have been identified for improving public transport in the area.

Table 6.2: Recommended Public Transport Actions

| Ref | Recommended Action | Priority | Timing | Responsibility |
|---|---|---|---|---|
| 1 | Investigate bus priority improvements along Pacific Highway between Tuggerah and Wyong, including bus advance signals, to be tied in with Pacific Highway upgrades even if not currently proposed. | High | Medium | Council/TfNSW |
| 2 | Reconsider the road space allocation and cross-section along the Pacific Highway, including opportunities to repurpose on-street parking for other movement purposes such as for public transport, freight, cars and/or active transport. | High | Long | Council/TfNSW |
| 3 | Investigate how Future Transport 2056's 'Bus Headstart' program can be leveraged to support public transport access for new subdivisions in the Corridor, including planned developments next to Westfield Tuggerah. | Medium | Medium | Council/TfNSW |
| 4 | Investigate improved public transport marketing opportunities for the frequent bus corridor that exists between Tuggerah and Wyong along the Pacific Highway, including messaging around 'catching any bus to travel along the Corridor' as well as route numbering simplification opportunities. This marketing would need to be carried out in concert with new bus priority measures on Pacific Highway to deliver a high-quality frequent and separated transit corridor. | Medium | Short | Council/TfNSW |
| 5 | Investigate opportunities for station precinct area redevelopments to improve walking amenity and accessibility, especially for Wyong train station where pedestrians must walk through a car park or walk on steps to access the overbridge. | High | Medium | Council/TfNSW |
| 6 | Investigate the viability of on-demand bus services to and from Wyong and Tuggerah railway stations. | Low | Medium | Council/TfNSW |
| - | Conduct number plate surveys of Park and Rider users at Tuggerah and Wyong to evaluate the origins of users, with the view of investigating the extent to which connecting buses and walking and cycling access are used. This initiative will support efforts to manage Park and Ride demand to avoid the costs of further expansion. | Low | Short | Council/TfNSW |

Figure 6.2: Public Transport Opportunities



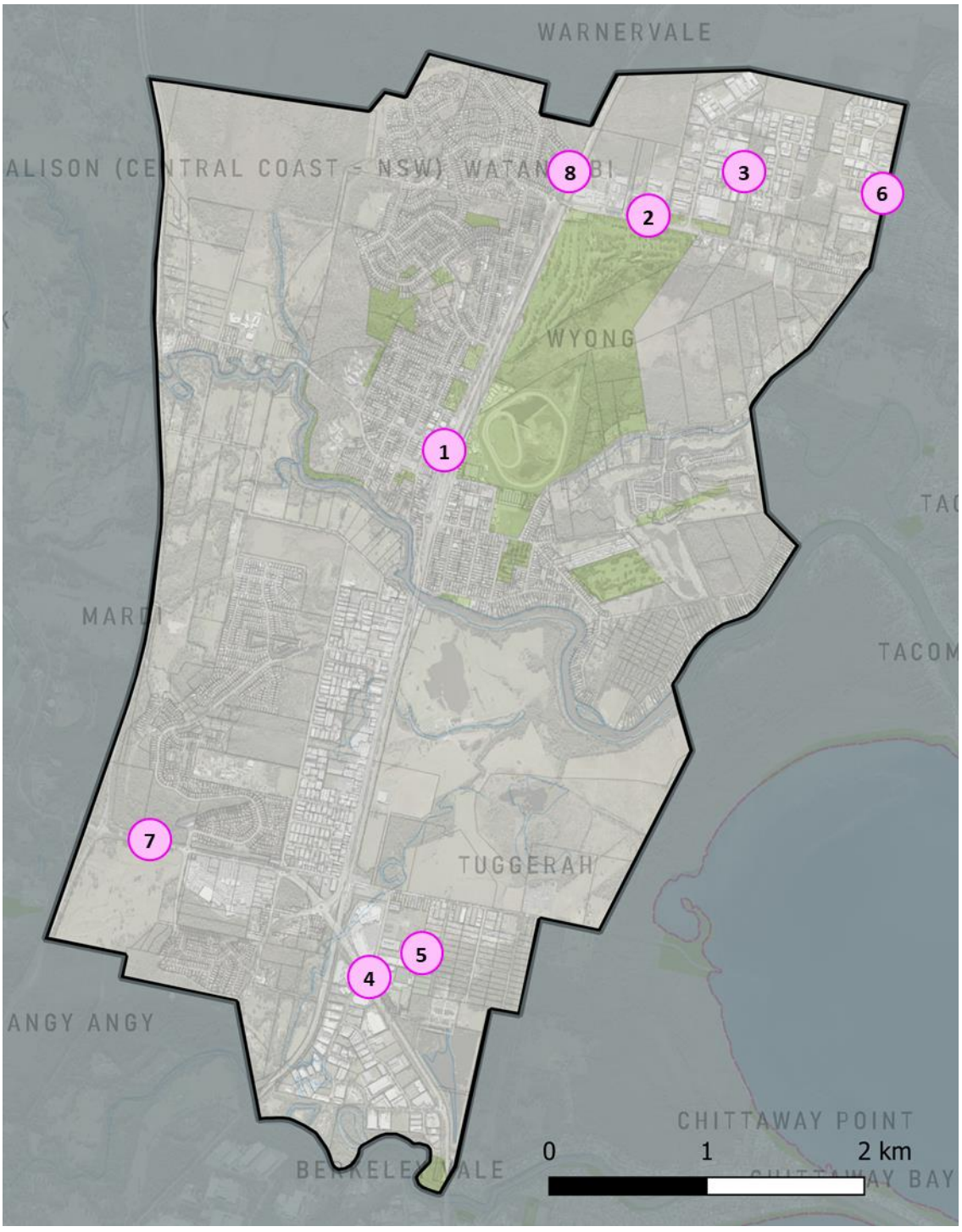
### 6.1.3. Road and Freight

The following opportunities have been identified for improving the road network in the area.

Table 6.3: Recommended Road and Freight Actions

| Ref | Recommended Action | Priority | Timing | Responsibility |
|---|---|---|---|---|
| 1 | Leverage the opportunity and mitigate impacts of the proposed Pacific Highway widening project by investigating slower speed limits and diverting traffic away from key Wyong town centre streets such as Alison Road. Possible alternative routes include Anzac Avenue, especially for traffic coming from the north. Undertake a more detailed traffic study and engage further with stakeholders to understand implications of proposed road network changes. | High | Medium | Council/TfNSW |
| 2 | Minimise access points to the Pacific Highway from the North Wyong Employment Area where possible, especially in light of proposed further development in the area. | Medium | Medium | Council/TfNSW |
| 3 | Improve the permeability and circulation of the road network within the employment precinct. | Medium | Medium | Council |
| 4 | Investigate and advocate for an upgrade to the Wyong Road – Bryant Drive – Reliance Drive intersection. | Medium | Medium | Council/TfNSW |
| 5 | Investigate the potential extension of Mooramba Road to Ibis Road and Wyong Road, to support traffic circulation to the east of Tuggerah station. It is recommended that a detailed cost estimate is undertaken to provide further clarity on the project's viability. | High | Short | Council |
| 6 | Investigate and advocate for the potential road widening of the Pacific Highway from Johns Road to Myrtle Terrace. Options include the use of the existing road space dedicated to cycling with an alternate cycling facility provided, or major road widening works. Additional modelling is required to further understand the future need. | Medium | Long | Council/TfNSW |
| 7 | Investigate and advocate for the potential road widening of Wyong Road from the Pacific Motorway to Gavenlock Road. Traffic modelling is required to further understand the future need. | Medium | Long | Council/TfNSW |
| 8 | Advocate for the expedited delivery of the Warnervale Link Road | High | Short | Council/TfNSW |

Figure 6.3: Road and Freight Opportunities



### 6.1.4. Parking

The following opportunities have been identified for improving parking in the area.

Table 6.4: Recommended Parking Actions

| Ref | Recommended Action | Priority | Timing | Responsibility |
|---|---|---|---|---|
| - | Review minimum and maximum parking requirements in the DCP as part of Council's ongoing work to update its DCP and LEP following the development of the LSPS, with the view of adjusting parking rates to support planned development while managing the on-street parking resource. This includes removing minimum parking requirements to encourage innovative development design that promotes public and active transport | High | Short | Council |
| - | Undertake regular parking surveys to evaluate parking demand to identify whether parking management interventions are required in Tuggerah and Wyong town centres and surrounding lands | Medium | Short | Council |
| - | Implement the recommended actions from Central Coast Council's *Car Parking Study and Implementation Plan 2020*, including:<br>▪ Investigating rollout of smart parking technology such as parking sensors, license plate recognition technology and digital wayfinding signage<br>▪ Use of the NSW Government's ParknPay app to ensure consistency and ease of use for customers state-wide<br>▪ Demand-responsive parking management, including the use of demand-responsive pricing to manage parking demand<br>▪ Repurpose long-stay parking to short-stay parking and other land uses in and near activity centres | High | Short to medium | Council |

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