

Merimbula Transport Study

Context Report

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Prepared for
Bega Valley Shire Council

30 November 2023



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Glossary

Term	Meaning
ABS	Australian Bureau of Statistics
BEI	Built Environment Indicators
BVS	Bega Valley Shire Council
CBD	Central Business District
FT56	Future Transport Strategy 2056
LGA	Local Government Area
LoS	Level of Service
LSPS	Local Strategic Planning Statement
SA2	Statistical Area 2
TfNSW	Transport for NSW

1 Introduction

1.1 Transport Study purpose

The Merimbula Transport Study is a key planning document for transport infrastructure prioritisation and implementation. The Study delivers and is a direct outcome of Action 8.1 of the Bega Valley Shire Local Strategic Planning Statement (LSPS), which identifies the need to develop a study that will inform a place-based plan for the Merimbula area that considers all modes of transport. It is intended to form part of the Shire-wide future transport strategy and also be key input to the Place Based Area plan for Merimbula.

A successful Transport Study is one that considers all transport needs of the community and visitors, now and in the future, and integrates with the great places that the Shire and the region offers.

The principal study area for the Transport Study is focused on the Merimbula Central Business District (CBD) and Fishpen Precinct, as shown in **Figure 1-1**. The assessment will consider the study area in the context of its surroundings, including connections to neighbouring towns and regional hubs.

1.2 Place-based approach

Places represent locations where people conduct any type of activities from working to resting. Places have different forms of meaning to people including places of convenience, conducting business, socialising and deep histories and heritage. Place values are important to preserve and enhance as it reinforces belonging in the community. It is important to understand place as well as movement before considering changes to either as they are intrinsically linked.

In partnership with the Government Architect NSW, Transport for NSW (TfNSW) has developed the Practitioners Guide to Movement and Place for use on NSW Government projects. The objective of Movement and Place is to achieve roads and streets that:

- > Contribute to the network of public space within a location, where people can live healthy, productive lives, meet each other, interact, and go about their daily activities.
- > Are enhanced by transport and have the appropriate space allocation to move people and goods safely and efficiently, and connect places together. Balancing movement and place recognises that trade-offs may be required to achieve a best fit for the objectives.

The NSW Movement and Place Framework includes five built environment themes. These themes are shown below and are used as organising principles throughout this Study.

Theme	Description
Access and connection	Walkable or accessible neighbourhoods, cycle routes and public transport support equitable movement around and between places
Amenity and use	Providing a diversity of uses, both public and private spaces, a variety of activities at different times of day
Green and blue	Trees, landscapes and water help to cool places in sustainable ways
Comfort and safety	Safe places with clear air, sun, shade, peaceful parks and active streets are important to great places. If places are pleasant, we use them and care for them. Roads and street environments cater for all users and minimise the risk of death and serious injury
Character and form	The identity of a place is perceived through its built form, landscape character, and the contributions of people over time. Culture and histories shape our everyday environments.

The application of the Movement and Place framework in the Merimbula Transport Study is outlined in **Table 1-1**.

The Movement and Place approach Steps 1 to 5 are provided in the *Context Report* (this document), and Step 6 is provided in the Recommendations Report.

Table 1-1 Place based Transport Study methodology

Step #	Movement and Place framework step	Aim	Methodology
1	Establish the vision, objectives and evaluation criteria	A shared, place-based vision applied to the study area and incorporates the aspirations of relevant local and State government agencies as well as the people, communities, businesses, and other organisations connected with the place.	- Stakeholder consultation - Strategic context review.
2	Understand place	The aim of this step is that Movement and Place practitioners and project stakeholders establish an evidence-based, shared understanding of the places that will be affected by the project or plan and can therefore better understand the implications of achieving the vision and objectives identified in Step 1, and identify existing gaps in performance.	- Stakeholder consultation - Site inspection - Strategic context review - Assessment and summary.
3	Understand movement	The aim of this step is to understand how transport networks are integrated with land use and public space within the study area, and how they serve users' needs.	- Stakeholder consultation - Site inspection - Strategic context review - Assessment and summary.
4	Overlay and discuss conflicts, issues, and opportunities	The aim of this step is to identify the issues and opportunities associated with achieving the vision and objectives, based on the evidence and understanding gained in the previous steps.	Summarise findings from steps 2 and 3.
5	Develop options	The aim of this step is to develop a range of options for achieving the vision and objectives identified in Step 1, taking into account the issues and opportunities identified in Step 4 (together, defined as the 'problem').	- Draft transport options using all previous steps - Address vision, objectives and evaluation criteria.
6	Choose the preferred option/s.	The aim of this step is to identify and agree on a preferred option (or discrete set of options) that best address the issues and opportunities and achieve the vision and objectives.	Public exhibition.

Source: NSW Government, *Movement and Place practitioners Guide*

1.3 Stakeholder consultation

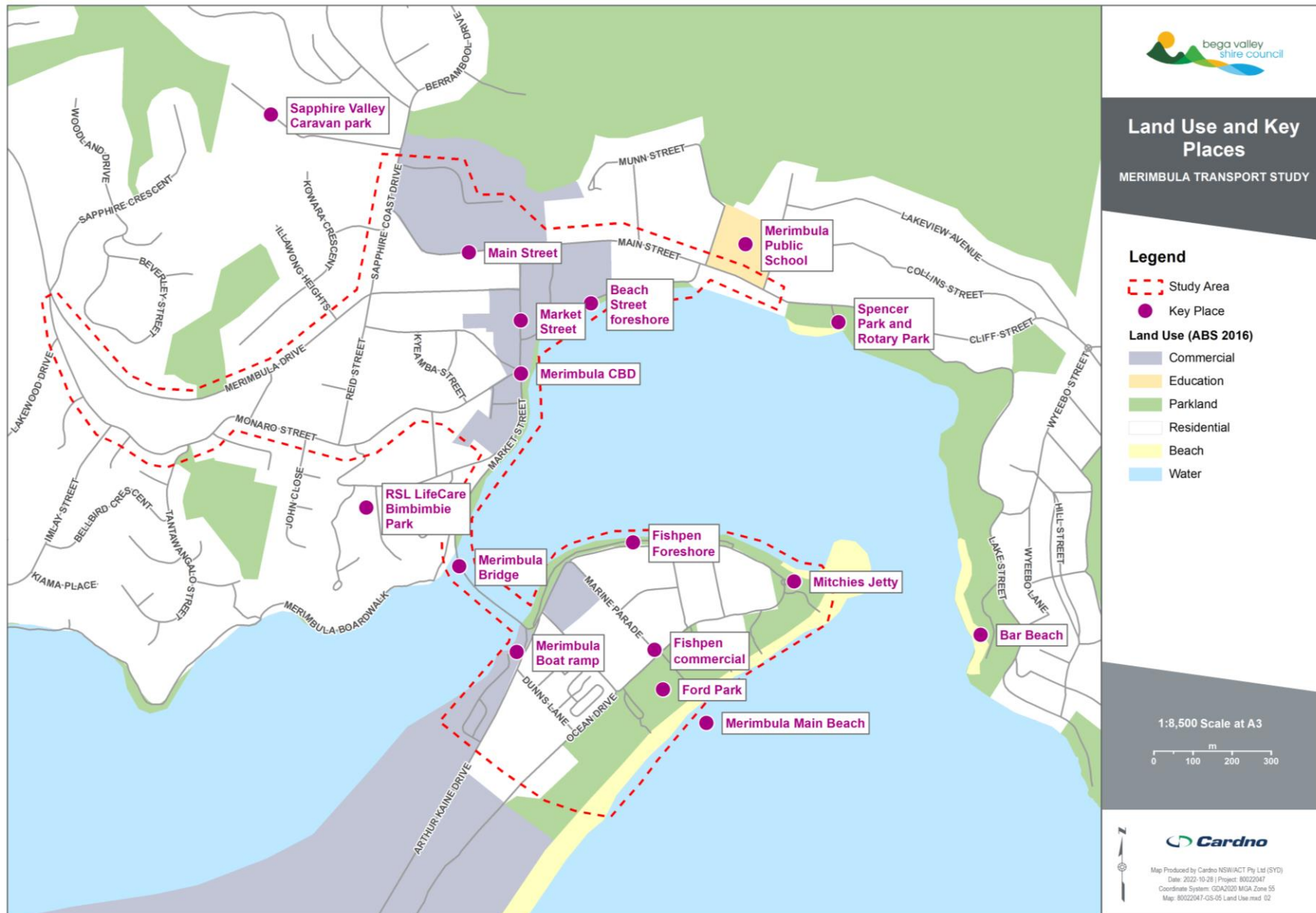
The Merimbula Transport Study is informed by stakeholder engagement across a variety of platforms. The *Consultation Summary Report* contains the summary of all engagement activities and can be found appended to the *Final Recommendations Report*.

Stakeholder engagement activities undertaken for the development of the Transport Study are explained in **Table 1-2**.

Table 1-2 Stakeholder engagement activities

Movement and Place framework step	Consultation activities	Stakeholder groups involved
1. Establish the vision, objectives and evaluation criteria		
2. Understand place	Community consultation web portal.	- Bega Valley Shire Council - Transport for NSW
3. Understand movement	Council web portal	Community members
4. Overlay and discuss conflicts, issues, and opportunities	Stakeholder and community workshops.	- Transport operators - Chamber of Commerce.
5. Develop options		
6. Choose the preferred option/s.	Public exhibition	Community.

Figure 1-1 Land use and key places



2 Strategic Context

The purpose of the Merimbula Transport Study is to guide transport investment and policy making. It needs to incorporate relevant state government plans and programs, and align with existing local government strategies as well as previous community consultation. It is important to understand the aspirations and planning directions for the town at both a local and regional scale to increase buy-in for all stakeholders.

2.1 State Government Context

2.1.1 Future Transport Strategy 2056, TfNSW, 2020

TfNSW's Future Transport Strategy 2056 (FT56) presents the overarching guide for transport investment over the next 40 years in the state. FT56 is underpinned by the concept of Movement and Place, and promotes a place-based approach when planning for communities. Three customer and network outcomes are promoted: customer focus, successful places for communities and enabling economic activity. The Strategy also outlines the importance of embracing new technologies including intelligent transport systems, processing of big data to deliver better outcomes and supporting electric and autonomous vehicles.

The transport network in NSW needs to be adaptable to the following emerging trends:

- > Connected and autonomous vehicles
- > Micromobility devices for short trips
- > Emerging aviation technologies
- > Transport powered by alternative fuels.

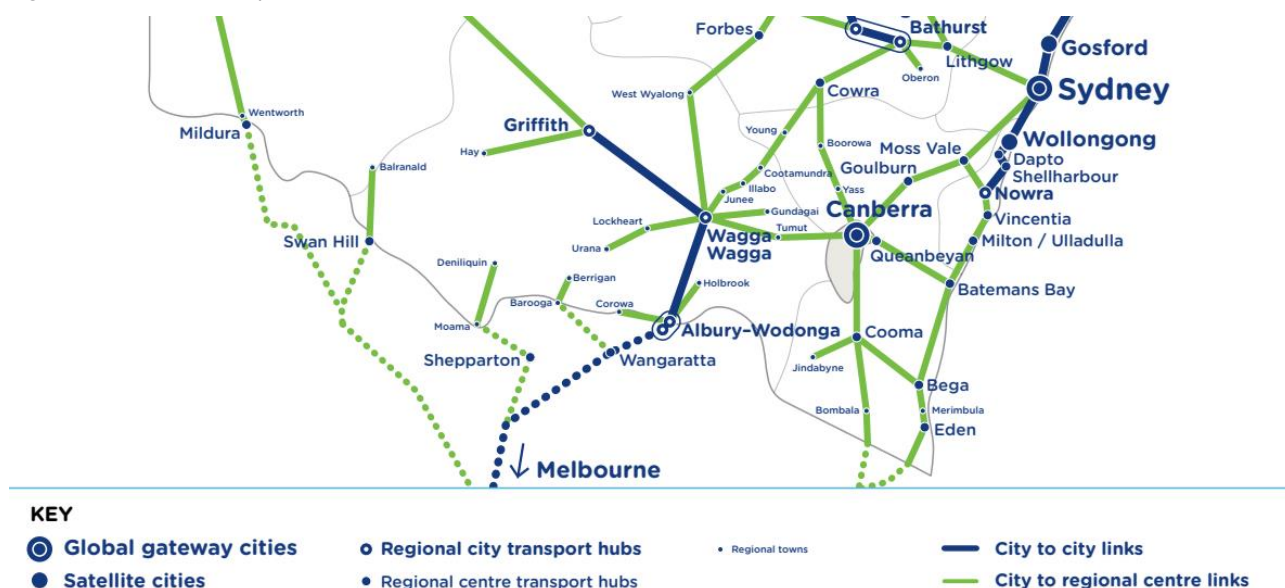
2.1.2 Regional NSW Services and Infrastructure Plan

The Regional NSW Services and Infrastructure Plan is the state government's blueprint for planning transport in regional NSW to 2056. It is a supporting plan of FT56, setting the vision and customer outcomes for regional NSW and supporting decision making.

The Plan identifies Bega and Eden as regional centre transport hub, and Merimbula as a regional town within the South East Tablelands. Merimbula is connected to these transport hubs via 'city to regional centre links' as described in the hub and spoke transport model shown in **Figure 2-1**.

The region is identified as being within the global gateway city, Canberra's area of influence, which provides high quality access to major services and facilities such as Level 1 hospitals, major education and international travel and trade gateways.

Figure 2-1 Hub and spoke model



Source: Regional NSW Services and Infrastructure Plan, TfNSW

2.1.3 South East and Tablelands Regional Plan 2036, NSW Government Planning and Environment, 2017

The South East Tablelands Regional Plan is the NSW Government's guiding document for land use planning priorities and decision making to 2036. The vision for the South East Tablelands region is:

"A borderless region in Australia's most geographically diverse natural environment with the nation's capital at its heart". To achieve this, four goals and associated directions for the region are developed:

1. A connected and prosperous economy
2. A diverse environment interconnected by biodiversity corridors
3. Healthy and connected communities
4. Environmentally sustainable housing choices

Priority growth sectors to diversify the economy in the Region are tourism, agriculture and aquaculture, freight and logistics, health, disability and aged care, public administration and defence, education and training, and renewable energy.

Merimbula is identified as a major coastal town within the region, servicing large numbers of tourists and experiencing a three-fold boost in population during summer peak periods.

Under the first goal of a connected and prosperous community, the Plan states that the networking of Canberra's international airport into the regions, such as via Merimbula Airport, increases exposure to greater market sectors. A recommended action is to plan for compatible and complementary economic development opportunities around Merimbula Airport. Additionally, the Port of Eden expansion is vital to the local economy and will require improved transport linkages as a global gateway.

The NSW Government is supporting Merimbula and its surrounding area through the following investments:

- > \$187 million for the South East Regional Hospital at Bega
- > \$44 million to extend the breakwater wharf at the Port of Eden.

2.1.4 Revitalising Eden Harbour Program, Port Authority of New South Wales

The Port Authority of NSW is leading the coordination of the Revitalising Eden Harbour Program, supported by the following projects:

- > Safe Harbour Project, TfNSW
- > Eden Harbourside Activation Project, Department of Planning, Industry and Environment.

The Program includes the Eden Welcome Centre, which will facilitate the movement of over 100,000 cruise passengers to the local region each year.

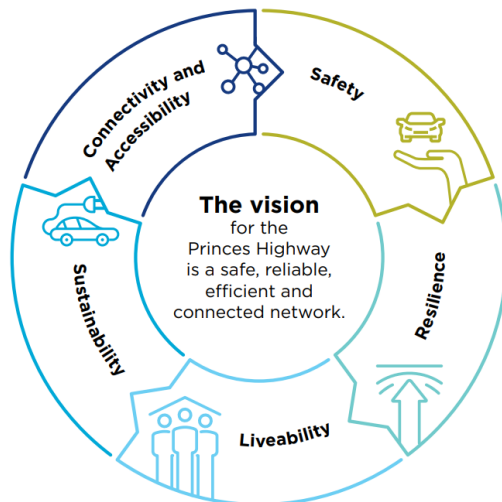
Expansion of the Eden Cruise Wharf was completed in 2019, allowing passenger vessels of up to 325 metres in length to berth at the wharf. It is estimated that this expansion contributes significantly to economic growth in the region, including the addition of 80 jobs in the tourism, hospitality and industrial sectors. Currently cruises are not operating out of Eden.

2.1.5 Princes Highway Upgrade Roadmap to 2040, TfNSW

The Australian and NSW Government has committed \$1.5 billion towards the upgrade of the Princes Highway between Nowra and the Victorian border. The nationally significant route is a key link in NSW's economic prosperity, servicing the needs of industry and employment, locals and tourists.

The vision for the highway and five key drivers of the upgrade are presented in **Figure 2-2**.

Figure 2-2 Princes Highway Upgrade vision



Source: Princes Highway Upgrade Roadmap to 2040, TfNSW

The following service priorities are identified for the Princes Highway:

- > Improved signage and wayfinding
- > Intelligent traffic management technologies
- > Improved public and active transport
- > Improved rest and service areas
- > Enabled use of electric and autonomous vehicles including securing the Princes Highway as an electric car super highway.

2.1.6 Older Persons Transport and Mobility Plan 2018 – 2022, Transport for NSW, 2019

The Older Persons Transport and Mobility Plan supports the TfNSW Future Transport Strategy's core objective of access for all, addressing the challenges that people may experience as they age. Actions to give effect to this are delivered in four broad outcomes:

- > Keeping active and connected with the community
- > Staying safe
- > Being informed
- > Maintaining independence.

2.2 Local Government Context

2.2.1 Bega Valley Shire Community Strategic Plan 2040, Bega Valley Shire Council, 2020

The Community Strategic Plan defines the priorities and aspirations of the community, and can be used by all individuals and authorities to build a stronger and better Shire.

The community vision for the Shire is:

"By working together, the Bega Valley Shire community integrates quality of life, enterprising business, sustainable development and conservation of the environment".

The vision and the Plan was developed with extensive engagement activities with the community and integrates with the state government's South East Tablelands Regional Plan.

Six outcomes with associated goals and strategies were identified during community engagement. The relevant elements are outlined in **Table 2-1**.

Within the Shire, lack of public transport infrastructure and services makes it difficult for people to travel for work education and social opportunities. The community desires better connected towns through active and public transport, the existing small town atmosphere maintained and improved sustainable living. There is also a desire for greater access to public recreation spaces likes beaches and reserves.

Table 2-1 Community Strategic Plan outcomes

Outcomes	Relevant goals	Relevant strategies
Active and healthy communities	- We are co-operative, caring and enjoy a culturally rich community life. - We are an active, healthy community with access to good quality recreation and sporting facilities, and medical health care.	- Collaborate with partners to provide and support opportunities for social interaction, cultural industries, activities and events and care and services for disadvantaged people. - Improve the accessibility of the built environment, recreation spaces and facilities. - Collaborate with partners to provide facilities, activities and services that encourage more people to have active and healthy lifestyles.
Employment and learning opportunities	Our economy is prosperous, diverse and supported by innovative and creative businesses.	Collaborate with relevant parties to develop and enhance the economic opportunities provided by the development of the Port of Eden, Merimbula Airport, East West freight corridor, and tourism services and facilities.
Sustainable living	Our air and water is pristine and our natural environment and rural landscapes are protected.	Adopt sustainable design principles in the planning of our urban areas and infrastructure provision, and encourage sustainable buildings and lifestyles.
Liveable places	- Our Shire continues to be a vibrant, enjoyable, safe and affordable place to live. - Our places retain their character and scale, development is well planned, and a range of goods and services are available within our Shire that meet local needs.	- Provide proactive programs and support organisations and services that respond to the safety needs of our community. - Improve the presentation, maintenance and physical accessibility of existing facilities and towns. - Provide infrastructure and services to meet the ranging needs of residents in our towns, villages and rural areas. - Encourage and support local identity, heritage and character in our towns, villages and rural areas.
Connected communities	- We have opportunities to work, learn and socialise through the provision of affordable public transport and telecommunications services. - We have a network of good quality roads, foot paths and cycleways connecting communities throughout the Shire and beyond.	- Advocate for relevant parties to develop better public transport options that are convenient, easily accessible and affordable. - Collaborate with relevant parties to grow the passenger numbers through Merimbula Airport. - Improve connectivity between, and physical accessibility within, our towns and villages. - Advocate for decision makers to provide better road, sea and air connections to areas outside the Shire.
Strong, consultative leadership	We are an informed and engaged community with a transparent, consultative and responsive Council.	- Lead, govern and regulate in an ethical, equitable, transparent and accountable way. - Inform our community about things that affect their daily lives using relevant and varied communication channels.

2.2.2 Local Strategic Planning Statement 2040, Bega Valley Shire Council, 2020

The Local Strategic Planning Statement (LSPS) provides Council's direction for land use and planning in the Shire over next 20 years.

Key challenges:	Key opportunities:
> Distance between settlements means that residents are highly dependent on private vehicles > Inaccessible and disconnected public and active transport infrastructure > Development pressure on the coast > Economic growth and diversification > Climate resilience and adaptation > Accommodating and servicing the ageing population > Maintaining town centre vibrancy > Pressure on communities and transport infrastructure during peak tourism periods > Preservation of unique bridges and wharves > Lack of access to recreation and open spaces	> Leveraging the global economy through Canberra international airport > Natural advantage promotes tourism, eco-tourism, forestry, aquaculture and marine economy > The Port of Eden is a gateway to the region delivering significant tourism benefits > Merimbula Airport expansion will increase accessibility for the region including for national and international markets > South East Regional Hospital (Bega) drives regional economic and residential growth including seniors living opportunities > Tertiary education opportunities in Bega > Merimbula is identified as an area of high probability of Aboriginal cultural heritage values

The LSPS provides 12 planning priorities to achieve the following 20 year visions:

- > **Community vision:** By working together, the Bega Valley Shire community integrates quality of life, enterprising business, sustainable development and conservation of the environment.
- > **Land use vision:** Land use in the Bega Valley Shire supports the activities, infrastructure and natural environment that enhance our quality of life and enable us to become more resilient to challenges.

Specifically for Merimbula, the LSPS documents the following 2040 vision:

The Coastal atmosphere of Merimbula as a vibrant seaside destination has been enhanced by orienting commercial development towards the lake, prioritising pedestrians and improving public open space.

The desired future character for Merimbula is expressed as features to protect, enhance and change:

Protect	> Key elements within the streetscape including sculpture and mature trees, view corridors to the lake and ocean and access to Merimbula Lake are retained. > Public views of Merimbula Lake, Back Lake and the ocean from Merimbula Drive on the approach into town are protected. The natural forested backdrop has been protected to retain the coastal bushland setting.
Enhance	> Development on all approaches to the town contributes to the sense of arrival. > Laneways and arcades provide connectivity and opportunities for boutique shopping, alfresco dining, seating and landscaping within a compact and clearly defined town centre that is easy to navigate where night time activation and temporary uses are encouraged. > Streetscape elements such as awnings and signage are well-articulated and proportioned. > New connections within the open space network around Merimbula Lake have been created and pedestrian connectivity to Mirador and Tura Beach has been improved.
Change	> Market Street and the lake foreshore is the physical and perceptual heart of the commercial centre. > Market Street (between Merimbula Drive and Beach Street) is a high pedestrian area, with a focus on boutique shopping, al fresco dining and children's play areas.

Table 2-2 LSPS planning priorities, directions and actions

Planning priority	Planning priority description	Relevant future directions	Relevant actions
2. Natural hazards	People, land and infrastructure are well positioned to face natural hazards	Plan for transport network improvements to improve emergency evacuation routes.	Develop adaptation and hazard response plans for communities subject to high natural hazards
3. Carbon neutral	Our community, environment and economy have actively responded to the threat of climate change and the Shire continues to work towards the goal of being carbon neutral by 2050	Support the establishment of new and innovative industries, initiatives and technologies that reduce emissions including waste diversion and recycling, alternative fuel vehicles, walking and cycling, co-working/ tele-commuter hubs, agricultural innovation and improved telecommunications.	Update planning controls to encourage incorporation of technology into new developments including micro gridding, energy efficiency, virtual gridding, electric vehicles and internet of things capability
7. Tourism	The natural and cultural assets of the Shire have been enhanced to create a flourishing year-round tourism industry supporting local employment in a wide range of associated businesses	Support expansion of walking, cycling tourism and accessible tourism through prioritised development of the shared path and cycle network and implementation of the BVSC Disability Inclusion Action Plan.	- Collaborate with relevant parties to identify and foster opportunities for embarkation and disembarkation facilities around wharf infrastructure to support marine-based tourism - Review Council's Use of Public Land policy to identify opportunities to encourage al fresco dining and streamline the assessment of temporary uses, events and markets - Review land use plans and policies to support extensions and upgrades to accessible and inclusive infrastructure, telecommunications and interactive technologies
8. Transport	The attractiveness, sustainability and success of our Shire is enhanced by the accessible and reliable transport network which enables the movement of people and goods and provides travel choices including walking, cycling and public transport	- Implement the NSW Movement and Place Framework in towns and villages to create vibrant streets, places for people and prioritise walking and cycling within communities. - Increase opportunities for and investment in foot and bike path connections, wider footpaths, kerb ramps, pedestrian crossings, disabled parking and mobility-scooter parking spaces. - Identify locations and planning controls for drop-off zones, parking and charging facilities to accommodate the growth in autonomous vehicles and electric vehicles. - Continue to advocate for delivery of accessible and affordable transport equity in the Bega Valley Shire. - Give priority to extending our shared network via grants and community/ business partnerships.	- Conduct Merimbula Transport Study to inform a place-based area plan and to ensure all transport modes are considered - Develop a plan for renewing and upgrading key transport infrastructure - Work collaboratively with Transport for NSW to implement the NSW 'Movement and Place' Framework in towns and villages and to develop and implement a comprehensive Transport Strategy for Bega Valley including Active Transport, local commuter, tourism and freight linkages - Review planning and subdivision controls to ensure a highly connected local street network with footpaths or shared paths connecting to town centres and recreation areas

Planning priority	Planning priority description	Relevant future directions	Relevant actions
			- Implement improved provisions for off-street car and bicycle parking and electric vehicle charging stations for commercial and residential development - Review and implement the Merimbula Airport Masterplan to ensure an integrated transport network that meets the changing and growing needs of the community, including potential capacity for light electric aircraft
9. Open space and recreation	A network of green spaces has created healthier and more liveable towns and villages and public places attract people of all ages and abilities to socialise, engage in arts and culture and be active and healthy	- Investigate ways to reconfigure public open space to relocate parking away from the immediate foreshore and prioritise public access and open space in key foreshore areas. - Continue to improve the accessibility of Council managed public open space and venues. - Continue to require the dedication of land and construction of public facilities with large residential land releases and public art with large commercial developments. - Identify opportunities to undertake accessibility and amenity upgrades in major town centres. - Support the development of Place Making Plans in partnership with communities to plan, design and manage public spaces and town centres. - Prioritise well-designed natural and built shade in the delivery of all public infrastructure and spaces and support the provision of well-chosen and well-placed street trees in residential or public domain developments.	- Review the Plans of Management for Council land to maximise use of public open space - Review the adequacy and quality of open space and public areas to support infill urban renewal strategies in Bega, Eden and Merimbula
12. Town centres	The vibrant and progressive town centres are attractive, green and clean and provide places for living, entertainment and socialising as well as access to a wide variety of shops and services	- Promote the role of Bega as the regional centre and primary administrative and service centre for the Shire. - Enhance town centres through improved connectivity and accessibility, streetscaping improvements, provision of gathering spaces, seating, shade and public toilets and tree plantings.	- Prepare a place-based area plan for Merimbula - Investigate opportunities for CBD parklands in Merimbula, Eden and Pambula

2.2.3 Commercial Land Strategy 2040, Bega Valley Shire Council, 2020

The Commercial Land Strategy provides a framework for the planning of commercial centres over the next 20 years, with a focus on encouraging employment opportunities within vibrant activated commercial environments. The Strategy aligns with the Community Strategic Plan's vision and the South East Tablelands Regional Plan, and was considered in the development of the LSPS.

The Strategy adopts a principle of Place-making to guide the recommendations for each of the commercial centres. This equates to authenticity of the centre and maintaining the unique feeling of a place that makes it special to live in and visit.

Merimbula/ Tura Beach is identified as a major centre supporting Bega as the regional centre, providing higher order goods and services including specialty shops, bulky goods, health and professional services. Nearby to Merimbula, Eden, Tathra and Pambula are considered local centres, which rely on tourism and service a residential catchment.

Table 2-3 Business land and vacancy rates, Merimbula/ Tura Beach October 2019*

	Zone	Area/ proportion of total
Business zones	B1 Neighbourhood Centre (Tura Beach)	7.5 hectares
	B2 Local Centre (Merimbula)	11.8 hectares
	B4 Mixed Use (Merimbula)	14.4 hectares
Maximum building height	Zone B1 (Tura Beach)	10 metres
	Zone B2/ Zone B4 (Merimbula)	10 metres/13 metres/16 metres
Non-commercial properties (vacant or residential use)	Zone B1 (Tura Beach) 2.4 hectares (32.0%)	2.4 hectares (32.0%)
	Zone B2 (Merimbula) 1.5 hectares (0%)	1.5 hectares (0%)
	Zone B4 (Merimbula) 5.1 hectares (35.4%)	5.1 hectares (35.4%)
Vacancy rate	Zone B1 (Tura Beach) 5.9%	5.9%
	Zone B2 (Merimbula) 22%	22%

*Estimated areas of vacant business zoned land include allotments that are currently occupied by a non-commercial use such as a dwelling or visitor accommodation or have not been built upon. Vacancy rates are the number of unoccupied constructed commercial premises as a proportion of total premises.

Source: Commercial Land Strategy, BVSC, 2020

Priorities for Merimbula are to support growth and development in the major centre through prioritised pedestrian access on Market Street and Beach Street and maximised access to open space and the natural environment. Easy navigation of the centre will support the night time economy.

2.2.4 Disability Inclusion Action Plan 2021 – 2025, Bega Valley Shire Council, 2021

The Bega Valley Shire Disability Inclusion Action Plan (DIAP) documents Council's commitment to the consideration of the needs of people living with disability in all planning and operations. Council's goal is to assist all people with disability to live full, meaningful lives and to participate fully in the community.

The Plan states that around 11 per cent of tourists to the Sapphire Coast are living with a disability or long term health condition, and this number is set to grow. It is therefore imperative that the future transport network addresses the needs of all people.

The Plan develops specific actions and measures to achieve this goal aligning with four themes set out in the NSW Disability Inclusion Plan, which are:

1. Developing positive community attitudes and behaviours
2. Creating liveable communities (this theme has relevant transport related actions)
3. Supporting access to meaningful employment
4. Improving access to mainstream services through better systems and processes.

Relevant actions from theme #2 are outlined in **Table 2-4**.

Table 2-4 Relevant Disability Inclusion Action Plan actions (Theme 2: Creating liveable communities)

Action	Measure	Outcome
2b. Review land use plans and policies to support improvements to accessible and inclusive infrastructure, telecommunications, and interactive technologies	- Land use plans and policies reviewed and updated. - AIAC and key community stakeholders consulted re proposed improvements to accessible and inclusive infrastructure, telecommunications, and interactive technologies	Incremental/ gradual improvement to inclusive infrastructure, telecommunications, and interactive technologies
2c. Work with Transport for NSW to implement the NSW 'Movement and Place' Framework in towns and villages and to develop and implement a Transport Strategy for Bega Valley	- Transport strategy implemented as per guidance/ consultation with Transport NSW. - Funding opportunities identified to support investment in foot and bike path connections, wider footpaths, kerb ramps, pedestrian crossings, disabled parking, and mobility-scooter parking spaces. - Gradual, increased investment made in foot and bike path connections, wider footpaths, kerb ramps, pedestrian crossings, disabled parking, and mobility-scooter parking spaces. - AIAC and key community stakeholders consulted in the development and delivery of projects and strategies under the framework. - Merimbula Transport Study outcomes informed a place-based area plan and to ensure all transport modes are considered. - Development of the shared path and cycle network is a priority to support expansion of walking, cycling tourism and accessible tourism. - Movement & Place' project spaces strategically activated.	- Improved accessible options across a range of different transport modes in the Bega Valley Shire. - Increased opportunities for active transport. - Increased social connectivity - Increased social capital and shared sense of 'place'. - Optimal utilisation of active transport projects.
2d. Advocate for delivery of accessible and affordable transport equity and other services in the Bega Valley Shire	Advocacy submissions made to external authorities.	Improved options across a range of different transport modes in the Bega Valley Shire.
2i. Develop and implement a car parking action plan	- Action plan developed that provides a prioritised list of works and activities within budget to improve parking accessibility. - An annual percentage increase in parking accessibility.	- Increased number of accessible parking options across the shire. - Increased community awareness of location and purpose of accessible parking spaces.
2j. Continue to improve the accessibility of Council managed public open space and venues and identify opportunities to undertake accessibility and amenity upgrades in major town centres.	- Funding opportunities identified to upgrade town centres. - Number of Council managed public locations and venues with improved public accessibility. - Review and improve signage and wayfinding in public venues and spaces	- Overall increase in public accessibility across the shire. - Increased community awareness of the scope of accessibility and amenity upgrades delivered by Council across the shire.

2.2.5 Climate Resilience Strategy 2050, Bega Valley Shire Council, 2020

The Bega Valley Shire Climate Strategy aims to strengthen the existing activities, projects and programs already contributing to positive sustainability outcomes and identifies ways to further secure a climate resilient Shire. Council's goal is to support the community with economic, social and environmental sustainability and resilience, by preparing for the impacts of climate change.

The BVSC Climate Resilience Strategy makes the following comments on future sustainability:

- > The climate of the Bega Valley Shire is expected to become hotter and rainfall more erratic
- > Climate change will exacerbate existing vulnerabilities in the Shire and create new threats
- > It is expected that the number and intensity of severe storms, bushfires and floods will increase
- > The long coastline leaves the Shire vulnerable to coastal erosion and inundation
- > Key vulnerabilities of the Shire include lack of public transport and connectivity between and within settlements.

The Bega Valley Shire Council has committed to a net zero emissions target by 2050 and an interim 100 per cent renewable electricity target by 2030.

The strategy focuses on initiatives and issues that are within Council's influence, including environmental management activities, infrastructure energy efficiency water supply, land use planning, natural hazard planning and local economy. Relevant climate resilient actions under the Liveable and connected places key response area are provided in **Table 2-5**.

Table 2-5 Climate resilient actions

#	Relevant climate resilient action	Timeframe	Cost
Liveable and connected places			
L1	Apply smart growth and climate ready principles to new development.	Ongoing	Nil
L3	Place based planning for key town centres with a focus on adapting them for a warming climate.	Short	Low
L4	Implement BVSC Bike Plan with a key focus on improving pedestrian and cycling connectivity between residential areas, town centres, schools and open space networks.	Ongoing	Med
L5	Implement street tree, open space and parkland tree planting program across all towns and villages to mitigate heat stress.	Short	Low
L7	Expand urban ecosystem restoration program to villages and connectivity to adjoining natural areas.	Short	Low
L10	Ensure rural residential development adjoins existing development, does not increase infrastructure network, hazard exposure or car reliance.	Ongoing	Nil
L14	Identification of strategic land acquisition / dedication priorities for key public access, facility expansion or critical environmental assets.	Short	Low

2.2.6 CBD Landscape Masterplan, Spiire, 2015

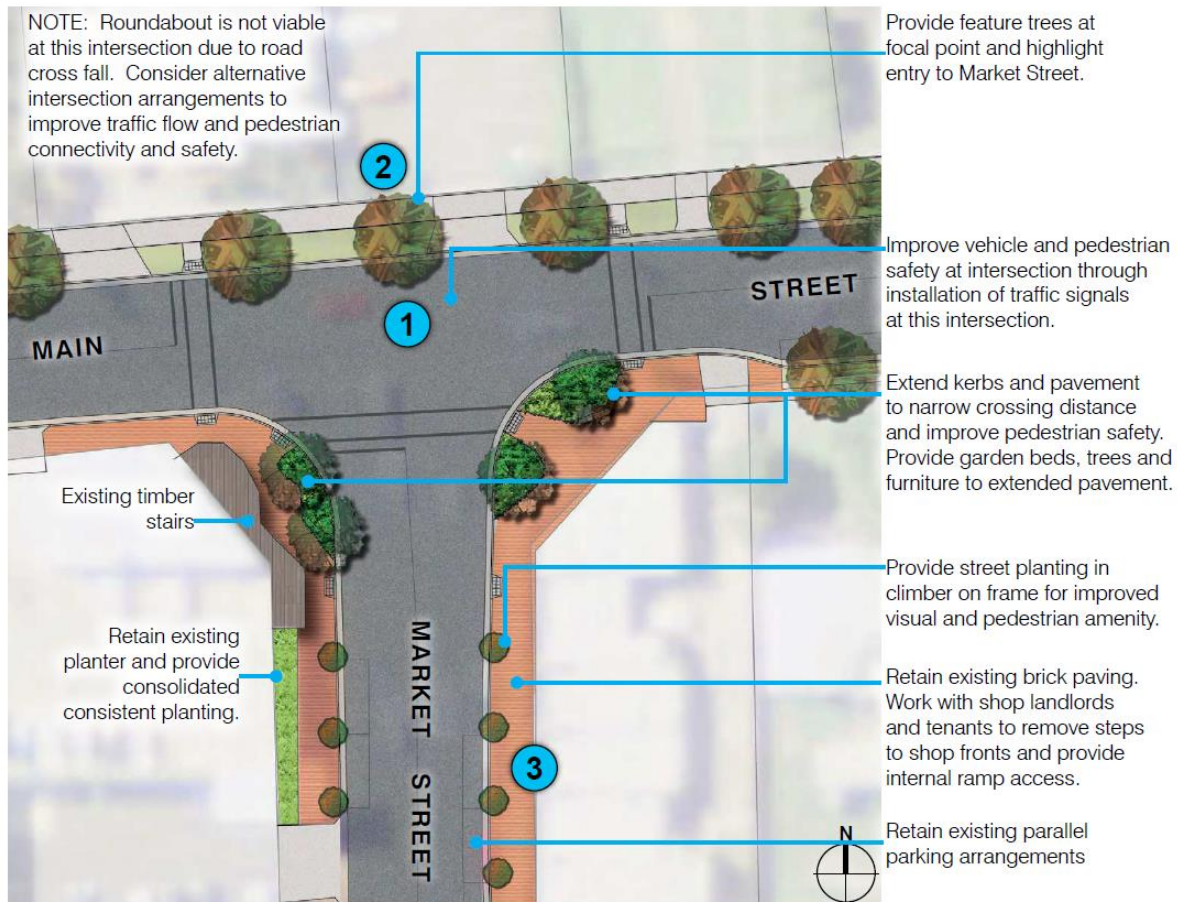
The Merimbula CBD Masterplan aims to:

- > Provide comfortable spaces
- > Connect and allow animation of the public space
- > Enable improved economic activity
- > Provide for cultural diversity and expression
- > Provide robust and sustainable outcomes.

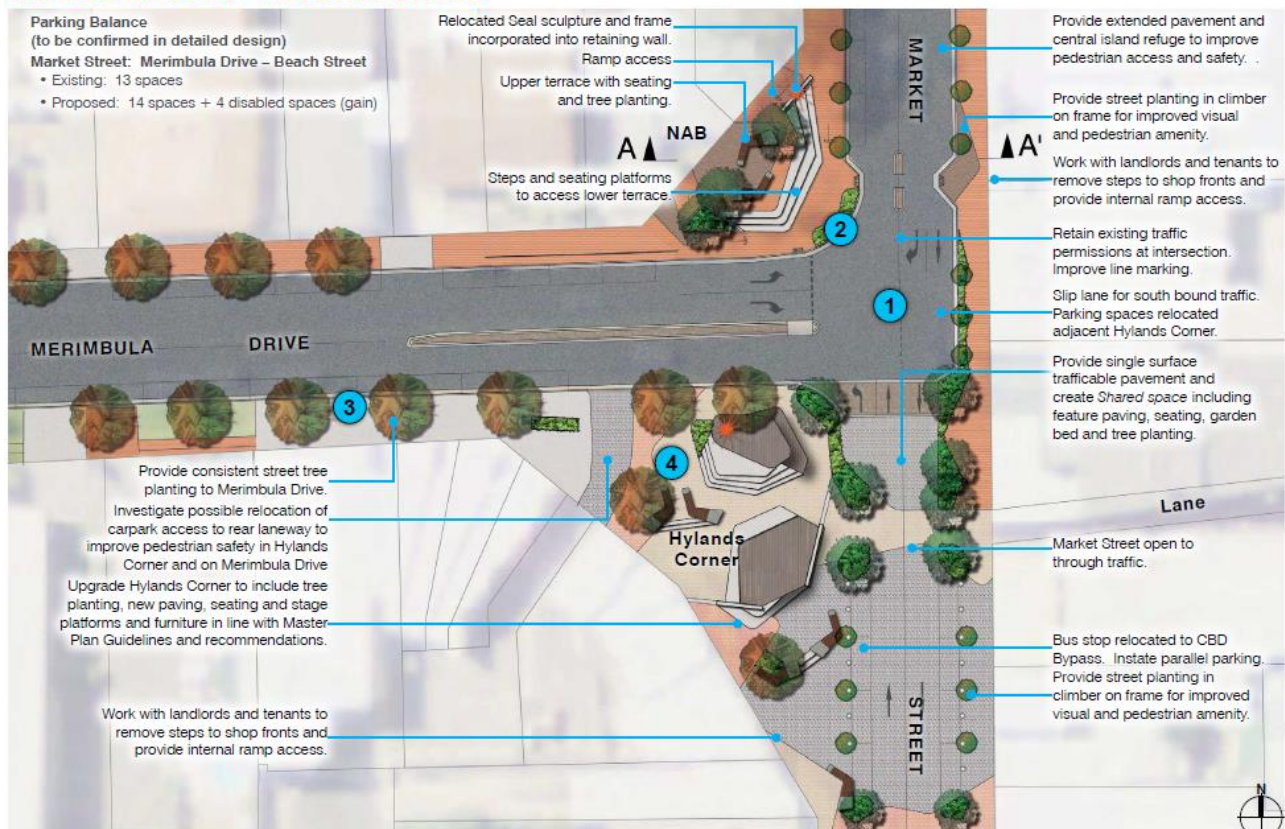
Six key recommendations are outlined for the Priority 1 Areas, shown in **Figure 2-3**.

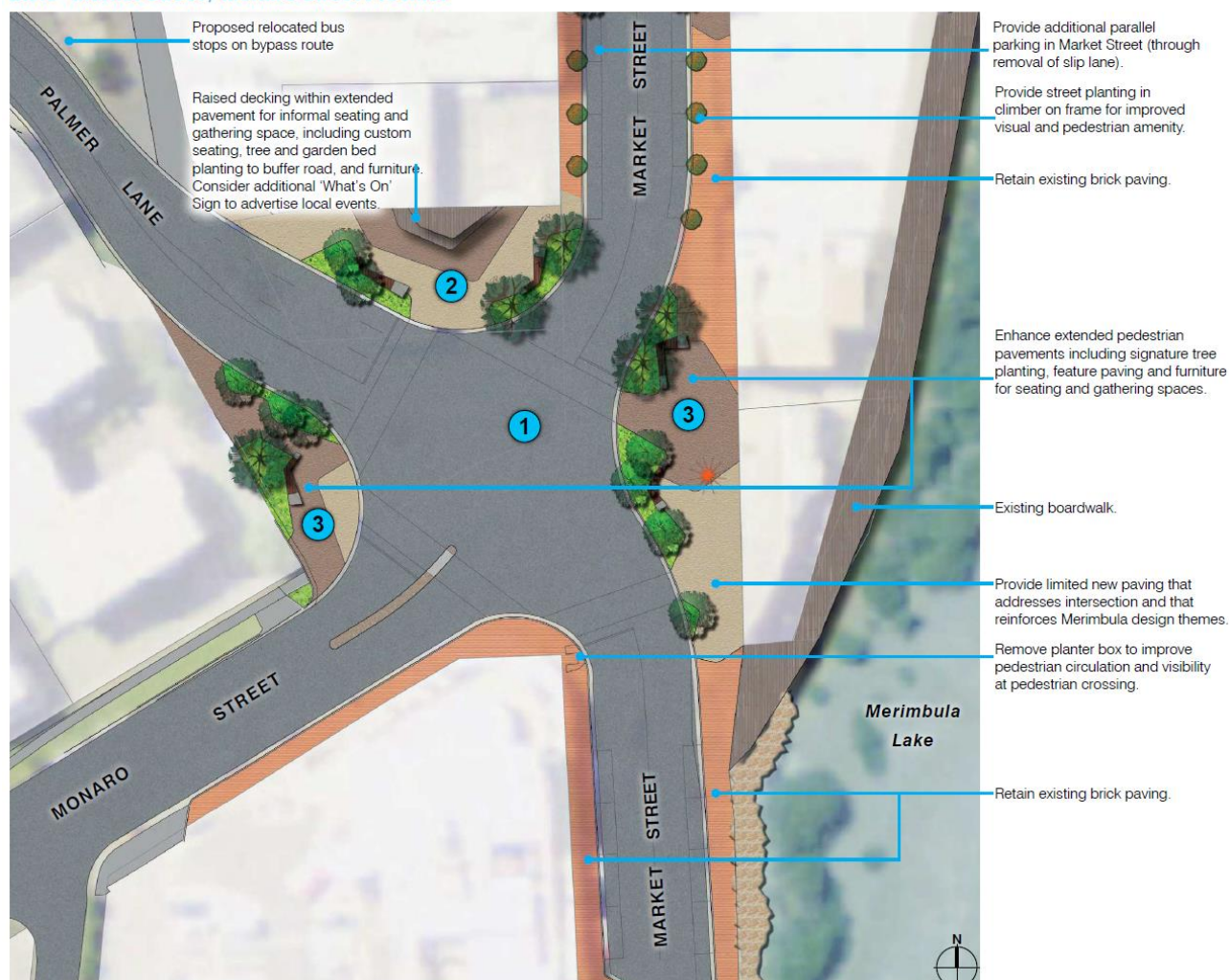
Figure 2-3 Merimbula CBD Masterplan

2.5.3 Main Street / Market Street Precinct



2.5.4 Merimbula Drive / Market Street Precinct





2.2.7 Bike Plan, Bega Valley Shire

The Bega Valley Shire Bike Plan identifies the importance of cycling in the LGA and outlines the plan to achieve the following five goals:

1. Goal 1: Provide and manage a safe and enjoyable cycling experience through practical network development with improved facilities, connectivity and continuity
2. Goal 2: Raise safety awareness and education amongst cyclists and road users
3. Goal 3: Support and advocate cycling as an alternate mode of transport and recreation opportunity throughout the Shire
4. Goal 4: Communicate, promote and fund cycling and related facilities to user groups and the community
5. Goal 5: Improve and advocate bicycle tourism and economic opportunities.

Cycling is encouraged in the Shire because of the many benefits it offers the community, including transport efficiency, reduced costs in capital expenditure such as parking provisions, reduction in greenhouse gas emissions, improved health outcomes and economic and social improvements for individuals and communities. The Plan states that active communities are likely to be more connected and able to participate in a productive way, and benefit from reduced car dependence.

Consultation with the community and targeted cycling groups within the Shire was undertaken through a survey. The survey indicated that safety concerns, poor quality/ standard of cycle lanes, lack of connectivity of paths and cycle lanes and the lack of end of trip facilities were the key barriers preventing mode choice of cycling in the Shire. Key improvements that would encourage cycling in the Shire are provision of cycle paths connecting towns and provisions of designated cycling infrastructure.

The Bike Plan proposes rural on-road cycleways between Tathra, Merimbula and Eden (Route 3 and Route 4). Other proposed routes within Merimbula are shown in **Figure 2-4**.

Key issues identified in implementing cycling in Merimbula are:

- > Bridges that don't have adequate width for cycling infrastructure
- > Sections of private land that decrease permeability and connectivity between the towns of Tura Beach/ Mirador/ Merimbula/ Eden Cove
- > Availability of funding
- > Difficulty in retrofitting infrastructure on main roads.

An Active Transport Strategy is in development and will encompass a review of the Bike Plan and consider other modes of active transport.

Figure 2-4 Bega Valley Shire Bike Plan: Merimbula – Tura Beach Cycleway Network





3 Vision, Objectives and Evaluation Criteria

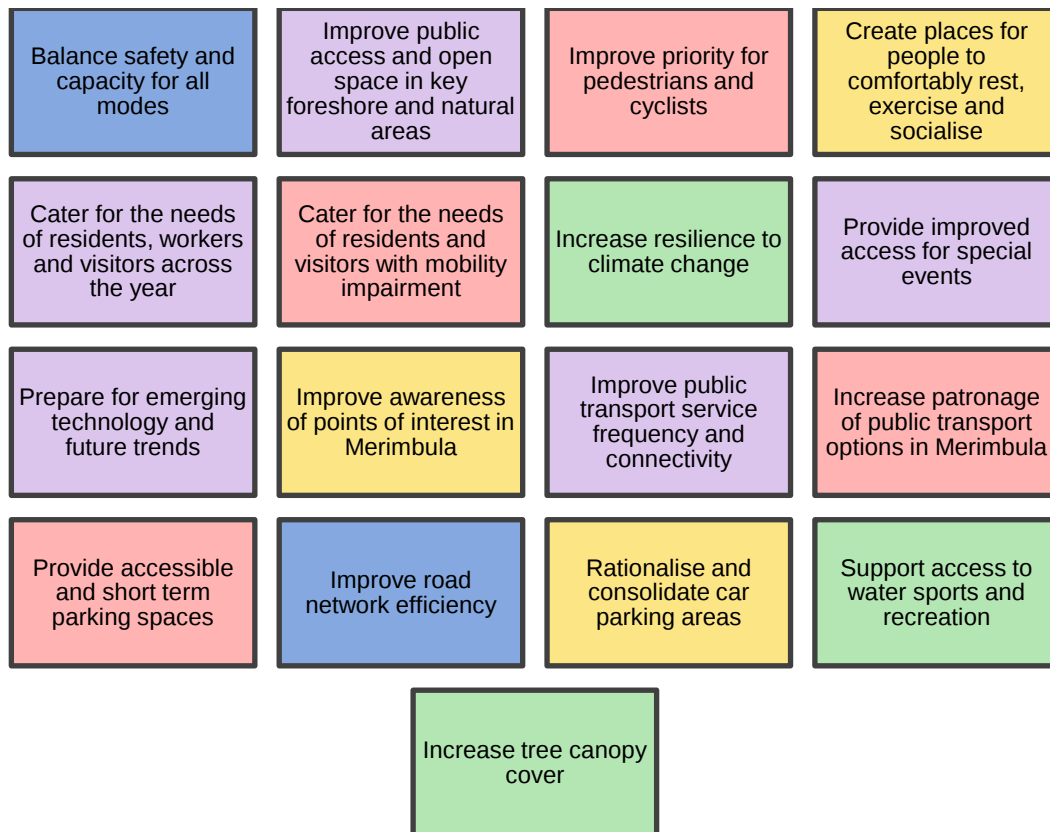
The vision for Merimbula adopted by Council in the Local Strategic Planning Statement (LSPS) incorporates the aspirations of communities, businesses and other local organisations for the town and is adopted for this Study. The objectives list the desired qualitative outcomes that have been derived from the vision, and also reflect outcomes of community and stakeholder consultation undertaken in this study.

Transport Plan Vision

Vision 2040 (LSPS)

The coastal atmosphere of Merimbula as a vibrant seaside destination has been enhanced by orienting commercial development towards the lake, prioritising pedestrians and improving public open space.

Transport Plan objectives

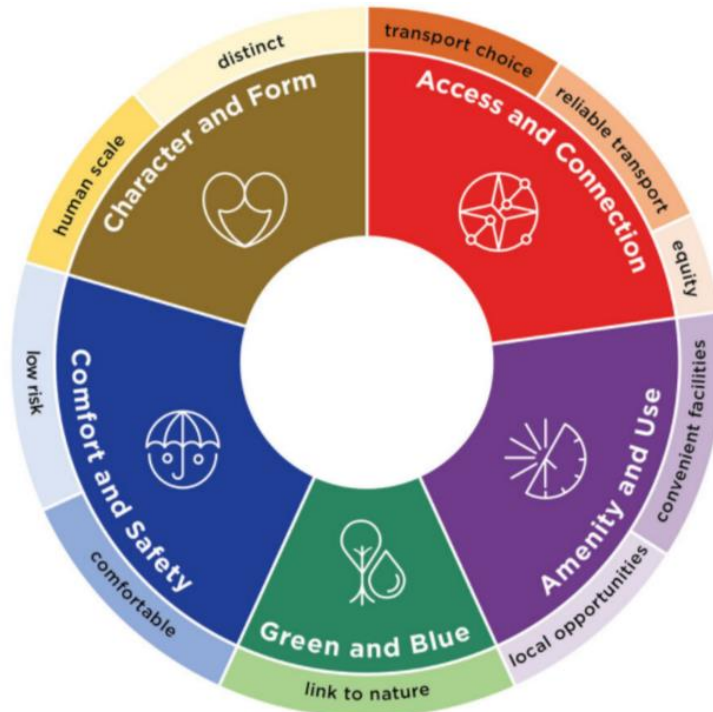


Note: the colours correspond to the built environment indicators explained in the next section.

Evaluation criteria

The NSW Movement and Place Framework has established a set of 36 built environment performance indicators (BEI) for evaluating Movement and Place projects. The Indicators consist of a set of 36 indicators under five themes relating to user outcomes. These themes are shown in **Figure 3-1**.

Figure 3-1 Built environment indicators



Source: NSW Government, Movement and Place

Relevant BEIs from the five themes were selected to best reflect the planning direction for Merimbula. The Context Report sections, Understanding Movement and Understanding Place detail existing conditions relating to the BEIs. The recommended actions provided in the **Merimbula Transport Study Recommendations Report** address the gap between the desired future and current context, and aim to improve outcomes for each of the BEIs. **Table 3-1** shows the most relevant BEIs used for gap analysis and to compare options.

Table 3-1 Built environment indicators

Theme	Description	Relevant indicators
Access and connection	Transport choice, reliable transport and equity (of access)	- Walking paths - Cycling accessibility - Equitable access
Amenity and use	Convenient facilities and local opportunities	- Public space - Places to stop and rest - Economic development
Green and blue	A link to nature	- Waterways - Tree canopy
Comfort and safety	A comfortable environment, that is low risk	- Road safety - Safe speed for environment - Pedestrian crowding
Character and form	A place that is human-scaled, that celebrates its distinct features.	- Permeability - Street space for pedestrians - Culture and heritage - Legibility

Source: TfNSW

3.2 Classifying Street Environments

Classifying street environments involves characterising road segments to better understand gap between the current and future desired state and design of a street.

Each street environment has a specific combination of movement and place function and fits within the four street environments outlined in **Figure 3-2**.

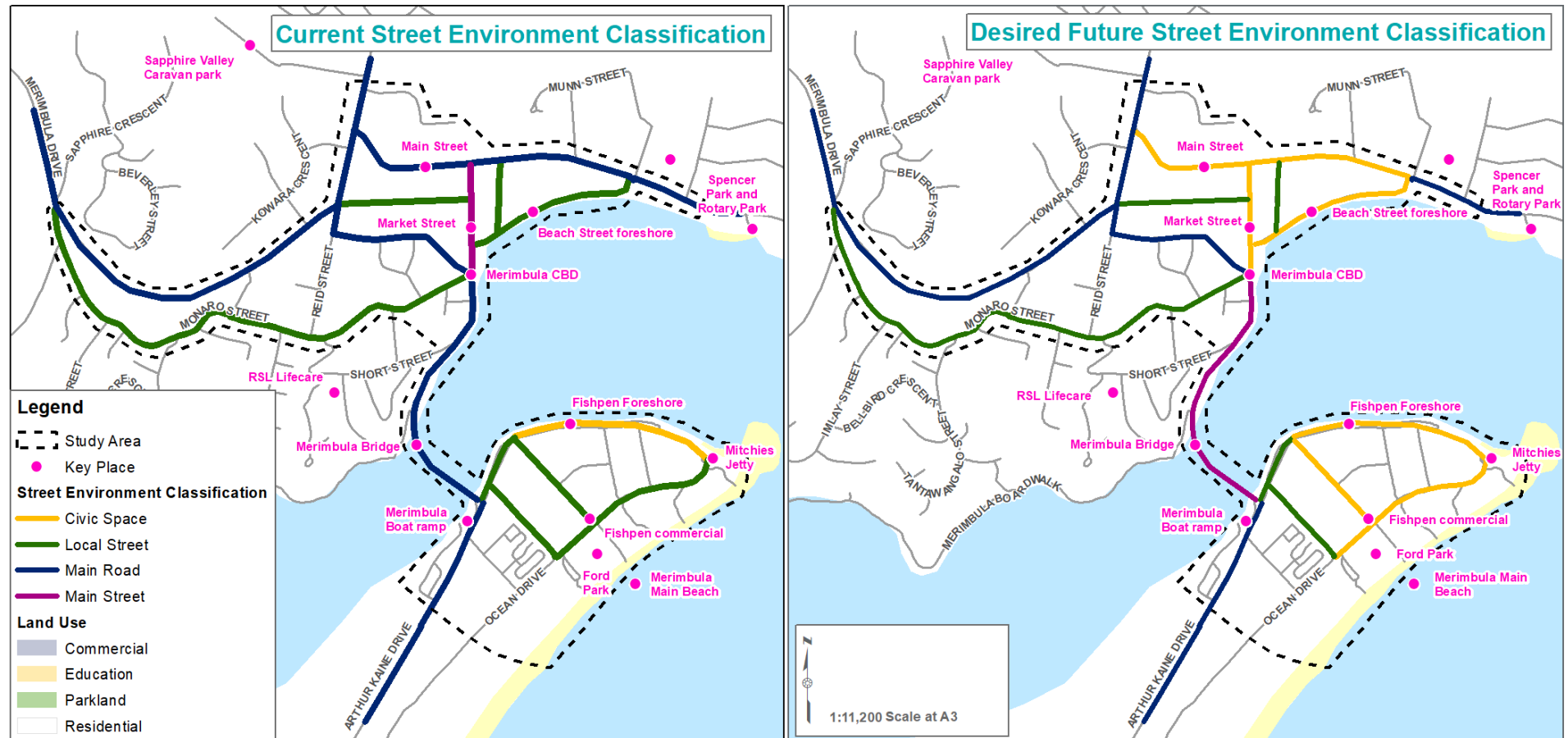
The current and desired future street classification is shown in **Figure 3-3**. This was developed through consultation with the community and stakeholders.

Figure 3-2 Street environments



Source: NSW Government Movement and Place

Figure 3-3 Street environment classification



4 Understanding Place

4.1 Key Places

This section outlines the key places within the Merimbula study area that reflect the varying land use, attractions and operations of the CBD and Fishpen Precinct, which are shown in **Figure 1-1**. The future transport network must promote connectivity and accessibility for all to these places.

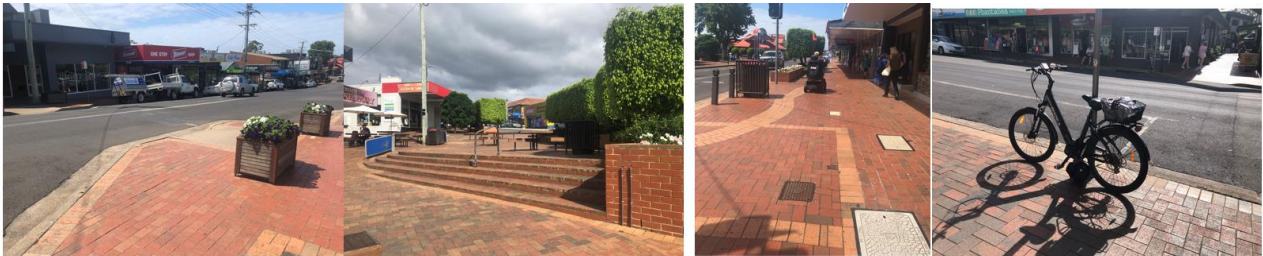
Market Street – Merimbula CBD

Market Street is a lively, busy, commercial street with a number of small businesses providing food, drink and small goods. This street experiences high levels of pedestrian traffic especially during peak tourism periods however lacks accessible crossings and prioritisation for people.

Hylands Corner is a pedestrian plaza where people gather to meet, eat and rest in the shade. Twyford Hall is a community space for theatre, art and markets and is a cultural centre in the town.

Pedestrians on Market Street also benefit from shade provided by street awnings. The northern end of Market Street is located on a steep grade.

Figure 4-1 Market Street features



Main Street – Merimbula CBD

Main Street forms part of the commercial core of Merimbula, providing access to bulky goods at Woolworths, Aldi and Mitre 10. The street environment lacks protection from trees and is highly exposed to the sun in the summer time.

Main Street would benefit from improved pedestrian crossing opportunities and amenities including provision of properly aligned kerb ramps.

Figure 4-2 Main Street features



Market Street –Merimbula Bridge and Foreshore

The Market Street foreshore and Bridge area is mainly used for panoramic view points, fishing and access for pedestrian and cyclists. The area is a popular route for walking and cycling between Fishpen and the Merimbula CBD. Access is also provided to Merimbula Marina from this location.

There is a small shoulder suitable for experienced cyclists on the Merimbula Bridge which becomes a parking lane on the northern side of the bridge. Families with children tend to cycle on the footpath which has associated conflicts with pedestrians, particularly during peak tourism season in this area.

Market Street would benefit from improved pedestrian and cyclist crossing opportunities providing increased protection from fast moving vehicles and poor sight distances.

Figure 4-3 Merimbula Bridge features



Beach Street Foreshore

The Beach Street waterfront is a popular location for boarding small boats via stairs leading to the water from the rocks. Public gym facilities are located along the foreshore along with sitting areas and shady grasslands. The War Memorial is located on the foreshore area and is a tourist attraction, however its position blocks pedestrian and cyclist access across the shared path.

The Beach Street shared path along the foreshore is a popular route for recreational cyclists including children and pedestrians.

Car parking areas located on the waterfront detract from views and provide a barrier between the community and nature.

Figure 4-4 Beach Street Foreshore features



Mitchies Jetty

Mitchies Jetty is a popular destination with calm waters suitable for families and people of all abilities to swim. The Jetty has facilities to launch small sized boats, kayaks and paddle boards. Coastlife Adventures is a local business operating close to Mitchies Jetty that provides kayaks and paddle boards. A small business offering beverages and small snacks operates at the Jetty. Fishpen Charters operates out of Mitchies Jetty, offering three, four or five hour fishing trips.

Mitchies Jetty car park is highly utilised and often full during summer peak periods.

There is a clear desire line on the grassy verges leading towards Mitchies jetty. Currently no footpaths in this locations and pedestrians must mix with vehicles.

Figure 4-5 Mitchies Jetty features



Fishpen Foreshore

The Fishpen Foreshore is a peaceful and tranquil natural interface with Merimbula Lake, providing pedestrian access for paddle boarders and small vessels. The Foreshore provides shaded picnic areas and gym equipment for people to enjoy views of the lake and the town. Properties on Fishpen Road are primarily short term stay accommodation premises. The intersection of Fishpen Road, Market Street and Arthur Kaine Drive is a key gateway to Merimbula and should be enhanced to welcome visitors and residents.

A pedestrian path is located along the foreshore, primarily used by recreational walkers and people accessing Mitchies Jetty swimming and boating area. The lack of footpath on the property side of Fishpen Road often forces pedestrians to walk on the road.

Fishpen Road is a one-way, slow speed environment providing access to accommodation premises and Mitchies jetty car park.

Parking is highly utilised during midday peak periods on Fishpen Road, and vehicles often circulate seeking parking spaces.

Each year in March, EAT Merimbula food festival takes place at the Fishpen Foreshore.

Figure 4-6 Fishpen Foreshore features



Ford Park and Merimbula Main Beach – Fishpen

Ford Park is an open green space at the interface of Merimbula Main Beach and Fishpen commercial on Ocean Drive. Ford Park was recently upgraded by Council to include a fully accessible playground with public toilets. On the western side of the park, four fully undercover basketball and netball courts are provided with seating. Ford Park also provides public barbeques and picnics areas.

Each year there is a New Years Eve and Australia Day event on in Ford Park, which includes market stalls, entertainment and activities for children. During this time, street parking is highly utilised.

Merimbula Main Beach (including Pambula Beach) is a 5.7 kilometre stretch of untouched coastline. In the northern section, Main Beach connects to the Mitchies Jetty Beach. Within Fishpen, Merimbula Main Beach is accessed through Ford Park, with a formal pedestrian access provided at the Ford Park playground.

Figure 4-7 Ford Park / Merimbula Beach features



Fishpen commercial

The Fishpen commercial area is located adjacent to Ford Park on Ocean Drive, and offers a café, a takeaway restaurant and a cycle and surf shop. This area attracts large amounts of walking and cycling trips from people staying within Fishpen, and from tourists who visit Fishpen to enjoy the many natural attractions. Many people enjoy getting takeaway food and drink from Fishpen commercial and eating it at the picnic tables and benches at Ford Park and the Fishpen Foreshore.

Street parking is provided at Ford Park and along residential roads, and is highly utilised during lunch times within peak holiday periods.

Footpaths are disconnected in this area and there is a lack of kerb ramps.

Figure 4-8 Fishpen commercial features



Bar Beach

Bar Beach is a scenic beach connecting to Merimbula Lake, offering panoramic views of Fishpen and the Beach Street Foreshore.

Access to Bar Beach is constrained due to the relatively long distance to its location on the Long Point peninsula. Bar Beach is approximately 30 minute walk and 10 minute cycle from the Merimbula CBD. The elevated boardwalk terminates before reaching Bar Beach. During peak season, parking on Lake Street and other surrounding streets is highly utilised.

Figure 4-9 Bar Beach features



Spencer Park and Rotary Park

Spencer Park and Rotary Park is a key activity generator located in close proximity to the study area. This area provides easy access for people to get into the lake for swimming and water activities and for launching small boats.

There is a missing link from Rotary Park to the shared path board walk that connects to Bar Beach.

Figure 4-10 Spencer Park and Rotary Park features



Merimbula Boat Ramp and rest area

The Merimbula Boat Ramp and rest area is located on the southern side of Merimbula Lake adjacent to the Merimbula Bridge, accessed by Arthur Kaine Drive. The Boat Ramp is used for launching small, medium and larger sized boats from vehicle trailers. A fish cleaning pontoon is also provided for visitors.

This area is also a common stop for passing vehicles because of the public bathrooms, picnic tables and rubbish bins.

Figure 4-11 Merimbula Boat Ramp features



4.1.2 Special events

The following special events attract visitors and locals to the study area:

- > Merimbula Jazz Festival – occurs yearly at various venues
- > Merimbula Rotary Markets – occurs monthly at Ford Park
- > Ford Park special events including Australia Day and New Years Eve celebrations
- > EAT Merimbula Food Festival – occurs yearly on Fishpen Foreshore
- > ANZAC Day event held on Beach Street which is closed to vehicles.

4.2 Existing Land Use

4.2.1 Tourist and recreation facilities

Merimbula Lake is key focus of the town, offering beautiful vistas and recreational activities. The study area contains a large number of tourist-based businesses including accommodation, restaurants and local shops. Many hotel accommodations are located on Merimbula Drive, west of the intersection with Reid Street. Additionally, the Merimbula Beach Holiday Resort at Short Point and the Sapphire Valley Caravan Park are key destinations for tourists.

Within Fishpen, properties are mainly made up of short term stay holiday accommodation premises and residential properties. Holiday accommodation locations within Fishpen are shown in **Figure 4-12**. Fishpen also provides a number of recreational land uses and spaces for special events that cater to people at all times of the year.

Figure 4-12 Holiday accommodation in Fishpen



Source: Bega Valley Shire Council

Local shops and restaurants are located within the CBD on Market Street and Main Street. Restaurants are also located along the Beach Street foreshore and on the Market Street foreshore. Aldi and Woolworths supermarkets are located on Main Street.

Other tourist and recreational attractions within the study area include:

- > Merimbula Aquarium and Wharf
- > Top Fun amusement business
- > Old School Museum
- > The Picture Show Man cinema.
- > Twyford Hall

4.2.2 Services

Merimbula Public School is located east of the study area at the corner of Main Street and Randolph Street. Currently 369 students are enrolled in years kinder to 6. The School enrolment area covers the suburb of Merimbula and extends north to Tura Beach and Bournda and west to Yellow Pinch. The local high school is located in the Bega regional centre.

A number of medical centres and clinics are located on Merimbula Drive and Main Street. Outside of the study area, the Pambula Health Service provides a 12 bed medical facility, and the Bega South East Regional Hospital offers increased services.

Other services within the study area include:

- > Little Nippers Child Care
- > RSL LifeCare Bimbimbie Retirement Village
- > Merimbula Public School
- > Multiple medical centres.

4.3 Regional Centres

Connectivity to regional centres is essential for Merimbula residents as they provide the health, education, retail, social and recreational services that cannot be accessed within the study area. A key limitation for the Shire is the large distances and proximity of centres, which results in heavy reliance on private vehicles.

4.3.1.1 *Bega Regional Centre*

Bega is the Shire's Regional Centre, located approximately 23 kilometres northwest, accessed either by the Princes Highway or by Sapphire Coast Drive. Bega provides cultural, administrative, retail, commercial, health and educational services to the region.

Key land uses provided in Bega include:

- > Bega Regional Sporting Facility
- > Bega High School
- > University of Wollongong campus
- > Bega TAFE
- > Bega South East Regional Hospital
- > Bega Valley Regional Gallery
- > Bega River Reserve.

4.3.1.2 *Eden*

Eden is a key centre within the Bega Valley Shire, bringing major tourist and economic benefits to the region. Eden has a predominant forestry and timber processing industry, and is the largest exporter of woodchips in Australia. The industrial precinct at Eden also consists of a navy wharf, timber processing facility, multi-purpose wharf and cargo storage facility.

The Port of Eden is NSW's southern-most deep water harbour, accommodating fishing, forestry and tourism uses. Three wharves are located at the Port, including a privately owned woodchip terminal, Royal Australian Navy wharf and Eden Cruise Wharf. The Cruise Wharf is currently not in operation.

Investment in the Port of Eden will significantly grow year-round visits to the Sapphire Coast.

4.3.1.3 *Pambula*

Pambula is an alternative high street location for people staying in Fishpen because it offers a less congested retail hub with greater parking perception. Pambula offers a similar array of shops, restaurants and recreational activities to the Merimbula study area as well as the Pambula Sports Complex, Pambula Aquatic Centre Beach. High activity generators are also present in Pambula with attractions including the Oakland Brewery, Pambula River and the Pambula-Merimbula Gold Club.

4.3.1.4 *Tathra*

Tathra is a small coastal town located approximately 19 kilometres northeast of Merimbula. Tathra is a popular tourist destination, offering beaches, headland, holiday parks and other outdoors activities.

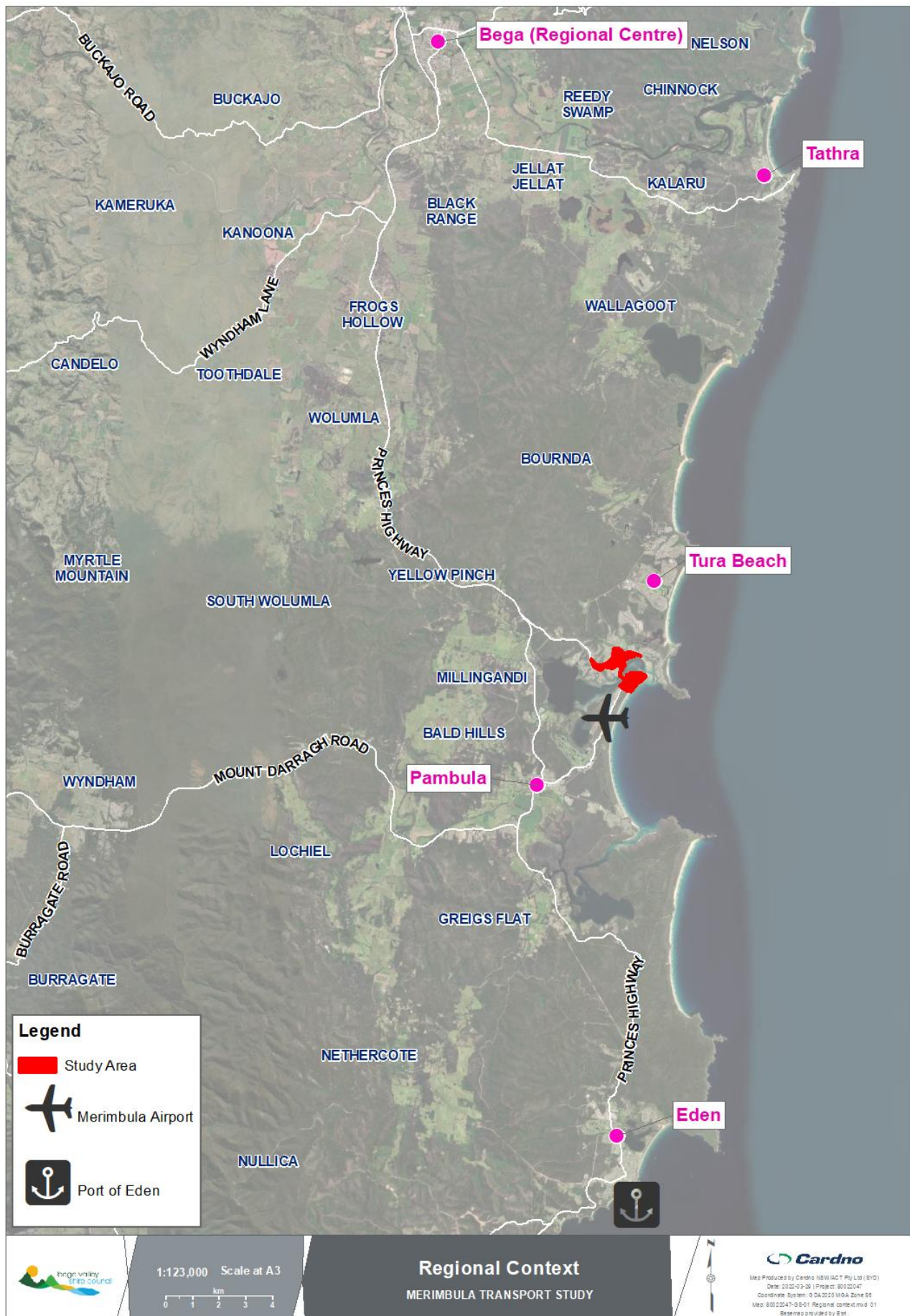
The Wharf to Wharf Walk recreational walk connects between Merimbula Wharf and Tathra Wharf via Tura Beach along a 27 kilometres of picturesque coastline.

4.3.1.5 *Tura Beach*

Tura Beach is a coastal suburb located north of Merimbula. Tura Beach Shopping Centre provides supermarket, bulky goods and fast food services.

Regional centres are shown in **Figure 4-13**.

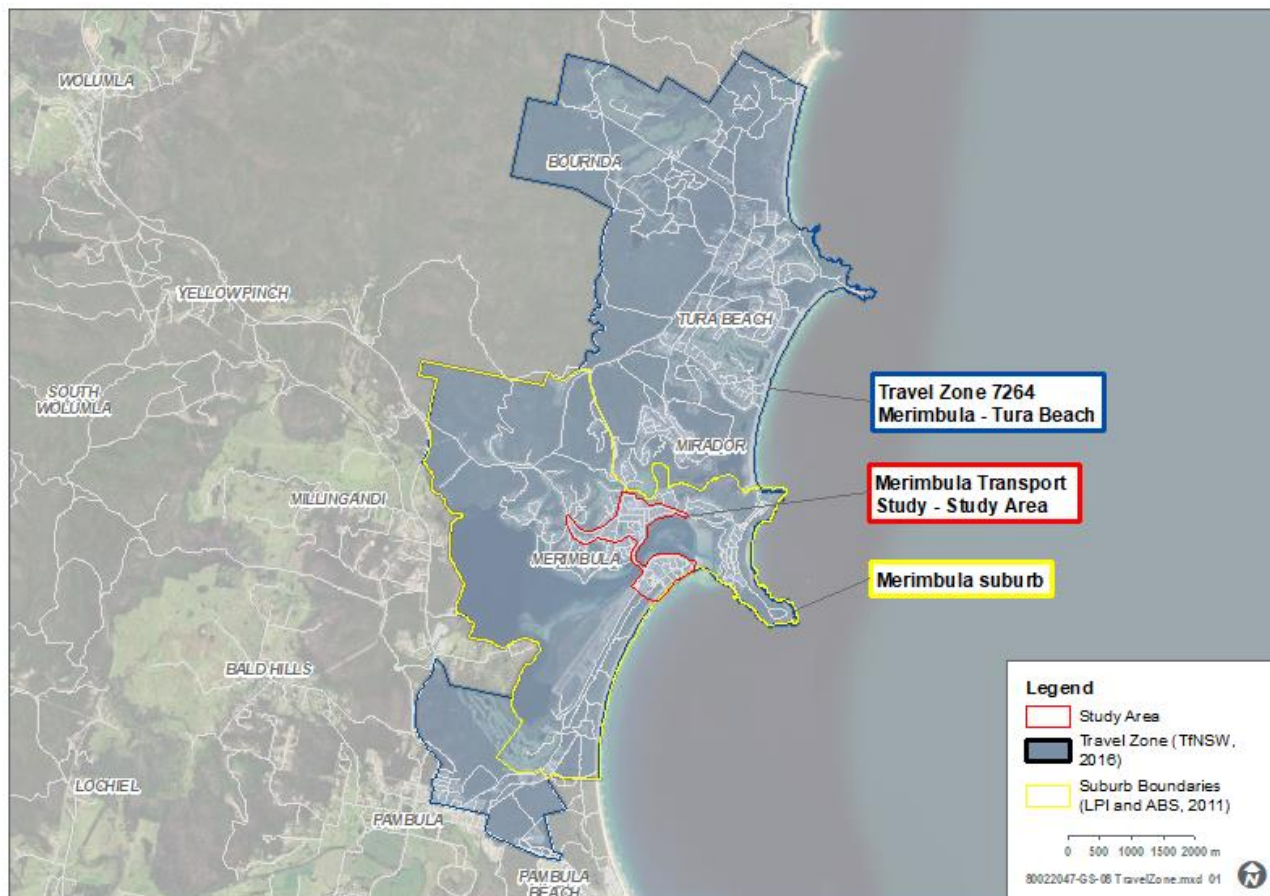
Figure 4-13 Regional centres



4.4 Population and Demographics

The Australian Bureau of Statistics (ABS) Census survey collects population data across Australia every five years. The most recent Census in 2016 is referenced in this study. The geographical areas that are referenced are shown in **Figure 4-14**.

Figure 4-14 Data analysis areas



4.4.2 Population overview

There were 3,544 residents in the suburb of Merimbula in 2016 (ABS, 2016) with a population density of around 195.8 persons per square kilometre.

Older age groups make up more than 50 per cent of the population in Merimbula, with the median age being 55, which is higher than the New South Wales median of 38. The population breakdown by age is shown in **Table 4-1**. In comparison to New South Wales, the Merimbula suburb has a lower proportion of younger people, and higher proportions of older people, with approximately double the percentage of people aged 65 years and older residing in the suburb.

Table 4-1 Merimbula suburb population demographic by age (ABS 2016)

Age group (years)	People	Percentage population	
		Merimbula suburb	New South Wales
0 – 14	383	10.8%	18.5
15 – 24	331	9.3%	12.5
25 – 34	288	8.1%	14.2
35 – 44	298	8.4%	13.4
45 – 54	456	12.9%	13.1
55 – 64	613	17.3%	11.9

Age group (years)	People	Percentage population	Percentage population
65+	1,173	33.1%	16.2
Total	3,544*		

* Note that the ABS makes small random adjustments to all values to protect the confidentiality of data, which cause the sum of data to be different by small amounts.

4.4.3 Cultural diversity

Ancestry data from ABS 2016 census shows that Merimbula residents primarily come from a European or Australian background. The top responses to ancestry being English (31.8 per cent), Australian (28.4 per cent), Irish (9.6 per cent), Scottish (8.9 per cent) and German (3.7 per cent). Less than two per cent of residents also identified as Aboriginal and/or Torres Strait Islander.

Residents' country of birth reflect that migration makes up a small portion of the population in Merimbula, with 76.5 per cent of residents born in Australia, compared to 65.5 per cent in New South Wales. English was the only spoken language in 87.6 per cent of households in Merimbula. Excluding households that did not provide a response, 6.0 per cent of households spoke a non-English language at home.

4.4.4 Household size and income

ABS 2016 shows a total of 1,514 households existed in the suburb of Merimbula, consisting of 887 families and 629 non-families. The average household size was two people, which is less than the New South Wales average of 2.6 people per household.

The median weekly income for all households was \$945 which was also lower than the median income of \$1,486 in New South Wales.

4.4.5 Education

Of people aged 15 and over in Merimbula, 73.8 per cent have obtained an education level of year nine or above (ABS, 2016). The summary of level of highest education attainment is shown in **Table 4-2**.

Table 4-2 Level of highest education attainment in Merimbula for ages 15 and above (ABS 2016)

Level of education	People	Percentage population	
		Merimbula suburb	New South Wales
Bachelor Degree level and above	478	15.2%	23.4%
Advanced Diploma and Diploma level	258	8.2%	8.9%
Certificate level IV	102	3.2%	2.8%
Certificate level III	497	25.8%	12%
Year 12	367	11.6%	15.3%
Year 11	175	5.6%	3.3%
Year 10	449	14.2%	11.5%
Certificate level II	0	0	0.1%
Certificate level I	0	0	0.0%
Year 9 or below	249	7.9%	8.4%
No educational attainment	0	0.0%	0.9%
Not stated	464	14.7%	10.3%

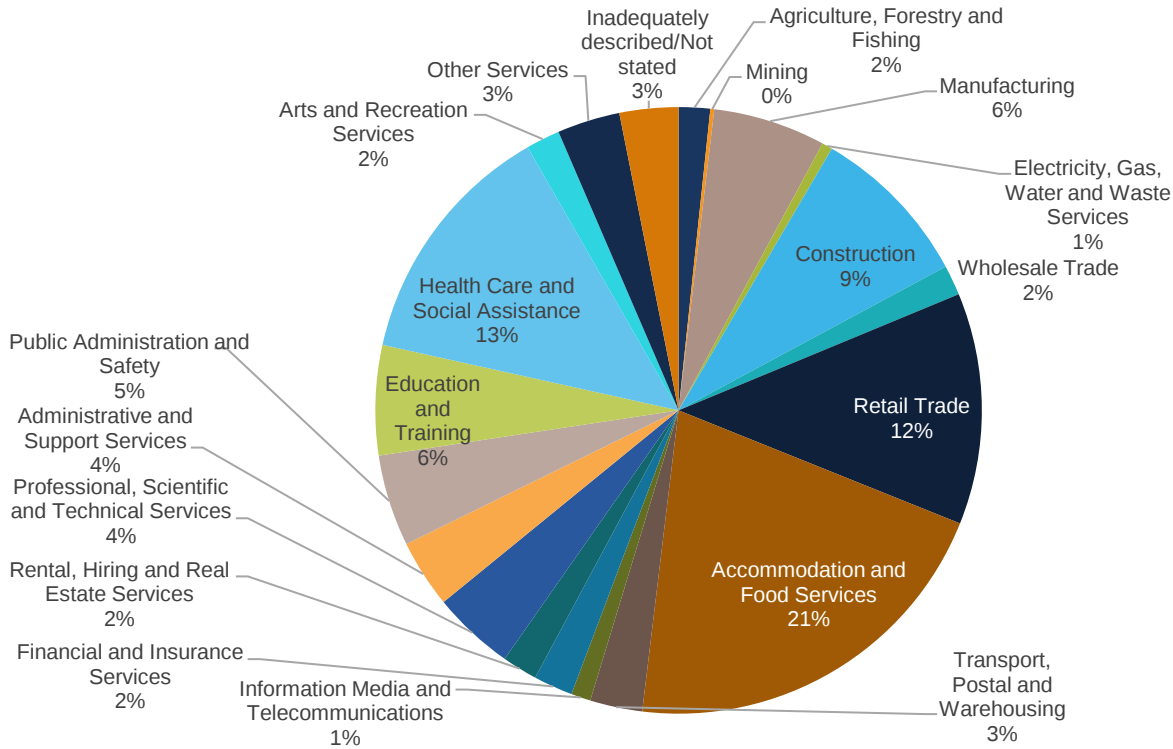
* Please note that the ABS makes small random adjustments to all values to protect the confidentiality of data, which cause the sum of data to be different by small amounts.

As of 2016, 24 per cent of the population were attending an education institution. Of those that were in an education institution, 18.5 per cent were in primary school, 18.3 per cent were in secondary school and 13.6 per cent were in a tertiary or technical institution, while the remainder did not state their institution.

4.4.6 Employment status and occupation

In the 2016 ABS census, 1,519 people were reported to be in the labour force, with a labour participation rate of 46.8 per cent (for people over the age of 15). Of those that were in the labour force, 49.9 per cent were working full time, 38.2 per cent were working part time and 5.7 per cent were unemployed. Industry of employment for the Merimbula suburb is shown in **Figure 4-15**.

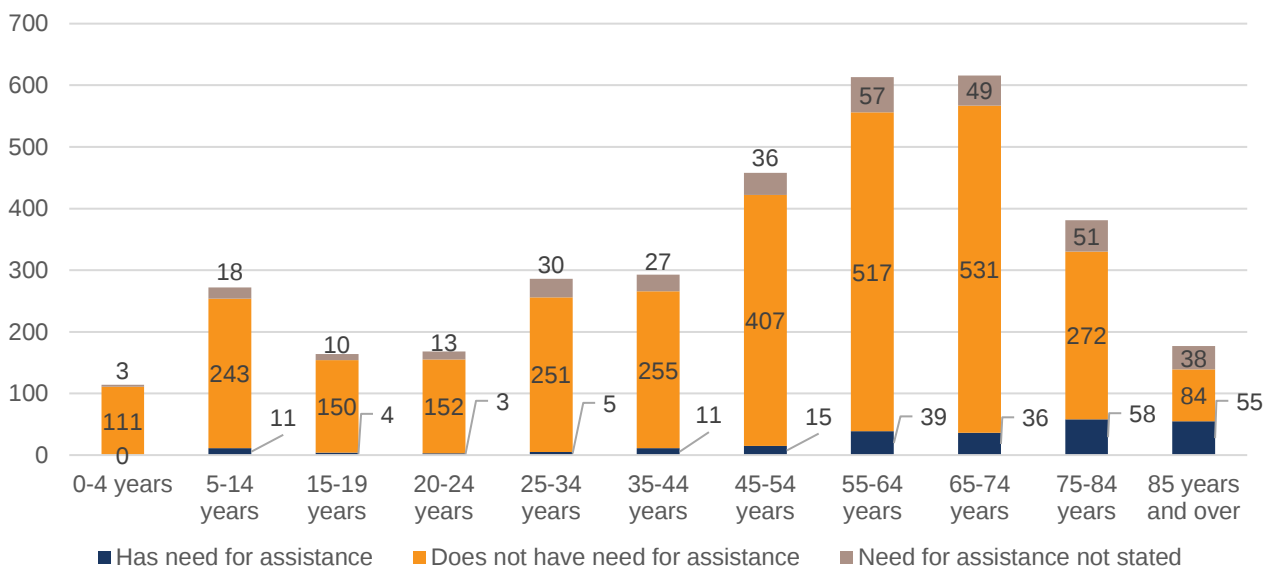
Figure 4-15 Industry of employment in Merimbula suburb, ABS 2016



4.5 Population Health

The number of people who indicated that they require personal assistance in their daily lives within the Merimbula suburb are shown in **Figure 4-16**. The largest proportions of people requiring assistance are above the age 55, accounting for 5.3 per cent of the population.

Figure 4-16 Need for assistance in Merimbula suburb, ABS 2016



Source: ABS Census, 2016

Mobility issues are a major barrier from contributing socially and economically in the community. Key features of the pedestrian network that contribute to increased participation are:

- > Accessible footpaths
- > Disability Discrimination Act compliant seating
- > Fit for purpose lighting
- > Integrated and digital wayfinding
- > Public bathrooms
- > Accessible parking spaces.

Additionally, trip hazards from uneven paving or bricks can cause injury and cause fear of walking.

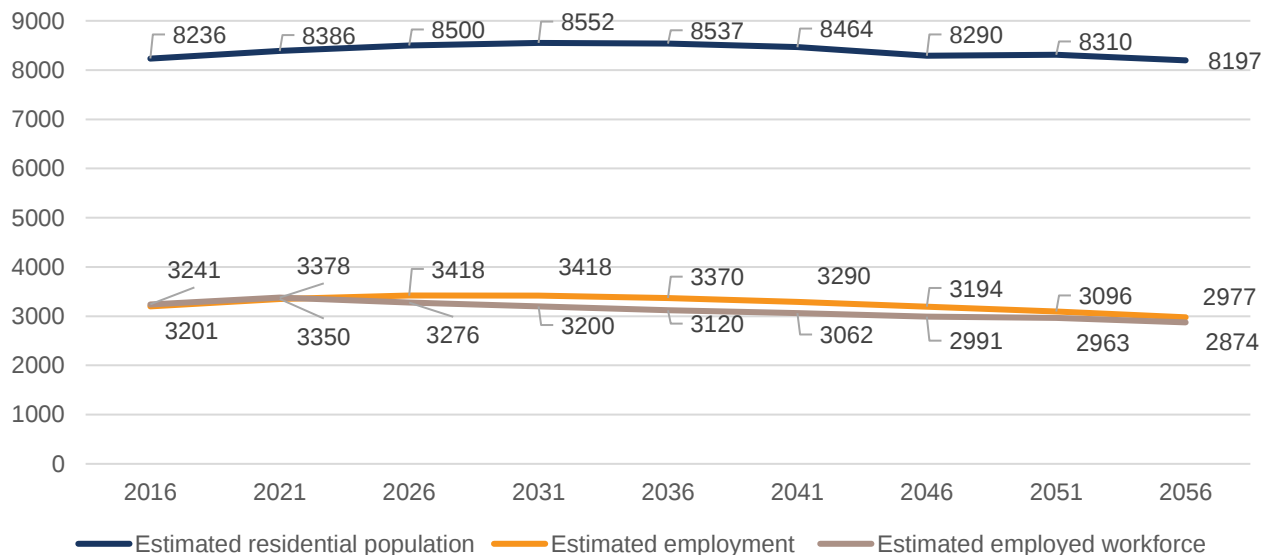
4.6 Future Context

4.6.1 Population

NSW Common Planning Assumptions are the information assets updated and developed by NSW government agencies to aid preparation of documents and reports that rely on data projections. Data from the NSW Common Planning Assumptions is used for forecasting population numbers. Population, employment and workforce projections for the Merimbula – Tura Beach travel zone (7264) are shown in **Figure 4-17**.

Forecasted data shows that over the next 20 years, the population, workforce and employment in the travel zone will remain relatively similar.

Figure 4-17 Projected population, workforce and employment (Merimbula – Tura Beach travel zone)



Source: Travel zone projections, 2019

Projected age groups show a general trends towards older groups between 2016 and 2056. In 2026, 49 per cent of people are predicted to be over the age of 55, which will increase to 52, 54 and 57 per cent in 2036, 2046 and 2056 respectively. This change in age profile indicates that Merimbula may have increased mobility implications. Projected age groups are shown in **Table 4-3**.

Table 4-3 Projected age groups (Merimbula – Tura Beach travel zone)

Years of age	2016	2026	2036	2046	2056
Less than 4	5%	4%	4%	3%	3%
5 to 9	5%	4%	4%	4%	3%
10 to 14	5%	5%	5%	4%	4%
15 to 19	5%	5%	4%	4%	4%
20 to 24	4%	3%	3%	2%	1%
25 to 29	4%	3%	3%	3%	2%
30 to 34	5%	5%	4%	4%	4%
35 to 39	4%	5%	4%	4%	3%
40 to 44	5%	5%	6%	5%	3%
45 to 49	6%	5%	6%	6%	6%
50 to 54	7%	6%	6%	7%	8%
55 to 59	9%	7%	6%	8%	10%
60 to 64	9%	9%	8%	7%	7%
65 to 69	9%	10%	9%	8%	7%
70 to 74	7%	9%	9%	9%	8%
75 to 79	5%	7%	8%	8%	7%
80 to 84	3%	4%	6%	7%	8%
85 to 89	2%	2%	3%	5%	6%
90 to 94	1%	1%	2%	2%	3%
95 to 99	0%	0%	0%	1%	1%
Over 100	0%	0%	0%	0%	0%

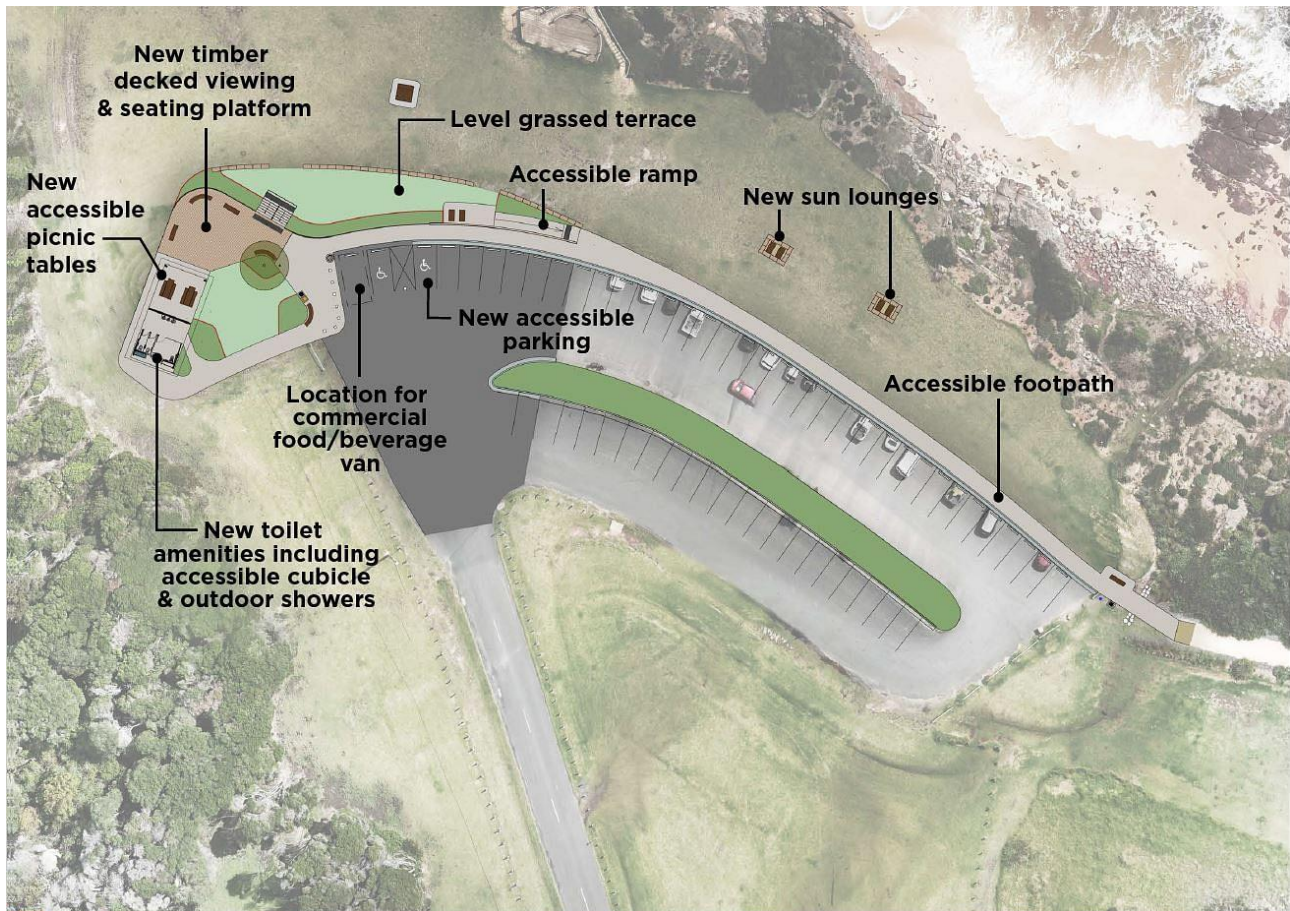
Source: Travel zone projections, 2019

4.6.2 Future development

At the time of this report, a mixed-use development application and planning proposal to increase maximum building height at the corner of Market Street and Palmer Lane is currently being assessed. This development would include commercial ground floor uses and 52 dwellings above. Through site links are proposed for pedestrian access and a range of public domain and landscaping works would be included.

Council is delivering the Short Point accessibility upgrades, depicted in **Figure 4-18**. This project promotes accessible tourism with works including new toilet amenities including accessible cubicle and outdoor showers, new accessible picnic tables, a new timber viewing deck and seating platform, new accessible parking bays, accessible footpath linking the new amenities building to headland walk, new sun lounges and furniture including bins, and a space for a future commercial food/beverage van.

Figure 4-18 Short Point accessibility works



Source: Bega Valley Shire Council website

4.7 Natural Environment Factors

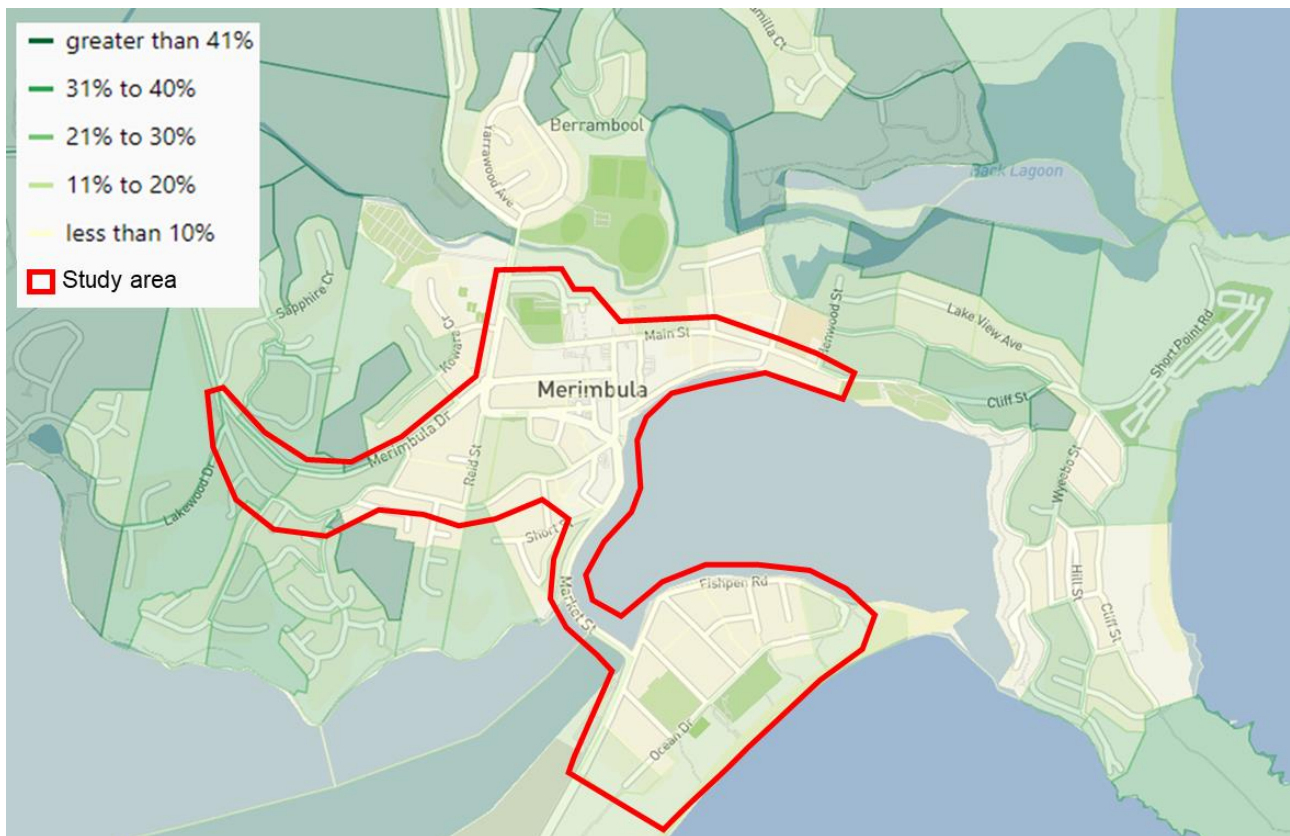
Economic and tourism growth in Merimbula will contribute to road congestion, parking demand increase and lower environmental outcomes without intervention. Poor planning for growth, including ways in which to reduce reliance on owning and driving a private vehicle will result in reduced liveability and community health. This is relevant for both local trips and visitor trips to the area.

Active transport options are highly sustainable and have substantial health and environmental benefits for the community. While walking and cycling journeys are promoted, there can still be a shortfall in terms of experience in the community. Walking and cycling are only viable modes of transport for the community when they are supported by safe, accessible and high quality infrastructure, and connected and reliable public transport services. Improved frequency, reliability and coverage of public transport services will support greater public transport mode share in Merimbula, contributing to lower parking demand and road delays.

4.7.1 Tree canopy cover

The NSW Government Built Environment Indicators website provides information on the existing conditions of the road network in NSW. Tree canopy cover information reveals that the Merimbula CBD streetscape has relatively low tree canopy cover of ten per cent and below, as shown in **Figure 4-19**. The benefits of tree canopy cover include reduction of urban heat island effects, shade, visual amenity, improved air quality and community wellbeing.

Figure 4-19 Tree canopy cover



Source: adapted from Built Environment Indicators web map, NSW Government

4.7.2 Topography

Two metre elevation data for the study area is shown in **Figure 4-20**, and Steepness as defined by the Movement and Place [Built Environment Indicators](#) is shown in **Figure 4-21**. Key active transport routes are to be avoided on steeper roads, and movement classifications for roads need to account for topography constraints.

Monaro Street and Merimbula Drive on the western side of the study area is located on a steep grade, and this extends to areas on Reid Street, Kyeamba Street, View Street and Park Street. This indicates that approaching the western side of the study area via bicycle is for stronger and more experienced riders. Sections on these streets have grades that range between three to seven degrees. The RSL Lifecare Bimbimbie Park is located on an area of steep grade, which has implications for residents who may have mobility issues.

The Merimbula foreshore area and Fishpen precinct is a relatively flat area, making it well placed for uptake in cycling for all ages and abilities.

Figure 4-20 Study area elevation

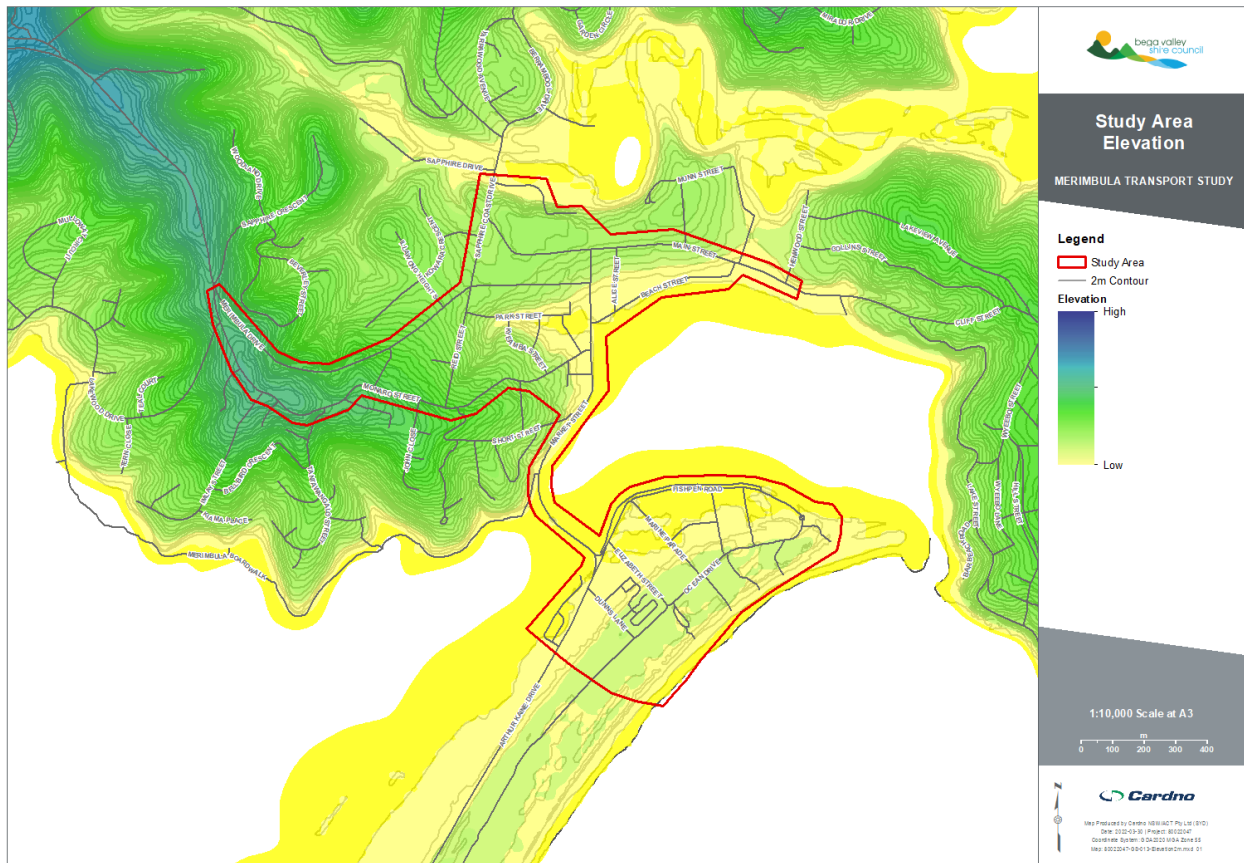
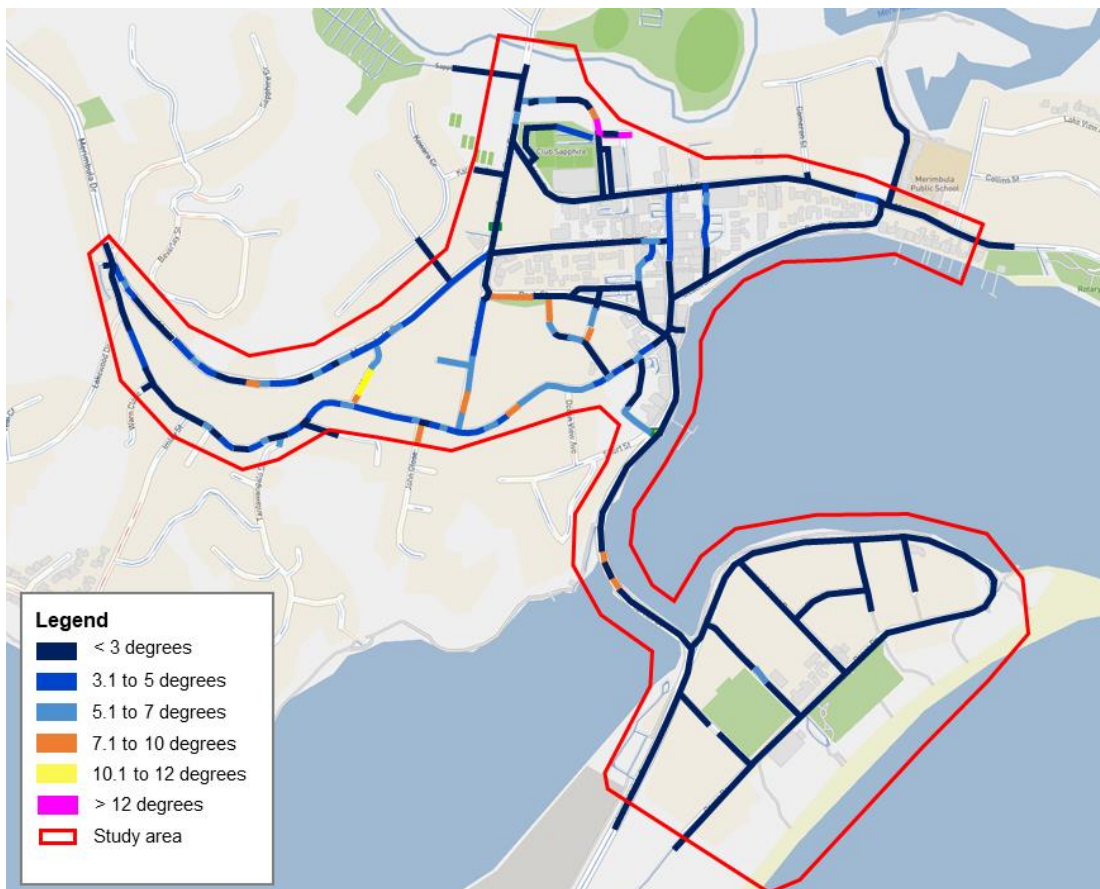


Figure 4-21 Street grade



Source: adapted from Built Environment Indicators web map, NSW Government

5 Understanding Movement

5.1 Existing Transport Network

5.1.1 Pedestrian network

5.1.1.1 Existing infrastructure

A number of recreational pedestrian routes are provided in the study area, including:

- > Shared path along the Beach Street foreshore, connecting the Merimbula CBD with Merimbula Public School and tourist locations outside of the study area such as Spencer and Rotary Park, Bar Beach and the Merimbula Aquarium and Wharf.
- > Shared path along the Fishpen Foreshore, connecting Mitchies Jetty and the foreshore with the Merimbula Bridge.
- > The Merimbula Boardwalk, located to the west of the study area, providing picturesque views of Boggy Creek and Merimbula Lake. The Boardwalk is accessed via a path from Market Street. Council is currently developing a Concept Design for an upgrade to the boardwalk that has a strong balance between visual amenity, environmental impacts and increased user demand. The boardwalk is currently 1.5 metres in width.
- > Elevated boardwalk and shared path located along Lake Street, connecting between Main Street and Bar Beach. There is a missing link connecting Rotary Park with the boardwalk. Topography and heritage constraints were identified in consideration of extension of the boardwalk to the Merimbula Wharf and Aquarium.
- > Shared path connecting Merimbula and Pambula via the Merimbula Airport.

Where footpaths are present, they are generally in good condition and provide adequate width for pedestrian circulation.

Formal pedestrian crossings are generally provided with new development. The development of Woolworth and Aldi on Main Street has resulted in the provision of high quality pedestrian crossings including a wombat crossing and pedestrian refuge located along key desire lines, shown in **Figure 5-1** and **Figure 5-2**. The CBD area also contains a number of activated lane ways that provide access to local shops and shortcuts to the Park Street car park and to the foreshore.

Figure 5-1 Pedestrian refuge on Main Street



Figure 5-2 Wombat crossing on Main Street



The Merimbula Public School has two school crossings, located on Main Street and Randolph Street. These crossings have faded line markings and lack associated advanced warning signs.

5.1.1.2 Pedestrian experience and desire lines

The Merimbula study area is suitable for walking with relatively flat terrain and short distances, however pedestrian infrastructure needs to be prioritised and made more accessible to support uptake. Vehicles are

generally prioritised over pedestrians within the study area, and greater protection and amenity of pedestrian infrastructure would improve access to businesses and the natural environment.

Within the commercial core of Merimbula on Market Street, pedestrians often J-walk because the signalised crossing is prioritised for vehicle movements and has a long cycle time of 1.5 minutes. An unprotected pedestrian crossing point consisting only of kerb ramps is located towards the northern end of Market Street, marked by signage indicating vehicle priority, shown in **Figure 5-3**. Market Street is an ideal location for shared zone infrastructure.

Elderly people want to be able to walk in Merimbula and independently access shops and services. Infrastructure in the study area can be difficult to navigate for elderly people as designated crossing points are infrequent and many verges lack kerb ramps. The height of the kerb is a key factor for pedestrian comfort and safety.

The Main Street pedestrian environment lacks tree coverage and shelter from the sun, creating an unpleasant experience. During bin collection day, bins litter footpaths and verges and reduce pedestrian walking space.

Pedestrian safety issues due to the interaction of fast moving vehicles and lack of safe crossings are located at:

- > **The roundabout at the intersection of Merimbula Drive, Sapphire Coast Drive and Reid Street.** This intersection is difficult for pedestrians to cross as vehicles approach from multiple directions at high speeds (50 kilometre per hour speed limit) and the roundabout lacks refuges.
- > **The intersection of Market Street, Fishpen Road and Arthur Kaine Drive.** This intersection experiences high levels of fast moving vehicle traffic (50 kilometre per hour speed limit) during summer peak periods and creates an unpleasant pedestrian experience. This area is traversed by families walking to the Merimbula CBD and requires a crossing treatment.
- > **The intersection of Park Street and Reid Street.** This intersection supports pedestrian demand for people accessing the CBD from residential/ tourist accommodation areas to the north and west however lacks a safe crossing point.
- > **The intersection of Main Street and Sapphire Coast Drive.** This intersection supports pedestrian demand for people accessing the CBD from the Sapphire Valley Caravan Park however lacks a safe crossing point.
- > **Market Street between the Merimbula Bridge and the intersection of Short Street.** This area of Market Street is used for recreational walking between Fishpen and the Merimbula CBD and is highly used by pedestrians. No formal crossing point is provided along Market Street, south of the intersection of Monaro Street, and many pedestrians run across the road to avoid cars.

Figure 5-3 Low pedestrian priority on Market Street

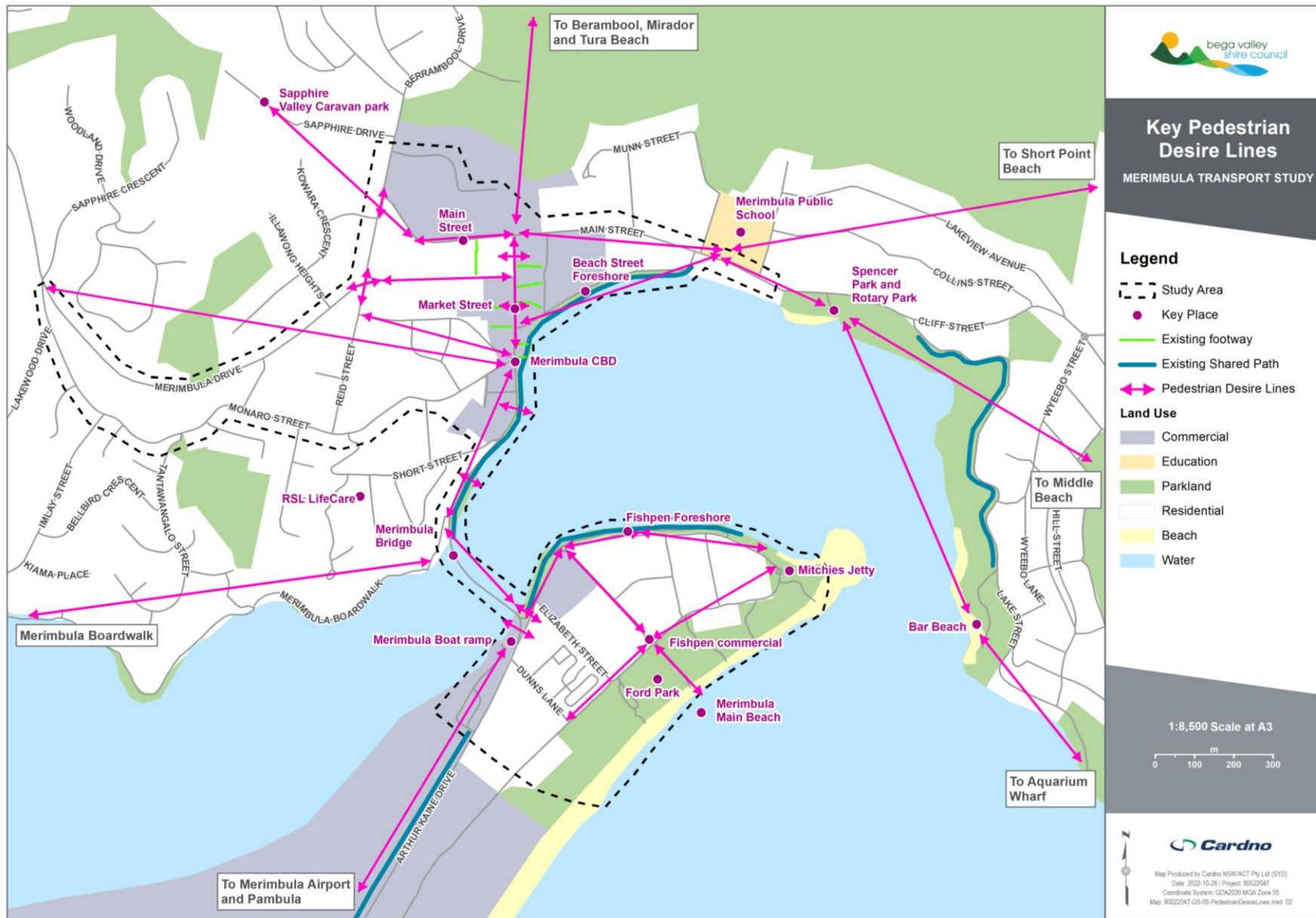


Figure 5-4 Lack of pedestrian infrastructure on Fishpen Road



The pedestrian network and key desire lines are shown in **Figure 5-5**. Desire lines are a straight line connecting between an origin and a destination.

Figure 5-5 Key pedestrian desire lines



5.1.2 Cycling network

5.1.2.1 Existing infrastructure

Cycling infrastructure within the study area is generally limited to on-road mixed traffic routes. Shared walking and cycling paths are provided on the Beach Street foreshore and along Arthur Kaine Drive connecting to the Merimbula Airport and to Pambula.

The Market Street footpaths across the Merimbula Bridge are not a designated shared path though they are frequently used by families to ride with children. More experienced riders mix with traffic and often straddle the shoulder linemarking. On the northern side of the bridge, the shoulder becomes a parking lane and cyclists must merge.

Local streets within the study area are suitable for on-road mixed cycling routes due to the low speed environments and wide carriageways. Some streets however have localised topography and physical constraints that decrease desirability for cycling including on View Street and Monaro Street.

No formal bicycle parking is provided in the study area. Within the CBD, bicycles were observed parked against poles on Main Street and Market Street, indicating that these locations would provide the highest amenity for cyclists.

5.1.2.2 Cycling experience and desire lines

Cycling is an easy and convenient way of travelling within Merimbula because of the relatively small distances between key land uses across the study area. Many tourists bring their own bicycles to Merimbula, and a bike hire business is located in Fishpen within the commercial area. Key demand routes for cyclists are located:

- > Between Fishpen and the Merimbula CBD across the Merimbula Bridge for access between tourist accommodation and commercial land uses
- > Between Fishpen and Pambula local centre for recreation and for access to local shops
- > Along the Beach Street foreshore for recreational purposes connecting to the elevated boardwalk
- > Along Fishpen Road and Ocean Drive to access the natural environment
- > Through the Merimbula CBD on Main Street and Market Street to access retail.

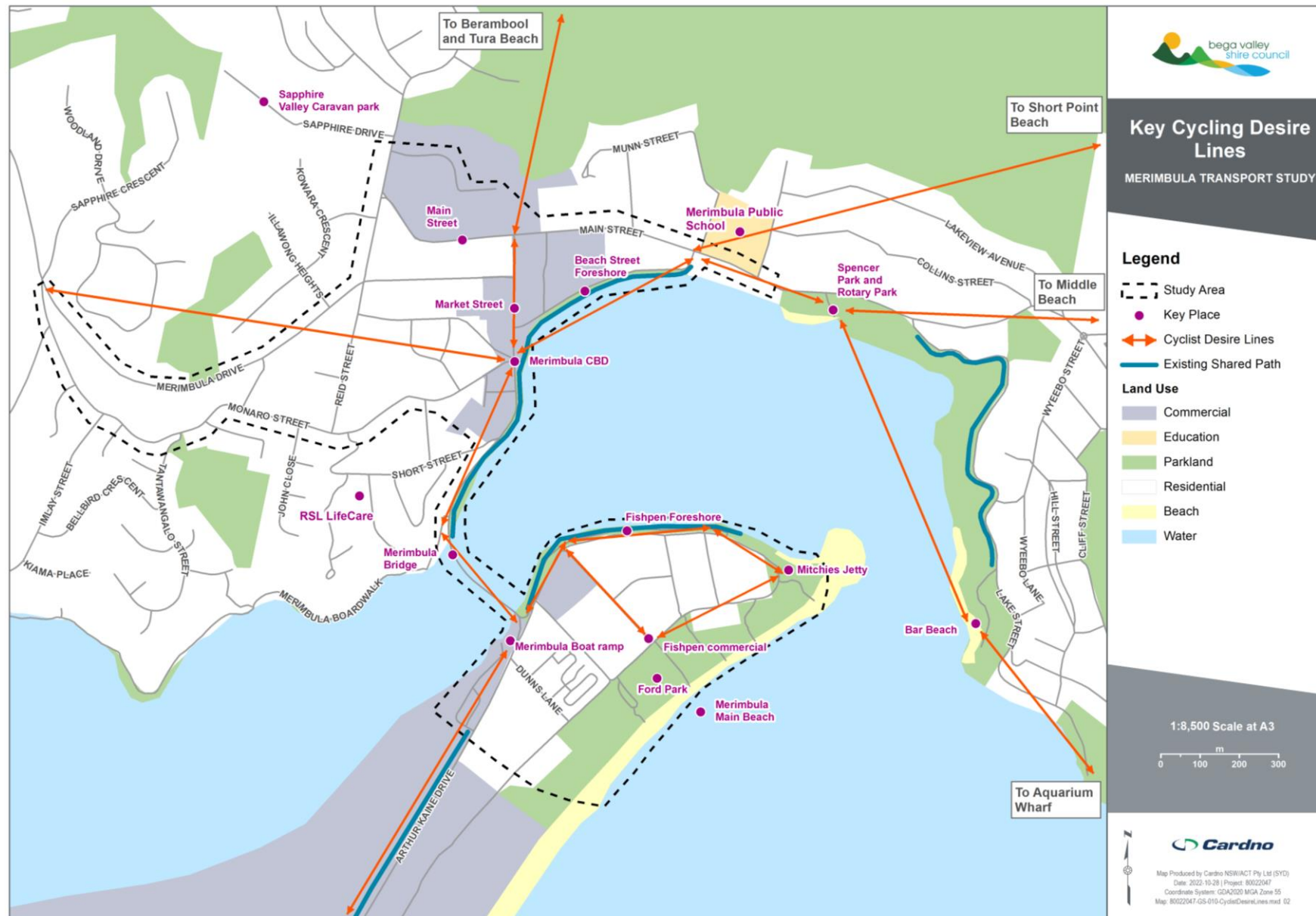
Cycling desire lines are shown in **Figure 5-8**.



Figure 5-6 Cycling on Market Street Bridge



Figure 5-7 Cycling on Beach Street



5.1.3 Bus network

5.1.3.1 Local bus routes

Public transport in Merimbula is limited and has low service frequency and poor connectivity. Four services are operated by Sapphirecoast Buslines, shown in **Table 5-1**.

Table 5-1 Bus routes servicing Merimbula study area

Bus route ID	Bus route name
786/886	Tathra to Merimbula via Kalaru
790/890	Bega to Eden via Wolumla & Merimbula Saturday only
791/891	Bega to Eden via Kalaru & Tura Beach
792/892	Merimbula to Pambula Beach via Pambula

Within the study area, the routes are consolidated to a singular route along Sapphire Coast Drive, Main Street, Market Street and Arthur Kaine Drive. The 792/ 892 bus route deviates to the Fishpen precinct. The majority of customers get dropped off and picked up on Main Street near the Woolworths, Aldi and Mitre 10, and on Market Street at Hylands Corner and Twyford Hall.

The majority of bus customers in Merimbula are elderly people who require short walking distances to their destinations. Within peak tourist times, bus patronage remains relatively similar to non-peak times because visitors are generally self-sufficient and use private vehicles.

Local bus routes servicing Merimbula are shown in **Figure 5-9**.

Figure 5-9 Merimbula local bus routes (Sapphirecoast Buslines)



Source: Sapphirecoast Buslines

Bus service frequency is minimal within the study area, and is limited to peak activity times such as morning and afternoon commute, school times and weekend midday peaks.

It is difficult to timetable bus services to match with Merimbula Airport arrivals and departures because of constantly changing air services and airline carriers. There is a lack of space within Merimbula Airport for bus drop off and pick up, and buses are required to stop in no stopping zones on Arthur Kaine Drive. The southbound bus stop outside of Merimbula Airport is located within a shared path.

5.1.3.2 On demand bus service

Within the region, lack of consistency in bus demand leads to on demand services being a highly viable public transport option.

An on demand bus route service provided by Sapphirecoast Buslines in partnership with TfNSW is available within Merimbula, Tura Beach and Pambula. The on demand bus will take customers anywhere within six kilometres of the towns.

Bookings can be made up to 20 minutes prior to the trip, and fares start from \$2.40 one way. Bookings are made through the Flexibus app, the Flexibus website or by calling. Generally, On demand services operate Monday to Friday 9:30am to 2:45pm, Saturday 9:30am to 3:35pm, and are not available on Sundays or public holidays.

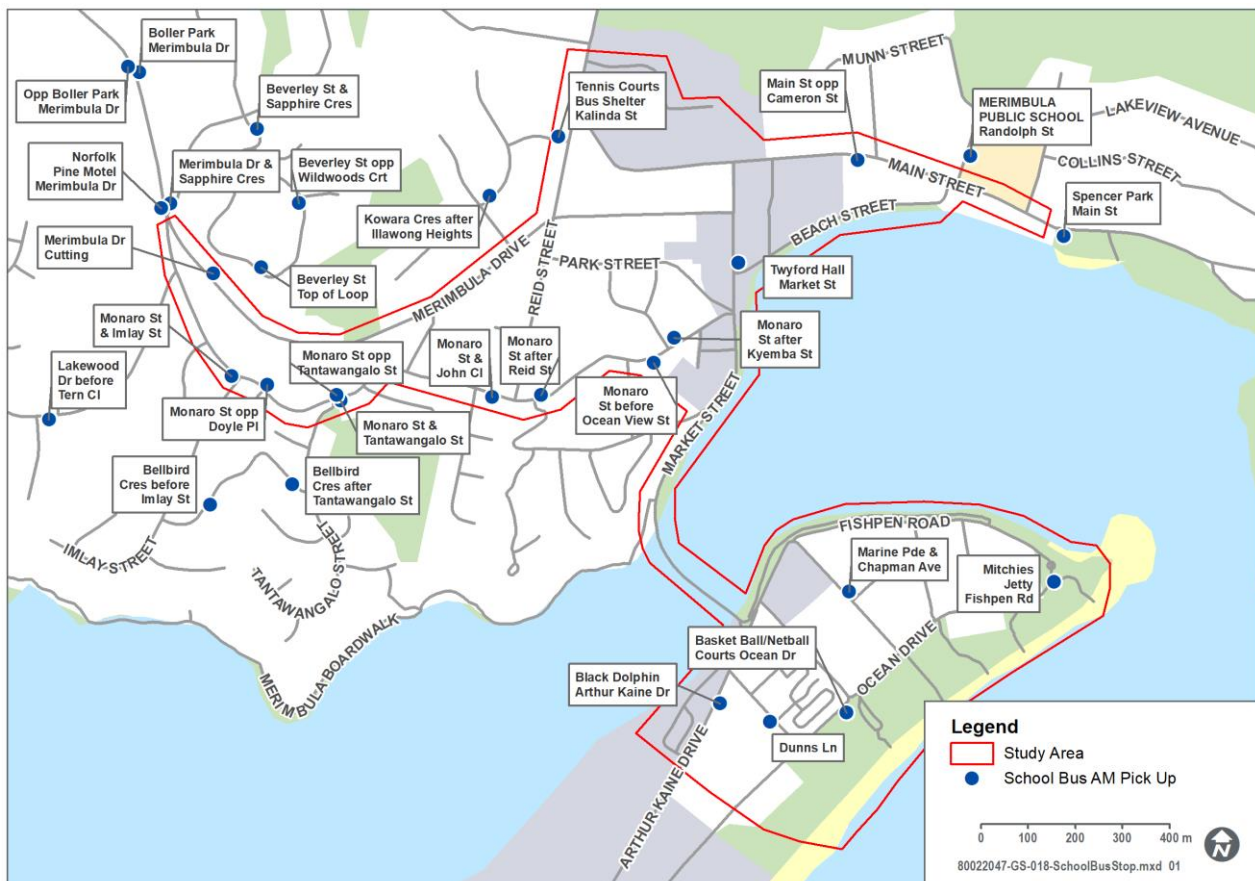
Within Merimbula, Bega and Eden, approximately 100 customers utilise the service on a typically busy day.

5.1.3.3 School bus routes

Sapphirecoast Buslines provides school service during semester. School bus routes run for morning drop offs and afternoon pick ups, with around ten routes operating during each session. Multiple pick up and drop off locations are available in Merimbula for local residents and links to schools in other townships including Bega, Wolumla, Pambula, Eden, Tathra. School bus vehicles are smaller than timetabled service vehicles and can access more suburban streets.

School bus pick up locations are shown in **Figure 5-10**.

Figure 5-10 School bus pick up locations



Source: Sapphirecoast Buslines

5.1.3.4 Coach services

Merimbula Coach Stop is located on Park Street near the intersection with Wonga Street. A number of coach routes service Merimbula, including routes 700-1 and 772 operated by NSW TrainLink, the Batemans Bay to Melbourne route operated by V/line from Victoria and private coaches PM1 and PM2 operated by Premier Motor Service.

Route 700-1 connects along the coast of NSW from Eden to Bomaderry via Merimbula. Other key stops along the route include Bermagui, Narooma, Batemans Bay and Nowra. Private Coach Route PM1 and PM2 follow the same route from Eden to Bomaderry as route 700-1, and extends further north from Bomaderry, connecting to Berry, Kiama, Wollongong and Sydney. Route 772 runs from Eden to Canberra via Merimbula, linking Merimbula to the capital as well as to Cooma.

The V/line Batemans Bay to Melbourne route travels via Merimbula and provides connections to regional areas in Victoria along the coast. The route consists a coach service from Batemans Bay to Bairnsdale, where customers can transfer to train service to Melbourne.

5.1.3.5 Bus stop amenity

Bus stops in Merimbula generally lack full Disability Discrimination Act compliance and are without shelters and seating or are located on a steep grade, including within the CBD area. A number of stops however are accessible for people who require walking frames and wheelchairs, and bus vehicles have low flooring to improve access. These stops are known to the community and residents will make their way to those stops.

Bus stop amenity for the 11 stops within the study area is described in **Table 5-2**.

Table 5-2 Bus stop amenity

Bus stop name/ location	Shelter	Timetable	Seating	Hardstand surface/ adequate waiting area	Accessibility (inc TGSi markers)
Main Street after Market Street (westbound)	X	✓	✓	✓	X
Main Street opp Market Street (eastbound)	X	X	X	✓	X
Hylands Corner, Market Street	X	✓	X	✓	X
Twyford Hall, Market Street	X	✓	✓	✓	X
Mitchies Jetty, Fishpen Road	X	X	X	X	X
Merimbula Netball Courts, Ocean Dr	X	X	X	X	X
Dunns Lane before Arthur Kaine Dr	X	X	X	X	X
Merimbula Airport, Arthur Kaine Drive (northbound)	X	✓	X	X	X
Arthur Kaine Dr opp Merimbula Airport (southbound)	X	X	X	X	X
Merimbula Coach Stop, Park Street (eastbound)	✓	✓	✓	✓	X
Merimbula Coach Stop, Park Street (westbound)	✓	✓	✓	✓	X



Hylands Corner, Market Street



Arthur Kaine Dr opp Merimbula Airport



Main St after Market St



Twyford Hall, Market Street

5.1.4 Air transport

Merimbula Airport forms part of the study area's integrated transport network, connecting the Shire with capital cities across eastern Australia. The airport provides rapid travel to the region for tourists, professionals and essential services.

The Merimbula Airport is located approximately two kilometres south of the study area on Arthur Kaine Drive. It is mainly accessed by private vehicle and also has a shared path connections to Fishpen and Pambula as well as north and southbound bus stops located on Arthur Kaine Drive.

The airport is serviced by Qantas and Rex flights connecting between Sydney and Melbourne, which are both approximately one hour and 15 minutes in length. Additional airlines may also come online in the future.

Rental car services are provided from Merimbula Airport including Hertz and Europcar.

5.1.4.1 Airport expansion

The Airport is owned and operated by BVS Council, and the importance of this asset is recognised for its social and economic benefits to the region. The expansion of the Merimbula Airport runway will open up tourism opportunities to the region and promote visitation and will allow larger freight aircraft to land. It is also expected that additional aircraft operators will lower ticket prices. In total, funds of up to \$20.45M are available to deliver Merimbula Airport infrastructure projects. Expansion will include three elements:

- > Runway extension of 120 metres at each end of the existing runway to allow larger aircraft including ATR 72 and Dash8 Q400
- > General aviation and commercial precinct, including general aviation infrastructure such as taxiways and utilities
- > Runway renewal to strengthen the existing runway to allow larger aircraft to take off and land.

The project was completed in March 2022.

5.1.5 Freight

The Princes Highway is a national freight route providing north-south connection along the NSW coastline and passing through Millingandi and Pambula. This route allows B-Double vehicles of all sizes. Regional freight movements do not pass through the study area.

5.1.6 Servicing

Within the study area, some businesses have access to rear-loading areas, and the Woolworths and Aldi are accessed via a specific off-street loading dock accessed by the rear service road.

An on-street loading zone is located on Alice Street within the Merimbula CBD. However there have been complaints from delivery drivers with an expectation to have loading zones outside of their delivery destination.

Site inspection revealed that rubbish bins litter footpaths during collection days (usually Thursdays) and often block paths for pedestrians, as shown in **Figure 5-11**.

Figure 5-11 Rubbish bin footpath obstruction example



5.1.7 Road network

The road network serves a number of movement and place functions, providing both a method of travelling to, from, within and through the study area as well as providing places for people to rest, eat and socialise.

Roads are classified into state, regional or local roads based on the function and importance to the broader road network. TfNSW is responsible for maintaining state roads while Council is responsible for maintaining regional and local roads. Key roads within the study area are described in **Table 5-3**.

Table 5-3 Description of key roads

Key road	TfNSW road classification	Description
Princes Highway (outside of study area)	State road (1)	The Princes Highway is a key state road and freight route in the NSW network, connecting between Sydney, Wollongong, Nowra, Bega, Pambula, Eden and the Victorian border. The Princes Highway is the main regional route for vehicles travelling from within NSW and Victoria.
Merimbula Drive	Unclassified regional road (7637)	Merimbula Drive is a regional road connecting the Princes Highway to Merimbula and the Merimbula CBD Bypass. It should be considered changing the eastern portion of Merimbula Drive (east of the CBD Bypass) to a local road.
Sapphire Coast Drive	Unclassified regional road (7621)	Sapphire Coast Drive connects north to the towns of Berambool, Tura Beach and Tathra. This is a regional tourist route, connecting between key places along the Coast. Sapphire Coast Drive also connects the Sapphire Valley Caravan Park to the Merimbula CBD. Council is currently investigating priority adjustments to the intersection of Sapphire Coast Drive and Berambool Drive.
Arthur Kaine Drive	Unclassified regional road (7622)	Arthur Kaine Drive connects south of the Merimbula Bridge to the Merimbula Airport, and to the town of Pambula. Regional traffic connecting to Pambula, Merimbula Airport, Pambula Golf Club and other southern areas must use Arthur Kaine Drive or detour via the Princes Highway. The lack of access and egress points in Fishpen creates bottleneck congestions during peak periods.
Market Street	Local road	The northern section of Market Street (north of Palmer Lane) provides access to local shops and restaurants, and is a key route for access to goods and services within the study area. The southern section of Market Street (south of Palmer Lane) performs a more regional travel function, connecting people in Fishpen with the CBD, as well as south towards to the Merimbula Airport and Pambula. This portion has high traffic volumes and higher travel speeds, and during summer peak periods vehicles tend to back up onto the bridge due to queuing.
Main Street	Local road	A number of bulky goods retail premises are located on Main Street, including Woolworths and Aldi, which have rear road access for servicing. The Aldi customer car parking area is accessed via a left-in, left-out driveway configuration, which was introduced to prevent queues from vehicles turning

Key road	TfNSW road classification	Description
		right. A wombat crossing and pedestrian refuge are located outside of the Aldi and the Woolworths.
Fishpen Road	Local road	Fishpen Road (between Market Street and Mitches Jetty) is a looped circuit with a slow speed environment of 40 kilometres per hour. Vehicles circulate along Fishpen Road in search of parking in tourism peak periods. Pedestrians and cyclists often use Fishpen Road carriageway due to lack of dedicated facilities. Council is considering the extension of one way travel to Ocean Drive at the intersection with Marine Parade as well as further reduction of the speed limit to 25 kilometres per hour.
Beach Street	Local road	Beach Street is a local road that connects the Merimbula CBD with the east via an open space foreshore area with shared path facilities. Beach Street is often used as a short cut for people accessing Middle Beach, Bar Beach and Short Point Beach from the Merimbula CBD.
Monaro Street	Local road	Monaro Street is a local road alternative to Merimbula Drive, connecting outside of the study area to the west and the Merimbula CBD via the signalised intersection. Monaro Street is very steep in some areas and has experienced drainage issues in the past. Monaro Street is identified as high potential for provision of a shared path to connect visitors from outside of the study area to the CBD, though is constrained by topographical issues.
Park Street/ Palmer Lane	Local road	Park Street/ Palmer Lane forms the Merimbula CBD Bypass. As a result, Park Street/ Palmer Lane experiences high levels of vehicle traffic including heavy vehicles accessing the Fishpen and to other southern areas.

5.1.7.2 Merimbula CBD Bypass

The Merimbula CBD Bypass was implemented in 2017 to reduce congestion and facilitate traffic movement in the CBD. This upgrade diverts through traffic from the intersections of Market Street with Main Street and Beach Street. The Bypass is located along the route from the roundabout on Merimbula Drive, to Reid Street, to Park Street, to Palmer Lane, and to Market Street, where vehicles can travel south. Council has applied to reclassify Park Street as a Regional Road, and Merimbula Drive between Reid Street and Market Street as a Local Road under the NSW Governments Regional Road Transfer and Reclassification Scheme to better suit the Merimbula Bypass route but is yet to be approved.

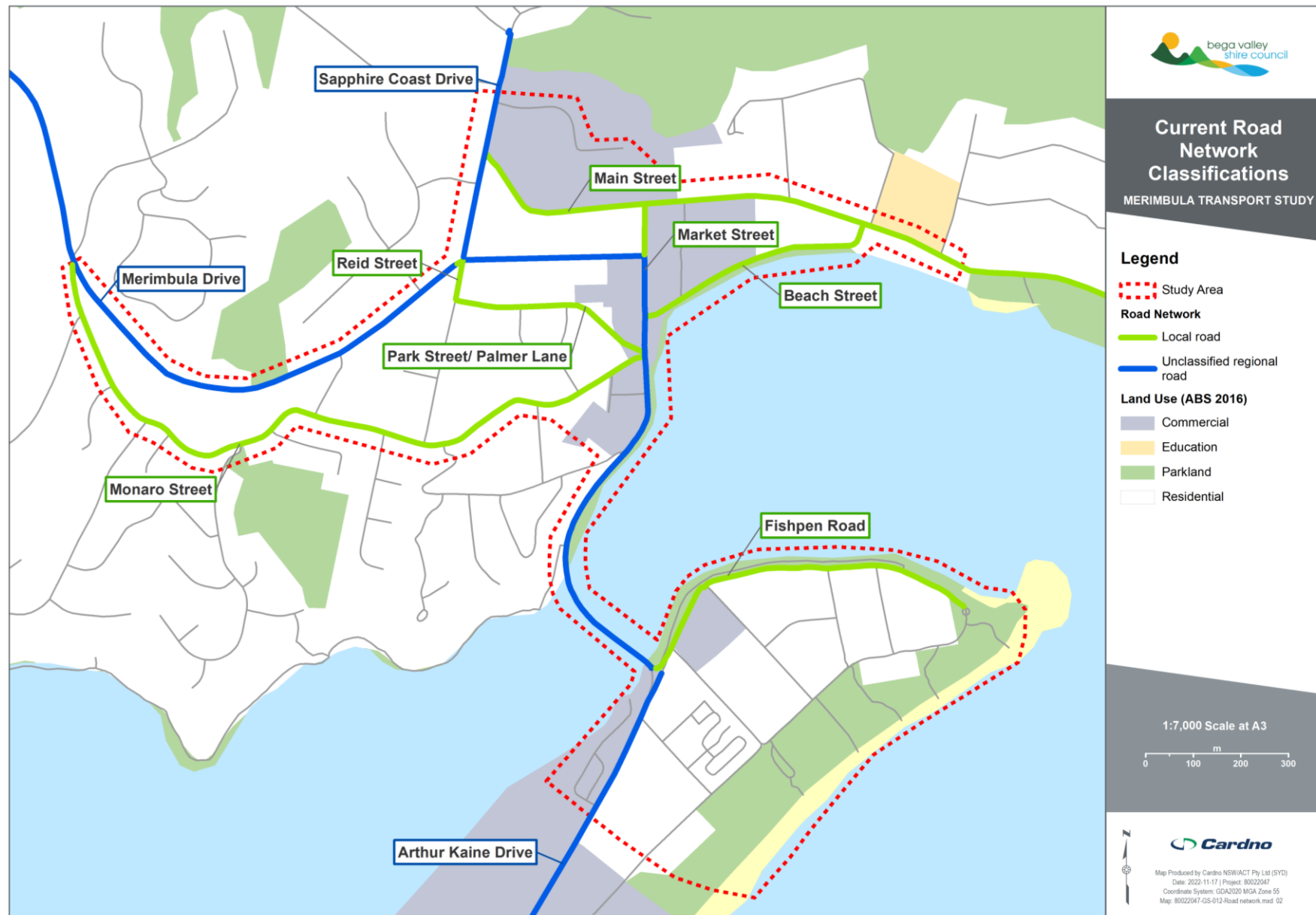
The project involved the following works:

- > Construction of a roundabout at the intersection of Merimbula Drive/ Reid Street
- > Realignment of Palmer Lane
- > Provision of signalised intersection at the intersection of Market Street, Monaro Street and Palmer Lane
- > Relocation of underground services
- > Provision of landscaping, street furniture and public art and other urban domain improvements.

Due to frequent closures on Merimbula Drive due to groundwater issues, Monaro Street often becomes the alternative CBD bypass route.

Opportunities for improving the bypass route includes improving legibility of the bypass, and prioritising through movements, particularly at the intersection of Market Street, Monaro Street and Palmer Lane.

Figure 5-12 Current road network classifications



5.1.8 Parking

Both residents and visitors to the study area are highly dependent on private vehicles and car parking. During peak tourism seasons, demand on parking increases significantly, placing pressure on parking provisions including for longer vehicles such as caravans. Demand is also expected to change as the Merimbula Airport is expanded and visitation increases. Future study area users will also require improved parking availability, fee and location information.

Parking issues have significantly reduced within Merimbula following from the provision of upgraded car parking with the Woolworths and Aldi developments on Main Street.

Caravans were observed parked at the Beach Street foreshore and within Fishpen.

Within Fishpen, the key land uses attracting long-stay parking are Mitchies Jetty, serviced by an off-street car park located at the intersection of Ocean Drive and Fishpen Road, and Merimbula Main Beach, serviced by street parking on Ocean Drive. The Mitchies Jetty car park has high demand and is often full during summer peak periods across the day as families tend to spend long periods of time enjoying the area. On Ocean Drive, perpendicular parking is provided outside of Ford Park, which is used for beach-goers as well as shorter term parking for the local café and take-away food restaurant. Vehicles often use the grassy verge on Ocean Drive between Mitchies Jetty and Marine Parade as longer-term parking for visiting the beach. Parking demand extends to Marine Parade on-street parking spaces during the summer peak periods.

Observations within Fishpen revealed that off street parking spaces within residential properties are often used for other purposes such as storage of goods, resulting in higher utilisation of street parking including at Marine Parade and Elizabeth Parade.

On-street motorbike parking is provided with approximately three spaces on Market Street and approximately four spaces at the Beach Street foreshore parking area.

Two accessible parking spaces are provided at the Beach Street foreshore area and four are provided in the Park Street car park.

No electric vehicle parking spaces are provided in the study area.

5.1.8.1 Parking perception

Within the community, there is a perception of lack of parking because it may not necessarily be located within a very short walk from a destination. There is an expectation that parking should be provided out the front of businesses etc. The nature of businesses within the CBD (non-bulky goods retail, cafes and restaurants) means that people are able to park away from their destination and undertake a short walk (with the exception of supermarkets).

Analysis from Smart Parking monitoring technology implemented in 2018 at the Park Street car parking area reveals that, parking spaces were not fully utilised despite this perception.

Motorcycles were observed parked in non-designated motorcycle parking spaces within the study area, including on painted chevron linemarkings at the Beach Street foreshore parking area. This indicates that there is low visibility and information on available parking locations.

5.1.9 Ride share and car share

Car share vehicles are not provided within the Merimbula study area, and are not identified as required in new developments in the Bega Valley Shire Development Control Plan.

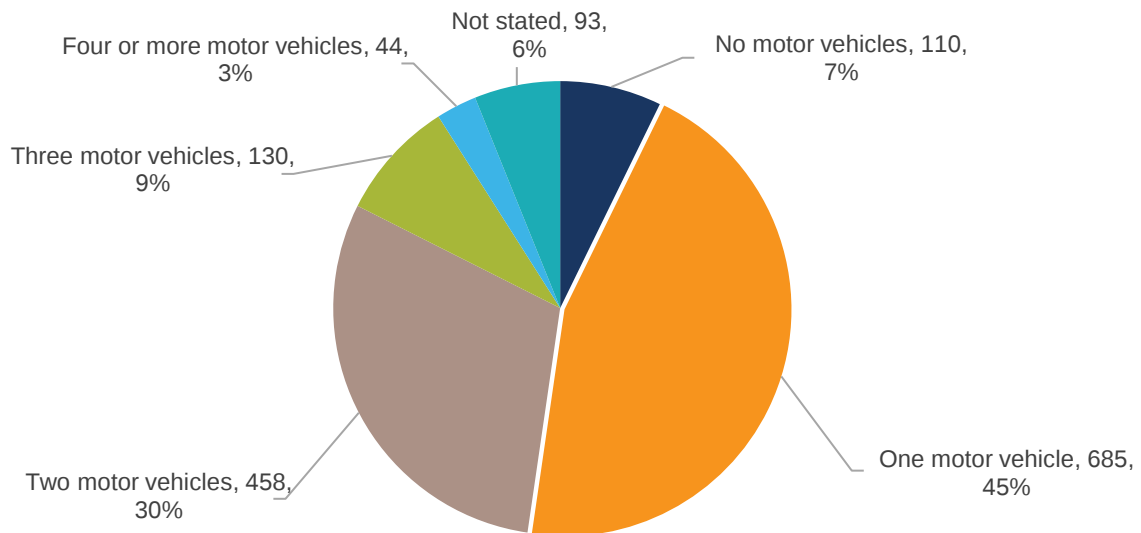
Taxi services are limited within the Sapphire Coast. A taxi zone is located outside of the Merimbula Bowling Club, and a taxi zone with two spaces are provided at the Beach Street foreshore parking. Additionally, Uber or other ride share services do not extend to the study area, which is not supportive of the night time economy, tourism or reduction in private vehicle usage.

5.2 Travel Behaviour

5.2.1 Vehicle ownership

Of the 1,514 households in Merimbula, 87 per cent own at least one motor vehicle. This percentage equates to the figure for NSW which is also 87 per cent. Vehicle ownership per household is shown in **Figure 5-13**.

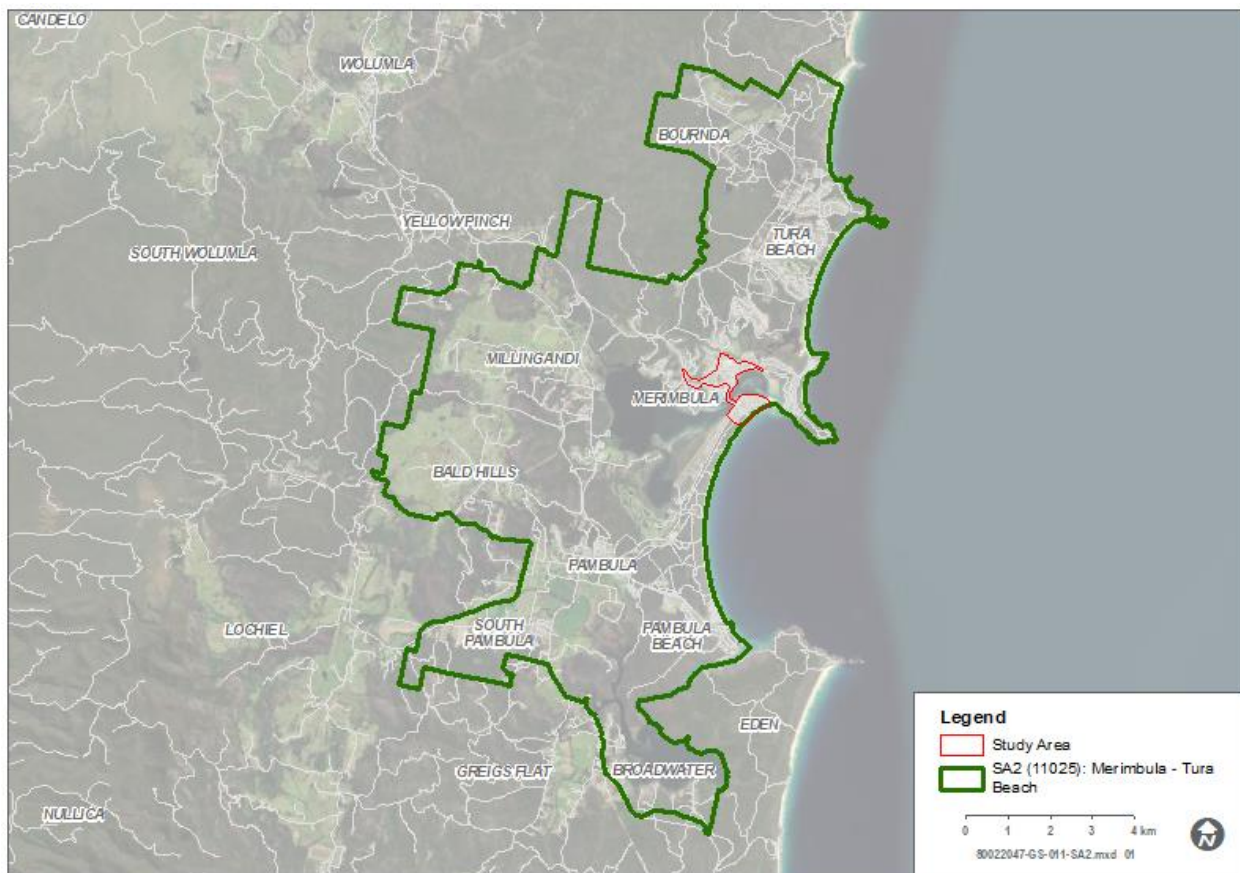
Figure 5-13 Household vehicle ownership in Merimbula suburb, ABS 2016



5.2.2 Travel to work

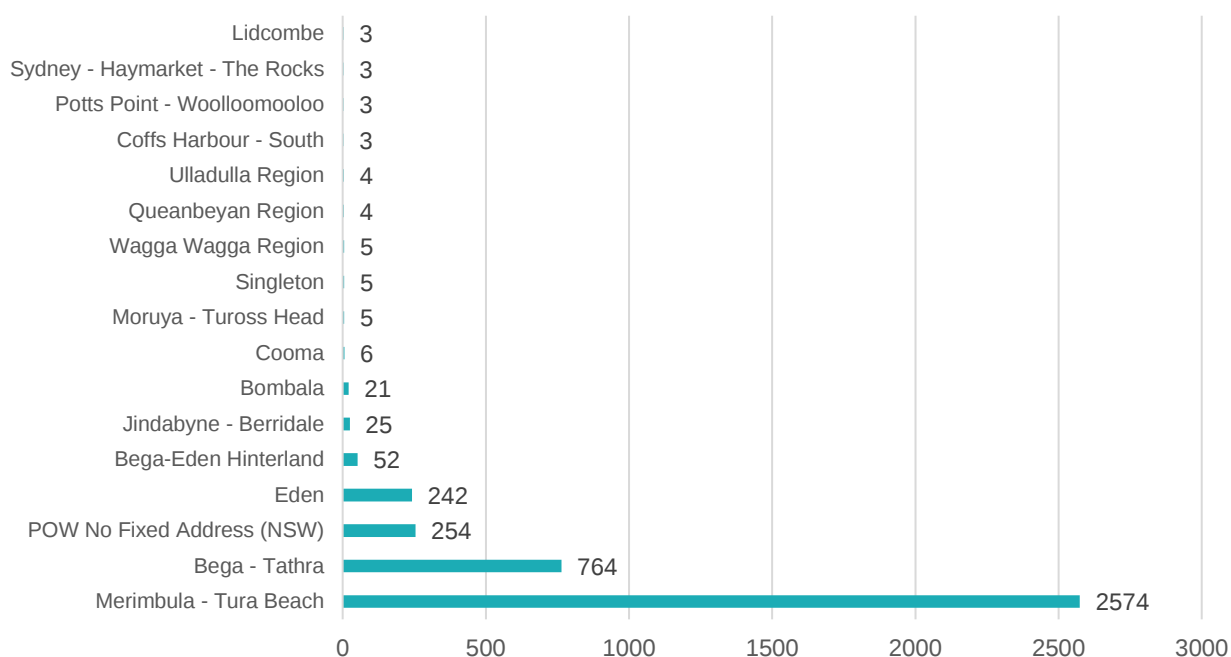
This section analyses ABS Census data for people living and working within the Merimbula – Tura Beach SA2. This geographical area is shown in **Figure 5-14**.

Figure 5-14 Merimbula – Tura Beach Statistical Area 2



The location of work for Merimbula – Tura Beach SA2 residents are shown in **Figure 5-15**. Internal trips within the SA2 account for approximately 64 per cent of all worker trips. The Bega – Tathra and Eden SA2s are the locations of work for 25 per cent of commuter trips.

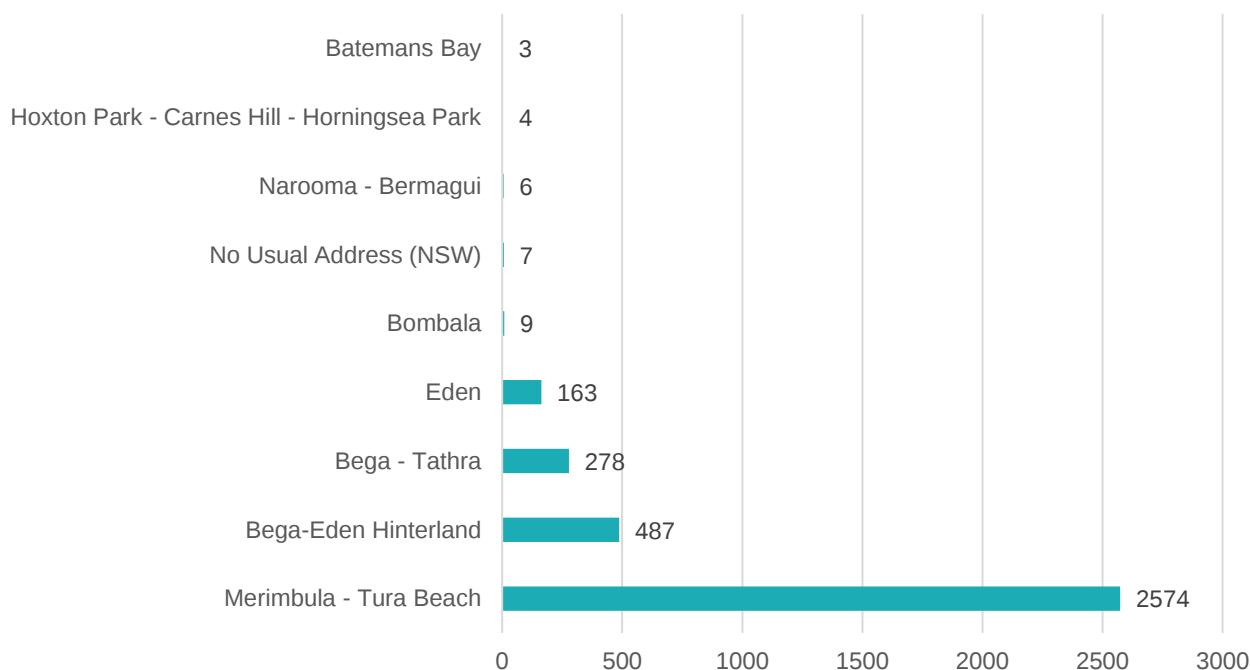
Figure 5-15 Location of work for people living in Merimbula – Tura Beach SA2



Source: ABS Census, 2016

The locations of residence for people who work in the Merimbula – Tura Beach SA2 are shown in **Figure 5-16**. Internal trips account for 72 per cent of all trips to the SA2, and trips from Bega – Eden Hinterland, Bega – Tathra and Eden account for 26 per cent.

Figure 5-16 Location of residence for people working in Merimbula – Tura Beach SA2

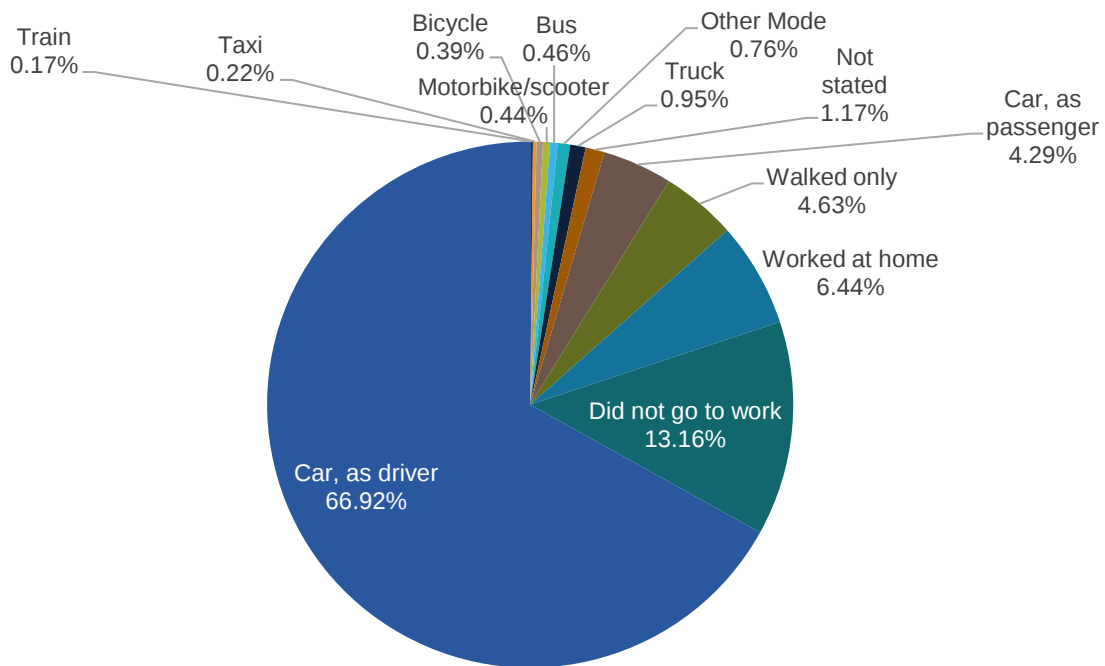


Source: ABS Census, 2016

5.2.3 Method of travel to work

For residents living within the Merimbula – Tura Beach SA2 that reported to be working at the time of the ABS 2016 census, the primary method of travel to work was by car, either as a driver or passenger, consisting of over 71 per cent of workers. Following private vehicles, the next most common mode of travel was walking, making up 4.6 per cent of the working population. Method of travel for work for residents is shown in **Figure 5-17**.

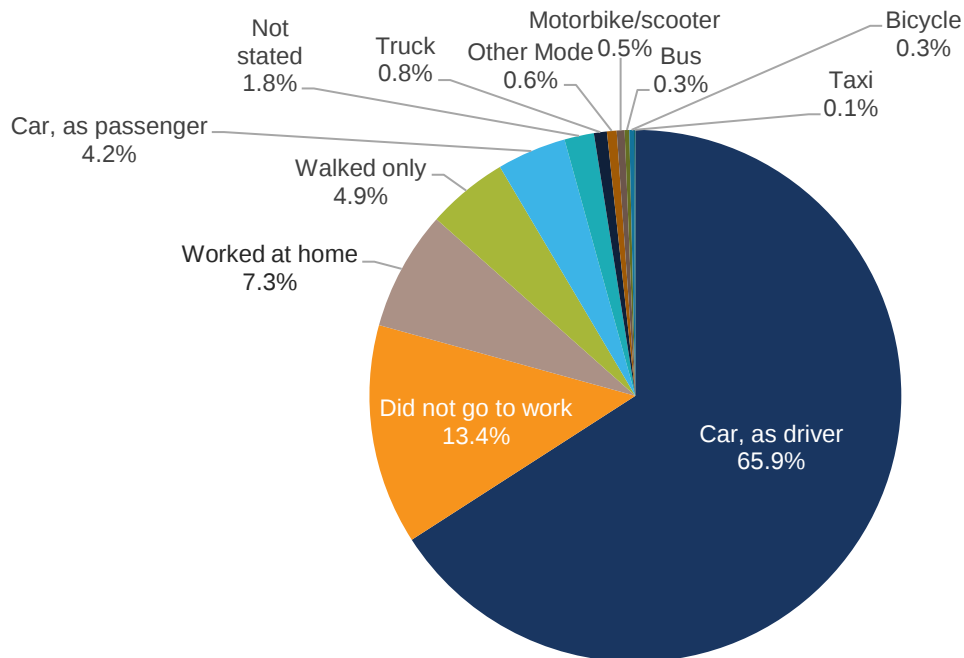
Figure 5-17 Method of travel to work for residents in Merimbula – Tura Beach SA2



Source: ABS Census, 2016

Similarly for people who work in the Merimbula – Tura Beach SA2, the largest proportion of mode share (70 per cent) is attributed to private vehicles, either as a driver or as a passenger, followed by walking (4.9 per cent). This is shown in **Figure 5-18**.

Figure 5-18 Method of travel to work for workers in Merimbula – Tura Beach SA2



Source: ABS Census, 2016

5.2.4 Trip purposes

In 2021, the Merimbula Chamber of Commerce developed the Merimbula Town Summit, which summarises the outcomes of a community and business summit held in Merimbula. The purpose of the summit was to summarise desired future directions and address any gaps in achieving this. The group identified the Merimbula visitation profile outlined in **Figure 5-19**.

Figure 5-19 Merimbula visitor profile



Source: Merimbula Chamber of Commerce

5.2.5 Tourism

The Bega Valley Shire is a major tourist destination for people in NSW, the ACT and Victoria. Tourists are attracted to its natural beauty, outdoor activities, heritage and culture, and the regional experiences three times higher population in summer months.

Generally, tourists who visit Merimbula are car dependent. The peak tourist season in Merimbula is during early January. During this period, increased vehicular traffic causes congestion especially on the town centre access via Merimbula Bridge. This link is a key travel route between Tathra, Bermagui, Tura Beach, Merimbula and Pambula.

Many tourist trips require access through the Merimbula CBD, such as connecting to Short Point, the elevated boardwalk to the aquarium and Bar Beach.

5.2.6 Traffic volumes

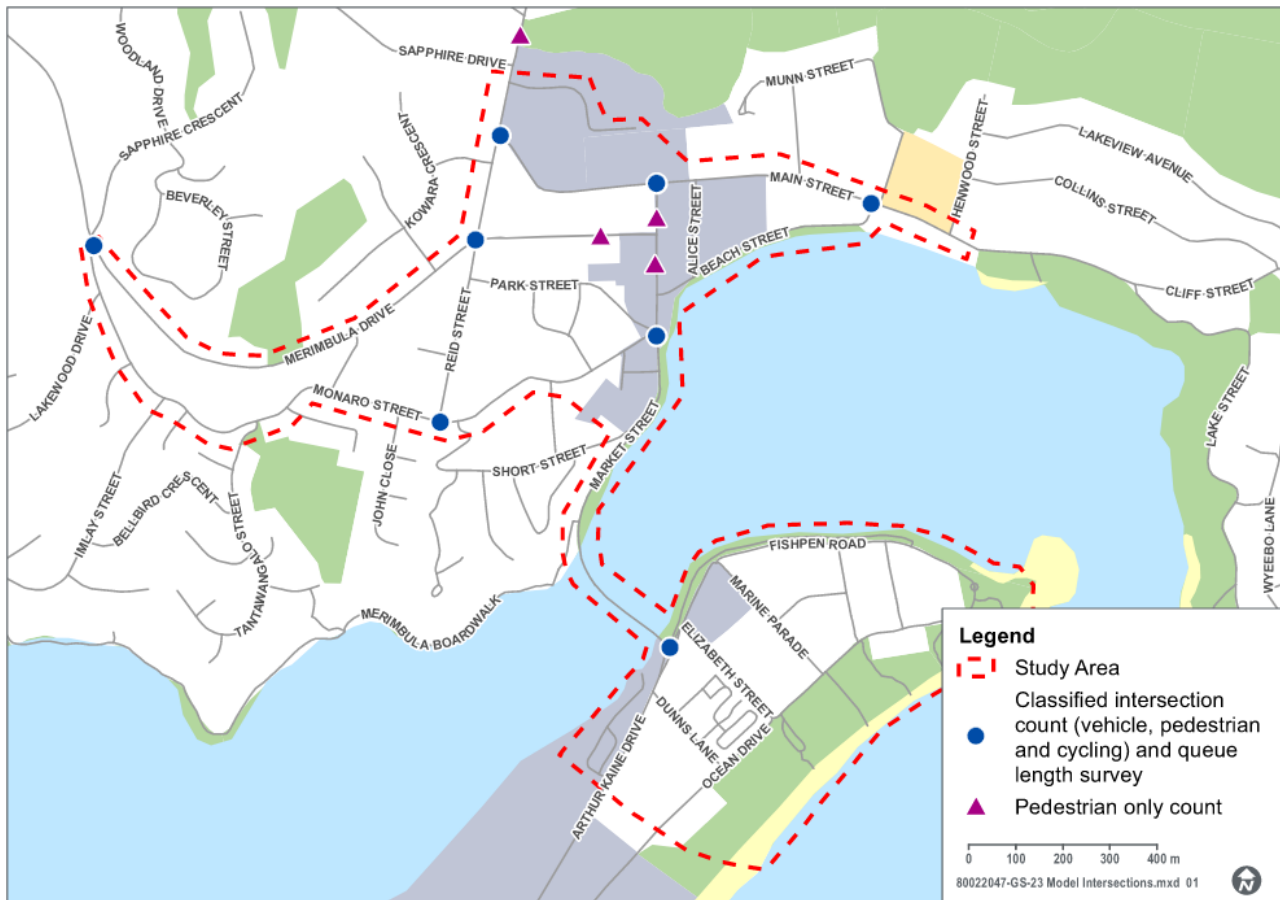
Traffic volume data analysis presented in this section is sourced from the following:

- > Classified intersection count data (vehicles, pedestrians and cyclists) for:
 - Typical Holiday period (Thursday 20 January 2022)
 - Typical AM and PM period (Wednesday 18 May 2022)
- > Permanent counter located on Arthur Kaine Drive shared path
- > Permanent counters located on Sapphire Coast Drive, Merimbula Drive and Arthur Kaine Drive.

The surveys were conducted at the following locations, and are shown in **Figure 5-20**:

- > Merimbula Drive / Sapphire Crescent / Monaro Street
- > Monaro Street / Reid Street
- > Market Street / Palmer Lane / Monaro Street
- > Sapphire Coast Drive / Main Street
- > Main Street / Market Street
- > Main Street / Beach Street
- > Market Street / Arthur Kaine Drive / Fishpen Road
- > Merimbula Drive / Sapphire Coast Drive / Reid Street
- > Market Street / Merimbula Drive (pedestrian)
- > Market Street pedestrian crossing (pedestrian)
- > Sapphire Coast Drive north of bridge (pedestrian).

Figure 5-20 Locations for classified traffic survey count



5.2.6.2 Pedestrian volumes

For both the Holiday Peak time and Typical Peak time surveyed days, the peak period for pedestrians was observed between 10:00am and 1:00pm. This period accounted for 4,016 and 2,472 pedestrians in the peak and non peak periods.

The highest pedestrian volumes across the survey periods were consistently observed at the intersections of Market Street and Merimbula Drive, Market Street, Palmer Lane and Monaro Street and the Market Street signalised pedestrian crossing.

The intersection of Merimbula Drive and Market Street is not supported by pedestrian crossing infrastructure despite significant pedestrian volumes. Other locations lacking dedicated crossing infrastructure that received high volumes of pedestrians included the intersections of Main Street and Market Street, Main Street and Beach Street and Arthur Kaine Drive and Fishpen Road.

North of the bridge on Sapphire Coast Drive, pedestrian volume was observed to be higher during the off-peak time than the peak time.

Pedestrian volumes per intersection and across the study area per 15 minutes are shown in **Figure 5-21** and **Figure 5-22**.

Figure 5-21 Pedestrian volumes by intersection (10am to 1pm)

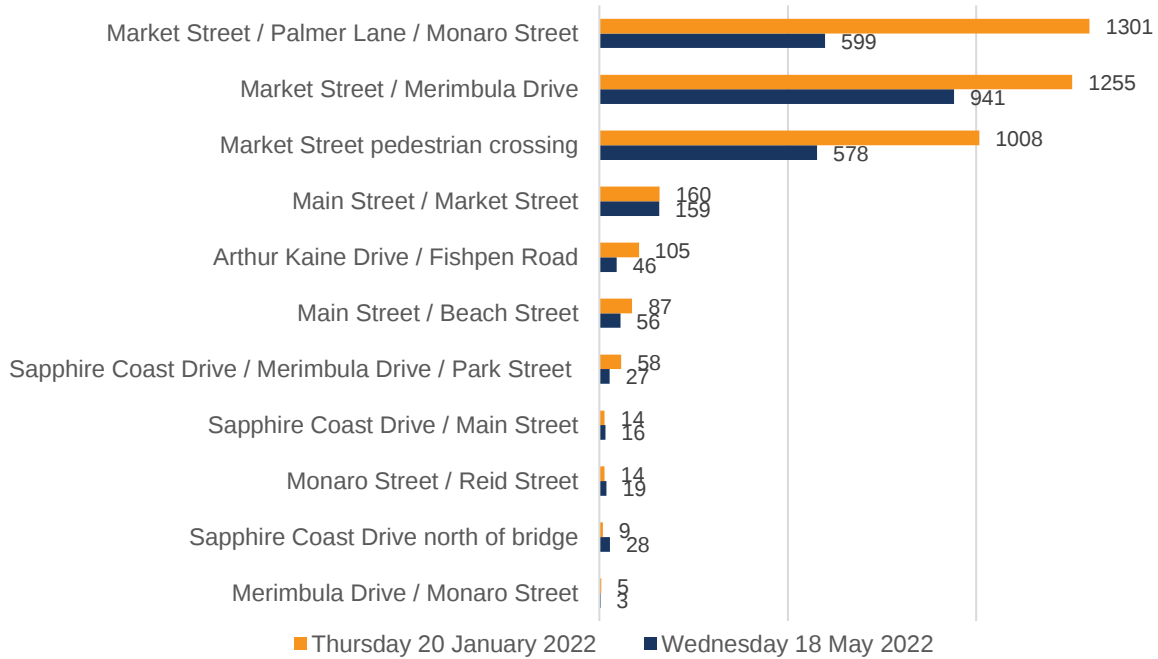
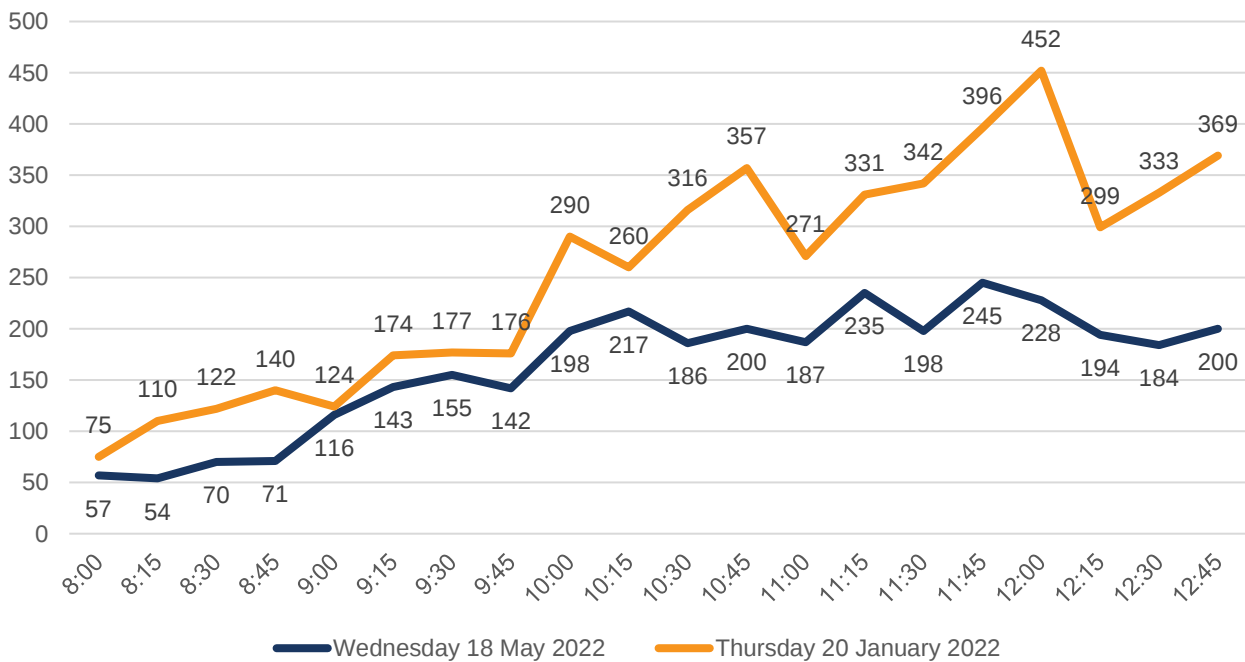


Figure 5-22 Pedestrian volumes across the day



5.2.6.3 Cycling volumes

Survey results for the summer peak period in January 2022 shows that the peak cycling volume was observed between 10:15am – 10:45am, with a total of 68 cyclists counted. Between 8:00am and 1:00pm, a total of 289 cyclists were observed. The cycling volume at each intersection for the survey period between 8:00am and 1:00pm is mapped in **Figure 5-23**.

Counts from 18 May 2022 show that the peak cycling volume is observed between 8:00am and 8:30am, with a total of 72 cyclists counted in this period. Between 8:00am and 1:00pm, a total of 193 cyclists were counted. The cyclist volumes at each survey location between 8:00am and 1:00pm for this survey day is shown in **Figure 5-24**.

Cyclist volumes across the day for both the peak and non-peak periods are shown in **Figure 5-25**. Figure 5-24

Figure 5-23 Total cycling volumes during survey period (8:00am – 1:00pm) Thursday 20 January 2022

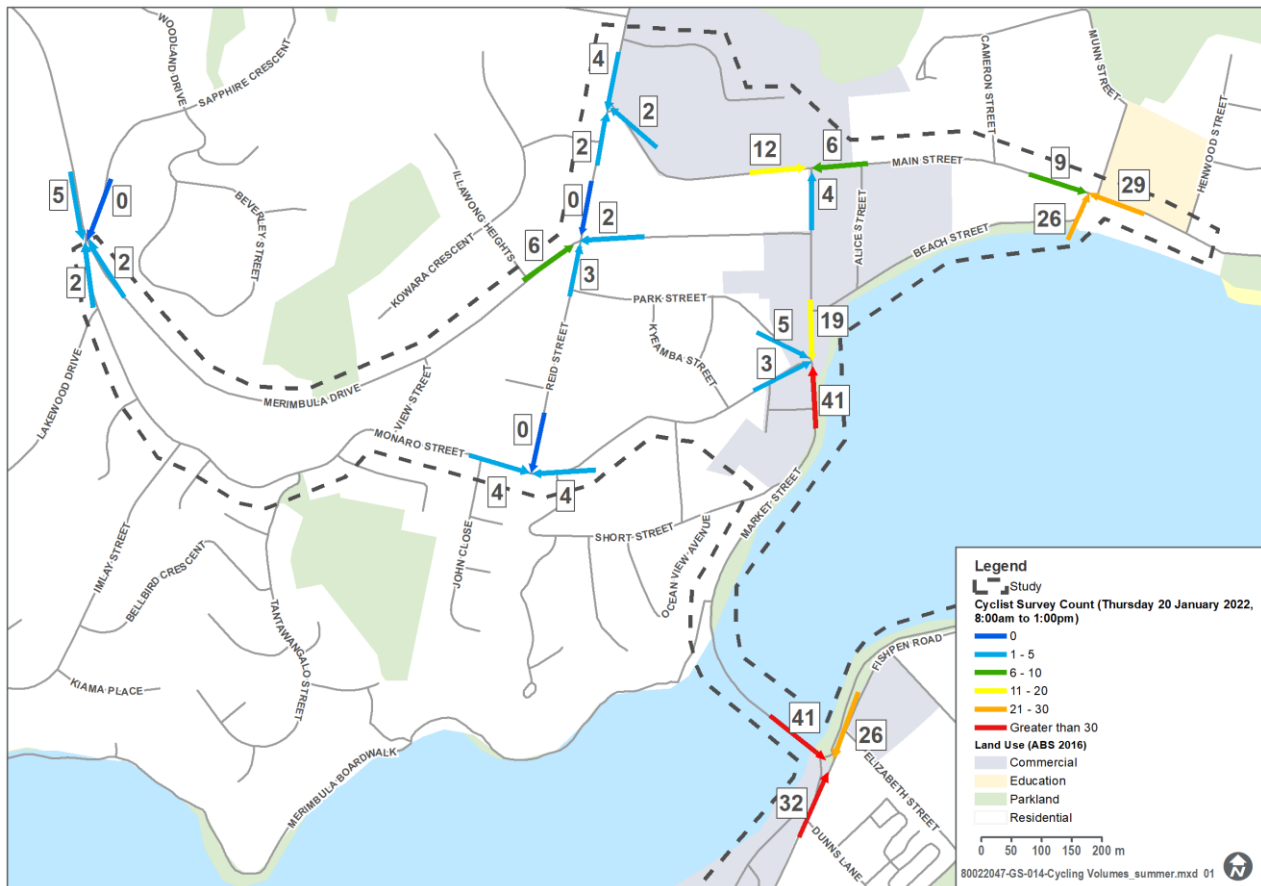


Figure 5-24 Total cycling volumes during survey period (8:00am – 1:00pm) Wednesday 18 May 2022

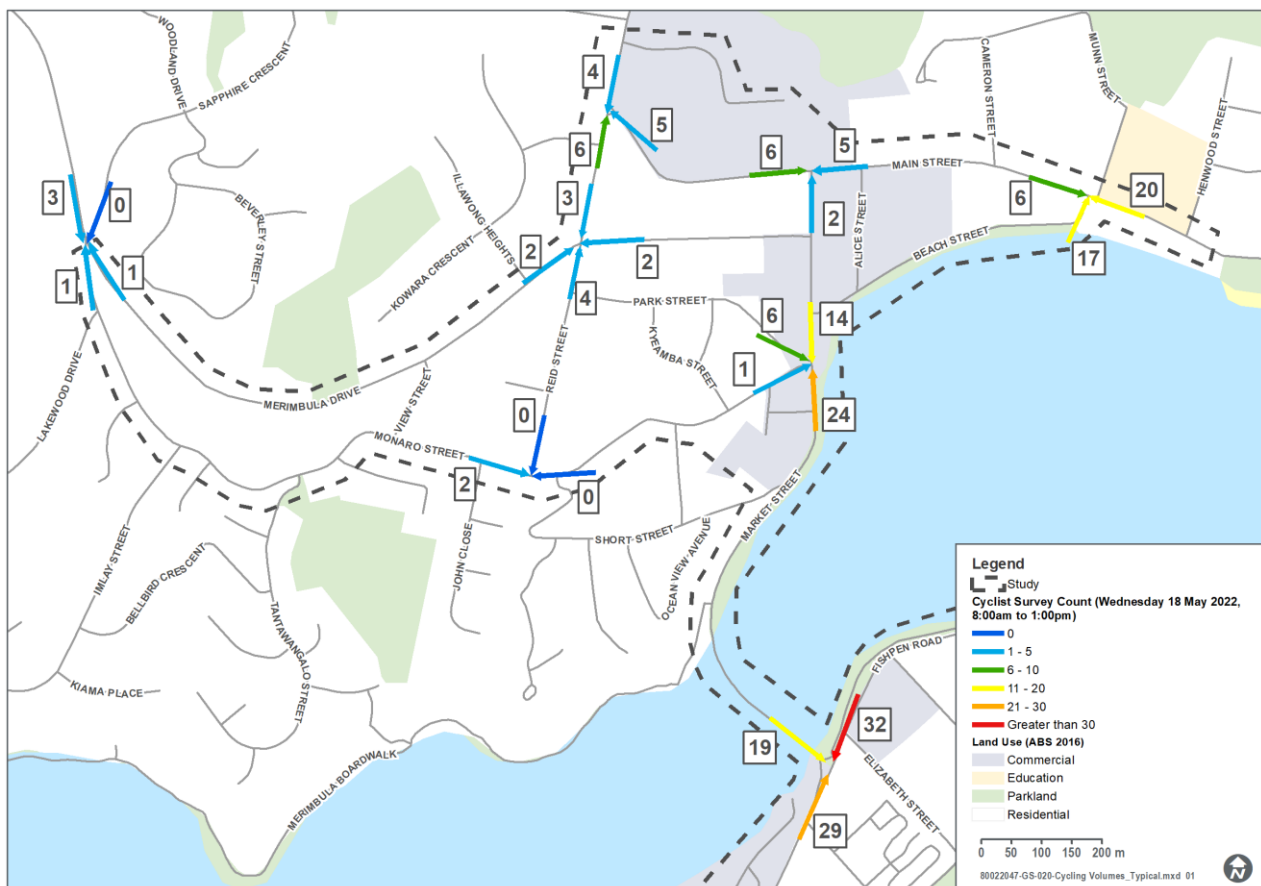
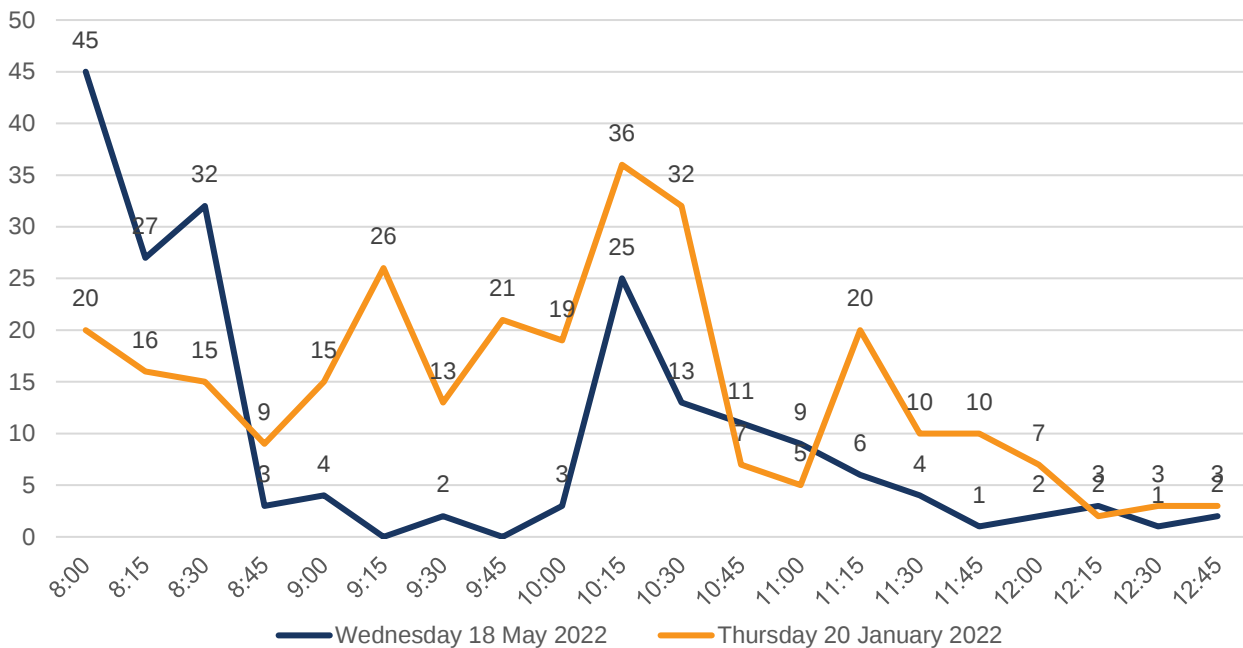


Figure 5-25 Cycling volumes across the day



5.2.6.4 Arthur Kaine Drive shared path

A permanent counter is located on the Arthur Kaine Drive shared path, which connects Fishpen Road with Merimbula Airport and Pambula. **Figure 5-26** shows the monthly average pedestrians using the Arthur Kaine Drive shared path in both directions. It should be noted that data for February 2022 is not available as the counter was decommissioned during works on Arthur Kaine Drive.

Figure 5-26 Arthur Kaine Drive shared path monthly average pedestrians

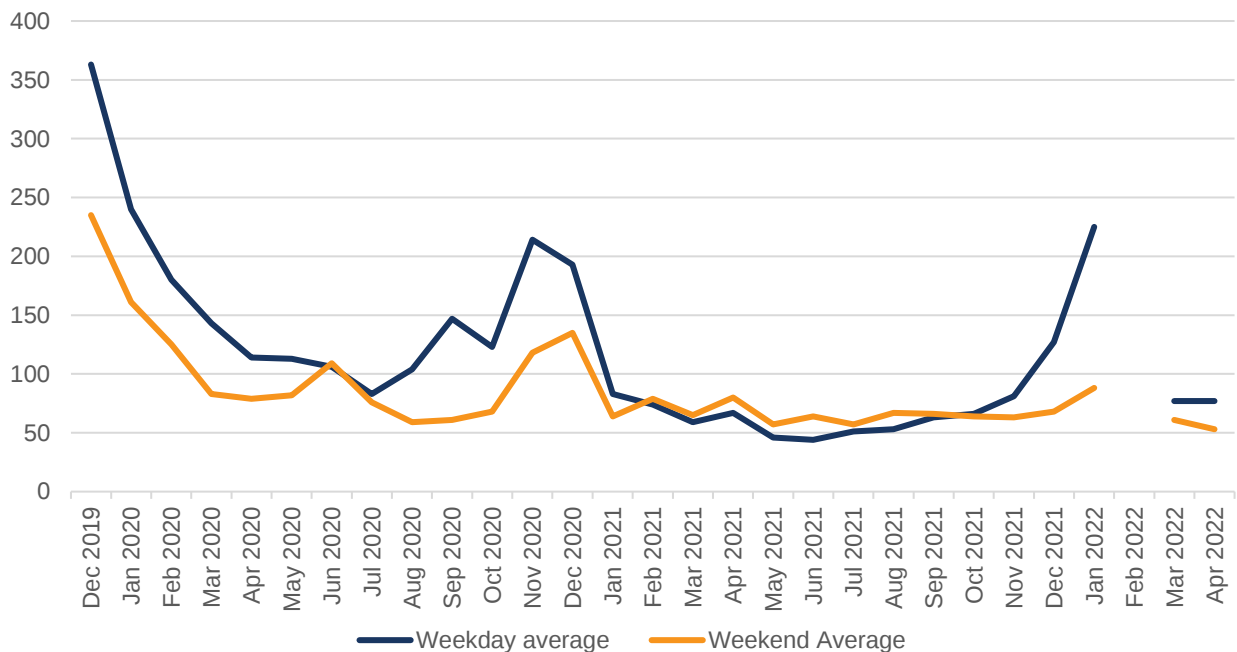
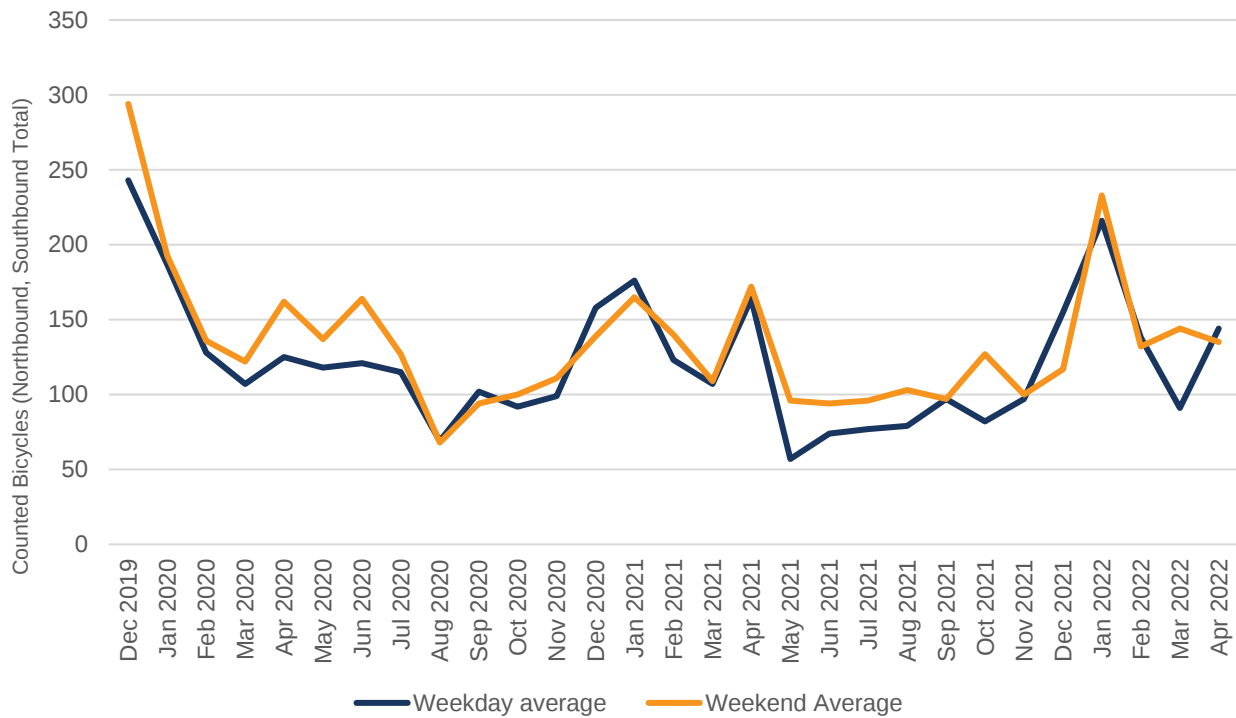


Figure 5-27 shows the weekday and weekend day monthly average number of cyclists using the Arthur Kaine Drive shared path.

Figure 5-27 Arthur Kaine Drive shared path monthly average cyclists



Counts were observed to be the highest during the months of December and January in line with peak tourism season in Merimbula. The relative drop in volume between 2019 and 2020 is reflective of the decrease in tourism from the 2019/20 summer bushfires and COVID-19. During peak months, the weekday and weekend average cycling counts are at similar levels, though weekend averages in general are higher than weekday averages for all other months.

5.2.6.5 Vehicle volumes

During the holiday peak period, the key intersections with the highest traffic volumes were the roundabout at the intersection of Merimbula Drive, Sapphire Coast Drive and Reid Street, and the signalised intersection at Market Street, Palmer Lane and Monaro Street.

Relatively high traffic volumes were recorded at the intersection of Sapphire Coast Drive and Main Street due to traffic entering and leaving Merimbula to the north (towards Bournda and Tathra), and at the Market Street, Arthur Kaine Drive and Fishpen Road intersection due to traffic entering and leaving Merimbula to the south (towards Pambula and Eden).

Intersections leading into predominantly residential areas experienced lower traffic volumes. All intersections with higher traffic volumes generally showed a similar trend with volumes increasing throughout the morning, before stabilising at their highest peaks between 10am and 12.30pm.

Typical holiday peak period volumes are shown in **Figure 5-28**, which generally reached over 1,800 vehicles every 15 minutes between 9:45am and 12:45pm. The highest proportion of heavy vehicles was observed at the intersection of Merimbula Drive and Monaro Crescent, where heavy vehicles accounted for six per cent of all vehicle traffic during the holiday peak survey period.

Overall, vehicle volumes were lower during the surveyed day in May 2022 compared to the Holiday peak in January 2022, as shown in **Figure 5-29** and **Figure 5-30**.

Figure 5-28 Classified intersection survey volumes (Thursday 20 January 2022) – Holiday peak

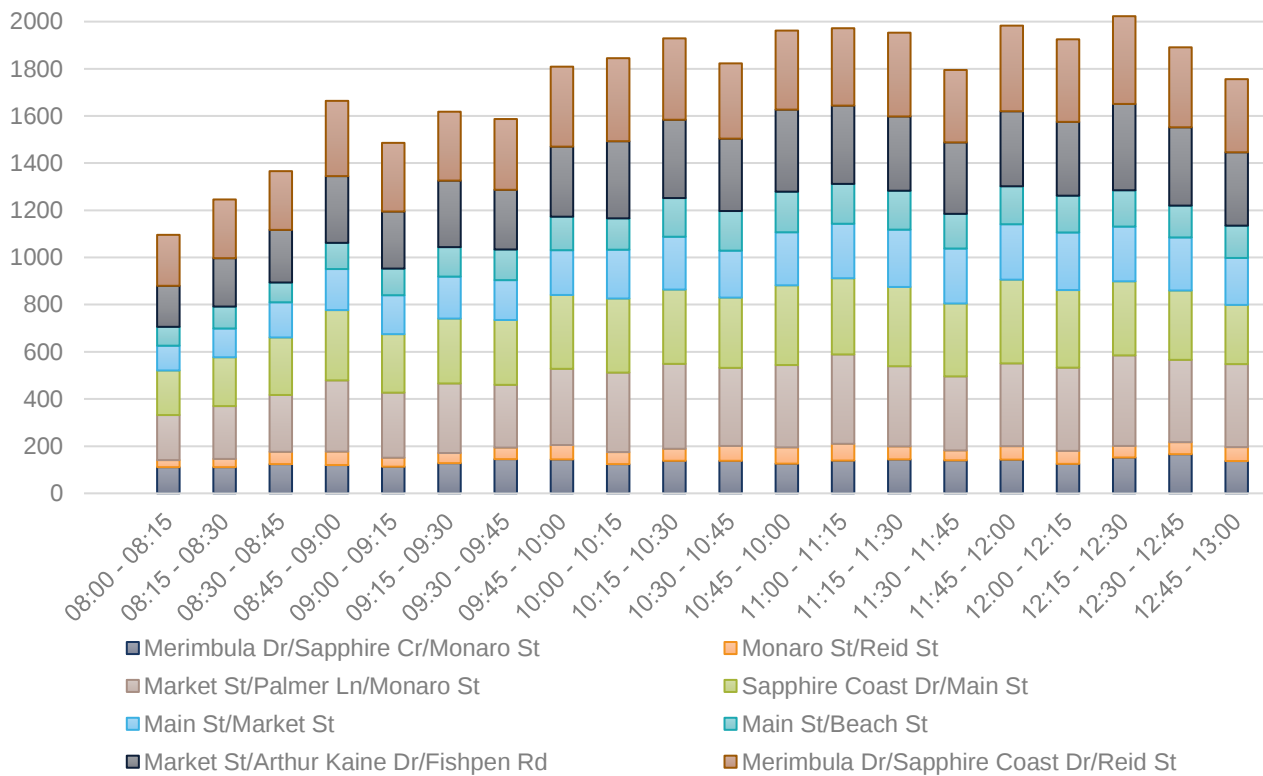


Figure 5-29 Classified intersection survey volumes (Wednesday 18 May 2022) – Business peak

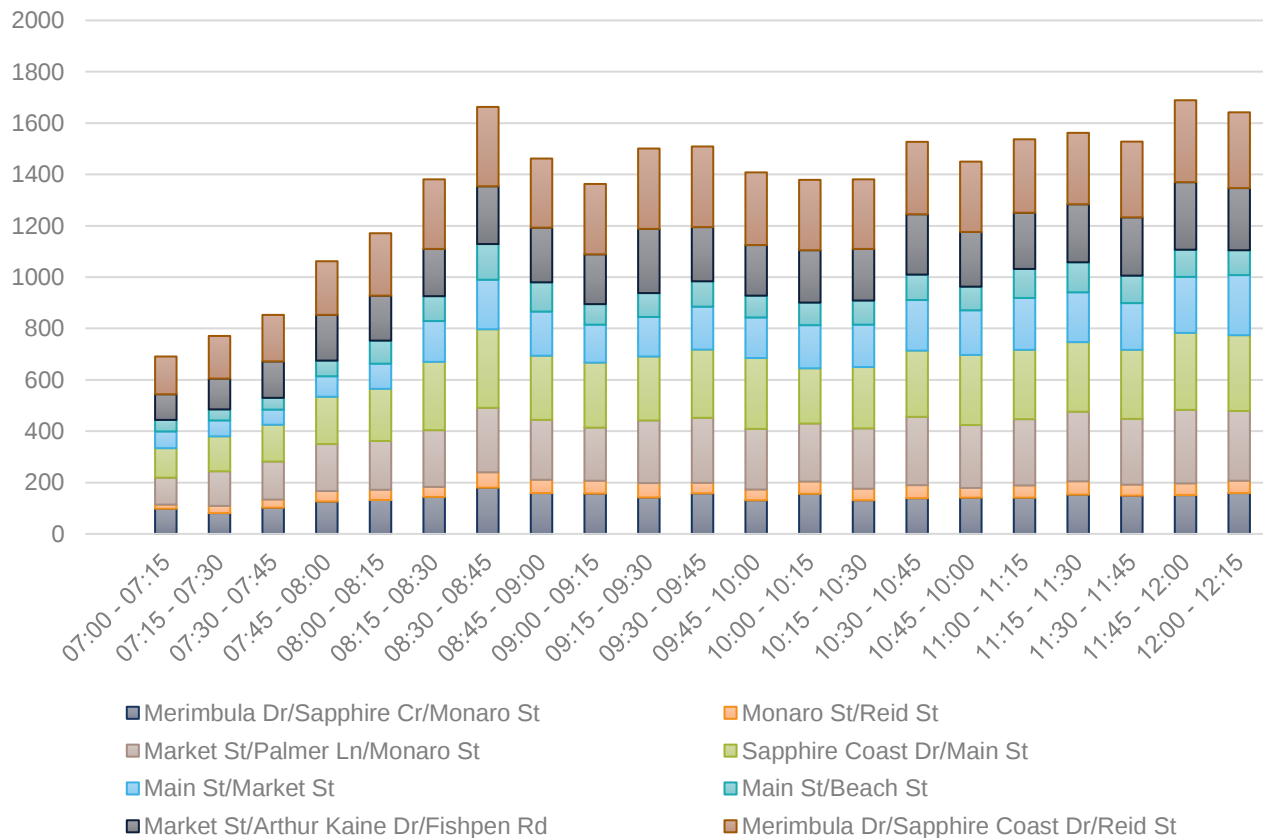
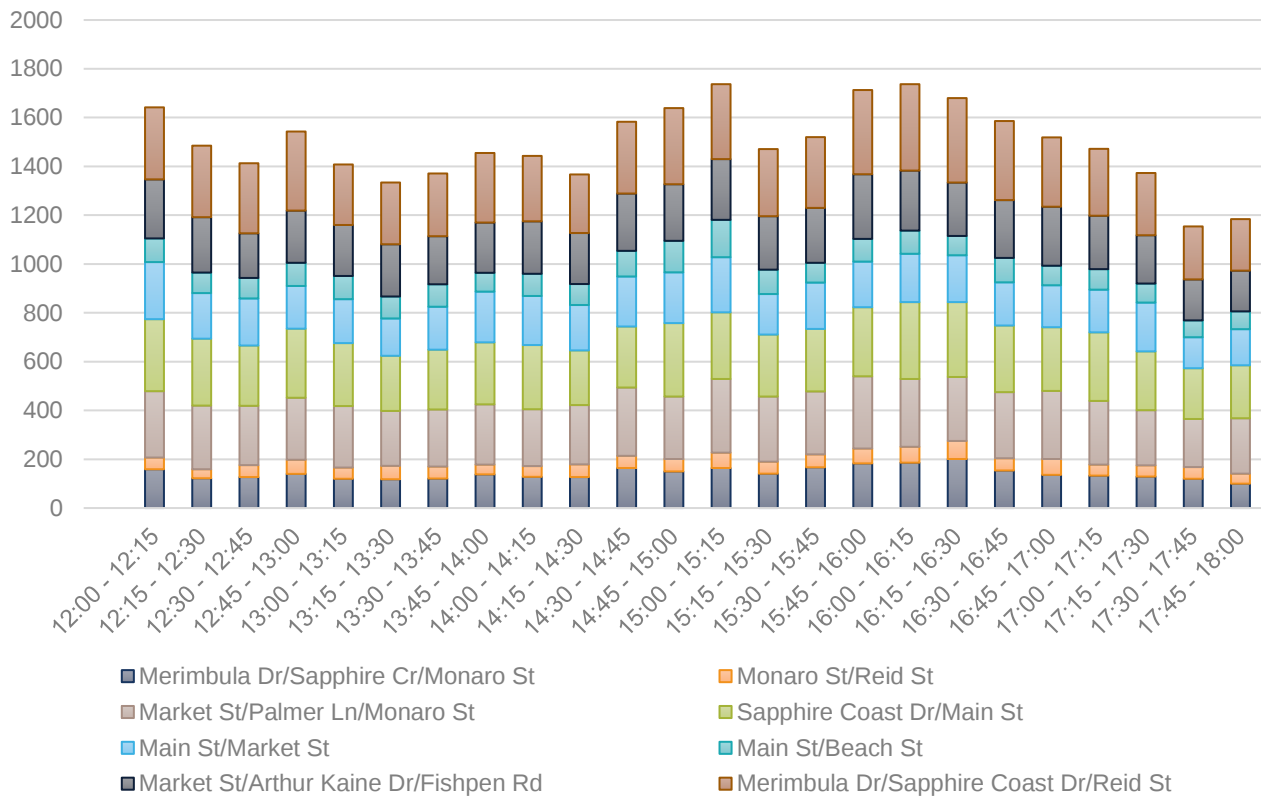


Figure 5-30 Classified intersection survey volumes (Wednesday 18 May 2022) – PM peak



5.2.6.6 Permanent vehicle counts

Permanent vehicle counters are located on Arthur Kaine Drive, Merimbula Drive and Sapphire Coast Drive. Data is available for the months of January, February, March and April 2022, and December 2019 for Arthur Kaine Drive only. Data for 2020 and 2021 does not reflect typical traffic counts due to the COVID-19 pandemic. Counts on Arthur Kaine Drive show similar vehicle volumes in 2019 (pre COVID-19) to early 2022.

Average vehicle volumes for Arthur Kaine Drive, Sapphire Coast Drive and Merimbula Drive are shown in **Figure 5-31**, **Figure 5-32** and **Figure 5-33**.

Figure 5-31 Average vehicle volumes – Arthur Kaine Drive

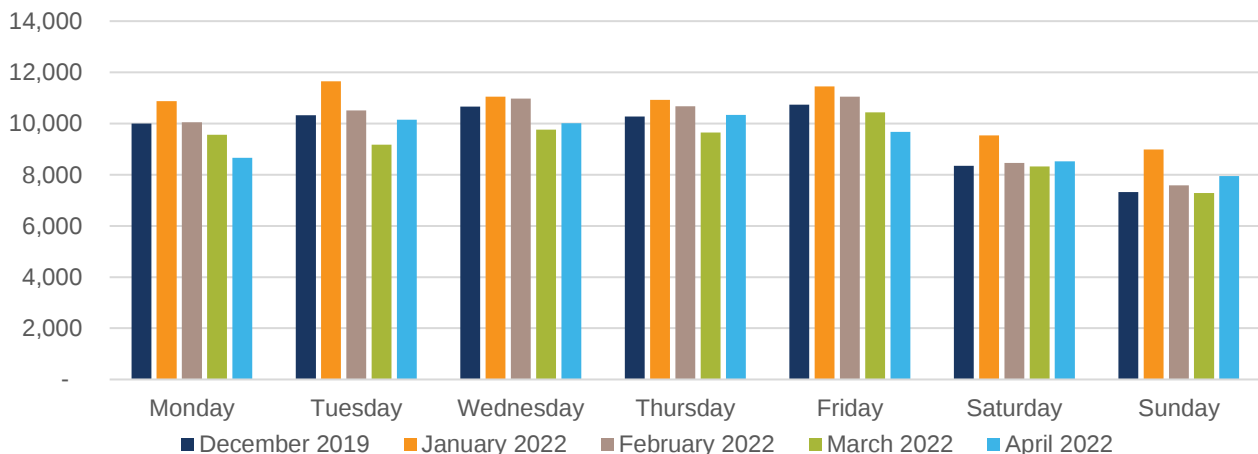


Figure 5-32 Average vehicle volumes – Sapphire Coast Drive

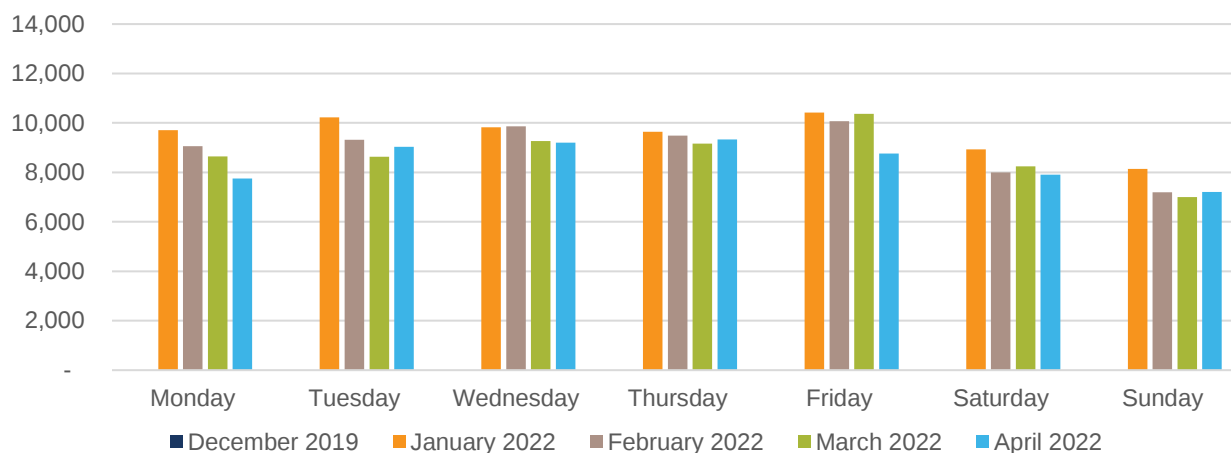
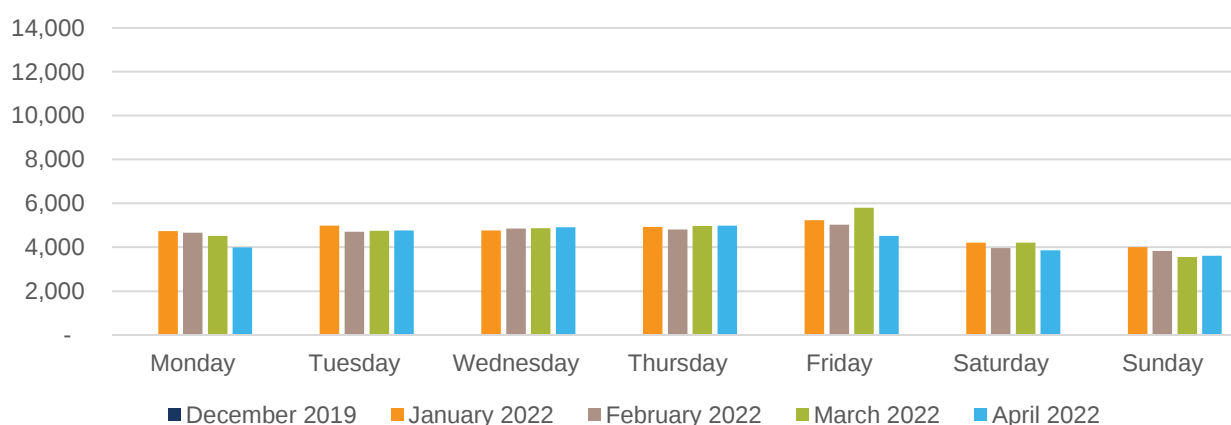


Figure 5-33 Average vehicle volumes – Merimbula Drive

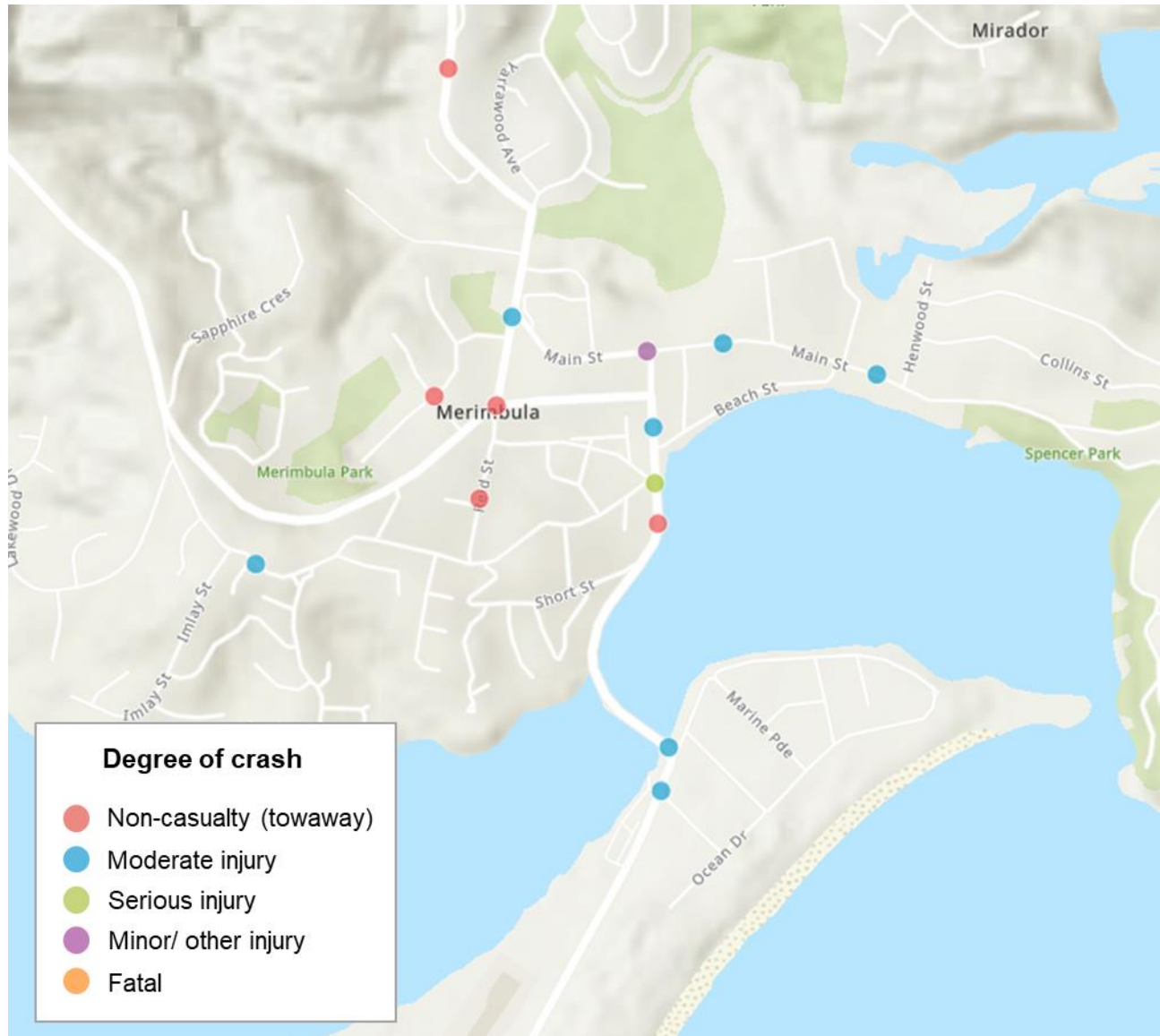


5.3 Road Safety

Reported crash statistics are provided by Transport for NSW for the period between 2017 and 2021. Data shows that crashes are focused at intersections within Merimbula. Within this period, one crash between a passenger van and pedestrian occurred near the midblock signalised pedestrian crossing on Market Street within the CBD, resulting in a moderate injury.

Two cyclist crashes occurred on Arthur Kaine Drive, at the intersections of Dunns Lane and Market Street, both resulting in moderate injuries. A serious injury crash occurred between two vehicles at the intersection of Market Street and Monaro Street.

Figure 5-34 Reported crashes (2017 to 2021)



Source: TfNSW Interactive crash statistics

6 Intersection Performance

Intersection models assess the performance of individual intersections based on analytical methods. Intersection modelling was undertaken for the eight intersections shown in **Figure 5-20**, using traffic survey data established in **Section 5.2.6.4**. The classified intersection counts identified in **Section 5.2.6** were used in intersection modelling

6.1 Key Intersections

Table 6-1 describes general traffic observations and issues for each key intersection.

Table 6-1 Observations, issues and opportunities at key Intersections

Intersection	Type	Observations
Sapphire Coast Drive / Merimbula Drive / Reid Street	Roundabout	- Many heavy vehicles drive over the roundabout. - Western approach of Merimbula Drive has the longest queue lengths. - Lack of kerb ramps or accessible pedestrian refuges.
Sapphire Coast Drive / Main Street	Priority	- Constant flow of traffic on Sapphire Coast Drive makes it difficult to turn out of Main Street. - Relatively narrow northbound lane width (less than six metres) on Sapphire Coast Drive makes it difficult for a through vehicle to pass a vehicle waiting to turn right. - No crossing facilities on Sapphire Coast Drive. - The crossing distance on Main Street is wide. - Give way linemarking is faded on Main Street. - Unexpected give way sign for drivers turning right from Sapphire Coast Drive to Main Street.
Main Street / Market Street	Priority	- U-turns observed on Main Street (from eastbound to westbound). - Long crossing distance and lack of crossing facilities across Main Street and Market Street.
Market Street / Merimbula Drive	Priority	- High numbers of elderly pedestrians observed to cross Market Street near Merimbula Drive. - Lack of kerb ramps or refuge islands for pedestrians crossing Merimbula Drive.
Market Street pedestrian crossing	Mid-block signalised crossing	- Many pedestrians cross on red light, and some pedestrians jay walk requiring cars to give way. - The pedestrian green light crossing phase has a low frequency.
Market Street / Beach Street	Priority	- Queueing created on Beach Street from traffic signals at Park Street. - Kerb ramps are misaligned. - Poor sightlines for pedestrians crossing Beach Street looking left due to vegetation.

Intersection	Type	Observations
Market Street / Palmer Lane / Monaro Street	Signalised	▪ Key turning movements are continuing northbound and southbound on Market Street. ▪ Low traffic volume on Monaro Street, slightly greater on Park Street. ▪ Long queue lengths on northern and southern legs of Market Street. ▪ It is difficult to turn right on the CBD Bypass from Palmer Lane to Market Street because of limited length of turning lane.
Arthur Kaine Drive / Fishpen Road	Priority	▪ 50 kilometre per hour speed limit on Arthur Kaine Drive lengthens traffic platoons, reducing the number of safe gaps for vehicles turning out of the non-priority road. This forces drivers to accept unsafe gaps. ▪ Queuing on Fishpen Road occasionally extends back into Elizabeth Street. ▪ Acceleration lane on Arthur Kaine Drive for vehicles turning right out of Fishpen Road is poorly signposted and line marked.
Main Street / Beach Street	Priority	▪ Slight delay time for vehicles turning out of Beach Street, but overall delays are minimal.
Monaro Street / Reid Street	Priority	▪ Residential area with very low traffic volume.
Merimbula Drive / Monaro Street	Priority	▪ Low traffic volume approaching the intersection from Monaro Street. ▪ Minimal delays from Monaro Street. ▪ Minimal pedestrian activity.

6.2 Peak Traffic Volumes

The total peak hour volumes were calculated by summing the total volumes recorded at each surveyed location. The peak hours are shown in **Figure 6-1** and outlined in **Table 6-2**.

The period with the highest total peak hour volume occurred during the holiday period (Thursday 20 January 2022), occurring between 11:45am and 12:45 pm, with over 7,800 vehicles across all surveyed locations in one hour. This figure is almost 22 per cent higher than the typical weekday morning peak and 16.5 per cent higher than a typical weekday afternoon peak.

Figure 6-1 Peak traffic volumes

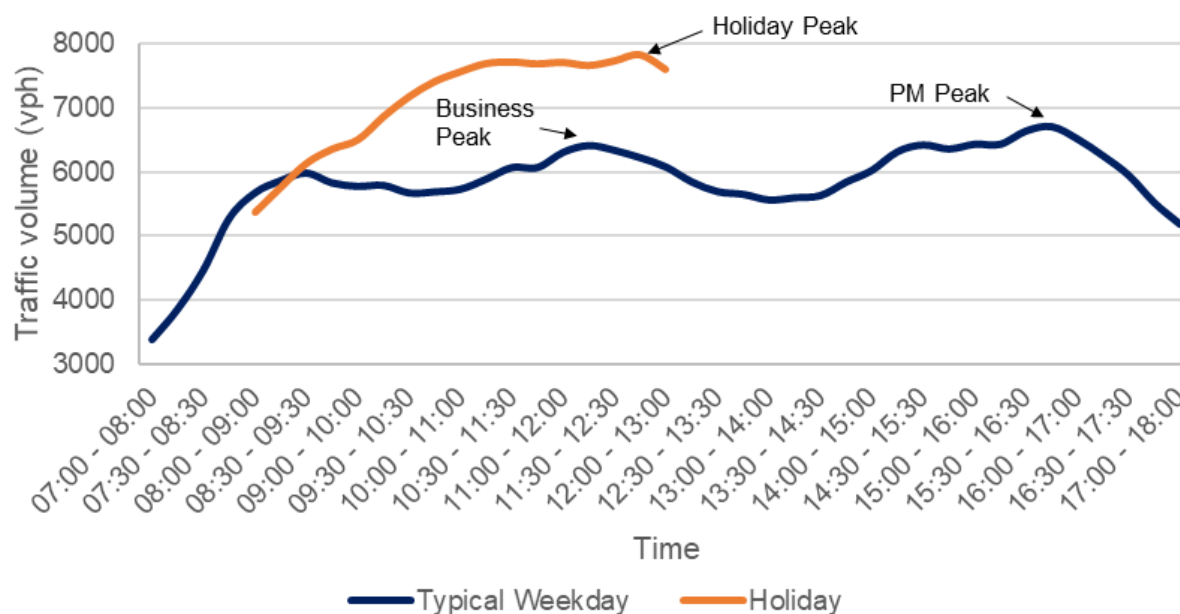


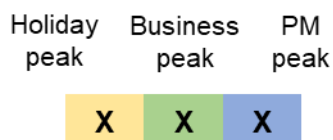
Table 6-2 Study area peak periods across surveyed times

Peak period	Peak hour	Total peak hour volume (across 8 intersections)
Typical Weekday Business Peak	11:15am – 12:15pm (Wednesday 18 May 2022)	6,421
Typical Weekday PM Peak	3:45pm – 4:45pm (Wednesday 18 May 2022)	6,716
Holiday Peak	11:45am – 12:45pm (Thursday 20 January 2022)	7,822

6.3 Queue Lengths

Queue length surveys were completed at the same time as each of the classified intersection counts in January and May 2022 to identify locations of congestion. Queue length surveys count the number of vehicles on any given approach that are delayed by giving way to other vehicles in the intersection.

The queue lengths recorded on the critical intersection approaches during the holiday peak, Business Peak and PM Peak are shown in **Figure 6-2** using the following key:



The queue length results showed that the highest levels of congestion were observed on the northern and southern approaches to the signalised intersection of Market Street / Palmer Lane/ Monaro Street, and on the northern and western approaches to the roundabout at Merimbula Drive / Sapphire Coast Drive / Reid Street.

Figure 6-2 Queue length results

Merimbula Drive / Sapphire Coast Drive / Reid Street



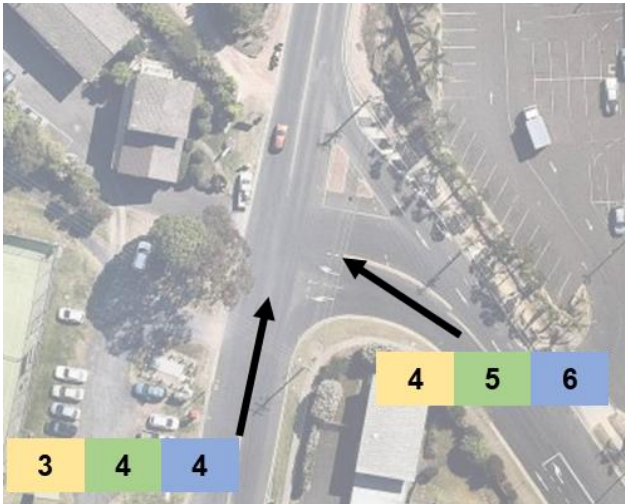
Monaro Street / Reid Street



Market Street / Arthur Kaine Drive / Fishpen Road



Sapphire Coast Drive / Main Street



Main Street / Market Street



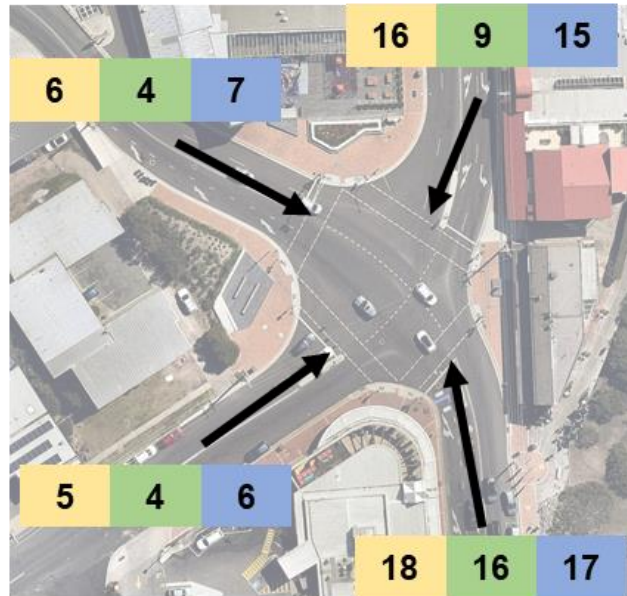
Main Street / Beach Street



Merimbula Drive / Sapphire Crescent / Monaro Street



Market Street / Palmer Lane / Monaro Street



6.4 Model Overview

The intersection performance criteria are based on the TfNSW Traffic Modelling Guidelines (2013). The capacity of a road network can be largely determined by the capacity of the controlling intersections. The key indicator of intersection performance Level of Service (LoS) is delay, where results are placed on a continuum from 'A' to 'F' as shown in **Table 6-3**.

The Modelling Technical Memo and SIDRA movement summaries are presented in **Appendix A**.

Table 6-3 Level of Service criteria

Level of Service	Average delay per vehicle (seconds)	Traffic signals/ roundabout	Give way and stop signs
A	<14	Good operation	Good operation
B	15 to 28	Good with acceptable delays & spare capacity	Acceptable delays & spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Operating near capacity	Near capacity & accident study required
E	57 to 70	At capacity; at signals, incidents will cause excessive delays	At capacity, requires other control mode
F	>70	Unsatisfactory and requires additional capacity	Unsatisfactory and requires additional capacity

Source: TfNSW Traffic Modelling Guidelines (2013)

Transport for NSW guidelines state that for roundabouts and priority control intersections, a Level of Service (LoS) assessment should be reported based on the worst performing movement of the intersection. For traffic signals, the average movement delay and corresponding LoS over all movements should be determined and reported.

Degree of Saturation is defined as the ratio of demand flow (vehicle arrival) to road capacity. Degree of Saturation above 1.0 represents oversaturated conditions (demand flows exceed capacity), and below 1.0 represents undersaturated conditions (demand flows are below capacity).

The results of the modelling assessment at each of the eight surveyed intersections in the study area across the three surveyed peak periods are outlined in the following sections.

6.5 Model Findings Summary

The Level of Service findings for the SIDRA modelling is shown in **Table 6-4**. Key findings for the worst performing intersections are provided in **Table 6-5**. Intersection treatments are recommended for LoS D, E and F. Further information is provided in **Appendix A**.

Table 6-4 SIDRA model results summary

	AM Peak	PM Peak	Holiday Peak
Merimbula Drive / Sapphire Coast Drive / Reid Street	A	B	B
Monaro Street / Reid Street	A	A	A
Market Street / Arthur Kaine Drive / Fishpen Road	B	B	F
Sapphire Coast Drive / Main Street	B	C	C
Main Street / Market Street	A	A	A
Main Street / Beach Street	A	A	A
Merimbula Drive / Sapphire Crescent / Monaro Street	A	A	B
Market Street / Palmer Lane / Monaro Street	B	B	C

Table 6-5 Modelling key findings

Intersection	Key findings
Market Street / Arthur Kaine Drive / Fishpen Road	- The overall vehicle count through the intersection was slightly higher during the Holiday Peak (1,329 vehicles) compared to the AM and PM Peaks (958 vehicles and 967 vehicles). - The worst performing movement is the right turn from Fishpen Road to Market Street in all three peak hours. - The Holiday Peak performs unsatisfactorily at LOS F with delays over 70 seconds for vehicles turning right out of Fishpen Road. - Maximum queue lengths on the worst performing approach range between 3 to 4 vehicles across typical AM and PM peak hours, however the maximum queue length during the Holiday Peak was 8 vehicles. - During the Holiday Peak, degree of saturation (91.5%) is above the acceptable limit, indicating that the intersection may need additional capacity / intersection improvements to cater for the increased traffic during the holiday period.
Sapphire Coast Drive / Main Street	- The overall vehicle count through the intersection was slightly higher during the Holiday Peak (1,292 vehicles) compared to the AM and PM Peaks (1,135 vehicles and 1,177 vehicles). - The worst performing movement is the right-hand turn from Main Street to Sapphire Coast Drive, which occurred in all three peak periods. - The AM peak hour generally performs well at LOS B with acceptable delays, whilst the PM and Holiday Peaks perform slightly poorer at LOS C, which is a satisfactory level of service with delays between 30 to 42 seconds for vehicles turning right out of Main Street. - Maximum queue lengths on the worst performing approach range between 4 to 6 vehicles across all periods. - Degree of saturation across the peak hours is between 40 to 75%. These values are either above or within proximity to the maximum practical degree of saturation

Intersection	Key findings
	at sign-controlled intersections (80%). This indicates that the intersection may need additional capacity.
Market Street / Palmer Lane / Monaro Street	- The overall vehicle count through the intersection was relatively much higher during the Holiday Peak (1,437 vehicles) compared to the AM and PM Peaks (1,085 vehicles and 1,107 vehicles). - Intersection performance at traffic signals is governed by the average movement delay over all movements. The AM and PM peak hours perform well at LOS B with acceptable delays between 25 to 27 seconds (on average). The Holiday Peak performs more poorly at LOS C, however this is considered a satisfactory level of service. - Across all three peak periods, the approaches with the longest delays were Market Street North and Monaro Street. The delays in Market Street North are of particular significance given the much higher degree of saturation compared to Monaro Street. Degree of saturation in Market Street North ranged between 75 to 85%, whilst degree of saturation in Monaro Street ranged between 30 to 45%. - The longest queue lengths were observed on the Market Street North and South approaches to the intersection, ranging between 15 to 18 vehicles across most peak hours. - Average degree of saturation across the peak hours is between 78 to 87%, which is just below the maximum practical degree of saturation at signals (90%), indicating that the intersection is close to reaching its capacity.
Main Street / Market Street	Intersection operation is good, with acceptable delay and spare capacity available.
Main Street / Beach Street	Intersection operation is good, with acceptable delay and spare capacity available.
Merimbula Drive / Sapphire Crescent / Monaro Street	Intersection operation is good, with acceptable delay and spare capacity available.
Merimbula Drive / Sapphire Coast Drive / Reid Street	Intersection operation is good with acceptable delays and spare capacity.
Monaro Street / Reid Street	Intersection operation is good.

7 Issues and Opportunities Summary

Built environment indicator theme	Access and connection	Amenity and use	Green and blue	Comfort and safety	Character and form
Strengths	- Streets are generally wide and are suitable for protected cycling infrastructure - Engaged and active community - Majority of commuter trips are within Merimbula – Tura Beach area	- Close proximity to Merimbula Airport and Port of Eden - Future population growth is manageable	Excellent access to nature		Strong culture and heritage values
Opportunities	Influence sustainable mode choice through parking management strategies and redistribute parking to suit the needs of visitors, locals and services	- Grow tourism and year round visitation through the Merimbula Airport expansion, Port of Eden revitalisation and improved access to events within Merimbula - Capitalise on accessible living and tourism in Merimbula	Reduce greenhouse gas emissions to manage the effects of climate change through improved active transport links	Expand one way streets and shared zones to emphasise place making	Strengthen on-demand bus services
Threats	- Vehicles are currently prioritised over pedestrians and cyclists - Walking and cycling desire lines are not supported by safe and accessible infrastructure - Higher than NSW average median age population - Negative perception of public transport				High dependency on private vehicles for work, social and education trips
Weaknesses		Large distances between regional centres and job opportunities		Constrained town gateways	- Physical constraints including the Market Street Bridge - Lack of integrated wayfinding

APPENDIX

A

SIDRA MODELLING RESULTS



now



Date	23 March 2023	Project	80022047 – Merimbula Transport Study
Subject	Traffic Modelling at Merimbula Study Area Intersections		
Attachment/s	SIDRA Results		

1 Introduction

1.1 Background

As part of the Merimbula Transport Study for Bega Valley Shire Council, Cardno now Stantec have undertaken traffic modelling at key intersections across the Merimbula Study Area using SIDRA modelling software (Version 9).

Three base models have been created for each intersection to replicate existing conditions during a typical weekday morning peak, typical weekday afternoon peak and a holiday time peak. These models will provide a base for which Council can develop future models and help inform future transport planning and/or intersection upgrades.

1.2 Study area

Within the Merimbula study area, eight key intersections were chosen to be analysed as part of the study. These intersections were:

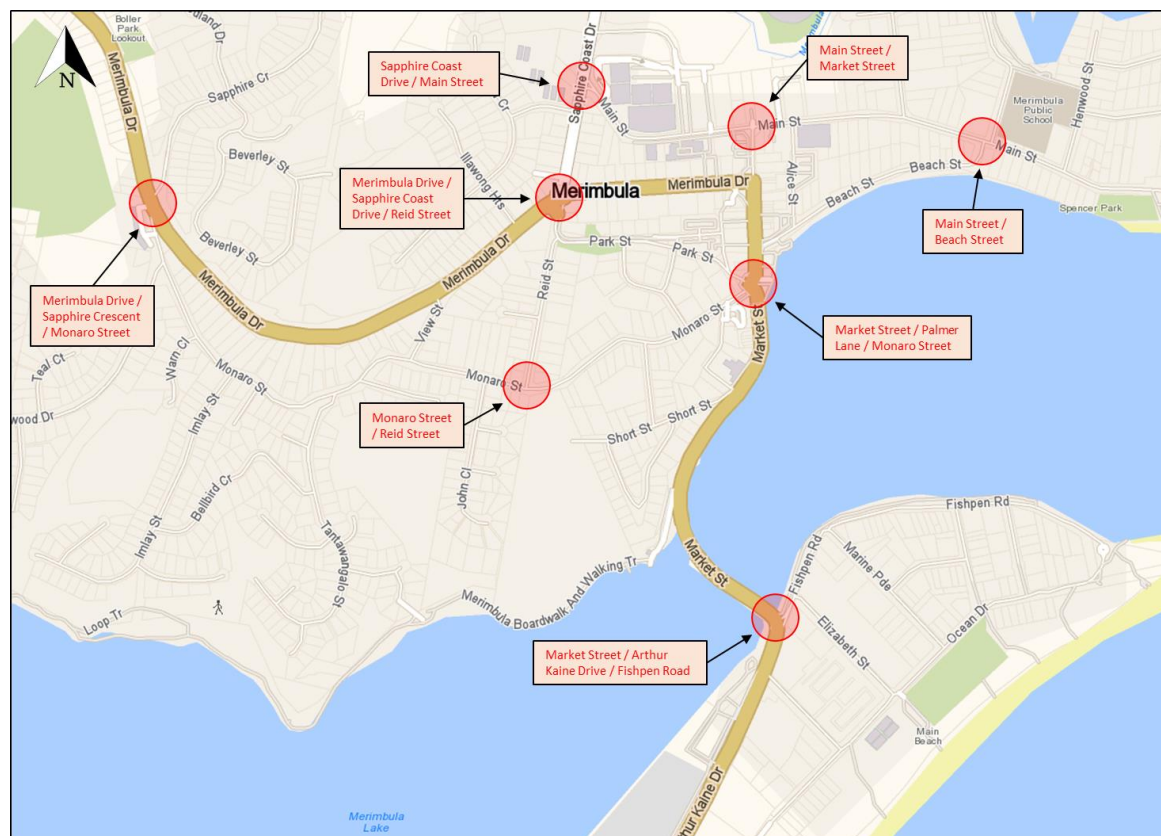
- > Merimbula Drive / Sapphire Crescent / Monaro Street
- > Monaro Street / Reid Street
- > Market Street / Palmer Lane / Monaro Street
- > Sapphire Coast Drive / Main Street
- > Main Street / Market Street
- > Main Street / Beach Street
- > Market Street / Arthur Kaine Drive / Fishpen Road
- > Merimbula Drive / Sapphire Coast Drive / Reid Street.

Merimbula Drive (RR 7637), Market Street (RR 7622), Arthur Kaine Drive (RR 7622) and Sapphire Coast Drive (RR 7621) are all unclassified regional roads. There are no state roads in the study area.

The regional roads connect the Merimbula study area to the following towns / points of interest:

- > To the west of the study area, Merimbula Drive leads to Bega
- > To the south of the study area, Arthur Kaine Drive leads to Merimbula Airport, Pambula and Eden
- > To the north of the study area, Sapphire Coast Drive leads to Kalaru and Tathra.

Figure 1-1 Study Area intersections



2 Existing conditions

2.1 Traffic surveys

Classified intersection counts were undertaken at the study area intersections on Thursday 20 January 2022 between 8:00am and 1:00pm, to collect peak hour data representative of a holiday peak, and on Wednesday 18 May 2022 between 7:00am and 6:00pm to collect peak hour data representative of a typical weekday morning and afternoon peak.

2.1.1 Overall network

The survey data was analysed to determine the overall peak hour across all eight intersections for each peak period. The peak hours that were determined are outlined below in **Table 2-1**. The total peak hour volumes were calculated by summing the total volumes recorded at each surveyed intersection.

Table 2-1 Study area peak hours

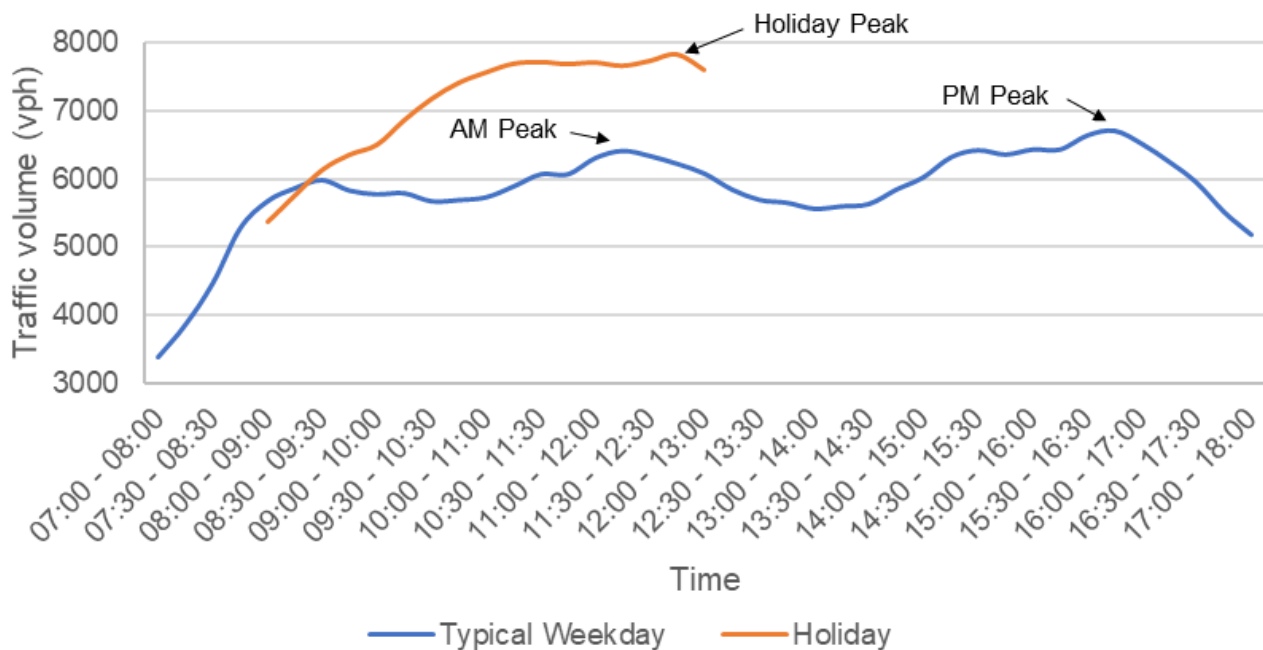
Peak period	Peak hour	Total peak hour volume (across 8 intersections)
Typical Weekday AM Peak	11:15am – 12:15pm (Wednesday 18 May 2022)	6,421 vph
Typical Weekday PM Peak	3:45pm – 4:45pm (Wednesday 18 May 2022)	6,716 vph
Holiday Peak	11:45am – 12:45pm (Thursday 20 January 2022)	7,822 vph

The peak period with the highest total peak hour volume is the holiday peak between 11:45am and 12:45pm with over 7,800 vehicles in one hour. This figure is almost 22 per cent higher than the typical weekday morning peak and 16.5 per cent higher than a typical weekday afternoon peak.

The holiday period generally attracts more visitors and tourists to Merimbula than during the school term, which in turns generates higher traffic volumes.

Figure 2-1 shows a comparison of the total peak hour volumes across the three surveyed peak periods.

Figure 2-1 Survey period comparison



2.1.2 Individual intersections

The traffic volumes at 15 minute intervals at each intersection across the three surveyed periods is graphed in **Figure 2-2**, **Figure 2-3** and **Figure 2-4**.

2.1.2.1 Typical weekday morning

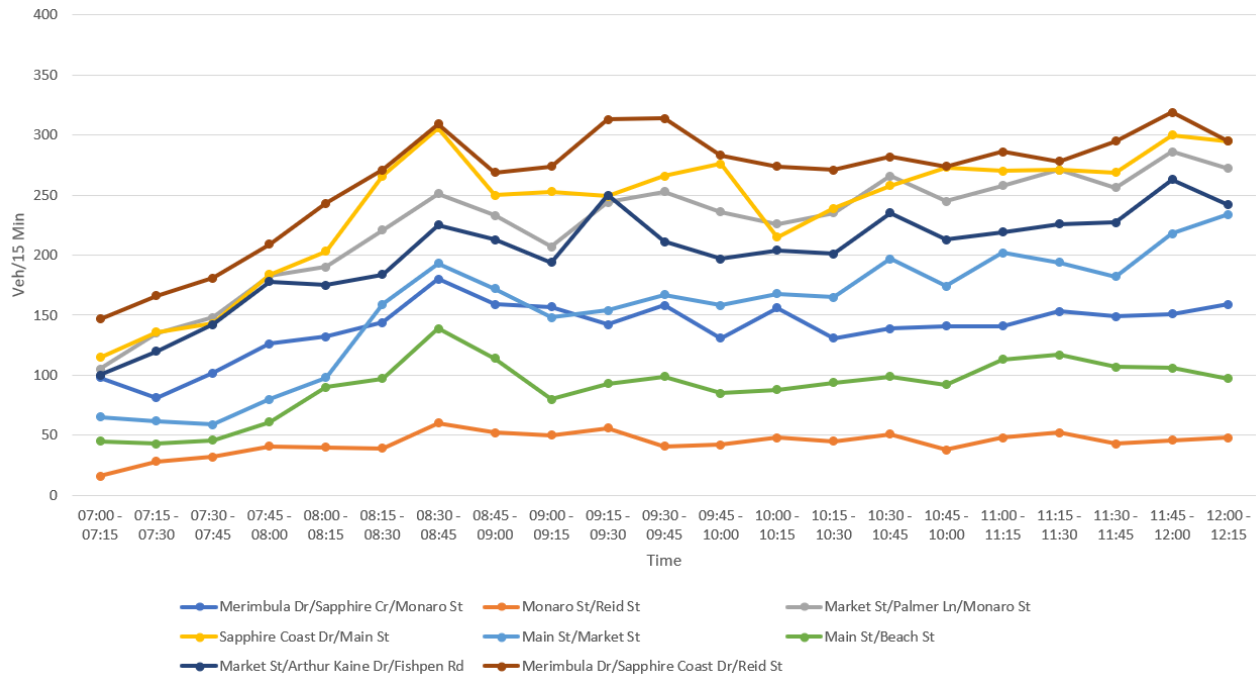
During the typical weekday morning period, all intersections showed a noticeable peak during the 8.30am to 8.45am time period. From this time, the majority of intersections recorded a slight drop in traffic before steadily increasing up to the lunch time peak. Exceptions to this were the intersections of Merimbula Drive / Sapphire Crescent / Monaro Street, Main Street / Beach Street, and Monaro Street / Reid Street, where volumes either remained steady or slightly declined.

The roundabout at Merimbula Drive / Sapphire Coast Drive / Reid Street experienced the highest traffic volumes throughout the morning.

As seen in **Figure 2-2**, the lunch time peak (11.15am to 12.15pm) was greater than the early morning peak (8.30am to 9.30am) and as such, the aforementioned lunch time peak has been adopted as the 'morning' peak throughout this analysis.

The typical AM weekday volumes are shown in **Figure 2-2**. Multiples peaks are observed which may correspond with school drop off periods.

Figure 2-2 15-Minute AM volumes



2.1.2.2 Typical weekday afternoon

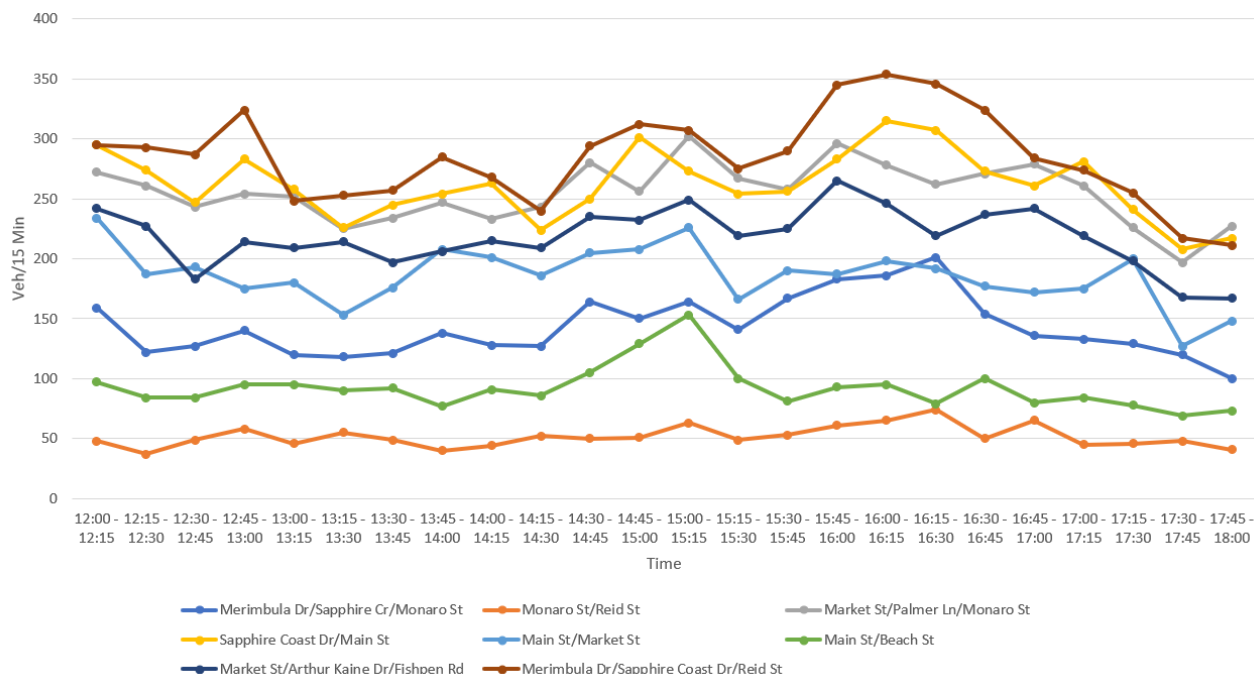
During the typical weekday afternoon period, all intersections retained similar levels of traffic relative to each other, with the Merimbula Drive / Sapphire Coast Drive / Reid Street generally experiencing the highest amount of traffic. Some of the recorded intersections appear to have a triple peak, which corresponds to school pick up times, end of the working day and also evening/ after school activities.

The intersections towards the north-eastern corner of the study area (Market Street / Palmer Lane/ Monaro Street, Main Street / Market Street and Main Street / Beach Street) all peaked during the 3.00pm to 3.15pm period. This aligns with the afternoon pick-up time for Merimbula Public School on Main Street.

The southern intersections of Market Street / Palmer Lane / Monaro Street and Market Street / Arthur Kaine Drive / Fishpen Road peaked between 3.45pm – 4pm, and the northern intersections of Merimbula Drive / Sapphire Coast Drive / Reid Street and Sapphire Coast Drive / Main Street peaked between 4pm – 4.15pm. This suggests a preferred northbound travel route during these times from Arthur Kaine Drive through to Sapphire Coast Drive.

The typical PM weekday volumes are shown in **Figure 2-3**.

Figure 2-3 15-Minute PM volumes



2.1.2.3 Holiday period

During the holiday peak period, the four intersections with the highest traffic volumes showed very similar volumes and trends throughout the surveyed period. The intersections with the highest volumes were the roundabout at Merimbula Drive / Sapphire Coast Drive / Reid Street and the signalised intersection at Market Street / Park Street/ Monaro Street.

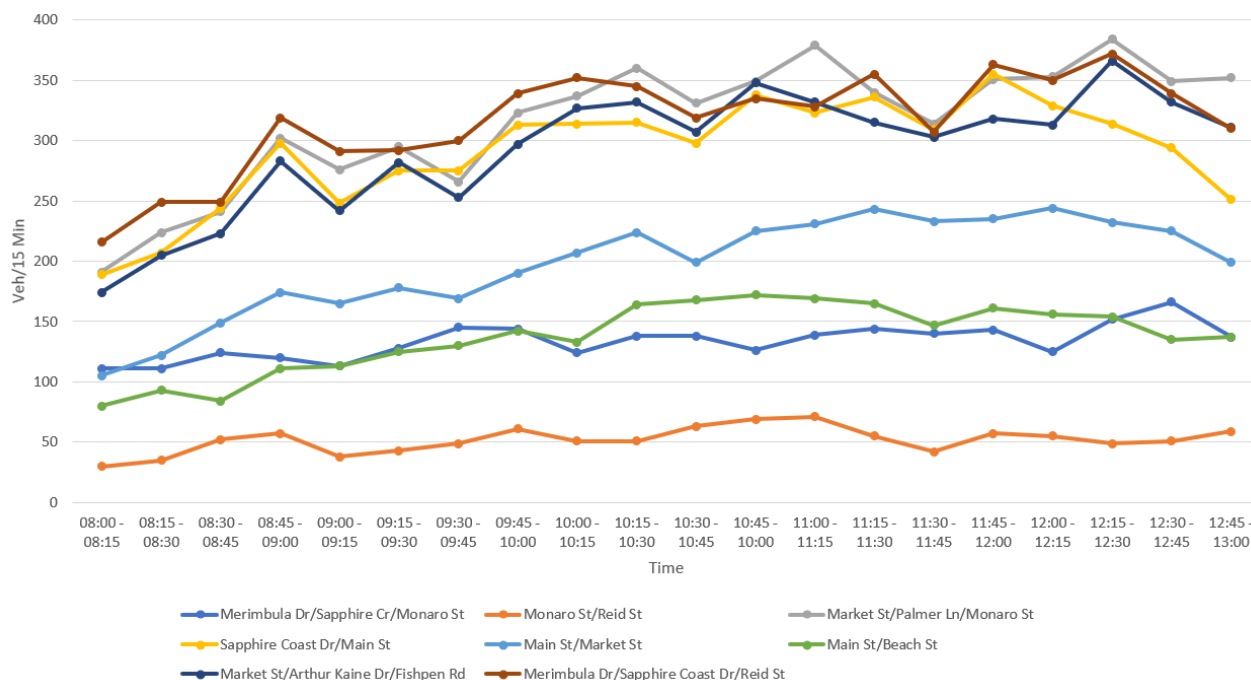
Relatively high traffic volumes were also recorded at Sapphire Coast Drive / Main Street due to traffic entering and leaving Merimbula to the north (towards Bournda and Tathra), and at Market Street / Arthur Kaine Drive / Fishpen Road due to traffic entering and leaving Merimbula to the south (towards Pambula and Eden).

Intersections in / leading into predominantly residential areas experienced lower traffic volumes.

All intersections with higher traffic volumes generally showed a similar trend with volumes increasing throughout the morning, before stabilising at their highest peaks between 10am and 12.30pm.

The holiday period volumes are shown in **Figure 2-4**.

Figure 2-4 15-Minute Holiday volumes



2.2 Site inspection

A site visit of the eight key intersections within the Study Area was conducted on the morning of Friday 21 January 2022. **Table 2-2** summarises general traffic observations that were made during the site visit.

Table 2-2 Site visit observations

Intersection	Observations
Merimbula Drive / Sapphire Crescent / Monaro Street	> Low traffic volume approaching the intersection from the non-priority road. > Minimal delays from Monaro Street.
Monaro Street / Reid Street	> Residential area with relatively low traffic volume.
Market Street / Palmer Lane / Monaro Street	> Key turning movements are continuing northbound and southbound on Market Street. > Low traffic volume on Monaro Street, slightly greater on Park Street. > Long queue lengths on northern and southern legs of Market Street.
Sapphire Coast Drive / Main Street	> Narrow northbound lane width (less than six metres) on Sapphire Coast Drive makes it difficult for a through vehicle to pass a vehicle waiting to turn right. > Constant flow of traffic on Sapphire Coast Drive makes it difficult to turn out of Main Street.
Main Street / Market Street	> U-turns observed on Main Street (from eastbound to westbound).
Main Street / Beach Street	> Main Street has a moderate traffic volume. > Insignificant delay time for vehicles turning out of Beach Street.
Market Street / Arthur Kaine Drive / Fishpen Road	> 50 kilometre per hour speed limit on Arthur Kaine Drive lengthens traffic platoons, reducing the number of safe gaps for vehicles turning out of the non-priority road. This forces drivers to accept unsafe gaps.

Intersection	Observations
	> Queuing on Fishpen Road occasionally extends back into Elizabeth Street.
Merimbula Drive / Sapphire Coast Drive / Reid Street	> Western approach of Merimbula Drive has the longest queue lengths. > Even traffic volumes across all approaches.

2.3 Congestion locations

As part of the traffic surveys conducted on 20 January and 18 May 2022, queue lengths on all approaches to the study area intersections were also recorded to identify locations of congestion. The queue length surveys count the number of vehicles on any given approach that are delayed by giving way to other vehicles in the intersection, with the maximum queue length defined when an arriving vehicle is no longer delayed by the back of a discharging queue.

The queue lengths recorded on the critical intersection approaches during the holiday peak, AM Peak and PM Peak are shown in **Figure 2-5** using the following key:

Holiday peak	Business peak	PM peak
X	X	X

Figure 2-5 Queue length results

Merimbula Drive / Sapphire Coast Drive / Reid Street



Monaro Street / Reid Street



Market Street / Arthur Kaine Drive / Fishpen Road



Sapphire Coast Drive / Main Street



Main Street / Market Street



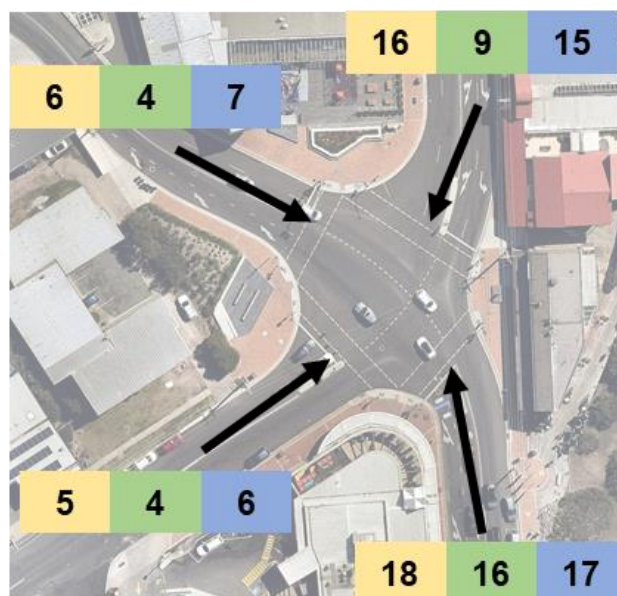
Main Street / Beach Street



Merimbula Drive / Sapphire Crescent / Monaro Street



Market Street / Palmer Lane / Monaro Street



The queue length results showed the highest levels of congestion on the northern and southern approaches to the signalised intersection of Market Street / Palmer Lane / Monaro Street, and on the northern and western approaches to the roundabout at Merimbula Drive / Sapphire Coast Drive / Reid Street.

3 Traffic assessment

3.1 Model assumptions

The following assumptions have been made during the development of the models

- > All traffic models are base models developed using existing 2022 intersection count data collected on 20 January and 18 May 2022
- > No traffic growth or reduction factors have been applied to the 2022 intersection count data
- > Based on visual observations, user-given cycle times of 100 seconds (holiday peak), 70 seconds (AM Peak) and 60 seconds (PM Peak) have been used for the signal phasing at the intersection of Market Street / Palmer Lane / Monaro Street
- > Also based on visual observations, red arrow protection for pedestrians has been modelled in SIDRA at Market Street / Palmer Lane / Monaro Street through using Late Start values of eight seconds for the turning movements in phase A (from Market Street South and Palmer Lane) and ten seconds for both approaches in phase B (Market Street North and Monaro Street).

3.2 Calibration

For the purpose of ensuring that the base models are a true reflection of the existing conditions, the models have been calibrated as per the TfNSW Traffic Modelling Guidelines and based on the queue length surveys and environmental factors, such as intersection design, driver attitudes, steep gradients and visibility issues.

Comparisons between the queue length survey data and the SIDRA model outputs for each intersection are shown in **Section 3.3**.

The calibration techniques used in SIDRA are briefly outlined below:

- > For the priority-controlled intersections, two gap acceptance parameters (namely the Critical Gap and Follow-Up Headway), have been adjusted in SIDRA to align the 95th percentile queue length SIDRA outputs with the queue lengths observed on-site. It should be noted that where the SIDRA outputs fall short of the observed queue lengths, the recommended maximum calibration values have been used in accordance with the TfNSW Traffic Modelling Guidelines.
- > For the roundabout, the SIDRA Environmental Factors have been adjusted to reflect any environmental factors impacting intersection performance, where lower values reflect less restricted (higher capacity / shorter queues) roundabout environments and higher values reflect more restricted (lower capacity / longer queues) roundabout environments.
- > For the signalised intersection, the Signal Coordination parameter has been adjusted to model platooning arrival patterns of vehicles.

3.3 2022 intersection performance

The intersection performance criteria are based on the Transport for NSW Traffic Modelling Guidelines (2013). The capacity of a road network can be largely determined by the capacity of the controlling intersections. The key indicator of intersection performance Level of Service (LOS) is delay, where results are placed on a continuum from 'A' to 'F' as shown in **Table 3-1**.

Table 3-1 Level of Service criteria

Level of Service	Average delay per vehicle (seconds)	Traffic signals/ roundabout	Give way and stop signs
A	<14	Good operation	Good operation
B	15 to 28	Good with acceptable delays & spare capacity	Acceptable delays & spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Operating near capacity	Near capacity & accident study required
E	57 to 70	At capacity; at signals, incidents will cause excessive delays	At capacity, requires other control mode
F	>70	Unsatisfactory and requires additional capacity	Unsatisfactory and requires additional capacity

Source: TfNSW Traffic Modelling Guidelines (2013)

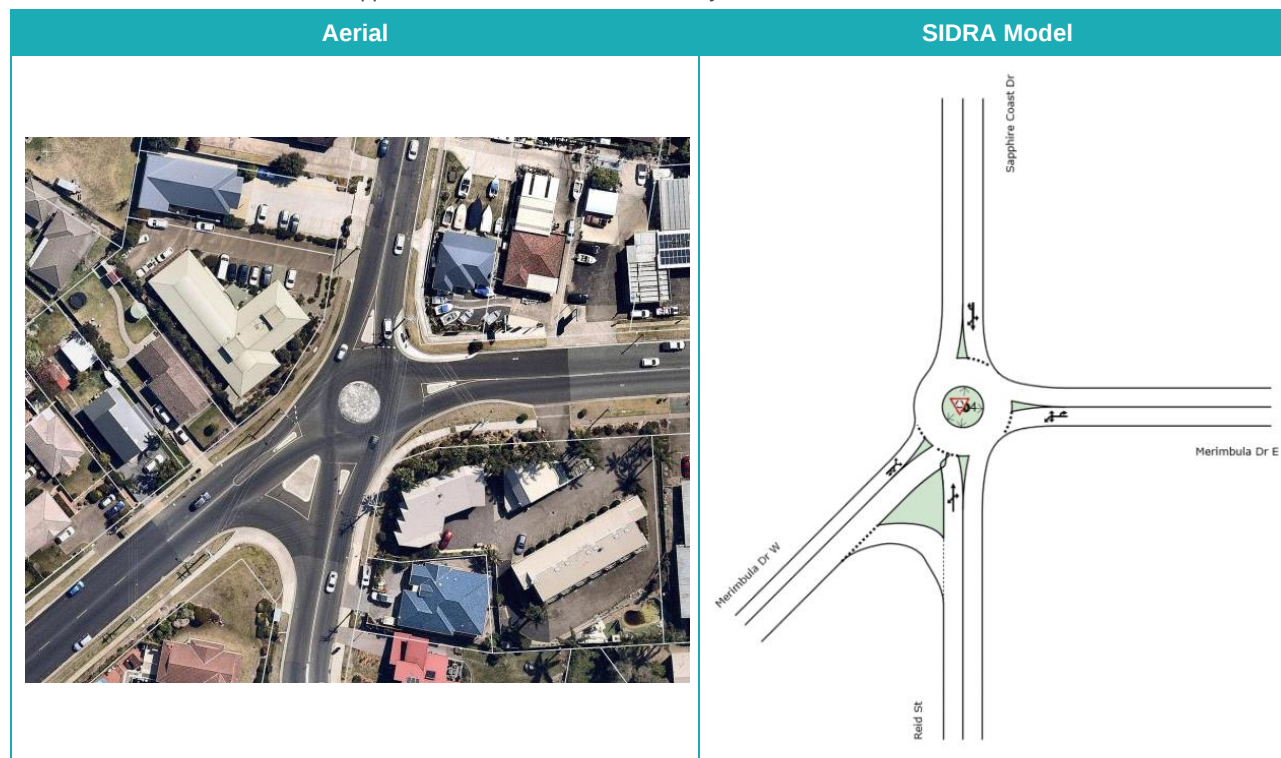
Transport for NSW guidelines state that for roundabouts and priority controlled intersections, LOS assessment should be reported based on the worst performing movement of the intersection. For traffic signals, the average movement delay and corresponding LOS over all movements should be determined and reported.

The results of the modelling assessment at each of the eight surveyed intersections in the study area across the three surveyed peak periods are outlined in the following sections.

3.3.1 Merimbula Drive / Sapphire Coast Drive / Reid Street

An aerial picture and layout of the intersection as modelled in SIDRA is shown in **Table 3-2**.

Table 3-2 Merimbula Drive / Sapphire Coast Drive / Reid Street – Layout



To ensure that the SIDRA models are a true reflection of the existing conditions, the models have been calibrated according to environmental factors such as intersection design, driver attitudes, steep gradients and visibility issues. A comparison of queue lengths is shown in **Table 3-3**.

Table 3-3 Merimbula Drive / Sapphire Coast Drive / Reid Street – Queue Length comparison

Approach	SIDRA Output (AM Peak)	Observed Queue Length (AM Peak)	SIDRA Output (PM Peak)	Observed Queue Length (PM Peak)	SIDRA Output (Holiday Peak)	Observed Queue Length (Holiday Peak)
Reid St (S)	2.0 veh	6 veh	3.0 veh	7 veh	3.3 veh	9 veh
Merimbula Dr (E)	1.2 veh	4 veh	1.6 veh	6 veh	1.8 veh	5 veh
Sapphire Coast Dr (N)	2.5 veh	14 veh	2.8 veh	11 veh	3.7 veh	12 veh
Merimbula Dr (SW)	3.9 veh	9 veh	6.9 veh	10 veh	6.0 veh	8 veh

The results of the worst performing movements during the three peak hour base models are summarised in **Table 3-4**.

Table 3-4 Merimbula Drive / Sapphire Coast Drive / Reid Street – Intersection performance

Peak Period	Turning Movement	Degree of Saturation, DoS	95 th Percentile Queue (m)	Average Delay (s)	Level of Service, LOS
AM Peak	Right turn from Merimbula Dr W into Reid St	49.9%	28.0	13.1	A
PM Peak	Right turn from Merimbula Dr W into Reid St	65.0%	49.4	18.6	B
Holiday Peak	Right turn from Merimbula Dr W into Reid St	61.6%	44.6	18.9	B

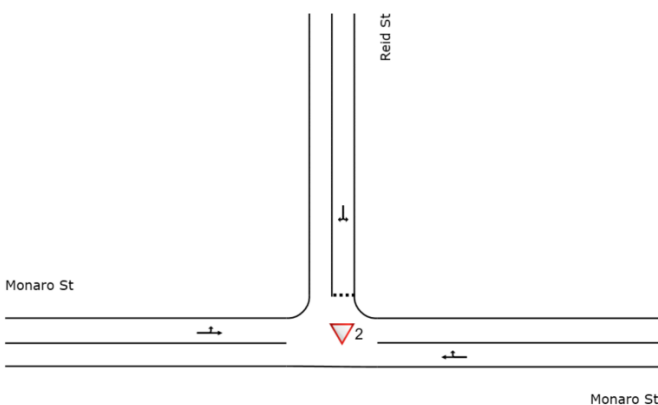
The intersection performance results presented above demonstrate the following:

- > The approach with the longest queue lengths is Sapphire Coast Drive, however the approach with the longest average delay times is Merimbula Drive West.
- > The overall vehicle count through the intersection was relatively much higher during the Holiday and PM Peaks (1,433 vehicles and 1,369 vehicles) compared to the AM Peak (1,188 vehicles).
- > Intersection performance is governed by the worst performing movement which is the right turn from Merimbula Drive West into Reid Street in all three peak hours. The AM peak hour experiences good operation at LOS A, with an average delay below 14 seconds. The PM and Holiday Peaks perform slightly poorer at LOS B, however this is still good operation with acceptable delays under 19 seconds.
- > Maximum queue lengths on the worst performing approach range between 4 to 7 vehicles across the various peak hours.
- > Degree of saturation across the peak hours is between 50 to 65%. These values are below the maximum practical degree of saturation at roundabouts (85%) and indicate sufficient capacity at the intersection.

3.3.2 Monaro Street / Reid Street

An aerial picture and layout of the intersection as modelled in SIDRA is shown in **Table 3-5**.

Table 3-5 Monaro Street / Reid Street – Layout

Aerial	SIDRA Model
	

A comparison of queue lengths is shown in **Table 3-6**.

Table 3-6 Monaro Street / Reid Street – Queue Length Comparison

Approach	SIDRA Output (AM Peak)	Observed Queue Length (AM Peak)	SIDRA Output (PM Peak)	Observed Queue Length (PM Peak)	SIDRA Output (Holiday Peak)	Observed Queue Length (Holiday Peak)
Monaro St (E)	0.1 veh	1 veh	0.1 veh	1 veh	0.2 veh	0 veh
Reid St (N)	0.1 veh	1 veh	0.1 veh	2 veh	0.1 veh	2 veh
Monaro St (W)	0 veh	0 veh	0 veh	0 veh	0 veh	0 veh

The results of the worst performing movements during the three peak hour base models are summarised in **Table 3-7**.

Table 3-7 Monaro Street / Reid Street – Intersection Performance

Peak Period	Turning Movement	Degree of Saturation, DoS	95 th Percentile Queue (m)	Average Delay (s)	Level of Service, LOS
AM Peak	Right turn from Reid St	2.2%	0.6	5.1	A
PM Peak	Right turn from Reid St	3.2%	0.8	5.3	A
Holiday Peak	Right turn from Reid St	4.0%	1.0	5.9	A

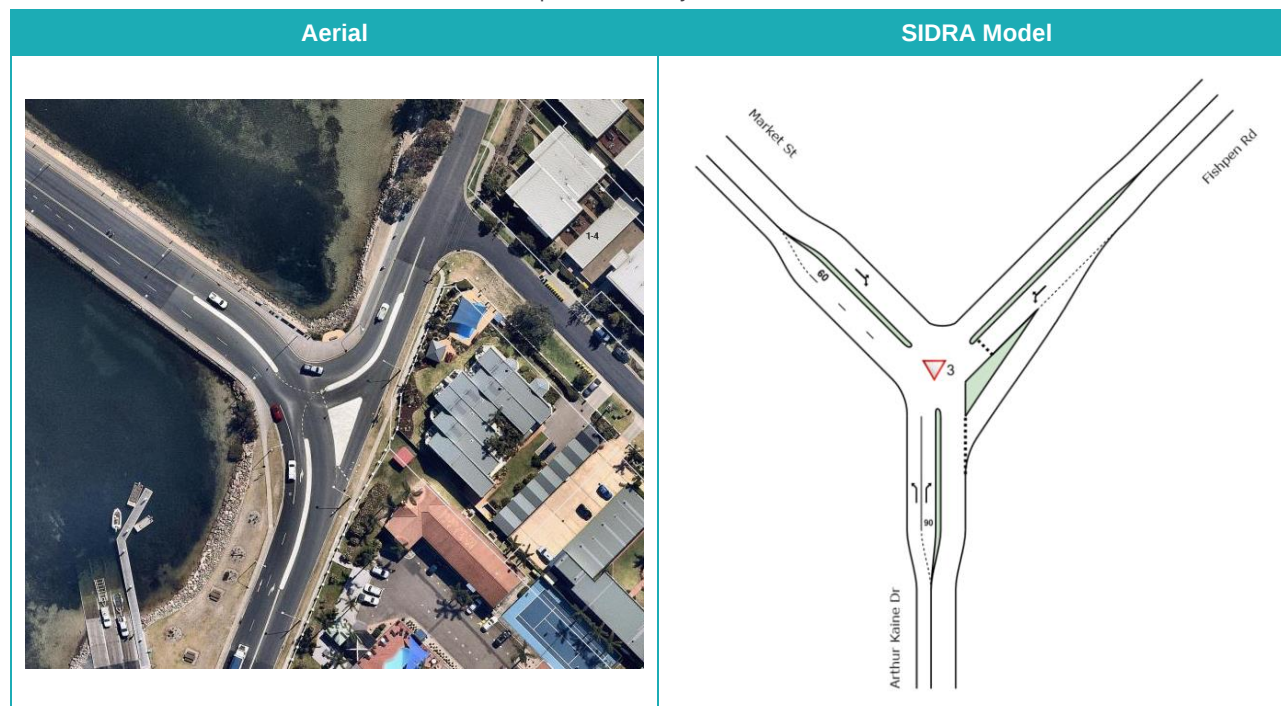
The intersection performance results presented above demonstrate the following:

- > The overall vehicle count through the intersection is fairly steady across the various peak hours, ranging between 180 to 250 vehicles.
- > Intersection performance is governed by the worst performing movement which is the right turn from the minor road (Reid Street) in all three peak hours. All peak hours experience good operation at LOS A, with average delays never exceeding 6 seconds.
- > Maximum queue lengths on the worst performing approach never exceed 2 vehicles in all peak hours.
- > Degree of saturation across the peak hours is under 10%. This is well below the maximum practical degree of saturation at sign-controlled intersections (80%) which indicates more than enough capacity at the intersection.

3.3.3 Market Street / Arthur Kaine Drive / Fishpen Road

An aerial picture and layout of the intersection as modelled in SIDRA is shown in **Table 3-8**.

Table 3-8 Market Street / Arthur Kaine Drive / Fishpen Road – Layout



To ensure that the SIDRA models are a true reflection of the existing conditions, the models have been calibrated so that the model queue lengths are similar to the observed queue lengths. A comparison of queue lengths is shown in **Table 3-9**.

Table 3-9 Market Street / Arthur Kaine Drive / Fishpen Road – Queue Length comparison

Approach	SIDRA Output (AM Peak)	Observed Queue Length (AM Peak)	SIDRA Output (PM Peak)	Observed Queue Length (PM Peak)	SIDRA Output (Holiday Peak)	Observed Queue Length (Holiday Peak)
Arthur Kaine Dr (S)	0.1 veh	1 veh	0.1 veh	0 veh	0.2 veh	2 veh
Fishpen Rd (NE)	1.5 veh	3 veh	1.1 veh	4 veh	7.6 veh	8 veh
Market St (NW)	0 veh	0 veh	0 veh	0 veh	0 veh	0 veh

The results of the worst performing movements during the three peak hour base models are summarised in **Table 3-10**.

Table 3-10 Market Street / Arthur Kaine Drive / Fishpen Road – Intersection performance

Peak Period	Turning Movement	Degree of Saturation, DoS	95 th Percentile Queue (m)	Average Delay (s)	Level of Service, LOS
AM Peak	Right turn from Fishpen Rd	37.2%	10.5	19.0	B
PM Peak	Right turn from Fishpen Rd	29.7%	7.7	19.7	B
Holiday Peak	Right turn from Fishpen Rd	91.5%	53.5	73.5	F

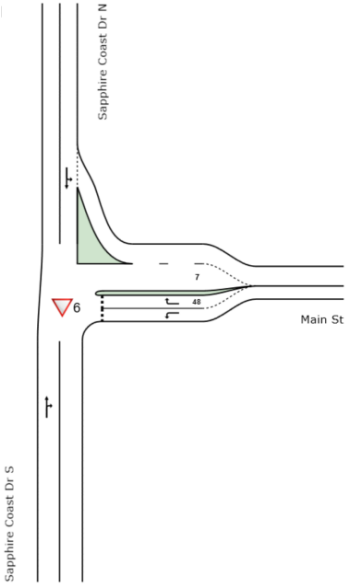
The intersection performance results presented above demonstrate the following:

- > The overall vehicle count through the intersection was relatively higher during the Holiday Peak (1,329 veh) compared to the AM and PM Peaks (958 veh and 967 veh).
- > Intersection performance is governed by the worst performing movement which is the right turn from the minor road (Fishpen Road) in all three peak hours. Whilst the AM and PM peak hours generally perform well at LOS B with acceptable delays between 19 to 20 seconds, the Holiday Peak performs unsatisfactorily at LOS F with delays over 70 seconds for vehicles turning right out of Fishpen Road.
- > Maximum queue lengths on the worst performing approach range between 3 to 4 vehicles across typical AM and PM peak hours, however the maximum queue length during the Holiday Peak was 8 vehicles.
- > Degree of saturation across typical AM and PM peak hours is between 30 to 40%, which is below the maximum practical degree of saturation at sign-controlled intersections (80%), indicating sufficient capacity. During the Holiday Peak, degree of saturation (91.5%) is above the acceptable limit, indicating that the intersection may need additional capacity / intersection improvements to cater for the increased traffic during the holiday period.

3.3.4 Sapphire Coast Drive / Main Street

An aerial picture and layout of the intersection as modelled in SIDRA is shown in **Table 3-11**.

Table 3-11 Sapphire Coast Drive / Main Street – Layout

Aerial	SIDRA Model
	

A comparison of queue lengths is shown in **Table 3-12**.

Table 3-12 Sapphire Coast Drive / Main Street – Queue Length comparison

Approach	SIDRA Output (AM Peak)	Observed Queue Length (AM Peak)	SIDRA Output (PM Peak)	Observed Queue Length (PM Peak)	SIDRA Output (Holiday Peak)	Observed Queue Length (Holiday Peak)
Sapphire Coast Dr (S)	2.6 veh	3 veh	2.9 veh	4 veh	3.1 veh	4 veh
Main St (E)	1.8 veh	4 veh	1.4 veh	5 veh	3.2 veh	6 veh
Sapphire Coast Dr (N)	0 veh	0 veh	0 veh	0 veh	0 veh	0 veh

The results of the worst performing movements during the three peak hour base models are summarised in **Table 3-13**.

Table 3-13 Sapphire Coast Drive / Main Street – Intersection performance

Peak Period	Turning Movement	Degree of Saturation, DoS	95 th Percentile Queue (m)	Average Delay (s)	Level of Service, LOS
AM Peak	Right turn from Main St	46.3%	12.5	24.0	B
PM Peak	Right turn from Main St	42.0%	10.2	30.5	C
Holiday Peak	Right turn from Main St	71.5%	22.9	41.6	C

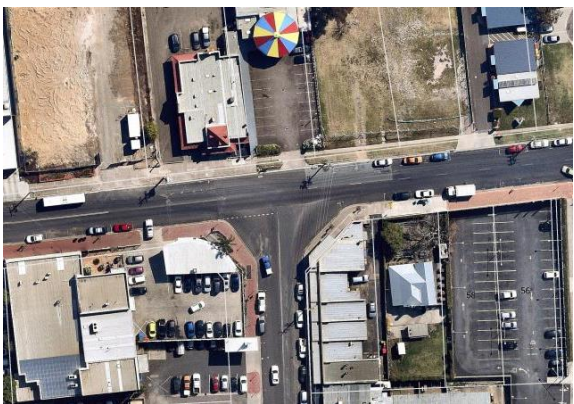
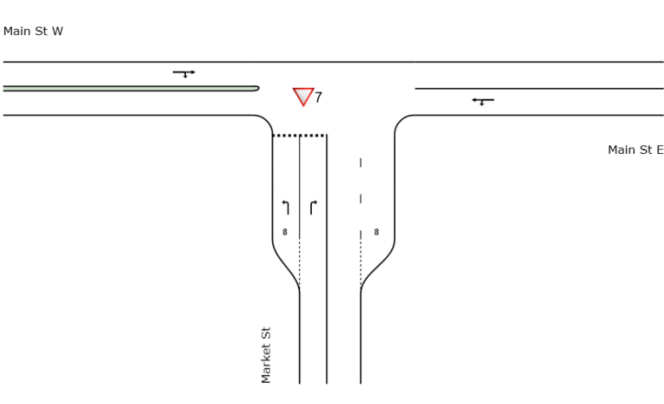
The intersection performance results presented above demonstrate the following:

- > The overall vehicle count through the intersection was slightly higher during the Holiday Peak (1,292 vehicles) compared to the AM and PM Peaks (1,135 vehicles and 1,177 vehicles).
- > Intersection performance is governed by the worst performing movement which is the right turn from the minor road (Main Street) in all three peak hours. The AM peak hour generally performs well at LOS B with acceptable delays, whilst the PM and Holiday Peaks perform slightly poorer at LOS C, which is a satisfactory level of service with delays between 30 to 42 seconds for vehicles turning right out of Main Street.
- > Maximum queue lengths on the worst performing approach range between 4 to 6 vehicles across the various peak hours.
- > Degree of saturation across the peak hours is between 40 to 75%. Whilst the AM and PM peaks are below the maximum practical degree of saturation at sign-controlled intersections (80%), the Holiday Peak degree of saturation is close to the practical maximum. This indicates that the intersection is likely to need additional capacity / upgrade works in the near future.

3.3.5 Main Street / Market Street

An aerial picture and layout of the intersection as modelled in SIDRA is shown in **Table 3-14**.

Table 3-14 Main Street / Market Street – Layout

Aerial	SIDRA Model
	

A comparison of queue lengths is shown in **Table 3-15**.

Table 3-15 Main Street / Market Street – Queue Length Comparison

Approach	SIDRA Output (AM Peak)	Observed Queue Length (AM Peak)	SIDRA Output (PM Peak)	Observed Queue Length (PM Peak)	SIDRA Output (Holiday Peak)	Observed Queue Length (Holiday Peak)
Market St (S)	0.4 veh	3 veh	0.4 veh	4 veh	0.5 veh	5 veh
Main St (E)	0 veh	0 veh	0 veh	0 veh	0 veh	0 veh
Main St (W)	1.2 veh	6 veh	1.1 veh	4 veh	1.8 veh	9 veh

The results of the worst performing movements during the three peak hour base models are summarised in **Table 3-16**.

Table 3-16 Main Street / Market Street – Intersection Performance

Peak Period	Turning Movement	Degree of Saturation, DoS	95 th Percentile Queue (m)	Average Delay (s)	Level of Service, LOS
AM Peak	Right turn from Market St	13.7%	2.9	10.5	A
PM Peak	Right turn from Market St	14.5%	3.0	9.8	A
Holiday Peak	Right turn from Market St	15.6%	3.1	12.9	A

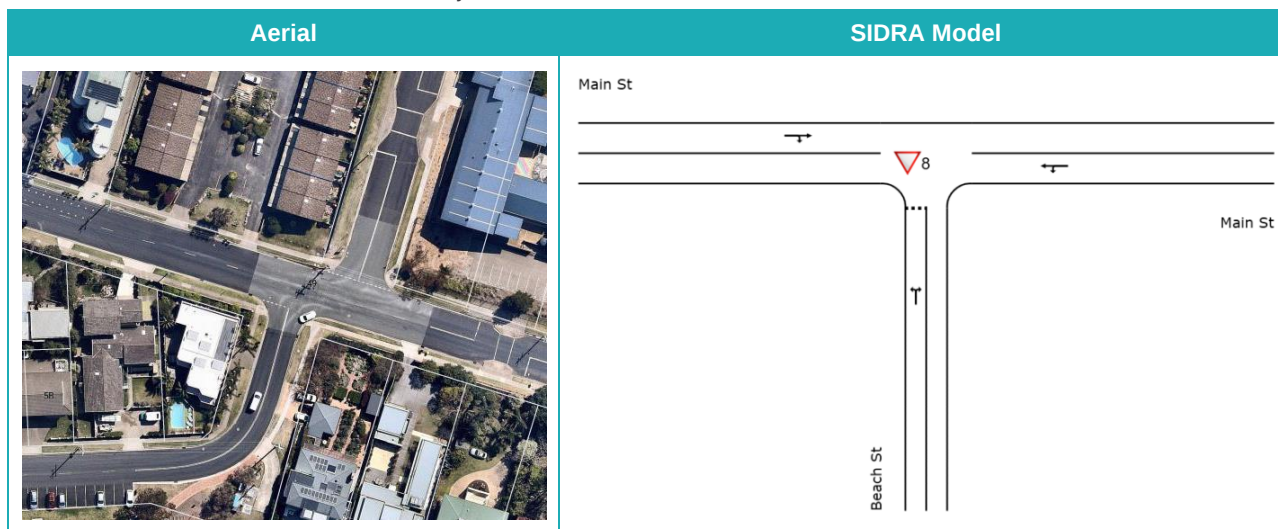
The intersection performance results presented above demonstrate the following:

- > The approach with the longest queue lengths is Main Street, however the approach with the longest average delay times is Market Street.
- > The overall vehicle count through the intersection was relatively higher during the Holiday Peak (936 vehicles) compared to the AM and PM Peaks (827 vehicles and 752 vehicles).
- > Intersection performance is governed by the worst performing movement which is the right turn from Market Street in all three peak hours. All peak hours experience good operation at LOS A, with average delays never exceeding 13 seconds.
- > Maximum queue lengths on the worst performing approach range between 3 to 5 vehicles across the various peak hours.
- > Degree of saturation across the peak hours is under 20%. This is well below the maximum practical degree of saturation at sign-controlled intersections (80%) which indicates more than enough capacity at the intersection.

3.3.6 Main Street / Beach Street

An aerial picture and layout of the intersection as modelled in SIDRA is shown in **Table 3-17**.

Table 3-17 Main Street / Beach Street – Layout



A comparison of queue lengths is shown in **Table 3-18**.

Table 3-18 Main Street / Beach Street – Queue Length comparison

Approach	SIDRA Output (AM Peak)	Observed Queue Length (AM Peak)	SIDRA Output (PM Peak)	Observed Queue Length (PM Peak)	SIDRA Output (Holiday Peak)	Observed Queue Length (Holiday Peak)
Beach St (S)	0.6 veh	4 veh	0.5 veh	2 veh	1.1 veh	4 veh
Main St (E)	0 veh	0 veh	0 veh	0 veh	0 veh	0 veh
Main St (W)	0.1 veh	0 veh	0.1 veh	0 veh	0.1 veh	2 veh

The results of the worst performing movements during the three peak hour base models are summarised in **Table 3-19**.

Table 3-19 Main Street / Beach Street – Intersection performance

Peak Period	Turning Movement	Degree of Saturation, DoS	95 th Percentile Queue (m)	Average Delay (s)	Level of Service, LOS
AM Peak	Right turn from Beach St	15.7%	3.9	7.3	A
PM Peak	Right turn from Beach St	13.7%	3.4	6.8	A
Holiday Peak	Right turn from Beach St	27.6%	7.5	9.6	A

The intersection performance results presented above demonstrate the following:

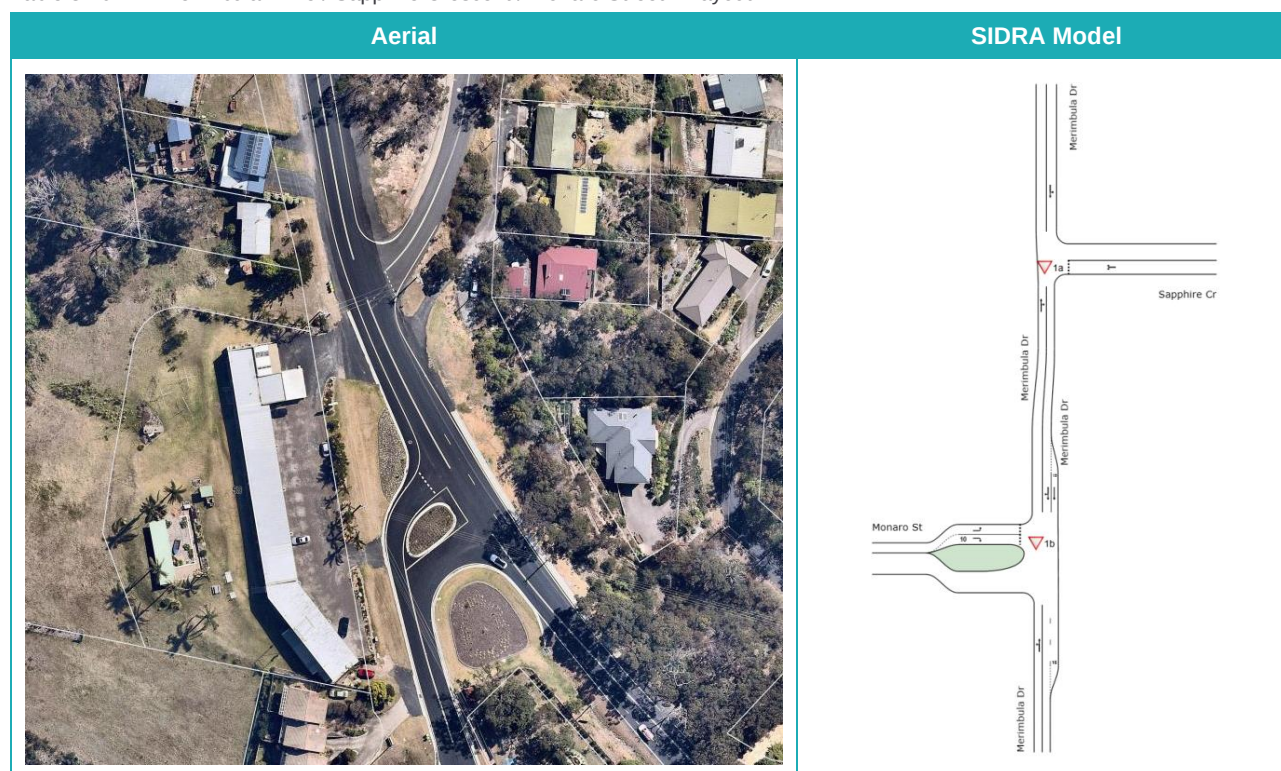
- > The overall vehicle count through the intersection was relatively higher during the Holiday Peak (606 vehicles) compared to the AM and PM Peaks (427 vehicles and 367 vehicles).
- > Intersection performance is governed by the worst performing movement which is the right turn from the minor road (Beach Street) in all three peak hours. All peak hours experience good operation at LOS A, with average delays never exceeding 10 seconds.
- > Maximum queue lengths on the worst performing approach range between 2 to 4 vehicles across the various peak hours.

- > Degree of saturation across the peak hours is under 30%. This is well below the maximum practical degree of saturation at sign-controlled intersections (80%) which indicates more than enough capacity at the intersection.

3.3.7 Merimbula Drive / Sapphire Crescent / Monaro Street

An aerial picture and layout of the intersection as modelled in SIDRA is shown in **Table 3-20**.

Table 3-20 Merimbula Drive / Sapphire Crescent / Monaro Street – Layout



A comparison of queue lengths is shown in **Table 3-21**.

Table 3-21 Merimbula Drive / Sapphire Crescent / Monaro Street – Queue Length comparison

Approach	SIDRA Output (AM Peak)	Observed Queue Length (AM Peak)	SIDRA Output (PM Peak)	Observed Queue Length (PM Peak)	SIDRA Output (Holiday Peak)	Observed Queue Length (Holiday Peak)
Merimbula Dr (S)	0.2 veh	2 veh	0.4 veh	1 veh	0.3 veh	2 veh
Sapphire Cr (E)	0.1 veh	1 veh	0.2 veh	2 veh	0.1 veh	2 veh
Merimbula Dr (N)	0.3 veh	1 veh	0.4 veh	3 veh	0.3 veh	1 veh
Monaro St (W)	0.2 veh	2 veh	0.2 veh	2 veh	0.5 veh	2 veh

The results of the worst performing movements during the three peak hour base models are summarised in **Table 3-22**.

Table 3-22 Merimbula Drive / Sapphire Crescent / Monaro Street – Intersection performance

Peak Period	Turning Movement	Degree of Saturation, DoS	95 th Percentile Queue (m)	Average Delay (s)	Level of Service, LOS
AM Peak	Right turn from Monaro St	5.3%	1.4	8.2	A
PM Peak	Right turn from Sapphire Cr	5.4%	1.4	11.4	A
Holiday Peak	Right turn from Monaro St	14.0%	3.4	15.2	B

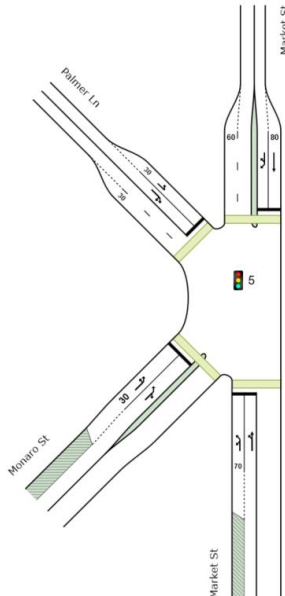
The intersection performance results presented above demonstrate the following:

- > The overall vehicle count through the intersection was relatively higher during the PM Peak (724 vehicles) compared to the Holiday and AM Peaks (586 vehicles and 612 vehicles). This varies from the other intersections, where the Holiday Peak has generally produced the highest traffic counts.
- > Intersection performance is governed by the worst performing movement which is the right turn from Monaro Street in the Holiday and AM Peaks, and the right turn from Sapphire Crescent in the PM Peak. The AM and PM peak hours experience good operation at LOS A, with average delays never exceeding 12 seconds. The Holiday Peak performs slightly poorer at LOS B, however this is still good operation with acceptable delays under 16 seconds.
- > Maximum queue lengths on the worst performing approaches never exceed 2 vehicles in all peak hours.
- > Degree of saturation across the peak hours is under 20%. This is well below the maximum practical degree of saturation at sign-controlled intersections (80%) which indicates more than enough capacity at the intersection.

3.3.8 Market Street / Palmer Lane / Monaro Street

An aerial picture and layout of the intersection as modelled in SIDRA is shown in **Table 3-23**.

Table 3-23 Market Street / Palmer Lane / Monaro Street – Layout

Aerial	SIDRA Model
	

A comparison of queue lengths is shown in **Table 3-24**.

Table 3-24 Market Street / Palmer Lane / Monaro Street – Queue Length comparison

Approach	SIDRA Output (AM Peak)	Observed Queue Length (AM Peak)	SIDRA Output (PM Peak)	Observed Queue Length (PM Peak)	SIDRA Output (Holiday Peak)	Observed Queue Length (Holiday Peak)
Market St (S)	12.8 veh	18 veh	14.0 veh	16 veh	24.8 veh	17 veh
Market St (N)	9.1 veh	16 veh	7.4 veh	9 veh	17.9 veh	15 veh
Palmer Ln (NW)	4.4 veh	6 veh	3.3 veh	4 veh	8.0 veh	7 veh
Monaro St (SW)	1.8 veh	5 veh	1.7 veh	4 veh	2.6 veh	6 veh

The results of the worst performing movements during the three peak hour base models are summarised in **Table 3-25**.

Table 3-25 Market Street / Palmer Lane / Monaro Street – Intersection performance

Peak Period	Leg	Turning Movement	Degree of Saturation, DoS	95 th Percentile Queue (m)	Average Delay (s)	Level of Service, LOS
AM Peak	Market St (S)	Left	19.2%	17.4	23.1	B
		Through	78.1%	90.8	27.7	B
		Right	78.1%	90.8	26.8	B
	Market St (N)	Left	74.6%	64.9	31.9	C
		Through	33.7%	20.2	31.8	C
		Right	33.7%	20.2	34.2	C
	Palmer Ln (NW)	Left	6.0%	4.8	23.0	B
		Through	27.8%	31.4	15.9	B
		Right	27.8%	31.4	17.4	B
	Monaro St (SW)	Left	11.8%	8.9	29.0	C
		Through	31.3%	13.6	30.9	C
		Right	31.3%	13.6	38.4	C
Overall		78.1%	90.8	27.0	B	
PM Peak	Market St (S)	Left	19.7%	16.1	20.4	B
		Through	80.1%	100.3	26.3	B
		Right	80.1%	100.3	23.3	B
	Market St (N)	Left	85.0%	53.0	34.7	C
		Through	34.2%	14.7	30.2	C
		Right	34.2%	14.7	32.6	C
	Palmer Ln (NW)	Left	4.7%	3.6	19.4	B
		Through	22.7%	24.6	13.4	A
		Right	22.7%	24.6	14.9	B
	Monaro St (SW)	Left	16.6%	8.7	29.7	C
		Through	43.9%	12.2	32.0	C

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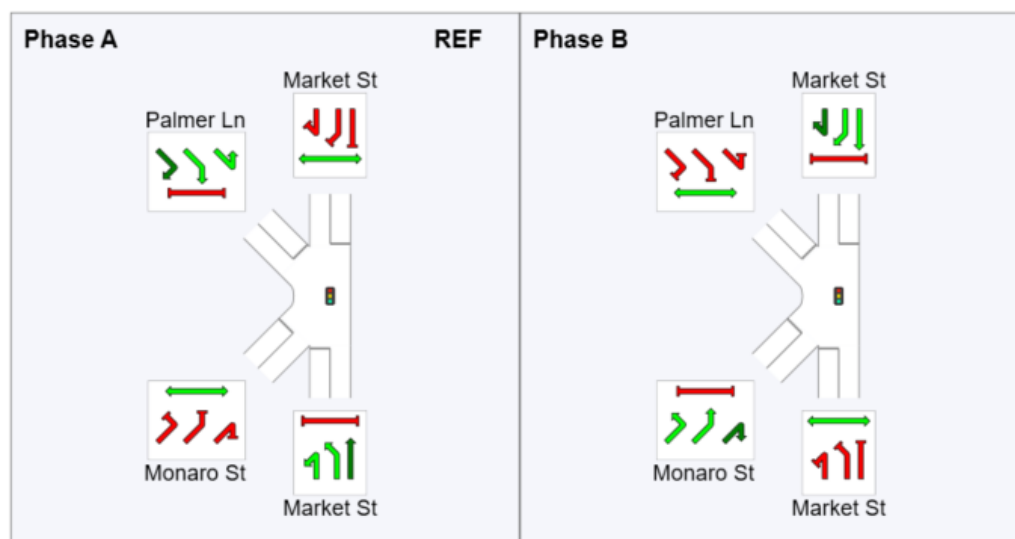
Peak Period	Leg	Turning Movement	Degree of Saturation, DoS	95 th Percentile Queue (m)	Average Delay (s)	Level of Service, LOS
		Right	43.9%	12.2	37.5	C
	Overall		85.0%	100.3	25.5	B
Holiday Peak	Market St (S)	Left	21.3%	35.1	22.1	B
		Through	86.7%	178.2	36.3	C
		Right	86.7%	178.2	40.4	C
	Market St (N)	Left	84.1%	126.4	47.9	D
		Through	32.1%	29.5	43.2	D
		Right	32.1%	29.5	45.5	D
	Palmer Ln (NW)	Left	5.6%	7.6	23.7	B
		Through	31.7%	58.0	17.7	B
		Right	31.7%	58.0	19.4	B
	Monaro St (SW)	Left	12.9%	15.7	36.7	C
		Through	34.2%	18.3	40.3	C
		Right	34.2%	18.3	53.1	D
	Overall		86.7%	178.2	36.1	C

The intersection performance results presented above demonstrate the following:

- > The overall vehicle count through the intersection was relatively much higher during the Holiday Peak (1,437 vehicles) compared to the AM and PM Peaks (1,085 vehicles and 1,107 vehicles).
- > Intersection performance at traffic signals is governed by the average movement delay over all movements. The AM and PM peak hours perform well at LOS B with acceptable delays between 25 to 27 seconds (on average). The Holiday Peak performs more poorly at LOS C, however this is considered a satisfactory level of service.
- > Across all three peak periods, the approaches with the longest delays were Market Street North and Monaro Street. The delays in Market Street North are of particular significance given the much higher degree of saturation compared to Monaro Street. Degree of saturation in Market Street North ranged between 75 to 85%, whilst degree of saturation in Monaro Street ranged between 30 to 45%.
- > The longest queue lengths were observed on the Market Street North and South approaches to the intersection, ranging between 15 to 18 vehicles across most peak hours.
- > Average degree of saturation across the peak hours is between 78 to 87%, which is just below the maximum practical degree of saturation at signals (90%), indicating that the intersection is close to reaching its capacity.

The traffic signal phasing used in all three models is shown below in **Figure 3-1**.

Figure 3-1 SIDRA signal phasing



The phase and cycle times used in the models are shown in **Table 3-26**.

Table 3-26 Phase Times

	Cycle Time (user-given)	Phase A	Phase B
AM Peak	70s	38s	32s
PM Peak	60s	35s	25s
Holiday Peak	100s	59s	41s

3.3.9 Summary

A summary of the level of service modelling results at each intersection is summarised in **Table 3-27**. Intersection treatments are recommended for LoS D, E and F.

Table 3-27 Level of Service Modelling Summary

	AM Peak	PM Peak	Holiday Peak
Merimbula Drive / Sapphire Coast Drive / Reid Street	A	B	B
Monaro Street / Reid Street	A	A	A
Market Street / Arthur Kaine Drive / Fishpen Road	B	B	F
Sapphire Coast Drive / Main Street	B	C	C
Main Street / Market Street	A	A	A
Main Street / Beach Street	A	A	A
Merimbula Drive / Sapphire Crescent / Monaro Street	A	A	B
Market Street / Palmer Lane / Monaro Street	B	B	C

4 Conclusion

Eight intersections within the Merimbula Study Area have been surveyed, modelled and calibrated for three peak hours (AM Peak, PM Peak and Holiday Peak) to determine how well each intersection is currently performing. Most intersections generally displayed good operation at LOS A or B over the three peak hours.

The sign-controlled intersection of Sapphire Coast Drive / Main Street showed satisfactory average delay times for drivers turning right out of Main Street in the PM and Holidays Peaks, however the Holiday Peak is nearing its maximum practical degree of saturation and hence approaching an unsatisfactory level of service. This indicates a need to investigate how to improve performance at this location.

The sign-controlled intersection of Market Street / Arthur Kaine Drive / Fishpen Road showed unsatisfactory average delay times for drivers turning right out of Fishpen Road, only during the Holiday Peak. This reflects the higher usage of the Fishpen precinct during the summer period.

Similarly, the signalised intersection of Market Street / Palmer Lane / Monaro Street showed a decline in level of service during the Holiday Peak due to an increase in traffic. Whilst queue lengths on the northern and southern approaches to the intersection are long, the intersection still performs satisfactorily at LOS C during the Holiday Peak. Alterations to the signal phasing may assist in reducing queues and improving level of service.